TAMPERE.
FINLAND

CLIMATE NEUTRAL TAMPERE 2030

ROADMAP

Tampere City Board 4 November 2024

TAMPERE

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Image: Visit Tampere Oy/Laura Vanzo

MAYOR'S FOREWORD

The Climate Neutral Tampere 2030 roadmap brings together measures to ensure well-being and a smooth, sustainable everyday life

Globally, the majority of climate emissions occur in cities, as they are population centres. Cities play an important role in mitigating climate change. In their everyday work, cities continuously make decisions that can either mitigate or increase emissions.

Tampere's appeal is attracting new residents to the city at an increasing pace. At the end of 2023, Tampere was home to 255,050 people, approximately 50,000 of whom were aged 20–29. Tampere is a city of action that is used to taking on challenges – this is a city where words are actually put into practice. Due to its young population, Tampere is also particularly capable of change.

Tampere takes care of the environment and works actively for the benefit of climate and biodiversity. Our efforts are also widely known internationally. The growing understanding of the link between climate change and biodiversity loss further underlines the importance of this Climate Neutral Tampere 2030 roadmap.

Image: Visit Tampere Oy / Tampere Taivaalta

Tampere a pioneer on an international scale

In spring 2024, Tampere was awarded the EU's Mission Label for impressive climate work. Only 53 European cities have been honoured in this way. When awarding the label, the European Commission praised the Climate Neutral Tampere 2030 roadmap in particular, for its comprehensive measures and the preparation of the package in cooperation with the city's units and subsidiaries.

In the summer, we were appointed to the EU Cities Mission Mayors Advisory Group. The advisory group, which consists of 17 mayors, has a direct dialogue with the European Commission and NetZeroCities, which coordinates EU's Cities Mission. International action with mayors from other EU countries further strengthens our city's position as a desirable partner for solving common challenges.

Climate work promotes welfare

Tampere's goal is to promote the well-being of residents and narrow welfare gaps. When we take convincing and effective climate measures, the well-being of city residents improves. In the Climate Neutral Tampere 2030 roadmap update, in addition to mitigating climate emissions, more attention was paid to climate change adaptation and to climate measures that promote the circular economy.

Extreme weather phenomena caused by climate change, such as storms, abundant snowfall and heatwaves, set new challenges for everyday life. For example, mitigating the heat island phenomenon by developing green areas and communicating to residents about how they can be prepared is important. Supporting a sustainable lifestyle will improve the well-being of both people and nature.

Building a climate-neutral Tampere together

The Carbon Neutral Actions development programme engages residents and stakeholders in the climate work carried out by the city. The city enables sustainable choices, which is reflected in the roadmap, especially under the theme of sustainable consumption. As well as fostering biodiversity and the circular economy, this programme aims to achieve significant reductions in emissions from mobility and consumption. Together, we will be the home of a sustainable future and show others the way.

Image 1 Mayor Kalervo Kummola.

INTRODUCTION AND SUMMARY

You are holding in your hands the second update to the Climate Neutral Tampere 2030 roadmap. The roadmap to be prepared in cooperation with the various city units and subsidiaries is updated every two years; the first version was approved in 2020. The Climate and Environmental Policy Unit is responsible for the drafting process.

The roadmap describes the city's steps in achieving climate neutrality by 2030. In the updates, the 236 measures of the first roadmap have been updated as needed and new measures have been added. The new measures also feature an increasing number of climate actions by subsidiary entities. The wide range of actions taken by city residents, businesses and communities, or by the state and other public bodies, are not described in this roadmap.

The measures have been compiled into seven themes. Six of them are the same as in previous updates of the roadmap: Sustainable Urban Planning, Sustainable Transport System, Sustainable Construction, Sustainable Energy, Sustainable Consumption and Sustainable Urban Nature. These themes arise from the City of Tampere's environmental policy, the Sustainable Tampere 2030 Guidelines. In addition to these, the roadmap was supplemented in 2022 with a cross-cutting theme of climate work coordination, the name of which is now Climate Leadership and Stakeholder Collaboration.

At the beginning of each theme, the main objective and a summary of the theme's measures are provided. Then comes a description of the theme's objectives and indicators used to monitor the achievement of the objectives. They cover the main sources of emissions that the city can influence.

Perspectives of climate change adaptation, circular economy and biodiversity have been strengthened

The perspective employed in the first roadmap was restricted to climate change mitigation, but the updates also include climate change adaptation measures. Likewise, circular economy measures have been included and separately marked in this 2024 update. The Sustainable Urban Nature theme increasingly shows the interlinking between climate change mitigation and biodiversity protection and the intertwining of phenomena.

The driving idea remains that these measures must not undermine the ecological, social, economic and cultural dimensions of sustainable development. In this update of the roadmap, the Sustainable Development Goals (SDGs) promoted by the measures are identified and presented with the icons of the UN Agenda 2030 targets for each set of measures.

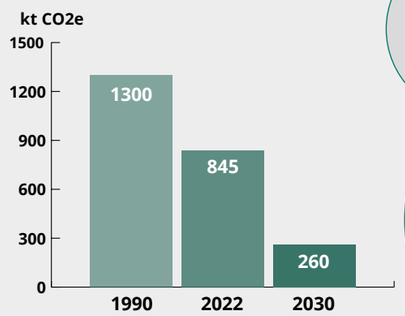
80% emissions reduction is possible

In 2022, Tampere's greenhouse gas emissions decreased by 35% in comparison to the 1990 level. The city's measures now included in the roadmap are expected to achieve a 77.5% emissions reduction by 2030. It is possible to make rough estimates of what other changes would reduce climate emissions more than predicted.

For example, if road transport emissions are reduced or industry abandons the use of fossil fuels in work machinery, this will have a significant impact on overall emissions. Projections on scenarios that could achieve the 80% emissions reduction target are presented in chapter 5.

Rough cost estimates, represented by circle symbols, were prepared for every measure discussed in the roadmap. In addition, more precise cost estimates (Appendix 2) have been compiled for some of the measures, as well as cost-effectiveness calculations (Chapter 5).

The 80% reduction required for climate neutrality necessitates ambitious and sustained climate work on the part of the city. In cooperation with businesses, communities and local residents, however, we can achieve it. The roadmap, and the roadmap impact assessment, will also be updated in future as information becomes available on the impacts the measures have and on new practices and solutions.



Tampere's greenhouse gas emissions in 1990 and 2022. Target 2030.

Goal

Climate Neutral Tampere 2030

80% climate emissions reduction

+

20% compensation of climate emissions and carbon sinks

Why?

City of action

Tampere City Strategy 2030, Sustainable Tampere 2030 guidelines, EU Mission: 100 Climate-Neutral and Smart Cities as well as the UN's 2030 Agenda for Sustainable Development guide the city towards and oblige it to achieve climate neutrality.

Future

Climate change mitigation, adaptation and preparedness, biodiversity loss reversal and the promotion of sustainable development are absolutely crucial for a safe future.

Result 77.5%

The city's measures described in the roadmap for which the emissions reduction can be estimated have the potential to achieve a 77.5% emissions reduction by 2030. The roadmap also shows what changes can be made to achieve the 80% emissions reduction target.

How?

Roadmap measures are divided into 7 themes:

0. Climate leadership and stakeholder collaboration
1. Sustainable urban planning
2. Sustainable mobility
3. Sustainable construction
4. Sustainable energy
5. Sustainable consumption
6. Sustainable urban nature

Total number of measures is 397

Climate and Environmental Watch

Follow the progress of the roadmap measures and the reduction of emissions from the Tampere Climate and Environmental Watch at ilmastovahti.fi.

Biodiversity

Climate change and biodiversity loss are elements of the same crisis. The Tampere Biodiversity Programme includes the city's measures to prevent loss of biodiversity.

READING INSTRUCTIONS

It is advisable to read the roadmap one full spread at a time.

The opening spreads of the themes first provide the theme's main objective and then the key measures. After that comes a description of the measures that have been compiled for the theme. The strategy, policies and various commitments that the theme as a whole implements are compiled in Appendix 3.

On the right page of the spread is a table that has the descriptions of the theme's objectives and the indicators with which the realisation of the objectives is monitored. Figures on the development of the indicators are visible, if possible. The value of 2025 is the intermediate target and the value of 2030 is the actual target to be achieved. They appear in the rightmost columns of the table and are highlighted in a different colour.

Below the quantitative objectives, marked with the same base colour, are the qualitatively expressed objectives. There is no single indicator for monitoring them.

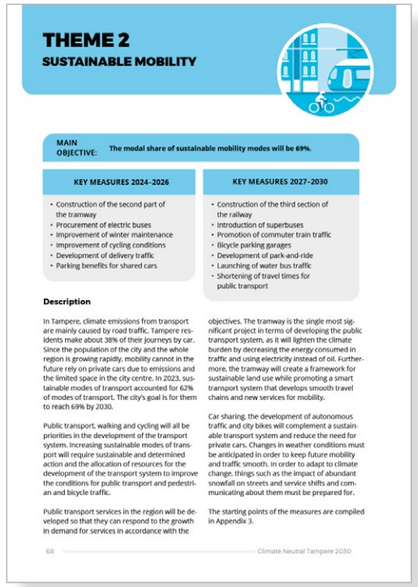
At the bottom of the right page of the theme spread, other benefits are recorded that have been brought by the theme measures in addition to emission reductions, such as a reduction in urban noise or more efficient use of urban space. In this roadmap, the themes are represented by different colours.

Each theme includes several sets of measures. They cover the main sources of emissions that the city can influence.

Main objective: The theme's main objective based on the Tampere 2030 policies.

Key measures of the theme: excerpts from the measures of the theme in 2024–2025 and in 2026–2030.

Description of the theme and how its measures reduce carbon emissions.


THEME 2
SUSTAINABLE MOBILITY

MAIN OBJECTIVE: The modal share of sustainable mobility modes will be 69%.

KEY MEASURES 2024-2026
- Construction of the second part of the tramway
- Procurement of electric buses
- Improvement of winter maintenance
- Improvement of cycling conditions
- Development of delivery traffic
- Parking benefits for shared cars

KEY MEASURES 2027-2030
- Construction of the third section of the railway
- Introduction of superbuses
- Promotion of commuter train traffic
- Bicycle parking garages
- Development of park-and-ride
- Launching of water bus traffic
- Shortening of travel times for public transport

Description

In Tampere, climate emissions from transport are mainly caused by road traffic. Tampere residents make about 38% of their journeys by car. Since the population of the city and the whole region is growing rapidly, mobility cannot in the future rely on private cars due to emissions and the limited space in the city centre. In 2023, sustainable modes of transport accounted for 62% of modes of transport. The city's goal is for them to reach 69% by 2030.

Public transport, walking and cycling will all be priorities in the development of the transport system. Increasing sustainable modes of transport will require sustainable and determined action and the allocation of resources for the development of the transport system to improve the conditions for public transport and pedestrian and bicycle traffic.

Public transport services in the region will be developed so that they can respond to the growth in demand for services in accordance with the objectives. The tramway is the single most significant project in terms of developing the public transport system, as it will lighten the climate burden by decreasing the energy consumed in traffic and using electricity instead of oil. Furthermore, the tramway will create a framework for sustainable land use while promoting a smart transport system that develops smooth travel chains and new services for mobility.

Car sharing, the development of autonomous traffic and city bikes will complement a sustainable transport system and reduce the need for private cars. Changes in weather conditions must be anticipated in order to keep future mobility and traffic smooth. In order to adapt to climate change, things such as the impact of abundant snowfall on streets and service shifts and communicating about them must be prepared for.

The starting points of the measures are compiled in Appendix 3.

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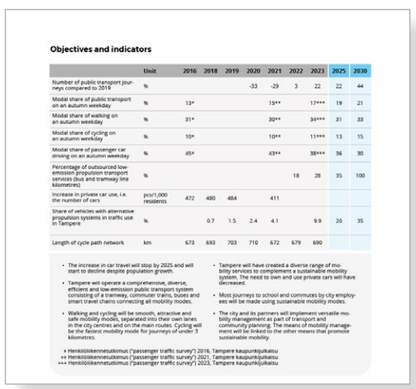

Objectives and indicators

	Unit	2016	2018	2019	2020	2021	2022	2023	2025	2030
Number of public transport journeys compared to 2019	%				-33	-29	3	22	22	44
Modal share of public transport on an autumn weekday	%	13*				15**		17***	19	21
Modal share of walking on an autumn weekday	%	31*				30**		34***	31	33
Modal share of cycling on an autumn weekday	%	10*				10**		11***	13	15
Modal share of passenger car driving on an autumn weekday	%	45*				43**		38***	36	30
Percentage of outsourced low-emission propulsion transport services (bus and tramway line kilometres)	%						18	28	35	100
Increase in private car use, i.e. the number of cars	pcs/1,000 residents	472	480	484		411				
Share of vehicles with alternative propulsion systems in traffic use in Tampere	%		0.7	1.5	2.4	4.1		9.9	20	35
Length of cycle path network	km	673	693	703	710	672	679	690		

- The increase in car travel will stop by 2025 and will start to decline despite population growth.
- Tampere will operate a comprehensive, diverse, efficient and low-emission public transport system consisting of a tramway, commuter trains, buses and smart travel chains connecting all mobility modes.
- Walking and cycling will be smooth, attractive and safe mobility modes, separated into their own lanes in the city centres and on the main routes. Cycling will be the fastest mobility mode for journeys of under 5 kilometres.
- Tampere will have created a diverse range of mobility services to complement a sustainable mobility system. The need to own and use private cars will have decreased.
- Most journeys to school and commutes by city employees will be made using sustainable mobility modes.
- The city and its partners will implement versatile mobility management as part of transport and community planning. The means of mobility management will be linked to the other means that promote sustainable mobility.

* Henkilöliikennetutkimus ("passenger traffic survey") 2016, Tampere kaupunkijulkaisu
** Henkilöliikennetutkimus ("passenger traffic survey") 2021, Tampere kaupunkijulkaisu
*** Henkilöliikennetutkimus ("passenger traffic survey") 2023, Tampere kaupunkijulkaisu

Objectives and indicators with which the realisation of the theme can be monitored.

Verbal objectives

The sets of measures, provided on the left page of the spread, present a short introduction and emission reduction target presented with ball symbols.

Below them, the UN Sustainable Development Agenda 2030 symbols have been used to tell which sustainable development goals the measures promote.

The measures are numbered and their title is bolded. The measures may have sub-sections to facilitate the monitoring of their progress. The next column contains the timetable of the measure by council term. The measure tables also include 70 measures that have already been completed and 48 measures that are linked to routine work. In the layout, these more than 100 measures are distinguished by a coloured background.

The party that bears the main responsibility for the measure is in bold. Estimates of the cost of the measure are provided. They are marked with ball points.

The rightmost column indicates with letters whether the measure promotes climate change mitigation (M), climate change adaptation (A), or the circular economy (C).

Some of the measures are explained further with examples. The more precise emission and cost effects are brought together at the end of the roadmap, in Chapter 5. In most cases, it is possible to make at least a rough estimate of the emission impact, but this is not always possible. The focus in the cost analyses is on the measures' direct costs that affect the city's finances, both in terms of investments and the operational economy. All cost estimates are based on data obtained from the units, public utilities and entities that are part of the city organisation. Often, measures set out in the roadmap are also taken largely for non-climate related reasons, which should be borne in mind when examining the figures.

Theme number and name

Number, title and description of the measure set

Emission reduction estimate of the set of measures presented as ball symbols (see legend on page 23).

Symbols of the UN Agenda 2030's sustainable development goals; the objectives that the set of measures promotes.

The **measures**, their timetable by council term and the responsible parties. The main responsible party is in bold. The measure has been given a cost estimate (see legend on page 23), and letter symbols are used to indicate whether the measure and its subsections promotes *climate change mitigation (M), climate change adaptation (A), or the circular economy (C).*

Measures either completed or Moved to routine work are distinguished with a coloured background.


THEME 2 - SUSTAINABLE TRANSPORT SYSTEM

Measure package 2.1
Tram traffic

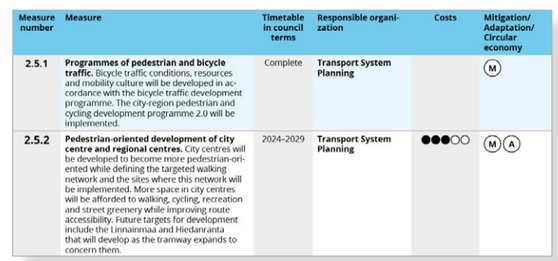
The construction of the tramway will continue. The second section, Pyynikintori–Santalahti–Lentävänniemi, will be built and the implementation plan for the third section, Pirkkala–Linnainmaa, will be completed. A project plan will be made for the Tampere–Ylöjärvi tramway.

The tramway and, for example, the extension of trams and the purchase of superbuses that complement the tramway are part of a long-term plan to increase the passenger volume of public transport.

EMISSION REDUCTION ●●●○○

Image: Visit Tampere/Otto Kivistö

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.1.1	**First tramway section.** The first section of the tramway (Hervanta–Pyynikintori–Tays) will be completed and will start operating in August 2021.	Complete	Tampere Tramway Ltd.		M
2.1.2	**Tramway traffic Keskustori–Sorin aukio.** Traffic on the Hatanpää highway tramway section Keskustori–Sorin aukio square will start in 2021.	Complete	Tampere Tramway Ltd.		M
2.1.3	**Second tramway section.** The second section of the tramway will be constructed. Traffic on section 2A (Pyynikintori–Santalahti) may launched on 7 August 2023 , and on section 2B (Santalahti–Lentävänniemi) it will start on 7 January 2025.	2024–2025	Tampere Tramway Ltd.	●●●●	M
2.1.4	**A regional master plan for the tramway will be drawn up (Kangasala, Pirkkala, Ylöjärvi).**	Complete	Tramway Development Programme		M
2.1.5	**Plan for the Tampere and Pirkkala tramway.** The Tampere–Ylöjärvi tramway project plan assignment will have been fully completed by 30 April 2024.	Complete	Tampere Tramway Ltd.		M


Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.5.1	**Programmes of pedestrian and bicycle traffic.** Bicycle traffic conditions, resources and mobility culture will be developed in accordance with the bicycle traffic development programme. The city-region pedestrian and cycling development programme 2.0 will be implemented.	Complete	Transport System Planning		M
2.5.2	**Pedestrian-oriented development of city centre and regional centres.** City centres will be developed to become more pedestrian-oriented while defining the targeted walking network and the sites where this network will be implemented. More space in city centres will be afforded to walking, cycling, recreation and street greenery while improving route accessibility. Future targets for development include the Linnainmaa and Hiedanranta that will develop as the tramway expands to concern them.	2024–2029	Transport System Planning	●●●○○	M A

DEFINITIONS AND ABBREVIATIONS

Definition/abbreviation	Legend
Alternative/sustainable/ clean propulsion	Propulsion that replaces the fossil fuels petrol and diesel, such as electricity, biogas, hydrogen, ethanol and renewable diesel.
Biodiversity (LUMO)	Biodiversity includes the diversity of living nature from the perspective of ecosystems, species and the genetic variation within species.
Biofuels	Fuels made of organic and renewable materials such as wood, logging waste or plants.
Blue-green infrastructure	The city's green and water areas together form the city's blue-green infrastructure. The blue-green infrastructure facilitated adaptation to climate change by, for example, helping to delay storm-waters and reduce temperatures, and enabling plants and animals to move to new habitats in a changing climate.
Blue-green structure	Entities and networks related to vegetative areas, natural waters and stormwater (e.g. green networks), as well as individual parts and structures (e.g. a stormwater depression in a park).
BREEAM	Building Research Establishment Environmental Assessment Method, a certification issued to eco-efficient buildings or areas (similar to LEED).
Carbon balance	The change in the amount of carbon in a carbon storage, such as in a forest, per unit of time (year). For example, in the case of forests, carbon balance takes account of the carbon sequestered by plant growth, deforestation and plant decay, and the carbon sequestered or released by soil.
Carbon footprint	The sum of the greenhouse gases produced during the life cycle of a product or service.
Carbon handprint	The climate benefits of a product, process or service; the emission reduction potential available to the user. When a city produces carbon handprint for its customers, they can reduce their own carbon footprint. Emphasises the positive emission effects in the future, whereas carbon footprint focuses on the current negative emission effects.
Carbon sink	A function that removes carbon dioxide from the atmosphere. Carbon sinks can be either natural (such as growing forests), chemical (such as concrete carbonation) or artificial (technologies to be developed).
Carbon storage	Atmospheric carbon stored in a product or material. For example, about one half of the dry weight of wood is composed of atmospheric carbon.
Centralised energy production	Electricity, heat and cold production of large-scale energy plants. The plant is most often connected to the main lines of the distribution network, and the main sector of the owner is usually energy production. Examples of such plants include combined heating and power plants and state-of-the-art plants in the district heating network. As renewable energy production increases, the boundary between centralised and decentralised production blurs, as renewable energy is naturally produced in a smaller unit size.
Circular economy	In the circular economy, the goal is to reduce the use of virgin natural resources by keeping products and materials and the value attached to them in the economy for as long as possible. In this way, production and consumption generate the smallest possible amount of waste and loss.
Climate budget	A practice launched in the City of Tampere's 2020 budget, which defines the emissions budget for the coming years in order to achieve the climate goals set, and compiles the most significant climate measures with their costs in the financial plan for the city organisation and its subsidiaries. The realisation of the climate budget is reported on an annual basis in the financial statements.
Climate change adaptation	Climate change adaptation means the ability of people and ecosystems to function in our current climate, to adapt to evolving environmental conditions and to prepare for changes occurring in climate. Adaptation can involve reacting to or preparing for various scenarios.
Climate change mitigation	The policies and measures that aim to cut greenhouse gas emissions so as to mitigate the effects of climate change. Examples include reducing the use of fossil fuels in industry and in energy production, stepping up renewable energy production, improving the energy efficiency of buildings as well as protecting and expanding forests and other carbon sinks so that they can remove larger quantities of carbon dioxide from the atmosphere.
Climate emissions	Climate emissions refer to man-made gaseous emissions that raise the temperature of the atmosphere, such as carbon dioxide, methane and nitrous oxide.

Definition/abbreviation	Legend
CO2/CO2e	Carbon dioxide and the abbreviation for carbon dioxide equivalent, denoting the combined (turned into an amount equal to carbon dioxide) climate-heating effect of different greenhouse gases.
Cost-effectiveness	Illustrates the economy of a measure, or the price of the emission reduction that results from it, expressed in the calculations as per tonne of reduced greenhouse gas emission (EUR/t CO2e). A negative value denotes both cost savings and an emission reduction.
Decentralised energy production	Electricity, heat and cold production of relatively small-scale systems. Often the system is owned by an individual or community for whom energy production is not the main function. An example of this is the production of electricity with solar panels in buildings. As renewable energy production increases, the boundary between centralised and decentralised production blurs, as renewable energy is naturally produced in a smaller unit size.
Demand response	Reducing the use of energy at suitable sites during demand peaks and rescheduling this consumption to a different time when energy can be produced more cheaply and more easily.
Direct/indirect emissions	Distribution employed in the calculation of municipal greenhouse gases, where direct emissions mean the emissions generated within the municipality, and indirect emissions refer to the emissions from production and consumption that occur outside the municipality.
Discounting	Discounting is used to convert future cash flows to present value at a discount rate, so that the cash flows from different years are commensurate. The calculations of this Roadmap use a discount rate of 4%.
Distribution obligation	By 2030, the share of energy from renewable sources in the EU needs to increase to 14% of the final consumption of energy in transport. In Finland, this has been achieved by nationally regulating the obligation for transport fuel distributors to supply a minimum proportion of renewable fuels for consumption each year ("distribution obligation").
Ecological connections	Ecological connections are routes through which animals and plants can move from one area to another through areas that are otherwise unfavourable to them: forest zones, forest-field connections, running waters and other green environment chains.
Ecosocial education	Ecosocial education is an understanding of rights and obligations based on a person's dependence on nature and other people. This understanding is achieved through human growth.
Ecosystem services	Free-of-charge, tangible and intangible benefits for people from the natural environment, such as nutrition and water, building materials, nutrient recycling, soil formation, climate regulation, water and air purification, aesthetics and recreation.
Energy community	A community of citizens or organisations (for example, housing associations) that generates and distributes energy within the community or, where appropriate, sells energy to an external grid.
Energy Efficiency Agreement for Municipal Sector (KETS)	A voluntary agreement through which the state and industries fulfil the international energy efficiency obligations imposed on Finland without any new legislation or other coercive measures. The objective of the agreement is to increase energy efficiency and renewable energy in municipal buildings, in public lighting and in vehicles. Similar agreements have also been concluded for many other sectors.
ESCO	Energy service company, an 'energy-saving as a service' operating model where the service provider is responsible for improving the energy efficiency of a building as an overall delivery.
First and last mile solutions	Services facilitating movement to a public transport stop or from a stop to the destination.
FOD model	The first order decay method (FOD) developed for the calculation of methane emissions from biodegradable waste in landfills. Updated in 2022, the model takes into account the updated IPCC calculation guidelines and coefficients.
Green factor	A detailed planning tool to ensure an adequate amount of green surface area on plots while preventing pluvial floods. The green coefficient describes the amount of vegetation and water detention solutions in a plot in relation to the surface area of the plot.
IPCC	Intergovernmental Panel on Climate Change. The panel analyses scientifically produced data on climate change to support decision-making, as well as producing reports on the analyses.
Life-cycle assessment	Life-cycle assessment (LCA) is a method for assessing the environmental impact of a product or a service throughout its life cycle (manufacture, use, disposal).
LIISA model	The LIISA model is one of the five models of VTT's system LIPASTO. The model calculates road traffic emissions for different vehicle types and road categories. In addition, the model produces Finland's official annual emissions volumes for the EU, UN and Finnish statistics.
LIPASTO calculation system	LIPASTO is a calculation system implemented and maintained by VTT Technical Research Centre of Finland Ltd for exhaust emissions and energy consumption in traffic in Finland. It covers road, rail, water and air traffic, as well as work machinery.

Definition/abbreviation	Legend
MaaS	Mobility as a Service offers customers a comprehensive service where they can combine public transport, car rental or transport services according to their needs.
MAL	Agreements on land use, housing and transport (MAL) are agreements concluded by the state with the largest city regions with the aim of guiding the urban structure in alignment with sustainable development.
Modal share	Share (%) of journeys made by different mobility modes (walking, cycling, car, public transport), expressed either in terms of number of journeys (number/person/day) or in terms of personal output (km/person/day).
Municipal waste	Waste generated in housing and waste generated in administrative, service and business operations that is of equal quality.
Net present value (NPV)	Net present value means adding up the investment costs and the operating costs of measures and discounting them to the present value. The value obtained represents the net present value of the measure. The calculations in this Roadmap evaluate net present value for the programming period, or up to 2030.
Net zero energy building/ nearly-zero energy building/ plus energy building	A building that generates the same amount of renewable energy for use outside the building as it uses energy brought into the building. A nearly-zero energy building (equivalent to the Energy Performance of Buildings Directive EPBD) is a building where the energy needs are covered to a significant degree by renewable energy produced in or near that building. A plus energy building is a building that produces more energy than it consumes.
Open data	Public information produced or accumulated by public administrations, organisations or undertakings, and opened in a digitally accessible form for free use by all.
Public transport trunk lines	Public transport routes with a high number of passengers, shorter-than-normal headways and various solutions to speed up public transport. Trunk lines strive to provide a public transport service level that enables a car-free life style.
Renewable energy	Renewable energy sources include forest processed chips and other bioenergy, solar heat and electricity, wind power and heat produced by heat pumps from the ground, air and water.
Resilience	The ability of people and communities to function in changing conditions and to recover from disruptions and crises, “change flexibility”.
SECAP	The Sustainable Energy and Climate Action Plan, which is based on the Covenant of Mayors for Climate and Energy.
Service facility network/ Service network	The service facility network comprises all physical service facilities maintained by the city, such as social and health centres, maternity and child health clinics, schools, day-care centres, and sports and leisure facilities. Additionally, the service network includes non-physical services, such as digital services.
Smart parking	Smart parking makes use of information technology and real-time data transmission to enable more efficient use of parking space, such as bicycle parking and parking of autonomous vehicles.
Stormwater and stormwater flooding	Stormwater is rain or melt water to be directed away from the ground, the roof of a building or other similar surfaces. Heavy rains have increased due to climate change and, as a result of the urban structure being built increasingly more densely, natural water retention and absorption areas have decreased. Lack of stormwater management results in stormwater flooding, erosion in receiving water bodies, and the pollution of water bodies with pollutants and nutrients.
Subsidiary	An entity in which a municipality or joint municipal authority has control alone or together with its group entities. Subsidiaries may include limited liability companies, associations and foundations.
The UN 2030 Agenda	The sustainable development programme agreed by UN member states in 2015, the goals of which guide the promotion of sustainable development up to 2030. The aim is to eradicate extreme poverty from the world and secure well-being in a manner sustainable for the environment. The agenda includes 17 Sustainable Development Goals (SDGs). The City of Tampere committed to implementing the agenda in its strategy in 2021.
Travel chains	Integration of different modes of transport into a smooth package.
Urban heat island	The urban heat island (UHI) phenomenon refers to the relative warmth of a city compared to the surrounding rural or more natural areas. The urban heat island refers to a phenomenon in which the city centre has a higher temperature than the surrounding areas.
Urban structure	An entity consisting of key social functions such as housing, work, recreation and services as well as the traffic and technical maintenance systems that connect them.
Zero fibre	Waste sludge from the production of pulp mills previously discharged with wastewater into the water system and found in large quantities at the bottom of Lake Näsijärvi, at the Sellupuisto beach in Lielahti.
The UN 2030 Agenda	The sustainable development programme agreed by UN member states in 2015, the goals of which guide the promotion of sustainable development up to 2030. The aim is to eradicate extreme poverty from the world and secure well-being in a manner sustainable for the environment. The agenda includes 17 Sustainable Development Goals (SDGs). The City of Tampere committed to implementing the agenda in its strategy in 2021.

Image: Visit Tampere Oy/Laura Vanzo

1. TAMPERE'S CLIMATE GOALS

Why is the climate changing and what are the consequences?

The global climate is changing. The amount of greenhouse gases in the atmosphere is increasing and the average global temperature is rising. Intensifying climate change and its effects are among the biggest global crises.

Since the late 1800s, the use of fossil energy has accelerated, which has changed the amount of carbon dioxide in the atmosphere. Carbon dioxide, methane and nitrogen oxides, among others, bind heat to the atmosphere. As their concentration in the atmosphere increases, the average temperature rises as is does in a greenhouse. In 2023, for the first time, the global average temperature was almost 1.5 degrees Celsius warmer than in the pre-industrial era (Global Climate Highlights, 2024). In various scenarios, the temperature is projected to rise 2–5 degrees by the end of the century. How much the temperature will rise depends on how effectively climate change is mitigated.

Global warming has a major impact both on societies and on the natural environment. Global warming is not unequivocally visible in Finland in the form of warmer summers and milder winters, but as an increase in extreme weather phenomena, such as severe frosts, storms and heat waves. Vegetation zones in Finland are retreating towards the north, floods are increasingly likely and the operating conditions of agriculture and forestry are changing. Finland is also significantly affected by the economic and political consequences caused by climate change in other parts of the world, such as problems in food production and waves of refugees caused by drought. On the other hand, Finland can also stand to benefit if it succeeds in developing and exporting technology that mitigates climate change.

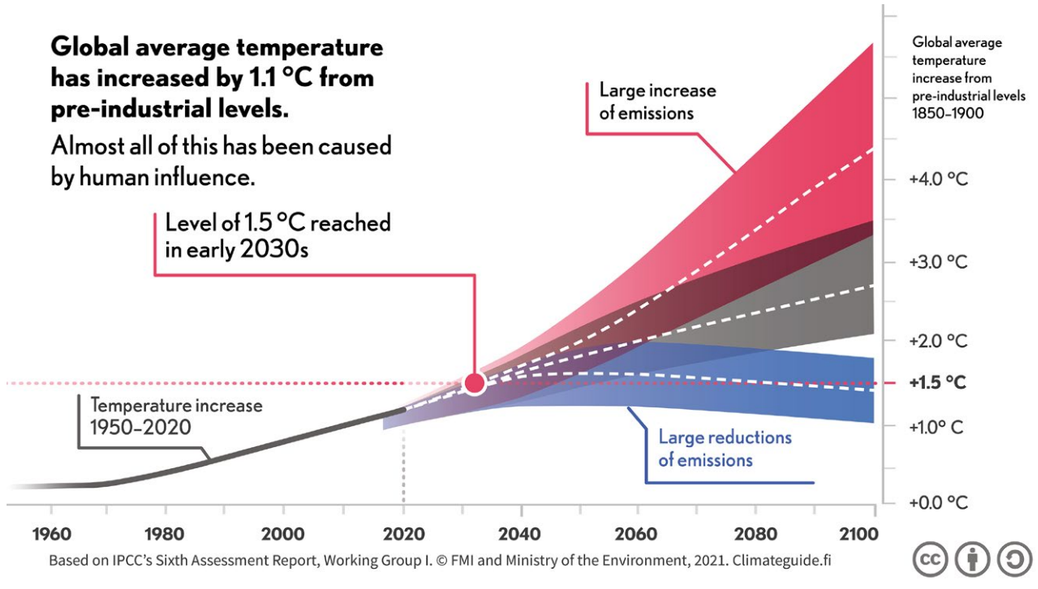


Figure 2 Rise in global average temperature. Source: IPCC's 6th assessment report, https://www.climateguide.fi/ipcc-infographics/

At the same time, biodiversity is decreasing and the condition of ecosystems is deteriorating. Together with climate change, they pose a huge global challenge. The international scientific community has been stating for some time that limiting climate change and halting the loss of biodiversity are mutually supportive objectives and must be solved at the same time (Pörtner et al., 2021). Nature's ability to provide ecosystem services to people, such as nature's ability to mitigate climate change, is also threatened.

Reducing climate emissions is essential

It is too late to halt climate change, but mitigating it is still possible. The objective of the 2015 Paris Agreement is to limit the global long-term average temperature increase to less than 1.5°C compared to pre-industrial levels. The EU and Finland are also committed to this objective. Intergovernmental Panel on Climate Change (IPCC) concluded in March 2023 that immediate action is needed to ensure a viable future for all.

The abandonment of fossil fuels, introduction of sustainable energies, energy savings, and improvements in energy efficiency are important instruments to curb rising temperatures. The focus is also on reducing emissions from transport through a shift to alternative propulsion systems and through increasing the use of sustainable mobility modes by reinforcing the conditions for walking and cycling and by improving the public transport service level.

Climate emissions are also curbed by the reduction of consumption and consumption choices that take into account the manufacturing method and transport distances of the products. For instance, replacing animal protein with plant proteins and repairing things instead of acquiring new ones will yield global benefits.

In addition reducing greenhouse gas emissions, the management of the carbon storage in forests and in green infrastructure as well as the expansion of the carbon sinks are important means to mitigate global warming. Recently, technological solutions for carbon sinks, such as carbon capture, have also evolved. These solutions will be needed in addition to forests and other green structures.

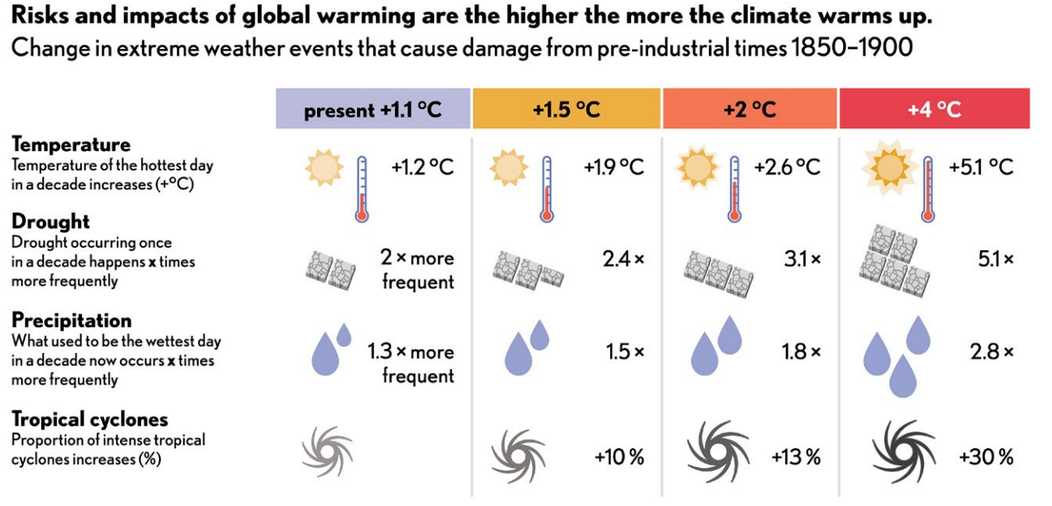


Figure 3 Risks and effects of global warming.
Source: IPCC's 6th assessment report, https://www.climateguide.fi/ipcc-infographics/

Climate change adaptation is already needed today

Apart from climate emission mitigation, it is vital to find ways to adapt to the changes brought about by climate change. Climate change adaptation refers to ways and means to prepare for changes caused by climate change and reduce the adverse effects that climate change has on society and on the environment. The effects of climate change are already visible in Tampere, and are expected to only intensify in the future. Adaptation measures strive to reduce the harm caused by these changes while promoting the ability of people, social activities and the environment to function under changed and evolving conditions.

Adapting to evolving conditions is absolutely necessary despite successful climate emissions mitigation measures. The later we launch the adaptation measures, the more costly this will be in economic and human terms.

The climate change adaptation goals include anticipating and managing weather risks and climate risks, safeguarding the security of supply, ensuring the sustainable competitiveness of society and businesses, and boosting social resilience. Resilience refers to the ability of people and communities to function in changing conditions and recover from disruptions.

The ways in which we adapt to climate change may be related to the physical characteristics of the urban structure, such as increasing the green environment and water-permeable surfaces in the urban structure, the weather resistance of buildings, managing increasing rainfall with different delay solutions, or changes in road maintenance so that maintenance corresponds to the new weather conditions. Ecological means of adaptation include ensuring ecological connections so that organisms can move as habitats change, as well as measures that increase the understanding of the features in the environment that maintain the vitality of species. Such features include, for example, shady places above small streams. The means of adaptation may also be related to the development of social and health services, taking the most vulnerable population groups into account, as well as the economy – such as resources, capabilities, approaches and insurance policies against loss or damage.

Striving for a climate-neutral Tampere

Cities play a major role in mitigating and adapting to climate change. An increasing proportion of people live in cities and, as a result, the majority of consumption and use of energy takes place in cities. Cities can lead the way towards climate-friendly solutions and they can enable sustainable ways of living, energy use, mobility and consumption.

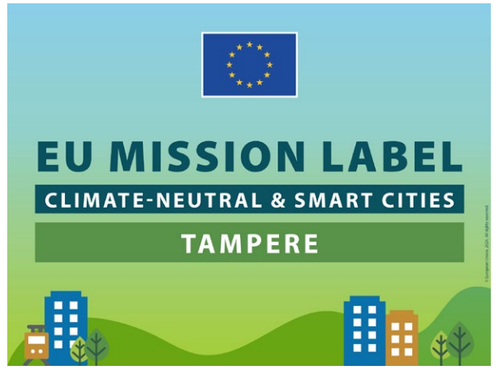
Internationally known for the climate work it has carried out, the City of Tampere is a pioneer. Tampere joined the EU Covenant of Mayors in 2009 and, in 2017, the renewed Global Covenant of Mayors for Climate and Energy. Today, it is the world's most significant climate covenant, covering thousands of cities in an effort to boost local climate and energy measures.

Tampere aims to be climate neutral by 2030. Tampere's climate neutrality goal is defined as an 80% reduction from the 1990 emission level while offsetting the remaining 20%. One of the four focus areas set out in the City of Action strategy published in 2021 and approved in 2023 is Climate Neutral Action. Among the goals of this focus area is a 60% emission reduction from the 1990 level by the 2025. In addition to the strategy, commitment to the climate neutrality goal is part of the Mayor's Programme for 2023–2025 Ihmisten Tampere – mahdollisuuksien kaupunki ("Tampere of the people – a city of opportunities"). According to the Mayor's Programme, the measures set out in the Tampere Climate Roadmap will be implemented.

Achieving the climate goals requires cooperation. Since 2022, Tampere has been part of a network of one hundred European cities seeking to achieve climate neutrality by 2030 i.e. EU Missions: Climate-neutral and smart cities. In addition, Tampere is part of the EU mission of adapting to climate change. These missions are among the approaches promoted by the European Commission aiming to provide practical solutions to the most difficult common challenges.

In spring 2024, Tampere's climate plan was awarded the European Commission's climate label, the Mission Label. So far, only 53 European cities have been awarded this climate label. The label signals that the city's climate plan is sufficiently ambitious and wide-ranging, and benefits Tampere in, for example, obtaining funding to support climate goals. The climate plan includes the measures of the Climate Neutral Tampere 2030 roadmap, the investment plan and cooperation agreements with, for example, the higher education community and the corporate climate partnership network. In Finland, the City of Tampere cooperates closely with its sub-regions, the six largest cities and other climate mission cities.

As part of its climate work, Tampere is also committed to promoting the circular economy. Circular economy refers to an economic model in which natural resources and materials are used within the limits of the planet's carrying capacity by keeping products, materials and resources in the use of the economy for as long as possible



and by reducing the amount of material that ultimately ends up as waste. Decisions and choices made by municipalities can have an impact on the use of natural resources. In particular, the measures carried out in the built environment are of great importance locally for the use of natural resources and materials, as well as for the creation of solutions that support the circular economy. In 2020, the City of Tampere signed the European Circular Cities Declaration (2020), which accelerates the circular economy transition. The aim of the declaration is to contribute to the creation of a resource-efficient, low-carbon and socially responsible society.

Climate work as part of city economy

The City of Tampere has integrated its climate work into its economic processes. Already in its budget for 2020, Tampere introduced a climate

Image: Visit Tampere Oy/Laura Vanzo

budget element and was the first city in Finland to do so. The climate budget contains a breakdown of the city-level annual maximum emissions *(emissions budget*) and the resources allocated by the City Group to the climate measures (*financial plan for climate measures*).

The figures are published on an annual basis in the budget, with the financial statements reporting the actual realised numbers. In the 2023 financial statements, the City of Tampere's reported climate budget operating expenditure was 11 million (1.1% of the city's total operating expenditure), while climate investments accounted for 7.1 million (3.1 per cent of the city's total investments). Subsidiaries owned by the city make significant climate investments, and their implementation in the 2023 climate budget was EUR 39.5 million. However, the amount of investment varies significantly from year to year. The information contained in the Climate Neutral Tampere 2030 Roadmap is more detailed than the information in the climate budget. Rather than basic activity, it focuses more on policy recommendations and contains a greater number of measures than the climate budget. The climate budget only details the activities for which it is possible and meaningful to detail costs already in the budget phase and for which it is possible to monitor implementation.

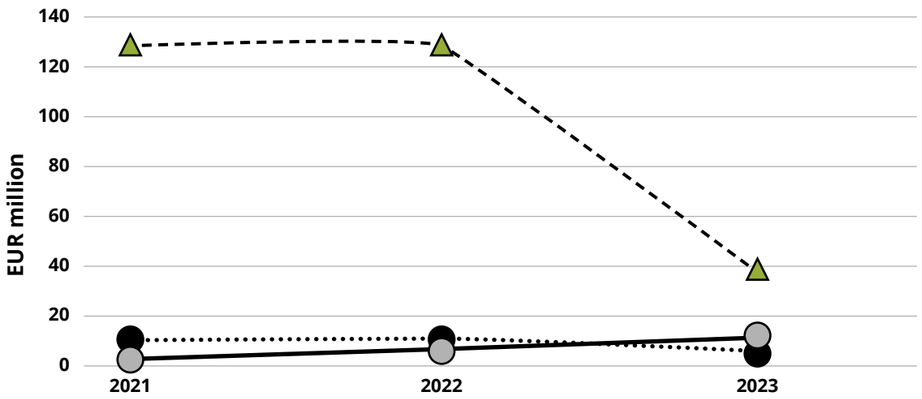


Figure 4 The city organisation's and subsidiaries' realised operating costs and investments in the climate budget in 2021–2023.

	2021	2022	2023
Operating costs of the climate budget financial plan as a percentage of all operating costs of the city (%)	0.2	0.4	1.1
Climate budget's financial plan's investments' share of the city's total operating costs (%)	3.9	4.7	3.1

Figure 5 City budget shares of investments and operating costs of measures taken into account in the financial plan of the climate budget (subsidiaries not included).

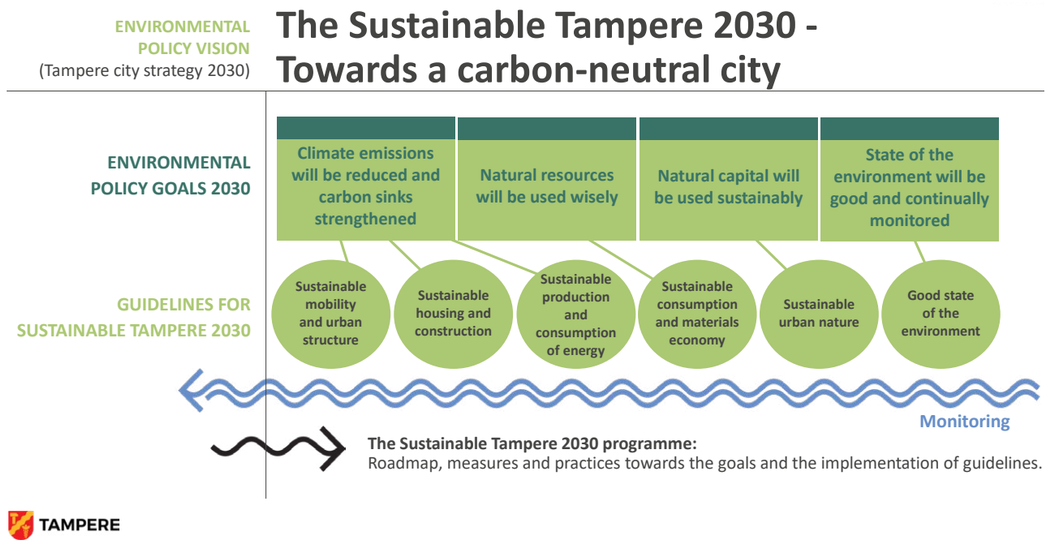


Figure 6 Sustainable Tampere 2030 Guidelines.

