NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Action Plan

2030 Climate Neutrality Action Plan of the City of Tampere

TAMPERE

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Summary

An abstract **summarizes the content** of the 2030 Climate Neutrality Action Plan (Action Plan) that is developed jointly by local authorities, local businesses and other stakeholders.

Textual element

The City of Tampere has a very strong foundation for its climate work. Tampere started its systematic work to mitigate climate change in 2010. Since then, Tampere has been one of the national forerunner-cities in climate change mitigation and adaptation in Finland. The results have been quite remarkable.

City's main guiding tool for climate work is the biennially updated "Tampere Carbon Neutrality Roadmap 2030". The roadmap contains a comprehensive set of measures defined in cooperation with city's units and its subsidiaries. The roadmap also includes impact assessment for a wide variety of actions, including both emission reduction and cost estimates. The progress of climate work is monitored in the Climate Watch and the Climate Budget, which transparently communicate the city's climate work to citizens, politicians, private sector and other stakeholders.

Tampere has already reduced climate emissions from a 1990 baseline more than 30 % in absolute numbers and more than 50 % per capita. According to current action and projections, the roadmap can take us to 73 % reduction, when the target is - 80 % by 2030. As the results obtained so far indicate, the low hanging fruit to enhance climate change mitigation have been picked. Tampere has already successfully invested in renewable energy and the public transport system. At the time being the very difficult systemic challenges remain to be solved. The most difficult of them is the reduction of GHG emissions from transport. This will require a mix of systematic work jointly with the citizens, private sector and the authorities.

Therefore, Action Plan focuses on the emissions gap remaining after the roadmap. This leaves 7% of the baseline emissions to be addressed. Also, so far the roadmap has been focused on what the city organisation can do to reduce emissions. To achieve our goal, we also need to involve city residents, businesses and communities. The action portfolio in the Action Plan addresses what needs to be done in the future and with which stakeholders to cover the gaps. The actual co-creation will take place during future updates of the roadmap and through development projects.

Action Plan has identified systemic strategic priorities that need to be taken into account in addition to those already planned to reach the target:

1) Boosting modal shift by co-creating actions with citizens and big employers to promote sustainable transport, and studying the public opinion.
2) Transforming city logistics move to lighter vehicles and alternative propulsion by guiding.
3) Promoting industrial electrification by communicating with big fossil fuel users to update projections and plans, implementing Green Deal for zero-emission construction sites and providing oil heating advice to SMEs.
4) Providing energy advice and alleviating energy hardship/mitigating energy vulnerability by oil heating advice to private homeowners, developing financing models and piloting energy advice to people with potential energy hardship.
5) Promoting smart energy systems and systems integration by preparing an energy strategy and an urban development platform.

In addition to the identified additional strategic priorities, we should focus on in the coming years, Action Plan contains our plan to:

- Understand the system we're working in and cross the special barriers we have identified
- Co-desing solutions with deeply committed but also recent stakeholders, specially citizens and companies in Tampere region
- Take action combining the Carbon Neutral Tampere 2030 Roadmap to measuring and estimating the results.

The costs of the additional prioritised measures identified in Action Plan could not yet be estimated and have therefore not been included in the Investment Plan. Investment Plan covers actions and

their costs that are already largely in the Carbon Neutral Tampere 2030 Roadmap. Investment Plan summarises the financial resources planned for these actions, and the potential capital needed in addition to the planned costs.

Our aim is to integrate the Climate City Contract, the roadmap and the climate budget into a single process that will complement each other with each update, ensuring that Tampere is carbon neutral by 2030. In achieving the climate neutrality goal by 2030, the City of Tampere recognizes the importance of collaboration with citizens, businesses, and academia.

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1 Introduction

Introduction - textual element

The City of Tampere started its systematic work to mitigate climate change in 2010. Since then Tampere has been one of the national forerunner-cities in climate change mitigation and adaptation in Finland.

Reducing greenhouse gas reduction goals have been set by the City Council and the needed work has been manifested over the years in city's strategy documents. The "Sustainable Tampere 2030" guidelines accepted in the City Council 2018 set the objective for Tampere carbon neutrality by 2030. The current city strategy contains the city's carbon neutrality target for 2030 and related actions. Furthermore, carbon neutrality has risen to one of the four focus areas of the city strategy. This objective is reflected in the City Strategy which sets the objective of increasing the share of sustainable modes of transport by 5% by the end of the City Council's term of office (2021-2025).

The results have been quite remarkable. To summarize the results, we have achieved a 30 % reduction in absolute greenhouse gas (GHG) emissions (reference year is 1990) while the city population has grown from 173 000 to 250 000 or 45 %. Subsequently, the per capita emissions have reduced more than 50 %. Since these figures from 2021, the city energy utility has renewed its largest plant in 2022 which will bring a further 20% decrease in GHG emissions.

The city has from the start taken the stand that climate issues do not have a dedicated climate management subsystem but they and their advancement will take place within the city's existing management structures. This was more challenging in the beginning but has proven to be the right choice as climate issues are dealt within normal strategic, governance and financial processes. This has also enabled us to include more easily largest city owned companies including energy utility, housing companies, real estate firms and water utilities under the same strategic goals as rest of the city. Subsequently, most city-owned companies of climate relevance have calculated their carbon footprint and created their own, internal roadmaps how they will reach carbon neutrality by 2030. For the companies, setting these goals makes also business-sense.

City's main guiding tool for climate work is the "Tampere Carbon Neutrality Roadmap 2030". It contains all the implementation actions across the city including their carbon relevance as well as investments needed to carry them out. All city units from early-childhood education to street planning and school building prioritize annually from the roadmap the actions they will carry out that year and they will also reserve the required funding in their budgets. The results are then collated in "Climate Watuard" that is a transparent interface to city climate work open to all citizens, politicians, the private sector and other stakeholders. The roadmap is updated by city units every two years.

The climate budget is part of the Tampere City Annual Budget. The climate budget sheds light on where we are currently regarding our climate targets, where we should be and what is being done about it. Tampere was the first Finnish city to start developing this structure and incorporate it in the city financial processes and financial statements.

To include various stakeholders even more, the city has also initiated a Climate Partners network for regional companies. There are now currently over 100 companies in this network. Further, Tampere is active in national networks including but not limited to Finnish Green Building Council, the Climate Leadership Coalition network for professionals and other professional networks. Internationally, Tampere is actively involved in network and Horizon Europe projects and has received international recognitions for its climate work.

As the results obtained so far indicate, the low hanging fruit to enhance climate change mitigation have been picked. Tampere has already successfully invested in renewable energy and the public transport system. Renewables in energy production have grown from 5 % to 55 % and will soon be 70 %. The per capita growth of energy consumption in heating and electricity has also stopped. It can

be said that most of the low hanging fruit as well as some of the heavy lifting is done. Thus, only very difficult systemic challenges remain to be solved. The most difficult of them is the reduction of GHG emissions from transport. This will require a mix of systematic work jointly with the citizens, private sector and the authorities.

No silver bullet is available: electrification of cars is not enough but a major model shift is needed in transport towards more sustainable future. To this end, the city has started a multi-year strategic programme that works with residents to empower them to change their mobility and consumption habits towards more sustainable alternatives. We try to find novel ways for doing this as traditional ways have not borne fruit anywhere.

The future looks bright. According to our impact estimates the latest update of the roadmap can lead to 73 % emissions reduction compared to 1990 while the goal is 80 %. In order to close the gap of the remaining 7 %, the modal shift in transport is needed. We can achieve this only with our citizens and various stakeholder groups in the coming few years.

2 Work Process

Work Process - combination of textual and visual elements

In this chapter we describe our work process, according to the NZC Climate Transition Map (Figure 2.1). The City of Tampere has already made huge steps towards climate neutrality before becoming a Mission City. Here we describe how we have done it and what are the plans for future. We acknowledge that there is more work ahead in the future, and EU Mission work will be important in this.

Figure 2.1. The NZC Climate Transition Map.

Build a strong mandate:
The City's climate actions have been gathered into the Carbon Neutral Tampere 2030 Roadmap. The roadmap was created together with all the city's service areas, various units, public utilities, and city's companies. The Climate and Environmental Policy Unit coordinates the process and monitors the implementation of the measures. The Climate Watch service has been created to monitor the measures, where everyone can follow the implementation of the City of Tampere's climate work. The roadmap currently contains a total of 305 measures under six different themes: sustainable urban planning, sustainable mobility, sustainable energy, sustainable construction, sustainable consumption, and sustainable urban nature.

The City Board approved the roadmap on August 31, 2020, and the first update on October 3, 2022. The roadmap will be updated every two years and the next updating process for 2024 has already begun. The implementation of the roadmap is embedded into the City's strategic management systems as the City units include their climate actions from the roadmap to their annual service and financial plans, which will be officially monitored.

Tampere's climate budget and Climate City Contract's Investment plan combines climate work with the city's budget and financial statements. It is used to monitor the progress towards the climate neutrality target and the adequacy of implemented measures. At the same time, the goal of climate neutrality becomes more concrete in the annual budget. The climate budget provides information for decision-making and increases transparency for residents. Tampere's climate budget consists of two parts: the climate emissions budget, and the financial plan for climate actions.

The latest demonstration of city's commitment to net-zero ambitions, including citizens, is its latest development program "Climate Neutral Actions". Development programme operates at city district level and promotes change from a local perspective. It concentrates on changing people's mobility and consumption habits as well as enhancing conditions for circular economy. The program enjoys funding until 2025.

Besides citizen work, Climate Neutral Actions programme's aim is to support companies in climate and environmentally sustainable business and help them find new business opportunities through circular economy and carbon neutrality. One of the many forms of business collaborations is the Tampere Region Climate Partnership which has systematically involved companies, associations, and communities in pursuing a carbon-neutral Tampere since 2020.

Our aim is to integrate the CCC, the roadmap and the climate budget into a single process that will complement each other with each update, ensuring that Tampere is carbon neutral by 2030. In achieving the climate neutrality goal by 2030, the City of Tampere recognizes the importance of collaboration with citizens, businesses, and academia.

Understanding the system:
We have identified systems through expert work, and workshops have also been held on these among other services in the context of the impact pathways. We have identified systems and linkages before, for example in our roadmap process, but the preparation of the CCC gave us a better understanding of the multiple systems and their linkages. For more information on these, see Chapter 3 for a discussion of the content of our portfolio, current policies, and strategies at local, regional, national and EU level. We strongly recognize the role of the city in this, and the engagement and commitment of stakeholders in our climate work.

Co-designing the portfolio:
The process of preparing the Climate City Contract was carried out jointly at national and local level. The City of Tampere has been strongly involved in the Mission's national support network, participating in meetings and workshops with other Mission cities. Tampere also hosted a Mission meeting in connection with the Climate Change Conference in May 2023.

As we are already well advanced in our Carbon Neutral Tampere 2030 Roadmap work, and as mentioned before, it has been created in cooperation with the whole city organization and its subsidiaries, we focused our Action Plan work on identifying gaps and stakeholders. Because of this, we organized stakeholder workshops during the summer of 2023 within the city, involving key people from areas such as transport system planning unit and land use, in addition to climate and environmental policy. We also organized workshops to consider impact pathways, with a particular focus on transport, which is one of the main challenges for the City of Tampere in terms of reducing emissions.

We have also held discussions about the Mission with Business Tampere, which coordinates the Climate Partners network. We have also had close discussions with Tampere University and the Tampere University of Applied Sciences, and they also joined us as partners in this round already.

Take action
We have had a Carbon Neutral Tampere 2030 Roadmap since 2020, and measures are being implemented across the city organization. The implementation of the measures is updated in the Climate Guard tool, which everyone can follow, i.e., the city's climate work is transparent both to citizens, politicians and private sector.

At the same time as the roadmap update process will start again in autumn 2023, the measures of the previous roadmap will be implemented. Our aim is to make the measures part of our core work. Some of the measures, for example in the building sector, are already in place and have reached their targets. 21% of the measures in the current roadmap are complete and only less than 10% have not been started Most of the measures are at the implementation or planning stage (see firuge 2.2.).

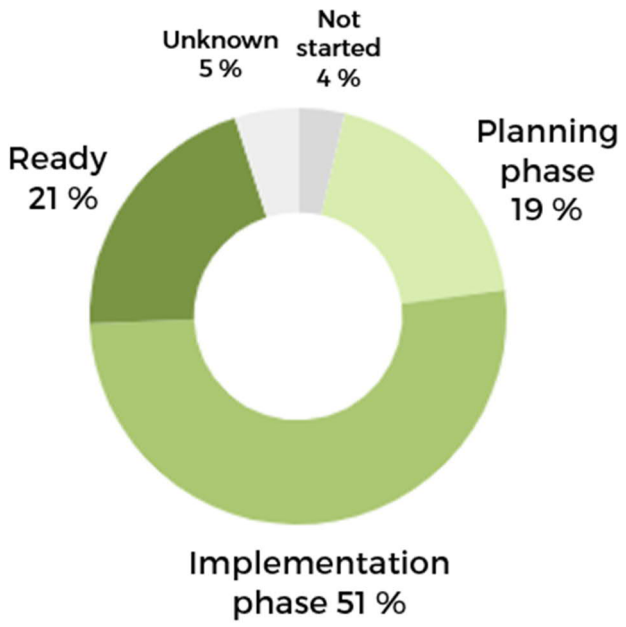

Figure 2.2. Climate Neutral Tampere 2030 Roadmaps measures.

Learn and reflect
The City of Tampere updates the Tampere 2030 Roadmap every two years. The updates are accompanied by workshops and meetings to discuss how the roadmap could be developed. This autumn, we have also conducted customer feedback interviews with the people in the departments responsible for updating the roadmap in those departments. In these interviews, we looked at how we could improve the process ourselves.

One of the lessons we have already learned from the current Roadmap measures is that some of them are difficult to measure: they are ongoing, basic work and will never be completed. For example, improving public transport service levels is an ongoing effort, and much progress has been made in recent years. We will also clarify our objectives and measures. Some measures have multiple responsibilities, with no one person taking ownership of the measure. We will consider these with other units during the next round of updates.

We also intend to learn from others as the mission work progresses. For example, we have now had discussions with other Finnish mission cities, and shared lessons with each other.

Make it the new normal
Our overall goal is to make climate work a new normal. For example, we have focused on a model of climate governance, which we are taking forward. Our roadmap measures are those that aim to become part of the core work of the city so that they do not need to be implemented separately. This is why we are constantly collaborating with other units. The intention is to extend this to businesses and other stakeholders in order to achieve our carbon neutrality goals. We are also working hard on sustainable lifestyles for residents, and our aim here too is to make climate action a normal part of everyday life.

In this CCC, we have identified our current gaps, which we will look to address in the next roadmap update process, which will start this autumn. Similarly, in the next CCC we will be able to update the measures of the new roadmap, as well as identify any gaps that exist at the moment. This will be repeated until 2030 (Figure 2.3). At the same time, we will implement our measures, as they are part of the annual plan of the services and the strategy of the City of Tampere. Our next steps are described in more detail at the end of the Action plan, in chapter six.

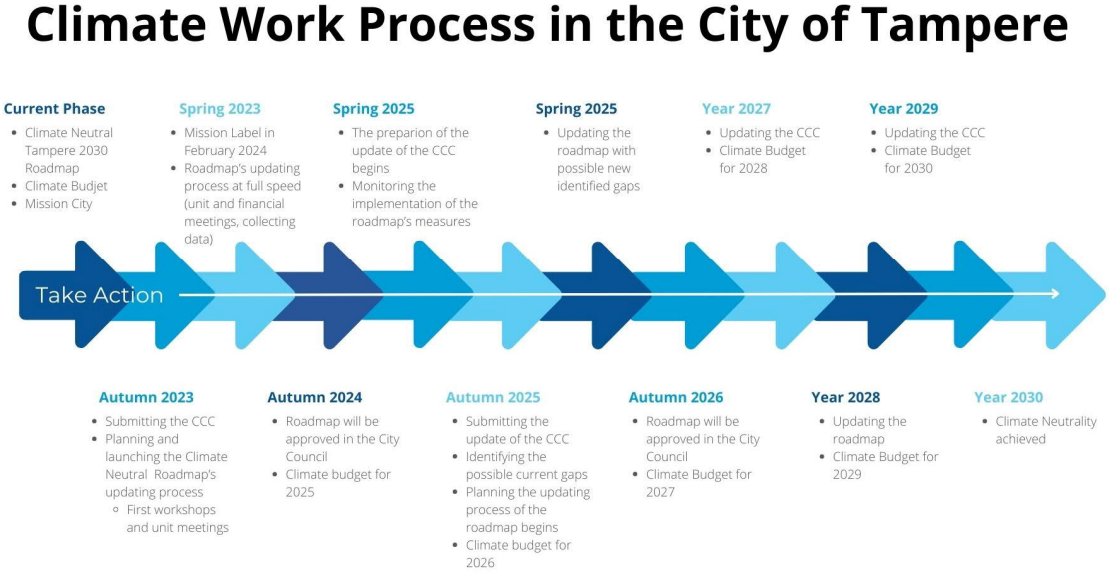

Figure 2.3. Climate work process in the City of Tampere until 2030. While updating the roadmap, the CCC and the Climate Budget, we will continue to implement measures listed in the roadmap the whole time.

3 Part A – Current State of Climate Action

3.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

A-1.5: Graphics and charts

The latest full Greenhouse gas inventory from Tampere is from 2021. Tampere has also reported fully to CDP platform since 2021. Thus, details of the emission calculations are not reported here, but the calculation excel sheet is attached to the Action Plan just as it is to the CDP-report.

Tampere follows up on the energy system separately from the emissions calculation, which is performed by an external partner. The full energy balance is done with few deviations the most important being that the energy use of road transport is based on fuel sold, whereas the emission calculations are based on a national model where the kilometres driven in Tampere are allocated there. Figure 3.1 presents the energy balance of Tampere from 2021. The current situation in 2023 has already changed significantly. The importance of natural gas has changed due to the war in Ukraine and subsequent embargos. The use of peat is quickly coming to an end due to a new biomass power plant that started producing energy in December 2022. The share of electricity being used for transport has yet to be estimated, but the share of electric cars is growing fast, so an estimate will need to be made in future balances.

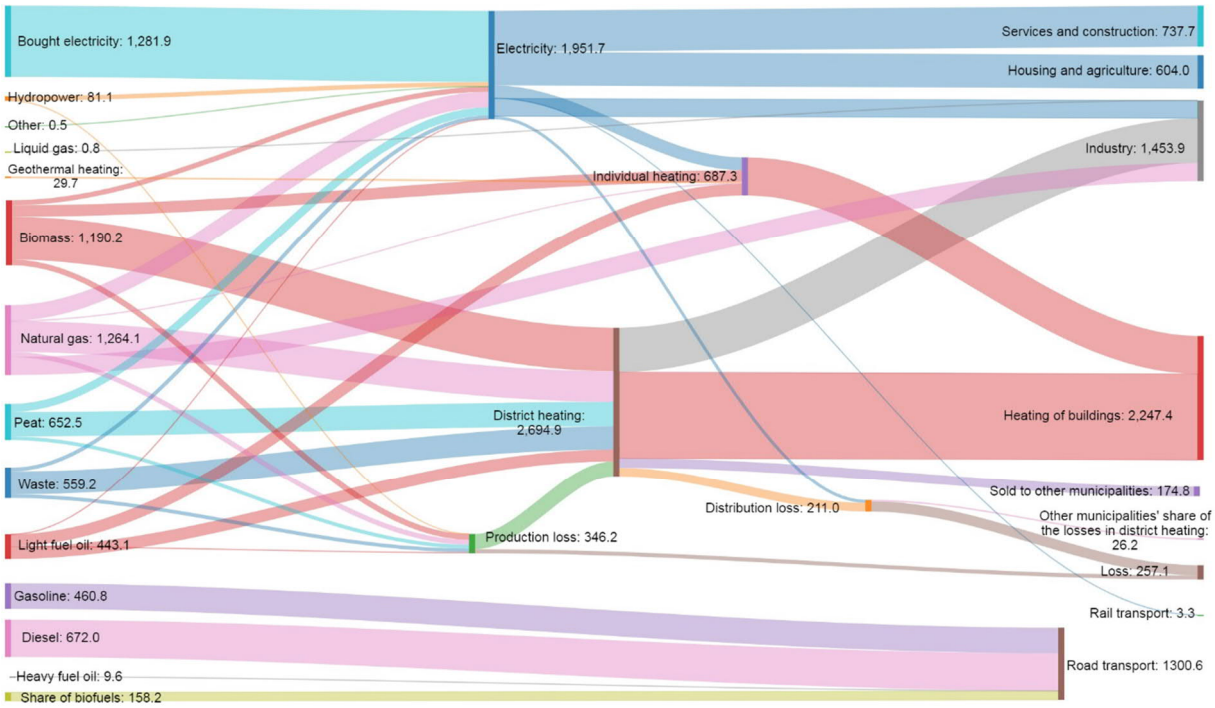

Figure 3.1. Energy balance of Tampere (all units are GWh). Total primary energy use is 6835 GWh, total end use is 6377 GWh. An amount of 174,8 GWh of district heating is sold to other municipalities, which causes some discrepancy here.

The main greenhouse gas inventory in Tampere is based on a national calculation that largely corresponds to GPC protocol for cities and thus accounts for scope 1 and scope 2 emissions within the geographical borders of the city. The total amount and per capita emissions are presented in Figure 3.2,

a further breakdown of the latest inventory by sector can be seen in Figure 3.3. For comparison, Figure 3.4 provides a similar breakdown of the baseline in 1990.