Image: Visit Tampere Oy/Laura Vanzo

Sustainable Tampere 2030 guidelines steer climate work

The climate work is based on the Sustainable Tampere 2030 – Towards a Carbon Neutral City guidelines, which were approved by the City Council on 18 June 2018. The guidelines combine environmental policy, sustainable development and the climate neutrality goal of the Tampere Strategy and guide the implementation and monitoring of the overall entity.

The Sustainable Tampere Guidelines cover the themes that are key to climate emissions: mobility and urban structure, housing and construction, energy, consumption, and urban nature. Furthermore, in line with sustainable development, the goal is to achieve environmental status that is good in other respects, too. The guidelines set a target state for each theme:

1. SUSTAINABLE MOBILITY AND URBAN STRUCTURE
Tampere is a pioneer in sustainable urban planning, mobility and work methods. The city is prepared for risks resulting from climate change. The living environment is safe, healthy and comfortable.

2. SUSTAINABLE HOUSING AND CONSTRUCTION
Residential areas are attractive and unique, and they promote sustainable lifestyles and participation. Easy access to nature promotes the wellbeing of residents. Through construction, we create conditions for safe, healthy and comfortable living.

3. SUSTAINABLE PRODUCTION AND CONSUMPTION OF ENERGY
Energy sources have low emissions. Energy is utilised efficiently as smart heating, cooling and electricity networks, energy storages and smart buildings work in conjunction with each other. Smart solutions and energy services also reduce consumption peaks of electricity and heat.

4. SUSTAINABLE CONSUMPTION AND MATERIALS ECONOMY
The use of materials are governed by the principles of the circular economy. The city supports sustainable consumption solutions for its residents.

5. SUSTAINABLE URBAN NATURE
Natural resources are used sustainably, and carbon sinks are strengthened. Biodiversity and the amount of green urban areas will be increased, and nature tourism further developed.

6. GOOD STATE OF THE ENVIRONMENT
The full life-cycle environmental impacts of the operations are identified and managed throughout the city organisation. The state of the environment is constantly monitored and improved. The monitoring data is publicly available and available to be used in decision-making.

The Climate Neutral Tampere 2030 Roadmap is based on the Sustainable Tampere 2030 Guidelines. However, the Roadmap specifically focuses on climate action. That is why the structure of the Roadmap differs slightly from the Guidelines: Sustainable mobility and urban structure are divided into two themes: sustainable urban planning and sustainable mobility. The 'Good state of the environment' theme is excluded from the Roadmap, because it mainly concerns areas of environmental policy other than climate policy. A good state of the environment is promoted through, among other measures, the separate Tampere Biodiversity Programme (LUMO) in 2021–2030. There is also a separate plan for the circular economy, approved by the City Board in 2022. The plan focuses on land use planning and plot allocation, the circular economy of service networks, real estate and construction, as well as material cycles and waste management and a sustainable food system. The roadmap takes into account the circular economy measures that have a climate impact. In addition to the themes of the policies, the roadmap also includes a theme that cross-cuts all the other themes: climate leadership and stakeholder collaboration.

In its strategy, the City of Tampere is committed to implementing the Sustainable Development Goals (SDGs) set out in the UN 2030 Agenda. The roadmap is a key tool, especially for the "Climate Action" and "Cooperation and Partnership" objectives (13 and 17). Roadmap measures are also strongly linked to objectives 7, 9, 11, 12 and 15.

The starting point is that climate goals are pursued through comprehensive sustainable development, and climate action must not undermine other sustainable development goals. This is why the sets of measures have been examined through the lenses of direct and indirect impacts and impacts that need to be supervised.

Emission vision

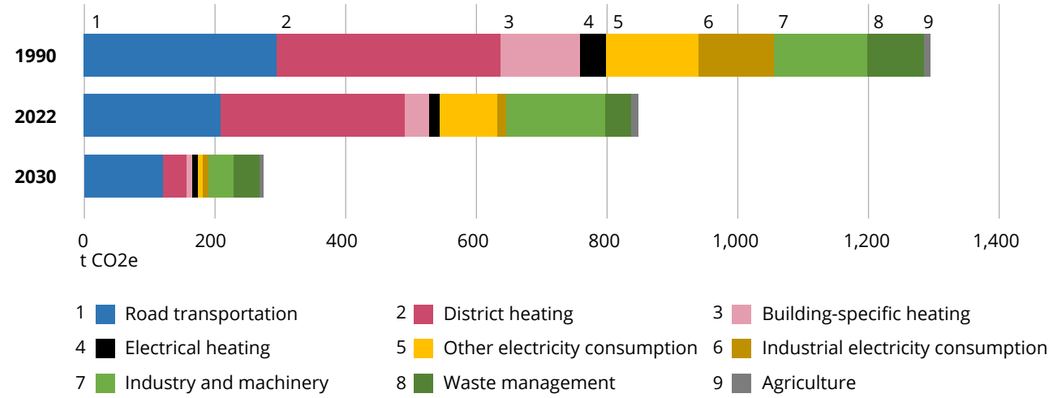


Figure 7 Realised climate emissions in 1990 and 2022 in Tampere and the emissions target in 2030 in carbon dioxide equivalent (Co2e) tonnes.

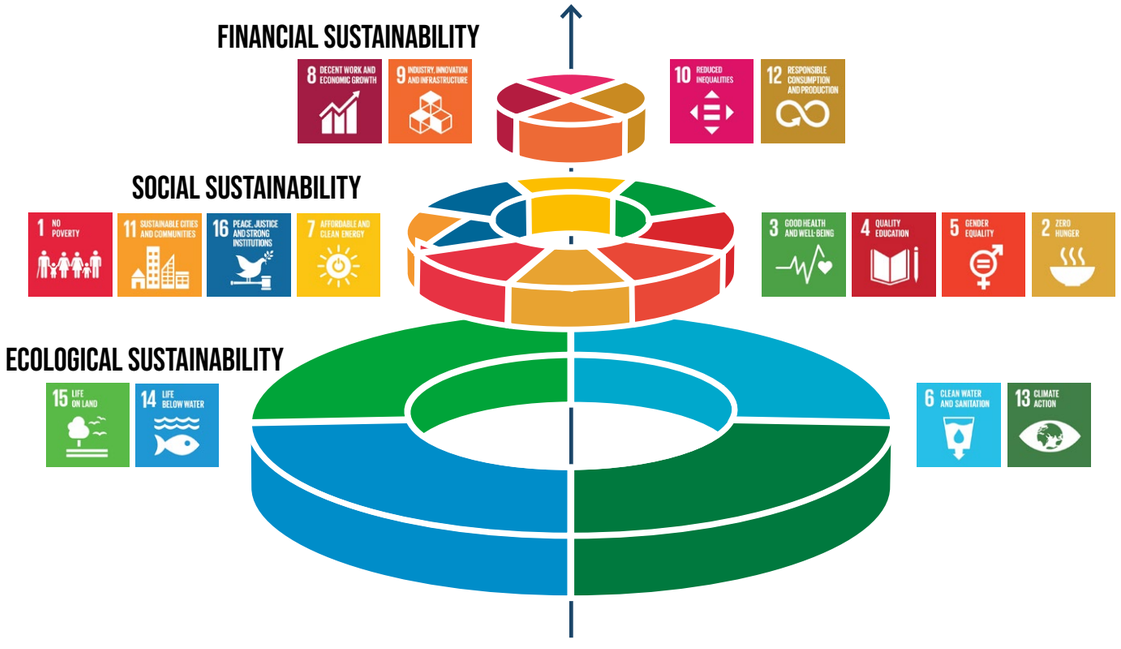


Figure 8 The "wedding cake model" created to outline the UN Agenda 2030 goals. Ecological sustainability defines the basis of planetary limits, because securing it is seen as the lifeblood of humanity. Human development that is fair globally is the goal of social sustainability. Economic sustainability acts as a tool to promote human development within planetary limits. Source: Rockström & Sukhdeev 2016; Opetus-, kasvatus- ja koulutusalojen säätiö – OKKA-säätiö. Image: Azote for Stockholm Resilience Centre, Stockholm University CC BY-ND 3.0.

2. ROADMAP UPDATE

The Climate and Environmental Policy Unit, operating under the auspices of the Sustainable City group part of Urban Environment Services, is responsible for updating the Climate Neutral Tampere 2030 Roadmap. The unit is tasked with monitoring and promoting the city's climate neutrality goal as well as with coordinating the climate efforts made in many quarters.

This is the second update of the roadmap. The original roadmap was published in 2020, and the first update was made in 2022. Like previous versions of the roadmap, this has been done in cooperation with the entire city organisation. The units of each service area have submitted their own proposals on how to update current measures of the roadmap and on adding new measures. In addition, the city companies have submitted their own measures for the roadmap and set intermediate targets for climate neutrality for 2025. On the basis of the proposals submitted, the Climate and Environmental Policy Unit has updated the roadmap measures.

The Climate and Environmental Policy Unit supported the units in updating the measures by organising a roadmap "road show" in autumn 2023, which included workshops on the different themes of the roadmap. In the workshops, experts from different units discussed cross-administratively. This inspired the participants to, for example, create new measures for the roadmap. In addition, both unit-specific and cross-administrative meetings were held during the winter and spring of 2024.

In connection with this update, the roadmap measures have been reviewed and updated to better reflect the city's operations as well as the new measures. The changes are described in more detail in chapter 4. Like previous versions of the roadmap, this updated version will be translated into English.

The measures set out in the Roadmap aim to reduce Tampere's climate emissions by at least 80% by 2030. The remaining 20% is intended to be tied to the carbon sinks available in the Tampere region or to be offset by other means. Compensation options will be explored in 2024. The City of Tampere participates in the Kuntanielu project, which harmonises municipalities' carbon sink calculations. New information on the status of carbon sinks will be available during 2025, when a decision on compensation will also be prepared on the basis of more detailed data.

When the implementation of the roadmap measures falls due, the city units will include measures from the final roadmap in the services' annual plans and in the work programmes of the units. The measures included in these annual plans are reported three times a year in connection with strategy reporting to the public Tampere climate and environmental watch service, from which everyone can follow the progress of the roadmap measures. The roadmap is a policy outline and a plan for the city's measures to achieve the climate neutrality goal. The measures will be decided upon separately at the relevant bodies in accordance with the city's normal decision-making system.

Roadmap markings and symbols

In addition to climate change mitigation and adaptation measures, this update specifies measures to promote circular economy. These include, in particular, climate change mitigation measures in construction. Circular economy measures are marked with a C. Coordination of climate and circular economy measures can strengthen the effectiveness and targeting of measures.

The themes and sets of measures set out in the roadmap indicate which UN Sustainable Development Goals they promote. The targets are marked with the symbols of the UN 2030 Agenda.

Supplementing the emission reduction estimates, the roadmap also shows for every measure the rough cost estimates of their implementation (circle symbols at each measure) as well as, where possible, the more detailed EUR investment (in appendix 2). It should be noted that these cost estimates are only a rather rough illustration of the magnitude of the investments made in the measures and, if possible, the cost savings. By way of illustration, more detailed economy calculations or cost-effectiveness calculations, discussed in section 5, were performed with regard to some measures.

These calculations illustrate the profitability of the measures with due consideration of the measure life cycle and the cost savings generated during it, while assessing for each measure the price of the emission reductions resulting from the measures.

Often the measures set out in the roadmap also have non-climate-related benefits, such as a more comfortable, healthier and safer environment, the commercial opportunities brought about by technologies, the economic sustainability enabled by life-cycle thinking, increased biodiversity and image benefits. Examples of these are provided on the themes' starting pages.

IMPACT ANALYSIS LEGENDS SHOWN IN THE MEASURE CARDS

Orders of magnitude of the emission reduction estimates:		Orders of magnitude of the cost estimates in 2024–2030:	
●○○○○	< 100 t CO_2e/year	●○○○○	official work or < EUR 0.1 million
●●○○○	100–1,000 t CO_2e/year	●●○○○	EUR 0.1–1 million
●●●○○	1,000–10,000 t CO_2e/year	●●●○○	EUR 1–10 million
●●●●○	10,000–50,000 t CO_2e/year	●●●●○	EUR 10–100 million
●●●●●	> 50,000 t CO_2e/year	●●●●●	> EUR 100 million

3. WHERE WE ARE NOW – CLIMATE EMISSIONS SITUATION

Tampere has been monitoring climate emissions on a regular basis since 2010. All emission reductions are calculated using a method commonly used by municipalities that is internationally comparable (in 2024, CO2 report: Lehikoinen et al., 2024). The calculation takes into account the greenhouse gas emissions generated in the city's geographical area, as well as the emissions of the energy consumption that occurs in the city (carbon dioxide, methane, nitrous oxide). Internationally, these are called Scope 1 and 2 emissions. The common unit of measurement for greenhouse gas emissions is carbon dioxide equivalent (CO2e). However, indirect emissions are not included in the calculation. Indirect emissions arise from sources such as the manufacture of goods and materials elsewhere and from their being brought to Tampere, or from Tampere city residents' travel outside the city. However, measures in the roadmap also aim to reduce these.

Tampere's regional (Scope 1 and 2) climate emissions have been gradually decreasing since 2010. The latest confirmed emissions data at the time of the roadmap update is for 2022. At that time, total emissions were about 35 percent lower than in 1990, the year of comparison. Per capita emissions have decreased significantly due to population growth, by up to 55% when compared to 1990.

The main sources of regional emissions (Scope 1 and 2) in Tampere are district heating, cars, industry and work machinery. Additionally, electricity consumption by consumers, individual heating, trucks and waste management are also major sources of emissions. Agriculture, on the other hand, plays only a minor role in Tampere.

The need to reduce emissions in different sectors is monitored in the climate budget and financial statements of the Tampere budget. The table in Figure 11 shows in more detail the realised climate emissions for 2022 as well as the difference to the emissions budget set for the same year. The emissions budget has an annual target that can be used to check whether achieving the target is on track. The expert judgement as to whether a sector is able to keep within the emissions budget is based on the relevant reduction need, the roadmap emission projection, and the known measures. Finally, the table shows in percentages the sector-specific change needed in 2020–2030. In the table, the emissions conform to the calculation employed in the CO2 report, except that the 'Consumer electricity consumption' item used in the CO2 report was rephrased in the table as 'Other electricity consumption' while 'Heating power' includes 'Geothermal'.

In the latest emissions data, the decrease has been slower than hoped, but significant changes in energy production are visible for 2023. Changes in district heating and electricity production have such a significant impact on emissions that it is almost certain that getting close to the 2022 emission budget only a year late is possible. An even more detailed description of the projected climate emissions in Tampere can be found in Appendix 1.

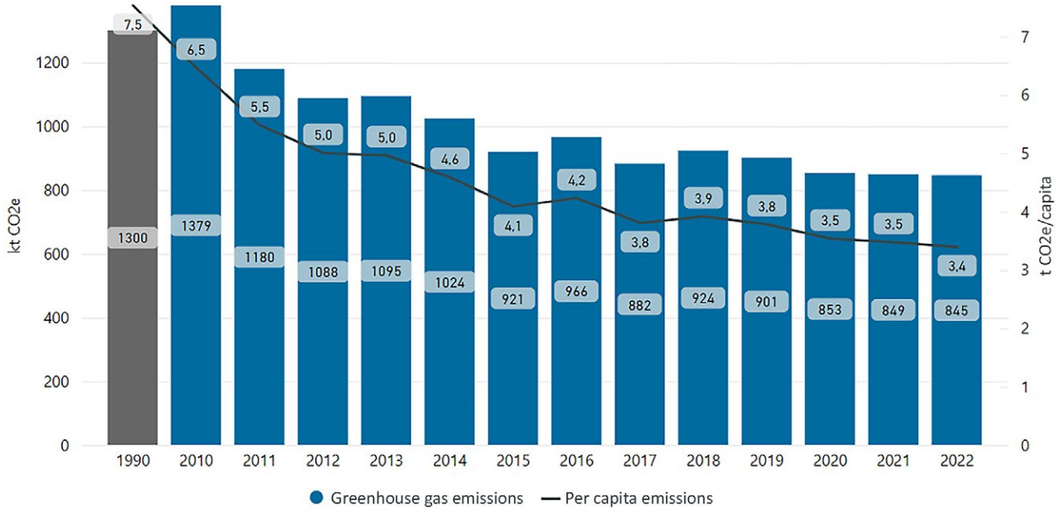


Figure 9 Development of climate emissions in Tampere in 1990–2022, including emissions from industry (Emissions created in the geographical area of Tampere, i.e. the city's Scope 1 and 2). Source: CO2-raportti (Lehikoinen ym., 2024).

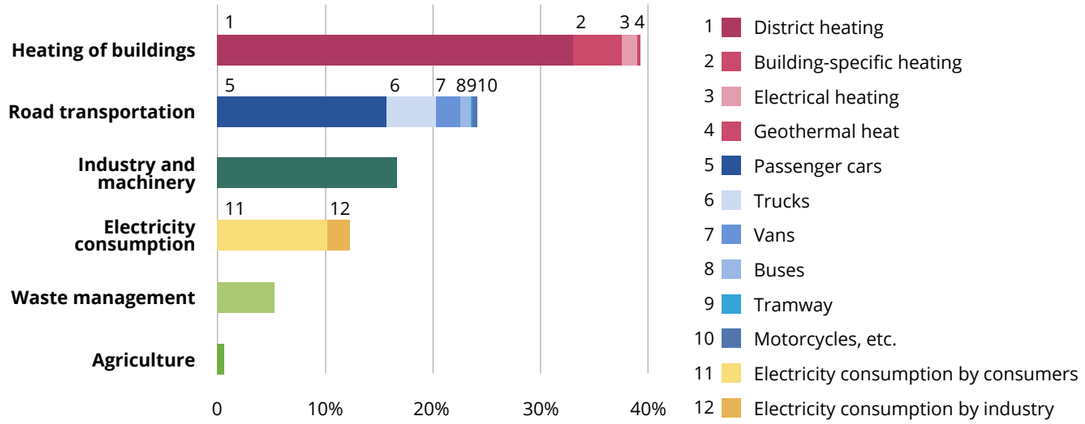


Figure 10 Sources of greenhouse gas emissions in Tampere in 2022 (emissions created in the geographical area of Tampere, i.e. the city's Scope 1 and 2). Emissions from the tramway are below 0.1% and therefore not clearly visible in the picture. Source: Tampere CO2 report (Lehikoinen et al., 2024) and LIISA road transport model, VTT Technical Research Centre of Finland.

	Emissions 2022	Difference to budget	Budget 2022	Advance 2023	Budget 2023	Target 2030	Will achieve the 2030 target
District heating	285,500	95,500	190,000	186,300	115,000	40,000	✓
Building-specific heating	32,400	-20,600	53,000	32,200	45,000	4,000	!
Electrical heating	19,400	400	19,000	13,000	17,000	5,000	✓
Road transportation	208,200	24,200	184,000	213,700	177,000	115,000	✗
Other electricity consumption	85,200	-7,800	93,000	49,800	85,000	25,000	✓
Electricity consumption by industry	17,600	-2,400	20,000		18,000	9,000	✓
Industry and machinery	146,100	54,100	92,000		86,000	25,000	!
Agriculture	6,700	700	6,000	7,000	6,000	5,000	✓
Waste and waste water	44,200	-19,800	64,000	44,200	62,000	32,000	✓
Total	**845,400**	**124,400**	**721,000**		**611,000**	**260,000**	
Emission reduction compared to 1990	**-35%**		**-45%**		**-53%**	**-80%**	

Figure 11 Tampere's confirmed climate emissions in 2022, the difference between the actual and the emissions budget in 2022, the emissions budget for 2022, preliminary information on the emissions for 2023 as well as emissions budgets for 2023 and 2030 (t CO2e). For 2022, the sectors with a red background were over and those with a green background significantly under the emissions budget.

District heat production was impacted by the energy crisis, which increased the share of fossil fuels in the production of district heat in 2022, but in 2023 the emissions from district heat were lower than ever before, thanks to the introduction of new power plants. The impact will be around 100,000 t CO2e, or 7% of the 1990 emissions. Emissions from electricity production will also decrease significantly for 2023. The impact of the change in heating and other electricity consumption is some 40,000 t CO2e less climate emissions.

The emissions calculation for **individual heating** was refined in spring 2024. The model of the CO2 report was corrected to correspond to Statistics Finland's statistics of total heating oil consumption in Finland. The change will not affect the total emissions, as the emissions are determined on the basis of the oil sold to Tampere. The rest of the oil is now counted towards industrial emissions. Approximately half of the heating oil is consumed in residential buildings, with majority being consumed in detached houses. Approximately one-third of the oil is consumed in industrial buildings and the rest in service buildings. The share of agricultural buildings is very small.

With regard to **transport**, achievement of the emission reduction goal is most challenging, as the population of Tampere is growing and the changes in mobility patterns are slow to take root. In addition, decisions on mobility modes are not in the hands of the city alone but require cooperation from both the state and individual citizens. The city's task is to make sustainable mobility smoother and safer by means of urban and traffic planning, increasing the comfort of the urban environment. These solutions affect mobility in the extremely long term, so they are also important for long-term emission reductions. Numerous methods have been described in the Sustainable Mobility theme, which is the most comprehensive entity in the roadmap.

Emissions from **other electricity consumption** seem to be reaching their targets, but this sector can provide flexibility for emissions that are more difficult and slower to curb. Changes in electricity production that cover the entire country, such as the introduction of the Olkiluoto 3 nuclear power plant and the growth of wind power production, have the most impact on electricity emissions. Emissions will be curbed by improving the energy efficiency of electricity use and by increasing demand response when electricity consumption is high and fossil production methods need to be utilised. This usually happens during the coldest winter days. The city can contribute to this by enhancing its energy counselling. In the name of a just transition, counselling should be targeted at those residents who have the most room for improvement in energy efficiency and other vulnerabilities, such as low income.

Reducing emissions from **industry and work machinery** requires action from Tampere-based companies. The emissions are mainly caused by the use of natural gas and fuel oil. In order to accelerate climate action by businesses, the City of Tampere is coordinating the Tampere Region Climate Partnership activities to commit businesses and communities to a common climate neutrality goal through measures that suit each of them individually. Emissions from industrial electricity consumption have been a fairly small sector whose consumption has remained stable and the emissions of which have decreased as electricity production has changed.

Efforts are being made to reduce emissions from **waste management** by improving waste prevention, waste sorting and circular economy solutions. Pirkanmaan Jätehuolto has already made significant investments to reduce emissions from waste treatment, and the central treatment plant Keskuspuhdistamo will have an impact on waste water treatment once the plant is completed. However, a high percentage of the sector's emissions is generated by methane emissions from old landfills. They are recovered and utilised in energy production, but the possibilities for mitigation are limited.

Emissions from **agriculture and forestry** are low in the Tampere region, but forests play an important role as carbon sinks. This, alongside with the vitality of urban nature, is something the roadmap measures strive to strengthen. Emissions from the production of food eaten in Tampere are Scope 3 emissions, which can be treated more roughly in the calculation of climate emissions from consumption.

Climate emissions from consumption

The climate target is mainly monitored on the basis of regional climate emissions, as these can be monitored and analysed in more detail. However, a large part of the emissions caused by the actions of Tampere residents is generated elsewhere. Efforts have been made to find out more about these emissions. In 2023, Sitowise Oy (Liljeström et al., 2023) twice calculated the consumption-based emissions of Tampere and 19 other Finnish municipalities. Consumption-based emission calculation means that some regional emissions are removed from the balance sheet to the emissions of products and services, and the emissions of products and services consumed in Tampere are calculated for the city.

In 2022, emissions from Tampere's consumption-based emissions amounted to 8.83 t CO_2e per capita, which is more than double the regional climate emissions of Tampere shown above in Figure 10. The total consumption-based emissions for 2022 were approximately 2,157 kt CO_2e. A more detailed breakdown is provided in Figure 13. This disparity highlights the fact that Tampere's consumption of food, goods and services significantly exceeds its local production. The previous calculations for 2020 were also refined. According to the updated figures, emissions were 7.37 tCO_2e

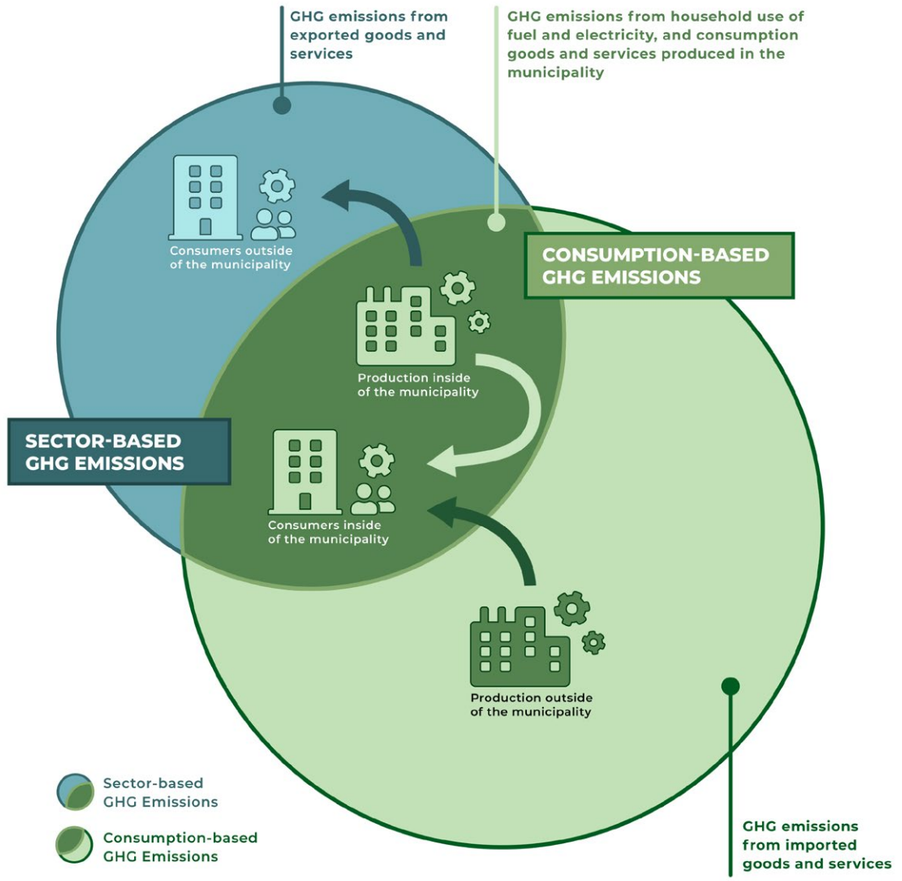


Figure 12 Differences in the delimitation of regional and consumption-based emission calculations. Source: Greenhouse gas emissions from Tampere consumption, Kulma model November 2023 Sitowise Oy and Natural Resources Institute Finland (Liljeströmet al., 2023).

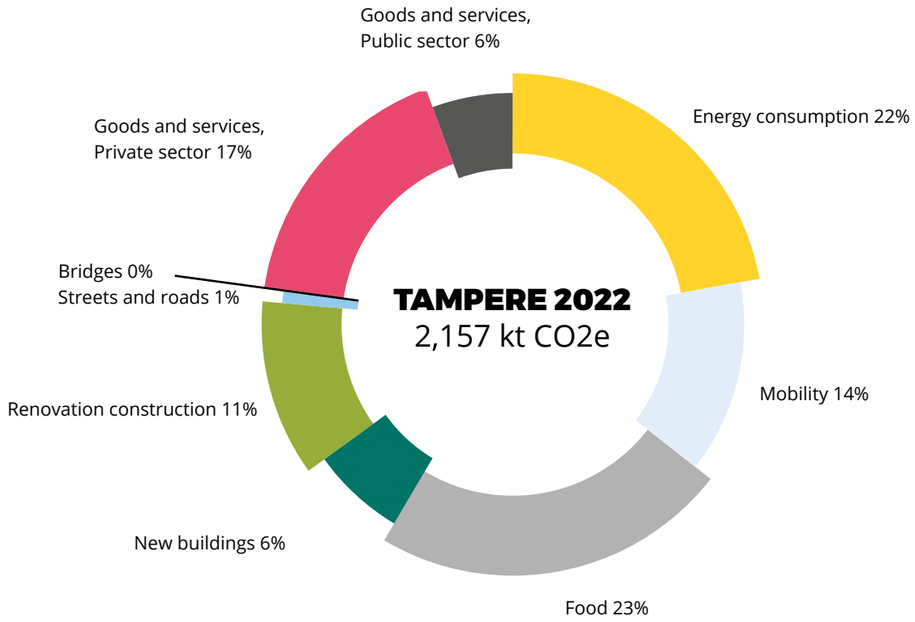


Figure 13 Tampere's consumption-based climate emissions by sector in 2022, Source: Greenhouse gas emissions from Tampere consumption, Kulma model November 2023 , Sitowise Oy and Natural Resources Institute Finland (Liljeströmet al., 2023).

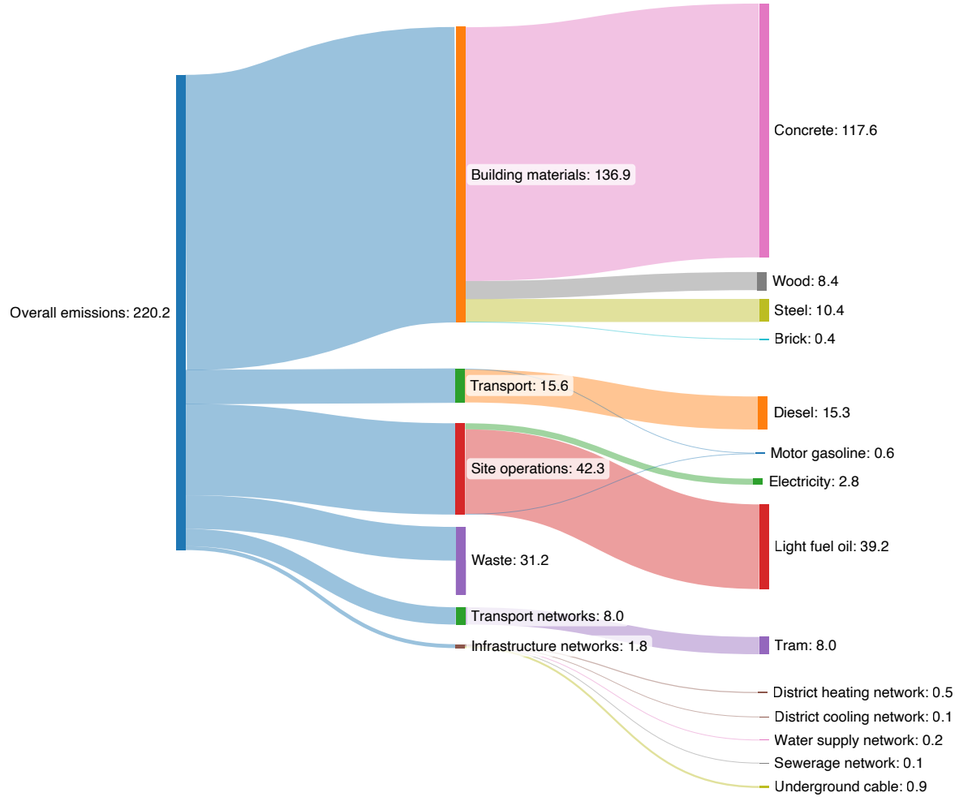


Figure 14 Carbon footprint of new buildings and infrastructure completed in Tampere in 2022 (kt CO2e); data about streets and sidewalks is missing. Source: City of Tampere, calculation model produced by Gaia Consulting Oy.

per capita. However, the 2020 calculations did not include the city's procurement activities and renovation projects, which have now been incorporated. This recalculation was piloted in three cities: Tampere, Turku and Helsinki. Additionally, a preliminary model for estimating annual emissions from construction was developed for Tampere, covering all new buildings and infrastructure projects. The results for 2022 indicate emissions of 220 kt CO_2e, excluding streets and pavements due to unavailable data. In the past, they have accounted for less than 5% of total emissions. Figure 14 shows that most emissions are clearly caused by construction materials, of which concrete production is the biggest source of emissions. The latest data about the carbon footprint of construction is provided in Figure 13 above. It can be observed that the climate emissions from renovation construction, calculated for the first time in late 2023, are even higher than those from new construction. Higher emissions are due to the significant volume of renovation construction and not because renovation construction itself would cause higher emissions than new construction.

Controlling emissions from consumption

Reducing consumption-based emissions is an important part of Tampere's climate work. In addition to reducing its own consumption, the city plays a key role in encouraging residents and businesses to engage in climate work. Residents can be supported in operating sustainably and taking climate neutral actions suitable for their own everyday lives. These actions often bring other benefits in addition to emission reductions; for example, walking and cycling also benefit the economy and health of Tampere residents.

The goal of the strategic Carbon Neutral Actions development programme (2022–2025) is to increase the awareness, competence and motivation of Tampere residents in the context of sustainable lifestyles and to make it easier for companies to operate sustainably. The city helps residents make active personal decisions by, for example, offering climate-friendly food at events and in institutional catering. The city also provides advice on things such as the energy use of housing companies, and modifies the solutions available in modes of transport, leisure opportunities and the rental and sharing of goods. The city also has an impact through the community structure and built environment solutions, such as land use. Education and training bring out sustainable practices.

Promotion of circular economy

Climate and circular economy measures are reconciled in the roadmap. In Tampere, circular economy pilots have been implemented in the procurement of infrastructure construction, and circular economy criteria have also been tested in plot allocation. Mass coordination has been able to reduce the consumption of virgin natural resources and reduce emissions. In connection with the demolition of the Ahvenisjärvi comprehensive school, possibilities for reusing building parts were surveyed.

Utilising pilots and the experiences gained from them in the further development of operations, utilising procurements as an accelerator of circular economy solutions, and increasing co-operation in the different stages of the projects are ways to promote the circular economy in city operations. More needs to be done to improve the understanding of the current use of materials and natural resources, the data resources held by the city organisation, and the possibilities for monitoring. In addition, the possibility of committing to the national Circular Economy Green Deal is being explored.

Adapting to and preparing for climate change

The aim of the City of Tampere's climate change adaptation is to create a healthy and safe living environment and increase the diversity and varied structure of urban nature and forests, strengthening the ecological network. Extensive sudden rainfall, heat waves and other extreme weather phenomena caused by climate change can be prepared for by, for example, increasing the number of trees, stormwater absorption structures and other city greening. Adaptation and preparation measures can reduce vulnerability to climate change risks.

The City of Tampere is preparing for climate change as part of general national and regional preparedness for threats and disruptions. The city takes into account the consequences of climate change in its own preparedness planning, and cooperates in many preparedness cooperation networks with various authorities, business life, organisations and citizens.

Efforts to adapt to climate change have been integrated into Tampere's broader processes, including risk management, update process of the Climate Neutral Tampere 2030 roadmap, annual and service planning, and the reporting of climate items. Evidence of these adaptation measures can already be seen in Tampere in initiatives like the stormwater programme, the biodiversity programme and the forest management model, as well as the phased comprehensive plan for the inner city. In support of these measures, Tampere has developed and applied various tools and methods, such as the green coefficient, the urban tree policy, the green roof policy and design guidelines for nature-based systems.

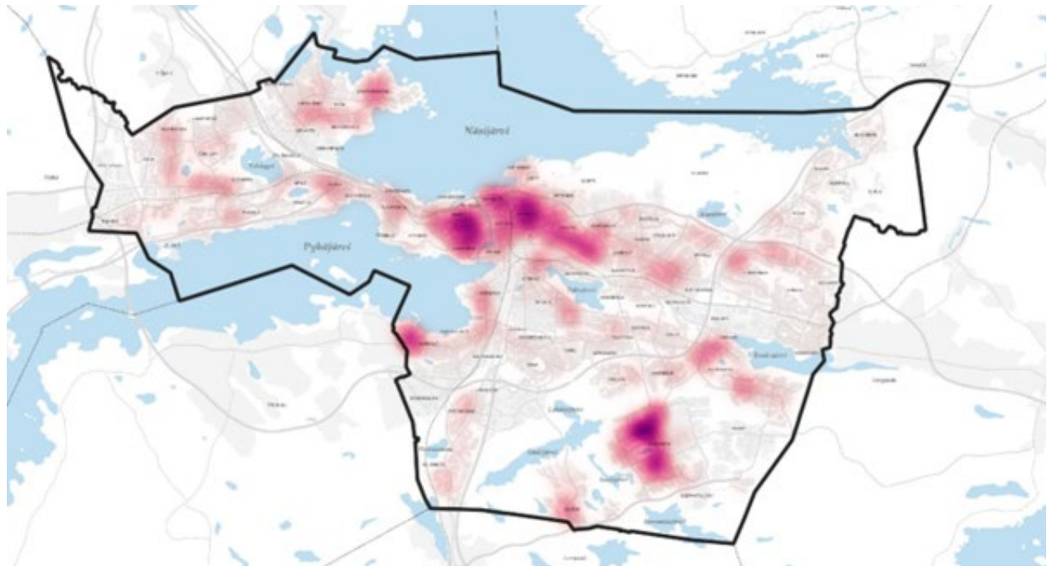


Figure 15 The vulnerability analysis of Tampere (2024) investigated population groups, livelihoods, ecosystems and critical functions of society that are vulnerable to the risks of climate change. The map describes the intersections of the population vulnerable to floods and heatwaves, as well as the heat island phenomenon and the areas where stormwater and water body floods occur, in accordance with the vulnerability analysis. Adaptation measures are particularly important for these areas. The results of the vulnerability analysis have been utilised in the planning of the adaptation measures of this roadmap.

The measures will be put into practice with the help of the Climate Neutral Tampere 2030 roadmap. Furthermore, city units identify climate change-related risks to the city organisation's own operations and objectives as part of a comprehensive risk management process, and report the identified risks and their management means to the Granite ERM system. In addition to the city's own measures, residents and companies are informed about adaptation to climate change and the required preparedness, and these aspects are also developed in cooperation with them.

Climate Neutral Tampere 2030 roadmap, results for 2020–2024

Everyone can follow the progress of the measures set out in the Climate Neutral Tampere 2030 roadmap free of charge in an online service open to everyone, Tampere's Climate and Environmental Watch. The first roadmap update approved by the City Board in October 2022 had 305 measures. By June 2024, 23% (69 measures) of these had been completed.

The completed measures, as well as those that have become part of the routine work of the city, are marked in the action tables of the roadmap. Overall, more than half (156) of the measures are currently being implemented and more than one-sixth (57) are being planned. The measures are scheduled by council term; 91% of them were reported to be on schedule (see Figure 17). Following the roadmap update, the number of measures increases to 397.

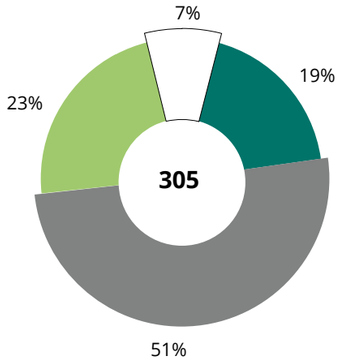


Figure 16
Realisation of roadmap measures 2020–2024.

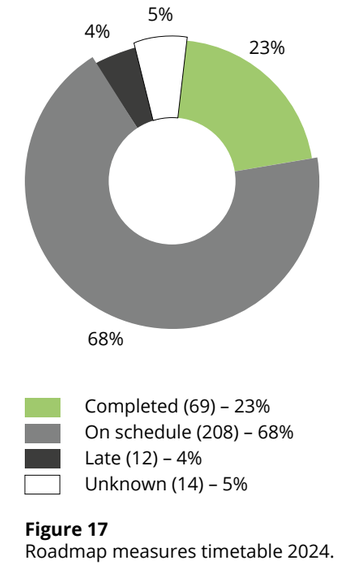


Figure 17
Roadmap measures timetable 2024.

4. ROADMAP

The Climate Neutral Tampere 2030 Roadmap is based on the themes set out in the Sustainable Tampere Guidelines and on the main goals derived from them. The 'Good state of the environment' theme is excluded from this roadmap, because it features sectors of environmental protection other than climate change mitigation. The first theme in the guidelines, mobility and urban structure, is divided into two parts: sustainable urban planning, and sustainable mobility. In this second update of the roadmap, the sets of measures were reviewed and updated to reflect the new measures. In addition, the cross-sectional 0 theme was expanded and the name was changed: Climate leadership and stakeholder collaboration. In connection with the update, the parties responsible for the measures have been clarified and extensive measures have been broken down into smaller parts so that there are tasks under the measures.

The seven main goals comprise 36 sets of measures, under which are a total of 397 measures.

Organising the implementation of the roadmap

1. The City Board approves the roadmap and on an annual basis monitors the implementation of the measures as part of reporting for the Carbon Neutral Actions development programme The emissions calculation is reported annually to the CDP (Carbon Disclosure Project) platform, from which the data is submitted to both the Covenant of Mayors and the EU Climate Mission. The progress of the roadmap is reported to the EU Climate Mission every two years in connection with the update of the Climate City Contract.

2. Roadmap measures are compiled annually in the climate budget included in the city budget.

3. The annual targets and measures are included from the roadmap in the Services' annual plans. The services groups and units of each service area update their own measures in cooperation with the Climate and Environmental Policy Unit and are responsible for the inclusion of measures from the roadmap in their service plans and annual plans.

4. The Climate and Environmental Policy Unit is responsible for monitoring, reporting and updating the roadmap for the entire city.

5. The roadmap is published as an open digital platform for the Climate and Environment Watch at ilmastovahti.tampere.fi, where the city's units and companies update the progress of the roadmap's measures. The roadmap's emissions forecast is also updated in the emissions scenario tool attached to the aforementioned website, where it can be reviewed in more detail. The city's partners can provide information on their climate actions at the ilmastokumppanuus.fi website.

CLIMATE NEUTRAL TAMPERE 2030 ROADMAP.
Themes, main goals and measure packages

THEME 0 – Climate leadership and stakeholder collaboration
Tampere is climate neutral in 2030. Tampere takes climate change risks and adaptation seriously.

- **0.1** Coordination and communications of climate work
- **0.2** Knowledge-based management and impact assessment
- **0.3** Sustainable business and corporate cooperation
- **0.4** Sustainable procurement

THEME 1 – Sustainable detailed planning
The city grows primarily into public transport zones and regional centres.

- **1.1** Assessment of the urban structure
- **1.2** Guiding the urban structure
- **1.3** Conditions for sustainable mobility
- **1.4** Strengthening green areas

THEME 2 – Sustainable transport system
Share of sustainable modes of transport is 69%.

- **2.1** Tram traffic
- **2.2** Commuter train traffic
- **2.3** Bus traffic
- **2.4** Service level of public transport
- **2.5** Pedestrian and bicycle traffic
- **2.6** Road transport
- **2.7** Delivery traffic
- **2.8** Waterborne traffic
- **2.9** Guidance of mobility
- **2.10** Transport equipment and work machinery

THEME 3 – Sustainable construction
New construction is at a zero-energy level, and the carbon footprint of housing is small.

- **3.1** New construction in city properties
- **3.2** Renovation construction in city properties
- **3.3** Guidance of low-carbon construction
- **3.4** Guidance of private construction
- **3.5** Infrastructure construction
- **3.6** Use of recycled materials

THEME 4 – Sustainable energy
Renewable energy accounts for 80%.

- **4.1** Centralised renewable energy
- **4.2** Smart energy networks and services
- **4.3** Decentralised renewable energy and energy efficiency
- **4.4** Abandoning oil heating

THEME 5 – Sustainable consumption
Consumption is sustainable and the circular economy is functional.

- **5.1** Waste management
- **5.2** Sustainable lifestyle
- **5.3** Ecosocial education
- **5.4** Eating
- **5.5** Sustainable tourism and experience economy

THEME 6 – Sustainable urban nature
Urban nature and blue-green structures sequester carbon, and the city is prepared for climate change.

- **6.1** Carbon sinks in urban nature
- **6.2** Role of the blue-green structure in adapting to climate change
- **6.3** Ecological network

THEME 0

CLIMATE LEADERSHIP AND STAKEHOLDER COLLABORATION

MAIN OBJECTIVE: **Tampere will be climate neutral in 2030. Tampere takes climate change risks and adaptation seriously.**

KEY MEASURES

- Support for city units, companies and projects in mitigation and adaptation work
- New financing opportunities
- Developing the effectiveness of the climate budget in financial planning
- Generation of ecosystem data: ecosystem services and accounts
- The Climate Partnership model for companies and cooperation with residents and communities.

Description

Global warming is a crisis that affects people all around the world. Cities represent some 80% of all consumption of energy and natural resources. In their everyday work, cities continuously make decisions that can either decrease or increase emissions.

Tampere is striving to be climate neutral by 2030. This means that the greenhouse gas emissions in Tampere will be reduced by 80% compared to 1990 while offsetting the remaining 20%. The Climate Neutral Tampere 2030 Roadmap compiles measures to achieve the target and to adapt to the impacts of climate change.

It is for the city to strive to mitigate global warming and to protect residents and society from the adverse effects of climate change. The city wants every Tampere resident to be able to live in a climate-sustainable way.

Climate change mitigation, as well as preparing for and adapting to the effects of climate change, call for a cultural change. Cooperation between residents, companies, associations and communities and their commitment to reducing climate emissions is essential. The principles of sustainable development and responsibility must become increasingly central in the city's investments, projects and procurement, and industrial policy must enable the transformation of companies.

Tampere's climate budget links the climate efforts to the city budget and financial statements. It is used to monitor the progress of the climate neutrality goal and whether the climate actions are adequate. Meanwhile, the climate neutrality goal takes concrete shape at the annual level. The climate budget produces data for decision-making purposes while providing increased transparency for the city residents.

The Tampere climate budget is composed of two parts:
1. the emissions budget and
2. the financial plan for climate measures.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2018	2020	2022	2023	2025	2030
Climate emissions (CO2e) and the percentage reduced (%)	kt CO2e (%)	924 (29)	853 (34)	845 (35)		520 (60)	260 (80)
Share of procurements involving environmental criteria of all city procurements, pcs.	% (of number of pieces)	33	23	30	22		

- Climate emissions will have reduced by 80% compared to 1990, and the remaining 20% will have been offset.
- The key climate risks will have been identified and action taken to mitigate them.
- Climate risk management will have been integrated into the city's risk management and preparedness process.
- City units will take climate change adaptation into account in their operations.
- Environmental criteria and life-cycle impacts will be taken into account, where applicable, in the most climate-relevant city procurements.
- The circular economy business will have expanded and the re-use of raw materials increased.

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Emissions reductions leading to financial savings
- Ecosystem services
- Positive impact on city's image
- Strengthening the community spirit and inclusion of city residents
- Facilitating new business
- Strengthening corporate cooperation.

Measure package 0.1
Coordination and communications of climate work

The city's units, companies and projects will be supported in the work and financing of climate change mitigation and adaptation. Climate goals and information will be part of the planning and monitoring of the city's finances and operations. The city will be active in regional, national and international climate change and mitigation networks.

Eco-support activities and communication campaigns will support city staff in achieving climate objectives. A plan will be established to offset the climate emissions that cannot be reduced by 2030.

Image: Matias Reinikainen

Figure 18 Tampere was selected for the EU Comission's 100 Climate Neutral and Smart Cities EU Mission. The plan directs its participants to engage in even closer cooperation with companies, Tampere residents and other stakeholders and offers financing opportunities. In addition, the European Commission awarded Tampere's comprehensive climate plan the EU Mission Label, and Tampere was one of 53 European cities to receive this recognition. The label was received by Hannele Räikkönen, Contact Director of the Tampere and Pirkanmaa EU offices.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.1.1	**The city's units and companies will be supported in climate change mitigation and adaptation work.** • The city's internal working group model will be developed and coordinated by theme. • Annual unit and company tours, climate morning coffees and a series of lectures on the progress of the roadmap will be organised. • Climate change adaptation as a whole will be coordinated in accordance with the adaptation operating model.	2024–2029	**Climate and Environmental Policy**	●○○○○	M A
0.1.2	**Cooperation networks.** The city will be active in regional, national and international networks related to the themes of climate change mitigation and adaptation.	2024–2029	**Climate and Environmental Policy**	●○○○○	M A
0.1.3	**New financing opportunities and coordination of project applications.** • Project needs will be assessed and project applications coordinated at a city-wide level. • New types of financing opportunities for climate measures will be actively sought.	2024–2029	**Climate and Environmental Policy**	●○○○○	M A
0.1.4	**Communicating the goals and measures of the roadmap.** Communications with companies, residents and other stakeholders about the city's climate and environmental work and goals will be carried out.	2024–2029	**Climate and Environmental Policy**	●○○○○	M A
0.1.5	**Residents' participation and opportunities to influence things in the themes of climate change mitigation and adaptation will be enhanced.** • Communicating the city's climate work, meeting people, consulting other parties and engaging in the city's climate and environmental work.	2024–2029	**Climate and Environmental Policy,** Community and development services	●○○○○	M A
0.1.6	**The Strategy Unit will support roadmap implementation and monitoring as part of the city's strategic management system.** Climate goals and information will be part of the planning and monitoring of the city's finances and operations as well as the local assessment and communication of sustainable development.	2024–2029	**Strategy Unit**	●○○○○	M
0.1.7	**The city's Project Office will support project managers in taking climate impacts into account as part of comprehensive sustainability development of project and development operations.** The Project Office will provide tools and training for taking sustainable development perspectives into account in project management.	2024–2029	**Project Office**	●○○○○	M
0.1.8	**Strengthening the cooperation of the city's climate and welfare management.** The future welfare plan will include a climate and environmental perspective, and the cross-effects between the well-being of residents and the environment will be examined.	2024–2029	**Welfare Management,** Climate and Environmental Policy	●○○○○	M A

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.1.9	**Developing staff competence in climate goals.** The competence of the city's personnel, supervisors and management in sustainable development and climate issues will be developed using the eco-support model and through other training events. • The duties of eco-support staff will include familiarising new employees with the climate and environmental goals and measures of the City of Tampere, wherever possible. • Communications campaigns for all staff on the city's climate and environmental goals, critical travel needs assessments, and sustainable and healthy lifestyles. • Tips for supervisors on how to make your team's sustainable work life possible.	2024–2029	**Climate and Environmental Policy**, Human Resources Unit	●○○○○	M
0.1.10	**A plan will be established to offset the emissions that cannot be reduced by 2030.** The offsetting methods to be investigates will include carbon sinks in forests, green structures, wooden construction and technical solutions as well as purchasing carbon offset credits from elsewhere in Finland or abroad.	2025–2029	**Climate and Environmental Policy,** Real Estate and Housing Policy, Green Areas and Stormwater Management	●○○○○	M
0.1.11	**Climate emissions from the city's air travel will be offset and monitored.**	2024–2029	**Climate and Environmental Policy**	●○○○○	M
	• Upper secondary schools will develop ways to compensate for the emissions of trips abroad and establish a permanent practice for all participants in trips abroad.	2024–2029	**Upper secondary school education**	●○○○○	M
0.1.12	**A climate change adaptation operating model is prepared in 2022.** The model has identified the key actors, their roles and how to promote the adaptation work within the city. Adaptation measures will be taken, focusing on the risks and risk areas that are the most important where the city is concerned.	Moved to routine work	**Climate and Environmental Policy,** Strategy and Development	●○○○○	A
0.1.13	**Preparedness communications to residents.** Informing residents of the possibilities to prepare for the risks of climate change, including raising awareness of the technical shortcomings of buildings in relation to changing conditions (e.g. humidity, temperature) and what to take into account.	2025–2029	**Health Protection Services**	●○○○○	A
0.1.14	**Preparedness communications to operating units.** In connection with systematic monitoring inspections, which will be carried out by Health Protection Services, in places such as service buildings, the preparedness possibilities for climate change risks will be communicated (preparedness for hot weather in social sector institutions, etc.). To the check list will be added items which should be communicated about during inspections of particular sites.	2025–2029	**Health Protection Services**	●○○○○	A

Figure 19 Patrick Child, Director of the EU Mission: Climate-Neutral and Smart Cities, and Ilkka Porttikivi, Deputy Mayor, present the EU Mission Label awarded to Tampere for successful climate work. Child visited Tampere when the City of Tampere Mayor Kalervo Kummola was appointed to the Covenant of Mayors of the EU's climate mission. The group of leaders of 17 European cities has a direct dialogue with the European Commission. Image: City of Tampere/Venla Kinnunen

Measure package 0.2

Knowledge-based management and impact assessment

The impact of the climate budget on economic planning processes will be developed. This includes testing the data produced by the emission scenario tool used by the city in the financial planning of city organisation units.

Ecosystem accounting will be used to monitor the development of ecosystems and ecosystem services so that they can be taken into account better in land use planning and so that the adequacy and integrity of blue-green areas can be ensured.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.2.1	**The impact of the climate budget on financial planning processes will be developed.** During 2025 and 2026, development work will be carried out as part of the Climate-4-CAST project. • The impact of the new data produced by the Emission Scenario Tool will be tested in the processes of preparing unit budgets with the aim of deploying the data produced by the tool more broadly in the financial planning processes (Climate-4-CAST project). • The process of financial accounting and data visualisation of the climate budget and environmental items (financial unit) will be developed and automated.	2024–2029	**Climate and Environmental Policy, Budgeting Unit**	●○○○○	M
0.2.2	**The emission scenario tool used by the city will be developed.** During 2025 and 2026, development work will be carried out as part of the Climate-4-CAST project, which will expand the tool's features and improve the tool's usability and application possibilities. • The tool will be expanded to assess the economic impacts of climate measures, and emission scenarios will be further developed. • In terms of usability, the interactive user features will be improved. • An English version of the tool will be produced.	2024–2029	**Climate and Environmental Policy**	●○○○○	M
0.2.3	**Ecosystem services and ecosystem accounting.** Data about the extent of ecosystems and the volume and economic value of the ecosystem services they produce will be produced in the ecosystem accounting framework. Ecosystem accounting will be used to monitor the development of ecosystem and ecosystem services, they can be taken better into account in land use planning, and the adequacy and integrity of blue-green areas can be ensured. • Participation in the Countecos project, which will assess, in the context of ecosystem accounting, the volume and financial value of the recreational service and local climate regulation service provided by green areas. • The account of the extent of the ecosystem will be examined as a potential indicator for monitoring the development of the city's natural capital. • Data about the ecosystem services produced by the city's water bodies will be produced from the perspective of adaptation to climate change.	2024–2029	**Climate and Environmental Policy,** Comprehensive Planning, Environmental Protection, Green Areas and Stromwater Management, Detailed Planning, Real Estate and Housing Policy	●○○○○	M A
0.2.4	**Review of the reflective effects.** Reflective effects will be reviewed, especially in relation to ensuring critical infrastructure and the city organisation's own operations.	2024–2029	**Risk Management, Safety and Preparedness,** Climate and Environmental Policy	●○○○○	M A
0.2.5	**Opportunities will be explored to assess the climate effects of the city's road transport projects.**	2024–2029	**Transport System Planning, Climate and Environmental Policy**	●○○○○	M A
0.2.6	**CO2 emissions from the building stock.** The Climate and Environmental Policy Unit will calculate the amount of carbon dioxide emissions from the city's building stock while monitoring and reporting on developments. Carbon dioxide emissions (energy consumption, and construction) from the buildings owned by the city will be added to the indicators monitored. Data on emissions from energy consumption will be obtained from Enerkey emissions, and the level of emissions from construction will be estimated based on carbon footprint calculations and on Gaia's tool.	2024–2025	**Climate and Environmental Policy,** Real Estate and Housing Policy	●●○○○	M

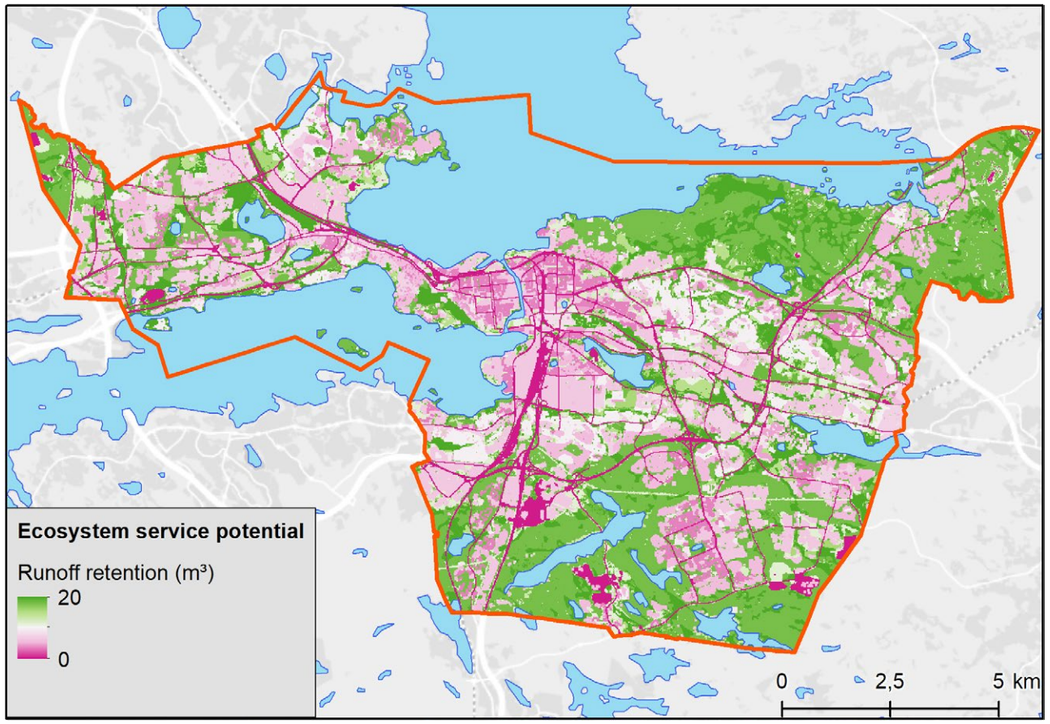


Figure 20 Nature's ability to retain runoff water is one example of ecosystem services. The figure shows the production potential of the stormwater regulation service in Tampere in 2018 in the case of 50 mm of precipitation. Source: Costadone et al. (2024).

	Scenario (year and precipitation)	**Industry**	**Commerce**	**Households**	**Total**
Financial value of runoff water regulation service	2018 - 24 mm	EUR 6,360,000	EUR 7,435,000	EUR 31,428,000	**EUR 45,223,000**
	2018 - 50 mm	EUR 8,363,000	EUR 9,659,000	EUR 41,334,000	**EUR 59,355,000**

Figure 21 Financial value of the stormwater regulation service in Tampere in different scenarios and their targeting. Financial value is based on the extent to which water absorption in green areas prevents potential harm caused by flood water for buildings owned by different sectors. Measure: 0.2.3. Source: Costadone et al. (2024).

Image: Visit Tampere Oy/Laura Vanzo

Measure package 0.3
Sustainable business and corporate cooperation

Corporate cooperation, such as the Climate Partnership model and the Think Sustainably partnership model, will be developed. Business ecosystems for climate business in the Tampere region and low-carbon business operations of small and medium-sized companies will be enabled. New major investments will be attracted to the region, with an emphasis on investments supporting the green transition.

Image: City of Tampere/Essi Lehtinen

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.3.1	**Climate Partnership.** The Climate Partnership operating model will be launched, whereby the city invites companies and communities to implement the Climate Neutral Tampere goal cooperatively and in ways that are appropriate for each of them. Post-launch, the activities will be continued and developed.	Moved to routine work	**Climate and Environmental Policy,** Business Tampere Oy	●○○○○	M A
0.3.2	**Corporate cooperation.** • The Think Sustainably (Valitse Vastuullisemmin) operating model will be taken forward. • A cooperation project at national level will be prepared, with companies as an important stakeholder. The pilot will involve many different actors and it will aim to improve the city's green network through different means, such as rainwater gardens, nature-based stormwater solutions, urban agriculture and meadows. The ultimate aim will be to improve climate change adaptation.	2024–2029 2024–2029 2024–2029	**Climate and Environmental Policy** **Climate and Environmental Policy,** EcoFellows Ltd, Visit Tampere Oy **Climate and Environmental Policy,** Green Areas and Stormwater Management, Business Tampere Oy, Economic Development, Competence and Real Estate Services	●○○○○ ●○○○○ ●○○○○	M A M A A
0.3.3	**New major investments will be attracted to the region, with an emphasis on different investments supporting the green transition.** These can be related, for example, to renewable energy projects and energy storage, CO2 capture, circular economy, material self-sufficiency and security of supply, the double transition of industry, e-fuels for traffic and moving work machinery, as well as electrification or solutions for the built environment, which widely serve the business life of Tampere and the entire urban region. A Nordic Ren-Gas Power-to-Gas plant is already being planned in Taraste in connection with Tammervoima's Waste-to-Energy Plant.	2024–2029	**Economic Development**, Business Tampere Oy	●○○○○	M
0.3.4	**Climate-business corporate ecosystems will be developed in the Tampere region.** Climate business will be one of the spearheads in the Tampere region economic strategy. Growth of the climate business will be facilitated by opening up the city's projects as development platforms (such as Hiedanranta).	2024–2025	**Economic Development,** Business Tampere Oy, Strategic Project Development, Hiedanrannan Kehitys Oy	●●○○○	M A
0.3.5	**Low-carbon products and services of SMEs.** The city's economic policy will support projects and operating environments that promote the productisation, commercialisation and market access of low-carbon product and service ideas of SMEs.	2024–2025	**Economic Development**, Business Tampere Oy	●○○○○	M
0.3.6	**Utilising and enabling green financing.** Advantage will be taken of green financing at applicable sites , while directing investments towards choices and packages that enable green financing.	2024–2029	**Ownership Steering,** Budgeting Unit, Climate and Environmental Policy	●○○○○	M A
0.3.7	**Responsibility of the city's investment activities.** Steps will be taken to further develop the ESG aspects of the city's investment activity, and the investment activity will have an ESG risk level that is lower than the baseline group. The carbon footprint of the portfolio continues to develop positively (in 2023 the figure was 128 tonnes of carbon dioxide per million USD, the benchmark index value was 168, in 2022 the portfolio figure was 138).	2024–2029	**Ownership steering**	●○○○○	M
0.3.8	**The development of the responsibility work and responsibility reporting of the subsidiaries will be continued.**	2024–2029	**Ownership Steering,** EcoFellows Ltd, Climate and Environmental Policy, Strategy Unit	●○○○○	M
0.3.9	**Tarastejärvi recycling park.** The Tarastenjärvi area as a recycling park will be developed, where materials such as demolition waste from buildings, vehicle parts, wood waste, metals and plastics will be utilised more efficiently.	2024–2025	**Business Unit,** Business Tampere Oy	●●●○○	M C
0.3.10	**Kolmenkulman Eco-Industrial Park.** The Kolmenkulman Eco-Industrial Park, a joint project between Tampere, Nokia and Ylöjärvi, will be developed. The area will be developed with a cleantech focus, maximising cooperation between businesses for the purpose of increasing material and energy efficiency and decreasing environmental burden while promoting the development of common eco-friendly approaches.	2024–2025	**Business Unit**, Business Tampere Oy	●●●○○	M C

Measure package 0.4
Sustainable procurement

Procurements will strive for sustainable consumption and a functioning circular economy. Environmental criteria will be used in procurements and companies will be actively informed about the city's climate and circular economy objectives in different procurements. Staff competence in the application of climate, environmental and energy efficiency aspects will be developed. When procuring ICT equipment and solutions, the sustainability aspect will be taken into account.

Image: Visit Tampere Oy/Mirella Mellonmaa

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.4.1	**Communications and market dialogue on the environmental objectives of procurement.** Information about the climate and circular economy objectives of the city's procurement categories will be communicated at targeted events for companies and on the city website. This will increase the suppliers' understanding of the city's intentions. The objectives of the category will be specified and maintained in cooperation with market actors through an active dialogue. New operating methods will be introduced that systematically provide data on companies' readiness to meet the city's objectives. The availability of sustainable solutions of companies and the use of environmental criteria will be specified on a procurement-specific basis.	2024–2029	**Procurement Services,** Service areas	●○○○○	M C
0.4.2	**Use of environmental criteria in procurement.** The achievement of the city's climate and circular economy objectives will be promoted through procurement. Procurement Services will ensure that the preparatory working groups assess the way environmental criteria are applied in the preparation of procurements. Suitable procurements will utilise the criteria bank for responsible procurements maintained by Motiva Oy. The use of environmental criteria in tendering procedures will be monitored and the results will be reported annually to the management.	2024–2029	**Procurement Services,** Service areas	●○○○○	M C
0.4.3	**Developing procurement competence.** The expertise of those responsible for procurement at the units will be developed in regard to climate, energy efficiency and other environmental aspects through training, networking and guidance.	Moved to routine work	**Procurement Services,** Climate and Environmental Policy	●○○○○	M A C
0.4.4	**Cooperation in sustainable procurement.** Cooperation will be increased on sustainable procurement themes with other cities and expert organisations.	Moved to routine work	**Procurement Services, Climate and Environmental Policy**	●○○○○	M A C
0.4.5	**Environmental objectives of procurement categories.** The most significant procurement categories have been identified from the perspective of low carbon. These include infrastructure construction, maintenance, facility construction, energy, ICT information systems, ICT infrastructure services, mobility, catering and food, furniture, as well as machinery and equipment. Procurement Services will progressively prioritise, refine and tighten climate and circular economy objectives for key categories in cooperation with category teams (representation of service areas). Category objectives and monitoring indicators guiding the procurements will be recorded in category plans and updated if necessary. The objectives and their monitoring will also be recorded in the service agreements of the in-house entities.	2024–2029	**Procurement Services,** Service areas	●○○○○	M C
0.4.6	**Environmental issues and energy efficiency will be addressed as part of the cloud transition of ICT services.**	2024–2029	**Digitalisation and ICT**	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
0.4.7	**Sustainable infrastructure service and information system procurements.** • The environmental criteria for infrastructure service and information system procurement will be specified. • Understanding and competence in new sustainable solutions in the ICT sector will be increased through market dialogue and training.	2024–2029	**Digitalisation and ICT**	●○○○○	M C
0.4.8	**Sustainable ICT equipment procurement.** • The city will procure all ICT equipment primarily using the leasing model to enable the recycling of equipment for reuse in a manner that addressed environmental aspects. Where possible, the leasing period will be extended. • Responsibility criteria will be taken into account in basic information technology tendering processes when defining the equipment requirements for ICT equipment. Additionally, the use of certificates as an environmental criterion will also be assessed on a case-by-case basis.	2024–2029	**Digitalisation and ICT**	●○○○○	M C
0.4.9	**Taking climate neutrality into account in procurements in Tampere Water.** Investigation of the carbon footprint of the key process chemicals and the potential to reduce it.	Complete	**Tampere Water**		M
0.4.10	**Procurements of schools and day-care centres.** In procurements, early childhood education, pre-primary education and basic education will explore opportunities to test the Ministry of the Environment's Green Deals. The aim will be to promote climate change mitigation and the circular economy through procurement.	Complete	**Early Childhood Education and Pre-Primary Education:**		M

Figure 22 The City of Tampere investigated, in cooperation with the University of Jyväskylä, the carbon footprint of the Tampere city organisation's procurements in 2022. The biggest emissions came from property heating, food and purchases related to accommodation and travel.

THEME 1

SUSTAINABLE URBAN PLANNING

MAIN OBJECTIVE: **The city will grow primarily into public transport zones and regional centres.**

KEY MEASURES 2024–2026

- Development of operating environment data
- Development of detailed planning regulations
- Land use policies
- Sustainable mobility in new and complementary areas

KEY MEASURES 2027–2030

- Impact analysis of city-centre development projects
- Securing the blue-green structure
- Climate change adaptation in urban planning
- Increasing canopy coverage.

Description

In recent years, Tampere has grown by 4,800-6,000 residents annually. The aim is to enable sustainable growth while preserving the quality and functionality of the urban environment. Detailed planning will be focused on the city centre, the regional centres and the key public transport zones. Assessment of the climate effects from infrastructure is increasingly central to land-use planning.

Tampere will aim to create the economic conditions for an efficient service structure, energy system and public transport system, to reduce the need to own or use a car, to reduce emissions from mobility, to support walking and cycling on everyday journeys, and to conserve nature and natural resources.

In land use planning, aspects such as local nature, the preservation of biodiversity and adequate green areas will be developed. The growth which the city is experiencing will create increasing pressure to use forests and nature areas, and therefore it will be vitally important to carefully consider expanding any construction areas to green areas. Value-based information and indicators derived from ecosystem services will be used as part of the planning and impact assessment of land use.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2015	2018	2019	2020	2021	2022	2023	2025	2030
Residential floor area planned for the public transport zones and for the regional centres	%	70	77	21	70	94	42	98	85	90
New residents in central Tampere* (+15,000 since 2015)	person	40,000	41,000	41,000	42,000	42,000	43,000	45,000		
New jobs in central Tampere* (+15,000 since 2015)	pcs	42,000	44,000	43,000	44,000	47,000	49,000			
Share of areas zoned for recreation in the inner city's detailed plan	%	26.5	26.2	26	29	29	30	30		
Green areas in master plans and city plans (incl. protected green areas) in the inner city area	m²/resident		220	224	219	216	213	208		

- Share of households (%) with 300 or 700 metres of distance to the key public services.
- The urban structure will be mixed in the city centres as well as around the major tramway stops and public transport transfer terminals.
- The urban structure will support walking, cycling and the use of public transport on everyday journeys.
- Residents will be satisfied with the comfort and usability of the urban environment.

*Source: Monitoring system of central Tampere, Microsoft Power BI 12 June 2024

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Diverse urban environment
- Enabling an economic and resource-efficient urban structure
- Strengthening the profitability of services and public transport
- Securing a carbon sequestering city green
- Strengthening urban biodiversity
- Positive impacts on comfort and microclimate, such as mitigation of heat, wind and stormwater floods
- Increasing awareness of alternative community development scenarios
- Developing new business
- Strengthening Tampere's attractiveness.

Measure package 1.1
Assessment of urban structure

The city will grow primarily into public transport zones and regional centres. Climate and energy reviews will be taken as a starting point for planning and assessing the urban structure. A method will be developed for planning and climate impact assessment, and this method will be used in regional planning.

Similarly, comparative carbon footprint calculations will be made for some parts of urban development projects. A summative socio-economic impact analysis will be carried out for the city centre's development projects.

EMISSION REDUCTION ●●●○○

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.1.1	**Assessment of the climate impact of the urban structure.** A methodology will be developed for the assessment of the climate impacts of the urban structure, to provide information to support planning and decision-making on the current and future emission and carbon sink impacts of alternative growth and development scenarios. The monitoring data of the current structure will be imported into a map service. The tool will be used to assess the impact of the master plan and to program city plans. The tool will be used in regional planning and the development of both the tool and its applications will continue (e.g. Carbon map project in cooperation with the Pirkanmaa Environment Centre ELY and SYKE).	Complete	**Comprehensive Planning**, Detailed Planning, Climate and Environmental Policy		M A
1.1.2	**Energy efficiency of the urban structure.** Tampere will contribute to the work carried out by the Tampere region municipalities to draw up an urban structure energy efficiency development programme, to plan the resources to implement that programme, and to introduce a tool to monitor the climate impacts of the urban structure (MAL agreement 2020–2023).	Complete	**Comprehensive Planning**		M
1.1.3	**Development of the assessment of the climate impact of the urban structure.** A methodology will be developed for the assessment of the climate impacts of the urban structure, to provide information to support planning and decision-making on the current and future emission and carbon sink impacts of growth and development scenarios. The tool provides information for the programming of land use implementation (for example, detailed planning projects, PALM). The development of the tool and its applications will be continued (e.g. emission scenarios, emission factors, carbon stocks, preconstruction and infrastructure construction, energy during use) in cooperation with other parties.	2024–2030	**Comprehensive Planning,** Detailed Planning, Climate and Environmental Policy, Real Estate and Housing Policy	●●○○○	M A
1.1.4	**Assessment of the climate impact of the city plan.** City-plan requirements that seek climate neutrality will be developed. • The CO2 emissions calculation tool will be introduced in detailed planning. • Energy reports will be drawn up for wider city plans. • The use of low-carbon building materials will be advanced with detailed planning regulations in new construction and complementary construction.	2024–2025	**Detailed Planning,** Comprehensive Planning, Climate and Environmental Policy	●●○○○	M
1.1.5	**Surveying areas built on the deck and setting indicators for them.** Inner city areas built on the deck will be surveyed. The information will be produced in the geographical data format for the city interface and as a view to the Oskari map service. The possibility of maintaining the material as part of the building permit process will be examined. An indicator will be created to monitor the development of the volume of deck construction.	2024–2029	**Comprehensive Planning,** Building Control	●○○○○	A
1.1.6	**Maintenance and development of operating environment information.** Coordination, dissemination and utilisation of urban structure monitoring information in the impact assessment of plans and programmes from strategy level to practical level will be carried out. Monitoring of the sustainability of the urban structure will be continuously developed and additional information will be produced with a wide range of materials. Monitoring will be carried out for the entire inner city, in the regional division of the urban environment situational monitoring and possibly also in other regional divisions, such as the city green development areas of the master plan. Monitoring will be carried out at least in terms of the mixed (mixed urban structure), green areas and green cover of the urban structure, as well as how walkable the structure is. Development work will be carried out to promote the content and ways of utilisation of monitoring, as well as sharing information within the city. Development will be carried out, especially in the context of steering city plans.	2024–2029	**Comprehensive Planning, Information and Knowledge Management,** Green Areas and Stormwater Management, Detailed Planning, Transport System Planning, Environmental Protection	●○○○○	M A

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.1.7	**Solutions related to adaptation to climate change in local detailed plans** Solution related to adaptation to climate change in local detailed plans will be discussed in the impact assessments of city plans.	2024–2029	**Detailed Planning**	●○○○○	A
1.1.8	**Climate change adaptation in the urban structure**. Information and solutions will be produced as to how adaptation should be considered in land-use planning; e.g. heat island phenomenon, air temperature, floods, blue-green infrastructure, canopy cover and green cover.	Moved to routine work	**Comprehensive Planning,** Climate and Environmental Policy, Detailed Planning, Green Areas and Stormwater Management	●●○○○	A
1.1.9	**Impact analysis of city centre development projects.** A collating socio-economic impact analysis will be conducted for all city centre development projects. The economic and employment impacts of construction and during use will be modelled at local, regional and national level.	2024–2029	**Strategic Project Development**	●●○○○	M A
1.1.10	**Carbon footprint calculations of urban development projects.** Comparative carbon footprint calculations will be made of the suitable subsections of the projects led by strategic project development to support the promotion of a more ecological and sustainable way of implementation. • Viinikanlahti • Hakametsä • Central Station • Särkänniemi • Underground parking • Hiedanranta projects	2024–2029	**Strategic Project Development,** Climate and Environmental Policy	●●○○○	M
1.1.11	**Energy modelling will be carried out for the Tammela complementary construction area.**	Complete	**Strategic Project Development,** Climate and Environmental Policy		M
1.1.12	**Enhancing information flow for project development.** The Strategic Project Development Unit will ensure the mutual flow of information through, for example, weekly project meetings on good measures to promote climate neutrality and climate change adaptation.	2024–2025	**Strategic Project Development,** Hiedanrannan Kehitys Oy	●○○○○	M A C
1.1.13	**Environmental classification of the Hiedanranta master plan.** On the basis of Hiedanranta's preliminary first-phase BREEAM Communities certificate (2021), development of the area will be continued with due consideration of the requirements of the BREEAM procedure, thereby making it possible to apply for area-specific certification for the city plan.	2024–2025	**Strategic Project Development,** Hiedanrannan Kehitys Oy	●●○○○	M A
1.1.14	**Utilisation of zero fibre.** A competitive tendering for the extraction and utilisation of zero fibre was held in 2022–20223 and the licensing process is underway in 2024. Extraction of zero fibre in 2025–2029 will significantly reduce the CO2 emissions of zero fibre.	2024–2025	**Strategic Project Development**	●●●●○	M
1.1.15	**Implementation of the city centre's development programme in accordance with the objectives.** The quantitative and qualitative objectives related to the sustainable urban planning of the City Centre Development Programme (Tampere 2040) will be systematically promoted.	2024–2029	**Strategic Project Development**	●●○○○	M A

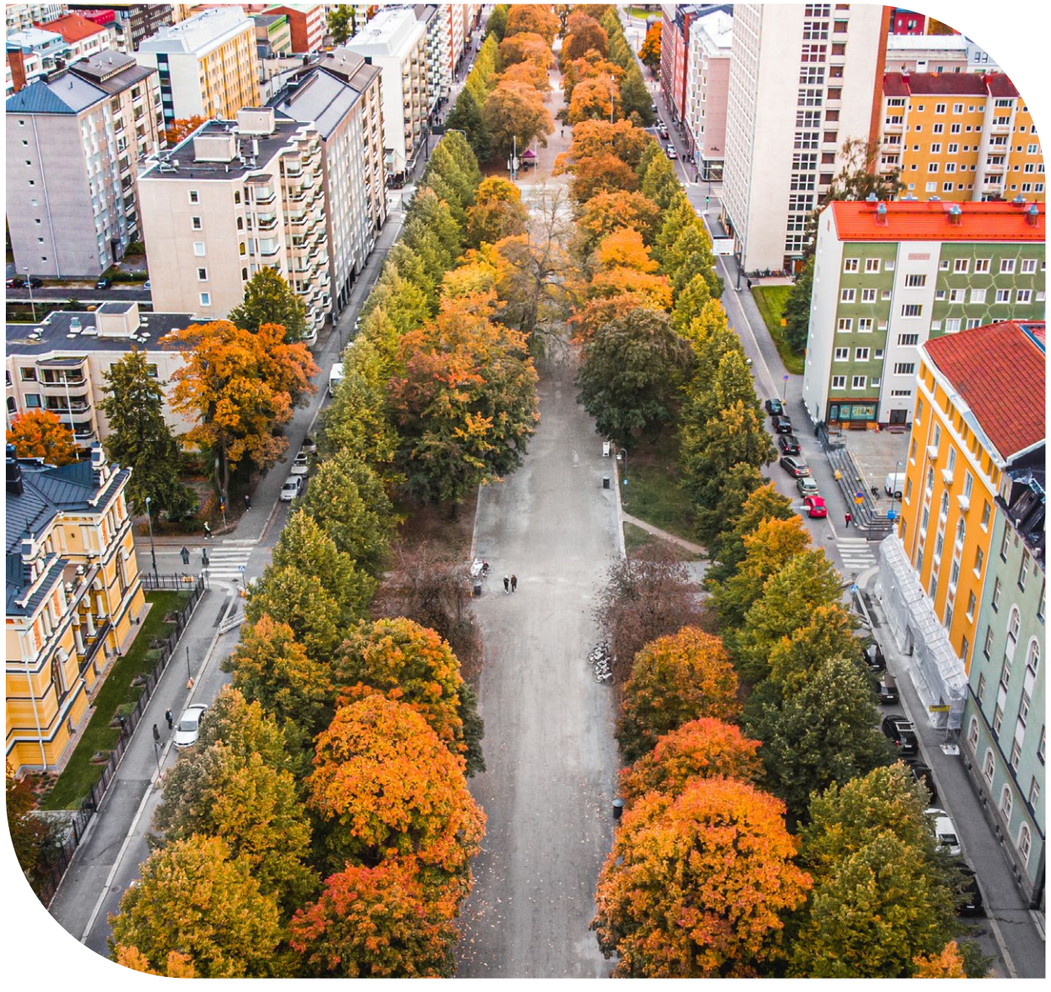


Image: Visit Tampere Oy/Laura Vanzo

Measure package 1.2
Guiding the urban structure

Image: Visit Tampere Oy/Laura Vanzo

Climate and energy principles will be included in land use planning and detailed planning. Hiedanrannan Kehitys Oy will prepare continuously developing housing construction sustainability criteria operating on market terms for the purpose of allocating plots in Hiedanranta.

The competitive tendering processes held for contracts in strategic project development will use absolute environmental impact requirements suitable for the contract. Over the railway yard a deck will be built, which means that a lot of demolition work can be avoided in the large city centre project. Detailed planning will develop zoning regulations that promote climate change adaptation. The guiding of the urban structure will have a significant impact on curbing the climate footprint emissions caused by the city's growth.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.2.1	**Land use policies.** The land use policy to be drawn up will include principles of sustainable growth, and the plan will anticipate the direction of growth after 2040.	2024–2025	**Comprehensive Planning,** Climate and Environmental Policy, Real Estate and Housing Policy	●○○○○	M
1.2.2	**Guiding the local detailed planning.** In the context of the detailed planning and the general plans, the CO2 and energy-efficiency analyses prepared for the geographies will guide detailed planning. • Account will be taken of the impact of the city plan on climate as a starting point for planning, and this approach will be recorded in the detailed planning quality manual.	2024–2029	**Comprehensive Planning, Detailed Planning**, Climate and Environmental Policy, Real Estate and Housing Policy, Building Control Department	●○○○○	M
1.2.3	**Sustainable procurement in detailed planning and transport planning.** Procurement of detailed planning and transport planning related specialist tasks will emphasise the city's climate neutrality goal, the specialists' competence in climate impact assessment, and the use of a certified environmental management system.	Moved to routine work	**Comprehensive Planning,** Detailed Planning, Transport System Planning, Climate and Environmental Policy	●○○○○	M
1.2.4	**Tendering processes for contracts implemented by Strategic Project Development will use the absolute requirements related to environmental impacts that are suitable for each contract.**	2024–2029	**Strategic project development**	●○○○○	M C
1.2.5	**Advancing wood construction in the detailed plan.** The detailed plan programme will define the planned sites that will advance the potential for wood construction.	Moved to routine work	**Detailed Planning,** Climate and Environmental Policy, Real Estate and Housing Policy	●○○○○	M
1.2.6	**Instructions for wood construction.** Guidelines will be prepared to advance wood construction in detailed planning.	Complete	**Detailed Planning,** Climate and Environmental Policy, Building Control Department		M
1.2.7	**Detailed plan regulations related to climate change adaptation are developed.**	2024–2029	**Detailed Planning**	●○○○○	A
1.2.8	**Tampere station and deck area.** A deck will be built over the railway yard to avoid additional demolition, despite the large scale of the project size and the central location.	2024–2029	**Strategic Project Development**	●●●●○	M
1.2.9	**Sustainable solutions of Hakametsä Sport Campus.** The measures to promote the ecological sustainability of Hakametsä Sport Campus have been recorded in the project's responsibility plan.	2024–2029	**Strategic Project Development**	●●○○○	M A C
1.2.10	**Carbon footprint of residential construction.** Hiedanrannan Kehitys Oy will prepare continuously developing sustainability criteria operating on market terms for the purpose of allocating plots in Hiedanranta. The targeted climate emission reduction for house-building in the first blocks is 32% as compared to the 2021 level.	2024–2025	**Strategic Project Development,** Hiedanrannan Kehitys Oy	●●○○○	M
1.2.11	**Marketing of complementary construction sites in the city centre.** To encourage complementary construction, complementary construction sites in the city centre will be marketed as part of a communication campaign for housing companies in 2021.	Complete	**Climate and Environmental Policy,** Strategic Project Development, Comprehensive Planning, Detailed Planning, Real Estate and Housing Policy, EcoFellows Ltd Oy		M
1.2.12	**Sustainable design competitions.** • Sustainability will be promoted in the evaluation criteria and objectives of design contests. • Smart and sustainable construction will be promoted in connection with design contests and development projects.	2024–2025	**Detailed Planning, Strategic Project Development**, Comprehensive Planning, Real Estate and Housing Policy, Transport System Planning, Green Areas and Stormwater Management, Climate and Environmental Policy	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.2.13	**Space reservations for adaptation structures.** City plans will take account of space provisions for climate change adaptation structures: stormwater management, snow storage, multipurpose areas and water reserves.	Moved to routine work	**Detailed Planning**, Green Areas and Stormwater Management, Construction and Maintenance of Urban Environment	●○○○○	A
1.2.14	**Snow space guidelines.** Snow space guidelines will be prepared, modelled on those drafted by Oulu; adequate snow storage space will be provided for in land-use planning.	Complete	**Green Areas and Stormwater Management,** Detailed Planning, Building Control Department, Transport System Planning, Construction and Maintenance of Urban Environment		A
1.2.15	**Utilisation of local collection areas in snow management.** The possibilities of using the local collection areas more extensively to reduce emissions from transporting snow around and to promote more controlled management of heavy snowy winters will be explored with the help of planned local collection points.	2024–2029	**Infrastructure Asset Management**	●○○○○	M A
1.2.16	**Construction of Hiedanranta, common facilities and communality.** The site-specific common facilities will be implemented under the new model, which is based on site-, block- and area-specific common facilities allowing for the implementation, at lower cost and generating fewer climate emissions, of common facilities that serve residents better.	Complete	**Strategic Project Development,** Hiedanrannan Kehitys Oy		M C
1.2.17	**Detailed plan regulations to promote circular economy are being developed.**	2024–2029	**Detailed Planning**	●○○○○	M C

Image: Visit Tampere Oy/Mikko Vares

Measure package 1.3
Conditions for sustainable mobility

Sustainable mobility will be promoted in new areas and where the existing urban structure is being built more densely. In local traffic, prerequisites will be created for railway stops for commuter trains and a smooth connection between them and walking and cycling. Special attention will be paid to mobility around the railway station and city centre as well as opportunities for sustainable event activities and Hiedanranta as a mobility hub.

Climate change will be taken into account and anticipated in traffic planning.

EMISSION REDUCTION ●●●●○

Image: Tiikerikuva/Jukka Salminen

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.3.1	**Planning in zones of sustainable growth.** Planning will focus on the city centre, the regional centres and the main public transport routes. Sustainable growth zones are defined in the master plan.	Moved to routine work	**Detailed Planning**, Comprehensive Planning, Public Transport	●○○○○	M
1.3.2	**Sustainable mobility in new and urban densification areas.** • Modal shares targets for 2040 for different zones of mobility and land use will be formed, taking into account the different roles of streets and areas in the transport system. • New areas, urban densification and street renovations will be planned using the modal share target defined for the target zone.	2024–2029	**Transport System Planning**, Comprehensive Planning, Detailed Planning	●○○○○	M
1.3.3	**Accessibility of services through sustainable modes of mobility.** Design of the service network and services, green and recreational services and public transport stops will take account of the accessibility of services by sustainable mobility modes. When constructing new operating units, their good accessibility for walking, cycling, public transport and remote connections will be taken into account.	Moved to routine work	**Comprehensive Planning,** Detailed Planning, Service Network Planning, Real Estate and Housing Policy, Transport System Planning, Public Transport, Green Areas and Stormwater Management	●○○○○	M
1.3.4	**Accessibility of local services.** The availability of neighbourhood services will be improved by creating mixed structures around the key public transport stops and in the core areas of the regions designated in the master plan as sustainable growth zones.	Moved to routine work	**Detailed Planning,** Comprehensive Planning, detailed planning, Green Areas and Stormwater Management, Construction and Maintenance of Urban Environment, Transport System Planning	●○○○○	M A
1.3.5	**Commuter train stations in land use planning.** In compliance with the inner city master plan, land use planning will take account of the space provisions for future commuter train stations, how they will be accessible on foot and by bicycle, as well as park-and-ride car parks.	Complete	**Comprehensive Planning**, Detailed Planning, Public Transport, Transport System Planning		M
1.3.6	**Walking, cycling and public transport in the local detailed plan.** Detailed planning will ensure adequate space provisions for pedestrian and cycling connections, for public transport stations and for mobility hubs. The accessibility of public transport stops will be improved through detailed planning.	Moved to routine work	**Detailed Planning**, Public Transport, Transport System Planning	●○○○○	M
1.3.7	**Implementation of canopy coverage of indicative recreation connections.** Implementation of the uniform canopy coverage of the indicative recreation connections of the inner city master plan will also be planned outside the areas of the initiated detailed plans. Tree plantings will be planned in accordance with the valid city plans in places such as public areas.	2025–2029	**Green Areas and Stormwater Management**, **Comprehensive Planning**, Environmental Protection, Real Estate and Housing Policy	●○○○○	M A
1.3.8	**Climate change adaptation in transport system planning.** • Information about adaptation methods in transport planning will be increased by, for example, organising internal training and cooperation meetings. • Measures to improve climate change adaptation in transport planning will be planned.	2025–2030	**Transport System Planning**, Climate and Environmental Policy Unit	●○○○○	A
1.3.9	**Sustainable Transport System of Hiedanranta.** The transport system in Hiedanranta will be based on the tramway and on locally sustainable and smart modes of mobility. Hiedanranta will serve as a connecting terminal for public transport in the western city region on the launch of tramway traffic. The preliminary feeder traffic solutions will be ready in 2024.	2024–2025	**Strategic Project Development,** Hiedanrannan Kehitys Oy, Transport System Planning, Public Transport	●●●○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.3.10	**Optimisation of accessibility in Viinikanlahti's**. Viinikanlahti will enable the implementation of sustainable lifestyles for residents through the optimisation of its good location and accessibility in an efficient urban structure.	2024–2029	**Strategic Project Development**	●●○○○	M
1.3.11	**Concentrated parking buildings in Viinikanlahti.** Concentrated parking buildings will be planned for Viinikanlahti. These will enable sustainable and flexible mobility services as well as innovative local energy solutions.	2025–2029	**Strategic Project Development**	●○○○○	M
1.3.12	**Development of railway station area.** The Tampere railway station area will be developed to become the city's most significant concentration of office jobs and numerous businesses, where many apartments and a new type of travel centre will also be built.	2024–2029	**Strategic Project Development,** Detailed Planning, Transport System Planning, Green Areas and Stormwater Management	●●●●○	M A
1.3.13	**Digital urban space manual.** A digital urban space manual will be introduced, collecting the City of Tampere's public urban space planning instructions and guidelines together in one place.	Complete	**Transport System Planning,** Comprehensive Planning, Detailed Planning, Green Areas and Stormwater Management, Construction and Maintenance of Urban Environment		M A
1.3.14	**High-speed Tampere–Helsinki railway connection.** The planning of the high-speed rail link between Tampere and Helsinki will be actively promoted as part of project company cooperation.	2024–2029	**Economic Development,** Comprehensive Planning, Detailed Planning, Public Transport, Transport System Planning	●●○○○	M
1.3.15	**Improving local tourism.** Hiking, lake and nature tourism services and mobility services will be developed in accordance with the lake and nature tourism roadmap.	2024–2025	**Visit Tampere Oy,** EcoFellows Ltd, Construction and Maintenance of Urban Environment	●●○○○	M
1.3.16	**Development of event conditions in the city centre and promotion of sustainable tourism.** • Urban venues situated along good public transport routes and in the vicinity of services in the city centre, such as Ratina Stadium, Nokia Arena, Tammela Stadium and Särkänniemi, will be developed. • Accommodation options for key locations will be planned to improve sustainable tourism.	2024–2029	**Strategic Project Development**	●●●●○	M
1.3.17	**The accessibility of walking and cycling in Särkänniemi will be improved with a new ticket office and entrance gate.**	2024–2025	**Tampereen Särkänniemi Oy**	●●○○○	M

Image: Visit Tampere Oy/Mikko Vares

Measure package 1.4
Strengthening green areas

The cohesion of green areas will be enhanced in order to secure and strengthen the natural environment and ecological connections, as well as for the outdoor activities and the recreation of city residents. A green factor will be introduced. Efforts will be made to plan how zoning could be used to increase trees and vegetation in development areas of city greening, even in areas that do not have an initiated detailed plan.