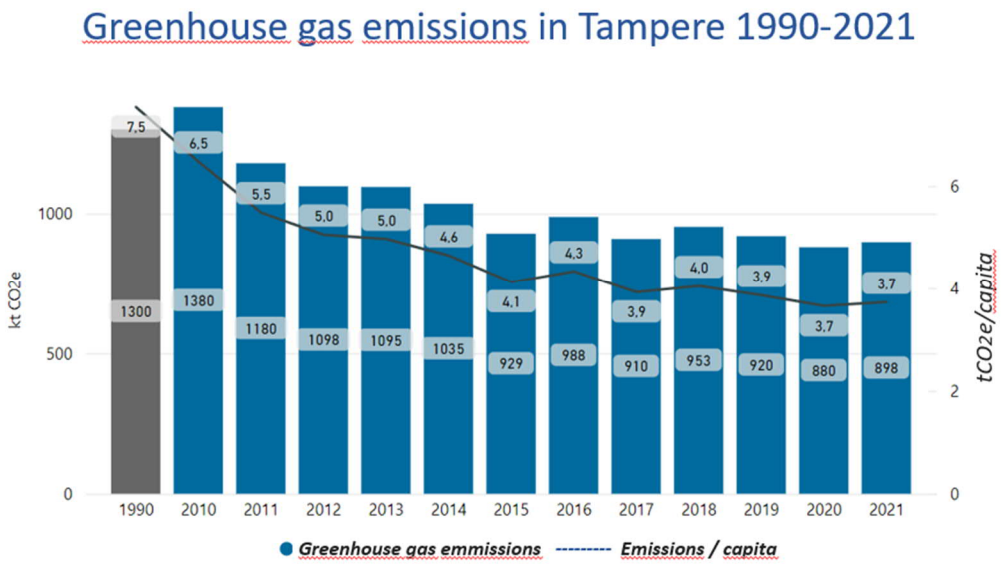

Figure 3.2. Total emission and per capita emissions of Tampere yearly since 2010 with comparison to 1990.

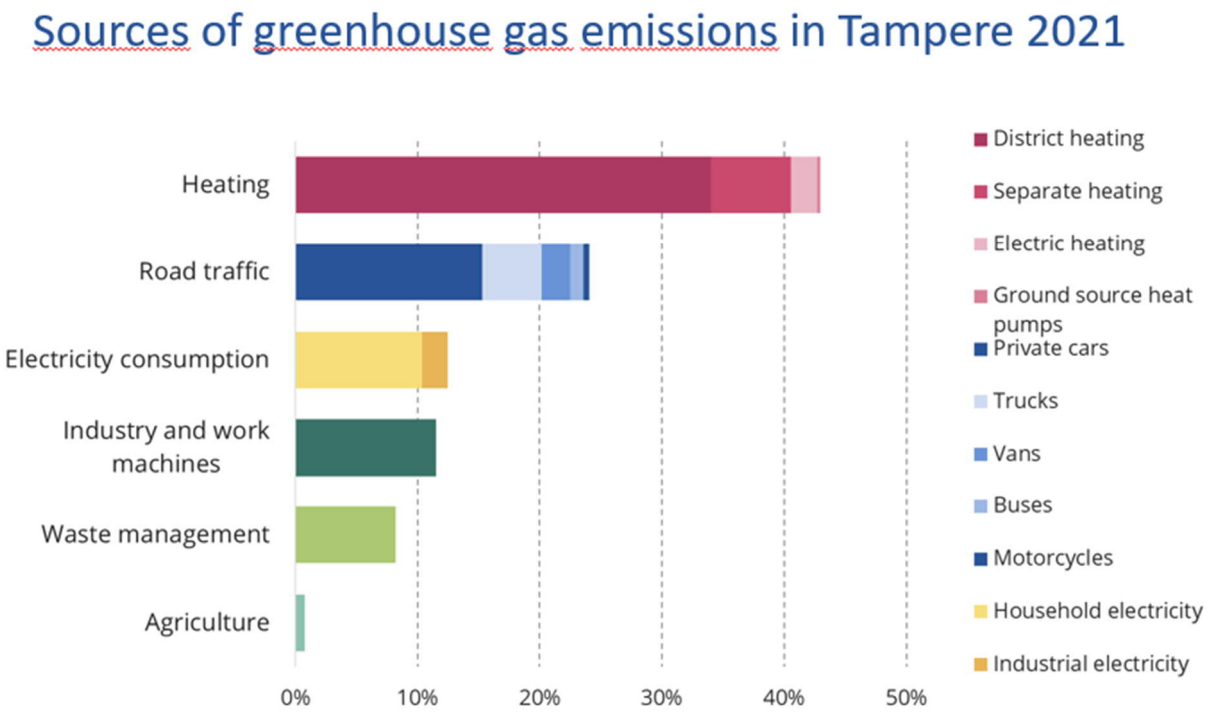

Figure 3.3. Breakdown of the latest emissions inventory from 2021. The main inventory does not include F-gases yet, but the numbers are now available. This is to be integrated in the inventory soon.

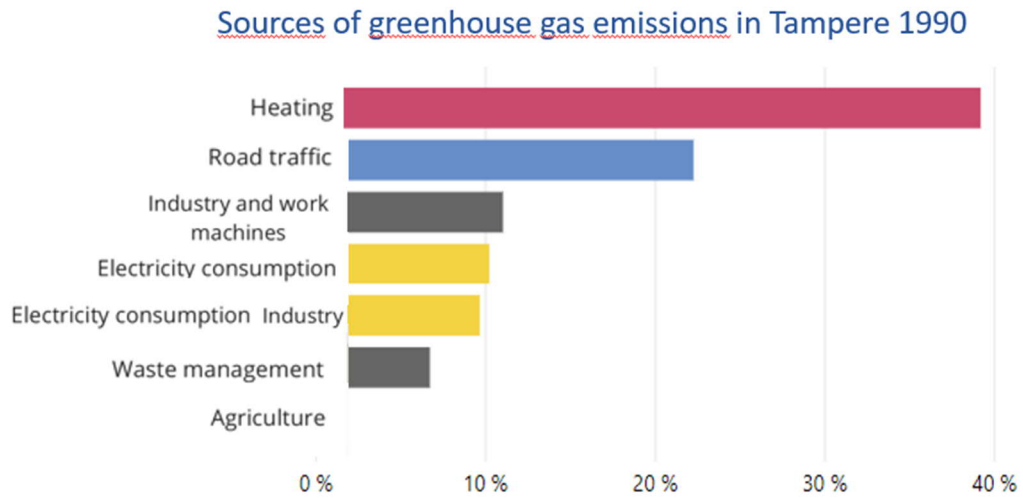

Figure 3.4. Breakdown of the baseline emissions inventory from 1990. This inventory does not include F gases.

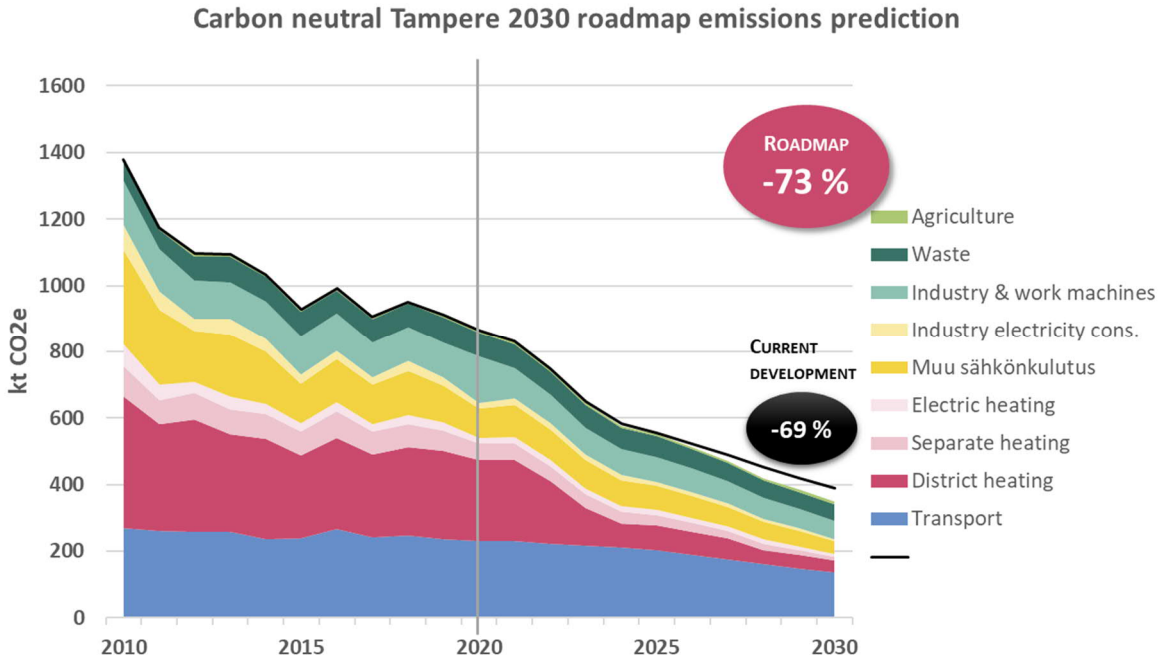

Figure 3.5. Total reduction of emissions in each sector as compared to 1990.

Both the emissions projection and climate budget are based on the same calculation method as the main greenhouse gas inventory. The climate budget, unlike the projection, is based on the target of -80 % by 2030 and states the maximum amount of emissions for each financial year that allows the city to achieve its carbon-neutrality target. The latest climate budget is presented in Figure 3.6.

	Realized 2019	Realized 2020	Realized 2021	Difference to budget	Budget 2021	Preview 2022	Budget 2022	Goal 2030
District heating	265 000	242 700	300 200	64 200	236 000	285 500	190 000	28 000
Separate heating	63 600	52 000	58 000	-2 000	60 000	53 300	53 000	4 000
Heating electricity	23 300	17 200	21 200	1 200	20 000	19 500	19 000	7 000
Traffic	238 200	231 200	212 600	20 600	192 000	228 200	184 000	115 000
Other electricity cons.	111 000	88 200	91 800	-13 200	105 000	87 200	93 000	40 000
Industry electricity cons.	25 700	17 700	18 200	-1 800	20 000		20 000	7 000
Industry and work machines	104 000	139 200	101 900	2 900	99 000		92 000	39 000
Agriculture	6 500	6 500	6 700	200	6 500	6 700	6 000	5 000
Waste management	76 900	72 600	72 700	7 700	65 000	72 700	64 000	15 000
Sum	914 200	867 300	883 300	79 800	803 500		721 000	260 000
Reduction compared to 1990	-30 %	-33 %	-32 %	10 %	-38 %		-45 %	-80 %

Figure 3.6. Climate budget and realized emissions as presented in the financial statements 2022 of City of Tampere.

A full picture of the current situation can be seen in Figure 3.7. Tampere is currently lagging behind the climate budgets of 2020-2021 but is likely to catch up by 2025 according to roadmap projections. However, there is still a significant gap projected at 2030. More information about the Climate Budget can be found in the link provided in Annexes.

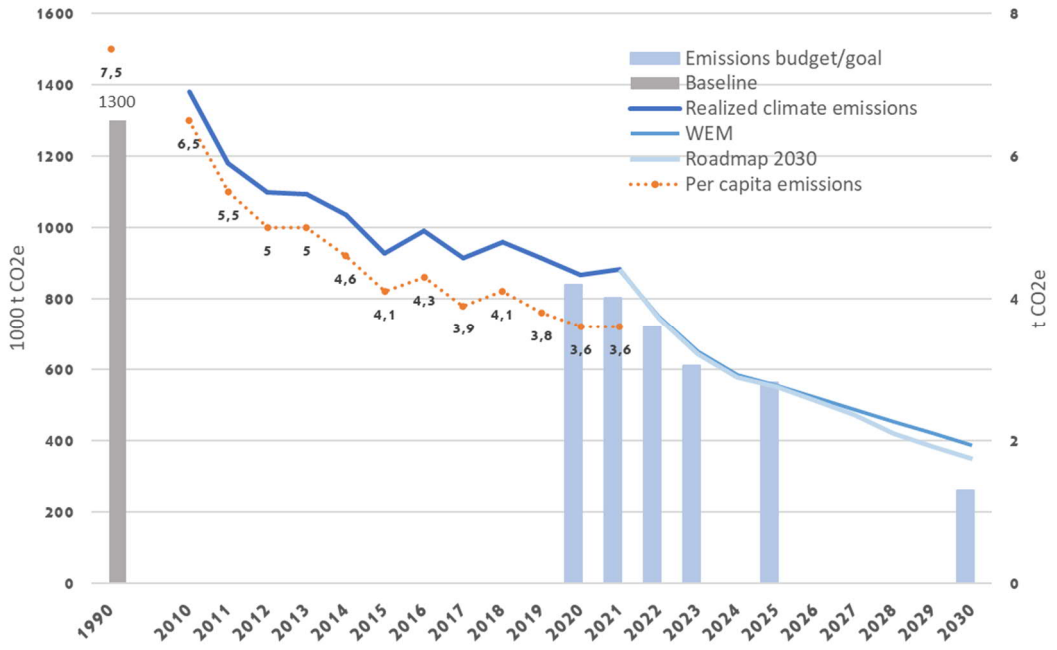

Figure 3.7. Climate budget and realized emissions as presented in the financial statements 2022 of City of Tampere.

Tampere has not included scope 3 emissions in its reporting or climate targets yet, but has been actively involved in developing methods for their calculation. Figure 3.8 presents the consumption based emissions from 2020 and 2022 from a recently completed co-operation with an external consultant and several Finnish cities. As expected, the total of consumption-based emissions is about double the amount of geographic emissions since there is not much industrial operations in the geographical area of Tampere.

Greenhouse gas emissions from consumption, kt CO_2 eq	2020	2022
Energy consumption	**419,0**	**472,9**
Electricity consumption	117,7	118,8
District heating	242,0	291,5
Oil, natural gas and wood heating	46,3	49,9
Cottage living (electricity consumption and wood burning)	12,9	12,7
Construction	**153,0**	**160,0**
New buildings	133,6	142,5
Streets and roads	14,8	16,6
Bridges	4,6	0,9
Carbon handprint of construction (positive climate impact achieved by choices of building materials)	-79,8	-79,4
Transportation	**283,4**	**284,9**
Passenger car traffic	160,0	157,4
Aviation, international	108,8	110,2
Aviation, national		0,1
Waterborne navigation, international	14,6	14,8
Waterborne navigation, pleasure boats		2,3
Food	**491,1**	**495,4**
Goods and services	**430,3**	**425,3**
Private sector consumption	368,1	366,0
Public sector consumption	62,2	59,4
Total	**1 776,7**	**1 838,6**

Figure 3.8. Consumption based emissions in Tampere in 2022.

Tampere has also developed a method for estimating the carbon footprint (scope1 -3) of all construction taking place in Tampere city area based on a national calculation made of the entire construction industry together with Gaia Consulting. The results of the pilot from 2020 are presented below.

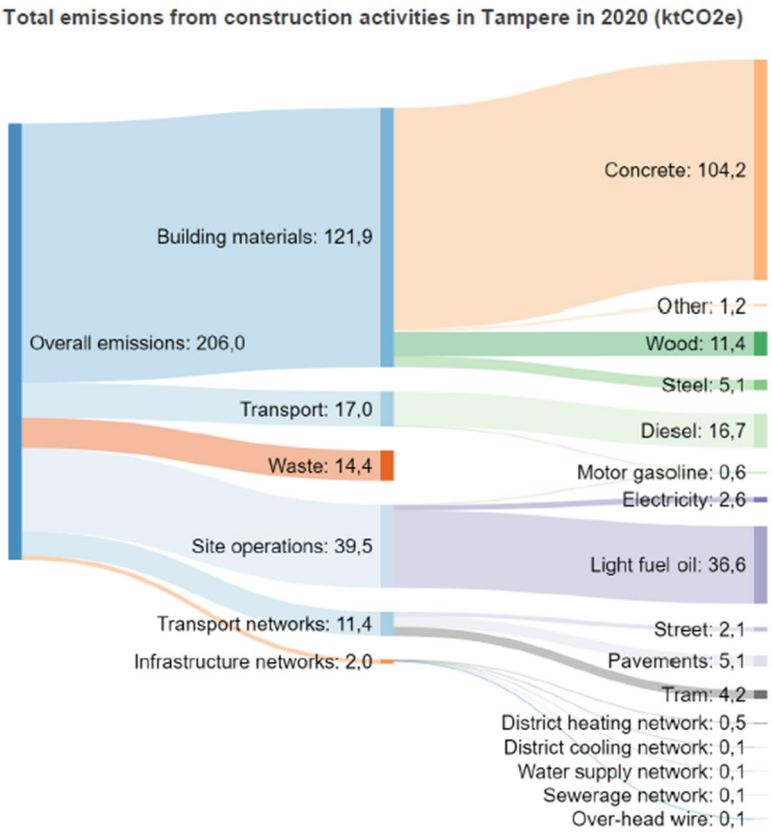

Figure 3.9. Carbon footprint of construction in Tampere in 2020.

A-1.6: Description and assessment of GHG baseline inventory

Emissions are presented in this Action Plan only as charts, but the details are openly reported to Carbon Disclosure Project -platform (CDP) since 2020. In this Action Plan we use emission calculations exactly as we use them in our local plans, objectives and management. For historical reasons, that does not include F gases, but now the data exists also for this sector and will be integrated soon.

Methodology

Tampere has had a yearly climate emissions inventory drawn up since 2010 using a nationally comparable methodology called CO2-raportti (CO2-report). The method calculates emissions from the geographical area of City of Tampere. A detailed description of the methodology is linked in the annexes of this Action Plan.

The division of sectors differs slightly from the Common reporting Framework:

Instead of *stationary energy*, the inventory presents separately emissions for heating and electricity use in buildings. The emissions for heating and electricity consumption can be calculated with a very high level of accuracy due to availability of both consumption and production data. Thus heating is further divided into categories: district heating, separate heating (oil and gas), electric heating and ground source heat pumps (electricity use). Electricity is divided into industrial electricity consumption and other electricity consumption. All energy emissions cover scope 1 and scope 2 emissions.

Transport emissions in total is the same as CRF, but it is broken down to by vehicle type. This sector covers only road traffic since the emissions from air and water in Tampere are negligible. Rail emissions are included in the projections since the share of tram and local trains is growing. Transport emissions cover scope 1, electricity used to charge vehicles cannot be separated from stationary energy.

Waste sector is the same. The waste that is collected from households in the region can be accounted for, the emissions are divided to municipalities based on the number of residents.

IPPU-sector is called industry and work machines. It covers fossil fuel use in industrial facilities and work machinery. Tampere has next to no industry with climate emissions from product use.

AFOLU sector covers the emissions from agriculture. There is no national methodology for land use and forestry emissions to be broken down by region. This is the next gap to be covered in the inventory.

F-gases are calculated by SYKE, a national environmental research center. The numbers are not yet integrated into the basic inventory or the climate budget, but that will be addressed latest in 2024. The numbers are reported to the CDP platform.

Working on scope 3

Tampere has started working on covering emissions occurring elsewhere due to consumption. The carbon footprint of construction from 2020 has been estimated earlier with an update to 2021 and 2022 being planned shortly. The results are seen in Figure 3.9.

There has been a common effort of several cities in Finland and the consultancy Sitowise Ltd to develop methods for calculating comparable consumption-based emissions for cities in Finland. The results from 2022 are visible in the Figure 3.8. These results show that the total emission just about double when emissions occurring elsewhere are taken into account.

Baseline and current situation

Tampere's baseline emissions are from 1990 as according to the Covenant of Mayors, which the city has joined already in 2009. The SEAP, SECAP, Carbon-neutral Tampere roadmap 2030 and Climate Budget are all based on this. As seen in figure 3.2, the baseline total of emissions is 1 300 000 t CO2e, which means that the residual emissions total in 2030 should be a maximum of 260 000 t CO2e. In per capita numbers, the baseline is 7,5 t CO2e and residual emissions an estimated 1,0 t CO2e, which is deemed to be less than our fair share by WWF in the One Planet City Challenge of 2021. Figure 3.4. shows are breakdown of emissions in 1990, which is not as detailed as the one from 2021 (Figure 3.3.) due to lack of granularity in data.

The latest emissions inventory is from 2021 and the total there is 898 000 t CO2e, which, compared to 1990, is a 31 % reduction in absolute emissions and 51 % in per capita emissions. Since the emission statistics come in very late, the actual situation has already changed in 2023. The local power utility has just completed an investment in a new, extremely efficient biomass power plant that allows ending use of peat in district heating. We estimate this reduces the emissions of the city by a total of about 20 % form 2021. So in effect, the reduction compared to 1990 is now around 45 % in absolute numbers.

Figure 3.5 gives a full picture of the emissions development in each sector from 2010 to 2020 as well as the emissions projection until 2030. More detailed analysis of the development of each of the sectors is included in the attached Carbon Neutral Tampere 2030 Roadmap pp. 20-22

Climate budget and emissions projection

The latest version of the carbon-neutrality roadmap from 2022 included an update of the emissions projection. The results are presented in Figure 3.5. This projection includes assumptions for external changes such as the decarbonization of national electricity production, baseline projection for heating and electricity demand and an optimistic scenario of electric vehicles and biofuels.

In addition, the *current development* scenario includes such climate action that cannot be seen in the GHG inventories yet, but the investments have already been decided and are being implemented.

The *roadmap scenario* includes other actions from the roadmap that could be accounted for. The biggest remaining question marks are modal shift impacts of the plan, the actual emissions from existing landfills (as opposed to modeled) and the impact of actions by industrial players.