EMISSION REDUCTION ●●○○○

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
1.4.1	**Cohesion of green areas.** The role of green areas as pleasant routes for outdoor exercise and recreation and as pedestrian environments will be strengthened by examining the continuity and connectivity of the green area network and by identifying the areas needing development in comprehensive planning. Detailed planning will ensure the continuity and connectivity of the green network. The Green Areas and Stormwater Management unit will prepare criteria for the promotion of cohesion between the green areas.	Moved to routine work	**Comprehensive Planning, Detailed Planning, Green Areas and Stormwater Management,** Construction and Maintenance of Urban Environment, Transport System Planning, Environmental Protection, Climate and Environmental Policy	●○○○○	M A
1.4.2	**A green factor will be introduced into and used in the appropriate detailed plans.**	Moved to routine work	**Detailed Planning,** Green Areas and Stormwater Management	●○○○○	M A
1.4.3	**Increasing and development of blue-green infrastructure in city green development areas.** The addition and development of blue-green infrastructure in the city green development areas of the master plan will also be planned outside the areas that have initiated detailed plans. • Tree plantings and potentially increasing of other vegetation will be planned in accordance with the valid city plans in places such as public areas. • Examination of the possibility of requiring tree plantings (or other similar areas such as plantable plot parts) pursuant to detailed plans in private areas. • Developing processes of possible street plans from the perspective of increasing city green.	2025–2029	**Green Areas and Stormwater Management, Comprehensive Planning,** Transport System Planning, Building Control, Real Estate and Housing Policy	●○○○○	M A
1.4.4	**Participation in the development of the blue green infrastructure planning tool and its introduction.** The city will participate as an associate partner in the ARVO project. The project will develop a blue-green infrastructure planning tool suitable for the assessment (regional blue-green infrastructure factor), implementation and measurement of regional blue-green infrastructure objectives. The tool will be introduced within the city organisation.	2024–2029	**Comprehensive Planning, Green Areas and Stormwater Management**, Detailed Planning	●○○○○	M A
1.4.5	**Defining the principles of securing the blue-green infrastructure in the growth and vitality zone.** The current state of the blue-green infrastructure in the growth and vitality zone will be determined, on the basis of which the criteria and actions for securing the blue-green infrastructure will be defined.	2025–2029	**Comprehensive Planning,** Detailed Planning, Green Areas and Stormwater Management, Environmental Protection	●○○○○	A
1.4.6	**Yard and garden plans in detailed plans concerning vulnerable people.** It will be ensured that detailed plans' yard and garden plans concerning groups of vulnerable people have enough shady places in yards and gardens (e.g. day-care centres and schools, special and service housing).	2024–2029	**Detailed Planning,** Real Estate and Housing Policy	●○○○○	A
1.4.7	**Landscaping in development projects of the city centre.** • Green areas in development projects in the city centre will be strengthened and increased wherever possible. • Managing stormwater and flood risks through landscaping in development projects concerning the city centre.	2024–2029	**Strategic Project Development**	●●○○○	M A
1.4.8	**Green roofs in urban development projects of the city centre.** Planning will be directed to add green roofs to buildings in the city centre's urban development areas in accordance with the city's green roof policy.	2024–2029	**Strategic Project Development** Green Areas and Stormwater Management, Detailed Planning	●○○○○	M A

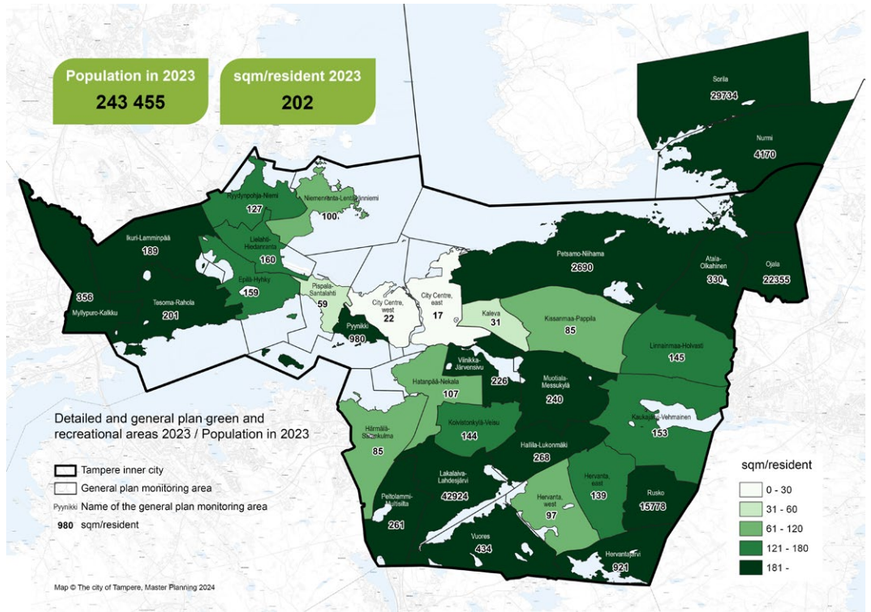


Figure 23 The inner city area has a total of 202 square metres per resident of planned green and recreation areas. The lowest volume of planned green and recreation areas per resident is in the heart of the city where the figure is 20 square metres. By calculation, the greenest area per capita is in areas with extensive greenery and recreation areas, such as the Kauppi–Niihama area, as well as areas with few inhabitants, such as the workplace-dominated Rusko area. However, as a result of the increase in the target population in the inner city area, the number of planned green areas per capita will decrease by about 22% by 2040, as there is little opportunity to increase the number of green areas in the vicinity of the populated areas. The number of green and recreation areas (surface area) has been calculated for urban environment situation monitoring areas. Source: Tampere inner-city phased local detailed plan, council term 2021–2025: Abstract of the blue-green infrastructure typification analysis.

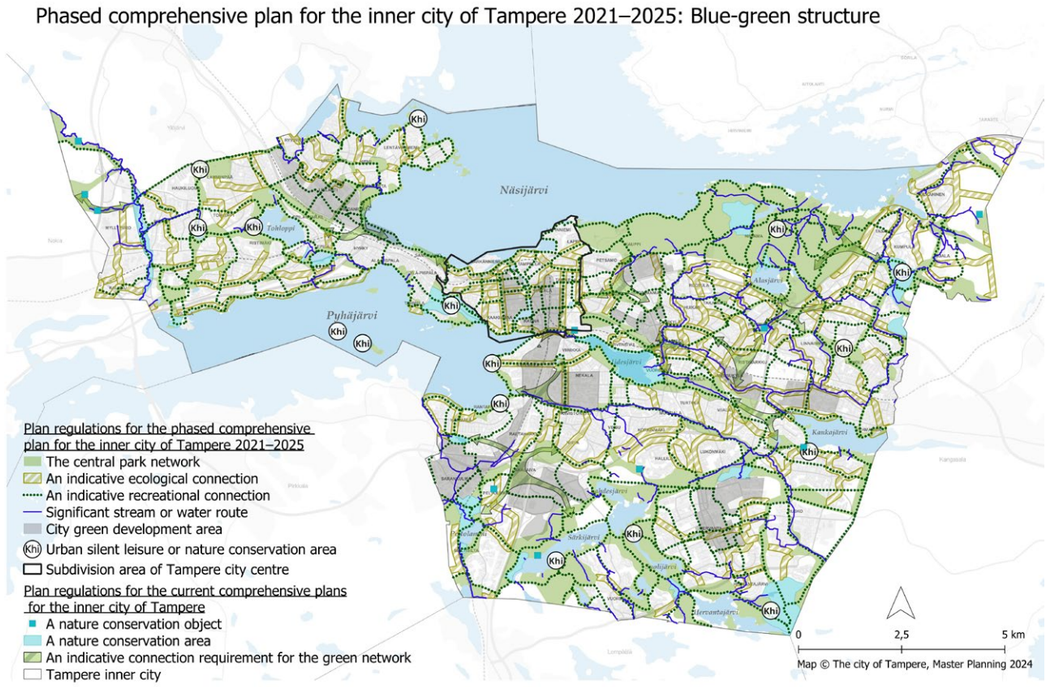


Figure 24 Extract from the key planning markings of map 2, Green environment and leisure services, of the Tampere inner-city detailed plan combination. In addition to the current master plan markings, the map image contains solutions of the currently initiated phase detailed plan 2021–2025. The central objective of the detailed plan is to ensure the preservation of the values of the central park network and the adequacy and accessibility by walking, cycling and public transport of the recreational areas and services. Additionally, the aim is to ensure the continuity of recreational connections and of the ecological network, as well as to improve the functionality, comfort and safety of recreational connections. In addition, the biodiversity of local nature and the sustainability of green areas must be developed, and the provision of ecosystem services must be strengthened.

THEME 2
SUSTAINABLE MOBILITY

MAIN OBJECTIVE: **The modal share of sustainable mobility modes will be 69%.**

KEY MEASURES 2024–2026

- Construction of the second part of the tramway
- Procurement of electric buses
- Improvement of winter maintenance
- Improvement of cycling conditions
- Development of delivery traffic
- Parking benefits for shared cars.

KEY MEASURES 2027–2030

- Construction of the third section of the railway
- Introduction of superbuses
- Promotion of commuter train traffic
- Bicycle parking garages
- Development of park-and-ride
- Launching of water bus traffic
- Shortening of travel times for public transport.

Description

In Tampere, climate emissions from transport are mainly caused by road traffic. Tampere residents make about 38% of their journeys by car. Since the population of the city and the whole region is growing rapidly, mobility cannot in the future rely on private cars due to emissions and the limited space in the city centre. In 2023, sustainable modes of transport accounted for 62% of modes of transport. The city's goal is for them to reach 69% by 2030.

Public transport, walking and cycling will all be priorities in the development of the transport system. Increasing sustainable modes of transport will require sustainable and determined action and the allocation of resources for the development of the transport system to improve the conditions for public transport and pedestrian and bicycle traffic.

Public transport services in the region will be developed so that they can respond to the growth in demand for services in accordance with the objectives. The tramway is the single most significant project in terms of developing the public transport system, as it will lighten the climate burden by decreasing the energy consumed in traffic and using electricity instead of oil. Furthermore, the tramway will create a framework for sustainable land use while promoting a smart transport system that develops smooth travel chains and new services for mobility.

Car sharing, the development of autonomous traffic and city bikes will complement a sustainable transport system and reduce the need for private cars. Changes in weather conditions must be anticipated in order to keep future mobility and traffic smooth. In order to adapt to climate change, things such as the impact of abundant snowfall on streets and service shifts and communicating about them must be prepared for.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2016	2018	2019	2020	2021	2022	2023	2025	2030
Number of public transport journeys compared to 2019	%				-33	-29	3	22	22	44
Modal share of public transport on an autumn weekday	%	13*				15**		17***	19	21
Modal share of walking on an autumn weekday	%	31*				30**		34***	31	33
Modal share of cycling on an autumn weekday	%	10*				10**		11***	13	15
Modal share of passenger car driving on an autumn weekday	%	45*				43**		38***	36	30
Percentage of outsourced low-emission propulsion transport services (bus and tramway line kilometres)	%						18	28	35	100
Increase in private car use, i.e. the number of cars	pcs/1,000 residents	472	480	484		411				
Share of vehicles with alternative propulsion systems in traffic use in Tampere	%		0.7	1.5	2.4	4.1		9.9	20	35
Length of cycle path network	km	673	693	703	710	672	679	690		

- The increase in car travel will stop by 2025 and will start to decline despite population growth.
- Tampere will operate a comprehensive, diverse, efficient and low-emission public transport system consisting of a tramway, commuter trains, buses and smart travel chains connecting all mobility modes.
- Walking and cycling will be smooth, attractive and safe mobility modes, separated into their own lanes in the city centres and on the main routes. Cycling will be the fastest mobility mode for journeys of under 3 kilometres.
- Tampere will have created a diverse range of mobility services to complement a sustainable mobility system. The need to own and use private cars will have decreased.
- Most journeys to school and commutes by city employees will be made using sustainable mobility modes.
- The city and its partners will implement versatile mobility management as part of transport and community planning. The means of mobility management will be linked to the other means that promote sustainable mobility.

* Henkilöliikennetutkimus ("passenger traffic survey") 2016, Tampere kaupunkijulkaisu
** Henkilöliikennetutkimus ("passenger traffic survey") 2021, Tampere kaupunkijulkaisu
*** Henkilöliikennetutkimus ("passenger traffic survey") 2023, Tampere kaupunkijulkaisu

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Improved service level for public transport: smoother and faster journeys
- Health benefits, including the reduction of harmful local emissions and noise, as well as the effects on overall well-being of using your own muscles to get from one place to another
- Increased comfort of the urban environment
- Improved traffic safety
- Reduced need to own a car
- More efficient use of urban space and economic benefits of a more densely built structure
- Creation of new business opportunities
- Tampere profiled as a European rail city
- Increased equality for mobility.

Measure package 2.1
Tram traffic

The construction of the tramway will continue. The second section, Pyynikintori–Santalahti–Lentävänniemi, will be built and the implementation plan for the third section, Pirkkala–Linnainmaa, will be completed. A project plan will be made for the Tampere–Ylöjärvi tramway.

The tramway and, for example, the extension of trams and the purchase of superbuses that complement the tramway are part of a long-term plan to increase the passenger volume of public transport.

EMISSION REDUCTION ●●●○○

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.1.1	**First tramway section.** The first section of the tramway (Hervanta–Pyynikintori–Tays) will be completed and will start operating in August 2021.	Complete	**Tampere Tramway Ltd.**		(M)
2.1.2	**Tramway traffic Koskipuisto–Sorin aukio**. Traffic on the Hatanpää highway tramway section Koskipuisto–Sorin aukio square will start in 2021.	Complete	**Tampere Tramway Ltd.**		(M)
2.1.3	**Second tramway section**. The second section of the tramway will be constructed. Traffic on section 2A (Pyynikintori–Santalahti) was launched on 7 August 2023 , and on section 2B (Santalahti–Lentävänniemi) it will start on 7 January 2025.	2024–2025	**Tampere Tramway Ltd.**	●●●●○	(M)
2.1.4	**A regional master plan for the tramway will be drawn up (Kangasala, Pirkkala, Ylöjärvi).**	Complete	**Tramway Development Programme**		(M)
2.1.5	**Plan for the Tampere and Pirkkala tramway.** The Tampere and Pirkkala tramway project plan assignment will have been fully completed by 30 April 2023.	Complete	**Tampere Tramway Ltd.**		(M)
2.1.6	**Scheduling of other tramway lines.** Target timetables for the other tramway lines will be defined during 2020–2023.	Complete	**Tampere Tramway Ltd.**		(M)
2.1.7	**Increasing the passenger volume of public transport.** A long-term public transport plan will be drawn up and maintained in order to increase the number of passengers. The plan takes account of the special features required to increase the number of tramway passengers. • Extension of trams. • Superbuses. • Extension of bus and tram stops.	2024–2029	**Public Transport**	●●●●○	(M)
2.1.8	**Green electricity for tram traffic.** All electricity for tramway transport will be produced by renewable energy sources.	Complete	**Tampere Tramway Ltd.**		(M)
2.1.9	**Tramway introduction campaign.** A campaign will be organised in the context of tramway commissioning, highlighting the positive climate, environmental and health effects of the tramway and of other low-emission transport and sustainable mobility.	Complete	**Tramway Development Programme**		(M)
2.1.10	**Third tramway section.** Construction of the Pirkkala–Linnainmaa tramway. • Planning for the construction of the Tampere and Pirkkala tramway will be carried out in 2023–2024 so that the decision-making material are ready by 10/2024.	2024–2029	**Tampere Tramway Ltd.**	●●●●●	(M)
2.1.11	**Fourth tramway section.** The project plan for the Tampere and Ylöjärvi tramway will be implemented in 2025–2026.	2025–2029	**Tampere Tramway Ltd.**	●●○○○	(M)

Measure package 2.2
Commuter train traffic

Efforts will be made to further increase commuter train traffic in cooperation with the neighbouring municipalities. The planned stopping points will be built. The emission impacts of commuter train traffic will be assessed by means of a user study.

EMISSION REDUCTION ●●●○○

Image: Tampere regional transport Nysse.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.2.1	**Pilot for commuter train traffic** Commuter train traffic will be expanded within the framework of the existing railway infrastructure by participating in the Nokia–Tesoma–Tampere–Orivesi–Lempäälä commuter train pilot (Ministry of Transport and Communications, regional commuter train pilot).	Complete	**Public Transport**		M
2.2.2	**The Tesoma commuter train stop will be built.**	Complete	**Construction and Maintenance of Urban Environment**		M
2.2.3	**Participation in the planning and financing of commuter train traffic services.** • A plan will be drawn up for the continuation of commuter train traffic. • Stopping points pursuant to the plan will be built.	2025–2029	**Public Transport,** Transport System Planning	●●●○○	M
2.2.4	**Regional plan for commuter train traffic.** Contributions will be made to drafting the Tampere region commuter train transport regional master plan.	Complete	**Public Transport,** Transport System Planning		M
2.2.5	**Common ticketing products for bus and train services will be developed.**	Complete	**Public Transport**		M

Image: Adobe Stock

Measure package 2.3
Bus traffic

The production agreement between the City of Tampere and Tampereen Kaupunkiliikenne Oy (TKL Oy) will be made in accordance with climate objectives. About 40 electric buses will be purchased for TKL, and a new depot will be built for the buses. The depot will be suitable for electric buses.

EMISSION REDUCTION ●●●●○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.3.1	**Development of bus traffic tendering models.** Tendering models will be developed to support the climate goals.	Complete	**Public Transport**		M
2.3.2	**Climate goals for TKL production agreement.** The production agreement of Tampereen Kaupunkiliikenne Oy (TKL Oy) will be drawn up in accordance with the city's climate objectives, and the operations of TKL will be changed completely for renewable propulsion.	2024–2025	**Public Transport,** Tampere City Transport	●●●●○	M
2.3.3	**Low-emission bus traffic.** On the basis of a propulsion system survey, policy guidelines will be drawn up for the low-emission conversion of bus traffic by 2030 (both TKL's own fleet and private buses). These policy guidelines will be issued in 2020. The guidelines will also help prepare for the implementation of the relevant EU Directive. According to the directive, at least 20.5% of the traffic that starts between 2022 and 2026 must run on electricity and 20.5% on other alternative fuels. At least 29.5% of the traffic that starts between 2027 and 2030 must run on electricity and 29.5% on other alternative fuels.	Complete	**Public Transport,** Tampere City Transport		M
2.3.4	**New bus depot.** A new depot will be built for TKL Oy's buses, designed for the needs of new propulsion systems.	2024–2025	**Public Transport,** Tampere City Transport	●●●●○	M
2.3.5	**Route planning of electric buses.** Methods will be developed for the route planning of electric buses. A pilot will confirm the possibilities available for public transport route profiling to reduce public transport costs and emissions.	Complete	**Smart Tampere,** Tampere City Transport, Public Transport		M
2.3.6	**Electric buses.** Some 40 electric buses will be purchased for TKL Oy.	2024–2025	**Public Transport,** Tampere City Transport	●●●●○	M
2.3.7	**Development of autonomous transport.** Autonomous transport, such as robot buses and demand-responsive autonomous vehicles, will be developed as part of the first and last mile public transport services.	2024–2025	**Public Transport,** Transport System Planning, Business Tampere Oy	●●○○○	M

Image: City of Tampere/Laura Happo

Measure package 2.4
Public transport service level

The travel times of public transport will be shortened by, for example, fare collection arrangements, street arrangements and right of way at traffic lights. Bus lines will be planned for 2030 so that the trunk line is expanded wherever possible and the expansions of the tramway is taken into account. The ticketing system will be developed further.

The goals and responsibilities of service transport in the Tampere region will be resolved.

EMISSION REDUCTION ●●●●○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.4.1	**Adequate headways for public transport.** Adequate headways on the trunk lines will be ensured (high headway + adequate number of seats).	Moved to routine work	**Public Transport**	●●●●○	M
2.4.2	**Speeding up travel times for public transport.** • Journey times will be sped up on the trunk lines through proof-of-payment, street arrangements and traffic light priorities. • The areas having a need and potential for speeding up journey times will be investigated.	2024–2029	**Public Transport,** Transport System Planning	●●●○○	M
2.4.3	**Expansion of public transport trunk lines.** Extension of the trunk lines to include additional connectivity. • Bus routes for 2030 will be planned. The expansion of the tramway will be taken into account.	2024–2029	**Public Transport**	●●●○○	M
2.4.4	**Development of public transport quality.** The quality of public transport will be developed by improving customer experience, by developing real-time communication to customers and in-house.	Moved to routine work	**Public Transport**	●●●○○	M A
2.4.5	**Development of public transport ticket system.** The tariff policy will be so developed that the public transport ticketing system is affordable, easy to use and flexible, it engages people to use public transport and is competitive in terms of the price/quality ratio compared to car use. • A review of the best ways to use the new account-based payment system will be carried out. Climate and economic aspects will be taken into account.	2024–2029	**Public Transport**	●●●○○	M
2.4.6	**New payment methods for public transport.** The new payment system will enable novel payment methods and smart service packages that will increase the number of passengers, while providing better data on customer behaviour.	Complete	**Public Transport**		M
2.4.7	**Open transport data.** Open data and interfaces enable smart information, payment and usage applications.	2024–2029	**Public Transport**	●●○○○	M
2.4.8	**Streamlining public transport hubs.** The smooth functioning of public transport hubs and service provision will be improved, for example through pedestrian and cycling connections to public transport stops, travel terminals, guidance boards, smart applications and cooperation with commercial service providers.	2024–2029	**Transport System Planning**, Public Transport, Construction and Maintenance of Urban Environment, Service Network Planning, Detailed Planning	●○○○○	M

Image: City of Tampere/Laura Happo

Measure package 2.5
Pedestrian and bicycle traffic

The main walking routes and the hierarchical network of cycling traffic will be defined as a basis for development and investment. High-quality bicycle parking facilities and spots are planned and implemented for bicycle traffic that take into account, among other things, electric bikes and cargo bikes. The operation of the city bikes will be developed based on the feedback received. The main cycling routes and centres will be managed more efficiently in winter.

EMISSION REDUCTION ●●○○○

Image: City of Tampere/Laura Happo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.5.1	**Programmes of pedestrian and bicycle traffic.** Bicycle traffic conditions, resources and mobility culture will be developed in accordance with the bicycle traffic development programme. The city-region pedestrian and cycling development programme 2.0 will be implemented.	Complete	**Transport System Planning**		M
2.5.2	**Pedestrian-oriented development of city centre and regional centres.** City centres will be developed to become more pedestrian-oriented while defining the targeted walking network and the sites where this network will be implemented. More space in city centres will be afforded to walking, cycling, recreation and street greenery while improving route accessibility. Future targets for development include the Linnainmaa and Hiedanranta that will develop as the tramway expands to concern them.	2024–2029	**Transport System Planning**	●●●○○	M A
2.5.3	**Improvement of main walking and cycling routes.** • The hierarchical target cycling network will be defined together with the main walking routes, while prioritising implementation of the investment and development sites according to these routes. • The pedestrian and cycle traffic solutions will be designed with an emphasis on quality in compliance with the approved design guidelines. The guidelines are also applied to the streets to be renovated, taking into account the starting points of each street.	2024–2029	**Transport System Planning**	●●●●○	M
2.5.4	**Bicycle parking garages.** Bicycle parking concentrated in city centres and other high-demand destinations will be implemented, taking into account the needs of different bicycles, including cargo bikes and opportunities for charging electric bicycles. The implementation of bicycle parking facilities will be advanced in the city centre following development of land use at Keskustori and at the railway station. • In the Tampere railway yard project, a facility of 350 bicycle parking spaces will be built at the railway station/in the vicinity of the railway station. • 2–3 bicycle parking facilities are planned for the station area.	2024–2029	**Transport System Planning,** Strategic Project Development	●●●○○	M
2.5.5	**Increasing the number of bicycle parking spaces in public areas.** • In accordance with the general plan for bicycle parking, the number of high-quality bicycle and light electric vehicle parking spaces will be increased in the public areas in urban centres, along the main cycling routes, at public transport hubs, and at stops. • The provision of maintenance and rental services and other cycling services will be facilitated at bicycle parking sites and at transport hubs, among other places.	2024–2029	**Transport System Planning**	●●○○○	M
2.5.6	**Bicycle parking at service properties.** Bicycle parking facilities will be built and improved at the city's service properties in accordance with the Tampere parking standard guidelines.	Moved to routine work	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●○○	M
2.5.7	**Development of bicycle parking spaces at the city's properties.** Development plans will be prepared for each service group. On the basis of the plans, the work will proceed to the implementation phase. • The work will begin with a school parking development plan. • Separate financing opportunities for the development of bicycle parking will be explored.	2024–2029	**Real Estate and Housing Policy, Transport System Planning, Climate and Environmental Policy**	●●●○○	M
2.5.8	**Winter maintenance of cycling and walking routes.** The level of winter maintenance will be enhanced route-specifically along the main cycling routes and on the pedestrian routes in city centres and in regional centres by introducing new maintenance methods through pilots and by developing cooperation. The potential for utilising the IOT platform will be investigated. Tampereen Infra will develop a resource management system to determine the utilisation rates of work machinery and to optimise the routes of travel of work machinery.	2024–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●○○○○	M A
2.5.9	**Development of city bike system.** The city bike system will be developed as part of sustainable urban mobility and the first and last mile solution for sustainable public transport. The operating area of the city bikes and the location of their stations will be developed based on the monitoring of the use and the feedback received.	2024–2029	**Transport System Planning,** Public Transport	●●●○○	M

Modal split – cost-benefit analysis of change

The economic impacts of the shift in the modal split that supports the Tampere climate neutrality goal, as well as who will be affected, were assessed through a cost-benefit analysis. The analysis enables the assessment of the impacts of the climate measures taken beyond just emission reductions and direct costs or cost savings.

It has been estimated that, in order to achieve the climate neutrality goal, the share of sustainable transport modes in Tampere should increase from the current 55% (2021) to 69% by 2030. The cost-benefit analysis compared the costs and benefits of the targeted change in the modal split with development that reflects the current situation.

The economic impacts take into account the costs or benefits caused for:

- the public sector through infrastructure investment and maintenance, as well as public transport operations and ticket revenues
- residents through vehicle, travel time and health impacts
- society through health effects, accidents, climate change, air pollution and noise.

This examination does not take a position on the measures whereby the targeted modal split could be achieved.

For residents, the most significant costs resulting from more sustainable mobility are caused by the increase in travel time due to the increase in slower modes of transport, as well as the increased operating costs of public transport. In turn, the most significant benefits for residents come from reduced car-driving costs and for public sector from increased ticket revenues. Additionally, both residents and society will gain significant health benefits, and society will also benefit from the decreased impacts of climate change.

When considering the public sector, residents and the whole society, the shift towards more sustainable mobility would result in total costs of EUR 146 million and total benefits of EUR 924 million in 2024-2030 (figure 25). Society would thus benefit economically significantly from a shift to a more sustainable mode of transport, as it would generate a total benefit of approximately EUR 789 million by 2030.

More detailed data about the calculation method and assumptions of the cost-benefit analysis can be found in a relevant Master's thesis (Joronen 2020) as well as in the previous version of the roadmap. For more detailed information, contact the City of Tampere's Climate and Environmental Policy Unit.

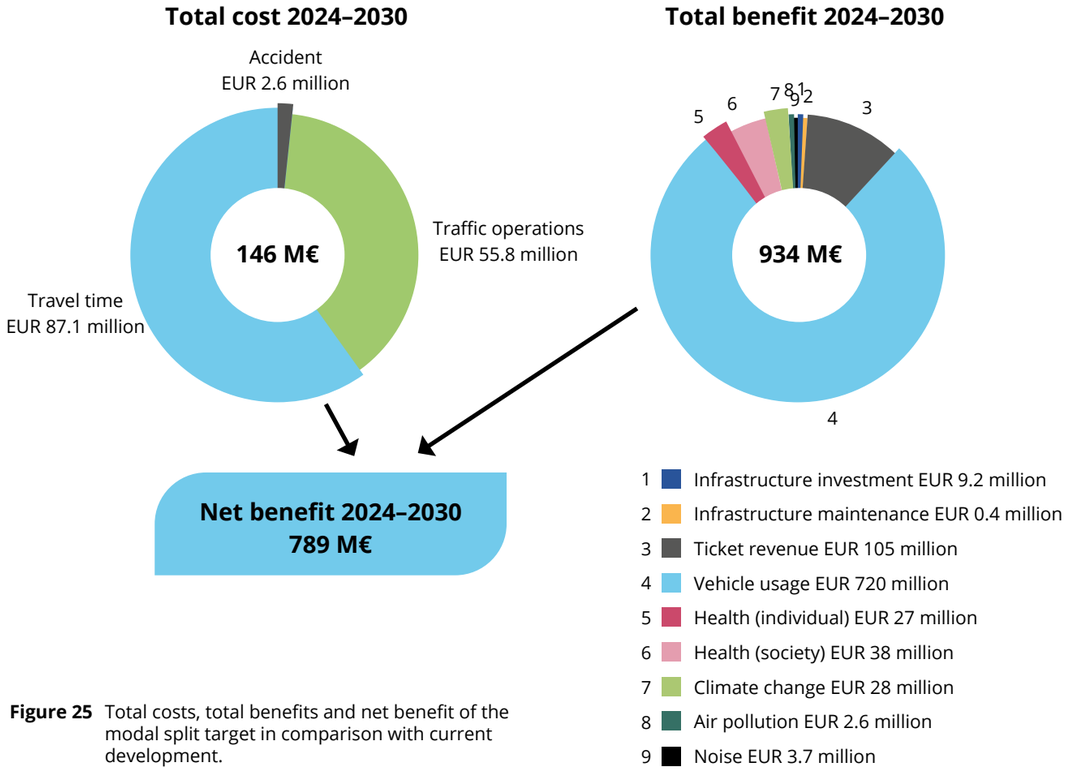


Figure 25 Total costs, total benefits and net benefit of the modal split target in comparison with current development.

Figure 26 The main cycling routes now have route-specific maintenance, which has resulted in more uniform and improved maintenance. During two winters, volunteer cycling agents have provided daily feedback on some of the main routes. Maintenance reporting models have also been developed.
Measure 2.5.8. Image: Tiikerikuva/Jukka Salminen

Measure package 2.6
Road transport

Sustainable mobility and logistics services will be promoted. Charging of electric cars at city properties will be promoted, and Finnpark will add charging points to parking facilities. Parking will be developed with AI-based applications and minihub trials of park-and-ride. Among other things, joint leisure and business rides will be piloted and prerequisites will be created for mobility services, Mobility as a Service (MaaS).

EMISSION REDUCTION ●●●●○

Image: Adobe Stock

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.6.1	**Electric car charging network.** How the electric car charging network could be expanded at city-owned properties will be determined.	2024–2025	**Transport System Planning,** Real Estate and Housing Policy	●○○○○	M
2.6.2	**Electric car charging stations in the city's new construction and renovation projects.** In the city's service network's new and renovation projects, electric car charging points will be added in accordance with the Finnish energy efficiency act and the obligation to install electric vehicle charging points at commercial properties.	Moved to routine work	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●○○	M
2.6.3	**Developing a parking policy.** The parking policy and, where necessary, the parking regulation will be updated to support sustainable mobility.	2024–2025	**Transport System Planning**	●○○○○	M
2.6.4	**Space freed up for sustainable modes of transport.** The space freed up along streets will be used to improve the conditions for sustainable mobility modes and increasing city greening, as parking in city centres is moved to multistorey car parks.	2024–2029	**Transport System Planning**	●○○○○	M A
2.6.5	**Concept of Smart Parking.** The Smart Parking concept will be developed and the introduction of the concept promoted, for example in Tammela and elsewhere in city-centre parking.	2024–2025	**Strategic Project Development,** Finnpark Oy	●●○○○	M
2.6.6	**Development of park-and-ride.** The park-and-ride development plan will be implemented and vision work for southerly park-and-ride service will be prepared. • Park-and-ride facilities for cars will be increased in Hiedanranta, in southerly areas and in Linnainmaa. • A more detailed plan for the development of the regional centres' mobility hubs will be prepared. • Mini-hub experiments will be promoted and further development and networking of mini-hubs will be decided based on them.	2024–2029	**Transport System Planning**	●●●○○	M
2.6.7	**Promoting sustainable mobility and logistics services.** The emergence of new smart and sustainable mobility and logistics services will be promoted by opening data and through commercial cooperation and the deployment of the city's pilot platforms and well-functioning solutions. New solutions, such as shared leisure and commute rides, will be piloted. Conditions will be created for the packaging of mobility services, for a compatible ticket system and for various service pricing models (Mobility as a Service, MaaS).	2024–2029	**Public Transport,** Business Tampere, Climate and Environmental Policy	●●○○○	M
2.6.8	**Diverse and innovative travel chain services.** Implementation and continuity of diverse and innovative travel chain services for selected user groups (e.g. hobby groups) will be planned (cf. NäätMaas pilot). • A coordinating entity for the service will be determined.	2024–2029	**Transport System Planning, Climate and Environmental Policy**	●○○○○	M
2.6.9	**Car-sharing services.** The growth of car-sharing services will be enabled by increasing designated parking spaces and providing parking benefits.	2024–2025	**Transport System Planning**	●○○○○	M
2.6.10	**City-centre low-emission zone.** Options for implementing a possible low-emission zone in the city centre, as well as its climate and other impacts (for example, noise and air quality), will be investigated.	2025–2029	**Transport System Planning,** Climate and Environmental Policy, Environmental Protection	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.6.11	**Congestion charges.** The benefits and disadvantages of congestion charges and road tolls will be investigated as set out in the Agreement on land use, housing and transport (MAL) concluded by the state and city regions. The possibility of introducing congestion charges or road tolls is currently ruled out in Tampere.	2024–2025	**Transport System Planning**	●○○○○	M
2.6.12	**Increasing the distribution of transport biogas.**	2024–2029	**Pirkanmaan Jätehuolto Oy**	●●○○○	M C
2.6.13	**Procurement plan for cars owned by the city** A gradual procurement plan will be established to increase sustainable propulsion systems (electricity, biogas, renewable diesel) in the city's cars. The aim is for all cars to run on low-emission propulsion by 2030. At the same time, preparations will be made for the implementation of the EU directive on clean propulsion.	2024–2025	**Tampereen Infra Oy,** Tuomi Logistiikka Oy	●●○○○	M
2.6.14	**Use of fully electric cars in subsidiaries.**	2024–2029			M
	• Use of fully electric cars.		**Pirkan Opiskelija-asunnot Oy**	●●○○○	
	• Replacement of petrol cars with electric cars (leasing).		**Finnpark Oy**	●●○○○	
	• Leasing cars will be replaced with electric cars.		**Tampereen Särkänniemi Oy**	●●○○○	
2.6.15	**Green Parking – promoter of travel chains.**	2024–2025	**Finnpark Oy**	●●○○○	M
2.6.16	**Increasing the number of charging stations for electric cars.**	2024–2025	**Finnpark Oy**	●●○○○	M

Figure 27 The new street arrangement on Rongankatu created new space for bicycle traffic. The space freed up along streets will be used to improve the conditions for sustainable mobility modes and increasing city greening, as parking in city centres is moved to multistorey car parks. Measure 2.6.4. Image: City of Tampere/Julia Koski

Measure package 2.7
Delivery traffic

Arrangements, conditions and parking for light low-emission delivery traffic will be developed. Attention will be paid to aspects such as loading and unloading points and time restrictions in the city centre area and the space required for delivery traffic in the city centre. Development work will be carried out in cooperation with transport companies, companies receiving goods and other stakeholders.

EMISSION REDUCTION ●●●○○

Image: Adobe Stock

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.7.1	**Delivery traffic arrangements.** Light low-emission traffic will be promoted in accordance with the Tampere City Logistics Action Plan 2023–2025. For example, loading and unloading points for delivery trucks will be developed, as well as time restrictions in the city centre area.	2024–2029	**Transport System Planning**	●○○○○	M
2.7.2	**Allowing the stopping of delivery trucks in areas where parking and stopping is prohibited.**	2024–2029	**Transport System Planning**	●○○○○	M
2.7.3	**Parking ID for delivery traffic will be adopted.**	2024–2029	**Transport System Planning**	●○○○○	M
2.7.4	**Establishing cooperation group for city logistics.** In addition to the city, the group will include representatives of transport companies, delivery companies, and other key stakeholders.	2024–2029	**Transport System Planning**	●○○○○	M
2.7.5	**Coordination of land use and logistics.** Sustainable distribution logistics' needs for space in the city area will be clarified. Space needs will be taken into account in land use planning and space will be reserved for sustainable logistics.	2024–2029	**Transport System Planning,** Detailed Planning, Comprehensive Planning	●○○○○	M
2.7.6	**Benefits of low-emission delivery vehicles.** A more detailed plan will be drawn up on how the city can favour low-emission delivery vehicles in traffic and what benefits can be granted to vehicles using alternative propulsion.	2024–2029	**Transport System Planning**	●○○○○	M
2.7.7	**Business models for delivery traffic charging stations.** Suitable sites and business models for permanent delivery-traffic charging stations will be investigated.	2024–2029	**Transport System Planning**	●○○○○	M
2.7.8	**Making Voimia's logistics more environmentally friendly.** Environmentally friendly logistics will be promoted by diversifying the propulsion systems used in transport operations and by increasing the use of renewable fuels.	2025–2029	**Pirkanmaan Voimia Oy**	●●○○○	M
2.7.9	**Improving the efficiency of freight and passenger logistics.** The optimisation of routes and the centralisation of transport operations in the city's freight and passenger logistics will be improved further. The need to use vehicles in freight and passenger logistics will be reduced by combining material flows more efficiently. A joint tendering round for transport services will be carried out in library and museum services as appropriate, and ecology will be introduced as one of the evaluation criteria.	Complete	**Tuomi Logistiikka Oy,** Culture Service Team		M

Image: Adobe Stock

Measure package 2.8
Waterborne traffic

Ports and their loading and refuelling facilities, for example, will be developed to serve sustainable waterborne mobility. Nature and cultural tourism will be promoted by developing the shuttle bus service and launching a low-emission waterbus service.

EMISSION REDUCTION ●●○○○

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.8.1	**Launching of low-emission waterbus transport.**	2025–2029	**Attractiveness and lobbying**	●●●○○	M
2.8.2	**Development of ports.** The ports will be developed into open, accessible and comfortable recreational areas where non-motorboat traffic will also be possible. To support this goal, more canoe sheds will be built and rental rowing boats introduced.	2024–2025	**Construction and Maintenance of Urban Environment**	●●○○○	M
2.8.3	**Port charging points and availability of biofuels**. Ports will be equipped with car charging stations while making preparations for the electrification of water-borne traffic. The availability of biofuels for boat refuelling stations will be improved. When putting refuelling points out to tender (e.g. the new Viinikanlahti district and the Särkänniemi detailed planning update), the availability of biofuels and electricity charging stations in marinas will also be among the criteria. The ports will be fitted with smart electricity posts.	2024–2025	**Construction and Maintenance of Urban Environment, Real Estate and Housing Policy**	●●○○○	M
2.8.4	**The number of waste collection points will be increased at ports while improving waste sorting at ports.** The waste vacuum collecting system network will be improved.	2024–2025	**Construction and Maintenance of Urban Environment**	●○○○○	M C

Image: Visit Tampere Oy/Laura Vanzo

Measure package 2.9
Mobility management

The planning of mobility management will be continued in cooperation between different administrative sectors. Emergency conditions such as extreme weather phenomena will be prepared for and information about them will be communicated in cooperation with other authorities.

Personnel's commuting will be actively supported and developed in cooperation with the modal split target, a shared electric bike for mobility during the working day will be piloted within the City Hall organisation, and commute by bicycle will be supported through campaigns and employee bicycles. Families and day-care centre staff and Tredu students will be encouraged to move sustainably by improving the storage of bikes and other prerequisites.

EMISSION REDUCTION ●●●○○

Figure 28 Sustainable mobility will be marketed to residents, taking into account different target groups, life situations and residential areas. Image: City of Tampere/Mimmi Virtanen

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.9.1	**Sustainable urban mobility plan.** A Sustainable Urban Mobility Plan (SUMP) will be prepared and the first measures launched.	Complete	**Transport System Planning**		M
2.9.2	**Action plan for mobility management.** The city's mobility management efforts will be planned in a cross-administrative manner. Annual mobility management priorities and key measures will be agreed and sustainable mobility will be communicated in accordance with the annual calendar. The planning work and budgeting will be linked to the board's annual plan drafting process.	2024–2029	**Transport System Planning**, Climate and Environmental Policy	●○○○○	M
2.9.3	**Traffic congestion and mobility management**. Congestion will be prevented and the problems caused by it will be solved primarily by means of mobility management. Traffic forecasts and their use will be developed to support the review of the service level of sustainable modes of transport.	2024–2029	**Transport System Planning**	●○○○○	M
2.9.4	**Management of disturbances in public transport.** • It will be investigated how to prepare for disturbances, such as weather conditions, in advance and how to inform city residents about them in cooperation with the other relevant public authorities. • Traffic disturbances will be defined while adapting the relevant service levels. For example, in the event of extreme weather conditions, not all buses will be operated.	2025–2029	**Public Transport,** Transport System Planning	●○○○○	A
2.9.5	**Promotion of public transport in culture and leisure services.** The use of public transport in culture and leisure services will be promoted by digitising tickets for museums, events and sports venues while including in them access to public transport free of charge or at reduced prices.	Moved to routine work	**Culture Service Area**, Sports Services, Public Transport, Strategic Project Development	●●○○○	M
2.9.6	**Marketing of sustainable mobility to residents.** Sustainable mobility and mobility services will be marketed on a customer-oriented basis, taking into account the various target groups, different life situations and residential areas. Opportunities will be provided to residents (especially current motorists) to try out sustainable mobility modes.	2024–2029	**Transport System Planning**, Public Transport, Climate and Environmental Policy	●●●○○	M
2.9.7	**Marketing of sustainable mobility to workplaces.** Sustainable mobility modes will be marketed to working-age people and workplace mobility management plans will be implemented in cooperation with the key employers.	Moved to routine work	**Public Transport**, Transport System Planning, Human Resources Unit	●●○○○	M
2.9.8	**Staff commuting.** Staff commuting is supported in accordance with Tampere's sustainable modal split target. • Commuting in accordance with the principles of sustainable development will be actively promoted and developed. • The City Hall will pilot a shared electric bicycle for moving around during the working day. • Campaigns for sustainable mobility for staff. Examples include the mileage race, tyre change campaigns for cyclists, options for overland travel and the launch of the employee bicycle.	2024–2029	**Human Resources Unit,** Climate and Environmental Policy, Transport System Planning	●○○○○	M
2.9.9	**Flexible working practices.** Opportunities for flexible work practices, remote work and remote meetings will be improved.	Complete	**Service Areas,** Human Resources Unit, Digitalisation and ICT		M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.9.10	**Sustainable mobility in day-care centre transport.** Early childhood education and pre-primary education will encourage children, families and day-care centre staff to move around in everyday life in a sustainable manner by implementing measures and offering experimentation opportunities for everyday mobility. • Maps that encourage sustainable mobility will be prepared for day-care centres.	2024–2029	**Early Childhood Education and Pre-Primary Education,** Climate and Environmental Policy, Transport System Planning	●●○○○	M
2.9.11	**Sustainable mobility in school transport.** Regional sustainable mobility plans will be implemented with schools. Sustainable mobility by children, parents and personnel will be encouraged through communication. The safety of school trips will be promoted through mobility management. Communication on the environmental impact of drop-off traffic will be boosted. Information packages on sustainable mobility will be prepared to assist families. Schools from basic education will participate in the Fiksusti kouluun programme.	Complete	**Basic Education,** Transport System Planning		M
2.9.12	**Encouraging sustainable mobility in school transport and a renewed transport park.**	2024–2026	**Basic Education,** Transport System Planning, Youth Services, Early Childhood Education and Pre-Primary Education, EcoFellows Ltd	●○○○○	M
2.9.13	**Promoting cycling among students.** • Students in upper secondary schools and vocational education will be encouraged to cycle by providing an opportunity to park bicycles safely within the school area. • Investments will be made in the winter maintenance of the environment of educational institutions to enable winter cycling. The prerequisites for cycling will be developed by offering students better opportunities for storing a change of clothes, etc. • Shared bicycles and/or electric scooters will be made available for use by students and staff. • Tredu will develop sports and exercise workshops.	2024–2029	**Upper Secondary School Education, Tampere Vocational College Tredu,** Tampereen Tilapalvelut Oy	●○○○○	M
2.9.14	**Encouraging sustainable mobility at Tredu.** Various guidance and encouragement methods will be developed to increase cycling and other forms of low-carbon or zero-emission mobility. • Instructions for arriving at the offices by public transport will be created. • Information about bicycle parking will be communicated. • Efforts will be made to influence different actors by, for example, providing safe and high-quality storage and locking places for bicycles. • Electric car charging points at Tredu locations.	2024–2029	**Tampere Vocational College Tredu**	●○○○○	M
2.9.15	**Promoting sustainable mobility in subsidiaries.** • Sustainable mobility measures, detailed in the Sustainable Mobility Plan, will be promoted. • Reduction in the use of private cars and promotion of public transport and cycling in commuting. Uniform employer's compensation. • Trips to clients and related travel expenses are specified in the price list, adding and utilising remote meetings wherever possible.	2024–2025	**Tampere Water** **Pirte**	●○○○○ ●○○○○	M

Figure 29 The renewed traffic park will encourage sustainable mobility. Measure 2.9.12. Image: City of Tampere

Measure package 2.10
Transport equipment and work machinery

Low-emission machinery will be introduced in maintenance and construction, and waste transportation will be developed. Low-emission methods in maintenance will be explored, and a plan will be made to increase sustainable propulsion, in preparation for the implementation of the EU directive on clean propulsion.

EMISSION REDUCTION ●●●○○

Image: Visit Tampere Oy/Mirella Mellonmaa

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
2.10.1	**Holding competitive tendering for transport and work machinery.** When tendering for the city's transport equipment and work machinery, a market survey will be carried out of the possibilities for increasing the use of alternative propulsion. Additionally, the market survey will also be used to determine the minimum procurement requirements, such as those for fuel consumption per car and/ or for economical driving behaviour.	2024–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●●○○○	M
2.10.2	**Emission categories for equipment procurement.** For equipment purchases, the minimum requirement with regard to emission class in 2020 will be: • EURO V standard for emissions of carbon monoxide, hydrocarbons, nitrogen oxides and fine particulates from trucks (vehicles' first year of use: 2010). • Stage III B standard for emissions of carbon monoxide, hydrocarbons, nitrogen oxides and fine particulates from work machines (work machines' first year of use: 2012).	Complete	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy		M
2.10.3	**Procurement plan for transport equipment, machinery and works contracts.** A gradual procurement plan will be drawn up to increase the use of sustainable propulsion systems (electricity, biogas, renewable diesel) in the city's transport equipment and machinery and in works contracts. The aim is for all transport equipment and work machinery to run on low-emission propulsion by 2030.	Complete	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy		M
2.10.4	**Modernity of vehicle and machine fleet at Tredu.** A Tredu-wide plan to electrify the vehicle and transport fleet will be prepared.	2024–2029	**Tampere Vocational College Tredu**	●○○○○	M A
2.10.5	**Reducing carbon dioxide emissions from Tampere Water's vehicle fleet.** The refuelling of My Diesel will be monitored on a semi-annual basis. On the basis of My Diesel consumption monitoring, goals will be set for refuelling quantities while defining the identified measures to achieve this goal.	2024–2025	**Tampere Water**	●●○○○	M
2.10.6	**Procurement plan for vans owned by city.** A gradual procurement plan will be prepared to increase sustainable propulsion systems (electricity, biogas, renewable diesel) in the city's vans. The aim is for all vans to run on low-emission propulsion by 2030. At the same time, preparations will be made for the implementation of the EU directive on clean propulsion.	2024–2025	**Tampereen Infra Oy,** Tuomi Logistiikka Oy	●●○○○	M
2.10.7	**Developing waste transport.** Waste transport will be developed in an environmentally and cost-effective way by increasing the amount and utilisation of data collected about waste transport.	2025–2029	**Pirkanmaan Jätehuolto Oy,** Waste Management Unit	●●○○○	M C
2.10.8	**Waste collection vehicles will switch to using biogas or other low-emission propulsion options.**	2024–2029	**Pirkanmaan Jätehuolto Oy**	●●○○○	M C
2.10.9	**Low-emission maintenance.** A report will be prepared on low-emission maintenance methods (fleet, waste management, logistics, winter maintenance).	2024–2025	**Construction and Maintenance of Urban Environment, Tampereen Infra Oy**	●○○○○	M
2.10.10	**Low-emission machinery will be deployed in maintenance and construction.**	2024–2025	**Tampereen Infra Oy**	●●○○○	M

THEME 3

SUSTAINABLE CONSTRUCTION

MAIN OBJECTIVE: **New construction will be at a zero-energy level, and the carbon footprint of housing will be small**

KEY MEASURES 2024–2026

- Calculation of life-cycle carbon footprint
- Preparation for climate change at city properties.
- Design guidelines for low-carbon construction
- Low-emission materials in infrastructure construction
- Use and recycling of soil masses
- Recycling of surplus materials and supplies
- Piloting of the use of low-carbon concrete.

KEY MEASURES 2027–2030

- Promotion of joint use of facilities
- Development of building automation systems
- Reduction of life-cycle carbon footprint of construction projects through planning solutions and material choices
- Examination of the use of low-carbon concrete in central station district
- Increasing the reuse of building materials and components
- Reducing emissions in product phase of construction projects.

Description

Renovating the existing building stock will play an important role in improving the energy efficiency of housing and services. Service properties are already being renovated and improved so that building elements are preserved and reused as much as possible. Things that are no longer in use are sold and recycled wherever possible. These measures also contribute to the circular economy.

Low-carbon construction is directed through competitive tendering processes of consultants and contractors, as well as framework contracts for master and architectural design. The calculation of the carbon footprint is included in the target price calculation at the stages of needs assessment and project planning. Choosing low-carbon building materials reduces the carbon footprint of construction in both building construction and infrastructure construction.

CO2 emissions from infrastructure construction are reduced through landmass management, such as recycling them and utilising them on the original site. This will also save natural resources and achieve cost savings through reduced transport operations. Additionally, the reuse of soil generated in construction will be increased, as landfills are slowly filling up. Efforts will be made to chain sites under construction, in which case reusable soil will end up directly at the right place without any intermediate storage.

Climate change adaptation is taken into account in construction. The city takes into account the shading needs of yards, gardens and buildings in service properties, such as schools and day care centres, when renovating and designing new ones. Shades are added by means of structural sunshades, shelters and green structure.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2016	2017	2018	2019	2020	2021	2022	2023
Share of energy efficiency class A of new residential buildings	%			16	19	21	18	29	40
Energy consumption per resident (electricity and heat, excluding industry and transport)	kW/resident/a	16,595	16,219	16,087	15,820	14,642	16,151	15,255	
Percentage of renewable energy of heat energy purchased by the city for its properties	%		47	47	45	54	48	53	53
Percentage of renewable energy of electricity purchased by the city for its properties	%		100	100	100	100	100	100	100
Percentage of wood construction of the load-bearing structure of residential blocks of flats of new buildings (incl. balcony-access blocks)	%		2	17	9	15	11	2	4
Total consumption-based emissions: new buildings	kt Co2e					133.6		142.5	
Total consumption-based emissions: renovation	kt CO2e							241.3	

- The city's service network plans and service facility network plans will be drawn up while minimising the carbon footprint and life-cycle costs. The efficient utilisation of the city's service facilities will be optimised.
- The climate neutrality criteria in use in construction will be applied throughout the land-use process (city plans, plot allocation data, building codes, complementary construction, incentives) as well as in the planning of the city's own construction projects and in building maintenance.
- The city will improve the energy efficiency of its own building stock while curbing in-service energy consumption. The energy consumption of facilities will decrease in proportion to the square metres used.
- The city's properties will be 80% climate neutral in terms of energy by 2025, provided that Tampereen Energia can produce an equivalent amount of climate neutral heat.
- Infrastructure construction will utilise all materials that can be utilised.
- Transport distances will have been minimised by ensuring adequate intermediate storage and circular economy hubs.
- Renewable materials will be used in all suitable infrastructure construction sites. Work machines will run on low-emission fuels.
- Construction will strive to meet the set emission goals through planning and by using construction carbon footprint calculations.
- Guidelines will be created for buyers and operators to address climate and environmental issues.

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- More efficient use of resources and space
- Savings over the life cycle of buildings, including maintenance costs
- Improved security of supply with decentralised energy production
- Fewer indoor climate issues
- Protecting the value of buildings
- Improved comfort of living
- Promoting diverse urban development
- Development of competence and business related to sustainable construction, such as wood construction
- Promotion of competition in building materials.

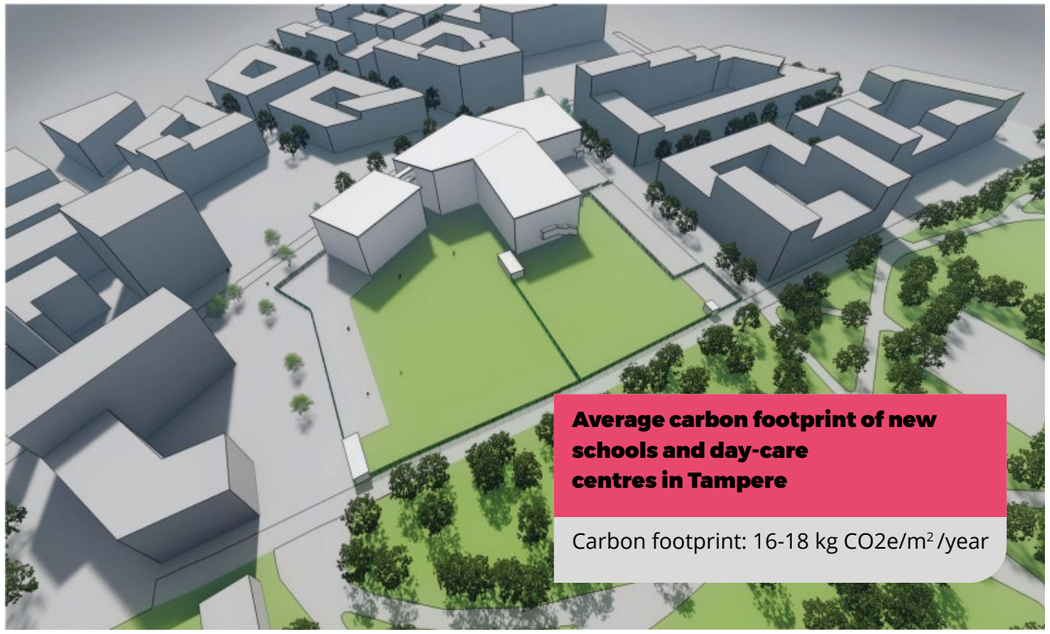
Measure package 3.1
New construction in city properties

Technical conditions will be created for the use of the premises outside the normal times of use; conditions including access, safety, ventilation, lighting and cleaning will be taken into account. The city's properties will prepare for climate change.

For construction projects, life-cycle carbon footprints will be calculated and projects will be steered in a low-carbon direction. In the design of service buildings, the carbon footprint will be a key indicator of design.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.1.1	**Carbon footprint of service facility network.** Assessment of the life-cycle carbon footprint will be included in the city's service facility network planning. Carbon footprint calculation methods will be investigated and in-house operations improved. The city's service facility network plans will be drawn up minimising the carbon footprint and the life-cycle costs while employing service design methods.	Complete	**Real Estate and Housing Policy,** Service Network Planning		M
3.1.2	**Use data for service facility network** Information on the total space available, number of users of that total space, capacities and utilisation rates will be maintained to serve as a basis for a comprehensive service network and service facility network plan.	Complete	**Real Estate and Housing Policy,** Service Network Planning, Tampereen Tilapalvelut Oy		M A
3.1.3	**Preparation of a guide to promote circular economy in city's construction projects.**	2025–2029	**Real Estate and Housing Policy**	●○○○○	M C
3.1.4	**Joint use of facilities.** Technical conditions will be created so that facilities can be utilised outside the normal times of use. Examples of things to consider are access, safety, ventilation, lighting, cleaning. Energy efficiency will be taken into account by focusing evening and weekend activities in specific parts of the buildings or on specific days of the week.	2024–2029	**Real Estate and Housing Policy,** Service Network Planning, Tampereen Tilapalvelut Oy, Service Areas	●○○○○	M
3.1.5	**Carbon footprint of construction projects.** The carbon footprint and the life-cycle costs of the city's construction projects will be calculated, and different solutions will be compared as part of the needs assessments and project planning for the city's service buildings and as part of the related justifications in decision-making. The calculations will be specified in the implementation planning phase.	Moved to routine work	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●○○○	M C
3.1.6	**Carbon footprint calculation for construction projects.** In the implementation planning phase of construction projects, Tampereen Tilapalvelut Oy will order life-cycle carbon footprint and life-cycle cost calculations and implement regulatory carbon footprint management in accordance with the Building Act that will enter into force in 2026.	2024–2025	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●●○○○	M C
3.1.7	**Promoting climate neutrality of rental housing communities** The City Group's rental housing communities will contribute to the city's climate neutrality goal by preparing their own roadmaps to achieve the goal.	Complete	**City Group's housing communities**		M
3.1.8	**Preparing for climate change at city properties.** The city's service buildings will take steps to prepare for climate change. • For all house-building projects completed in recent years, it will be assessed whether the solutions are functional with a view to the weather conditions, which are becoming more extreme. The design guidelines will be specified, where necessary. • Preparation for climate change progress will be included as a permanent issue on the agendas of design meetings.	2024–2025	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	A
3.1.9	**Implementation of RTS environmental classification will be piloted.**	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●○○○○	M
3.1.10	**Promotion of wood construction.** Wood construction will be promoted by implementing the service network's projects as wooden structures, either partially or in full. A decision on the use of wood will be made in the need assessment phase, where the carbon footprint of the life cycle is calculated for different structural solutions. Other criteria for the use of wood are the life-cycle economy, sustainability and feasibility of the building.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●●○	M
3.1.11	**Calculation of life-cycle carbon footprint of new construction** The life-cycle carbon footprint of new construction sites will be calculated and projects will be guided in accordance with the low-carbon management model.	2024–2029	**Tampereen Vuokratalosäätiö**	●●○○○	M
3.1.12	**Implementation of RTS environmental classification will be piloted.**	2024–2029	**Tampereen Vuokratalosäätiö**	●○○○○	M



Average carbon footprint of new schools and day-care centres in Tampere

Carbon footprint: 16-18 kg CO2e/m^2 /year

Conventional new construction	Low-carbon new construction
Investment cost: EUR 52,322,000 Carbon footprint: 17.06 kg CO2e/m^2 /year	Investment cost: EUR 53,584,000 (+2%) Carbon footprint: 13.98 kg CO2e/m^2 /year (-18%)

Figure 30 Comparison calculations of two different options for the construction of Hiedanranta School and Day-Care Centre: Investment costs of conventional and low-carbon new construction (EUR) and their annual carbon footprint (kg CO2e). In the options for low-carbon construction, the materials of conventional construction have been replaced by low-carbon concrete, low-carbon hollow-core slab and wood (façade and partitions). It was decided to continue the planning of the project on the basis of a needs assessment with an 18% smaller carbon footprint and 2% higher investment costs than in the conventional construction option. The market already has an increasing number of low-carbon structure materials whose price level is likely to be competitive in the future. The calculation was carried out by Granlund Oy. Image: Sweco Architects Oy

Image: Visit Tampere Oy/Mikko Vares

Measure package 3.2

Renovation construction in city properties

Every year, an adequate number of basic improvements to existing building automation systems will be carried out. The basic improvement will be carried out in a timely manner,taking into account the technical life cycle and the occupancy rate of the building and the need for use.

The city will procure emission-free electricity. The transition to zero-emission district heating will occur in cooperation with Tampereen Energia.

In the construction of the City Hall, the circular economy and low-carbon construction will be promoted and the environmental classification will be complied with.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.2.1	**The functionality, usability and reliability of building automation systems will be at a good level and will continue to be developed.** Every year, an adequate number of basic improvements to the building automaton system of buildings in use will be carried out. The basic improvement will be carried out in a timely manner, taking into account the technical life cycle and the occupancy rate of the building and the need for use.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●○○	M
3.2.2	**Procurement of emission-free electricity and district heating.** The transition to zero-emission district heating will occur in cooperation with Tampereen Energia.	2024–2029	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M
3.2.3	**Improvement of energy efficiency of service buildings.** Whenever repairing and renovating service facilities, the potential for improving their energy efficiency will always be investigated while taking the possible development measures based on profitability calculations. Energy subsidy application will be integrated into the planning process.	Moved to routine work	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M
3.2.4	**Solar window films will be installed on the windows at Tietotalo to reduce energy consumption.**	Complete	**Tampereen Palvelukiinteistöt Oy**		M A
3.2.5	**The heat system of the Ikuri sports hall will be replaced in 2022, the Linnainmaa well-being centre in 2023 and Tammelakeskus in 2023.**	Complete	**Tampereen Palvelukiinteistöt Oy**		M
3.2.6	**The façade windows at the Hepolamminkatu 10 building will be replaced.**	Complete	**Tredu-Kiinteistöt Oy**		M
3.2.7	**The Metsätie building will undergo a local ventilation system renovation.**	Complete	**Tredu-Kiinteistöt Oy**		M
3.2.8	**Energy-saving projects for school buildings.** During 2017–2025, an energy saving project is being carried out in ten school buildings under the so-called ESCO (Energy Service Company) concept. Based on the experience gained, the profitability and feasibility of the following projects will be assessed.	Complete	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy, Climate and Environmental Policy		M
3.2.9	**Smart heating control will be increased (according to the weather forecast, etc.).**	2024–2025	**Tampereen Tilapalvelut Oy,** Climate and Environmental Policy, Real Estate and Housing Policy	●●●○○	M
3.2.10	**Property management reporting.** Property management reporting will be developed to be site-specific and digital by the end of 2022. In addition to what is reported currently (electricity, heat, water, and related emissions), site-specific reports will be expanded to cover the costs of maintenance, the management of outdoor areas, security and waste management at monthly levels. Faults will be automatically reported for maintenance purposes.	Complete	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy		M
3.2.11	**Sustainable development certificate of Tredu OKKA Foundation.** Influence will be exercised on the owners of the Tampere Vocational College buildings following the cultural change brought about by the strategy.	2024–2029	**Tampere Vocational College Tredu,** Tredu kiinteistöt Oy	●●○○○	M A
3.2.12	**Construction of the City Hall.** • Promotion of circular economy. • Low-carbon construction. • RTS classification of buildings.	2024–2025	**Tampereen Virastotalo Oy**	●●○○○	M C

Investment cost: EUR 9,620,000
Life-cycle cost: EUR 20,921,000
Carbon footprint: 26.65 kg CO2e/m2/year

Figure 31 Calculation of the investment and life-cycle costs and carbon footprint of the renovation of the Jukola Day Care Centre in Hatanpää. The building was completed in 1890 and it was originally a cowshed of Hatanpää Manor. The life-cycle cost and carbon footprint apply for an assessment period of 50 years. All results are estimates. The calculation was carried out by A-insinöörit rakennuttaminen Oy. Image: Arkkitehdit MY Oy

Measure package 3.3
Guidance of low-carbon construction

A comprehensive design guide for low-carbon construction will be drawn up. The carbon footprint will be reduced by choosing low-carbon materials. Competitive tendering processes will require experience in carbon footprint management in construction projects and take experience into account in the main and architectural design agreements.

In construction, a carbon footprint limit value will be set for projects for the duration of their life cycle and a quality level will be defined. The requirements of the Green Deal for Emission-free Construction Sites will be adopted, if the city decides to join the deal.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.3.1	**Design guideline for low-carbon construction.** A design guide for low-carbon construction will be prepared, and it will compile the means of the City of Tampere for low-carbon construction.	2024–2025	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●○○○○	M A C
3.3.2	**Low-carbon building materials and products.** The carbon footprint of the product phase (A1–A3) will be reduced by selecting low-carbon building materials and products.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●○○○	M C
3.3.3	**Holding competitive tendering for consultants and contractors.** Competitive tendering requires consultants and contractors to have experience in managing the carbon footprint of construction projects.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●○○○○	M
3.3.4	**Framework agreements for master and architectural design.** Experience in low-carbon design will be taken into account in the framework agreements for master and architectural design.	2024–2029	**Real Estate and Housing Policy**	●○○○○	M
3.3.5	**Life-cycle carbon footprint of construction projects.** During the needs assessment phase, a life-cycle carbon footprint limit value and a quality level will be set for projects included in the investment programme in cooperation with Tilapalvelut. The carbon footprint calculation will be specified according to the master drawing level at the reception stage of the building.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●○○○	M
3.3.6	**Target price calculation.** The calculation of the carbon footprint is included in the target price calculation at the stages of needs assessment and project planning.	2024–2029	**Real Estate and Housing Policy**	●●○○○	M
3.3.7	**Utilisation of data models (BIM).** Planners will be required to have BIM competence to develop carbon footprint calculation. Carbon emissions will be introduced as part of the data model to guide design solutions and material choices to be low-carbon. • Updating of data modelling instructions.	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy **Tampereen Tilapalvelut Oy**	●○○○○	M C
3.3.8	**Emission-free construction sites, operations in accordance with the requirements of the Green Deal.** Tampereen Tilapalvelut has piloted operations in accordance with the requirements of the Green Deal for Emission-free Construction Sites and is ready to implement it in suitable projects, if the city decides to join the agreement.	2024–2025	**Tampereen Tilapalvelut Oy, Real Estate and Housing Policy,** Tampereen Infra Oy	●○○○○	M

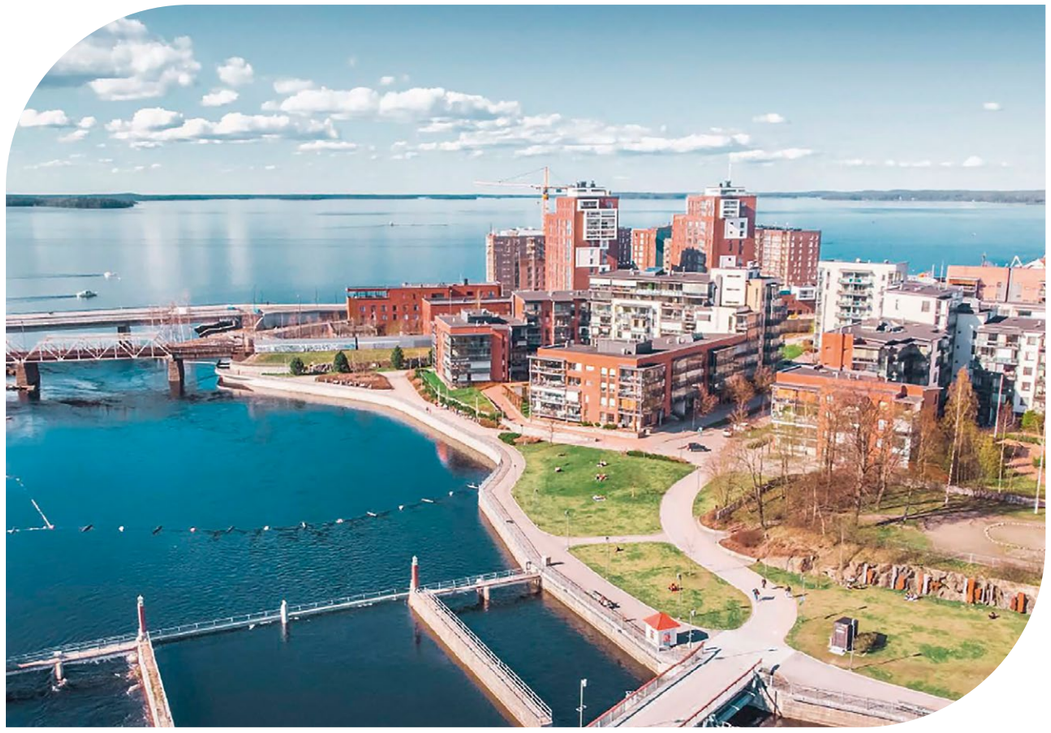


Figure 32 The growing city builds a high volume of housing, services and urban infrastructure. Tampere will introduce climate neutrality criteria throughout the land-use process while calculating the carbon footprint of construction and minimising it, for example through wood construction, energy-efficient construction and by utilising recovered materials as much as possible. Image: Visit Tampere Oy/Laura Vanzo.

Measure package 3.4
Guidance of private construction

Carbon footprint calculation will be included as part of the land allocation process and housing and land policy guidelines will be updated to make incentives for low-carbon construction more effective.

Daily work now includes elements such as encouraging the construction of houses and blocks of flats to be more energy-efficient and promoting wood construction.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.4.1	**Carbon footprint calculation will be made part of the land allocation process for corporate-form residential buildings.**	2024–2025	**Real Estate and Housing Policy,** Climate and Environmental Policy, Building Control Department	●○○○○	M
3.4.2	**Housing and land policy guidelines will be updated on the basis of impact assessments.** The aim is to provide more effective incentives to promote low-carbon construction.	2025–2029	**Real Estate and Housing Policy,** Climate and Environmental Policy	●○○○○	M
3.4.3	**Energy efficiency of house builders** The impact of the house-builder energy efficiency incentive will be assessed in the context of updating the housing and land policy guidelines for the next council term while updating the incentives into the guidelines.	Moved to routine work	**Real Estate and Housing Policy,** Climate and Environmental Policy	●○○○○	M
3.4.4	**Zero and plus energy construction.** Construction will be guided towards net zero energy construction and, in the long term, towards plus energy construction. The assignment of a plot requires having the energy class A in the construction of blocks of flats.	Moved to routine work	**Real Estate and Housing Policy,** Climate and Environmental Policy	●○○○○	M
3.4.5	**A communication campaign for housing companies will be organised to encourage complementary construction.** The campaign will promote the city's land policy incentives for complementary construction and introduce good practices for combining refurbishment, energy refurbishment and complementary construction.	Complete	**Climate and Environmental Policy,** Strategic Project Development, Comprehensive Planning, Detailed Planning, Real Estate and Housing Policy, EcoFellows Ltd.		M
3.4.6	**Plot application programming.** Plot search programming will present the themes and areas of sustainable and smart construction each year. The themes will be specified at the plot level in the context of the plot application process.	Moved to routine work	**Real Estate and Housing Policy,** Climate and Environmental Policy	●○○○○	M C
3.4.7	**Energy counselling for housing companies and residents.** Energy counselling for housing companies and residents will be developed. There will be cooperation with housing companies and property managers on energy efficiency issues. The introduction of demand response services at apartment blocks will be intensified.	Moved to routine work	**Climate and Environmental Policy,** EcoFellows Ltd	●○○○○	M
3.4.8	**Promotion of wood construction.** Plot application programming will define which areas and how many plots are set to be available for application for wood construction each year.	Moved to routine work	**Real Estate and Housing Policy**, Detailed Planning, Climate and Environmental Policy	●○○○○	M

Image: Visit Tampere Oy/Laura Vanzo.

Measure package 3.5
Infrastructure construction

Efforts will be made to reduce the carbon footprint of infrastructure construction by making comprehensive emissions calculations and by, for example, testing ecological compensation in large-scale projects. Low-emission materials will be used in infrastructure construction.

The use and recycling of soil will be enhanced and the involvement of the city in the use of an open soil recycling data platform will be improved. Areas for soil processing and storage will be established in the vicinity of all major new city plan areas and construction sites.

Tampere Water will introduce an environmental tool, continue the planning of the material balance and promote the management of soil masses. In addition, Tampere Water will carry out carbon footprint calculation in plant design projects.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.5.1	**Carbon footprint of infrastructure construction.** Comprehensive emission calculation is used in IHKU. A plan for how the results of the emission calculation will be utilised in the development of operations and in the reduction of emissions will be drawn up. • The use of ecological compensation will be piloted, for example in large infrastructure projects. • The life-cycle assessment will be tested in 1–2 projects and suitable projects will be designated. The results of life-cycle assessment projects will be utilised in operations.	2024–2025	**Construction and Maintenance of Urban Environment**	●●○○○	M C
3.5.2	**Low-emission materials in infrastructure construction.** • In principle, only domestic kerbstones and paving stones will be used. • The use of elements such as low-carbon concrete and low-temperature asphalt will be tried and promoted on suitable sites. • The use of wood will be promoted in suitable structures. • The development of new low-carbon materials will be monitored and pilot projects in which new low-carbon materials can be tested will be named.	2024–2025	**Construction and Maintenance of Urban Environment**	●●○○○	M C
3.5.3	**Use and recycling of soil masses.** • Information exchange and communication will be improved and experiences of recycled soil materials and their use and storage solutions will be collected. • Experimenting and deployment of new processing methods and methods for utilising the masses (e.g. recycled substrate and End-of-Waste chips). • Mass coordination will be developed and enhanced. • A requirement for the utilisation of recycled materials will be established.	2024–2025	**Construction and Maintenance of Urban Environment,** Detailed Planning, Comprehensive Planning	●●○○○	M C
3.5.4	**Soil information platform.** • Participation by the city's Infrastructure Services in an open and mobile soil information platform (soil exchange or similar) will be promoted. • The snow and soil reception system was introduced in 11/2023. The further development of the system will be utilised more extensively in material records. • An appropriate solution for the implementation of a database for geographical data will be determined.	2024–2025	**Construction and Maintenance of Urban Environment**	●○○○○	M C
3.5.5	**Intermediate storage of soil materials.** Areas for soil processing and storage will be designed, licensed and established in connection with all major new city plan areas and construction sites. The aim is to launch the operations of the Kolmenkulma recycling area at the beginning of 2025. In addition to temporary areas, efforts will also be made to establish permanent recycling area(s).	2024–2029	**Construction and Maintenance of Urban Environment**, Real Estate and Housing Policy, Comprehensive Planning, Detailed Planning	●●●○○	M C
3.5.6	**Utilisation of natural landscapes.** The city's own construction and planning sites will utilise natural landscapes and local structures.	Moved to routine work	**Construction and Maintenance of Urban Environment,** Detailed Planning	●○○○○	M A C
3.5.7	**Optimisation of road maintenance.** The need for road maintenance will be optimised by developing real-time data collection on road conditions. The CityIoT project will test data collected automatically by utility traffic that reduces the need for special measurements and unnecessary anti-slip measures taken 'for the sake of safety'.	Complete	**Construction and Maintenance of Urban Environment,** Smart Tampere, Tampereen Infra		M A
3.5.8	**Use of low-carbon concrete in station centre will be explored.**	2025–2029	**Strategic Project Development**	●●○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.5.9	**Environmental tool for facility construction investments.** The piloting of an environment tool will be launched in a facility construction project in 2022, including buildings, process technology and the design, implementation and operation phases. The tool will be introduced for use in facility construction investments in 2024.	2024–2025	**Tampere Water**	●○○○○	M A
3.5.10	**Material balance planning and soil monitoring tool.** Material balance planning will be continued in the detailed planning phase (at sites of more than 10,000 floor square metres) and soil management will be promoted by means of a monitoring tool.	2024–2025	**Construction and Maintenance of Urban Environment,** Real Estate and Housing Policy	●○○○○	M C
3.5.11	**Carbon footprint calculation of plant design projects.** Carbon footprint calculation will be included as a permanent element in facility design projects. Emissions from projects will be minimised in the design phase by comparing various construction and renovation methods and by making choices that support climate neutrality. Realised CO2-e emissions will be monitored up to project conclusion.	2025–2029	**Tampere Water**	●●○○○	M
3.5.12	**Network investments in Tampere Water.** A designer will be asked to perform a CO2e calculation concerning the network's investment projects and a monitoring system will be agreed to monitor the CO2e emission calculations performed in the context of construction and renovation plans. Various construction and renovation methods will be compared while making choices that support climate neutrality. Realised CO2-e emissions will be monitored up to project conclusion.	2024–2029	**Tampere Water**	●●●○○	M
3.5.13	**Sustainable environmental construction.** Understanding of greenhouse gas emissions from urban and water landscaping will be increased through training (e.g. pipe material choices, fleet, soil, construction, maintenance). Implementation of the national Sustainable Landscape Construction (KESY) Guidelines at the Green Areas and Stormwater Management unit. A pilot under the KESY approach will be carried out in the Niemenranta 3 city plan green area.	Moved to routine work	**Green Areas and Stormwater Management,** Climate and Environmental Policy Planning, Construction and Maintenance of Urban Environment	●○○○○	M
3.5.14	**Calculation of carbon effects.** The carbon calculations for the Unalab project demos will be performed in 2022. Calculations will also be part of the design of green areas and stormwater management sites.	Complete	**Green Areas and Stormwater Management,** Climate and Environmental Policy		M A
3.5.15	**Infrastructure construction in Viinikanlahti and solutions for contaminated soil will aim for minimal transport needs.**	2025–2029	**Strategic Project Development**	●●●●○	M

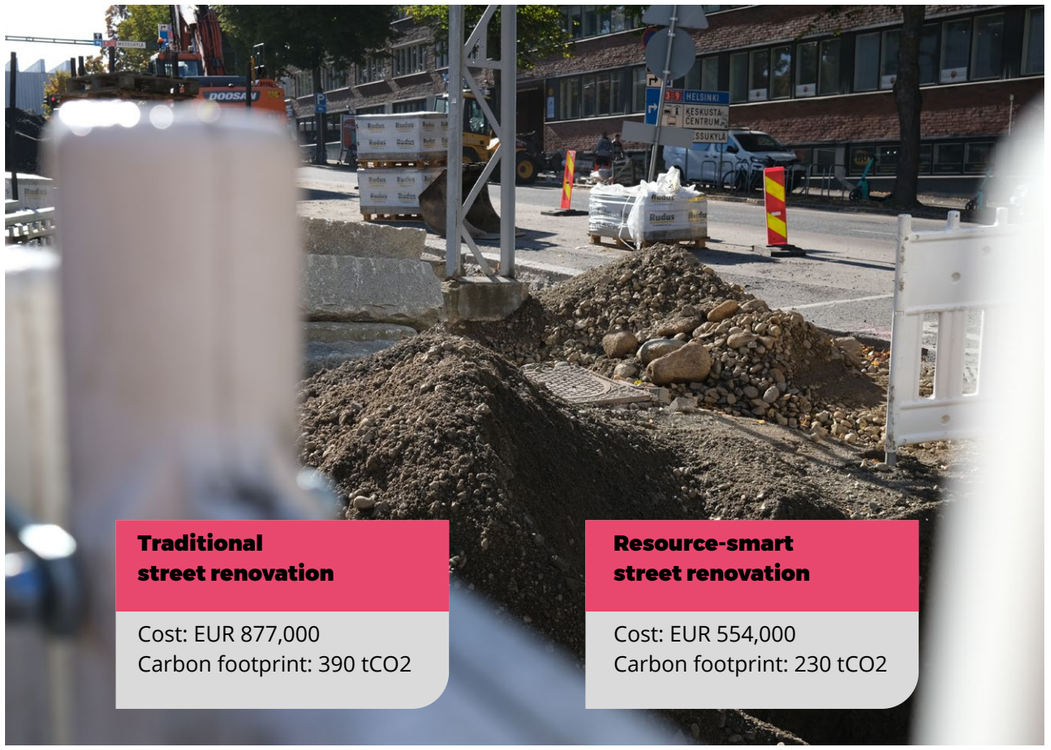


Figure 33 Comparison calculations of two different options for Yliopistonkatu: Costs (EUR) and carbon footprint (t CO2) of traditional renovation and resource-smart renovation. The renovation of Yliopistonkatu was carried out in 2022 in accordance with the principles of the circular economy, i.e. as a resource-smart solution. The calculation provides an understanding of the financial and emission savings of the implementation method. It should be noted that the total costs presented differ from the actual costs of the contract, but are indicatively correct and do not affect the comparability of the different options. Only part of the unit price data in the calculation tool was directly applicable in the cost calculation of the resource-smart option. The cost calculation takes into account building elements (such as materials, transport, installation work, incl. machine work hours), but excludes costs related to district heating, welding, design, overhead expenses and roofing. In addition, the costs related to lampposts and equipment (benches and waste bins) have been estimated as "basic equipment" with lower costs, in contrast to doing it based on the requirements of the Urban Space Manual. The information has been obtained from the contractor and the developer. The calculation was carried out by Sitowise Oy. Image: Miika Peltola

Measure package 3.6
Use of recycled materials

The possibility to use recycled materials will always be assessed in the project and building design of public street and park areas. Wherever possible, different materials and building elements will be recycled at the city's demolition and construction sites.

The Kolmenkulma soil reception area will be developed into a circular economy centre for the recycling of aggregates. In Rusko, similar activities will be launched on a small scale. Effort will be made to procure the stone material for creating more land in the Viinikanlahti bay from the underground parking projects in the city centre to minimise transfer distance and storage.

EMISSION REDUCTION ●●●●○

Figure 34 The old concrete structures of the office building on Kyttälänkatu were removed as complete elements so that they could be reused in the construction industry. The experiment is related to the international ReCreate research project. Image: City of Tampere/Essi Lehtinen.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
3.6.1	**Utilising recyclable materials.** The possibility to use recycled materials will always be assessed in the project and building design of public street and park areas. The checklist for environmental issues (of the infrastructure construction) will be utilised to support planning. Listings will be drawn up to show what recycled and reusable materials are available in the area (the city's own warehouses and private producers).	2024–2029	**Construction and Maintenance of Urban Environment**, Climate and Environmental Policy, Strategic Project Development, Hiedanrannan Kehitys Oy	●○○○○	M C
3.6.2	**Improving the recycling rate of materials from demolition sites.** An operating model will be developed to enhance the reuse of materials and building parts from the city's demolition sites.	2024–2029	**Real Estate and Housing Policy,** Construction and Maintenance of Urban Environment, Tampereen Tilapalvelut Oy	●○○○○	M C
3.6.3	**A study will be carried out on the utilisation of the side aggregate produced in Teisko.**	Complete	**Construction and Maintenance of Urban Environment**		M C
3.6.4	**Use of recycled materials in private construction.** With the permission of the director of real estate management, replacing virgin soil and stone materials with recycled materials can be made possible at suitable leased properties owned by the city.	2024–2029	**Real Estate and Housing Policy**	●○○○○	M C
3.6.5	**Circular economy centres of Rusko and Kolmenkulma.** An operating model has been developed for the Kolmenkulma soil reception area where the area is being developed into a circular economy area (recycling of aggregates and other materials used in construction). The operating model of the recycling areas will be further developed through the experience gained, and it will also be utilised in the development of other similar areas. The circular economy activities in Kolmenkulma will be launched during 2024 and Rusko's small-scale recycling activities during 2025.	2024–2025	**Construction and Maintenance of Urban Environment**	●○○○○	M C
3.6.6	**Recycling of surplus materials and supplies.** Surplus materials from infrastructure construction (kerbstones, paving stones, etc.) will be directed directly to use or collected in recycling areas. Inventory of stored material and information about available materials will be developed through communications.	2024–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●○○○○	M C
3.6.7	**Use of recycled materials in Viinikanlahti.** The purpose of the Viinikanlahti lake infill project is to use aggregates from the city centre's underground parking projects (as the transportation distance is short and storing is minimal) and to use demolition waste in foundation construction and environmental rehabilitation.	2025–2029	**Strategic Project Development**	●●●○○	M C
3.6.8	**Carbon footprint of public areas.** Material emissions from the structural layers of Hiedanranta roads will be reduced using 40% recycled materials compared to structures made entirely of natural materials. This will apply to public transport connections built by HRKOy.	2024–2029	**Strategic Project Development,** Hiedanrannan Kehitys Oy	●○○○○	M C

THEME 4

SUSTAINABLE ENERGY

MAIN OBJECTIVE: **Renewable energy to account for 80%.**

KEY MEASURES 2024–2026

- The energy efficiency of the Tammervoima's Waste-to-Energy Plant will be improved.
- Oil heating will be phased out in the city's own buildings by 2025.
- The city's street lighting will be converted to use LEDs, and smart light control will be implemented by 2025.

KEY MEASURES 2027–2030

- Tampereen Energia will promote the introduction of non-combustion and carbon negative district heating in Tampere.
- Energy-efficient heating systems for corporate properties
- The Lielahti Natural Gas Power Plant will be shut down.

Description

Emissions from the production of electricity and district heat in Tampere will be reduced significantly by replacing fossil energy sources with renewable energy. Furthermore, replacing oil heating with a sustainable heat source, such as a heat pump, district heating or a biomass boiler, will reduce climate emissions significantly.

Smart energy technologies can optimise energy consumption, save energy and keep costs under control. Tampere will transition to smart outdoor lighting by 2025.

Increasing decentralised renewable energy production, such as solar energy and heat pumps, will cut emissions if this production replaces fossil energy. Energy efficiency will improve and emissions will decrease, as energy production avoids energy transfer losses. In addition, decentralised solutions will improve the security of supply while enabling the introduction of new technologies.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2015	2018	2019	2020	2021	2022	2023	2025	2030
Percentage of renewable energy of the production of Tampereen Energia	%	31.3	43.5	45.1	50.5	46	52	67	80	90
Emissions from centralised energy production	kt (CO2e)/a	562	527	503	424	502	368			
Oil heating emissions	kt (CO2e)/a	70	65.2	60.1	48.6	25.7	28.9		31.3	14.2
Grid-connected solar panel systems in the Tampere region	pcs	44	214	431	602	766	1,356	2,187		
Total power of solar panel systems in the Tampere region	MW			5.4	7.1	9.9	16	24.8		20

- Reduction of greenhouse gas emissions from Tampereen Energia's production as compared to 2010: 47% (2021), 80% (2025), 95% (2030)
- The city will phase out oil heating at its own properties by 2025.
- The use of oil in the individual heating of buildings will have stopped.

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Diverse and economical range of fuels
- Utilisation of local renewable energy
- Development of new skills and business
- Reduced life-cycle costs in street lighting
- Diversification of the energy system
- Development of new services and business
- Decreased life-cycle costs
- Positive impact on city's image
- Increased energy self-sufficiency
- New services and business models
- Decreased local emissions.

Measure package 4.1
Centralised renewable energy

The measures concerning large-scale energy production plants, such as the Naistenlahti Power Plant and the Tammervoima Waste-to-Energy Plant, will increase renewable energy, improve energy efficiency and promote the use of renewable energy in the Tampere region. For example, biogas will be increasingly utilised as an energy source. Wherever possible, carbon capture, reuse and storage, as well as other new solutions, will be taken into account in the next updates of the roadmap.

EMISSION REDUCTION ●●●●●

Image: Adobe Stock

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.1.1	**The Naistenlahti 2 Power Plant Unit will be replaced (2020-22).** In this way, it will be possible to use 100% renewable biofuels in the new Naistenlahti 3 Power Plant in the future.	Complete	**Tampereen Energia Oy**		M
4.1.2	**The technology at geothermal installations will be developed in cooperation with other actors.**	2024–2029	**Tampereen Energia Oy**	●●○○○	M
4.1.3	**Energy efficiency of Waste-to-Energy Plant.** The energy efficiency of the Tammervoima Waste-to-Energy Plant will be enhanced by improving the quality of the waste incinerated through improvements in the sorting of glass, metal and organic waste.	Moved to routine work	**Pirkanmaan Jätehuolto Oy**, Tammervoima Oy	●●○○○	M
4.1.4	**The Lielahti Natural Gas Power Plant will be shut down.**	2025–2029	**Tampereen Energia Oy**	●●●○○	M
4.1.5	**Some of the city's properties will be connected to the district cooling network, where necessary, following expansion of the district cooling network.**	2024–2029	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●○○	M A
4.1.6	**Tampereen Energia will promote the introduction of non-combustion and carbon negative district heat in Tampere.** • Electric boiler and district heat battery. • Waste heat recovery. • Additional investments in the Naistenlahti 3 Power Plant.	2024–2029	**Tampereen Energia Oy**	●●●●○	M
4.1.7	**Finnpark's renewable energy.** The electrical and district heat energy procured by Finnpark will be produced by renewable energies. Renewable district heat energy will be used for the time being and an agreement exists to use renewable electricity up to the end of 2023.	Moved to routine work	**Finnpark Oy**	●○○○○	M
4.1.8	**Pirkanmaan Jätehuolto Oy will switch to using sustainably produced and low-emission energy.**	2024–2029	**Pirkanmaan Jätehuolto Oy**	●○○○○	M
4.1.9	**Utilisation of district cooling in Tietotalo heating.**	2024–2025	**Tampereen Palvelukiinteistöt Oy**	●○○○○	M
4.1.10	**Execution of the sludge treatment and biogas plant.** Utilisation of biogas in the production of heat and electricity in the treatment plant and utilisation of nutrients contained in the sludge as soil conditioner.	2025–2029	**Tampereen Seudun Keskuspuhdistamo Oy**	●●●●○	M C
4.1.11	**Koukkujärvi Biogas Plant.** Pirkanmaan Jätehuolto Oy will build a biogas plant at Koukkujärvi, and the biogas produced there will be utilised as transport fuel or it can be utilised in the production of electricity and heat. The material generated in the process will also be utilised as a soil improver that can be further processed into various fertiliser products.	Complete	**Pirkanmaan Jätehuolto Oy**		M C
4.1.12	**Developing the operations of the biogas plant.**	2025–2029	**Pirkanmaan Jätehuolto Oy**	●●●○○	M C

Image: Pirkanmaan Jätehuolto Oy/Marika Vanhatalo

Measure package 4.2
Smart networks and services

In Tampere, smart energy technology and services will be introduced and developed to optimise energy use and manage electricity and heat loads, adapting consumption to varying production situations. In the electricity system in particular, this will enable the increased production of renewable energy sources, such as wind and solar energy.

EMISSION REDUCTION ●●●○○

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.2.1	**Demand response and energy-saving services** Tampereen Energia's services for demand response and energy saving will be further developed and marketed to customers.	Complete	**Tampereen Energia Oy**		M
4.2.2	**Introduction of a district heat battery in Tampere will be investigated.**	Complete	**Tampereen Energia Oy**		M
4.2.3	**Smart grid and virtual power plant technologies will be developed and piloted.**	2024–2025	**Tampereen Energia Oy**	●●○○○	M A
4.2.4	**LED street lighting.** The city's street lighting will be converted to use LEDs and smart light control will be implemented by 2025.	2024–2025	**Construction and Maintenance of Urban Environment**	●●●○○	M

Figure 35 Tampere's street lighting will be converted to use LEDs and smart light control will be implemented by 2025. Measure 4.2.4. Image: Visit Tampere Oy/Mirella Mellonmaa

Measure package 4.3

Decentralised renewable energy and energy efficiency

Tampere will increase the production of renewable energy, such as solar energy, and promote its utilisation in the city area. In addition, the energy efficiency of city properties will be improved.