More detailed analysis of the projection and the remaining gap is also presented in the annexed Carbon neutral Tampere 2030 roadmap on pages 128-129 and its appendix 1 pp. 142-149.

Tampere sets yearly targets for each emission sector in the Climate Budget, which is a part of the annual financial planning and documents. This allows for transparency in how well the city is advancing towards its targets as well as an annual analysis of progress in each sector. The latest analysis from financial documents of 2022 can be seen in figure 3.6.

Figure 3.7 brings together all of the above: baseline, past and current emissions, climate budget and the emissions projection. As can be seen, Tampere can get very close to its target, but there is still clear gap that remains and it is the toughest change that still needs to happen.

Residual emissions

The residual emissions for 2030 should be a maximum of 260 000 t CO2e. A breakdown of the target per sector is the target of the climate budget as in figure 3.6 above.

The remaining emissions from *heating* are based on predictions of how much of fossil fuels can be replaced in the sector by 2030. Residual emissions in district heating are mainly from waste incineration, where district heating can be considered waste heat usage. A small fraction of oil heating will likely remain in 2030 and the national legislation only demands a 10 % share of biofuel in it. Heating consumption is affected by increases in energy efficiency and renewal of the building stock.

Electricity emissions are calculated according to the national average production. It will be almost decarbonized by 2030 but an estimated 31 g CO2/kWh is predicted to remain. This is enough to reach the targets set in the climate budget.

Residual *traffic emissions* target is set according to the national target and made a little bit stricter since Tampere is a city with more potential for sustainable transport than small towns and rural areas. According to projections and analysis, it will be very hard to reach in a short amount of time. Even with very optimistic assumptions of the share of electric cars and biofuels, it is clear we need more efficient transport to reach the target. That means modal shift to sustainable modes and optimization of logistics as well as reduction of transport need through urban planning.

Residual emissions for *industry and work machines* is set according to current trends and national projections of industry emissions reductions. It might be possible to reach lower levels, if major industrial facilities will electrify their operations in time. Work machines are electrifying very slowly, so some level of residual emissions is likely.

Residual emissions from *waste* are set according to an estimation of how the emissions from existing landfills will gradually decrease. However, the emissions inventories from last years are far from the predicted trend. This needs to be studied more closely to see if the issue is with real emissions or the calculation. Other emissions from waste will be dealt with by 2025.

Emissions from *agriculture* are very small to begin with and the transition to more climate friendly methods is slow. The target is set as lenient and the projection is made based on current trends.

3.2 Module A-2 Current Policies and Strategies Assessment

Table A-2.1: List of relevant policies, strategies & regulations					
Type	Level	Name & Title	Description	Relevance	Need for action
(regulation/ policy/ strategy/ action plan	(local, regional, national, EU)	(Name of policy/ strategy/ plans)	(Description of policy/ strategy/ plans)	(Describe relevance/ impact on climate neutrality ambition)	(list any suggested action in relation – to be further picked in Module C-1)
Local policies, strategies, initiatives and regulation					
Policy	Local	City of Tampere's environmental and climate policy guidelines	Tampere aims to be carbon neutral by 2030. Tampere will reduce its climate emissions and strengthen its carbon sinks. Natural resources will be used and consumed resource-wise.	Sets the aim for climate-neutrality	Guidelines are transformed into action via roadmap which includes a list of actions. More information below.
Action plan	Local	Carbon Neutral Tampere 2030 Roadmap	The roadmap aggregates the actions that the city plans to take in order to achieve climate neutrality by 2030.	Engages the city organisation in the climate neutrality target. Includes impact assessments of the planned actions.	Capacity building about systems thinking in both the city organisation and among stakeholders while updating the plan in 2024
Policy	Local	Strategic Local Master plan for main city area	The plan seeks solutions for the urban and natural environment that support adaptation to and mitigation of climate change.	Promotes sustainable land use in a growing city.	Studying future energy systems while making the city urban plan
Policy	Local	City of Tampere housing and land policy guidelines 2022-2025	A lot of new housing has been built in Tampere, mainly along public transport routes and by densifying existing residential areas. Efficient public transport and high quality walking and cycling routes move people quickly and with low emissions from one area to another. The need to move around in everyday life is reduced by the proximity of services and jobs to homes. Energy is renewable and increasingly produced by non-combustion	Climate-neutrality and sustainability are mainstreamed and integrated in the daily workings of the city. Developing a holistic approach to housing and land use.	Ensuring new holistic ways of working and innovations are taken up widely in the city. This requires resources, planning and follow-up.

			technologies, nearby or self-produced. The principles of the circular economy are widely applied to all activities, including construction. Recycled materials and building components are used in buildings. Buildings are designed to be flexible, durable and ultimately demountable and recyclable. Construction and renovation will minimise the carbon footprint of buildings throughout their life cycle.		
Policy	Local	Tampere City Strategy	The City Strategy lays the foundation for the city's management. It represents city's long-term goals from the present to 2030.	One of the four priorities of the strategy is carbon neutral actions.	Ensuring continuity of climate action over the course of time.
Strategic plan	Local (and city region dimension)	Sustainable Urban Mobility Plan (SUMP)	SUMP is a strategic plan that reviews people's mobility needs from the perspective of better quality of life.	Transport and mobility are a key emission area for Tampere to work on in order to reach the 2030 target. SUMP promotes a transition into more sustainable modes of transport required by traffic climate targets.	Making sure the political will and resources continue to match the objectives set in SUMP. Pilot project for boosting the modal shift and producing information that supports the change and communicates co-benefits well to different actors.
Action Plan	Local	Cycling Development Programme 2030	The programme puts together actions to achieve a minimum 15% modal share of cycling in Tampere by 2030.	Promoting bicycle traffic plays a significant role in achieving carbon neutrality.	Ensuring the programme is matched with the required resources.
Action Plan	Local	Walking and Urban Life Programme 2030	The programme intends to improve the walking conditions in the city to make walking a more attractive modal choice while also developing the city centre.	Promotion of walking in the city centre and more widely has an important role in the toolbox as the city works towards climate neutrality.	Coordination with the Cycling Development Programme and collaboration across service areas.
Action Plan	Local	Biodiversity Programme 2021-2030	The programme sets the ambition to improve biodiversity in the city – from the city centre to protected areas. Biodiversity is seen as a key component of urban development. The programme has six main goals that are complemented with 112 actions.	Climate change and biodiversity are closely linked to each other. Biodiversity has value as such but can also help with adaptation to climate change.	Growing city and its landuse needs are a challenge for biodiversity. Cross-sector coordination of different objectives and interests requires continuous work as defined in the programme.
Regional policies, strategies, initiatives and regulation					

Policy	Regional, national	Regional MAL agreement: Land use, housing and transport agreement	The purpose is to facilitate and support the cooperation between municipalities in urban regions and between municipalities and the State in the guidance related to the urban structure.	Includes the objectives for land use development and housing production in the coming years (current period is 2020-2023) and key development projects concerning the transport network. These in turn affect the emissions of built environment and transportation.	The climate change mitigation measures should be prioritised more in the agreement.
National policies, strategies, initiatives and regulation					
Regulation	National	Climate Act	Finland aims to be carbon neutral by 2035. The Climate Act was recently reformed to reach the target.	Obliges municipalities to draw up climate plans and set emission reduction targets.	Making sure the state financially supports the cities to the degree that is necessary in order to reach the target.
Policy	National	The Government Programme 2023	Finland aims to be a leader in clean energy: Businesses will be offered stable and predictable operating conditions in order to promote the green transition and cleantech investments and attract new business to Finland. The Government will explore the need and possibilities for the central government to participate in financing solutions for strategic investments (guarantees or capital investments). E.g., Clean Energy Finland projects.	Financial support for major energy and infrastructure investments of the cities could significantly promote climate neutrality.	The policy is expected to promote investments related to large-scale energy projects in the city. Making sure the city benefits these opportunities.
Regulation	National	The Government Programme 2023	The Government will ensure that the regulatory and permit processes for solar power parks are uniform, flexible and predictable throughout the country. The up-to-dateness of the determination of the tax values of the structures of solar power plants is checked, ensuring that the solar power plant is not subject to a disproportionately	Will reduce red tape and accelerate increasing the share of solar power in the city and surrounding region of Tampere.	Improving preparedness in the city for when constructing more solar power becomes easier.

			higher property tax than wind power. Solar power parks are expected to become more common due to improved profitability and accelerated permit processes also in the cities		
	National	The Government Programme 2023	The link between meeting the objectives of MAL agreements and financing the investments will be strengthened. The Government Programme 2023 includes investment support to MAL agreements.		
Policy	National	The Government Programme 2023	Development of main Helsinki-Tampere rail-link, Liminka-Oulu twin track. The Government will make substantial investments in developing the railway network in various parts of Finland. In addition to the State the municipalities may be shareholders in the companies that execute infrastructure projects. Linked to use of CEF funds which will also be used to fund Tampere related projects.	Will enable Tampere to be more sustainably accessible hence reducing emissions.	Continuous lobbying to ensure adequate funding for major railway projects related to Tampere.
Policy	National	The Government Programme 2019	The municipalities, residents and communities have been able to apply for ARA grants (energy-efficiency improving subsidies) and ELY grants (e.g. replacing oil heating) to switch to low-emission forms of heating since 2020.	The financial support to public authorities and citizens to make climate-neutral changes in their real estates promotes climate-neutrality.	Continue to utilise the mentioned grants.
Regulation	National	The act banning the use of coal for energy generation in 2029	Coal-fired power and heating generation will be banned as of 1 May 2029. Programme of Prime Minister Sanna Marin's Government 2019 included supporting investments to replace coal, EUR 90 million during the budget planning period.	Directly promotes decarbonisation.	Applying for available funding.
Regulation	National	Land Use and	New construction and large-scale renovations	Incread use of renewable energy	Making sure city's construction and

		Building Act (927/2021), (132/1999)	will be subject to a minimum requirement of renewable energy. In construction projects, it must be ensured that at least 38 percent of the calculated purchase energy used in the energy calculation in a new building or a building undergoing large-scale repair is renewable energy, if it is technically, functionally and economically feasible. These requirements ensure investments in renewable energy in new construction and large-scale renovations.	sources will reduce use of fossil sources hence promoting carbon-neutrality.	renovation projects fulfill the requirements.
Programme	National	KIRA, The programme on a low-carbon built environment	The programme on a low-carbon built environment offers a total of EUR 40 million in funding in 2021–2023 to support Finnish companies and other organisations in developing low-carbon solutions related to the built environment. Municipalities and other public procurement entities can receive funding for innovative public procurement. Funded projects have concerned, e.g., development of climate and energy impact assessment and solutions for low-carbon suburban development.	Promotes climate-neutrality in the field of built environment, a major emission sector.	City should apply for funding available.
European policies, strategies, initiatives and regulation					
Regulation	European	EU Directive on Energy Efficiency and Energy Efficiency Act	The Energy Efficiency Directive (EU/27/2012 & amendment (EU/2018/2002). The directive lays down energy efficiency targets at the EU and national level, the national energy saving obligation and measures and obligations to promote energy efficiency. As part of the recast of Fit for 55 Package in 2021	The directive will reduce emissions by pushing member states to improve energy efficiency.	Ensuring cities have the needed tools such as funding and financing instruments to do their share of the work.

			the target to reduce energy consumption by 32.5% in the EU will be tightened to 36–39%. The target will become binding. Finland would need to limit final energy consumption to 255 TWh by 2030. These requirements encourage investments to be directed to improving energy efficiency and, e.g., energy-efficient construction.		
Regulation	European	The Renewable Energy Directive, (RED II; 2018/2001). EU emission trading system (ETS)	Finland has announced that it aims for a renewable energy share of at least 51 percent in 2030. The RED II directive also requires that 14 percent of the energy used by transport in the member states is renewable energy by 2030. The Directive encourages directing investments to renewables and stabilizes the investment environment. A cap, or limit, is set on the total amount of certain GHGs that can be emitted by the factories, power plants and other installations in the system. The cap is reduced over time so that total emissions reduce. The system allows trading of emission allowances so that the total emissions of the installations stays within the cap and the least-cost measures can be taken to reduce emissions. (Directive 2003/87/EC, Delegated Decision (EU) 2020/1071 and Delegated Regulation (EU) 2021/1416.) The Fit for 55 package aims to reform the EU ETS by making it more ambitious.	Power plants and installations which the city owns (or a share of them) or transport systems run by cities are affected. More significant incentive to invest in climate-neutrality.	Collaboration with the organisations affected. Supporting them in making more sustainable investment decisions. Once the Social Climate Fund starts to operate, the city should see if it can benefit of its funds.

			The system can bring investments in low-carbon technologies to ETS power plants and other installations. Revenues from the sale of the allowances are put into the social fund. The Social Climate Fund will provide support to vulnerable groups.		
Regulation	European	European Climate Law	The European Climate Law - as part of the Fit for 55 package - makes reaching the EU's climate goal of reducing EU emissions by at least 55% by 2030 a legal obligation. The Innovation Fund (IF) and Modernisation Fund (MF) already existing in the EU ETS are retained in the Fit for 55 package and increased, while a new Social Climate Fund (SCF) is introduced.	Directly tightens the emission reduction target contributing to climate-neutrality.	The city needs to act with the binding target in mind. However, city's own target of 80 % for 2030 is already more ambitious than that of the EU's.
Regulation	European	EU Clean Vehicles Directive	Clean Vehicles Directive (CVD) 2019/1161 is aimed at promoting the adoption of low and zero-emission vehicles in the EU. It sets mandatory procurement targets for clean vehicles in the public sector, including electric and hydrogen-powered vehicles, with the goal of reducing GHGs, air pollution, and energy consumption in transportation. The directive stimulates investments in clean vehicle technologies and related infrastructure.	Growing number of clean vehicles and public procurement will inevitably reduce GHGs and hence promote climate-neutrality.	City's transport and mobility investments need to aligned with the directive in the context of public procurement. The city's infrastructure and planning also need to be adjusted to the changing clean vehicle environment.
Regulation	European	EU legislation on buildings and construction	The Energy Performance of Buildings Directive EPBD; 2010/31, 2018/44. Construction-related matters such as construction product approvals, the environmental impacts of buildings and the energy efficiency of	The renewal of building stock is expected to reduce energy bills and help curb climate change.	Making sure the city's procurement, investment, installation and maintenance plans are ready for 2027+.

			buildings and construction products. The legislation contains, e.g., regulations for urban buildings to utilize solar energy. From 2027, each new government building or private office building larger than 250 square meters must have solar panels. Legislation guides investments for more environmentally friendly buildings and construction.		
Regulation	European	Revision of the Energy Union Governance	Original plan consists of five dimensions: - decarbonisation (GHG reduction and renewables) - energy security - energy efficiency - internal energy market - research, innovation and competitiveness	Direct impact on climate-neutrality. To be confirmed later one.	Upcoming (situation in 9/2023)
Regulation	European	Green Deal Industrial Plan	Four pillars: Predictable and simplified regulatory environment Faster access to funding Enhancing skills Open trade for resilient supply chains	City's role as an enabler for economic development (e.g. partnering up with companies or exploring regulatory sandboxes on local level) and being in charge of e.g. vocational training is something where objectives of Green Industrial Plan should be taken into consideration.	Upcoming (situation in 9/2023)

A-2.2: Description & assessment of policies

The Carbon Neutral Tampere 2030 Roadmap describes climate change mitigation efforts in the city. In total there are over 300 measures – and their number may develop according to needs - under seven themes. We have compiled the roadmap in close cooperation with the entire city organization. Each measure has at least one team that is responsible for its implementation. However, the roadmap does not follow the administrative structure of the city. Therefore, several bodies may be responsible for a given measure. The operating model ensures that the entire city organization is committed to the carbon neutrality target.

The aim of the roadmap is to reduce 80 % of city's CO2 emissions from 1990 level by 2030. When setting the climate neutrality target, we have been aware of the Paris agreement emission scenarios and have set a significantly stricter target than the national one. This comparison is basically qualitative in nature since no detailed calculations have been made. While making our SECAP and

this roadmap, we have made scenarios of climate emissions of the city with current developments and another one with roadmap actions. These scenarios are quantitative and fairly detailed. The roadmap is actually based on the work started in SECAP and currently, we focus on improving and updating the roadmap instead of SECAP.

The sustainable urban mobility plan (SUMP) reinforces and demonstrates the objectives set for mobility in the local master plan, the Carbon Neutral Tampere 2030 Roadmap and other city's development plans. The key goal of SUMP is to instill the principles of sustainable urban mobility more prominently into mobility planning and decision-making. The sustainable urban mobility plan and actions have been drawn up for 2021–2024. The plan will be updated in connection with updates of the local master plan or earlier, if necessary, in case significant change needs arise.

The Strategic Local Master plan for main city area is periodically updated once every electoral term. In the most recent update, the themes of this plan are adaptation to climate change and development of the green environment. This plan is the second master plan to include a wide estimate of climate emission impacts. The residents can provide feedback on the plan online. In addition, four events are organized to give the residents an opportunity to ask questions and comment the plan.

The importance of climate change mitigation has been recognized in the Tampere city strategy as well. The focus of the theme "Carbon Neutral Actions" is on citizens and private sector. We have found a four-year development program to pursue the strategy. The aim of the program is to enable sustainable choices for everyone.

To conclude, we feel that our plans are quite advanced already, but we also need evaluation of the city's governance approaches to ensure the city's governance system truly is fit for the 2030 objective. For example, funding issues are a big challenge for us, and this is what we will be working on before the next CCC update to make up for the gaps. The City of Tampere is already engaged in co-development, but this needs to be continuously developed in a way that takes into account all citizens and businesses of different backgrounds.

Table A-2.3: Emissions gap*

	Latest emissions (percentage), **2021**		Residual emissions (from 1990) / offsetting[1]		Necessary reduction[2]	Projection for emissions in 2030 according to Roadmap[3]		Emissions gap (to be addressed by action plan)[4]
All units kt CO2e	*(absolute)*	*(%)*	*(absolute)*	*(%)*	*(absolute)*	*(absolute)*	*(%)*	*(absolute)*
Buildings – electricity	**91,8**	10	**40**		-51,8	**39**	11	1
Buildings - heating	**379,4**	42	**39**		-340,4	**62**	18	-23
Transport	**212,6**	24	**115**		-97,6	**135**	38	-20
Waste	**72,7**	8	**16**		-56,7	**51**	14	-35
Industrial Process and Product Use (IPPU) + work machines	**116,6**	13	**39**		-77,6	**54**	15	-15
Industrial electricity cons.	**18,2**	2,0	**7**		11,2	**6**	2	1
Agriculture	**6,7**	<1	**4**		2,7	**6**	2	-1
Total	**898**	100	**260**	20	638	**353**	100	-92

*The emissions gap has been presented here in a similar fashion as it is presented in the Climate Budget of Tampere. Thus the structure is slightly different to what has been proposed in the template.

[1] Residual emissions consist of those emissions which can't be reduced through climate action and are being offset. Residual emission may amount to a maximum of 20 % as stated by the Mission Info Kit. *Residual emissions are compared to 1990 as per the decisions made in Tampere when joining the Covenant of Mayors*
[2] Necessary reduction = Latest emissions – residual emissions offsetting.
[3] Emissions in 2030 according to the Carbon Neutral Tampere 2030 Roadmap emissions projection including the estimated impact of actions in the roadmap. The projection is unable to include the impact of every single action, especially when it comes to the actions gearing towards modal shift.
[4] Emissions gap = Residual emissions offsetting – Projection for emissions in 2030.

3.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

Table A-3.1: Systems & stakeholder mapping			
Key stakeholders		**Systems and networks they are involved in**	**Influence and interest**
Public sector	Tampere City Region	Mobility& transport Urban planning Built environment Education Sustainability Climate change mitigation	Sustainable and smooth mobilty, transport, housing and living in the region. Key policy maker and influencer among smaller towns in Tampere central region.
	Council of Tampere region	Sustainability Climate change	Strategy work for the whole region. Local provider of EU structural funds.
	Centre for Economic Development, Transport and the Environment (ELY Centres)	Mobility& transport Waste & circular economy Climate change mitigation	Sustainable solutions for mobility, climate change and circular economy in the region. Key policy maker in climate change related actions and an additional channel for us to national government
	Environmental institutes, e.g. the Baltic Institute of Finland Circular Economy Networks	Broad networks in the Baltic Sea area in innoavation and sustainability, waste management & circular economy	Project engine and expert organization in their key substance areas. Impact through extensive networks. Collating scattered players together. Seeking to provide assistance in European-wide projects. Promoting Circular Economy

	Business Finland	Government agency for innovation, including green innovation	Financier of R&D&I, start-up, also cities. Run extensive thematic programs that city can benefit from.
	Finnish Government, the Ministry of Environment	Governance & policy	Supporting the work of municipalities. Operates mostly through Economic Development Centers, see above
	Ministries of Environment and Employment and Economy	These two ministries are the key ones in climate change mitigation, green transition and novel business opportunities and innovation in green economy	These are the key palyers. Policymakers, financiers, partners for the city.
	Mission support projects; Climate Mission Finland 2030, NetZeroCities	Governance & policy	Supporting cooperation (e.g. through common brand)
City of Tampere owned development firms	Business Tampere	Green industry Waste & circular economy Clean-Tech Logistics & mobility Operates Climate Partner network for the city	Speeding up company growth opportunities and partnerships in the Tampere Region, Finland and globally.
	EcoPartners Ltd (non-profit)	Citizen engagement in sustainable actions from energy to circular economy and citizen engagement. Broad European networks.	Promoting sustainable lifestyle and business. Project engine.
Private sector	Companies (over 800 firms in clean-tech and circular economy ecosystems)	Green industry Mobility & transport Energy Clean-tech in manufacturing Consumer behavior, circular economy	Sources of industrial emissions. Employee, customer and logistic mobility and transport emissions. Procurements. Reaching their own climate targets, due diligence and brand.
	Climate Partners, a network of over 100 firms committed to climate actions.	Green industry, Mobility & transport, Energy Consumer behavior, circular economy	Sources of industrial emissions. Employee, customer and logistic mobility and transport emissions. Procurements. Reaching actively their own climate targets, due diligence and brand. Brand, pioneering

	Development partners, e.g. Kausal	Green industry, Mobility & transport, Energy	Developing through knowledge; developing tools for monitoring climate neutrality
Citizens	Carbon Neutral Actions development programme Local active citizens and communities	Mobility & transport, Food, recycling, consumption Consumer behavior Social innovation Social impact, education	Engagement and ownership to reaching climate-neutrality through co-creation in three areas in Tampere. Creating new resident coming from activity that suites to everyday life in the areas.
	Organizations	Social impact, education Housing Consumer behavior	Citizen participation within organizations having some other unifying factor than carbon neutrality. Get publicity and more members, brand, influence.
	Public opinion	Social impact Consumer behavior	Have on influence on what is taken as normal or expected in e.g. consumption or mobility.
University/ research	Tampere University Tampere University of Applied Sciences Students VTT Research Center	Research, innovation, education, mobility & transport, circular economy. One of the key stakeholders from the city point of view. Source of new knowledge.	New research and innovations in all aspects of sustainability; city plays the role of partner and platform for Uni's. Students as future experts, employee and students mobility and transport emissions, procurements, Research funding, education, brand.
Media	Local newspapers Tv, radio (Yle)	Social impact, education	Influence the way sustainability issues are discussed locally, educating and keeping citizens up to date, Get more customers, be the first to publish articles and stories.
	Tampere.fi	Social impact, education	Influence the way sustainability issues are discussed locally, educating and keeping citizens up to date.
	Social media	Social impact	Influence the way sustainability issues are discussed locally

A-3.2: Description of systemic barriers – textual elements

As can be seen in Figure 3.6 of the climate budget, the sectors clearly lagging behind targets are district heating, traffic and waste. The emissions development in each sector is further analysed in the Carbon Neutral Tampere 2030 Roadmap attached to this Action Plan.

District heating is not far behind its target, the reinvestments from fossil fuels to renewables and waste incineration has already taken place. The remaining use of fossil fuels for district heating is only for peak load times in very cold weather with no excess electricity production. On the other hand, combined heat and power production from waste remains base load for the district heating system. Merely improving energy efficiency or doing demand side management will not reduce these emissions. So the systemic barriers to overcome are:

- **Waste CHP emissions**
- **Lack of demand side management in peak load times**
- **Producing clean heat at peak load**

In ***traffic*** emissions, the challenge is much bigger. The focus is on private cars and logistics as they cause more than 90 % of the emissions together with more than 60 % caused by private cars. Tampere has already made major investments in a tramway and service levels of public transport. The land use planning for residential buildings is also focused to public transport zones. The use of public transport is growing fast despite the adverse impact of pandemic times. According to projections, even very optimistic scenarios of electric vehicles and the nation mandated biofuel distribution share will not take us to the 2030 target, which is set at 115 000 t CO_2e. Thus, it is necessary to reduce the amount of kilometres driven compared to current levels despite a significant population growth. The systemic analysis here becomes very complex. The main barriers identified are:

- **High persistence of having a private car and driving smoothly anywhere:** the actions are necessary to make the most of sustainabile mobility investments and make space on the road network for necessary driving.
- **Funding for necessary changes to existing road network to have space for sustainable transport:** Tampere invests a lot to new residential areas as the population growth has only gotten bigger in recent years.
- **Funding the needed growth of public transport**: the national government might not be willing to provide growing financial support for growing public transport operation.
- **Making choices in land use planning** : Balancing different interests and needs in land use planning while making determined effort for reaching climate neutrality especially when it comes to traffic emissions is challenging. It is necessary to find ways to measure the impacts against each other.

More than 30 % of traffic emissions come from logistics. Tampere already has a logistics action plan for 2023-25. The climate aspect and especially the systemic aspect of logistics remains yet to be unpacked. It's important to start co-operation with private companies that are big employers and have big logistics needs (e.g. big grocery store chains and industry) to work on the traffic system transition together.

The challenge with ***waste management emissons*** is lack of reliable data. Based on the current emissions calculation method, the main part of emissions is existing landfills. It remains unclear if the reason for the high emissions is in the model or the data used for the model. The results are very different for different regions in Finland. Another indication of this kind of error is that the methane collected from the landfill is reducing faster than the calculated emissions. Otherwise many necessary emissions-reducing solutions have already been implemented in the waste sector:

- Municipal biowaste is being treated to produce biogas for transport and fertilizer for farming, the biogas is used for transporting waste in the region

- Wastewater treatment is being transferred to a new facility that is built underground to control emissions from waste water, the sludge will be treated to biogas and used for heat and power production for the facility
- Landfills are no longer in use, all municipal waste that is not recycled is used as fuel in a combined heat and power plant
- Biogas is collected from the existing landfill and used as fuel at the combined heat and power plant

In addition, a few sectors look fairly good on the climate budget, but have known challenges for getting to the target.

Industry and work machines emissions look good on the Climate Budget table, but are very dependent on big industrial facilities using fossil gas to produce heat. The challenge here is to find a technical solution that will not be too hard on the electricity production system. Work machines are the smaller portion, but the change also needs to happen. It starts with a national Green Deal for zero-emission construction sites. The city's own construction sites are a fraction of all construction in the city. But, by showing example and demanding a change in the technology the city can have a widespread impact.

At the moment ***Oil heating*** (more than 95 % of separate heating) looks like it might get to its target, but the situation could change. This sector has gained speed from financial support from the national government to private homeowners. The latest government has cut the support from future budgets, which might hinder the progress and lead to lagging behind from targets. The city provides support and advice to oil heaters but has no means to provide financial assistance. This is an important topic related to energy poverty. Some people cannot afford the investment it would take to lower the cost of daily energy.

The final systemic barrier is not directly related to emissions but ***financing*** the work that needs to be done both in investment and operations terms. Financing has been readily available and for the big investments Tampere has successfully applied innovative financing models. However, systematically following up and planning to the future for the climate action has not been done for very long. Changing ways of working and starting to document cost saving and measure sustainability impacts along with money takes time in a big organization. Financial barriers are further analyzed in the Investment Plan Module A-3.1 and Table 4

A-3.3: Description or visualisation of participatory model for the city climate neutrality – textual and visual elements

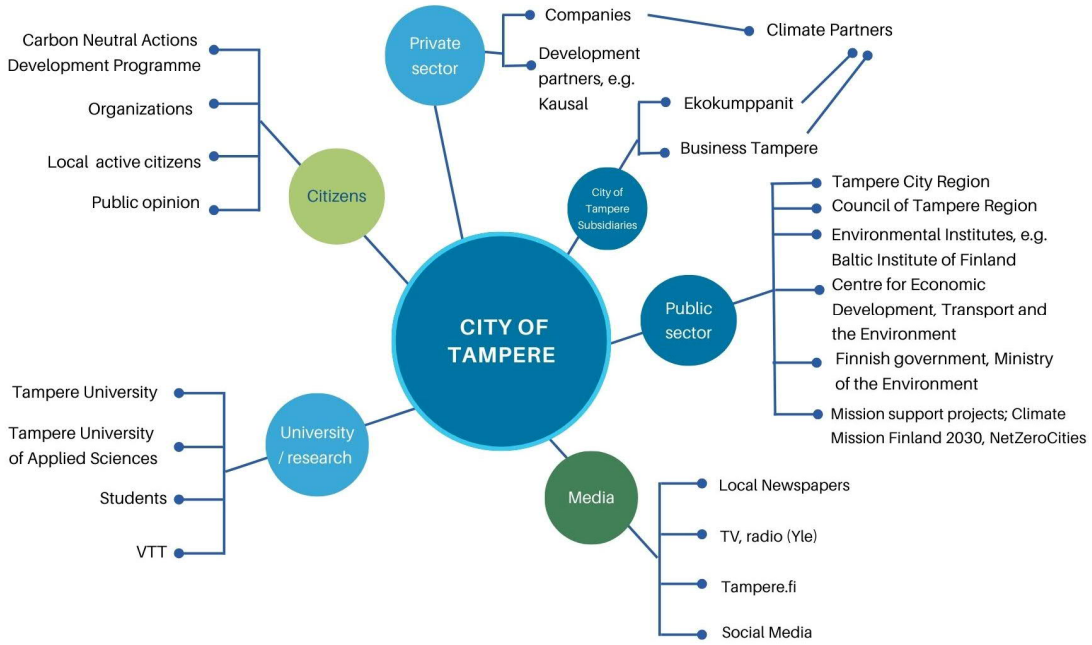

Figure 3.10. The Tampere climate stakeholder model brings together the main actors in society. For the time being the focus has been on the public sector, but it is increasingly clear that the contribution of businesses and residents is fundamental.

Figure 3.10. The Tampere climate stakeholder model brings together the main actors in society. For the time being the focus has been on the public sector, but it is increasingly clear that the contribution of businesses and residents is fundamental.

Public sector sharing crucial data and goals

The most important field of stakeholders, at least for the time being, is the public sector, whose actors in different sectors and levels are central to the work. The City of Tampere is an active forerunner of the Tampere City Region. The eight municipalities in the region co-operate through a joint 2030 Roadmap for a Carbon Neutral City Region. The work is organized through national HINKU-network and follows the targets and framework of the network. The Council of Tampere Region holds the strategy work for the whole region. The Council also provides EU structural funds locally.

In close cooperation there is also the Centre for Economic Development, Transport and the Environment (ELY Centres) that leads the local Climate forum, providing a common network to share information about funding opportunities, local new research innovations, crucial data and local information about the local development scenarios of emissions and carbon sequestration. Environmental institutes like The Baltic Institute of Finland bring the civil society to discussion with the local governance.

Circular Economy Networks

As an environmental institute for the circular economy there are publicly (municipalities) owned organizations promoting Circular Economy, these include Pirkanmaa Regional Council, Tampere City Region, Business Tampere, Ekokumppanit Oy/EcoFellows and especially its Circular Economy Project in Pirkanmaa region (main focus on the construction sector and industrial symbiosis). There is a good co-operation between public operators to work together and Pirkanmaa has been selected as one of the pilot regions in Europe in Circular Cities and Regions Initiative, CCRI (Circular Cities and Regions Initiative | Circular Cities and Regions Initiative (europa.eu)). Also other stakeholders, such as university of Tampere, private sector (Tampere Chamber of Commerce & Industry, private companies) and the waste management company owned by 17 municipalities in Pirkanmaa Region are part of the circular economy network in Tampere.

At the national level the Ministry of the Environment and EU Mission support projects such as Climate Mission Finland 2030 and the Net Zero Cities network are naturally important stakeholders.

Subsidiaries reach the companies
Of course, the private sector is also essential. The economic development agency Business Tampere is owned by the City of Tampere. It is the link between the public and private sectors. Business Tampere promotes investments and creates an attractive environment for sustainable business in the region. The same applies to Ekokumppanit/EcoFellows from another angle. Ekokumppanit is also a subsidiary of the City of Tampere. It is counselling, training and offering expert services in the Tampere region to promote a sustainable lifestyle and business. The unique eco-partnership activities were launched in 2003, when the City of Tampere and its enterprises together with Pirkanmaan Jätehuolto Oy established the company. The third owner of the company since the beginning of 2009 has been Tampereen Energia. Ekokumppanit belongs to the European network of energy agencies. It is also social enterprise and holds The Finnish Social Enterprise mark to show the engagement to responsible business acitivites and the social good as a primary objective.

The Climate Partnership actively engages businesses
Together with Business Tampere and Ekokumppanit the City of Tampere reaches for private companies. The Tampere region's climate partnership model (Ilmastokumppanit) is to involve companies and communities in the region in pursuing a carbon-neutral Tampere. The Climate Partnership is, as the name implies, a partnership; it is intended to benefit both parties to the partnership agreement. There are already 116 climate partners in Tampere Region. Kausal is an example of a company with which the City of Tampere work closely, for example in assessing carbon neutrality work.

Explicitly and openly involving residents in climate work
The importance of citizens and the communities they form as stakeholders is increasing. The city is well into the process of changing the way it does things, now that it is realising that sustainable transport choices, for example, are residents' choices. The Carbon Neutral Actions development programme, one of the four priorities of Tampere's strategy, explicitly involves residents in climate work and openly develops with them ways in which citizens can build a good and sustainable everyday life. This will be done in partnership with communities and associations, but in three selected areas in particular. The aim is for public opinion to reach the point where sustainable choices become the choices of the majority. The aims and process of the programme is described in more detail in chapter 2.1.

Strategic cooperation with academia and research
The stakeholder model also includes the University of Tampere and Tampere University of Applied Sciences with its students. The city is now to set a target for research community collaboration and hired resource to promote strategic partnerships between the city and the higher education community (TAMK and the university), including student cooperation, international cooperation, business cooperation and RDI. The City of Tampere has strategic collaboration agreement with two of it's major research partners and climate action has been identified in them as one of strategic topic. The carbon neutrality work is also evaluated by the state-owned research institute VTT. Major barrier found here is strategic funding of processes.

The media as a shaper of public opinion
The media is also a relevant stakeholder; local newspapers, especially Aamulehti, have a strong influence on public opinion. So do the regional radio, television and online operations of the Finnish Broadcasting Corporation (Yle). The Tampere.fi website, as the city's information channel, is an opportunity to report on the progress of climate work without using the media as a tool. The social media channels of the city and its various communities also have a strong and human influence on the opinions and everyday choices of Tampere residents.

4 Part B – Pathways towards Climate Neutrality by 2030

4.1 Module B-1 Climate Neutrality Scenarios and Impact Pathways

Table B-1.1: Impact Pathways					
Fields of action	Systemic levers	Early changes (1-2 years)	Late outcomes (3-6 years)	Direct impacts (Emission reductions	Indirect impacts (co-benefits)
Energy systems	Technology/ infrastructure	Renewable energy sources the district heating network with biofuels, heat storage, heat pumps and electricity	Carbon-neutral energy available	District heating emissions will drop to 25 g CO2/kWh Local CHP electricity production decreases significantly	Regional biofuels strengthen local economy and create jobs More stable energy prices for consumers Non-combustion heat production units can participate in the demand response market
		Investment in solar panels increases due to more volatile energy prices	Local renewable energy production replaces grid-provided energy	Reduction in need of grid-provided electricity, 1 500 t CO2e	Self-sufficiency in electricity production increases Consumers are less vulnerable to electricity prices
		Adding storage capacity and demand side management to public and private facilities that have a significant peak power demand during the day	Electricity demand adapts better to growing variable renewable energy production	Less need for fossil peak load production -> national electricity system can decarbonise efficiently	Electricity prices become more stable
		Applying solutions to heat demand side management	District heating and electricity peaks loads become smaller	Less need for fossil peak load production -> district heating emissions	District heating prices are less dependent on imported fossil fuels

				reduce further	
		Feasibility studies for CCS/U implementation	Carbon capture and use/storage in biomass CHP and waste CHP	Reliable carbon removals produced locally 300-400 000 t CO2e Potential for producing hydrogen and synthetic fuels	Opportunities for local economy to grow from using captured carbon in ways that permanently store it Hydrogen production can add to flexible electricity capacity
	Learning and capabilities	City planning takes local energy production into account	Local renewable energy production increases	Local renewable energy production replaces grid-provided energy	Consumers are less vulnerable to electricity prices
		City provides energy advice to citizens, housing companies and targets especially those in danger of energy poverty	Citizens can identify the most affordable energy efficiency actions	Energy use becomes more efficient in residential buildings Oil heating is changed to renewable energy or district heating	Risk of energy poverty decresed Dependence on imported fossil oil reduces
Mobility & transport	Technology/ infrastructure	Expand the tramway after phase 2 More local trains Improvements in walking and cycling infrastructure and bike parking Enhanced winter maintenance of the cycling and walking paths	Public transport zones and transfer zones develop Urban structure supports walking, cycling and the use of public transport Cycling is smooth, attractive and safe	Reduced private car use and number of vehicles in the city,	Less traffic noise, health benefits (more walking), accessible public transport, more jobs, improved safety for all travellers, more space in the city for city life, economic benefits to citizens as well as the public and private sectors See Figure 4.1 for details
	Finance and funding	Ensuring sufficient funding for sustainable mobility infrastructure and public transport services in local	Sustainable mobility growth		

		and national context			
	Social innovation	Mobility management: Co-operation between city units Nudging Communication Stakeholders promoting sustainable transport choices	Changing attitudes about sustainable transport and reaching a social tipping point in growth of sustainable transport		
	Democracy and participation	Climate neutral actions programme	Co-creation of the needed actions together with citizens		
	Governance & policy	Mixed urban structure in city centres, major tramway stops and public transport transfer terminals	Sustainable mobility growth		
		Sustainable mobility and travel chain improvements a common practise in urban planning			
	Capabilities and capacities	Data platform on transport system situation created	More knowledge provided on the impacts of sustainable mobility to city planners, decision makers and citizens		
	Governance & policy	Find ways to regulate city logistics to favor light vehicles and cleaner propulsion	Less heavy fossil fuel vehicles used in city logistics	Less transport emissions from city logistics	Traffic safety increases Cycling and walking becomes smoother in the center areas

					Less noise and air pollution in center areas
		Taking a convenient EV charging network and biofuel stations into account in urban planning	The share of electric vehicles and biofuel use increases	Average emission from car travel output decreases, impact included in roadmap projection	Health benefits from improved air quality
Waste & circular economy	Technology & Infrastucture	Ensuring that existing landfills capture as much of the methane emissions as possible		Emissions from existing landfills are under control, 50 000 t CO2e	Increased amount of renewable energy available from biogas
	Governance & Policy	Implement Tampere's Circular Economy plan Improve availability of material flow data in the city	Awareness of material flows and co-creation of actions with stakeholders to optimize the reuse and use of materials	Use of primary materials decreases, scope 3 impact	Material prices remain more stable
Green Industry	Technology & Infrastructure		Electrifying industry that currently uses fossil gas/biogas as energy source	Emissions from industrial process will go down about 50 000 t CO2e	Adding capacity to the demand side management market
	Governance & policy	Joining the National Green Deal for zero-emission construction sites forces the city to develop ways for procuring emission-free construction jobs	Zero-emission construction sites start becoming the norm	Emissions from construction work machines will be reduced 5 000 t CO2e	Less noise and air pollution in the city despite inevitable construction sites from densifying city structure and traffic infrastructure changes
Built environment	Governance & policy	Urban planning of new residential buildings focused in public transport zones and district centres	More people have the opportunity to use sustainable modes of transport in their everyday lives The need to travel long distances for	Less transport emissions from reduced mileage with private cars Less need to build new infrastructure for new residents	Less need to disturb natural areas and disrupt biodiversity

			everyday needs decreases	Less need to build new greenfield areas	
		Demanding readiness for data collection and demand side management of energy in new buildings	New buildings don't add as much to peak load demand of energy	Less need for peak load fossil production	Energy prices are more stable
		Encouraging wood construction in plots rented out by the city	Lower footprint from construction of new buildings Carbon storage in the Tampere grows	Scope 3 emission impacts and carbon storage increase	Use of non-renewable resources decreses Faster construction on-site More diverse urban environment

B-1.2: Description of impact pathways– textual and visual elements

Tampere focuses on mapping the most critical impact pathways remaining in the way of reaching the carbon neutrality target in 2030. Figure 3.6 from the Tampere climate budget clearly highlights which sectors are notably falling short of their targets - specifically district heating, traffic and waste management. Urban development is included in impact pathway analysis due to its pivotal role in establishing a sustainable transport system. The emissions development in each sector is further analysed in the Carbon Neutral Tampere 2030 Roadmap attached to this Action Plan.

District heating in Tampere is making impressive strides towards its target. The transition from fossil fuels to renewable energy sources and waste CHP is almost done. The limited use of fossil fuels now primarily occurs during peak load times in very cold weather conditions. While local electricity production has decreased because of this transition, it's worth noting that national electricity production has seen substantial growth, particularly in the domains of nuclear and wind power. While local electricity production is a valuable addition to our energy strategy, it's important to note that there are no significant issues with a shortage of clean electricity supply, except during peak load times in extremely cold weather or in the rare event of electricity shortages in neighbouring countries.

As result, the energy system impact pathways are related to utilization of renewable energy sources in heating production, aiding housing companies in enhancing energy efficiency and implementing demand-side management measures within both the energy system and the built environment. Significant progress has already been made in the decarbonization efforts, particularly in improving the energy efficiency of housing company buildings constructed during the 1970s and 1980s. However, the primary focus has now shifted to buildings from the 1990s and the early 2000s, which were constructed before energy efficiency directives were put in place. Implementing demand-side management strategies for both heating and electricity will play a crucial role in reducing reliance on fossil fuel production during peak load times and maintaining stable prices for consumers.

Traffic emissions are key to achieving climate neutrality in Tampere and the most challenging system to change in a short period of time. The climate budget leaves a significant amount of the 2030 residual emissions to traffic due to the current slow development and the challenges in making the change happen. The complete impact pathway of transport system transition is very complex and thus very hard to present in one picture. So, the essential impacts are broken down to two parts. The first part is

included in Table B-1.1 with the possible paths of action and their impacts in the short and long term. The end part and a very essential part of the pathway is presented below in Figure 4.1.