EMISSION REDUCTION ●●●○○

Image: Adobe Stock

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.3.1	**Decentralised energy systems.** The piloting of new decentralised energy systems will be promoted in the land allocation terms and conditions and competitions in accordance with the guidelines and initiatives of the Climate and Environmental Policy Unit. The results of these pilots will be monitored and the activities expanded as experience is gained.	Moved to routine work	**Climate and Environmental Policy**, Real Estate and Housing Policy	●○○○○	M
4.3.2	**Solar panels and air-to-water heat pumps of buildings.** The primary energy needs of the city's properties will be reduced in connection with new construction and renovation construction. The potential to use solar panels and heat pumps will be investigated at all sites constructed and implementation will be decided on a case-by-case basis.	Moved to routine work	**Real Estate and Housing Policy,** Education and Culture Services, Upper secondary school education, Tampere Vocational College Tredu, Tampereen Tilapalvelut Oy	●●●○○	M
4.3.3	**Energy-efficient heating systems for corporate properties.**	2024–2025			M
	• Geothermal heat for new buildings.		**Tampereen Särkänniemi Oy**	●○○○○	
	• Acquisition of a heat pump for the site at Valkeakoskentie 19.		**Tredu-Kiinteistöt Oy**	●●○○○	
	• Improvement of the annual efficiency of the LTO rotating parking facility.		**Finnpark Oy**	●○○○○	
	• Installation of exhaust air heat pumps.		**Tampereen Vuokra-asunnot Oy**	●●○○○	
	• Balancing of the property's heating system.		**Pirkan Opiskelija-asunnot Oy**	●●○○○	
	• Installation of exhaust air heat pumps in seven locations.		**Pirkan Opiskelija-asunnot Oy**	●●●○○	

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.3.4	**Tampereen Energia will promote the expansion of solar energy.** This will be achieved by, for example, expanding the Tarastenjärvi Solar Power Plant and selling solar energy installation packages and by participating in remote solar energy production systems, such as Ilokkaanpuisto.	Complete	**Tampereen Energia Oy**		M
4.3.5	**The energy efficiency of air conditioning will be stepped up at Hämeenpuisto.**	Complete	**Finnpark Oy**		M
4.3.6	**Solar power plants for corporate properties.**				M
	• Solar panels will be installed on the roof of Hall F, which is currently in the design phase.	2025–2029	**Tampereen Messu- ja Urheilukeskus Oy**	●○○○○	
	• Solar panels will be installed on the roof of Tuomi Logistiikka at Särkijärvenkatu.	2024–2025	**Tampereen Palvelukiinteistöt Oy**	●●○○○	
	• Solar energy of Tietotalo.			●○○○○	
	• Property-specific solutions for renewable energy production at pumping stations (solar panels, geothermal)	2025–2029	**Tampereen Seudun Keskuspuhdistamo Oy**	●●○○○	
	• Property-specific solutions for renewable energy production in Sulkavuori (solar panels).	2025–2029	**Tampereen Seudun Keskuspuhdistamo Oy**	●●○○○	
	• Investigation of solar electricity in investment projects.	2025–2029	**Tampere Water**	●○○○○	
	• Installation of solar collectors.	2024–2025	**Tampereen Vuokra-asunnot Oy**	●●○○○	
	• Installation of solar panels.	2024–2025	**Tredu-Kiinteistöt Oy**	●●○○○	
4.3.7	**Electrical energy will be switched from fossil energy to renewable energy.**	2024–2025	**Tampereen Messu- ja urheilukeskus Oy**	●○○○○	M
4.3.8	**More energy-efficient lighting in companies.**				M
	• Lighting will be made more energy efficient through annual additions and in the context of new construction.	2024–2025	**Tampereen Särkänniemi Oy**	●●○○○	
	• Lighting renovations in the following locations: Sammonkatu 45, Pallotie 5, Santalahdentie 10, Valkeakoskentie 19.	2024–2025	**Tredu-Kiinteistöt Oy**	●●○○○	
	• Replacing the lighting in P-Hämppi with LED technology.	2024–2025	**Finnpark Oy**	●●○○○	
4.3.9	**A land use review of Tampere's green transition will be carried out.** The potential, land use conditions and suitability of different green transition solutions in different areas will be explored.	2024–2025	**Comprehensive Planning**, Climate and Environmental Policy, Tampereen Energia Oy	●○○○○	M A
4.3.10	**Tredu-Kiinteistöt Oy will procure solar power plants for the following sites:** Hepolamminkatu 10 L, Hepolamminkatu 10 S, Pallotie 5, Santalahdentie 10, Finnentie 39 and Santalahdentie 10.	Complete	**Tredu-Kiinteistöt Oy**		M
4.3.11	**Hiedanranta's energy system and life-cycle carbon footprint.** An energy system based on non-combustion energy production will be implemented in Hiedanranta, to enable local production and utilisation of renewable energy. Open bi-directional energy networks will make up the internal balancing of energy production and consumption. The preconditions for energy communities, and for an internal energy market within the area, will be explored and promoted.	2024–2029	**Strategic Project Development,** Hiedanrannan Kehitys Oy, Climate and Environmental Policy, Tampereen Energia Oy	●●○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.3.12	**Carbon neutral district heating in Särkäniemi.** A carbon neutral option will be chosen for district heating.	2024–2029	**Tampereen Särkänniemi Oy**	●○○○○	M
4.3.13	**The production of decentralised renewable energy and energy efficiency will be promoted in the design of buildings in the station centre area.**	2025–2029	**Strategic Project Development**	●○○○○	M
4.3.14	**The regional energy efficiency systems and alternative energy production opportunities of the Viinikanlahti plans** This will be achieved with geothermal well and solar panel provisions, stormwater solutions, parking facilities, ecological networks and landscaping, city block and house construction.	2025–2029	**Strategic Project Development**	●●○○○	M
4.3.15	**Meals for children and young people will be prepared in an energy-efficient manner at the Voimian Pata production kitchen starting in 2022–2023.** An in-house solar power plant will produce one-third of the electricity needed. Logistic arrangements will be streamlined.	Moved to routine work.	**Pirkanmaan Voimia Oy**	●●○○○	M
4.3.16	**Optimisation of wastewater pumping stations' operations.** Pilot site is the Tasanne pumping station. It will be tested whether a change in the operation pattern of the pumps can save electricity.	2024–2029	**Tampere Water**	●○○○○	M
4.3.17	**Energy-efficiency measures in subsidiaries**	2024–2029			M
	• Window renovation of the property		**Pirkan Opiskelija-asunnot Oy**	●●○○○	
	• Energy consumption monitoring (water, electricity, heat)		**Pirkan Opiskelija-asunnot Oy**	●●○○○	
	• Increasing of flat-specific condition monitoring.		**Pirkan Opiskelija-asunnot Oy**	●○○○○	
	• Refrigerant R404A (fluorine gas) will be replaced.		**Tampereen Särkänniemi Oy**	●○○○○	
	• Investments that enable energy savings in wastewater intake pumping		**Tampereen Seudun Keskuspuhdistamo Oy**	●●●○○	
	• Heat recovery from different wastewater treatment plant air fractions (air conditioning, wastewater aeration)		**Tampereen Seudun Keskuspuhdistamo Oy**	●●●○○	
	• Optimisation of water production and distribution By optimising water production and pumping, it will be possible to save electricity. A pilot phase will be implemented and a final optimisation system might be built.		**Tampere Water**	●●○○○	
	• Energy-saving measures in heating, plumbing, ventilation and sanitation engineering work.		**Tampereen Vuokra-asunnot Oy**	●●○○○	
	• Emissions from machine work in waste facilities will be reduced.		**Pirkanmaan Jätehuolto Oy**	●○○○○	

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.3.18	**Development of carbon capture.**	2025–2029	**Pirkanmaan Jätehuolto Oy**	●●○○○	M
4.3.19	**Leakage inspections in the wastewater network.** Data analysis of the Neuroflux system and the city's own automation/reporting system. The aim is to find network renovation sites on the basis of the electricity consumption data of wastewater pumping stations. Network renovation will reduce leakage, which in turn will reduce electricity consumption in the network and emissions at the wastewater treatment plant.	2024–2029	**Tampere Water**	●●○○○	M
4.3.20	**Network renovations to be carried out every year.** The total annual length of the water and wastewater network to be renovated is approximately 10–15 km. The renovation of the networks will reduce leakages and thereby electricity consumption and emissions at the wastewater treatment plant, and it will also save water.	2024–2029	**Tampere Water**	●●●●○	M
4.3.21	**Opportunities for increased energy recycling and storage will be mapped.**	2024–2029	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M
4.3.22	**Calculation of the total consumption of comparable items.** • The normalised total consumption of heating energy will decrease compared to the same data from the previous year. • The total consumption of electrical energy will decrease compared to the same information from the previous year. • The total consumption of domestic water will decrease compared to the same information from the previous year. • The amount of carbon dioxide emissions will decrease compared to the previous year.	2024–2029	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M

Measure package 4.4

Phasing out oil heating

The city will phase out oil heating and encourage oil heaters to switch to sustainable energy.

EMISSION REDUCTION ●●●●○

Image: Adobe Stock

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
4.4.1	**Residential areas with oil heating will be identified in order to be able to more effectively encourage and guide people to switch to a new heating method.** An operating model will be established to support detached houses that use oil heating to switch to a new heating method. Building-owners will be guided towards taking advantage of the relevant government subsidies.	Moved to routine work	**Climate and Environmental Policy,** EcoFellows Ltd, Building Control Department	●●○○○	M
4.4.2	**Oil heating will be phased out in the city's own buildings by 2025**. Efforts will be made to make use of government subsidies.	2024–2025	**Real Estate and Housing Policy,** Tampereen Tilapalvelut Oy	●●●○○	M

Image: Visit Tampere Oy/Laura Vanzo

THEME 5

SUSTAINABLE CONSUMPTION

MAIN OBJECTIVE: **Consumption will be sustainable and the circular economy functional.**

KEY MEASURES 2024–2026

- Reduction of the amount of meat protein in school and daycare meals
- Ecosocial education in Education and Culture Services
- Tampere City Hall will enable sustainable everyday working life for employees
- Energy efficiency training for property stakeholders
- Encouraging cycling
- Sustainable practices will be required from service providers
- The rental policy for outdoor event venues will be revamped and aligned with sustainable development.

KEY MEASURES 2027–2030

- Residents' voluntary climate work will be supported
- Creating a sustainability education path that reaches from early childhood education to upper secondary education
- Digital services
- Promotion of climate neutral tourism business operations
- Monitoring and compensation of the carbon footprint of Visit Tampere's business operations
- Tredu site certification
- Certification of Tredu's campuses
- Replacing all or some meat protein with plant-based proteins in school and daycare catering.

Description

Greenhouse gas emissions from consumption are significant, which is why it is important for the city to lead by example in reducing consumption, and to encourage sustainable and emission reducing consumption patterns among city residents and businesses. The prerequisites for a sustainable lifestyle must also be increased. Sustainable choices should be easy and comfortable and available at a reasonable price.

Food accounts for a large percentage of emissions from consumption. A more plant-based diet is not only healthy but also climate-friendly. The city promotes it at school and work canteens. Climate-friendly catering is also taken into account in the city's hospitality and events.

In Tampere, increasing digital services is a cross-cutting goal that can also reduce the consumption of materials and the mobility needs. Other methods of sustainable consumption include equipment sharing and different types of reuse.

Ecosocial education creates a framework for the entire Education Services in Tampere. The values of ecosocial education are responsibility, moderation and interpersonal aspects. Sustainability education is approached through these values in basic education and early childhood education. The well-being of nature cannot be separated from the well-being of people. This value base also serves as a basis for things such as the development of culture in Tampere. Climate issues are also taken into account in general upper secondary education and vocational education.

It is easy for Tampere residents and people travelling to Tampere to make sustainable choices in terms of both local tourism and experiences. The aim is to turn the City of Tampere's tourism sector into one of the pioneers of climate work and an international model example. Climate-resilient tourism is a significant part of the Smart Tourism Destination development, which is one of the main themes of the Visit Tampere tourism strategy.

The starting points of the measures are compiled in Appendix 3.

Objectives and indicators

	Unit	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030
Municipal waste recycling rate*	%										55	60
Percentage of biowaste in mixed waste	%	36.9		38.4				37.7	33.9			
Amount of mixed household waste	(kg/ resident/ year)						155	147	141			

- The amount of food waste at Voimia kitchens will have decreased.

* An estimate of the recycling rate of municipal waste will be added to the next update of the roadmap.

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Health benefits
- Increased biodiversity
- Increased sense of community
- Positive impact on city's image
- The economic and social impact of sustainable development in addition to ecological effects
- Facilitating new business
- Cost savings
- City residents' increased independent activity.

Measure package 5.1

Waste management

Waste management will be developed at city properties and construction sites. New ways of arranging waste management in dense residential areas will be sought. The introduction of a fee that encourages sorting will be prepared.

EMISSION REDUCTION ●●●○○

Image: Pirkanmaan Jätehuolto Oy/Marika Vanhatalo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.1.1	**Update of waste management regulations**. The waste management regulations will be updated by 2022 so that separate collection of organic waste, plastic, metal, glass and cardboard will become mandatory for every building consisting of five housing units or more.	Complete	**Waste management**		M C
5.1.2	**Recycling of biowaste.** The waste management regulations will be updated so that separate collection of organic waste will be mandatory for every building in population centres with more than 10,000 inhabitants as of 1 September 2023.	Complete	**Waste management**		M C
5.1.3	**Waste fees.** The incentive element of waste fees will be strengthened to improve the sorting of organic and recyclable waste.	Complete	**Waste Management ,** Pirkanmaan Jätehuolto Oy		M C
5.1.4	**The potential and impact of introducing a fee that encourages sorting will be investigated.**	2024–2029	**Pirkanmaan Jätehuolto Oy,** Waste Management	●○○○○	M C
5.1.5	**Life-cycle assessment of waste management services.** An analysis of the options available for organising waste management services will take the form of a life-cycle assessment in order to assess the environmental impacts of the different solutions.	Moved to routine work	**Pirkanmaan Jätehuolto Oy**	●●○○○	M C
5.1.6	**Waste management of city properties.** The waste contracts, waste facilities, sorting practices, guidance, shortcomings and needs of city-owned properties will be mapped. Waste sorting opportunities will be enhanced at city-owned properties. • Waste bins and their emptying interval will be optimised in cooperation with Pirkanmaan Jätehuolto.	2024–2025	**Real Estate and Housing Policy,** Pirkanmaan Jätehuolto Oy, Tampereen Tilapalvelut Oy, Early Childhood Education and Pre-Primary Education, Waste Management	●●○○○	M C
5.1.7	**Improving recycling potential in upper secondary school buildings**. Recycling opportunities will be increased at school buildings, also for students. Besides the climate neutrality goal, this also has an educational aspect.	Moved to routine work	**Upper secondary school education**	●○○○○	M C
5.1.8	**Placement of recycling containers in compliance with the amendments of the new waste legislation.**	Moved to routine work	**Tampereen Särkänniemi Oy**	●○○○○	M C
5.1.9	**Waste management in land use planning.** Detailed plans will take into account the space required for organising waste management. In the detailed plans of new residential areas, waste management solutions will mainly be based on local collection.	Moved to routine work	**Detailed Planning,** Pirkanmaan Jätehuolto Oy	●○○○○	M C
5.1.10	**The city's construction sites will organise the separate collection of waste by waste type while avoiding the generation of mixed construction waste.** The city's infrastructure procurement will require contractors to have in place an operational system for waste management, while defining the related responsibilities.	2024–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy, Climate and Environmental Policy	●○○○○	M C
5.1.11	**Organisation of waste management in densely built urban area.** Opportunities will be explored to create an operating model that, due to space shortages, will allow existing residential areas (incl. areas that will see complementary construction) to organise property waste management services flexibly through a combination of property-specific, joint collection and local collection by utilising the land owned by the city, if necessary.	2024–2025	**Waste Management,** Pirkanmaan Jätehuolto Oy, Building Control Department, Transport System Planning, Green Areas and Stormwater Management, Waste Management, Detailed Planning	●○○○○	M C
5.1.12	**Circular economy of sanitation and food production.** Urban solutions based on the circular economy will be promoted for sanitation and food production, such as dry toilets, algal biomass cultivation and urban and vertical farming. Solutions will be developed and piloted in Hiedanranta, for example in projects.	Complete	**Strategic Project Development,** Hiedanrannan Kehitys Oy, Climate and Environmental Policy		M A C
5.1.13	**Reception of precipitation sludge and sealed tank sludge.** Implementation of the central treatment plant in the Tampere region in such a way that it is possible to receive septic tank and sealed well sludge via a sewer instead of transporting it to waste treatment by road transport.	2025–2029	**Tampereen Seudun Keskuspuhdistamo Oy**	●●○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.1.14	**Shutdown of Viinikanlahti and Rahola wastewater treatment plants.**	2024–2025	**Tampere Water**	●●●○○	M C
5.1.15	**Optimisation of precipitation chemical feed at wastewater treatment plants.** A dosing system based on the quality of the lake water in use at the Rahola wastewater treatment plant. The goal will be to reduce chemical consumption.	2024–2025	**Tampere Water**	●○○○○	M
5.1.16	**More efficient nutrient cycle.**	2024–2025	**Pirkanmaan Jätehuolto Oy**	●●○○○	M C
5.1.17	**Promotion of the recycling of plastic material.** Possibilities for improving the collection of plastics and material recycling will be explored in cooperation with companies and producer communities.	2025–2029	**Pirkanmaan Jätehuolto Oy,** Waste Management, Business Tampere, EcoFellows Ltd	●○○○○	M C
5.1.18	**More efficient collection of plastic waste and biowaste at all schools.**	2024–2025	**Basic Education,** Pirkanmaan Voimia Oy	●○○○○	M C
5.1.19	**Reducing Tredu's carbon footprint by reducing waste.** • Reducing waste (biowaste and mixed waste) generation is taken into account already at the planning stage. Waste sorting will be examined. • Investigation work related to sorting and transport will be continued. The waste disposal intervals at the sites will be rationalised (holiday periods, etc.). • Efforts will be made to turn the resulting waste into raw material.	2024–2025	**Tampere Vocational College Tredu**	●○○○○	M C
5.1.20	**Improving sorting possibilities in apartments.** The implementation of a sorting concept that improves sorting possibilities by introducing sorting containers to apartments will be launched.	2024–2029	**Tampereen Vuokratalosäätiö**	●○○○○	M C

Image: Pirkanmaan Jätehuolto Oy/Laura Tammisto

Measure package 5.2

Sustainable lifestyle

Tampere will encourage a sustainable lifestyle by, for example, increasing the opportunities of the sharing economy and supporting residents' voluntary climate work. Sustainable working practices will be made possible for employees, and sustainable practices will be required from the city's service providers.

EMISSION REDUCTION: Impacts will be indirect but necessary to achieve direct emission reductions. The scale cannot be estimated.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.2.1	**Supporting residents' voluntary climate work.** • Possibilities for a new grant category will be explored. • Supporting of organisations in their own climate and environmental work. • Opportunities to meet other interested residents will be created.	2024–2029	**Climate and Environmental Policy**, Community and development services	●○○○○	M
5.2.2	**Sustainable development campaigns.** The city will promote residents' sustainable consumption in 2021–2025 under the Climate Neutral Action development programme. In the context of this development programme and other activities, a host of campaigns and thematic weeks will be organised including Green Week, Climate Week, Cycling Week, Mobility Week, and Energy Saving Week. EcoFellows Ltd. will organise environmental and energy-saving advice activities for residents.	2024–2025	**Climate and Environmental Policy,** EcoFellows Ltd	●●●○○	M A C
5.2.3	**A natural management guide for residents will be compiled.**	Complete	**Green Areas and Stormwater Management,** Climate and Environmental Policy		M A
5.2.4	**Residents' understanding and know-how of climate change mitigation and climate change adaptation will be improved.** • The Tampere Climate and Nature Guide will be maintained. • Support for housing companies and houses in mitigation and adaptation themes through, for example, communications campaigns • Development of the annual climate and environmental communication calendar (includes campaigns in which the city participates) • Marketing of the Think Sustainably service to consumers.	2024–2029	**Climate and Environmental Policy**	●○○○○	M A
5.2.5	**Upper secondary schools will pay attention to energy saving in everyday life, especially with regard to digital devices.**	2024–2029	**Upper secondary school education**	●○○○○	M
5.2.6	**Särkänniemi will digitize its management of chemicals.**	2024–2025	**Tampereen Särkänniemi Oy**	●○○○○	M
5.2.7	**The new Tampere City Central Office Building will enable sustainable everyday working life for employees.** • The Tampere City Central Office Building's café and restaurant selections and operating methods will take sustainability and responsibility into account. These criteria will also be taken into account when organising meeting menus. • The sustainable and well-being-enhancing commuting of staff will be supported. This will be achieved by, for example, enabling safe bicycle parking and good social welfare facilities for people who move around using only their muscles as well as sustainable mobility pilots. • Easy recycling during the working day will be enabled. • Where possible, second hand furniture will used in the office building, and energy efficiency and smart use of resources will be taken into account.	2024–2029	**Human Resources Unit,** Procurement Services	●○○○○	M C
5.2.8	**Properties' stakeholders active training.** Tailored energy efficiency trainings will be organised for the stakeholders of Tampereen Tilapalvelut.	2024–2029	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M
5.2.9	**Consumption data of the service facility network.** Site-specific consumption reporting will be shared with city employees on the intranet. The consumption report will show the monthly consumption of heating, electricity and water. From the intranet, the consumption data can be utilised in other information displays.	2025–2029	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Policy	●○○○○	M
5.2.10	**Monitoring of electricity and water consumption.** The energy and water consumption of the sites can be monitored in the Enerkey service. A few employees at the learning environment services have credentials for the service. The sharing of appropriate information through info-tv, etc. will be investigated.	2024–2029	**Tampere Vocational College Tredu**	●○○○○	M
5.2.11	**The monitoring of the production of solar panels and the share of their use in the info-TV of sites or other easily accessible channel.**	2024–2029	**Tampere Vocational College Tredu**	●○○○○	M
5.2.12	**Sustainability objectives will be included in the criteria for partnership agreements for cultural spaces.** In the re-tendering of café and restaurant services, the environmental aspect will be included among the criteria while requiring service providers to adopt ecological practices and to provide Fairtrade products and comprehensive plant based options. • Operation of the Nekala Cultural Centre. • Operation of Tullikamari. • Hiedanranta's future partnership agreements.	2024–2030	**Cultural Services**	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.2.13	**The reuse of exhibition structures will be enhanced in museums wherever possible**. Shared use and storage will be increased between museums.	2024–2030	**Cultural Services**	●○○○○	M C
5.2.14	**International sustainable development work will be participated in.** For example Green Orchestra and Eurocities.	2024–2030	**Cultural Services**	●○○○○	M
5.2.15	**Equipment management system in Sports and Exercise Services.** Sports and Exercise Services will introduce an equipment management system to reduce overlapping procurement and to extend the life cycle and diversity of use of sports and exercise equipment.	2024–2029	**Sports and Exercise Services:**	●○○○○	M C
5.2.16	**The circular economy as an employer.** The KIERTO project will help boost city residents' circular economy competence from the perspective of jobs, careers and business opportunities. Support will be provided to businesses and associations to transition to circular economy activity and to create jobs. City employees will be trained to address circular economy aspects in career counselling, in commercial cooperation and in their own work. Through the city's in-house employment measures, climate neutrality action by the city's units and related development will be supported.	Complete	**Employment services**		M C
5.2.17	**Promotion of shared use in Tredu.** • For example, the shared usability of the equipment used at fairs will be increased with a Trail pilot. (Trail is a cloud-based system for managing different types of equipment, and it can be used to take care of the equipment throughout its life cycle, and at the same time the data collected about the equipment helps in the making of smarter investment decisions.) • The zero-loss mindset will be promoted by, for example, recycling furniture through a recycling Teams channel. Furniture will be recycled as efficiently as possible.	2024–2030	**The Tampere region Tampere Vocational College Tredu**	●○○○○	M C
5.2.18	**Sustainability of teaching materials at Tredu.** • All teaching materials will be catalogued in the Aurora database of Tredu's information and library services. This will help avoid duplicate acquisitions and the accurate location of the material will be known. Physical materials will circulate among people borrowing them and also between different units. • Textbooks that are no longer used will be available on the 'discontinued' shelves at Tredu data centres. • Textbooks that are not suitable for customers and outdated textbooks, as well as broken equipment, will be sorted for recycling.	2024–2030	**Tampere Vocational College Tredu**	●○○○○	M C
5.2.19	**Sustainable development scanning will be implemented in libraries.** The scanning will help the relevant parties inspect their library from different perspectives of sustainable development, detect possible shortcomings and brainstorm new solutions.	2024–2025	**City of Tampere Library**	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.2.20	**Digital services in the city's services will be developed in cooperation with service areas**. Digital customer services will be increased with the aim of improving customer service and productivity while striving for material savings, energy savings, reduced travel needs and improved efficiency in the use of facilities.	2024–2030	**Digitalisation and ICT,** Service Areas	●●●○○	M
5.2.21	**Digital tools for remote work.** Digital tools will be used to reduce unnecessary commuting. The aim will be to increase remote work in all activities where remote work is possible. The hybrid practices taught by COVID-19 help reduce the need for office space, and the carbon footprint from construction will be reduced. Mobility and the need to use facilities in the decision making (meetings) by the administrative bodies will be reduced through smooth utilisation of hybrid work practices.	Complete	**Service areas, Digitalisation and ICT**		M
5.2.22	**Reducing the use of paper**. Digitalisation and ICT will maintain a modern fleet of printers while addressing environmental aspects in equipment procurement. Digitalisation will help reduce the consumption of paper and other materials. Offices will step up the shared use of printers and other equipment. Unnecessary paper printing will be avoided and eco-certified paper used. Computers and displays will be switched off when not in use. Electronic calendars will be used. Secure printing will reduce environmental impacts by preventing unnecessary printing and by preventing individual printers from being overloaded. Printing on paper will be monitored using PowerBI reporting. The monitoring feature is available in the City of Tampere intranet.	Moved to routine work	**Service areas, Digitalisation and ICT**	●○○○○	M C
5.2.23	**The old documentation needed in processes will be digitalised.** The usability of the archive of digital materials will be enhanced by developing the search functionalities of the electronic archive. In the context of digitalisation, the life-cycle management of documentation will be taken into account. The city carried out a large-scale digitisation project in 2020–2022. The digitisation guidelines produced for the city after the project and the framework contract tendering for digitisations are under way. A single larger entity to be made available to processes through digitisation is special plans for building supervision. This digitisation is expected to be carried out in 2024–2027.	2024–2029	**Administration and Support Services Unit,** Group Units, Services and Public Utilities	●●○○○	M
5.2.24	**Tredu's ICT devices have defined life cycles and will go for further use or to manufacturers for the manufacture of new ones.** Where possible, machines and equipment will be procured second hand. The purchase of machines will take into account their energy consumption. Discarded devices will be returned, sold or recycled.	2024–2029	**Tampere Vocational College Tredu**	●○○○○	M C

Measure package 5.3

Ecosocial education

Ecosocial education will create a framework for teaching sustainable development in basic education and early childhood education. Climate issues will be a key element of the education content in upper secondary schools and in vocational studies. Discussion opportunities, events and workshops will be held in Tampere to discuss the environment and the need for change in society. In addition, art will be used to create an impact on an emotional level and to take a stand for nature and society.

EMISSION REDUCTION: Impacts will be indirect but necessary to achieve direct emission reductions. The scale cannot be estimated.

Figure 36 Nature School Korento in Terälahti.
Image: City of Tampere/Laura Happo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.3.1	**Education path for sustainability.** An education path for sustainability will be created for Tampere. It will define roles and activities from early childhood education to upper secondary education. The work will begin by creating an education path for food, through which a base will be created for the construction of an education path for sustainability.	2024–2030	**Basic Education,** Early Childhood Education and Pre-Primary Education, Upper Secondary School Education, Tampere Vocational College Tredu, Climate and Environmental Policy Unit	●○○○○	M
5.3.2	**A sustainable future in early childhood education and pre-primary education.** City level "Sustainable future plan and support material for early childhood education and pre-primary education".	2025–2029	**Early Childhood Education and Pre-Primary Education:**	●○○○○	M A
5.3.3	**Ecosocial education will create a framework for teaching in early childhood education and pre-primary education.**	2024–2029	**Early Childhood Education and Pre-Primary Education:**	●○○○○	M
5.3.4	**Ecosocial education will create a framework for teaching sustainable development in basic education.** Sustainability education will be approached through the values of ecosocial education, which are sustainability, moderation and humanity. The well-being of nature cannot be separated from the well-being of people. • Schools will write down in their school year plans how ecosocial values are improved in the school's operating culture, management and pedagogy.	2024–2030	**Basic education**	●○○○○	M
5.3.5	**Cycling education.** Bicycle maintenance as part of handicrafts education. Schools will be supported in the procurement of bicycle maintenance equipment.	2024–2030	**Basic education**	●○○○○	M
5.3.6	**Ecosocial education communications.** Basic education will prepare communication material about ecosocial education. The material will help in the understanding of the value base, teaching and operating methods of ecosocial education.	2024–2025	**Basic education**	●○○○○	M
5.3.7	**Sustainable summer jobs in youth services.**	2024–2030	**Youth services**	●○○○○	M
5.3.8	**Environmental professorship.** Pedagogical competence in sustainable development will be boosted by supporting Tampere University's professorship in environmental pedagogy and its goals in 2019–2021.	Complete	**Attractiveness and lobbying**		M A
5.3.9	**Climate and environmental competence in upper secondary schools.** • In upper secondary schools, climate and environmental competence that is based on scientific data will be an integral part of the educational content of several subjects taught at upper secondary schools. Teachers will be encouraged to seek further training on climate change issues. • Climate issues will be actively introduced as part of the education provided (school-specific theme study units of upper secondary schools, My2050 experience game, Climademy network, international climate-themed cooperation projects). • Events and themed days organised at upper secondary schools will highlight and discuss sustainable development and ecology. People will be encouraged towards reducing unnecessary consumption and giving immaterial gifts. • Awareness will be raised by informing students, teachers, guardians and cooperative partners about climate action.	2024–2029	**Upper secondary school education**	●○○○○	M
5.3.10	**Tampere Vocational College will create sustainable management and a sustainable operating culture at Tredu.** • The three offices of Tredu have the sustainability certificate of the Okka Foundation (education, operating culture and management). In 2024, the certificate will be applied for the next three locations, and the goal is to certify the entirety of Tredu by the end of 2027. • The carbon footprint will be monitored, and the aim will be to promote the transition to responsible procurement, as well as to increase the staff's competence in, for example, the circular economy. TOKI online library 24/7. TOKI's electronic teaching materials will be available remotely wherever there are functional network connections.	2024–2029	**Tampere Vocational College Tredu**	●●○○○	M A

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.3.11	**Promotion of ecosocial education through culture.** • Making sustainable actions visible. By means of communication, we will highlight our own measures and share tips for a sustainable lifestyle and use of services. • Education through lectures, events, workshops and exhibitions. Discussion events, events and workshops will be held to discuss the environment and the need for change in society. Steering towards moderation. • Direct action for the environment. Events and workshops where concrete sustainable actions can be taken will be organised and supported. Examples include repair workshops, birdhouse voluntary work, recycling points, etc. • Art will be used to make an impact on an emotional level. Interaction between audiences and works of art and artists will be produced. The works will take a stand for nature and society and increase empathy.	2024–2030	**Cultural Services**	●○○○○	M

Figure 37 Bicycle maintenance is a skill of the future – encouraging active journeys to school has been tested with bicycle maintenance workshops at three different pilot schools in 2023. In bicycle maintenance workshops, students learn under the guidance of professionals the basics of caring for their own bicycle. In addition, bicycle maintenance equipment has been purchased for schools, and bicycle maintenance is taught as part of handicraft classes. Measure 5.3.5. Image: City of Tampere/Mimmi Virtanen

Image: City of Tampere/Laura Happo

Measure package 5.4

Meals

The transformation to environmentally friendly eating will be promoted by, among other things, increasing the attractiveness of vegetarian food and offering vegetarian food on a daily basis in schools and daycare centres. At the same time, young people will be raised with responsible eating habits. Pirkanmaan Voimia will step up the use of plant proteins while reducing food waste. The city's hospitality functions will prefer locally sourced food.

EMISSION REDUCTION ●●●○○

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.4.1	**Voimia head for climate neutrality** Pirkanmaan Voimia Oy will develop its business in a climate-neutral direction while reducing emissions as set out in the climate roadmap. The use of plant proteins, fish and meat chicken in meals will be increased while reducing red meat. Rice will be replaced with potato and other cereals. Oat drink will be offered as an option for all customers to drink with their meal. Preference will be given to seasonal vegetables.	2024–2030	**Pirkanmaan Voimia Oy**	●●●○○	M
5.4.2	**Voimia reduces food waste.** Voimia sites will reduce food waste from the meals of all customer groups and make the best possible use of any possible waste food.	Moved to routine work	**Pirkanmaan Voimia Oy**	●○○○○	M C
5.4.3	**Introduction of Hävikkimestari application.** The Hävikkimestari application will be introduced at all Voimia facilities while using knowledge-based management to reduce waste and to include customers.	Complete	**Pirkanmaan Voimia Oy**		M C
5.4.4	**Carbon footprint of catering.** All catering for meetings, conferences and events organised by the city will strive for the lowest possible carbon footprint. The Fusilli project will produce more detailed guidelines.	Moved to routine work	**Climate and Environmental Policy**	●○○○○	M
5.4.5	**The city's hospitality functions will favour locally sourced food.**	Moved to routine work	**Strategy and development**	●○○○○	M
5.4.6	**Catering of Culture and Leisure Services.** In the restaurant services of the Culture and Leisure Services and at camps and events, vegetarian food will be included as an option on an equal footing with the other foods. Preference will be given to locally sourced food. Disposable tableware will be avoided and, where necessary, biodegradable tableware will be used. Efforts will be made to reduce food waste and to consider the potential for giving food waste to charity in future. In re-tendering of café and restaurant services, the environmental aspect will be included among the criteria while requiring service providers to adopt ecological practices and to provide Fairtrade products and comprehensive vegetarian options.	Moved to routine work	**Culture, Sports and Youth Services,** Pirkanmaan Voimia Oy	●○○○○	M C
5.4.7	**Food policies.** The city's different roles in the sustainable food system will be identified. A food policy action plan will be drafted and efforts will be made to further it. The Milan Urban Food Policy Pact will be signed. This work will be coordinated under the FUSILLI project.	Complete	**Climate and Environmental Policy**		M C
5.4.8	**City residents' understanding of the sustainable food system will be increased.** City residents' awareness of sustainable and healthy food and different opportunities to produce food in the urban environment will be improved.	Complete	**Climate and Environmental Policy,** EcoFellows Ltd		M
5.4.9	**Addition of edible plants**. The number of edible and pollinator-friendly plants in the urban environment will be increased through measures such as utilisation of the green factor tool. The map service will be updated, mentioning fruit trees and fruit-bearing shrubs that the city residents can freely utilise.	Complete	**Climate and Environmental Policy,** Green Areas and Stormwater Management		M A
5.4.10	**Establishment of school gardens**. School gardens will be established while developing, together with schools and pupils, a method to tend them that supports the various subjects taught at school. The FUSILLI project will assist with the development of this operating model.	Moved to routine work	**Climate and Environmental Policy Unit,** Basic Education	●○○○○	M A
5.4.11	**Raising young people with responsible eating habits.** • Daily free-choice vegetarian option. • Option of eating without a tray. • Efforts will be made to encourage sustainable meals and well-being. • Communication and cooperation between the home and the school on encouraging sustainable school meals.	2024–2030	**Early Childhood Education and Pre-Primary Education, Basic Education, Upper Secondary School Education, Tampere Vocational College Tredu,** Pirkanmaan Voimia Oy **Early Childhood Education and Pre-Primary Education, Basic Education**	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.4.12	**Reducing the amount of meat protein on menus.** • Meat protein will be replaced completely or partially with vegetable proteins by, for example, introducing hybrid dishes to menus. • Vegetarian day at least once a week.	2024–2029	**Early Childhood Education and Pre-Primary Education, Basic Education, Upper Secondary School Education, Tampere Vocational College Tredu,** Pirkanmaan Voimia Oy **Early Childhood Education and Pre-Primary Education, Basic Education**	●●●○○	M
5.4.13	**Reducing food waste.** • Reduction of food waste from plates. • More efficient monitoring of food waste. • Upper secondary schools will organise a food waste week and they will promote the reduction of food waste through communication efforts and regular measurements. Waste monitoring will be developed and information will also be brought to the attention of staff and students through, for example, information displays. • Surplus food will be sold in the afternoon and served the following day. • The units of Tampere Vocational College Tredu will develop practices and communication in cooperation with food service operators in order to reduce food waste and biowaste. • Distribution of surplus food at youth centres will continue.	2024–2030	**Early Childhood Education and Pre-Primary Education, Basic Education, Upper Secondary School Education, Tampere Vocational College Tredu, Youth Services** Pirkanmaan Voimia Oy **Upper secondary school education** **Upper secondary school education** **Tampere Vocational College Tredu** **Youth services**	●○○○○	M C
5.4.14	**Making vegetarian food attractive.** • Naming vegetarian food as a lunch option, without special mention of vegetarian food. • Vegetarian food will be served as the first option in the line. • Involving pupils in the development process.	2024–2029	**Early Childhood Education and Pre-Primary Education, Basic Education, Upper Secondary School Education, Tampere Vocational College Tredu,** Pirkanmaan Voimia Oy	●○○○○	M

Food	t CO2e
Red meat	10,518
Dairy products	6,006
Grain products	3,934
Fish and seafood	2,038
Poultry	2,014
Vegetables	1,309
Fruits, berries and nuts	705
Coffee, tea and cocoa	636

Food	t CO2e
Oils and other vegetable fats	408
Pastries, sweets and ice cream	387
Ready-made vegetarian dishes	292
Eggs	128
Drinks	126
Sugar	72
Ready-made meat dishes	57
Soy products	26

Figure 38 Carbon footprints of foods purchased by the City of Tampere in 2022, by food category. By reducing red meat by, for example, replacing it with vegetable proteins either completely or partially in dishes can significantly reduce the emissions from food service procurements. Measure 5.4.12.

Figure 39 Since the beginning of 2023, all schools and day-care centres in Tampere have had a daily vegetarian dish that children can freely choose. The aim is to introduce children and young people to vegetarian food and new flavours. Adding vegetables to your plate is also good for your health. Food education emphasises a sustainable planetary diet and is part of the value base of eco-social education. Measure 5.4.11. Image: City of Tampere/ Essi Lehtinen.

Measure package 5.5

Sustainable tourism and experience economy

Tampere residents and people travelling to Tampere will be encouraged to engage in sustainable experiences and local tourism. Climate neutral tourism business will be promoted in cooperation with companies. The sustainable mobility of passengers will be supported by, for example, providing public transport tickets for events and promoting bicycle tourism. Tampere will develop year-round nature services and encourage people to go to nearby nature destinations by bus or by utilising their own muscle strength.

EMISSION REDUCTION: Indirect impact, especially on traffic emissions and the carbon footprint of services, cannot be estimated.

Image: Visit Tampere Oy/Laura Vanzo

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.5.1	**Digitalisation, such as electronic ticketing and service products, as well as the streamlining of internal processes, will reduce the carbon footprint.**	Complete	**Tampereen Särkänniemi Oy**		M
5.5.2	**Sustainable events.** The organisation of sustainable events will be promoted by aligning the event management guidelines with the principles of sustainable development. The management of platforms and outdoor venues that are in event use will be improved by revamping the rental policy for outdoor event venues so that it is aligned with sustainable development. These measures will be integrated into the experience economy development programme.	2024–2025	**Attractiveness and Lobbying,** Business Tampere Oy, Visit Tampere Oy	●○○○○	M
5.5.3	**Public transport tickets for events.** A chain of participation and mobility that favours public transport will be created by providing event-attendees with a free-of-charge public transport ticket.	Complete	**Attractiveness and Lobbying,** Public Transport		M
5.5.4	**Särkänniemi will introduce a joint ticket with Nysse.**	Complete	**Tampereen Särkänniemi Oy**		M
5.5.5	**Minimising the climate impact of Visit Tampere's operations.** Monitoring and compensation of the carbon footprint of Visit Tampere's business operations. The work is part of the measures specified in Visit Tampere's Ecocompass certificate and environmental programme. • Visit Tampere calculates its carbon footprint annually. • Visit Tampere monitors the carbon efficiency of its operations on an annual basis – the first step is to define appropriate benchmarking indicators. • Visit Tampere will aim to improve the carbon efficiency of its operations and compensate for the emissions of its operations, where applicable. • Effort will be made to increase Visit Tampere's own competence in the tourism sector's carbon footprint calculation and climate work, to share good practices for the industry's use, and to develop the use of compensation as part of tourism's path towards climate neutrality.	2024–2029	**Visit Tampere Oy**	●○○○○	M
5.5.6	**Promotion of climate neutral tourism business operations** Visit Tampere has signed the Glasgow Declaration, a joint climate declaration for the tourism industry, with the strategic goal of becoming a climate neutral tourist destination by 2030. Concrete measures for the annually updated Visit Tampere Climate Action Plan. The main goal is to support companies' climate work and increase cooperation. • Engaging tourism companies in the Sustainable Travel Finland programme • Supporting the calculation of emissions by tourism companies and the preparation of climate plans • Development of the measuring of the carbon footprint of tourism and the impact of climate work at the destination level • Coordination of the Urban Climate Leaders corporate cooperation network together with Helsinki. • Increasing the offsetting services available to tourists through climate business cooperation and partnerships • Applying for suitable EU funding and other financing as additional resources.	2024–2029	**Visit Tampere Oy**	●○○○○	M

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
5.5.7	**Promoting tourists' sustainable mobility.** Visit Tampere has prepared an action plan for sustainable tourism mobility as part of the Sustainable Tourism Mobility project financed by the REACT programme of Pirkanmaan Liitto. • Cooperation will promote the use of rail connections and commuter train traffic in the arrival and movement of tourists. • There will be cooperation with Nysse to develop tourists' service path in public transport. • Promotion of electric car transport and the tourism use of rental cars. • A cost-effective model for measuring the carbon footprint of tourism mobility will be sought.	2024–2029	**Visit Tampere Oy**	●○○○○	M
5.5.8	**Tampereen Messu- ja Urheilukeskus will adopt a certified environmental system by 2025.**	2024–2025	**Tampere Exhibition and Sports Centre**	●○○○○	M
5.5.9	**Särkänniemi will revamp its CO2 calculation.** Carbon footprint studies concerning travel to the venue will be performed using new software and surveys.	2024–2025	**Tampereen Särkänniemi Oy**	●○○○○	M
5.5.10	**Development of local tourism services that leave a positive nature handprint**. Tools include the Regenera Water Sport project (Erasmus+ financing programme).	2024–2029	**Attractiveness and lobbying,** EcoFellows Ltd, Visit Tampere Oy	●○○○○	M
5.5.11	**Increasing local tourism in which people get from one place to another using their own muscles.** • Promotion of cycling tourism – in accordance with the cycling development programme. • Development and maintenance of the infrastructure of the Lakes Trails – in the Tampere area, cooperation with other municipalities. • Productisation and packaging of bicycle tourism. • Increasing of bicycle rental services. • Increasing and development of Bike & Boat services	2024–2029	**Attractiveness and lobbying,** EcoFellows Ltd, Visit Tampere Oy	●○○○○	M
5.5.12	**Year-round nature services.** Year-round development of nature services in accordance with the nature and hiking development programme and utilisation in local tourism.	2024–2029	**Real Estate and Housing Policy,** Attractiveness and Lobbying	●○○○○	M
5.5.13	**Development and establishment of express shuttle bus services.** From Tampere to the region's nature and cultural sites.	2024–2029	**Attractiveness and lobbying,** EcoFellows Ltd, Visit Tampere Oy	●●●○○	M

Image: Visit Tampere Oy/Laura Vanzo

THEME 6

SUSTAINABLE URBAN NATURE

MAIN OBJECTIVE: **Urban nature and urban structures sequester carbon, and the city is prepared for climate change.**

KEY MEASURES 2024–2026

- Adding biochar to substrate to act as a carbon sink and to improve water management
- The green area programme will be updated
- Urban trees will be added.

KEY MEASURES 2027–2030

- Management and use of the city's forests will strengthen carbon sinks
- Implementation of the canopy cover of riverbeds and ecological connections to be marked in the master plan
- Strengthening of soil carbon sinks.

Description

The aim is to keep and develop forests and the blue-green infrastructure of the urban environment as functional, diverse and vibrant elements, even as the city grows. This will sequester carbon from the atmosphere while mitigating climate change. In addition to the carbon sink and carbon storage impact, forests and blue-green structures provide a wealth of other benefits. For example, they provide habitats for different species, as well as fostering the well-being of city residents and providing them with a pleasant environment. In addition, they help in the adaption to climate change through stormwater regulation and a cooling effect.

Nature reserves are also carbon sinks. Establishing nature reserves will strengthen the ecological network and thus support adaptation to climate change.

Adaptation to climate change and the adverse effects of urbanisation can be managed through the blue-green infrastructure. Blue-green infrastructure includes natural areas such as forests, streams and small bodies of water, as well as built green areas such as parks, green roofs, street greening and stormwater structures. Vegetation areas and the green swales and water-absorbing soil layers in them reduce flood risk, noise, wind and vibration, lower surface temperatures, act as a carbon sink, cool and clean the air, and improve the comfort and health effects of urban space through ecosystem services.

In accordance with the city's stormwater programme, nature-based stormwater solutions will be devised for the development of diverse urban nature in different areas of the urban environment. Riverbeds will be restored and piped riverbed sections will be opened to control stormwater and improve water quality.

The starting points of the measures have been compiled in Appendix 3.

Objectives and indicators

	Unit	2018	2020	2021	2022	2023	2024
Annual growth of city-owned forests	m^3	52,000	46,666		46,464	46,191	
Annual harvesting in the city-owned forests	m^3	17,000	15,765		4,549	13,418	
Carbon sink effect of forests in the Tampere region*	CO^2 t						
Impermeable surfaces in the inner city	%	24.51					
Amount of vegetation in the inner city	%	62.92	63.62		63.04	58.42	
Canopy cover in the inner city**	%	37.71					
Percentage of protected, restored and naturalised areas of the city's land area	%						5.5
Number of people living in heat island phenomenon areas***	person			16,217			

- The carbon sink impact of the forests and city green infrastructure in the Tampere region will cover a significant percentage of the emission offsetting requirement.
- The carbon sink in city-owned forests (growing stock and soil) will cover about 20% of the emission offsetting need of the 2030 goal.
- Sudden abundant rainfall has been prepared for by increasing stormwater absorption structures in urban areas and diversifying the green structure.
- The heat island phenomenon will be mitigated and heat waves will be prepared for by developing green areas, increasing canopy cover and structural shade sites, and by communicating to residents about their own preparation opportunities.

* An estimate of the carbon sink impact of forests will be added to the next update of the roadmap.

**Source: Copernicus Imperviousness Density data, data for 2021 will be available in 2024

***Population is from 7 January 2021 and surface temperature zones are from 3 July 2021.

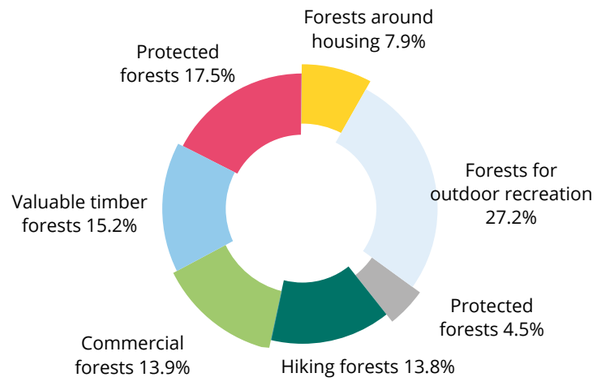


Figure 40 In 2023, the area of city-owned forest property was about 7,500 hectares, the majority of which was forests for outdoor recreation (41% in total). There are no timber sales targets for the forests owned by the city.

BENEFITS IN ADDITION TO EMISSION REDUCTIONS

- Positive ecosystem impacts
- Increased biodiversity
- Health effects such as the cooling effect of the blue-green structure and health benefits of contact with nature
- Communications and resident participation related to adaptation and preparedness improve the resilience of residents, resulting in better overall preparedness
- Improved environmental safety and reduced risks
- Adapting to a changing climate can bring savings in the future
- Measures related to increasing the blue-green structure will increase the comfort and attractiveness of the city from a perspective of residents and tourists
- Reputation as a climate-resilient city
- Comfort of the urban environment.

Measure package 6.1
Carbon sinks in urban nature

The city's forest management, green areas and soil will strengthen the carbon sinks. The growing conditions of urban trees, shrubs and other plantings and the treatment of stormwater will be improved by, for example, building biochar substrate.

EMISSION REDUCTION: No emission reduction. Enables emission offsetting.

Image: City of Tampere/Salla Leppänen

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
6.1.1	**Management and use of city-owned forests will strengthen carbon sinks.** The measures to strengthen carbon sinks are set out in the 2022–2030 forest management policy. Uneven-aged forest management will be preferred, for example, in the forests located around housing and in those used for outdoor recreation and hiking. Sustainable management and use of commercial forests will be ensured. Nature conservation areas will be operated in line with the management and use plans approved by the Centre for Economic Development, Transport and the Environment. • The afforestation potential of wasteland will be mapped. • The need to update the measures of the forest management operating model on the basis of the updated carbon sink calculation will be examined in connection with the assessment of the forest management operating model carried out annually by the council. • Restoration of peatland forests. The restoration needs of swamp forests and the carbon sink potential of peatlands will be determined. The measures and implementation will be planned.	2024–2030	**Real Estate and Housing Policy,** Climate and Environmental Policy, Environmental Protection	●○○○○	M A
6.1.2	**Strengthening of carbon sinks in city green.** Carbon sequestration will be increased in suitable areas through means such as planting trees. The intention is to plant more trees than are felled on city-owned land. Suitable sites will be mapped while planning the planting of new trees. A method for monitoring will be created. It will not be possible to afforest all open areas due to natural, landscape and cultural values. • Target proposals will be made to increase carbon sequestration in the city's green areas on the basis of the city green development zone survey carried out in the master plan. • Natural areas will be expanded by revising the restrictions of maintenance categories.	2024–2029	**Green Areas and Stormwater Management, Climate and Environmental Policy,** Real Estate and Housing Policy, Tampereen Infra Oy, Environmental Protection	●●○○○	M A
6.1.3	**Strengthening of soil carbon sinks** Carbon sinks in the soil will be strengthened by, for example, avoiding soil exchange, leaving autumn leaves in suitable areas and adding sites where such measures can be carried out. • Preference will be given to on-site substrate, and soil exchange will be avoided. Consideration will be given to the needs related to the establishment of new meadows and the fight against invasive species. • The means and potential of a green service programme for open environments will be defined. For example, procedures to strengthen soil organisms by leaving autumn leaves in suitable tree root areas in green areas and solutions for the placement of mowing waste will be agreed. • The number of areas where measures to strengthen soil carbon sinks can be taken will be increased.	2024–2029	**Green Areas and Stormwater Management,** Infrastructure Asset Management	●○○○○	M A
6.1.4	**Adding biochar to substrate to act as a carbon sink and to improve water management** The growing conditions of urban trees, shrubs and other plantings and the treatment of stormwater will be improved by, for example, building biochar substrate. In terms of stormwater filtration, Niemenranta has been selected as the first test site. The test structure also features a measurement arrangement for monitoring water quality. • Rehabilitation measures for existing tree substrate will be implemented in connection with street renovation projects. • The use of biochar substrate will be adopted as a practice in restricted substrate and load-bearing substrate.	2024–2029	**Green areas and stormwater management**	●●○○○	M A

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
6.1.5	**The calculation and reporting of carbon sinks will be developed in each council period while carrying out carbon footprint assessment.** • A report and monitoring will be ordered when more information has been obtained for carbon sink calculation from sources such as the Kuntanielu project. • A carbon calculator will be piloted as part of the green factor of plots in the Co-carbon project.	2024–2029	**Real Estate and Housing Policy,** Climate and Environmental Policy	●●○○○	M
6.1.6	**i-Tree project.** For the research area selected, the i-Tree project defined the green material and carbon sequestration of urban trees as well as other ecosystem services in order to determine the current level and to understand the value of the urban tree stock. This report supported the goals set out in the urban tree policy to increase the number of trees. The results of the project have already been realised as measures in the urban tree policy, the development of land cover data and planning markings.	Complete	**Green Areas and Stormwater Management**		M A
6.1.7	**Increasing carbon sequestration in parks** Through means such as a research thesis or a specific survey, sites will be examined that are suitable for the purpose of increasing carbon sequestration in the city's green areas.	Moved to routine work	**Green areas and stormwater**	●○○○○	M A

Figure 41 In 2019, the carbon storage of the city's forests and soil was equal to the total emission of approximately six years. This storage will grow by about an estimated one million tonnes of carbon dioxide by 2030. According to Tapio Oy's report, the trees and soil of the forests that the city owns bind a total of approximately 60,000 tonnes of carbon dioxide annually. The forest carbon sink has grown up to the 2020s owing to the city's forest management principles. However, the sink will already decrease during this decade as forests age and their growth slows. The method of calculating forest carbon sinks will be harmonised between different municipalities in the Kuntanielu project. The project's recommendations for the assessment of sinks will be completed at the end of 2024. Measure 6.1.5. Image: Visit Tampere Oy/Laura Vanzo

Measure package 6.2

Role of blue-green structure in adapting to climate change

The city will take care of the vitality and health of the trees, a diverse forest and tree stock structure and the diversity of forests. The goal of the management and use of the city's forests is a multifunctional, diverse, safe, experience-rich forest environment that promotes well-being, mitigates climate change and adapts to it. In master plan work, solutions will be sought for the urban and natural environment, as well as for transport, which support adaptation to climate change and its mitigation, and promote biodiversity.

EMISSION REDUCTION: No emission reduction, more carbon sinks.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
6.2.1	**Forests' ability to adapt to climate change will be strengthened by diversifying the species and age structure of trees**. Forest damage will be prepared for by maintaining the vitality and health of the tree stock. The measures are set out in the 2022–2030 Forest Management Model.	Moved to routine work	**Real Estate and Housing Policy**	●○○○○	A
6.2.2	**Green area programme will be updated**. The programme will also examine climate change adaptation. The update will strive to seek ways to increase carbon sequestration in green areas zoned in local detailed plans • A vegetation policy will be drawn up alongside the urban tree policy to apply to elements such as perennials and bushes; for example, in the selection of plant species, preference will be given to sustainable, local, biodiversity-friendly and easy-to-manage species. • The accessibility and dimensioning of green areas will take into account sustainability and the formation of green routes. • The integrity of the green network will be ensured from a recreational and ecological perspective. • Efforts will be made to preserve the soil in addition to the existing trees. • The quality and quantity of vegetation to be planted will be ensured from the perspective of the growing space and conditions, as well as canopy cover, diversity and layering. • The objective and content of the greening plan will be clarified in the green area programme work. The green area programme will aim to cover the greening plan where applicable.	2024–2025	**Green areas and stormwater**	●○○○○	M A
6.2.3	**Tools to guide the design of a green structure that adapts to climate change will be developed.** The green efficiency of public areas will be promoted by developing new tools for the planning process, implementation planning and construction. • The NBS design guidelines have been prepared and the urban space guide has been published for expert use. The distribution of the NBS design guidelines to designers will be increased. • The regional green factor will be piloted in the ARVO project.	2024–2029	**Green Areas and Stormwater Management, Detailed Planning**	●○○○○	M A
6.2.4	**A green-roof policy will be implemented.** The implementation will be monitored by the City green cooperation group.	Complete	**Real Estate and Housing Policy,** Green Areas and Stormwater Management, Tampereen Tilapalvelut Oy, Building Control Department, Climate and Environmental Policy, Comprehensive Planning, Detailed Planning, Environmental Protection		A
6.2.5	**The tree variety experiment project will be looking for completely novel tree species.** The aim is to diversify the range of tree species in use in Tampere. Diversification of the tree species range helps prepare against the pests that will move from south to north as climate change progresses.	2024–2029	**Green Areas and Stormwater Management**, Tampereen Infra Oy	●●○○○	A
6.2.6	**A stormwater programme will be implemented.** Flood risks will be prepared for and water will be directed appropriately as rainfall increases.	Moved to routine work	**Green Areas and Stormwater Management**, Climate and Environmental Policy	●○○○○	A
6.2.7	**The operation of the City of Tampere's stormwater network will be modelled**.	2024–2030	**Green areas and stormwater**	●○○○○	A
6.2.8	**In connection with the updating of building regulations, a building code will be prepared containing construction instructions for the stormwater systems of buildings.** This code will be in line with the stormwater management programme.	2024–2030	**Building Control Department**, Green Areas and Stormwater Management	●○○○○	A
6.2.9	**Hiedanranta stormwater solutions.**	2024–2029	**Hiedanrannan Kehitys Oy**	●●●○○	A

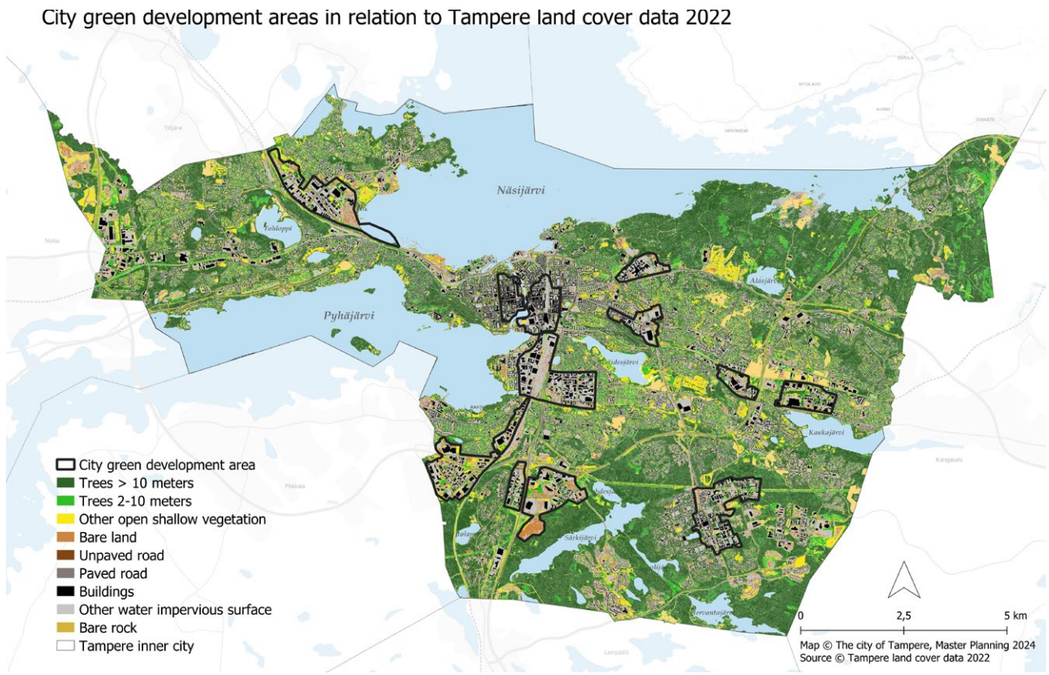


Figure 42 A report of the development areas of city green defined 13 areas where things such as unpleasant heat, sparse vegetation, flood risks and an unpleasant environment were observed. In the plan proposal, the plan regulation encourages increasing the greening of these development areas. The amount of street greening must be increased. Stormwater management solutions must primarily be implemented as nature-based solutions, such as green streets and green roofs. (Central City Phase Master Plan 2021–2025.)

Image: City of Tampere/Laura Happo

Measure package 6.3

Ecological network

The city's ecological network will be safeguarded and improved in order to support adaptation to climate change. The integrity of the green structure is important for the production and safeguarding of ecosystem services, as well as for recreational values.

Measure number	Measure	Timetable in council terms	Responsible organization	Costs	Mitigation/ Adaptation/ Circular economy
6.3.1	**Implementation of the canopy cover of streams and ecological paths to be marked in the master plan.** The uniform canopy coverage of streams and ecological paths to be marked in the master plan will be increased in public areas and in other pending detailed plan areas. Tree plantings will also be planned in accordance with the valid city plans in places such as public areas.	2025–2029	**Green Areas and Stormwater Management,** Environmental Protection, Comprehensive Planning, Detailed Planning, Real Estate and Housing Policy	●●○○○	A
6.3.2	**Steps will be taken to prepare the protection of the sites set out in the nature conservation programme.** • The sites in the nature conservation programme 2012–2020 will be protected. • An update of the nature conservation programme will be prepared.	2024–2029	**Environmental Protection**	●○○○○	M A
6.3.3	**Green areas are added to the school yards of upper secondary schools by, for example, establishing meadows and planting trees with the students.** By participating in planting, upper secondary school students can learn about biodiversity and the importance of city greening in adaptation to climate change, in which case the measure also has a pedagogical perspective.	2024–2029	**Upper Secondary School,** Tilapalvelut Oy, Real Estate and Housing Policy	●○○○○	A
6.3.4	**Urban trees will be added.** Action will be taken to increase the number of street trees and to nurture existing trees. • Urban trees will be added and maintained on the basis of the urban tree policy and the boulevards report. • The number of urban trees in different projects (removals and plantings) will be monitored. • Promoting an increase in the number of street trees during street renovations will be made a practice. The work will be based on the green street study.	2024–2029	**Green areas and stormwater**	●○○○○	M A
6.3.5	**Green areas will be added to the Särkänniemi area.**	2024–2025	**Särkänniemi Oy**	●○○○○	A

Figure 43 Both the heat island phenomenon and canopy cover are closely linked to the natural management of stormwater. The canopy cover of the areas surrounding streams provides protection for living organisms and cools the water temperature. Vihioja was restored in 2021 by moulding the stream to follow the route visible in a 1940s aerial photo by building erosion protection, adding decayed wood, creating flood meadows and building a wetland for pikes to spawn in. The reproduction of the pike will be promoted in Pyhäjärvi Lake. The pike wetland will also be a habitat for waterfowl. Measure 6.3.1. Image: City of Tampere/Salla Leppänen

5. CLIMATE NEUTRAL TAMPERE 2030 ROADMAP EMISSION PROJECTION AND COSTS

In cooperation with specialists representing various sectors, the Climate and Environmental Policy Unit assesses the future trend of the city's climate emissions. The projection is made separately for each emission sector, compiling data from various studies, plans and known changes. Projections are made on an annual basis and separately for entities such as the consumption of heating energy and electricity and the emission factor for heating and electricity, as well as for the traffic contribution, the propulsion forces of different vehicles and propulsion-specific emission factors. These projections then calculate the annual development for each emissions sector separately.

The projection pursuant to the current development includes investments that are already being implemented, such as the second stage of the tramway. In addition, it includes changes that are hardly affected at the city level, such as the electrification of traffic and the reduction of emissions from electricity production. The roadmap emission projection was made by adding to current development the impacts of the measures planned in the roadmap. All projections have been made on an annual level and the impact of the measures has been calculated for the year in which the measure is likely to be implemented.

Measures accelerate reduction of climate emissions

The measurable roadmap measures and the likely measures of industry can achieve an emission reduction of around 77.5% by 2030 (Figure 44). Thus, the emission reduction of the first roadmap of 2020 has moved more than five percentage points closer to the target, and the emission reduction that can be achieved through current development has risen from 61% to 69%. In other words, the direction of emissions development has been good. The roadmap also contains measures whose effects cannot be assessed as the necessary data is not available. Thus, by resolutely implementing the roadmap, it is possible to achieve a larger emission reduction than predicted. On the other hand, this version of the roadmap includes, for the first time, a rough emission estimate of the measures that affect the mobility choices of local residents. There has been no such estimate in the previous emission projections.

Compared to the previous emission projection, the biggest change is caused by the revised projection of industrial emissions. If industrial emissions are realised as predicted, the impact will be decisive for the climate neutrality objective. The key is to replace the use of natural gas in industry with low-emission energy sources. In addition, the calculation and projection of waste management and individual heating have been revised even retroactively in accordance with the updates of the 2024 CO2 report. The difference to the target is relatively small in the projection, but at the same time the assumptions made in the calculation affect the result a little more.

Involvement of city residents and businesses important

Achieving the climate neutrality goal requires not only measures by the city but also the contributions of city residents and actions of local companies. Critical emissions sectors in terms of the target are transport, industry and work machinery, as well as building-specific heating (Figure 44).

Important issues for reducing transport emissions that are not directly influenced by the city are a strong fuel distribution obligation, an electric vehicle charging network, and more efficient logistics and low emissions. Therefore, the city plays an important role in developing the conditions for sustainable mobility so that it becomes smoother, safer and more attractive. Local residents, on the other hand, must be prepared to adopt new solutions, as has happened with the tramway.

Emissions from industry and oil heating must also be significantly reduced. In practice, this means

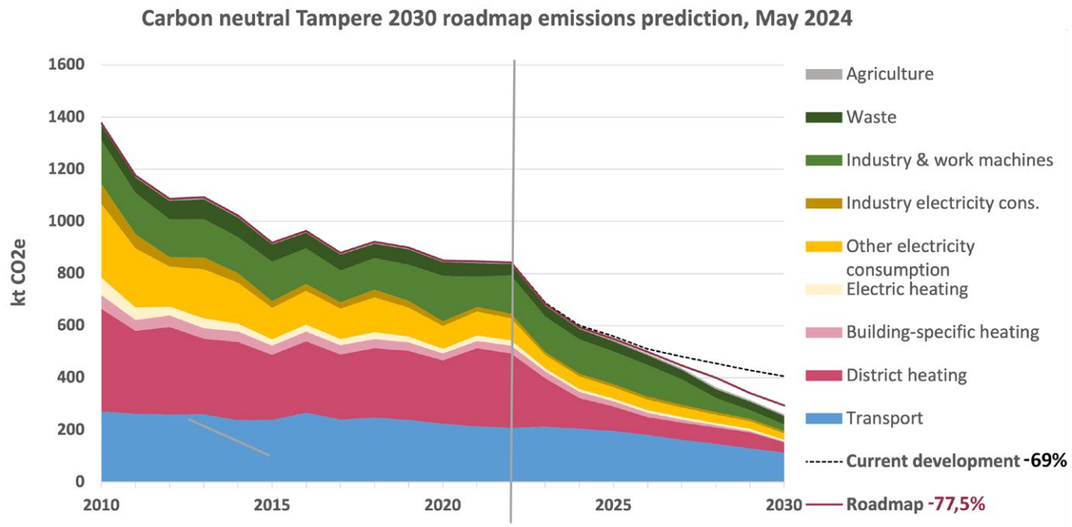


Figure 44 Tampere's actual climate emissions in 2010–2022, and a projection prepared based on current development and the measures set out in the Climate Neutral Tampere 2030 Roadmap. Apart from national development, Current Development includes the key climate measures taken in Tampere that are already about to be realised. The roadmap forecast includes roadmap measures and their effects on, among other things, the building stock and a reduction in the industrial use of fossil fuels.

Total emissions and sector-specific emissions ktCO2e

	Year	Total	Road transportation	District heating	Building-specific heating	Electrical heating	Other electricity consumption	Industry's electricity consumption	Industry and machinery	Waste management	Agriculture
Realisation	1990	1301	290	347	124	40	134	126	144	88	9
	2022	843	208	286	30	19	85	18	146	44	7
Forecast	**2030**	**294**	**128**	**41**	**10**	**7**	**25**	**9**	**35**	**32**	**6.5**
Goal	2030	260	115	28	4	7	40	7	39	15	5

Picture 45 Total emissions and sector-specific emissions ktCO2e in the base year 1990, latest realised emissions in 2022 and roadmap forecast for 2030 and climate budget target for 2030.

making the use of fossil fuels more efficient, but above all replacing them with other solutions. Fuel oil consumption is already showing a promising downward trend, for which the energy crisis has caused uncertainty. Oil heating in industrial buildings, on the other hand, still produces a significant amount of individual heating emissions.

The consumption of natural gas has been fairly steady in industry, but many industrial sectors now have a climate neutrality roadmap and some local operators have quite concrete plans to phase out fossil fuels. The projection assumes that natural gas will be replaced by electric solutions.

Residual emissions and climate budget

This roadmap provides a more accurate assessment of residual emissions, i.e. those climate emissions the reduction of which by 2030 is not possible. This information is also increasingly needed for international reporting, especially in the framework of the EU mission 100 Climate Neutral and Smart Cities in Europe.

One clear residual emission in 2030 stems from waste management landfills. Initially, an optimistic forecast of emission reductions was made for them, which is why the sector will not quite reach the target figures of the climate budget. Waste management emissions are technically almost impossible to reduce by more than presented in the forecast.

Image: Adobe Stock

According to the forecast, missions from district heating will also remain higher than the target set in the climate budget. This is due to fossil emissions from waste incineration. Removing emissions from district heat production would mean their transfer to waste management emissions and would require a compensatory additional investment in district heat production. This would only generate additional costs and no benefits in relation to the city's climate target. Thus, emissions will remain in district heating as long as the waste has to be incinerated.

Although it is possible to capture and reuse or store the carbon dioxide released by a waste incineration plant, the emissions still remain with the plant when it comes to emission calculations. The benefit from the recovery will be transferred either to the reuse of carbon dioxide (e.g. zero-emission transport fuel) or, in the case of storage, to the party that buys a certificate to offset their emissions. However, the recovery may later appear in the city's balance sheet as a technical carbon sink. There is not yet a common and uniform global calculation method for this calculation, which is why it has been excluded from the calculations. If an interpretation of carbon capture or storage were to be made now, it might prove to be an error in the definition of global guidelines. Wherever possible, carbon capture, reuse and storage, as well as other new solutions, will be taken into account in the next updates of the roadmap.

Reducing climate emissions from transport lags significantly behind other energy consumption sectors. Emissions from this sector also fall short of the climate budget target for 2030. More than 40% of the remaining emissions in 2030 are projected to be emissions from transport. However, there are concrete opportunities for reducing traffic emissions in both passenger and freight traffic and, over time, transport can also be made almost climate neutral. In order to reach the target and achieve long-term emission reductions, it is important to do everything possible to promote a change in the sustainability of transport.

How can the 80% emission reduction target be achieved?

It is possible to make at least rough estimates of which changes would reduce climate emissions more than projected. Despite this, it is still difficult to isolate the effect of one measure in a larger entity, especially the transport system. In addition, the measures affect each other. It is possible that, in passenger transport for example, different measures affect each other, intensifying change. On the other hand, it is not possible to separate other propulsion changes in freight transport from measures such as granting benefits to low-emission vehicles for their impacts. In addition, the existing assessment methods are limited. The best current knowledge-based estimates of the impacts of the changes by emission source are shown in Figure 46. The methods for assessing the change in passenger traffic are very limited, so the impact of the measures may actually be more significant.

Emission sector	Forecast 2030	Possible changes By 2030	Impact in 2030, kt CO2e
Passenger cars	70	**Actions of sustainable mobility reinforce each other's impact**	-5
Trucks	42.3	**Deliverables grow half as much as predicted**	-4
		No significant increase in performances	-8
Trucks + vans	56.6	**Logistics measures: a quarter of car driving gets cut or is emission-free**	-5
		Logistics measures: half of car driving gets cut or is emission-free	-10
District heating	40	**More efficient consumption of district heat than expected (-50 GWh)**	-1
Building-specific heating	10	**All industrial buildings stop using fossil oil for heating**	-8
Other electricity consumption and electric heating	32	Electricity emission factor decreases more than expected (20 g CO2e/KWh)	-3
Industry and machinery	35	**Industry abandons fossil fuels, maximum impact**	-30

Figure 46 Cautious estimates of the changes that could be used to achieve necessary additional emission reductions by 2030. Industry has a reported maximum in a situation where fossil fuels have been completely replaced. How realistic it is for 2030 is difficult to assess. The difference between the target and the forecast is 34 kt CO2e.

Comparing the realised traffic results with previous forecasts, it can be observed that the contributions of different vehicles have grown more slowly than the results of the Tampere region traffic model used in the forecast indicated. This can only be a phenomenon caused by crises and economic recession, but it is also possible that the previous growth curve cannot be achieved again. The forecast was not changed in this update either, as there was nothing new. If the current trend continues and does not return to the pre-pandemic path after economic growth, emissions from transport will decrease more than forecast.

In the case of industry, no estimate has been made of how much of the remaining fossil fuels can be replaced by 2030 in terms of economy, even though technology and, for example, clean electricity are likely to be available.

From the changes presented in Figure 46, the more moderate estimates have been chosen to prepare two alternative scenarios in which the 80% emission reduction target has been achieved by 2030. The selected changes are highlighted in green. The first scenario is "Sustainable transport". In the transport emissions scenario, the use of industrial fossil fuels has been reduced only as much as necessary to achieve the target. This scenario is illustrated in Figure 46 as coloured areas that end in the target.

For comparison, an alternative scenario, "Clean industry", has been made. In this scenario, emissions from transport cannot be reduced more than forecast. In this case, fossil fuels must be completely abandoned in heating and industry in order to achieve the goal. This scenario is shown alongside the others in Figure 47.

Climate emissions in 2030, kt CO2e

	Total	Road transportation	District heating	Building-specific heating	Electrical heating	Other electricity consumption	Electricity consumption by industry	Industry and machinery	Waste management	Agriculture
Roadmap	**294**	128	41	10	7	25	9	35	32	7
Sustainable transport	**260**	113	40	2	7	25	9	25	32	7
Clean industry	**260**	128	40	2	7	25	9	10	32	6.5

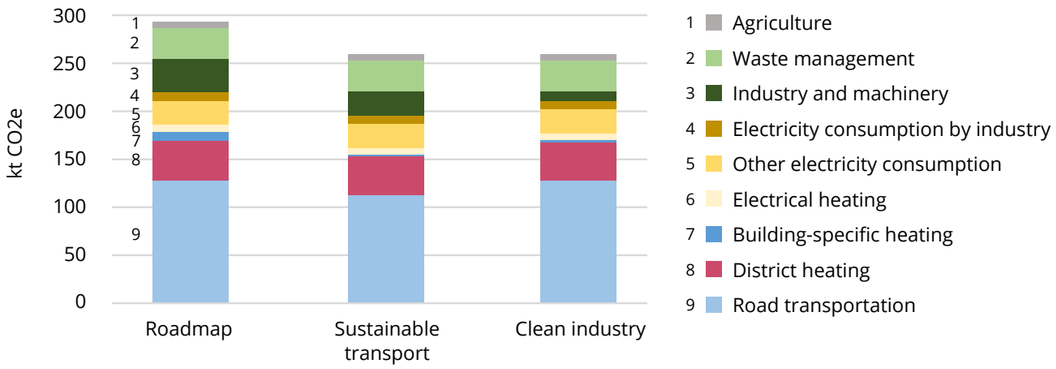


Figure 47 Comparison of roadmap emissions and target scenarios for 2030, units kt CO2e.

Estimated costs of roadmap measures

Rough cost estimates, represented by circle symbols, were prepared for every measure discussed in the roadmap. Additionally, more precise cost estimated for 2024–2030 were made for some of the measures (Appendix 2). The cost estimates are based on climate budget data collected in connection with the 2024 budget. Additionally, the emission reduction potential for every measure for which it was possible to estimate this potential is provided in the same context.

For the measures that were estimated, the city organisation's total investment in climate measures in 2024–2030 will be EUR 156.7 million. For operating expenditure, the total cost is EUR 322.6 million. For the subsidiaries owned by the city organisation, the respective figures are EUR 425.0 million and EUR 102.4 million. A large share of this sum is already included in the current budgetary framework. Additionally, some of the measures are expected to result in cost savings of EUR 33.9 million for the city organisation and EUR 129.2 million for the subsidiaries.

However, the estimated total cost that the measures will incur cannot be treated as a 'price tag' for the Climate Neutral Tampere Roadmap, as many of them are projects that are carried out largely for non-climate-related reasons and that would be implemented in any case. The roadmap therefore will not necessarily incur any additional costs for the projects, but projects will nevertheless have significant positive climate impacts.

In order for the measures to be implemented, they must be economically viable, based on business development or derived from legislation, especially in the case of companies belonging to the City Group. Increasingly, climate investments are proving to be a good solution commercially and they bring a competitive advantage, which has led to the mainstreaming of climate-friendly activities.

Example measures examined	Please note! The example measures are not always exactly identical to the measures set out in the roadmap but provide an understanding of the cost-effectiveness of the measure in question.
Electric buses (related to measures 2.3.1–2.3.6)	The number of Nysse's buses using different propulsion systems is assumed to develop such that, in 2030, 50% of the bus traffic will be electric, 40% renewable diesel-powered and 10% biogas-powered.
Passenger cars (related to measure 2.6)	In Tampere, the propulsion of cars will develop in such a way that, in 2025, 12% of cars will be electric and 1% gas-powered, and in 2030, the share of electric vehicles will be 27% and the share of gas-powered 1%.
New construction (related to measure package 3.1)	All new buildings owned by the city organisation will be constructed to be 20% more energy-efficient than the minimum legal requirement.
Renovation (related to measure package 2.6)	All buildings owned by the city organisation will be renovated to be 20% more energy-efficient than the minimum legal requirement.
Outdoor lighting (measure 4.2.4)	95% of the city's outdoor lighting will be replaced with smart control LED lights by the end of 2026.
Solar panels (related to measures 4.3.2 and 4.3.6)	The amount of solar energy produced in Tampere is expected to increase exponentially so that, in 2030, the annual power will be approximately 150,000 kWp and annual production approximately 130,000 MWh.
Oil heating (measure 4.4.2)	Properties owned by the city organisation will abandon oil heating by 2025.

Figure 48 Example measures for which cost-effectiveness has been calculated.

Economy of the example measures

Cost-effectiveness is a key metric used to assess the economic viability of the measures. Figure 49 illustrates the cost-effectiveness of the example initiatives outlined in the roadmap, with the y-axis indicating cost-efficiency (EUR/tCO_2e). The curve presents the measures ranked by their cost-effectiveness, with the most economical solutions positioned on the left-hand side.

Cost-effectiveness refers to the cost of reducing emissions, expressed per tonne of reduced greenhouse gas emissions (EUR/tCO_2e). A negative cost-effectiveness value indicates that the measure not only reduces emissions but also generates cost savings, for instance through lower energy or maintenance expenses. The more negative the cost-effectiveness value, the more profitable the measure. Conversely, a positive value signifies increased costs.

The cost-effectiveness calculations take account of the costs of measure implementation or investment as well as the cost savings generated by a measure as compared to a scenario where the measure is not implemented. Calculations of this type provide a good assessment of the total economy, but they entail uncertainty as to, for example, how the price development taking place over the coming years will be assessed.

Based on the calculations, all of the examined example measures are financially viable. Thus, they produce life-cycle cost savings, as their value on the y axis is negative. This illustrates that, in reality, several energy saving measures are economically viable investments when considering their entire life cycle. Although some investments may entail high costs, during their life cycle they can generate enough cost savings for the measures to be economically preferable to current development.

It should also be kept in mind that energy-efficient investments are no longer necessarily more costly than so-called traditional solutions and that, thanks to electrification, savings in energy costs can be significant when compared to savings in fuel costs, for example. It is often a good idea to implement measures, even if they generate some total costs during their life cycle. This is because they often also create other significant benefits besides reducing emissions.

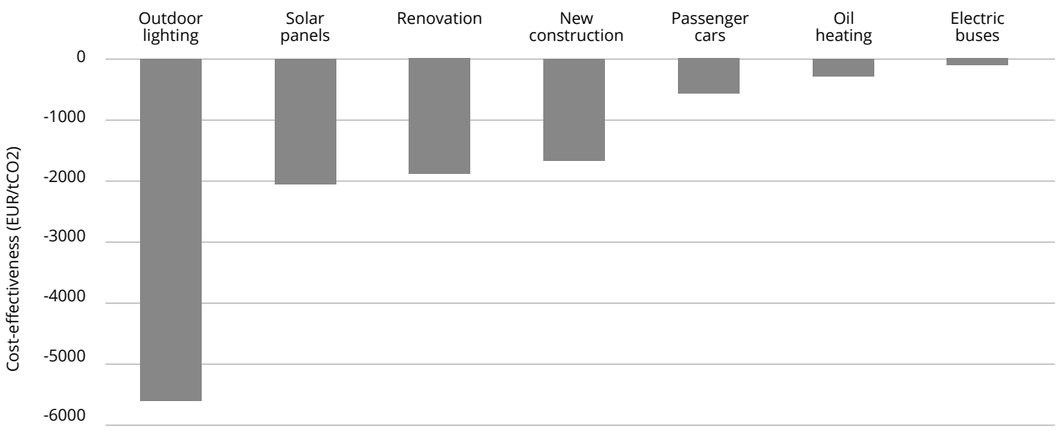


Figure 49 Cost-effectiveness of example measures.

The calculations allocate to the period examined here, 2025–2030, the relative cost of the investments whose life cycle goes beyond the climate neutrality target year, 2030. For example, for an investment made in 2025 with an economic service life of 25 years, 20% is considered, for (2030–2025)/25=20%. The calculations employ a discount rate of 4%, which is used to convert future cash flows to net present value (NPV) for commensurability. The example calculations are dynamic, and the measures are therefore always compared to current development, not to any static status quo. Additionally, under these models, the development of prices and emission factors has a temporal dimension. Owing to the dynamic nature of the emission factors, the emission impact may not necessarily peak in the target year, 2030, not even in the case of significant measures, as the emission factors will experience a downward trend over the years in any case, which will also bring down the emission reduction impact that the measures can achieve.

Cost-effectiveness was calculated by employing the UK's general emission reduction cost-effectiveness method framework (GOV.UK 2023) and the cost-effectiveness examination of Finland's national emission reduction measures (Granskog et al 2018). Cost-effectiveness is expressed as the adjusted Net Present Value of a measure divided by the cumulative emission savings over the calculation period. For more detailed information on the calculation method and the initial values, see the background memorandum prepared on the costs of the original Climate Neutral Tampere 2030 Roadmap (Nieminen 2020). The calculations have been updated, and further information regarding them is available from the City of Tampere's Climate and Environmental Policy Unit.

Costs of climate change for Tampere

The costs, or harm, of greenhouse gas emissions caused for Tampere can be assessed on the basis of the shadow price of carbon dioxide. In its calculations, the European Investment Bank (EIB) uses the shadow price of carbon for suitable destinations in order to quantify the harm caused by greenhouse gas emissions in euros. The EIB has estimated that the shadow price of carbon in 2020 will be EUR 80/tCO2 and by 2030 the price will rise EUR 250/tCO2 (EIP 2020).

If the measures of the roadmap were not implemented and Tampere's emissions developed according to the current trends, the emissions gap would, according to EIB's shadow price of carbon, cause approximately EUR 59.4 million of harm in the period 2024–2030. In other words, when the roadmap measures are implemented, they will generate EUR 59.4 million in benefits between 2024 and 2030.

EUR 59,400,000

If the measures in the roadmap were not implemented in full, it would cause a total of approximately EUR 59.4 million harm to society in 2024–2030.

Image: Visit Tampere Oy/Laura Vanzo

6. CONCLUSION

This third edition of the Climate Neutral Tampere 2030 Roadmap presents 397 climate measures by the City of Tampere, 93 of which promote not only climate change mitigation but also climate change adaptation and preparedness. Seventy-six measures to promote the circular economy have been identified. The roadmap has again been updated in cooperation with the city's service areas, units and companies. The aim of the update was to clarify the parties responsible for the measures and to combine the climate budget and the roadmap. Representatives of the city's units and companies have actively participated in events organised in connection with the roadmap update, on the basis of which the roadmap measures have been updated.

The roadmap contains climate measures big and small. It should be noted that the measures also have other benefits and causes in addition to climate change mitigation and adaptation. Many of the roadmap measures curb climate emissions indirectly, enabling city residents to live, move and use energy and services in a sustainable fashion. These include purchasing electric cars or solar panels for the city, increasing the number of bicycle parking spaces, increasing the share of vegetarian food in schools and staff canteens, increasing recycling and the use of recycled materials. Furthermore, Tampere is determined in its efforts to guide the growth that the city is experiencing towards central areas and along the trunk routes of public transport. The tramway will make the city structure denser while also making a car-free everyday life possible. The impact of these measures is significant, but we will witness it only in the longer term and it is difficult to assess in advance the scope of that impact.

The measurable measures set out in the roadmap can achieve an emission reduction of around 77.5% by 2030. Thus, the emission reduction of the first roadmap of 2020 has moved more than five percentage points closer to the target, and the emission reduction that can be achieved through current development has risen from 61% to 69%. In other words, the direction of emissions development has been good. However, it should be noted that the impact of many of the measures cannot be assessed, as it was not possible to produce data on their impact. Thus, by resolutely implementing the roadmap, it is possible to achieve a larger emission reduction than predicted.

Adapting to evolving conditions is absolutely necessary despite successful climate change mitigation measures. Adaptation measures, such as increasing green areas or developing city residents' preparedness, reduce the harm caused by global warming while promoting the capability of people, social activities and the environment to function under changed and evolving conditions. The later we launch the adaptation measures, the more costly this will be in economic and human terms. Many of the measures, including cherishing the city's green infrastructure, decentralising the energy system and assessing climate impacts in the context of the city's development projects, serve both climate change mitigation and climate change adaptation. Monitoring the progress made with all roadmap measures is possible on the open website, Tampere's Climate and Environmental Watch.

Mitigating global warming will bring financial savings

For the measures that were estimated, the city organisation's total investment in climate measures in 2024–2030 will be EUR 156.7 million. For operating expenditure, the total cost is EUR 322.6 million. For the subsidiaries owned by the city organisation, the respective figures are EUR 425.0 million and EUR 102.4 million. A large share of this sum is already included in the current budgetary framework. Additionally, some of the measures are expected to result in cost savings of EUR 33.9 million for the city organisation and EUR 129.2 million for the subsidiaries.

However, the estimated total cost that the measures will incur cannot be treated as a 'price tag' for the Climate Neutral Tampere Roadmap, as many of them are projects that are carried out largely for non-climate-related reasons and which would be implemented in any case. The roadmap therefore will not necessarily incur any additional costs for the projects, but projects will nevertheless have significant positive climate impacts. By way of example, however, this edition of the roadmap sets out economy calculations for some of the measures, as well as assessing the costs of the mobility mode shift in relation to the benefits that can be derived from them.

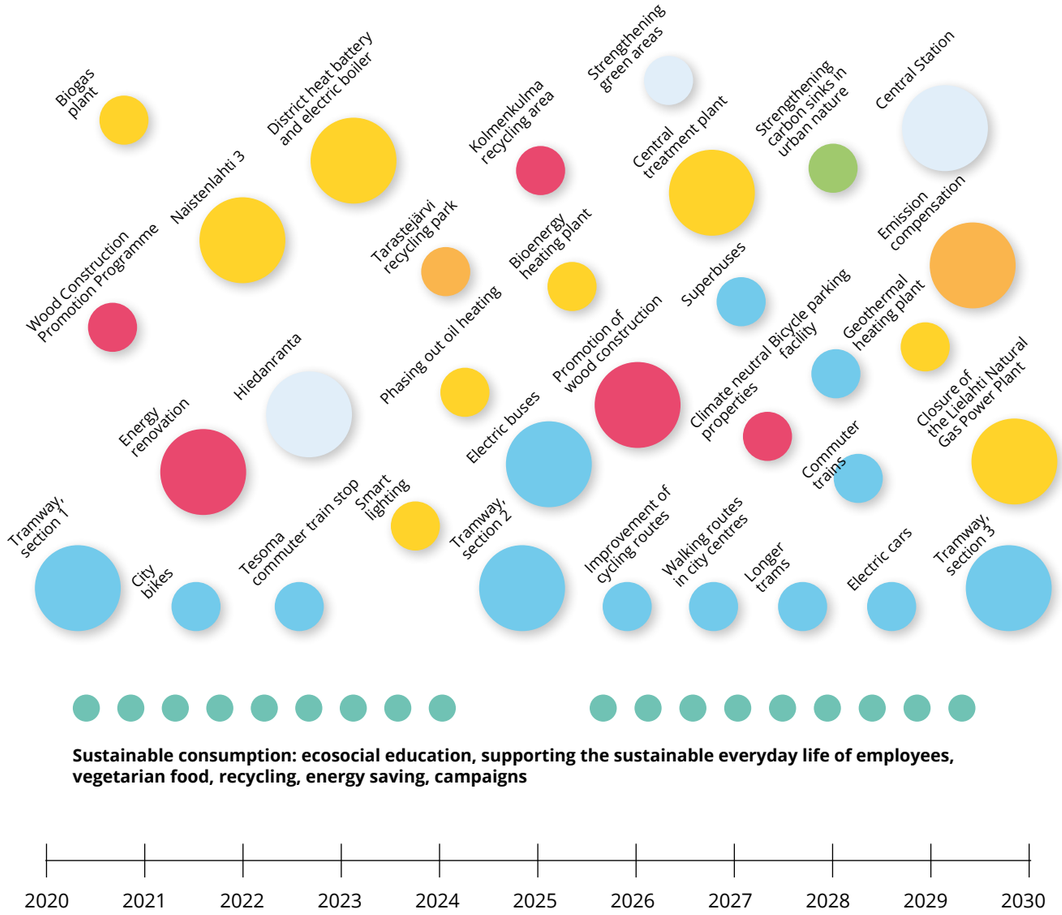


Figure 50 Roadmap measures timetable. Large circles represent larger climate investments, medium-sized circles represent smaller climate actions and small circles represent changes in everyday practices that are necessary to achieve emission reductions. The colours in the image indicate under which theme the measure is. Completed measures are also included.

Increasingly, climate investments turn out to be economically viable solutions, which is why climate-friendly action has become more mainstream. Instead of the roadmap 'price tag', it may be more relevant to know the costs that will be incurred if we do not invest enough in climate change mitigation and adaptation. If the measures of the roadmap were not implemented and Tampere's emissions developed according to the current trends, the emissions gap would, according to estimates, cause approximately EUR 59.4 million of harm to society in the period 2024–2030.

Climate neutral Tampere is achieved together

This roadmap only discusses the Tampere City Group's measures to promote climate neutrality. Measures are also needed from companies, communities and city residents, and an encouragingly high number of them has already been taken. Achieving our goal will require major changes in many areas, including phasing out oil heating, improving the energy efficiency of old buildings and replacing the propulsion systems of transport vehicles and work machinery. In order to accelerate the climate actions by businesses, since autumn 2020 the City of Tampere has been coordinating the Tampere Region Climate Partnership activity, in the course of which almost 140 businesses and communities have now committed to a common climate neutrality goal through measures that suit each of them individually.

Achieving Tampere's ambitious climate neutrality goal requires a determined and long-term commitment from the entire city organisation. The commitment to climate neutrality has also been taken into account at EU level when Tampere was awarded the EU's official climate work label, the Mission Label, in spring 2024, as an indication of the city's planned and effective work to achieve climate neutrality by 2030. With the label, Tampere is a pioneer in climate work in the European Commission's mission and an example to other European cities, together with Finland and other European climate mission cities.

The roadmap is intended to be updated on a regular basis. The updates are an opportunity to assess the achievement of the goal and, if necessary, to step up measures. In the context of the updates, it is also possible to examine the changes in the local and global operating environment. For example, the development of transport propulsion systems and technologies is rapid, and solutions that are currently unknown may enter the market.

Image: Visit Tampere Oy/Laura Vanzo

Annex 1

MORE INFORMATION ON THE EMISSION FORECAST AND ROADMAP ASSESSMENT FOR THE MAIN EMISSION SECTORS

The emissions forecast is based on information collected from various parties on the current development of climate emissions and an assessment of the impact of the roadmap measures. Many of the impacts of the roadmap measures cannot be accurately assessed, but the forecast takes into account all the factors that affect emissions. An estimate of future changes in emissions has been made either on the basis of the current trend or existing emission forecasts.

The emission forecast was thoroughly updated for this 2024 update of the Climate Neutral Tampere 2030 Roadmap, and the figures are based on the emissions calculation of the CO2 report revised in early 2024. In particular, the calculation of emissions from independent heating was made more accurate, and part of the light fuel oil previously used for heating purposes was transferred to the industrial sector. In addition, the Finnish Environment Institute (Syke) produced a new First Order Decay (FOD) model for calculating landfill emissions, and the model was used to refine the estimate of emissions from Tampere's landfills.

Key general assumptions in emission forecast

Population growth is based on the population projection 2022–2040, as no newer one is yet available. The starting point for the end of 2023 has been corrected to correspond to the actual population.

Emissions from transport

Key assumptions in forecast of current development

- The shares of the propulsion of cars have been calculated for the car stock registered in Tampere. The roadmap forecast assumes that cars are driven in traffic in the same proportion as the distribution of the propulsion of the car stock. For chargeable electric fuel hybrids, it is assumed that half of the driving is powered by electricity. Thus, about 7% of driving was by electricity in 2023. The roadmap forecast assumes that the same proportion will be slightly over 30% in 2030.
- The realisations of traffic contributions are in line with VTT's Liisa model. The latest Liisa results, i.e. the 2022 data, will not be available in spring 2024, as an error was found in the model and the corrected data could not be published.
- The forecast for traffic has been made with the Talli model in connection with the planning of the second section of the tramway. The traffic forecast uses 2022 data, as the latest data from the Talli model was not yet available at the time of this roadmap update.
- The emission factors for freight transport have been updated to align with the emission factors calculated on the basis of the 2021 national transport base forecast. The realisation is in accordance with VTT's Lipasto calculation.
- The emission factors for cars have been updated to align with the propulsion-specific factors calculated on the basis of the 2021 national vehicle base forecast. The propulsion distribution forecast has been made by researchers at Transport Research Centre Verne of Tampere University on the basis of the current car stock. The total emission factor for cars has been calibrated to match Lipasto's results for 2021.
- All transport emission factors assume a 30% biofuel distribution obligation in 2030. The company (Sitowise Oy) that calculates the emissions calculations nationally has used the same distribution obligation for all cities. Although the current distribution obligation is 34%, the government is currently discussing reducing the binding nature of the distribution obligation. Due to national comparability and current discussions, it is justified to use the more conservative 30%. The forecast and the input data will be reviewed in the next roadmap update.

Measures in Roadmap Scenario

- The Roadmap Scenario has been modelled directly for transport. It includes both the strong electrification of transport, construction of the tramway and the main transport projects of the Talli model.
- The impact selected for the tramway is the performance difference of passenger cars between the tramway and zero options from the modelling carried out in the design of the second phase.
- The scenario includes the complete transformation of bus transport into a low-emission version, in accordance with the report completed in 2020.
- Included is a new assessment of the service level of public transport, the development of cycling conditions and the development of parking to support sustainable mobility. The estimate is based on the cross-elasticity method, which is limited as a method, but it was still able to create the first version of the current development of transport emissions.

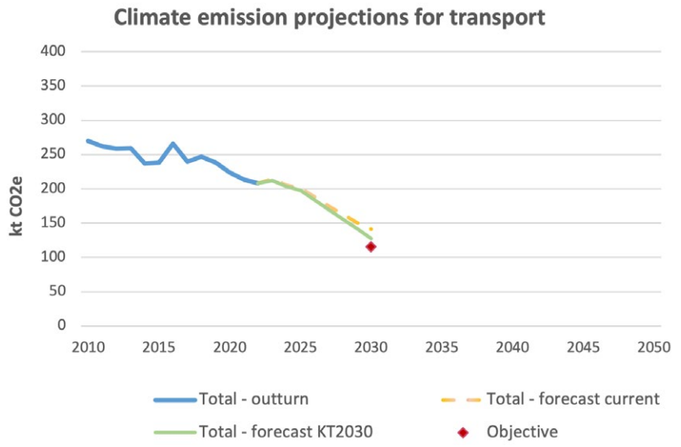


Figure 51 The roadmap's climate emission projection for transport. The goal is identical to the preliminary emissions budget for 2030

Transport emissions will decrease by approximately 67 kt CO2e in the current development forecast and by approximately 80 kt CO2e in the roadmap forecast. In the roadmap scenario, the target is missed by only 13 kt CO2e (Figure 51). The calculation is very rough, especially because estimating the emissions effects of transport is difficult when transport measures affect each other. Calculating the impact of individual measures gives a limited result, and their combined effect is difficult to model.