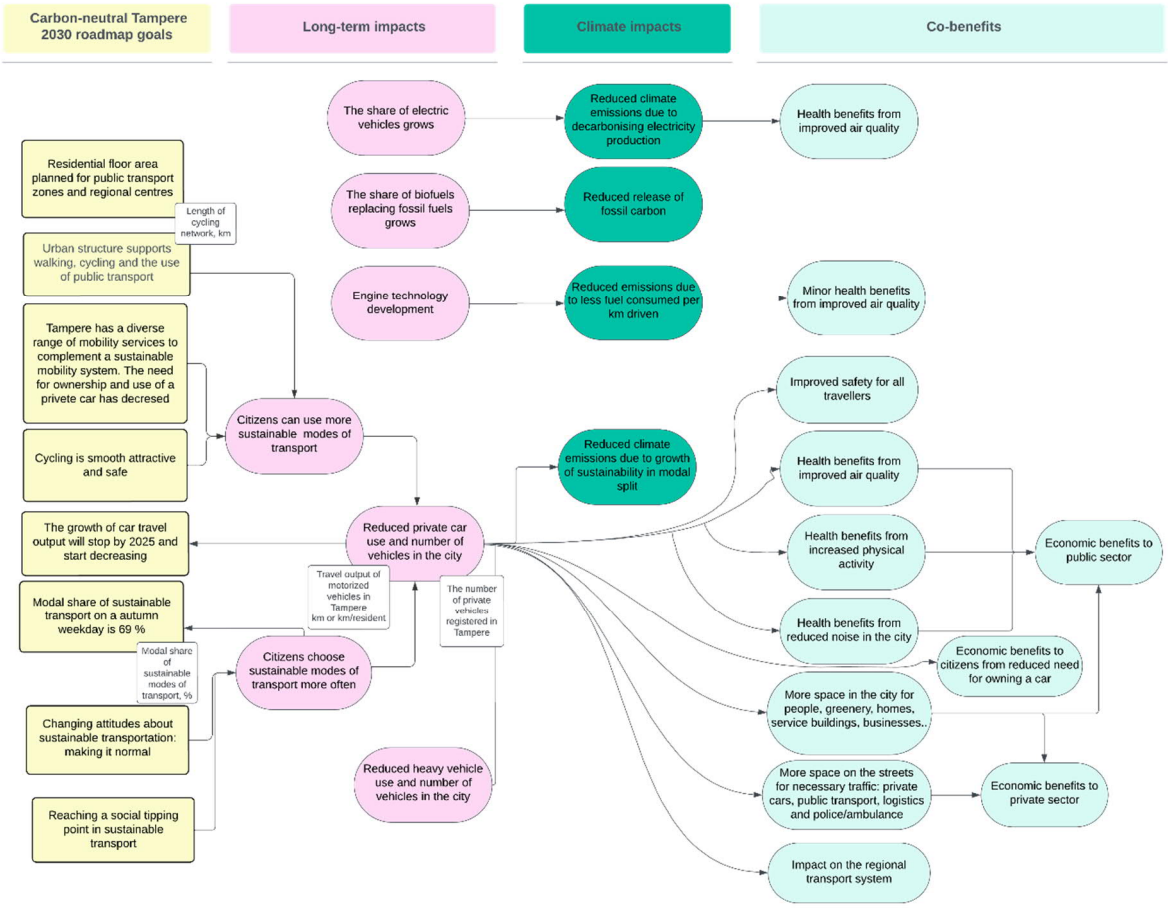

Figure 4.1 ***Transport system impact pathways part 2.*** *The figure indicates the multiple benefits from reducing the use and number of private cars in the city as opposed to the few benefits from alternative propulsion and technology development.*

Both alternative propulsion and reduction of total kilometrage of vehicles are vital to get to the targets and create a sustainable and safe traffic system. However, the alternative propulsion change is happening and being supported on the national level. The charging infrastructure seems to be progressing well on a free-market basis and is included in national regulation. However, the change to sustainable modes is very much up to the city organisation's work and decision making in urban planning, working with companies and citizens to co-create solutions and doing guidance for the new infrastructure and public transport options to be used more. Also, as seen in Figure 4.1 the local benefits to the people and the public sector are multiple when it comes to sustainable transport, whereas the benefits from propulsion change are scant.

Industrial emissions look to be okay, but a lot of the progress towards targets depends on one specific industrial facility. Tampere has not officially co-operated with the facility yet, but electrification of their operation by 2030 is already a part of their corporate responsibility plan. That will create a significant change in the energy demand when their load is likely to transfer from fossil gas to electricity. However, that should work well together with the growing production of wind power, if the electrification is combined with storage capacity.

4.2 Module B-2 Climate Neutrality Portfolio Design

B-2.1: Description of action portfolios - textual or visual

Climate action has been taking place in Tampere for a more than a decade already. The latest update of Carbon Neutral Tampere 2030 Roadmap brings together all the climate action in City of Tampere and its subsidiaries. It includes 37 measure packages that contain a total of 305 smaller actions. Each package belongs to a theme and each of the 7 themes have their individual goals and indicators for progress (Figure 4.2). The roadmap was created together with the city's units, subsidiaries and public utilities. The last update to the roadmap was made in 2022, so this Climate City Contract action plan does not repeat the actions in the roadmap itself, which can be found as an annex.

However, many of the actions from the roadmap are covered in the Investment Plan. Module B-1 of the Investment Plan covers actions and their costs that are already largely in the Carbon Neutral Tampere 2030 Roadmap. Tables 5 and 6 of the Investment Plan summarise the financial resources planned for these actions. Module B-2 of the Investment Plan includes the capital needed in addition to the planned costs. However, for most actions the capital needs cannot be accurately analysed at this stage.

Instead this action plan focuses on the emissions gap remaining after the roadmap. According to our projections, the roadmap can take us to -73 % of emissions compared to 1990. So 7% of the baseline emissions remain to be addressed. Also, so far the roadmap has been focused on what the city organisation can do to reduce emissions. To achieve our goal, we also need to involve city residents, businesses and communities. The action portfolio in this CCC addresses what needs to be done in the future and with which stakeholders to cover the gaps. The actual co-creation will take place during future updates of the roadmap and through development projects. The costs of these additional measures have not yet been estimated and therefore not included in the Investment Plan.

Figure 4.2 collects together the measure packages and themes and their goals in the Roadmap.

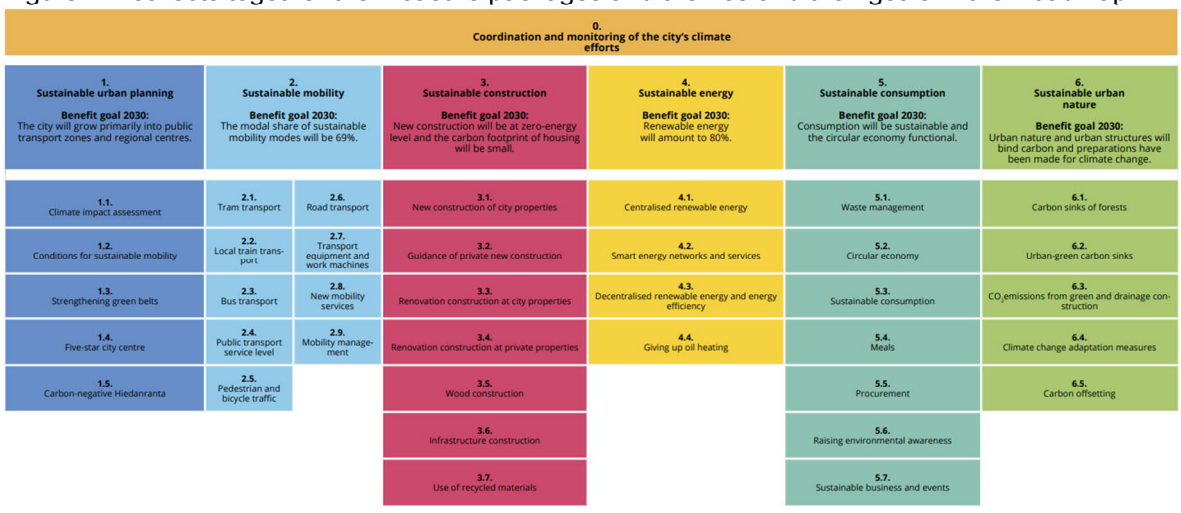

Figure 4.2 Carbon Neutral Tampere 2030 Roadmap themes, goals and measure packages updated in 2022.

The detailed analysis of remaining emissions by sector can be found in the annexed Carbon-neutral Tampere Roadmap pp 128-129 and its appendix 1 pp. 142-149. However, there is also a more practical approach to the emissions gap in the roadmap that serves as an action portfolio starting point. The specific emissions from each sector that remain to be addressed are identified in Figure 4.3.

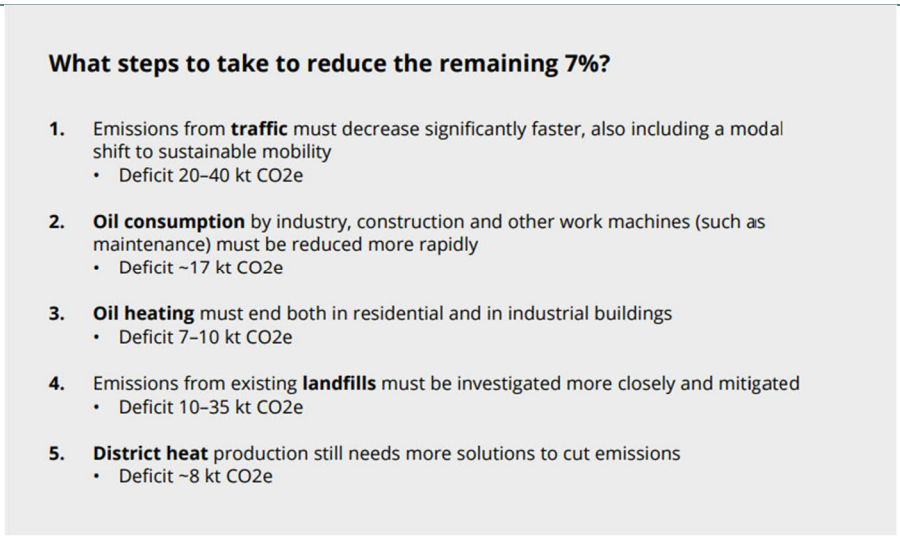

Figure 4.3 Conclusion of the Carbon-neutral Tampere 2030 roadmap projection about the gap emissions needed to mitigate in order to reach the target

In this Action Plan work we created an outline for action portfolios necessary for reaching climate neutrality in 2030. The individual actions are still drafts and the detailed content needs to be co-created with several stakeholders.

City of Tampere gap portfolios

- Boosting modal shift
  - Co-creating actions in pilot areas to make all forms of transport more equal
  - Co-creating actions with big employers to promote sustainable transport
  - Studying the public opinion
- Transforming city logistics
  - Guiding city logistics move to lighter vehicles and alternative propulsion
- Industrial electrification
  - Communicating with big fossil fuel users to update projections and plans
  - Implementing Green Deal for zero-emission construction sites
  - Oil heating advice to SMEs
- Energy advice and alleviateing energy hardship/mitigating energy vulnerability
  - Oil heating advice to private home owners, developing financing models
  - Piloting energy advice to people with potential energy hardship
- Promoting smart energy systems and systems integration
  - Energy strategy
  - Urban development platform

Individual actions in the tables below are based on this action portfolio. More precise information on the 305 individual actions planned already earlier are in the annexed Carbon Neutral Tampere 2030 roadmap.

Table B-2.2.1: Individual action 1 outlines		
Action outline	Action name	Co-creating actions in pilot areas to make all forms of transport more equal
	Action type	Social participation and spatial intervention
	Action description	To be determined in more detail during 2024
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	Democracy and participation, Infrastructure
	Outcome (according to module B-1.1)	Co-creation of the needed actions together with citizens.
Implementation	Responsible bodies/person for implementation	Carbon Neutral Action Programme/City of Tampere, Traffic System Planning Unit/City of Tampere,
	Action scale & addressed entities	District scale intervention with how transport infrastructure is distributed between different modes of transport
	Involved stakeholders	Citizens
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Transport fuels
	GHG emissions reduction estimate (total) per emission source sector	Reduced private car use and number of vehicles in the city
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.2: Individual action 2 outlines		
(fill out one sheet per intervention/project)		
Action outline	Action name	Co-creating actions with big employers to promote sustainable transport
	Action type	Stakeholder co-creation with awareness campaign and physical intervention
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	Democracy and participation
	Outcome (according to module B-1.1)	Co-creation of the needed actions together with citizens/employers.
Implementation	Responsible bodies/person for implementation	Climate and Environmental Unit/City of Tampere, Traffic System Planning Unit/City of Tampere
	Action scale & addressed entities	Chosen stakeholder organisations and their employees, co-creation leading to awareness campaigns and physical interventions
	Involved stakeholders	Big employers
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Transport fuels

	GHG emissions reduction estimate (total) per emission source sector	Reduced private car use and number of vehicles in the city
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.3: Individual action 3 outlines		
Action outline	Action name	Studying the public opinion
	Action type	Awareness raising
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	Learning and capabilities
	Outcome (according to module B-1.1)	More knowledge provided on the impacts of sustainable mobility to city planners, decision makers and citizens.
Implementation	Responsible bodies/person for implementation	Climate and Environmental Unit/City of Tampere, Traffic System Planning Unit/City of Tampere
	Action scale & addressed entities	City/region-wide population studies
	Involved stakeholders	Tampere University, Citizens, Decision makers
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Transport fuels
	GHG emissions reduction estimate (total) per emission source sector	Reduced private car use and number of vehicles in the city
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.4: Individual action 4 outlines		
(fill out one sheet per intervention/project)		
Action outline	Action name	Guiding city logistics transition to lighter vehicles and alternative propulsion
	Action type	City logistics
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	Governance & Policy
	Outcome (according to module B-1.1)	Less heavy fossil fuel vehicles used in city logistics Less transport emissions from city logistics
Implementation	Responsible bodies/person for implementation	Traffic System Planning Unit/City of Tampere, Climate and Environmental Unit/City of Tampere
	Action scale & addressed entities	City center and district centers, heavy vehicles and logistics companies
	Involved stakeholders	Companies with big logistics needs
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	N/A

	Removed/substituted energy, volume or fuel type	Transport fuels
	GHG emissions reduction estimate (total) per emission source sector	Less transport emissions from city logistics
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.5: Individual action 5 outlines		
Action outline	Action name	Communicating with big fossil fuel users to update projections and plans
	Action type	Awareness, technical intervention
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Green Industry
	Systemic lever	Technology & Infrastructure
	Outcome (according to module B-1.1)	Emissions from industrial processes will go down
Implementation	Responsible bodies/person for implementation	Climate and environmental policy unit
	Action scale & addressed entities	Industrial facilities
	Involved stakeholders	Industry stakeholders
	Comments on implementation	Requires private stakeholder investment
Impact & cost	Generated renewable energy (if applicable)	
	Removed/substituted energy, volume or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	50 000 t CO2e (Industry and work machines)
	Total costs and costs by CO2e unit	Private investment

Table B-2.2.6: Individual action 6 outlines		
Action outline	Action name	Implementing Green Deal for zero-emission construction sites
	Action type	Governance intervention
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Green industry
	Systemic lever	Governance & policy
	Outcome (according to module B-1.1)	Zero-emission construction sites start becoming the norm
Implementation	Responsible bodies/person for implementation	Construction and Maintenance of Urban Environment unit, Real estate and housing, Climate and Environmental policy unit
	Action scale & addressed entities	Construction sites of the city organisation
	Involved stakeholders	Construction contractors
	Comments on implementation	The implementation happens gradually
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Work machinery fuels

	GHG emissions reduction estimate (total) per emission source sector	5000 tCO2e
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.7: Individual action 7 outlines		
Action outline	Action name	Oil heating advice to SMEs and to private home owners, developing financing models
	Action type	Awareness raising, technical intervention
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	Learning and capabilities
	Outcome (according to module B-1.1)	Citizens can identify the most affordable energy efficiency actions
Implementation	Responsible bodies/person for implementation	Climate and environmental policy unit, Ecofellows Ltd.
	Action scale & addressed entities	Citizens and private companies with oil heating
	Involved stakeholders	Citizens, energy efficiency solution providers
	Comments on implementation	Implemented also currently
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Heating oil
	GHG emissions reduction estimate (total) per emission source sector	Oil heating is changed to renewable energy or district heating
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

Table B-2.2.8: Individual action 8 outlines		
Action outline	Action name	Piloting energy advice to people with potential energy hardship
	Action type	Awareness raising, technical intervention
	Action description	To be planned in more detail during 2024
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	Learning and capabilities
	Outcome (according to module B-1.1)	Citizens can identify the most affordable energy efficiency actions
Implementation	Responsible bodies/person for implementation	Climate and environmental policy unit, Ecofellows Ltd.
	Action scale & addressed entities	Piloting in districts
	Involved stakeholders	Citizens, companies with energy efficiency solutions
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume or fuel type	Energy efficiency in private homes

	GHG emissions reduction estimate (total) per emission source sector	Energy use becomes more efficient in residential buildings
	Total costs and costs by CO2e unit	Costs have not yet been estimated.

B-2.3: Summary strategy for residual emissions
Tampere has decided to learn more about offsetting residual emissions until 2025 and then build a strategy for creating the market for reliable and permanent carbon removals. The compensation options available currently are not transparent enough. The local carbon sinks could cover up to 30 % of the needed amount, but according to preliminary studies carbon sink amount varies a lot from year to year. The city owns a small part of forests in Tampere area, but the large part is privately owned and the city does not have means to regulate or guide their use. Another option that is starting to look viable is local carbon capture. One company in the region produces biochar that can be used for example in green area construction to create carbon storage. Encouraging wood construction does the same. In addition the city has worked together with the power utility on feasibility studies for Carbon capture and use or storage in biomass and waste incineration plants. The future plan is to find viable options for storing carbon and creating synthetic fuels form the captured carbon with the help of renewable energy, biomethanation and hydrogen production.

4.3 Module B-3 Indicators for Monitoring, Evaluation and Learning

Table B-3.1: Indicators

Outcomes/ impacts addressed	Action/ project	**Indicator No.**	Indicator name		Target values	
					2025	2030
Global warming potential		1	Climate emissions		526 kt CO2-e/a	260 kt CO2-e/a
Energy systems		1.1	Emissions from buildings – electricity			40 kt CO2-e/a
Energy systems	Action 7	1.2	Emissions from buildings - heating			39 kt CO2-e/a
Mobility &Transport		1.3	Emissions from transport			115 kt CO2-e/a
Waste		1.4	Emissions from waste			16 kt CO2-e/a
Green Industry	Actions 5 & 6	1.5	Emissions from Industry and work machines			39 kt CO2-e/a
Green Industry		1.6	Emissions from industrial electricity			7 kt CO2-e/a
AFOLU		1.7	Emissions from agriculture			4 kt CO2-e/a

Built environment		2	Residential floor area planned for the public transport zones and for the district centres		85 %	90 %
Mobility & transport : modal shift	Action 1 & 2	3	Share of sustainable modes of transport on an autumn weekday		63 %	69 %
Mobility & transport : modal shift	Action 1 & 2	3.1	Cycling		Targets are set for the total only	
Mobility & transport : modal shift	Action 1 & 2	3.2	Walking		see above	
Mobility & transport : modal shift	Action 1 & 2	3.3	Public transport		see above	
Mobility & transport : modal shift	Action 1 & 2	3.4	Private cars		see above	
Mobility & transport : alternative propulsion		4	Percentage of vehicles with alternative propulsion systems in traffic use in Tampere		20 %	35 %
Mobility & transport: alternative propulsion		4.1	Percentage of vehicles using alternative propulsion systems of the city organisation's passenger car fleet		40%	100 %
Mobility & transport: alternative propulsion		4.2	Percentage of vehicles using alternative propulsion systems of the city organisation's all vans		20 %	100 %
Mobility & transport: alternative propulsion		*5*	*Share of outsourced low-emission propulsion transport services (bus and tramway*		*35 %*	*100%*

			line kilometres)			
Built Environment: Wood construction		6	Percentage of wooden apartment block construction from all new apartment blocks on plots allocated by the city		15 %	20 %
Energy systems: Decarbonizing district heating		7	Percentage of renewable energy of local heat and power company's production		80 %	90 %
Energy systems: Decarbonizing district heating		8	Reduction of greenhouse gas emissions from Tampereen Energia production as compared to 2010		*80 %*	*95 %*
Energy systems		9	The capacity of grid-connected solar energy			20 MW
Waste & circular economy: Circular economy plan		10	Municipal waste recycling rate		55 %	60 %
Waste & circular economy		11	Percentage of procurements involving environmental criteria of city's all procurements		Targets are yet to be determined	
Waste & circular economy		12	Percentage of meals served by the municipal company Voimia that are climate friendly (includes meals in schools and daycare)		70	90
Green infrastructure & nature based solutions		13	Amount of inner-city green area in town plans and master plans		Targets are yet to be determined	

			per (m2/resident)			
Financing		14	Percentage of climate investments in climate budget of city's total investments (5 % in 2022)		No official targets	No official targets
Climate warming potential		15	Residual emissions			20 %

Table B-3.2.1: Indicator 1 – 1.7 Metadata	
Indicator Name	Climate emissions, total and by sector
Indicator Unit	kt CO2-e/a
Definition	Annual regional greenhouse gas emissions in Tampere.
Calculation	Based on the CO2 report methods, all grid-supplied energy emissions are included in these numbers
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	All sectors
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Each sector connects to several pathways
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	CO2 report
Expected availability	Available
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	City Strategy

Table B-3.2.2: Indicator 2 Metadata	
Indicator Name	Residential floor area planned for the public transport zones and for the regional centres
Indicator Unit	%
Definition	Percentage of residential floor area planned for the public transport zones and for the regional centres
Calculation	
Indicator Context	

Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Mobility & transport, built environment
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Mobility transport, modal shift and Built environment, focusing residential planning
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	City of Tampere, urban planning
Expected availability	available
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	City strategy

Table B-3.2.3: Indicator 3 Metadata	
Indicator Name	Share of sustainable modes of transport on an autumn weekday
Indicator Unit	%
Definition	Share of sustainable modes of transport on an autumn weekday
Calculation	Based on national travel survey methods. Share of trips.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Mobility & transport: modal shift
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Mobility & Transport, modal shift
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	National travel survey, other sources being developed
Expected availability	Available every 4 years
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	City Strategy, SUMP

Table B-3.2.4: Indicator 4 Metadata	
Indicator Name	Percentage of vehicles with alternative propulsion systems in traffic use in Tampere
Indicator Unit	%
Definition	Percentage of vehicles with alternative propulsion systems in traffic use in Tampere
Calculation	Vehicles with electricity, plug-in hybrid and gas as propulsion are calculated as having alternative propulsion
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Mobility & transport
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Mobility & Transport, alternative propulsion
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Traficom database or SYKE indicators
Expected availability	Available
Suggested collection interval	Yearly
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	SYKE

Table B-3.2.5: Indicator 4.1 Metadata	
Indicator Name	Percentage of vehicles using alternative propulsion systems of the city organisation's passenger car fleet
Indicator Unit	%
Definition	Percentage of vehicles using alternative propulsion systems of the city organisation's passenger car fleet
Calculation	Vehicles with electricity, plug-in hybrid and gas as propulsion are calculated as having alternative propulsion
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Mobility & transport
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits

Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Mobility & Transport, alternative propulsion
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Infra Oy subsidiary
Expected availability	Can be aquired
Suggested collection interval	Yearly
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.6: Indicator 4.2 Metadata	
Indicator Name	Percentage of vehicles using alternative propulsion systems of the city organisation's all vans
Indicator Unit	%
Definition	Percentage of vehicles using alternative propulsion systems of the city organisation's all vans
Calculation	Vehicles with electricity, plug-in hybrid and gas as propulsion are calculated as having alternative propulsion
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Mobility & transport
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Mobility & Transport, alternative propulsion
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Infra Oy subsidiary
Expected availability	Can be aquired
Suggested collection interval	Yearly
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.7: Indicator 5 Metadata	
Indicator Name	Share of outsourced low-emission propulsion transport services (bus and tramway line kilometres)
Indicator Unit	%
Definition	Share of outsourced low-emission propulsion transport services (bus and tramway line kilometres)
Calculation	The regional public transport unit estimates the number of vehicle kilometers driven with different fuels and electricity by all operators together and allocates the kilometers to different municipalities it operates in.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it impact?	Mobility & Transport
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Mobility & Transport, alternative propulsion
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Nysse, regional public transport service unit
Expected availability	Available since 2023
Suggested collection interval	Yearly
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.8: Indicator 6 Metadata	
Indicator Name	Percentage of wooden apartment block construction from all new apartment blocks on plots allocated by the city
Indicator Unit	%
Definition	Percentage of wooden apartment block construction from all new apartment blocks on plots allocated by the city
Calculation	To be defined more precisely
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Built environment
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits

Can the indicator be used for monitoring impact pathways?	no
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	City of Tampere spatial data
Expected availability	To be determined
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.9: Indicator 7 Metadata	
Indicator Name	Percentage of renewable energy of local heat and power company's production
Indicator Unit	%
Definition	Percentage of renewable energy of local heat and power company's production
Calculation	Tampereen Energia reports annually on their energy sources. Renewables currently include biomass, waste heat (heat pumps) and half of waste used in CHP.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Energy systems
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Decarbonizing the district heating network
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Tampere Power Utility annual report/corporate responsibility report
Expected availability	Available
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.10: Indicator 8 Metadata	
Indicator Name	Reduction of greenhouse gas emissions from Tampereen Energia production as compared to 2010
Indicator Unit	
Definition	Reduction of greenhouse gas emissions from Tampereen Energia production as compared to 2010
Calculation	Tampereen energia emissions energy production emissions in 2010 were 983 kt Co2, the target is to reduce it down to 53 kt of CO2 by 2030.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Energy systems
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes
If yes, which NZC impact pathway is it relevant for?	Energy, Decarbonizing the district heating network
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Tampere Power Utility annual report/corporate responsibility report
Expected availability	Available
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.11: Indicator 9 Metadata	
Indicator Name	The capacity of grid-connected solar energy
Indicator Unit	MW
Definition	The capacity of grid-connected solar energy
Calculation	The local electricity network calculates the total capacity of grid-connected solar energy. This includes small units in residential and service buildings.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Energy systems
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	Yes

If yes, which NZC impact pathway is it relevant for?	Energy, Investments in solar panels increases
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Tampere Power Utility Responsibility Report
Expected availability	Available
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.12: Indicator 10 Metadata	
Indicator Name	Municipal waste recycling rate
Indicator Unit	%
Definition	Municipal waste recycling rate
Calculation	The local waste management subsidiary calculates the rate of recycling in the waste they collect.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Waste & circular economy
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Pirkanmaan Jätehuolto Ltd
Expected availability	Available
Suggested collection interval	Yearly
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.13: Indicator 11 Metadata	
Indicator Name	Percentage of procurements involving environmental criteria of city's all procurements
Indicator Unit	%
Definition	Percentage of procurements involving environmental criteria of city's all procurements
Calculation	The number of procurements taken place in the city compared to the number of total procurements

Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Waste & circular economy
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Climate and Environmental Policy Unit
Expected availability	March
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.14: Indicator 12 Metadata	
Indicator Name	Percentage of meals served by the municipal company Voimia that are climate friendly (includes meals in schools and daycare)
Indicator Unit	%
Definition	Percentage of meals served by the municipal company Voimia that are climate friendly (includes meals in schools and daycare)
Calculation	
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Waste & circular economy
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Voimia environmental reporting
Expected availability	Available
Suggested collection interval	annually
References	

Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.15: Indicator 13 Metadata	
Indicator Name	Amount of inner-city green area in town plans and master plans per redsident (m2/resident)
Indicator Unit	m2/resident
Definition	Amount of inner-city green area in town plans and master plans per resident (m2/resident)
Calculation	
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Green infrastructure & nature based solutions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits
Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Tampere City spatial data
Expected availability	Available
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.16: Indicator 14 Metadata	
Indicator Name	Percentage of climate investments in climate budget of city's total investments (5 % in 2022)
Indicator Unit	%
Definition	Percentage of climate investments in climate budget of city's total investments (5 % in 2022)
Calculation	
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Financing
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	Co-Benefits

Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Climate and Environmental policy unit
Expected availability	March
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table B-3.2.17: Indicator 15 Metadata	
Indicator Name	Residual emissions
Indicator Unit	%
Definition	Percentage of climate emissions remaining in target year 2030 compared to baseline 1990
Calculation	Perccentage of emission numbers based on CO2 report
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it impact?	
Does the indicator measure indirect impacts (i.e. co- benefits)?	No
If yes, which co-benefit does it measure?	
Can the indicator be used for monitoring impact pathways?	No
If yes, which NZC impact pathway is it relevant for?	
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Climate and Environmental policy unit, CO2 report
Expected availability	May
Suggested collection interval	annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	Climate budget, City strategy

5 Part C – Enabling Climate Neutrality by 2030

5.1 Module C-1 Organisational and Governance Innovation Interventions

Module C-1 "Organisational and Governance Innovation Interventions" consists of a summary table, listing organizational and governance interventions and describing their impact (C-1.1) and a section for more detailed descriptions and comments (C-1.2).

Table C.1.1: Enabling organisational and governance interventions

Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Carbon Neutral Tampere 2030 Roadmap	The roadmap aggregates the actions that the city plans to take in order to achieve climate neutrality by 2030.	Climate and Environmental Policy unit/City of Tampere	All city units and subsidiaries	Engages the city organization in the climate neutrality target. Includes impact assessments of the planned actions.	Increases cooperation, increases transparency on the city's climate work.
Climate Budget	Monitors the progress towards the climate neutrality target.	Climate and Environmental Policy unit/City of Tampere, Economic unit/City of Tampere	All city units and subsidiaires	Monitors the adequacy of implemented actions and provides input for future budget negotiations.	Increases transparency on the city's spending.
Climate Partners	Tampere region's climate partnership model involves companies and communities in the region in pursuing a carbon-neutral Tampere. The Climate Partnership	Business Tampere, Climate and Environmental Policy unit/City of Tampere, Ekokumppanit Oy	A total of 116 companies, associations and communities	Climate partners are committed to continuously developing their operations to be more responsible in accordance with the principles of sustainable development	Increasing cooperation, accelerating climate action by the private sector.

	is, as the name implies, a partnership; it is intended to benefit both parties to the partnership agreement.				
Advisory Board on Circular Economy	To guide and steer up the circular economy within the Tampere Region	Climate and Environmental Policy Unit/ City of Tampere		Public-private dialogue on circular economy actions	Implementing Tampere's Circular Economy plan. Material prices remain more stable
School meals working group	Brings together all those involved in school meals and food education in Tampere. The working group will propose measures to promote school meals and food education, which will be incorporated into, for example, school year plans, service contracts and student councils.	Climate and Environmental Policy unit and primary education/The City of Tampere. FUSILLI-project (until 2024)	Politicians, primary education administration and development, Voimia (the city's own company that organises the city's food service procurement), experts (climate and environmental policy, health and well-being), headmasters, teachers, pupils, parents	The development of school meals and food education is an essential part of eco-social education in primary education in Tampere. Increasing food literacy is an important part of the city's efforts to make a long-term impact on the consumption-based emissions of its residents.	Promoting children's well-being and health
Vulnerability analysis	The City of Tampere wants to adapt to climate change in the best possible way. In its adaptation work, the city wants to take into account groups that are particularly	Climate and Environmental Policy Unit/The City of Tampere	Children and young people, Elderly and older people, People with disabilities, People on low incomes, The long-term sick and mentally ill, Immigrants and refugees, People who earn their	In climate work, it is important to identify marginalised groups so that the future is equal for all, regardless of their socio-economic background and where they live.	Equality

	vulnerable to climate change. Therefore, measures to adapt and prepare for climate change will be designed in cooperation with vulnerable groups.		living from agriculture and forestry, Tourism entrepreneurs and event producers, Businesses dependent on international logistics chains and foreign raw materials		
Energy strategy	Co-creating a common energy strategy for all stakeholders addressing a just energy transition in the city/region and local economic development	Climate and environmental policy unit	Energy companies, city planning units, private companies	Creating a common vision and actions related to energy the different stakeholders can work together towards the same goals and thus further the energy transition, make it just and make the most of it in terms local economy	Just transition
Urban development platform	A format of co-operating openly togeher with different stakeholders of urban development, especially in energy issues in the first phase	REKO-project	Urban planners, companies and start-ups in the urban development and energy fields	Efficiently exchanging information between stakeholders and creating solutions for smart energy systems and systems integration	New economic development in the region

C-1.2: Description of organisation and governance interventions – textual and visual elements

The Climate Neutral Tampere 2030 roadmap

The City of Tampere's biggest governmental intervention is the Climate Neutral Tampere 2030 Roadmap. The Climate and Environmental Policy Unit coordinates the process and monitors the implementation of the measures. The implementation of the roadmap is embedded into the City's strategic management systems as the City units include their climate actions from the roadmap to their annual service and financial plans, which will be officially monitored (Figure 5.1).

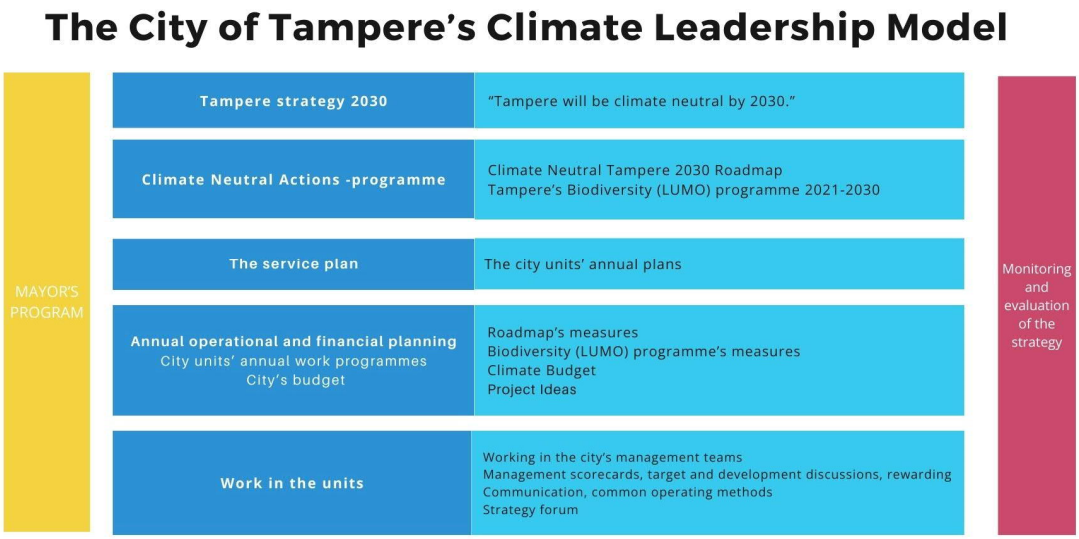

Figure 5.1. The City of Tampere's Climate Leadership Model.

Climate Budget

Tampere's climate budget with the city's budget and financial statements. It is used to monitor the progress towards the climate neutrality target and the adequacy of implemented measures. At the same time, the goal of climate neutrality becomes more concrete in the annual budget. The climate budget provides information for decision-making and increases transparency for residents. Tampere's climate budget consists of two parts: the climate emissions budget, and the financial plan for climate actions.

Climate Partners

The City of Tampere, Business Tampere and Ekokumppanit Ltd are coordinating the Tampere Region Climate Partnership model. A total of 116 companies, associations and communities are already involved. The Climate Partners themselves define their own organisation's climate change mitigation actions and targets. The Climate Partnership Network has meetings with content that supports companies in their climate work.

Circular Economy (Advisory Board of Circular Economy)

Besides ambitious climate actions transition to circular economy is highly on the agenda of City of Tampere. Circular Economy has its dedicated *Circular Economy Action Plan* with four focus areas (the built environment in land use planning and construction, material cycles and waste management as well as the sustainable food system). In the climate neutral roadmap circular economy is included especially in "Sustainable consumption" part.

Promoting circular economy still suffers the lack of data on the consumption of materials, material flows and data on the use of natural resources. It can be foreseen though that the information on both CO2 emissions and on materials flows will be complemented within the coming years, as new legislation will require more detailed information. Through pilot projects and public procurement and their circular economy criteria the city of Tampere can influence the operating environment and the demand for green solutions (which private companies offer). This is also one of the most important interfaces of

cooperation between the private sector (companies) and the City of Tampere, in particular in the construction sector. This is why the City of Tampere has organized the Advisory Board of Circular economy, which brings together different stakeholders.

School Meals Working Group

The FUSILLI (Fostering the Urban food System Transformation through Innovative Living Labs Implementation) project aims to develop and implement sustainable systemic solutions for food systems in cities and surrounding areas. The main objective is to remove barriers to the development and implementation of integrated, systemic food policies that support the transition towards sustainable food systems in urban, peri-urban and peri-urban rural areas.

As the project progressed, the need for a School Meals Working Group was identified, where different stakeholders could discuss about the issue. The working group will propose measures to promote school meals and food education, for example in school year plans, service contracts and student councils.

Vulnerability Analysis
The City of Tampere wants to adapt to climate change in the best possible way. In its adaptation work, the city wants to take into account groups that are particularly vulnerable to climate change. Therefore, measures to adapt and prepare for climate change will be designed in cooperation with vulnerable groups. Vulnerable groups have been identified as children and young people, the elderly and elderly, people with disabilities, people on low incomes, people with long-term illnesses and mental health problems, migrants and refugees. The results of the vulnerability analysis will be completed by the end of 2023 and will be used, for example, in the update of the Carbon Neutral Tampere 2030 roadmap.

5.2 Module C-2 Social and Other Innovation Interventions

Module C-2 "Social and Other Innovation Interventions" consists of a summary table, listing organizational and collaborative governance interventions and describing their impact (C-2.1) and a section for more detailed descriptions and comments (C-2.2).

Table C.2.1: Enabling social innovation interventions

Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Climate neutral actions	The Carbon Neutral Actions is a strategic development programme of City on Tampere. The key aim is to support residents in changing their own consumption and mobility habits and ensure fair	Climate and Environmental Policy Unit/ City of Tampere	Citizens, Communities, Residents' associations, Tampere University, Businesses.	The goal is to identify and develop approaches that support citizens' own capability and motivation to change their consumption and mobility habits to make them more sustainable.	Public acceptance of climate action increases when it is co-created. Sustainable mobility and consuming increases overall health, well-

	and equitable transition to a climate resilient society.				being, safety and equality.
We Make Transition! (2023-2025)	The project aims to strengthen societal resilience and eco-social sustainability by learning, adapting and piloting transition management methodology for engaging civil society and other innovation actors to co-create solutions for sustainability.	The Baltic Institute of Finland	Council of Tampere Region, The Helsinki-Uusimaa Regional Council, Regional Council of Southwest Finland, Foundation for Science and Liberal Arts Domus Dorpatensis, Social Innovation Centre, Vidzeme Planning Region. Baltic Institute for Regional Affairs BISER, City of Gdynia, Trøndelag County Authority, University of Bremen	The main output of the project will be a manual on practical utilisation of Transition Arena method at regional and local administrations. The purpose of the manual is to provide local and regional authorities inspiration for a new way of thinking, concrete cases and understanding on the benefits of involving all levels of society in the strategy and development work to enhance societal resilience and eco-social sustainability.	Public acceptance of climate action increases when it is co-created and take into account all groups, which increases equality.
Climate Justice Discussion Forum	A discussion forum bringing together residents and other stakeholders will be set up to support the Carbon Neutral Actions development programme, with the aim of ensuring that the programme's interventions are fair and take account of the different opportunities for	Climate and Environmental Policy Unit/ City of Tampere	Commissions and advisory boards of the citizens (e.g. The youth council, elder people's council, disability council), local NGOs, University of Tampere	The Forum supports the citizen participation in climate action and promotes their empowerment.	Increased public acceptance, equality and safety in the city.

	different types of people in Tampere to take carbon neutral actions.				
The Mobility Carbon Footprint Calculator	The mobility carbon footprint calculator in the Tampere.Finland application encourages Tampere residents to move greener. The calculator shows, for example, user's most common Mode of Transport and monthly carbon footprint.	Climate and Environmental Policy Unit/ City of Tampere	Tampere. Finland - application, Kausal Oy, Geniem Oy.	The city of Tampere receives valuable statistical information and an understanding of where and how the citizens move. In this way, services can be developed to meet the needs of residents. An individual user cannot be identified from the data.	Sustainable mobility increases overall health, well-being, safety and equality.
Keli - Promoting more sustainable mobility with the help of a carbon footprint calculator (2022-2023)	This study project examined whether people could be encouraged to choose walking or cycling instead of driving by appealing to the health benefits of physical activity. The study did an intervention using the mobility carbon footprint calculator.	Climate and Environmental Policy Unit/ City of Tampere	The University of Helsinki, VATT Institute for Economic Research, Kausal Oy, Geniem Oy, Citizens	The project, activated citizens to move more sustainably and participate in the implementation of the city's climate targets, implement the city's strategy and develop the technical implementation of the calculator using open source code.	Sustainable mobility increases overall health, well-being, safety and equality.
Tampere Cycles Project (2022)	The project aimed to improve cycling in Tampere opportunities and a visible campaign year for city bikes 2022. This increased the acceptance of cycling in the city.	Traffic System Planning Unit/ City of Tampere	Public Transport Unit, Nysse/The City of Tampere, Ekokumppanit Oy	As public acceptance and awareness of improved cycling conditions increases, the number of cyclists will also increase.	Sustainable mobility increases overall health, well-being, safety and equality.

City Blues (Bluegreen nature-based solutions for climate change adaptation and citizen wellbeing) Interreg project 2023-2026	In the project integrated nature-based solutions (NBS) are developed for urban flooding and stormwater management. Project involves local residents and stakeholders in planning, implementation, monitoring and maintanance of the selected area in Tampere, near lake Iidesjärvi. The goal is to make the living environment for the inhabitants more inclusive, healthy, and attractive and to reduce pollution.	Green Areas and Stormwater Unit/ City of Tampere	NGOs, citizens, companies	The overall project aim is to support adaptation to negative effects of climate change and to improve green and blue infrastructure of densifying cities through integrated nature-based solutions (NBS) for urban flooding and stormwater management.	

C-2.2: Description of social innovation interventions – textual and visual elements

The Carbon Neutral Actions Programme

The Carbon Neutral Actions is a strategic development programme of the City of Tampere. The key aim is to support residents in changing their own consumption and mobility habits and ensure fair and equitable transition to a climate resilient society. The guiding principles and tools are co-creation and citizen participation, communication, use of data to support the change and broad collaboration with stakeholders. The goal is to identify and develop approaches that support citizens' own capability and motivation to change their consumption and mobility habits to make them more sustainable.