The entire transport forecast already includes a strong change in propulsion and a significant distribution obligation. An important task of the city is to work decisively for smooth, safe and comfortable solutions to sustainable mobility – not forgetting travel chains. In this case, the measures reinforce each other's impact and a social tipping point can be achieved where, instead of the linear change predicted by the calculation models, the mobility habits may change faster than anticipated.

District heating

Key assumptions in forecast of current development

- The forecasts for the consumption and production of district heat are based on development that is in line with Tampereen Energia's long-term action plan. The planned measures are described on pages 116–118.
- Current development includes investments that have been found to be financially viable. Roadmap development aims at climate neutrality by all possible means.
- In the Roadmap Scenario, only emissions from the fossil fraction of waste incineration remain for district heating, and they can only be reduced by reducing the generation of waste.

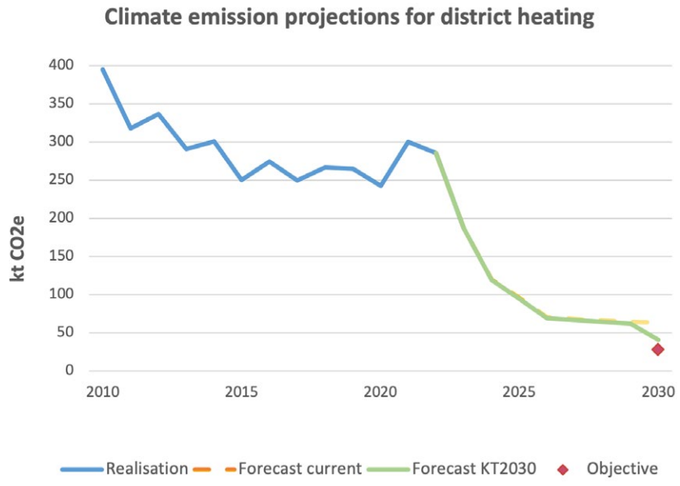


Figure 52 The roadmap climate emission projection for district heat. The goal is identical to the preliminary emissions budget for 2030

According to the roadmap forecast, emissions from district heating will fall short by about 40 kt CO2e of the 2030 target (Figure 52). In reality, the target will not be achieved because, according to the emission calculation standards, the emissions of waste incineration are categorised under consumers of district heat, if district heat is recovered at the plant. Also, potential carbon capture and use does not eliminate emissions from the plant, but causes a significant reduction in emissions where synthetic fuel produced in the process replaces fossil fuels. There are not yet any international guidelines for taking this into account in the city's balance sheet.

In addition to changes in production, emissions from district heating are reduced by the broad implementation of the energy-saving potential of renovation construction through proper guidance (measure package 3.4), as well as individual energy repairs to the City Group's buildings, if there is an estimate of their consumption change.

Individual heating, or oil and natural gas heating

Key assumptions in forecast of current development

- Natural gas heating in Tampere is already minimal, and decreased significantly during the energy crisis in 2022. The assumption is that natural gas heating will almost disappear or be replaced by biogas in the future.
- Oil heating in residential buildings has been on the decline. The decline will slow down a little once benefits are discarded but, even with a cautious estimate of the current trend, there will be very little oil heating left in residential buildings.
- Oil heating in service buildings has been decreasing very slowly. The assumption is that the change will continue to be slow and only about a fifth of the oil heating will be eliminated.
- The share of industrial buildings in oil heating remains the most significant in terms of achieving the target. Based on previous data, the change has been slow, so it is expected to be slow in the future as well. About one-sixth of industrial oil heating will be eliminated.

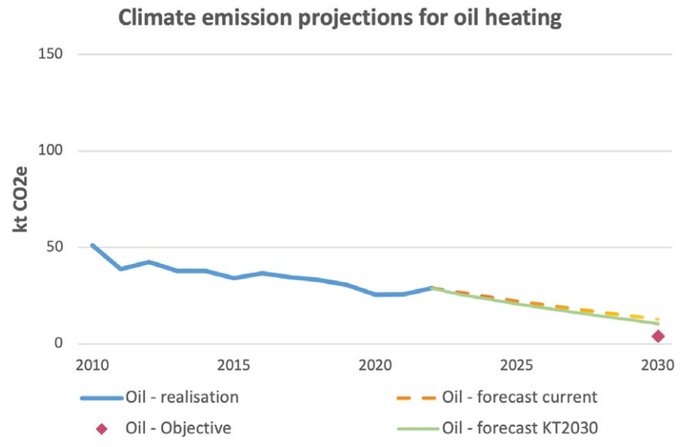


Figure 53 The roadmap's climate emission projection for oil heating. The goal is identical to the preliminary emissions budget for 2030.

With the current development, emissions from individual heating (mainly oil heating) are falling ever closer to the emissions budget. In order to achieve this goal, industrial properties in particular must abandon oil heating. However, this change has been very slow recently. With these assumptions, 10 kt of climate emissions remain in the forecast (Figure 53), while the climate budget aims for 4 kt of CO2e in 2030. In the forecast, the remaining emissions correspond to about 54 GWh of heating oil consumption, about two-thirds of which remain for heating industrial buildings.

In the roadmap, oil heating emissions are reduced by the guidance provided for oil heated buildings, but the effect of the measure has been reduced from the previous one, as the change is already happening at a rapid pace anyway. In addition, it has been calculated that the city will have phased out oil heating in its buildings as planned by 2025. However, this will have only a small impact, as there are very few properties that still use oil heating.

Other electricity consumption, industrial electricity consumption and electric heating

Key assumptions in forecast of current development

- Electricity consumption is developing in relation to population growth. Resident-specific other electricity consumption was 5,139 kWh in 2022 and, according to the linear trend, will decrease by about 41.3 kWh a year. This figure excludes electricity consumption for industry, transport and heating, for which there are separate forecasts.
- The decrease in the emission factor of electricity production is included in current development. It will decrease significantly from 2022 (69 tCO2/GWh) to 2023 (advance 42 t CO2/GWh). As a forecast, it is assumed that the electricity emission factor will be 10 t CO2/GWh in 2035 in accordance with Finnish Energy's low-carbon roadmap for the energy sector. However, the current emissions from electricity production are already ahead of Finnish Energy's forecast, so the change was accelerated by two years. As a result, the coefficient for 2030 is 22.4 t CO2/GWh.
- The consumption of direct electric heating in Tampere remains fairly stable, as it has been for almost the entire forecast. Energy efficiency compensates for the low number of new buildings.
- Building-specific heat pump heating is included in the emission figures for electric heating. This increase takes account of current development, increasing the efficiency of renovation construction and replacement of oil heating with sustainable sources of energy.

Key assumptions in roadmap forecast

- The amount of solar power connected to the grid has grown faster than estimated. In a couple of years, the growth expected to be very moderate has been almost exponential, and the previously estimated production of 22 GWh (25 MW capacity) for 2030 was unexpectedly already reached in 2023. The new forecast assumes that growth will be something between linear and exponential growth in the future, and in 2030 we will have production of 130 GWh (145 MW). The assumption seems bold, but corresponds to about 10% of other electricity consumption in Tampere (does not include industry, transport or heating). In addition, the technical electricity generation potential of building roofs alone is estimated to be 800–900 GWh in 2016. New residential and service buildings will soon receive solar electricity almost as a standard element, and it will also be fitted on old buildings. In addition, the solar electricity of the buildings does not have to be produced on-site.
- The roadmap forecast also includes an estimate of the decline in industrial fossil fuels, according to the Finnish Forest Industries Federation's climate roadmap's low-carbon scenario and local operators' own plans.
- The forecast does not take into account possible new industrial plants that consume significant amounts of electricity. These include, in particular, hydrogen production plants. However, green hydrogen plants must ensure the exact origin of the electricity they use, so their consumption does not negatively affect the city's climate neutrality target.

The climate budget target for other electricity consumption is exceeded in the roadmap forecast with the above assumptions. The climate budget target is 40 kt CO2e, while the roadmap forecast ends at 25 kt CO2e (Gifure 54). This emissions reduction is largely driven by a significant decrease in the national electricity emission factor, partly due to investments made by Tampereen Energia. Energy efficiency measures help to manage consumption growth despite increasing electricity demand, particularly in transport, but also in industry and heating. Although the emission factor for electricity is already low, overall consumption remains constrained by the low availability of output capacity, particularly during extreme cold spells, calm winter weather or disruptions at major power plants.

The current development includes a decrease in consumption per capita and the development of the national emission factor for electricity. The roadmap forecast includes, on the basis of measure package 3.4, an estimate of the improvement of energy efficiency in the city's blocks of flats, as well as an estimate related to 4.3 on the growth of solar power production in buildings.

In the industrial electricity consumption emission forecast, the emissions seem to almost achieve the target. The target is 7 kt CO2e in 2030. Emissions are 5.9 kt CO2e in the current development forecast, and 8.7 kt CO2e in the roadmap forecast. The roadmap forecast estimates a significant increase in electricity use, assuming that fossil fuels are replaced with electricity. If large-scale electricity-intensive investments are made in the area, it should be ensured from the start that they only operate on climate neutral electricity produced at the same time, so that the target can be met.

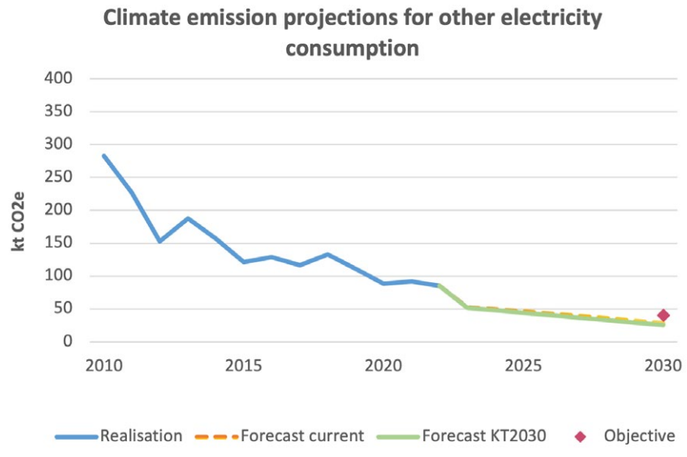


Figure 54 The roadmap climate emission projection for other electricity consumption. The goal is identical to the preliminary emissions budget for 2030.

Industry and machinery

Key assumptions in forecast of current development

- The year 2022 of the latest data was so exceptional in terms of the use of natural gas that the starting point for the forecast is 2021 instead. The use of natural gas has been fairly stable in the past.
- The forecast for oil consumption is based on a flexible three-year average. There is great volatility in oil purchases every year, reflecting that fuel is occasionally bought for and used from storage, even over several years.
- For the most important fuels, i.e. fuel oils, natural gas and liquefied petroleum gas, the current development includes the assumption of a decrease in fuel use in accordance with the Finnish Forest Industries Federation's climate roadmap.

Key assumptions in roadmap forecast

- The roadmap forecast includes the Finnish Forest Industries Federation's low-emission scenario and the assumption that the largest operators covered by the emissions trading scheme abandon fossil fuels altogether in accordance with their own sustainability plans.

The climate emissions from industry and work machines changed as a result of the specification of the calculation. The forecast has been refined by further assessing the consumption of the most significant fuels that create emissions, i.e. oil and natural gas, in the future. Emission reductions from local industry are included in the roadmap forecast as before. With these refinements, it seems quite possible that emissions from industry will be reduced by up to 100 kt CO2e and the target will be achieved (Figure 55). This only requires determined action to replace fossil fuels with electricity or other low-emission alternatives.

The highest emissions from waste management are methane emissions from existing landfills where no significant volumes of waste have been deposited since 2016. Previous calculations overestimated the level of emission reductions, and that is why this forecast will not achieve the 2030 goal (Figure 56). The calculation method has been refined with the new FOD model published by Syke. In addition, the CO2 report includes further detailed calculations from the historical development. The emission forecast for waste management should be treated with some caution, but the revised calculation is now presumably more in line with the reality of a gradual decrease in emissions. However, it is difficult to accelerate the reduction of methane emissions through any measures. Their compensation should, therefore, be considered.

Waste management produces significant amounts of renewable energy and biogas. Their effects are reflected in energy production and energy consumption. Additionally, waste management plays a major role in circular economy activities.

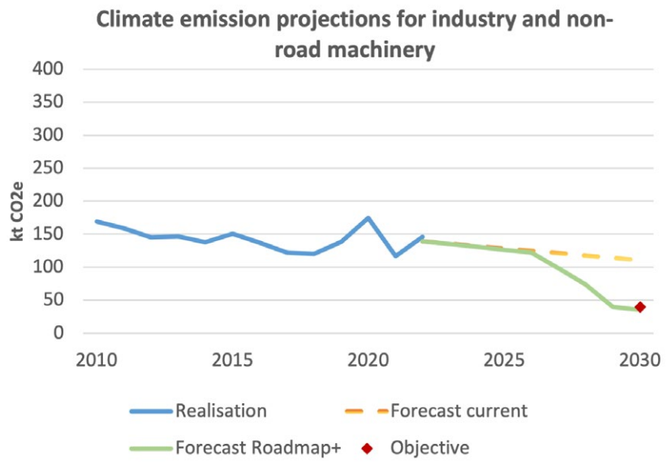


Figure 55 The roadmap climate emission projection for industry and machinery. The goal is identical to the preliminary emissions budget for 2030.

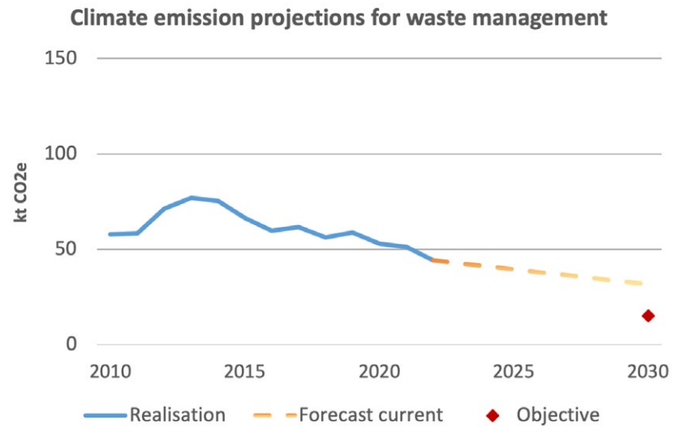


Figure 56 The roadmap's climate emission projection for waste management. The goal is identical to the preliminary emissions budget for 2030.

Appendix 2

DETAILED COST ASSESSMENT OF ROADMAP

Total cost of city organisation's measures in 2024–2030

Measure number	Measure		Costs 2024–2030 (EUR 1,000)
2.2.3	Construction of commuter train stops (Hankkio and Messukylä)	Investment cost	6,000
		Operational expenditure	1,400
		Cost savings	
2.3.2	Transition of bus traffic to clean propulsion (TKL Oy's production contract)	Investment cost	
		Operational expenditure	300.000
		Cost savings	-30.000
2.3.6	Electric buses and charging infrastructure	Investment cost	53,000
		Operational expenditure	4.608
		Cost savings	
Related to measure 2.5.2	Pedestrian-oriented development of city centre and regional centres	Investment cost	700
		Operational expenditure	
		Cost savings	
2.5.3	Improvement of main walking and cycling routes	Investment cost	45.500
		Operational expenditure	
		Cost savings	
Related to measure 2.5.3	Walking and cycling guidance	Investment cost	210
		Operational expenditure	
		Cost savings	
2.5.5	Increasing the number of bicycle parking spaces in public areas	Investment cost	700
		Operational expenditure	
		Cost savings	
2.5.6	Bicycle parking at service properties	Investment cost	4.499
		Operational expenditure	
		Cost savings	
Related to measure 2.5.8	Winter maintenance of cycling and walking routes	Investment cost	
		Operational expenditure	14.000
		Cost savings	
2.5.9	Development of city bike system	Investment cost	
		Operational expenditure	1.350
		Cost savings	
2.6.2	Electric car charging stations in the city's new construction and renovation projects	Investment cost	280
		Operational expenditure	
		Cost savings	
Related to measure 2.9.3	Transport calculators	Investment cost	350
		Operational expenditure	350
		Cost savings	

Measure number	Measure		Costs 2024–2030 (EUR 1,000)
Related to measure 2.10.4	Modernity of vehicle and machine fleet at Tredu	Investment cost	925
		Operational expenditure	
		Cost savings	-385
3.1.5	Carbon footprint of construction projects	Investment cost	1.380
		Operational expenditure	
		Cost savings	
3.1.10	Promotion of wood construction	Investment cost	16.000
		Operational expenditure	
		Cost savings	
3.2.1	The functionality, usability and reliability of building automation systems will be at a good level and will continue to develop	Investment cost	2.850
		Operational expenditure	
		Cost savings	-310
Related to measure 3.2.12	Environmental certificate, City Hall	Investment cost	50
		Operational expenditure	
		Cost savings	
Related to measure 3.3.2	Additional cost estimate for low-carbon construction (mainly normal concrete for low-carbon concrete)	Investment cost	12,000
		Operational expenditure	
		Cost savings	
4.2.4	LED replacements for outdoor lighting	Investment cost	3.000
		Operational expenditure	30
		Cost savings	-1.260
4.3.2	Solar panels and air-water heat pumps of buildings	Investment cost	1.450
		Operational expenditure	
		Cost savings	-145
4.4.2	Phasing out oil heating	Investment cost	2,000
		Operational expenditure	
		Cost savings	-350
Related to measure 5.3.10	Sustainable development at Tredu: In information and library services, the recycling of and reduction of the use of printed products, the use of e-materials and the sharing of equipment	Investment cost	
		Operational expenditure	161
		Cost savings	
Related to measure 5.3.10	Sustainability of teaching materials at Tredu	Investment cost	
		Operational expenditure	
		Cost savings	-700
Related to measure 5.3.10	Sustainable development at Tredu: Hybrid work, remote participation	Investment cost	
		Operational expenditure	
		Cost savings	-700
Related to measure 6.2.6	Natural stormwater solutions (stormwater streams, retention ponds, absorption fields, wetlands)	Investment cost	5,775
		Operational expenditure	700
		Cost savings	
Total		**Investment cost**	**156,700**
		Operational expenditure	**322,600**
		Cost savings	**-33,900**

Total cost of subsidiaries' measures in 2024–2030

Measure number	Measure		Costs 2024–2030 (EUR 1,000)	Subsidiary
Related to measure 1.3.9	Hiedanranta routes for pedestrian and bicycle traffic	Investment cost Operational expenditure Cost savings	8,173	Hiedanrannan Kehitys Oy
2.1.3	Construction of the second part of the tramway	Investment cost Operational expenditure Cost savings	50,454	Tampere Tramway Ltd.
2.1.7	Tram fleet	Investment cost Operational expenditure Cost savings	32,000	Tampere Tramway Ltd.
2.1.10	Construction of the third section of the railway	Investment cost Operational expenditure Cost savings	164,000	Tampere Tramway Ltd.
2.6.13	Transport gas distribution point in Tarastenjärvi	Investment cost Operational expenditure Cost savings	725	Pirkanmaan Jätehuolto Oy
2.6.14	Replacement of petrol cars with electric cars (leasing)	Investment cost Operational expenditure Cost savings	150	Finnpark Oy
2.6.14	Leasing cars will be replaced with electric cars	Investment cost Operational expenditure Cost savings	187	Tampereen Särkänniemi Oy
2.6.14	Use of fully electric cars	Investment cost Operational expenditure Cost savings	247	Pirkan Opiskelija-asunnot Oy
2.6.15	Green Parking – promoter of travel chains	Investment cost Operational expenditure Cost savings	290 245	Finnpark Oy
2.6.16	Increasing the number of charging stations for electric cars	Investment cost Operational expenditure Cost savings	120	Finnpark Oy
2.7.8	Making Voimia's logistics more environmentally friendly	Investment cost Operational expenditure Cost savings	503	Pirkanmaan Voimia Oy
2.9.15	Promoting sustainable mobility	Investment cost Operational expenditure Cost savings	35	Tampere Water
2.10.5	Reduced CO2 emissions from vehicle fleet	Investment cost Operational expenditure Cost savings	115	Tampere Water
3.2.12	Promoting the circular economy (circular economy consulting)	Investment cost Operational expenditure Cost savings	100	KKOy Tampere office building
3.2.12	Low-carbon construction	Investment cost Operational expenditure Cost savings	200	KKOy Tampere office building
3.2.12	RTS classification of buildings	Investment cost Operational expenditure Cost savings	400	KKOy Tampere office building
3.5.9	Piloting an environmental tool in a plant construction project	Investment cost Operational expenditure Cost savings	100	Tampere Water
3.5.11	Reducing the carbon footprint of plant and network investments/ Plant design projects	Investment cost Operational expenditure Cost savings	600	Tampere Water
3.5.12	Reducing the carbon footprint of plant and network investments/ Network investments	Investment cost Operational expenditure Cost savings	2,100	Tampere Water
4.1.4	Closing the Lielahti Natural Gas Power Plant: compensatory heat production investments and network arrangements, etc.	Investment cost Operational expenditure Cost savings	10.000	Tampereen Energia Oy
4.1.6	Electric boiler and district heat battery	Investment cost Operational expenditure Cost savings	12,000 57,600 -88,400	Tampereen Energia Oy
4.1.6	Additional investments in the Naistenlahti 3 Power Plant	Investment cost Operational expenditure Cost savings	32,000 9,000 -39,600	Tampereen Energia Oy
4.1.9	Utilisation of district cooling in heating, Tietotalo	Investment cost Operational expenditure Cost savings	10 -1	Tampereen alvelukiinteistöt Oy
4.1.10	Execution of the sludge treatment and biogas plant	Investment cost Operational expenditure Cost savings	19,400 27,000	Tampereen Seudun Keskuspuhdistamo Oy
4.1.12	Developing the operations of the biogas plant	Investment cost Operational expenditure Cost savings	4,000	Pirkanmaan Jätehuolto Oy
4.2.3	Development and piloting of smart grid and virtual power plant technologies	Investment cost Operational expenditure Cost savings	 -210	Tampereen Energia Oy
4.3.3	Heating system renovation (geothermal and exhaust air heat pumps)	Investment cost Operational expenditure Cost savings	2,617 -251	Pirkan Opiskelija-asunnot Oy

Measure number	Measure		Costs 2024–2030 (EUR 1,000)	Subsidiary
4.3.3	Balancing of the property's heating system	Investment cost Operational expenditure Cost savings	 245 	Pirkan Opiskelija-asunnot Oy
4.3.3	Geothermal heat for new buildings	Investment cost Operational expenditure Cost savings	60 	Tampereen Särkänniemi Oy
4.3.3	Installation of exhaust air heat pumps	Investment cost Operational expenditure Cost savings	450 -21	Tampereen Vuokra-asunnot Oy
4.3.3	Installation of heat pumps	Investment cost Operational expenditure Cost savings	500 -468	TREDU-Kiinteistöt Oy
4.3.6	Property-specific solutions for renewable energy production at pumping stations (solar panels, geothermal)	Investment cost Operational expenditure Cost savings	100 30 	Tampereen Seudun Keskuspuhdistamo Oy
4.3.6	Other property-specific solutions for renewable energy production in Sulkavuori (solar panels)	Investment cost Operational expenditure Cost savings	300 75 	Tampereen Seudun Keskuspuhdistamo Oy
4.3.6	Installation of solar panels	Investment cost Operational expenditure Cost savings	150 	Tampereen Palvelukiinteistöt Oy
4.3.6	Investigation of solar electricity in investment projects.	Investment cost Operational expenditure Cost savings	7 -2	Tampere Water
4.3.6	Installation of solar collectors	Investment cost Operational expenditure Cost savings	100 -10	Tampereen Vuokra-asunnot Oy
4.3.6	Installation of solar panels	Investment cost Operational expenditure Cost savings	110 -42	TREDU-Kiinteistöt Oy
4.3.8	Replacing the lighting in P-Hämppi with LED technology	Investment cost Operational expenditure Cost savings	160 	Finnpark Oy
4.3.8	Lighting renovations	Investment cost Operational expenditure Cost savings	340 -12	TREDU-Kiinteistöt Oy
4.3.12	A climate neutral option will be chosen for district heating	Investment cost Operational expenditure Cost savings	 21 	Tampereen Särkänniemi Oy
4.3.17	Energy consumption monitoring (water, electricity, heat)	Investment cost Operational expenditure Cost savings	 336 	Pirkan Opiskelija-asunnot Oy

Measure number	Measure		Costs 2024–2030 (EUR 1,000)	Subsidiary
4.3.17	Increasing of flat-specific condition monitoring	Investment cost Operational expenditure Cost savings	 90 	Pirkan Opiskelija-asunnot Oy
4.3.17	Window renovation of the property	Investment cost Operational expenditure Cost savings	353 	Pirkan Opiskelija-asunnot Oy
4.3.17	Heat recovery from different wastewater treatment plant air fractions (air conditioning, wastewater aeration)	Investment cost Operational expenditure Cost savings	2,500 450 	Tampereen Seudun Keskuspuhdistamo Oy
4.3.17	Investments that enable energy savings in wastewater intake pumping (automation and high-efficiency pumps)	Investment cost Operational expenditure Cost savings	2,000 240 	Tampereen Seudun K eskuspuhdistamo Oy
4.3.17	Refrigerant R404A (fluorine gas) will be replaced	Investment cost Operational expenditure Cost savings	 42 	Tampereen Särkänniemi Oy
4.3.17	Optimisation of water production and distribution	Investment cost Operational expenditure Cost savings	100 60 -60	Tampere Water
4.3.17	Energy-saving measures in heating plumbing ventilation and sanitation engineering work	Investment cost Operational expenditure Cost savings	540 -60	Tampereen Vuokra-asunnot Oy
4.3.17	Reservation for energy projects	Investment cost Operational expenditure Cost savings	2,550 	TREDU-Kiinteistöt Oy
4.3.18	Development of carbon capture	Investment cost Operational expenditure Cost savings	500 	Pirkanmaan Jätehuolto Oy
4.3.19	Leakage inspections in the wastewater network	Investment cost Operational expenditure Cost savings	 231 	Tampere Water
4.3.20	Annual network renovations	Investment cost Operational expenditure Cost savings	70,000 	Tampere Water
5.1.14	Implementation of a treatment plant in such a way that it is possible to receive septic tank and sealed well sludge via a sewer.	Investment cost Operational expenditure Cost savings	100 30 	Tampereen Seudun Keskuspuhdistamo Oy
5.1.15	Shutdown of Viinikanlahti and Rahola wastewater treatment plants	Investment cost Operational expenditure Cost savings	2,000 100 	Tampere Water
5.1.16	Optimisation of precipitation chemical feed at wastewater treatment plant	Investment cost Operational expenditure Cost savings	 72 -34	Tampere Water

Measure number	Measure		Costs 2024–2030 (EUR 1,000)	Subsidiary
5.1.16	More efficient nutrient cycle	Investment cost	500	Pirkanmaan Jätehuolto Oy
		Operational expenditure		
		Cost savings		
5.4.1	Voimia's business operations are carbon neutral	Investment cost		Pirkanmaan Voimia Oy
		Operational expenditure	2,380	
		Cost savings		
5.4.2	Reducing food waste	Investment cost		Pirkanmaan Voimia Oy
		Operational expenditure		
		Cost savings	-24	
6.2.9	Hiedanranta stormwater solutions	Investment cost	5,228	Hiedanrannan Kehitys Oy
		Operational expenditure		
		Cost savings		
Total		**Investment cost**	**425,017**	
		Operational expenditure	**102,400**	
		Cost savings	**-129,200**	

Appendix 3

STARTING POINTS OF ROADMAP BY THEME

All measures are based on the Sustainable Tampere 2030 Guidelines, the Tampere Strategy 2030, the Mayor's Programme 2023–2025 and legislation. Other agreements, programmes, plans and policies that the measures implement are described below by theme.

0. Climate leadership and stakeholder collaboration

- Municipal energy efficiency agreement
- Covenant of Mayors commitment
- Green City Accord initiative
- 100 Climate Neutral and Smart Cities (EU Mission)
- Climate change adaptation (EU Mission)

1. Sustainable urban planning

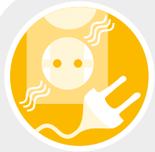
- Tampere City Region Construction Plan 2024+ Our Verdant Metropolis
- Inner-city master plan 2040
- Five-Star City Centre programme
- Hiedanranta Development Programme

2. Sustainable mobility

- Phased master plan for the inner city, council term 2017–2021
- Phased master plan for the inner city, council term 2021–2025
- Tampere inner-city master plan 2040
- Tampere city-centre strategic partial master plan
- Detailed planning programme 2024–2028
- Tampere Region Construction Plan 2040
- Target-oriented future vision for commuter train traffic in the Tampere city region for 2030 and 2050
- Land use, housing and transport agreement (MAL agreement)
- of the state, Tampere region municipalities and Joint Authority of Tampere City Region 2024–2027.
- Action Plan for Electro-mobility
- Tampere Parking Policy Guidelines 2023
- City of Tampere guidelines for personnel
- Green City Accord initiative
- National transport system plan
- Tampere's cycling development programme 2030
- Tampere's walking and urban life programme 2030
- Sustainable urban mobility plan SUMP
- Five-Star City Centre programme

3. Sustainable construction

- Energy efficiency agreement for municipalities and the state (KETS)
- Green Deals
- UUMA plan for use of recovered materials in groundworks



4. Sustainable energy

- Tampereen Energia's strategy
- EU RED III Renewable Energy Directive
- National Climate and Energy Strategy
- Energy efficiency agreement for municipalities (KETS)
- Covenant of Mayors for Climate and Energy
- Goals of the Carbon Neutral Municipalities network

5. Sustainable consumption

- National waste plan until 2027
- Joint municipal waste strategy until 2025
- Pirkanmaan Jätehuolto Oy's strategy
- Finland's strategy for sustainable development
- Lake and nature tourism roadmap
- Hiking development programme
- Glasgow Declaration on Climate Action in Tourism
- Tampere Fairtrade City Commitment
- Visit Tampereen Climate Action Plan
- Milan Urban Food Policy Pact

6. Sustainable urban nature

- Urban tree policy 2020
- Forest management operating model 2022–2030
- Biodiversity programme 2021–2030
- Central City Phased Master Plan 2021–2025
- Stormwater programme 2023–2030

Appendix 4

MEASURES TO BE REMOVED

Measure number	Measure	Timetable	Reason for removal	Main responsible party
0.0.1	The Climate Neutral Tampere 2030 Roadmap and the climate budget will be used to coordinate and monitor the progress made with the city organisation's and the City Group's climate efforts. The climate budget and the impact of the climate budget will be developed. The climate neutrality goal will be promoted as part of the communication on strategy and on sustainable development and as a component in city marketing. The Strategy and Development unit will support roadmap implementation as a whole using the existing structures.	2022–2029	This item is included in the other measures.	Climate and Environmental Policy
1.2.2	Data will be produced on the densification potential of the urban structure outside the tramway zone. Data will be produced, for example, by means of situational pictures and impact assessments of urban structure monitoring, such as the urban structure functional mixing indicator and the climate impact assessment tool for the urban structure.	2022–2025	This item is included in the other measures.	Comprehensive Planning
1.5.5	Design of the Hiedanranta School and Well-being Centre will make carbon footprint a key design indicator	2022–2029	The measure has been found unnecessary in this form.	Strategic Project Development
1.5.7	Hiedanranta will serve as a development platform for smart and sustainable urban construction, enabling dialogue, solution development and the creation of new business and investment opportunities. Every development project will run based on a dedicated budget.	2022–2029	The measure has been found unnecessary in this form.	Strategic Project Development
2.2.6	A commuter train transport user survey will be carried out to assess the emission impacts.	2022–2025	The measure has been found unnecessary in this form.	Public Transport
2.4.4	Demand-responsive public transport for areas of low demand will be developed.	2025–2029	Transferred to the wellbeing services county.	Public Transport
2.5.7	The existing potential for and commercial applications of the re-use of crushed stone will be investigated. This investigation work will be continued in order to utilise crushed stone in applications other than as anti-skid material. Promising methods will be tested.	2022–2025	This item is included in the other measures.	Construction and Maintenance of Urban Environment
2.7.6	Reducing emissions from the Rescue Department's vehicle fleet, for example in the passenger car category, phased transitioning to hybrids and electric cars. Renewal and recycling of heavy equipment within the framework of the investment plan so as to maintain a reasonable service life.	2022–2024	Transferred to the wellbeing services county.	Rescue Department
2.9.10	The support provided for commute mobility will adopt a flexible public transport benefit, while work-related travel will increasingly take advantage of common travel cards as well as low-emission car- and bicycle-sharing. The services will propose that workplaces have facilities that support commute mobility (social facilities, bike storage). Examples: Shared bicycles and electric bicycles will be procured for well-being centres. Shared bicycles will be procured for use by the employment services personnel, and bicycle maintenance will be provided as an incentive to use one's own bicycle. The Environmental Health Unit will map the transition traffic, commute traffic and car use for work-related purposes with the aim of increasing walking, cycling, car-pooling and public transport.	2022–2025	This item is included in the other measures.	Public Transport
2.9.14	Supporting sustainable travel to work, for example supporting public transport commute tickets and increasing the number of bicycle parking spaces. Enabling the charging of electric cars. Introducing the electric car in work-related travel.	2022–2025	Transferred to the wellbeing services county.	Tammenlehväsäätiö foundation
3.1.3	The use of space will be made more efficient, for example by taking into consideration in the planning of the service facility network (e.g. early childhood education, pre-primary education and basic education) that many of the services can be arranged outside the service facility network's service points.	2022–2029	This item is included in the other measures.	Real Estate and Housing Policy
3.1.7	The property projects undertaken by Culture and Leisure Services will strive for low-carbon/climate-neutral implementation while ensuring the conditions for sustainable activities (e.g. Tampere Art Museum, Nekala container library, outdoor sports facilities, Hiedanranta).	2020–2029	This item is included in the other measures.	Sports, Exercise and Young People
3.1.9	The city will join the Green Deal for Sustainable Demolition while implementing all demolition measures in accordance with the Green Deal conditions. Advantage will be taken of the circular economy on the basis of the circular economy plan being drafted, while including it as a measure in 2023–2024. Construction and planning processes will be designed to ensure that demolition waste from the city's buildings will be used increasingly in construction, and the amount and utilisation of waste will be monitored. If any of the city's new buildings are sited at a property where an unusable building is first demolished, the potential for utilising the demolished material in new construction will always be considered.	2022–2025	The Green Deal ends in 2025, and the city will not join it. New legislation will replace it.	Real Estate and Housing Policy
3.1.10	The city's construction projects will increase the recycling and processing of building materials and the choice of low-carbon materials. The city will revamp the demolition works procurement criteria in accordance with the Ministry of the Environment's procurement guide on circular economy in public demolition projects. The city will join the Green Deal for Sustainable Demolition. A process description for placing demolition orders will be prepared.	2022–2025	The Green Deal ends in 2025, and the city will not join it. New legislation will replace it.	Real Estate and Housing Policy
3.3.10	A space efficiency and cost level target, as well as energy and environmental targets, will be defined for all sites managed by the city, grouped by their purpose of use, by 2023. An up-to-date database will be developed for related data. As well as service design, the data will be used to formulate policy guidelines on changes to the service network.	2022–2025	This item is included in the other measures.	Real Estate and Housing Policy
3.4.2	The use of open building databases and building data will be intensified in the development and marketing of the services provided by local energy efficiency businesses.	2022–2025	The measure has been found unnecessary in this form.	Climate and Environmental Policy
3.5.4	Wood construction will be promoted by constructing day-care, school and other service buildings out of wood. The first sites include the Hippos day-care centre (2019) and the Isokuusi day-care centre and school as well as the Multisilta day-care centre (2021). 2023 will see the completion of the Ikuri day-care centre and school, and the Tasanne day-care centre will be completed in 2024. The design phases will calculate the site's life-cycle carbon footprint while investigating the materials options available.	2022–2025	This item is included in the other measures.	Real Estate and Housing Policy
3.5.5	The annual investment plan will decide on the wood construction sites for infrastructure construction, including at planned sites. (Bridges, park structures, lampposts, park construction competitions).	2022–2025	This item is included in the other measures.	Construction and Maintenance of Urban Environment
3.5.6	Complementary construction will guide the high-quality implementation of additional floors from wood.	2022–2025	This item is included in the other measures.	Detailed Planning
3.6.3	Greenhouse gas emissions and the costs of various bridge solutions will be calculated. Research theses will be utilised.	2022–2025	Theses and publications on the subject will be utilised (e.g. publications of the Finnish Transport Infrastructure Agency). The measure has been found unnecessary in this form.	Construction and Maintenance of Urban Environment
3.7.2	An up-to-date database of recycled materials will be established and maintained.	2022–2025	This item is included in the other measures.	Construction and Maintenance of Urban Environment
3.7.5	For asphalt procurement, the technical and economic conditions and effects of transitioning to lower emission production methods (including green asphalt) will be investigated.	2022–2025	The measure has been found unnecessary in this form. Will be partially implemented in other measures as well.	Construction and Maintenance of Urban Environment
4.3.11	Investigation of the potential to introduce a solar power system to serve as the energy source for Tammenlehväkeskus.	2022–2025	Transferred to the wellbeing services county.	Tammenlehväsäätiö foundation
5.1.6	Steps will be taken to prepare for the separate collection of textile waste in compliance with the relevant legislative requirements.	2022–2025	The measure has been found unnecessary in this form.	Pirkanmaan Jätehuolto Oy
5.1.10	Minimising the use of disposable tableware and disposable packaging. Replacing the disposable packaging and tableware in use with biodegradable packaging.	2022–2025	Transferred to the wellbeing services county.	Tammenlehväsäätiö foundation

Measure number	Measure	Timetable	Reason for removal	Main responsible party
5.3.5	Environmental issues will be addressed as part of the cloud transition of ICT services. Environment-sensitive ICT procurement criteria will be specified. Responsible suppliers will be selected and procurement processes will, where possible and with due consideration of appropriateness, require even stricter climate goals in order to be able to affect the promotion of climate neutrality. Actors who provide low-carbon and sustainable solutions will be preferred. The City of Tampere will procure all ICT equipment primarily using the leasing model to enable the recycling of equipment for reuse in a manner that addressed environmental aspects. Additionally, consideration will also be given to employing certificates as an environmental criterion if suitable certification systems can be found.	2022–2025	A new measure has replaced it.	Digitalisation and ICT
5.3.7	The library's own carbon footprint will be investigated for the purpose of prioritising measures; for example, the ecological advantages of electronic materials in comparison to printed materials will be investigated.	2022–2025	The measure has been found unnecessary in this form.	Culture
5.3.8	The sharing and reuse of goods will be increased to achieve savings in procurement and to enable more efficient use of goods. Examples: Museums will increase the reuse, sharing and storage of exhibition structures between museums. A market for recycling educational materials will be organised at the adult education centre every autumn. Upper secondary school textbooks, for instance, will be recycled through social media channels and by the student body. Tampere Vocational College Tredu will host a permanent book exchange market. Libraries will investigate the process of discarding library materials and open it to the public. Sports and Exercise Services will introduce a needs management system to reduce overlapping procurement and to extend the life cycle and diversity of use of sports and exercise equipment.	2022–2029	A new measure has replaced it.	Service areas
5.4.2	Voimia will serve Nordic Ecolabel meals.	2025–2029	Within the framework of the criteria, the measure is not realistic.	Pirkanmaan Voimia Oy
5.4.8	In early childhood education, pre-primary education and basic education, vegetarian food options will be increased to two vegetarian meals per week in cooperation with the food service provider. Food waste will be reduced by exploring the potential for utilising food waste, such as resale, in cooperation with the food service provider. A joint campaign will be organised with Voimia to reduce food waste.	2022–2029	A new measure has replaced it.	Basic education, early childhood education and pre-primary education
5.4.9	Upper secondary schools will organise a food waste week and they will promote the reduction of food waste through communication efforts and regular measurements. Surplus food will be sold in the afternoon and served the following day. Vegetarian food will be served as the first option in the line.	2022–2029	A new measure has replaced it.	Upper secondary school education
5.4.10	The units of Tampere Vocational College Tredu will develop practices and communication in cooperation with food service operators in order to increase the popularity of vegetarian meals and to reduce food waste. Efforts will be made to encourage sustainable meals and well-being.	2022–2025	A new measure has replaced it.	Tampere Vocational College Tredu
5.4.11	In Social Services and Health Care, ecological options, or vegetarian and organic foods, will be increasingly emphasised at work canteens and in services. Service provider agreements will require a daily vegetarian option at lunch restaurants and that climate impacts be addressed in general. Attention will be paid to food waste, and employees will be afforded more opportunities to buy surplus food from the canteen.	2022–2025	Transferred to the wellbeing services county.	Social Services and Health Care
5.5.1	The procurements that are the most important for climate and other environmental impacts will be identified so as to enable planning and implementation to focus on reducing adverse impacts. Consideration of life-cycle impacts and the definition of environmental criteria will be improved where the most climate-relevant procurements are concerned. Ways will be investigated to monitor the inventory data of goods in real time (such as by using an app).	2022–2029	A new measure has replaced it.	Service areas
5.5.4	In the context of reporting on the city's activities and finances, the use of environmental criteria in tendering procedures will be systematically monitored. More detailed data will also be collected on energy efficiency, vehicle fuel consumption, and renewable energy criteria.	2022–2029	A new measure has replaced it.	Administration and support services unit
5.5.6	Procurements for Social Services and Health Care will pay attention to the sustainability of equipment, to energy consumption and to the ecological aspects and recyclability of materials by utilising the roadmap work carried out on the environmental criteria of social and health care procurement. For each procurement individually, the procurement sustainability criteria will be applied. In respect of materials, supplies and goods, the aim will be to avoid waste (for example, pharmaceutical warehouses, KÄTSY warehouses employed by the Goods Shelving Service, freely distributed medical supplies, assistive devices).	2022–2025	Transferred to the wellbeing services county.	Social Services and Health Care

Measure number	Measure	Timetable	Reason for removal	Main responsible party
5.6.1	In Social Services and Health Care, communication and training will take account of climate issues. The Social Services and Health Care management team (Sote-jory) will decide on a target for the service and annual plan that supports carbon neutrality. In this way, the theme will be taken up in management and in communication.	2022–2025	Transferred to the wellbeing services county.	Social Services and Health Care
5.6.2	Culture, sports, physical exercise and youth work will promote city residents' eco-social education. Communications will highlight commitment to the climate neutrality goals while providing information on how to promote sustainability through action. The situation of those in charge of sustainable development will be checked at each work unit. Their role will be strengthened while organising common events for them. Sustainable development issues will be widely included in orientation materials. Staff working with children and young people will be trained to discuss sustainable development themes with clients and to integrate the theme into everyday work. Events, exhibitions, camps, youth work, the library, and the adult education centre lectures and courses will highlight sustainable development themes. Compliance with the principles of sustainable development will be included as a criterion in various partnerships.	2022–2029	A new measure has replaced it.	Sports, exercise and young people
5.6.3	In early childhood education, pre-primary education and basic education, the three-year implementation, monitoring and evaluation model set out in the Sustainable Future Plan will be implemented. The Sustainable Future Plan and Non-discrimination and Equality Plans will be included as part of the annual plan for the implementation of the local curriculum in basic education. The Sustainable Future Plans will supplement the action plans prepared by the early childhood education unit.	2022–2029	A new measure has replaced it.	Basic education, early childhood education and pre-primary education
5.6.5	In upper secondary schools, climate and environmental competence based on scientific data will be an integral part of the educational content of several subjects taught at upper secondary schools. Teachers will be encouraged to seek further training on climate change issues. Climate issues will be actively introduced as part of the education provided (for example, the Ilmasto.nyt study unit common for upper secondary schools, school-specific theme study units of upper secondary schools, Climate University cooperation, international climate-themed cooperation projects). Events and thematic days organised at schools will highlight and discuss sustainable development and ecology. Steps will be taken to encourage people towards reducing unnecessary consumption (e.g. Black Friday counter campaign Free Hugs) and towards giving non-material gifts. Awareness will be raised by informing students, teachers, guardians and cooperative partners about climate action. Upper secondary schools will develop their own "emission offsetting" for trips they make as part of upper secondary school curriculum. Offsetting here refers to students' participation in a climate action, campaign or similar.	2022–2029	A new measure has replaced it.	Upper secondary school education
5.6.7	The competence of the city's personnel, supervisors and management in sustainable development and climate issues will be developed using the eco-support model and through other training events.	2022–2029	A new measure has replaced it.	Climate and Environmental Policy
5.6.11	The compilation and introduction of environmental induction material. The launch of the Ekotsemppari activity and training of Ekotsemppari experts. Annual sustainable development campaigns (e.g. a thematic week aiming to reduce food waste, a Fairtrade campaign).	2022–2025	Transferred to the wellbeing services county.	Tammenlehväsäätiö foundation
5.6.12	Communication and education for in-house employees and residents, for example communication with citizens emphasising the impact of emissions from wildfires.	2022–2025	Transferred to the wellbeing services county.	Rescue Department
6.4.8	Regional cooperation on climate change adaptation will be developed between different actors. Active participation will also be ensured in the international climate change adaptation networks.	Will be removed	This item is included in the other measures.	Climate and Environmental Policy
6.4.10	Readiness will be created to form an up-to-date common situational picture between the relevant authorities, municipal actors and other cooperation parties and to distribute it under different disturbances.	2022–2025	Transferred to the wellbeing services county.	Rescue Department
6.4.11	The situation and command centre will be developed further to the level of the local government co-management area for the purpose of creating, maintaining and relaying a common situational picture.	2022–2029	Transferred to the wellbeing services county.	Rescue Department
6.4.12	Data analytics will be developed to prepare for sudden and foreseeable changes in the operating environment.	2022–2029	Transferred to the wellbeing services county.	Rescue Department
6.4.13	The Rescue Department's in-house preparedness for disturbances of an extended duration will be developed	2022–2029	Transferred to the wellbeing services county.	Rescue Department

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