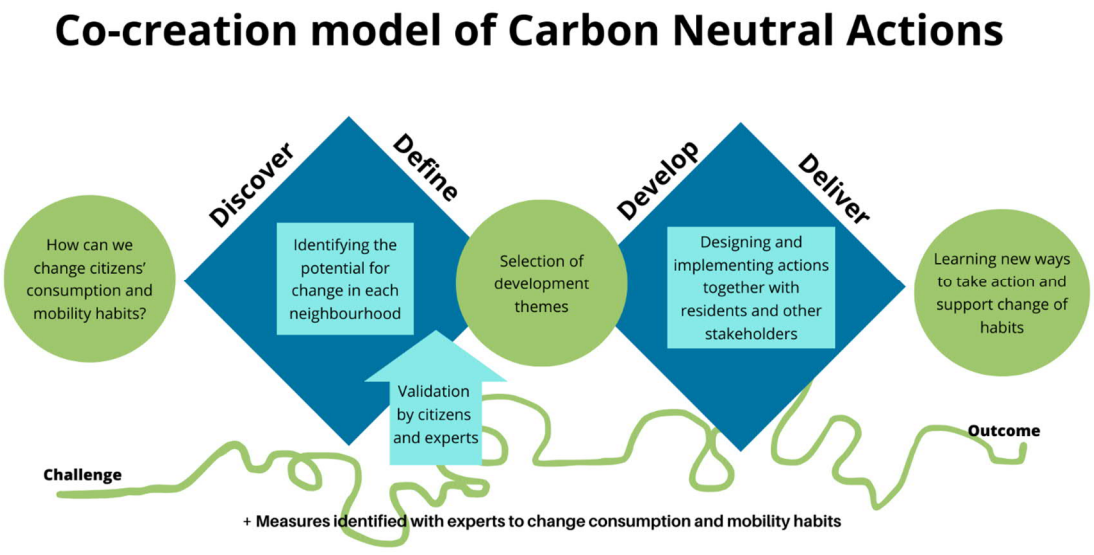

Figure 5.2. The Carbon Neutral Actions programme co-creates solutions together with the citizens.

Development programme operates at city district level and promotes change from a local perspective. Three different city districts have been selected to focus on. Through citizen insight, targeted actions to promote sustainable lifestyles in these areas will be considered. The programme has recognized that people have different motivations to make sustainable choices and it uses different motivational profiles identified through the survey to empower citizens to change their habits.

Besides working with citizens and other local actors, the programme supports actors in city organization to recognize and respond to the need to support citizens in their change. See all programme's stakeholders in Figure 5.3.

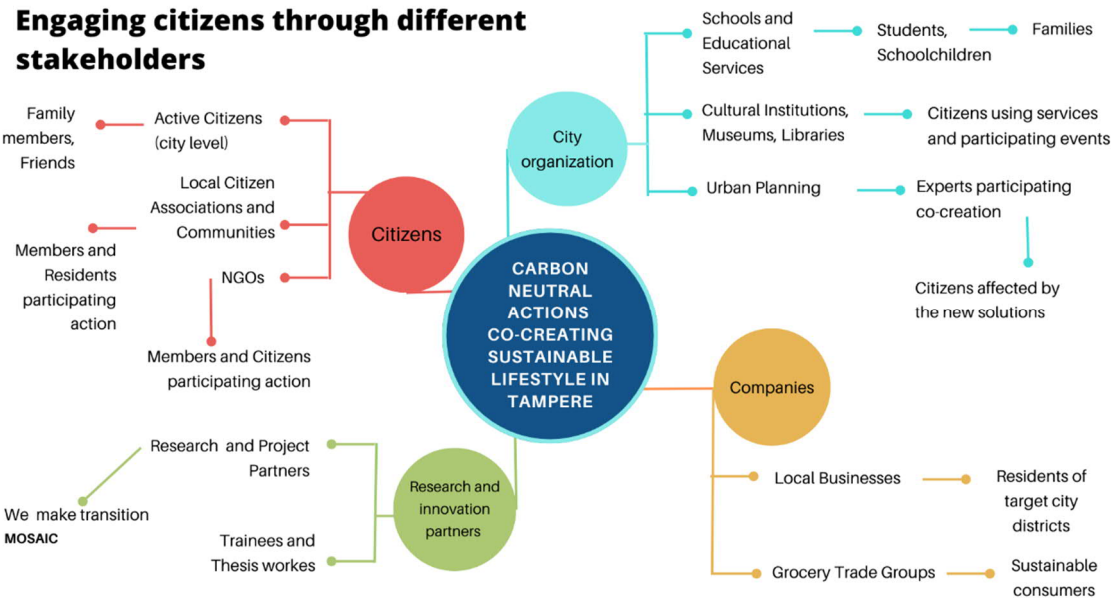

Figure 5.3. Recognized stakeholders of the Carbon Neutral Action's Programme.

We Make Transition!
We make transition! (2023-2025) is a transnational project co-financed by the EU Interreg Baltic Sea Region Programme. The project has 11 partners from 6 countries and is coordinated by the Baltic Institute of Finland. City of Tampere participates in the project as associated partner being the main beneficiary of the project.

The project aims to strengthen societal resilience and eco-social sustainability by learning, adapting and piloting transition management methodology for engaging civil society and other innovation actors to co-create solutions for sustainability. City of Tampere focuses on finding new ways to foster biodiversity and sustainable lifestyle in urban environment in cooperation with civil society actors, such as NGOs, associations, social entrepreneurs, communities and individuals. Best co-created solutions will be selected and implemented during the project.

Climate Justice Discussion Forum
The Forum supports the citizen participation in climate action and promotes their empowerment. By providing a forum to discuss climate action and the role of residents, the City of Tampere helps to increase understanding of the need for residents to play an active role and to motivate and support change in private arenas (indirect effects on emissions) to ensure fair and equitable transition to a climate resilient society. The forum will include people from different backgrounds, for example commissions and advisory boards of the citizens (e.g. the youth council, elder people's council, disability council), local NGOs and the University of Tampere.

The Mobility Carbon Footprint Calculator

Carbon footprint calculators help by steering people to change their behaviour. The City of Tampere has developed and published a free carbon footprint calculator for mobility in its city application. The project produces research information on how residents can be encouraged to use sustainable means of mobility. The calculator shows, for example, user's most common Mode of Transport and monthly carbon footprint. Every month you can aim for gold, silver or bronze level.

The city of Tampere receives valuable statistical information and an understanding of where and how the citizens move. In this way, services can be developed to meet the needs of residents. An individual user cannot be identified from the data.

KELI – Promoting more sustainable mobility with the help of a carbon footprint calculator
The Keli project used a mobility carbon footprint calculator in the Tampere.Finland application to see whether it would be possible to motivate people to choose walking and cycling instead of driving by appealing to the health impacts of physical activity. Messages about the health benefits of everyday physical activity were sent to certain users. The results were compared to a control group of calculator users who were not targeted with health messages. The health content made people use the application more, but no potential changes in mobility habits were found during the test period. Even though the people's mobility didn't change during the project, it gave important information about the issue to the city.

Tampere Cycles Project (2022)
The project aimed to improve cycling in Tampere opportunities and a visible campaign year for city bikes 2022. This increased the acceptance of cycling in the city. The project included "cycling agents". Every citizen who cycled during the winter was able to apply for the programme. Cycling agents monitored Tampere's cycle paths and reported on the condition of cycle paths, such as snow, slippery roads and icy pavements. As a result, the maintenance of the main cycling routes improved this winter.

City Blues (Bluegreen nature-based solutions for climate change adaptation and citizen wellbeing) Interreg project 2023-2026
In the project integrated nature-based solutions (NBS) are developed for urban flooding and stormwater management. Project involves local residents and stakeholders in planning, implementation, monitoring and maintenance of the selected area in Tampere, near lake Iidesjärvi. The goal is to make the living environment for the inhabitants more inclusive, healthy, and attractive and to reduce pollution. The overall project aim is to support adaptation to negative effects of climate change and to improve green and blue infrastructure of densifying cities through integrated nature-based solutions (NBS) for urban flooding and stormwater management.

5.3 Module C-3 Financing of Action Portfolio

Module C-3 "Financing of Action Portfolio" should contain the list of action portfolios and interventions outlined in Modules B-2, and those from C-1 and C-2 with cost implication to provide a summary list of interventions that need to be unpacked in the Investment Plan.

Table C-3.1: Summary of interventions with cost implication (to be unpacked in Investment Plan)

Action/ intervention name	Responsible entity	Start/end date	Field of action	Impact	Total cost estimated
Existing planned actions of the city organisation related to transportation	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Transportation	1 tCO2	147,1 M€

Existing planned actions of the city organisation related to built environment	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Built Environment	26 tCO2	38,28 M€
Existing planned actions of the city organisation related to energy systems	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Energy Systems	N/A: No Emission Impact Assessment	1,5 M€
Existing planned actions of the city organisation related to green infrastructure and nature based solutions	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Green Infrastructure and Nature Based Solutions	N/A: No Emission Impact Assessment	7,2 M€
Existing planned actions of the city organisation related to waste and circular economy	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Waste and Circular Economy	N/A: No Emission Impact Assessment	N/A No Investments Planned
Existing planned actions of city's subsidiaries organisation related to transportation	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plant Table 6	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Transportation	1270 tCO2	269,6 M€
Existing planned actions of city's subsidiaries organisation	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap and	Timetable for implementation stated in Carbon Neutral Tampere 2030	Built Environment	16 797 tCO2	110,9 M€

related to built environment	in Investment Plant Table 6	Roadmap and in Investment Plan (Annex)			
Existing planned actions of city's subsidiaries organisation related to energy systems	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plant Table 6	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Energy Systems	65 608 tCO2	117,9 M€
Existing planned actions of city's subsidiaries organisation related to green infrastructure and nature based solutions	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plant Table 6	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Green Infrastructure and Nature Based Solutions	N/A: No Emission Impact Assessment	5,3 M€
Existing planned actions of city's subsidiaries organisation related to waste and circular economy	Responsibilities stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plant Table 6	Timetable for implementation stated in Carbon Neutral Tampere 2030 Roadmap and in Investment Plan (Annex)	Waste and Circular Economy	N/A: No Emission Impact Assessment	25,6 M€

6 Outlook and next steps

This section should draw any necessary conclusions on the Action Plan above and highlight next steps and plans for further refining the Action Plan as part of the Climate City Contract.

Plans for next CCC and Action Plan iteration – textual elements

This Climate City Contract describes our current situation. Our current Carbon Neutral Tampere 2030 Roadmap shows a 7% gap between our current measures and achieving our carbon neutrality target. In addition, our current measures need to be accelerated to become a reality. This is a gap identified in the Action Plan and we will seek solutions to this gap in the next roadmap update process together with the whole city organization.

The roadmap's updating process has been planned in parallel with the preparation of the CCC. Updating the roadmap is a highly interactive process and has been designed with a strong focus on customer feedback from the city's units. The Climate and Environment Policy Unit will organize workshops for the roadmap's themes. These workshops will take place by the end of January 2024. After the workshops, each unit will be individually met, and the measures taken by each unit will be discussed at these meetings. Cross-pollination meetings will also be organized between the units.

As a newly identified need, we will also organize financing meetings with the management of the units, the economic unit, the city's finance manager and the project office to discuss the financing of the actions; whether sufficient own-financing is available to implement the actions or whether external funding or loans – be they national or European - must be sought. In this way, we aim to ensure that the measures are implemented and meet the Investment Plan's gaps.

All meetings will be held by mid-March, after which the Climate and Environment Policy Unit will start to compile the roadmap into a single document by the end of May. The roadmap will be finalized by the end of August 2024, and at around the same time data will already be collected for the next climate budget, taking into account the measures negotiated in the roadmap's financial meetings. The roadmap will go through the city's management groups and then to the city's board for approval. The final roadmap will be approved in autumn 2024.

The roadmap work will also involve an input from residents, as the Climate Neutral Actions development programme will organize a workshop in late September 2023 before the start of the roadmap's update process itself within the city. With the upcoming Vulnerability Analysis and also the City of Tampere's award-winning SUMP (Sustainable Urban Mobility Plan), we can learn lessons for the roadmap, on inclusion and equality.

We have also identified specific companies in the city with which a more strategic partnership would be relevant in climate work. These include a factory and large companies with the potential to influence the commuting of large numbers of people. Stakeholder engagement will play a key role in the coming years, and the Mission process will support this work.

Since the completion of the latest roadmap, we have responded to the gaps identified in the Action Plan and the Investment Plan. New rounds of updates both in CCC and roadmap will show more need for re-evaluation and gaps. The CCC will be updated in 2025, and to this point we have gained more business and citizen cooperation to implement the Action Plan in collaboration with the Climate Neutral Actions development programme.

While updating the roadmap and later the CCC, actions will be implemented continuously. The Climate and Environment Policy Unit will monitor this by requesting regular updates to the Climate Watch service. We have identified a need for meetings to jointly review the progress of measures within the themes when the roadmap's updating process is not running. These will be held a few times a year.

Along the way, we will learn and ensure the planned implementation of measures to achieve carbon neutrality in Tampere by 2030. To do this, we need cooperation, into which we will focus on in the coming years. We will also engage more Tampere-based companies as our Mission Partners.

The CCC-process has already shown that we have gaps in our climate work. We need support for these and rethinking of the city's governance approaches. For example, funding issues are a big challenge for us, and this is what we will be working on before the next CCC update to make up for the gaps. The City of Tampere is already engaged in co-development, but this needs to be continuously developed in a way that takes into account all citizens and businesses of different backgrounds.

7 Annexes

Add any textual or **visual material** to the 2030 Climate Neutrality Action Plan in the ANNEX as necessary.

Annexes:

Carbon Neutral Tampere 2030 Roadmap, version 2022

https://www.tampere.fi/sites/default/files/2023-04/climate_neutral_tampere_roadmap_0.pdf

Climate budget in visuals

https://app.powerbi.com/view?r=eyJrIjoiMDA3Njg2ZTgtOWU3ZC00OWYyLThhNjAtODZiY2QwNDVmMzQ2IiwidCI6ImRkZTVkYzEyLWJkM2MtNGMwNi04NWNjLTM0MzYxZWZlOWFkNCIsImMiOjI9

Tampere emissions inventory 2021 (pdf-annex)

CO2-report emissions calculation methodology (in Finnish)

https://co2.sitowise.com/CO2tilastot/CO2-raportti_Menetelm%C3%A4kuvaus_2023.pdf

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of the City of Tampere

TAMPERE

NetZeroCities has received funding from the H2020 Research and Innovation Programme under the grant agreement n°101036519.

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Table of contents

1 Introduction

Explain your city's motivation to join the EU Mission "100 climate-neutral and smart cities by 2030" and highlight your city's present commitments to climate action. You may also want to include the aims of this document.

Your text

The City of Tampere joined the EU Mission "100 climate-neutral and smart cities by 2030" because we want to be part of the Mission Cities Initiative. Together, a large group of cities can make a difference in Europe and this can benefit other cities around the world, and we want to be part of the change. EU Mission will help us to make connections, get new perspectives and ideas, and get sparring support from experts. We hope the Climate City Contract process and the Mission Label will help mobilise more funding and finance which is needed to make an impactful change.

Mission label will also bring important recognition for the climate work we are already doing, while sharing our lessons with other cities. The label gives us a mandate around what we do, encouraging all businesses and citizens in the Tampere region to join us in working towards a carbon-neutral Tampere.

Tampere aims to be climate neutral by 2030. This means that Tampere will reduce its greenhouse gas emissions by 80 per cent compared to 1990 levels and that the remaining 20 per cent will be compensated for example, by increasing carbon sinks, such as forests and green areas. The climate neutrality goal has been explicitly stated in the city strategies and mayoral programs since 2017.

Tampere has a continuous tradition of sustainability and climate work since first citizen engagement actions in the 1990s. The climate neutrality goal has been explicitly stated in the city strategies and mayoral programs since 2017. A detailed Carbon Neutral Tampere 2030 roadmap with 305 tangible actions, as well as emission impact and cost estimate evaluations, has been created through active citizen and stakeholder engagement and cross-sectoral cooperation. The roadmap and its latest update in October 2022 have been approved by the City Board. The plan will be regularly updated and monitored through an open platform, Tampere Climate and Environmental Watch.

The results of the climate work done in Tampere have been significant. To summarize the results, we have achieved a 30 % reduction in absolute greenhouse gas (GHG) emissions (reference year is 1990) while the city population has grown from 173 000 to 250 000 or 45 %. Subsequently, the per capita emissions have reduced more than 50 %. Since these figures from 2021, the city energy utility has renewed its largest plant in 2022 which will bring a further 20 percentage points decrease in GHG emissions.

The roadmap contains major actions such as investments in renewable energy and smart solutions in district heating, including carbon capture and storage studies, and saving energy by replacing outdoor lighting with smart LEDs and energy retrofitting of the city's service buildings. The construction of the tramway and the conversion of bus fleet to low emission will enable more sustainable mobility. Our city-owned public utility and service companies are committed to the climate neutrality goal.

People-centred housing, sustainable mobility, smart energy systems, circular economy, and green and blue infrastructure, as well as co-creation with citizens, are at the core of our flagship urban investments, such as the new Hiedanranta city district. We also use data- and AI-driven solutions to develop smarter and more sustainable urban infrastructure and public services.

Our annual climate budget is an important climate governance and transparency tool, which as part of the official financial statements makes visible the progress towards climate neutrality and the financial resources allocated for the measures.

Achieving the above climate vision requires a change in our ways of doing and thinking in all spheres of urban development and urban life, and determination for working together. Citizen empowerment, human-centered actions and co-creation are at the core of our climate policy and all related actions. We are co-creating a climate neutral city and a just and resilient urban future for Tampere together with our citizens,

The development of the CCC and the process it incorporates has already shown that we have gaps in our climate work. We need support for these, and a rethinking of the city's governance approaches. For example, funding issues are a big challenge for us, and this is what we will be working on before the next CCC update to make up for the gaps. The City of Tampere is already engaged in co-development, but this needs to be continuously developed in a way that takes into account all citizens and businesses of different backgrounds.

2 Goal: Climate neutrality by 2030

Articulate your 2030 climate neutrality ambition, as expressed and defined in your Cities Mission Expression of Interest (EoI). This should include your ambition and commitment to a 2030 horizon as a whole city, as well as describe any exclusion areas and summarise how these areas would be addressed beyond 2030. (A more detailed plan for exclusion areas should be included in the 2030 Climate Neutrality Action Plan.) Your 2030 ambition should be supported at a minimum by a Council decision, and it is recommended that it is also supported by a wider stakeholder group. We also recommend you to list other co-benefits you aim to achieve when working towards the climate neutrality goal, like well-being, health, equity, justice, financial savings.

Your text

The City of Tampere aims to be carbon neutral by 2030. This means that greenhouse gas emissions in the city area will be reduced by 80% compared to 1990 and the remaining 20% will be offset. Achieving this target will require a reduction in climate emissions, in particular from construction, housing, transport, energy use and consumption. The city's climate measures have been compiled in the Carbon Neutral Tampere 2030 roadmap, a long-term plan. The implementation of the roadmap measures can be monitored on the Tampere Climate Watch.

Our sector-specific vision for 2030 includes the following:

- The city will grow primarily into public transport zones and regional centres, the modal share of sustainable modes of transport will be 69%
- New construction will be at zero-energy level, and the carbon footprint of housing small
- Renewable energy will amount to 80%
- Consumption will be sustainable and the circular economy functioning
- Urban nature and structures will bind carbon

According to the roadmap impact analysis, the city’s measures will achieve a 73% reduction in greenhouse gas emissions by 2030. It has not yet been possible to assess the impacts of all measures. The most important factors that remain excluded from assessment are the measures whereby we can affect the mobility choices of local residents through instruments such as town planning and transport system development.

Achieving the above climate vision requires a change in our ways of doing and thinking in all spheres of urban development and urban life, and determination for working together. Citizen empowerment, human-centered actions and co-creation are at the core of our climate policy and all related actions. We are co-creating a climate neutral city and a just and resilient urban future for Tampere together with our citizens, communities, universities and companies. The Mission Label will be a big part of the achievement as well.

Co-benefits:

By working together to create a carbon-neutral city, we will also increase equality, safety, health, a welcoming and vibrant city, among other co-benefits. Mitigating climate change helps prevent habitat loss, while diverse, thriving nature helps adapt to climate change and acts as a carbon sink. These two should always be promoted simultaneously.

Reductions in greenhouse gas emissions often lead to health benefits. Lower levels of air pollutants improve air quality and reduce respiratory illnesses, and increased use of electric vehicles and public transportation reduce noise pollution, improving the quality of life for residents. Climate-friendly urban planning leads to more walkable cities, better public transportation, and increased green spaces, improving the quality of life for urban residents. Investments in public transportation and active transportation options can reduce traffic congestion and thus improve mobility in cities.

Climate actions are often economically profitable because those often result in cost savings; higher investment costs often pay for themselves quickly. Furthermore, climate actions drive innovation, fostering the development of new technologies and solutions that can have broader applications beyond just mitigating climate change thus boosting local economy. Transitioning to a low-carbon economy can create new job opportunities in renewable energy, energy efficiency, and other green and digital sectors, contributing to employment and economic growth. Investments in renewable energy sources and energy efficiency can reduce the dependency on fossil fuels, enhancing energy security and reducing exposure to energy price fluctuations.

In some cases, it is possible to monetise the economic benefits of the actions. A monetary assessment may increase the acceptability of measures by allowing their multiple benefits to be monetised, for example in a cost-benefit analysis. The City of Tampere's Investment Plan assesses the wider economic impacts of the city achieving its target of sustainable mode share by 2030, separately assessing the economic costs and benefits to the city organisation, citizens, and wider society (see IP Table 7). This has been done because mobility and modal shift have been identified as the key and most difficult elements to achieve the carbon neutrality target. The results also include the monetisation of indirect benefits, such as health benefits.

3 Key priorities and strategic interventions

This is the core section of the Commitments document that should summarise **at least 3 or 4 systemic strategic priorities** that need to be implemented for your city to become climate neutral by 2030. These should be meaningful changes that will have a profound impact on reducing GHG emissions in your city, like decarbonising the heating system in the city or generating 100% energy from renewables. The individual commitments between your city and other stakeholders should address these key priorities and contribute to reaching them. The annexed 2030 Climate Neutrality Action Plan should describe the all interventions, including those to reach your priorities as well as all further actions, in detail and describe how your city plans to implement them.

Your text

Tampere is experiencing a rapid population growth (245 000 inhabitants in 2021 vs. estimated 280 000 in 2040). This means major urban investments during this decade. We want to make sure all our investments and policy interventions contribute to climate neutrality and ecologically resilient urban biodiversity. Our overall vision is to ensure sustainable growth of Tampere without compromising health and well-being equity and urban biodiversity of the city.

Tampere's climate neutrality goal is defined as an 80% reduction from the 1990 emission level while offsetting the remaining 20%. The importance of climate change mitigation has been recognized in the Tampere City Strategy. One of the four focus areas set out in the City of Action Strategy published in 2021 is Carbon Neutral Actions. Among the goals of this focus area is a 60% emission

reduction from the 1990 level by the end of this council term (2025). In addition to the strategy, commitment to the climate neutrality goal is part of the Mayor's Programme for 2021–2025. According to the Mayor's Programme, the measures set out in the Carbon Neutral Tampere 2030 Roadmap will be implemented.

To pursue the strategy Tampere has established a four-year development programme, called Carbon Neural Actions, which focuses especially on citizens and private sector. The aim of the program is to enable sustainable choices for everyone. The Carbon Neutral Actions is one of the three new development programmes for the Council period and contributes to each of the four priorities of the strategy. The programme is a continuation of the Sustainable Tampere 2030 programme, which was in place during the 2017-2021 council period. The key aim is to support residents in changing their own consumption and mobility habits and ensure fair and equitable transition to a climate resilient society.

The City's climate actions have been gathered into the Carbon Neutral Tampere 2030 Roadmap. The roadmap was created together with all the city's service areas, various units, public utilities, and city's companies. The Climate and Environmental Policy Unit coordinates the process and monitors the implementation of the measures. The roadmap currently contains a total of 305 measures under six different themes: 1. *sustainable urban planning,* 2. *sustainable mobility,* 3. *sustainable energy*, 4. *sustainable construction,* 5. *sustainable consumption, and* 6. *sustainable urban nature.* Each measure has at least one team that is responsible for its implementation. The operating model ensures that the entire city organization is committed to the carbon neutrality target.

In addition to the citizens, we have identified specific companies in the city as critical stakeholders necessary to bring about accelerated change. These include a factory and large companies with the potential to influence the commuting of large numbers of people. Stakeholder engagement will play a key role in the coming years, and the Mission process will support this work.

Tampere already has a very strong foundation for its climate work and the Carbon Neutral Tampere 2030 Roadmap already contains a comprehensive set of measures and their impacts. The progress of climate work is monitored in the Climate Watch and the Climate Budget. The CCC's Investment Plan summarises the costs of these measures up to 2030. However, the Action Plan has identified systemic strategic priorities that need to be taken into account in addition to those already planned to reach the target:

1) **Boosting modal shift** by co-creating actions with citizens and big employers to promote sustainable transport, and studying the public opinion
2) **Transforming city logistics** move to lighter vehicles and alternative propulsion by guiding
3) **Promoting industrial electrification** by communicating with big fossil fuel users to update projections and plans, implementing Green Deal for zero-emission construction sites and providing oil heating advice to SMEs.
4) **Providing energy advice** and alleviating energy hardship/mitigating energy vulnerability by oil heating advice to private home owners, developing financing models and piloting energy advice to people with potential energy hardship.
5) **Promoting smart energy systems** and systems integration by preparing an energy strategy and an urban development platform.

4 Principles and process

Highlight the key principles that will guide your city as it implements its Climate City Contract, like accountability, transparency, or an open attitude to new approaches. The process should encompass principles like **co-creation, innovation, multi-actor and citizen engagement,** and should be **systemic and demand-driven in nature.** It should also be based on **monitoring** and **joint learning**. The

Commitments Guidance document provides more specific guidance on how integrate these principles into your own process.

Your text
In Tampere, we have understood that achieving climate neutrality by 2030, and ensuring a just and inclusive urban climate transition, requires new ways of engaging citizens and making their sustainable choices as easy as possible. The transition must be socially justified and meaningful to people. By 2030, everyone in Tampere has to able to live a climate resilient lifestyle and make climate friendly choices best suited for oneself, regardless of one's socioeconomic situation, neighbourhood, age, gender or health. This requires strengthening of cultural sustainability of our climate action. It means keeping everyone on board and working seriously towards cohesive and sustainable communities and the social and ecological change. Tampere aims to be transparent with its climate work. Our roadmap's measures can be followed in our Climate Watch service, where all the measures are listed, and progress is followed. All the citizens can follow Tampere's climate work process. Tampere has a dedicated team in charge of citizen participation and engagement. Many climate-related citizen engagement activities have been carried out in collaboration with them. Furthermore, in the city strategy 2021-2025, one of the four focus areas is Carbon Neutral Actions. In collaboration with academia, we plan to build an understanding and communicate the benefits and impacts of daily, realistic climate actions and make them more attractive for citizens and businesses. This programme is organizing co-design and co-creation activities, dialogues, campaigns, and courses for citizens including youth. Our ambition is just transition to climate resilient society, where everyone can lead a change toward climate neutral future. The key aim is to support residents in changing their own consumption and mobility habits and ensure fair and equitable transition to a climate resilient society. The guiding principles and tools are co-creation and citizen participation, communication, use of data to support the change and broad collaboration with stakeholders. The goal is to identify and develop approaches that support citizens' own capability and motivation to change their consumption and mobility habits to make them more sustainable. With the City of Tampere's award-winning SUMP (Sustainable Urban Mobility Plan), we can also learn lessons for other plans, such as the roadmap, on inclusion and equality. The City of Tampere wants to mitigate and adapt to climate change in the best possible way. The city wants to take into account groups that are particularly vulnerable to climate change. Therefore, measures to adapt and prepare for climate change will be designed in cooperation with vulnerable groups. Vulnerable groups have been identified as children and young people, the elderly and elderly, people with disabilities, people on low incomes, people with long-term illnesses and mental health problems, migrants and refugees. The results of the vulnerability analysis will be completed by the end of 2023 and will be used, for example, in the update of the Carbon Neutral Tampere 2030 roadmap. The City of Tampere is also launching Climate Justice Discussion Forum in the fall 2023. This discussion forum is bringing together residents and other stakeholders to be set up to support the Carbon Neutral Actions development programme, with the aim of ensuring that the programme's interventions are fair and take account of the different opportunities for different types of people in Tampere to take carbon neutral actions. Besides citizen work, Climate Neutral Actions programme's aim is to support companies in climate and environmentally sustainable business and help them find new business opportunities through circular economy and carbon neutrality. One of the many forms of business collaborations is the Tampere Region Climate Partnership which has systematically involved companies, associations, and communities in pursuing a carbon-neutral Tampere since 2020. Currently, 116 organizations have joined the CP. The climate partners define their own organization's climate actions and goals related to climate change mitigation and

they focus on e.g. energy savings, energy efficiency, environmental friendliness in procurement, waste management or staff engagement. The climate partners receive information on climate issues, get support, gain visibility, with opportunities to present their own activities and attracting new customers climate resilient life regardless of the neighborhood they are living in or their life situation.

During the CCC process we have identified specific needs for closing our current gap. We will find solutions to this during our next Climate Neutral Tampere 2030 roadmap's updating process, which starts in the autumn of 2023 and will be ready in the autumn 2024. During the process, we will have dialogues and workshops within the whole city organization and subsidiaries. We have also identified the importance of companies in the city with which a more strategic partnership would be relevant in climate work. These include for example a factory and large companies with the potential to influence the commuting of large numbers of people. Stakeholder engagement will play a key role in the coming years, and Mission work will support this work. We will also deepen our cooperation and co-creation processes with academia and citizens during the next two years. By the next CCC update we will have more signatories in our commitment plan and together with our stakeholders we will achieve the climate neutrality target.

5 Signatories

Include a list of stakeholders who have committed to help your city achieve its goal to reach climate neutrality by 2030. Detailed commitments and agreements between individuals or groups of stakeholders should be appended to this Commitments document. This list will likely increase over time.

Name of the institution	Sector/Area	Legal form	Name of the responsible person	Position of the responsible person
Tampere University (Tampere University Foundation)	Research and higher education	Foundation	Eeva-Liisa Viskari, PhD	Chief Specialist in Sustainability
Tampere University of Applied Sciences Ltd. (TAMK, Tampere University Foundation)	Research and higher education	Foundation	Dr. Eveliina Asikainen	Senior Lecturer, School of Pedagocical Innovations and Culture
Annalan Vuokra-asunnot Ltd	Property management	Limited company	Ville Salo; Satu Eskelinen	Financial Manager; CEO
Ekokumppanit Ltd (Ecofellows Ltd)	Environmental consultancy, environmental training	Limited company	Suvi Holm	CEO
Finnpark Ltd	Parking services	Limited company	Matti Anttila; Antti Marttila	Financial Manager; CEO
Hiedanrannan Kehitys Ltd	Urban planning	Limited company	Anna Saraste; Mikko Leinonen	Business Controller; CEO
Pirkan Opiskelija-asunnot Ltd	Rental apartments	Limited company	Timo Jokinen	CEO
Pirkanmaan Jätehuolto Ltd	Waste management services	Limited company	Jari Romo; Pasi Muurinen	Accounting Manager; CEO
Pirkanmaan Voimia Ltd	Catering and cleaning services	Limited company	Piia Saarenoja; Esa Sairanen	Business Controller; CEO

Tampereen Infra Ltd	Infrastructure construction and maintenance services	Limited company	Joonas Huhtanen; Lauri Niemi	Safety and Environment Manager; CEO
Tampereen Messu- ja Urheilukeskus Ltd	Exhibition services	Limited company	Olli Tokoi	CEO
Tampereen Palvelukiinteistöt Ltd	Rental and management of properties	Limited company	Aija Puustelli; Mikko Salonen; Marko Tulokas	Head of Administration; Property Manager; CEO
Tampereen Raitiotie Ltd	Transportation	Limited company	Antti Ainola; Pekka Sirviö	Chief Financial Officer; CEO
Tampereen Seudun Keskuspuhdistamo Ltd	Waste water treatment	Limited company	Kirsti Toivonen; Timo Heinonen	Financial Manager; CEO
Tampereen Energia Ltd	Energy production, electricity sales	Limited company	Juko Vähätiitto; Jussi Laitinen	Business Intelligence Manager; CEO
Tampereen Särkänniemi Ltd	Activities of amusement and theme parks	Limited company	Heidi Paasikoski; Miikka Seppälä	Chief Financial Officer; CEO
Tampereen Tilapalvelut Ltd	Property service	Limited company	Anna Koivumäki; Petri Mölsä	Development Specialist; CEO
Tampereen Vesi Ltd (will be incorporated at the beginning of 2024)	Water supply and sanitation	Limited company	Tiiu Vuori; Petri Jokela	Development Engineer; CEO
Tampereen Virastotalo Ltd	Property service	Limited company	Terhi Karhumaa; Petri Mölsä	Financial Planner; CEO
Tampereen Vuokra-asunnot Ltd	Rental apartments	Limited company	Tero Huuhtanen; Marko Salonen	Building Services Engineering Expert; CEO
Tampereen Vuokratalosäätiö	Rental apartments	Foundation	Ville Salo; Eskelinen Satu	Financial Manager; CEO

Tampere-Talo Ltd	Meeting facilities, Conference rooms	Limited company	Heidi Rehakka; Pauliina Ahokas	Chief Financial Officer; CEO
TREDU-kiinteistöt Ltd	Property management	Limited company	Aija Puustelli; Lance Cagle; Marko Tulokas	Head of Administration; Property Manager; CEO
Tullinkulman Työterveys Ltd	Health Service	Limited company	Tiina Surakka	CEO
Vilusen Vuokra-asunnot Ltd	Property management	Limited company	Ville Salo; Satu Eskelinen	Financial Manager; CEO

Appendix: Individual Signatory Commitments

Specific agreements that articulate the details of the climate action(s) between the municipality and other stakeholders (individual or groups) can be added to the Commitments document appendix.

1. Commitment document of the Tampere University (pages 12-19)
2. Commitment document of the Tampere University of Applied Sciences (pages 20-27)

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of the City of Tampere

TAMPERE

Appendix: Individual Signatory Commitments – The University of Tampere

In this document city of Tampere's climate work partners describe their work and commitments that contribute to the goal of climate-neutral Tampere by 2030. This document will be attached to Tampere's Climate City Contract. This document may be updated and developed when working towards target year 2030. An update will be submitted to European Commission every two years for assessment.

Short introduction of Tampere University

Tampere University is one of the most multidisciplinary universities in Finland. We bring together research and education in technology, health and society. The University is known for its excellence in teaching and research, and it collaborates with hundreds of universities and organisations worldwide. Our community consists of 21,000 students and over 4,000 staff members from more than 80 countries.

Almost all internationally recognized fields of study are represented in our university, which has seven faculties:

- Faculty of Built Environment
- Faculty of Education and Culture
- Faculty of Engineering and Natural Sciences
- Faculty of Information Technology and Communication Sciences
- Faculty of Management and Business
- Faculty of Medicine and Health Technology
- Faculty of Social Sciences

Tampere University has integrated sustainability as an elemental part of its strategy: *We work together to build a sustainable world.* This statement includes the principle of developing sustainable solutions through research and provide high-impact education for the benefit of the society.

Name of the organization: Tampere University

Number of employees in total and in Tampere: 21,000 students and over 4,000 staff members

Main business area / line of activity: Research and higher education

Organisations website: *https://www.tuni.fi/en/about-us/tampere-university*

Contact person in climate collaboration (name and position): Eeva-Liisa Viskari, PhD, Chief Specialist in Sustainability

Operations related to climate action: Tampere University is committed to the common goal of the Ministry of Education and Culture administrative branch in achieving carbon neutrality by 2030. Tampere University has calculated its carbon footprint annually since 2019. In 2022 the carbon footprint of the university was 15 000 t CO_2ekv - which is 40 % less than in 2019. Reduction is partly result of the Covid-19 pandemic and its multiplier effects and thus can be considered temporary, but also active measures have been taken to reduce the footprint, especially in the maintenance of the properties. Furthermore, the calculation model has changed during this time and more categories of carbon sources have been included in the calculation.

Tampere University has **many research groups actively doing research in the key strategic priority areas**, as defined in Table 1 of this document. Furthermore, our university is **active in advancing higher**

NetZeroCities has received funding from the H2020 Research and Innovation Programme under the grant agreement n°101036519.

education in climate issues, through its own bachelor and master's programmes (e.g., Bachelor´s Degree Programme in Sustainable Urban Development) and also though national and international initiatives, such as the Climate University initiative where Tampere University contributes[1].

Existing collaboration with the City of Tampere and expectations for future collaboration related to climate action:

- **Partnership agreement between the City of Tampere, Tampere University and Tampere University of Applied Sciences.** The City of Tampere, Tampere University, and Tampere University of Applied Sciences have agreed on a partnership that aims at:
  - Deepening the existing cooperation between the parties
  - Developing the effectiveness of research cooperation in the development of the city and its services
  - Responding to the common challenges of the operating environment.
  - Promoting the region's competitiveness, attractiveness and recognition.
  - Promoting the region's attractiveness as a student town
  - Promoting the effectiveness of international cooperation and the attraction of experts.
  - Enhancing the implementation of jointly identified advocacy goals nationally and internationally.
  - Strengthening the prerequisites for data-based decision-making

  One of the focus areas for the Universities' cooperation in research, innovation and education is called "*sustainable city as a trailblazer*". This supports research, innovation and educational collaboration in sustainability themes, including climate action.

- **Tampere Region Climate Partnership**. Tampere University has joined the Tampere Region Climate Partnership (Climate partner - Tampereen seudun ilmastokumppanuus). The goal of this partnership model is to involve companies and communities in the region in pursuing a carbon-neutral Tampere in cooperation with the Sustainable Tampere 2030 program. Tampere University reports annually about the measures to reduce carbon footprint.

- **STUE research community and profiling area.** Tampere University has a multidisciplinary research community and profiling area called Sustainable Transformation of Urban Environments (STUE). The aim of STUE is to create and promote research-based solutions that transform cities into safe, resilient, and sustainable living environments for people of all ages, ethnicities, and capabilities. STUE supports multidisciplinary research and fosters opportunities for collaboration between researchers and the public sector, civil society, communities, and businesses. STUE researchers and the city of Tampere have several collaborations.

- **ECIU collaboration with European Mission cities**. Tampere University is a member of the ECIU (European Consortium of Innovative Universities). The ECIU community has initiated a collaboration among those ECIU institutions and their respective cities that are part of the Mission for 100 Climate-neutral and smart cities. As part of this collaboration, Tampere University and the City of Tampere are discussing Mission-related opportunities and challenges with the other organisations involved. As a concrete action, the cities and universities are together identifying opportunities for research collaboration and searching for suitable European funding to support research collaborations in the Mission themes.

[1] Climate University provides free online courses for universities and everyone who wants to make the sustainability transition in the society real. The courses are made in multidisciplinary collaboration of several universities in Finland with the funding from the Ministry of Education and Culture, Finnish Innovation Fund Sitra and the participating universities.

- **Existing and future research collaboration between the University and the City in Mission-related themes**: Tampere University and the City of Tampere have several joint research projects (e.g. Horizon2020 funded ReCreate project on Circular Economy in the construction sector), and future research collaboration on Mission themes is planned.

Key strategic priorities

Please describe shortly on Table 1 your organization's role in the key areas of climate work in Tampere. You may fill in information only in the domains that are relevant to your organization.

	Carbon footprint (CO2 reductions in Tampere)	**Carbon handprint**[2] (new innovations, research, products, and services that contribute to CO2 reductions elsewhere)	**Climate heartprint** (changes in skills, capabilities, mindsets, and actions needed for systemic change towards a climate-neutral city)
Energy Systems	Tampere Universities Community facility management has EcoCompass Environmental Management System (EMS) and Certificate and is committed to reduce energy use. Tampere University properties use only carbon neutral electricity and district heating.	JUSTHEAT project aims to understand how home heating transition has impacted our lives and what we can learn for the current transition to low carbon systems. H2020-funded BL2F project use "Black Liquor" (side stream of pulp industry) to create a clean, high-quality biofuel	CNESS - Climate Neutral Energy Systems and Society is a newly established research platform on energy transition
Mobility and Transport	Ongoing discussion and measures to reduce carbon emissions from business traveling.	LIFE-funded CANEMURE project develops solutions for smart and low-carbon mobility BiciZen citizen science pilot aims is to increase awareness of urban mobility, communal engagement and cycling through cooperation between people cycling within the cities and municipal stakeholders	Transport Research Centre Verne at Tampere University promotes developing a sustainable transport system and logistics through research, education activities and societal impact.

[2] This column includes a non-exhaustive list of research projects focusing on the priority areas, involving Tampere University researchers. For a more thorough overview of Tampere University carbon handprint and examples of research and innovation on the different priority themes,, please see a recently launched Sustainability Report (https://www.tuni.fi/en/news/tampere-universitys-sustainability-report-describes-communitys-multiple-actions-build-more):

Waste and circular economy	Tampere Universities Community facility management has EcoCompass Environmental Management System (EMS) and Certificate and is committed to reduce waste and promote circular economy.	WASTE MATTERS aims to analyse how various change agents engage in transformation toward Circular Economy (CE) business ecosystems CICAT2025 project aim to accelerate the transition from a linear economy to a circular economy	Research Centre for Managing Circular Economy (ManCE) brings together and consolidates circular economy expertise and strengthens the specialized research on circular economy University Platform for Circular Economy promotes the implementation of circular economy solutions.
Built environment	Tampere Universities Community facility management has EcoCompass Environmental Management System (EMS), guiding the building maintainance	ReCreate-project (coordinated by Tampere University) develops solutions for reuse of precast concrete structures and circular economy within the construction sector around Europe. The INPERSO project will deliver inclusive, affordable, efficient, and sustainable renovation which will be adaptable to various climate zones and building typologies but focused on residential and heritage buildings The CIRCUIT project aims to bridge the implementation gap between theory, practice and policy and showcase how circular construction approaches can be scaled and replicated across Europe, to support the creation of regenerative cities.	The Energy Efficient and Sustainable Built Environment group studies the hygrothermal behaviour of structures and construction materials, as well as the energy consumption of buildings and the physical phenomena that affects indoor air quality. Research Centre Terra produces research-based information that enables the safe construction and use of infrastructures as well as their cost-effective and sustainable maintenance
Nature-based solutions	Business2Nature project develops nature-based solutions and promotes biodiversity at Tampere university campus areas (e.g., through green roofs, campus gardens)	Business2Nature project develops understanding of creating and developing novel ecosystems in urban environments	Business2Nature project develops understanding of creating and developing novel ecosystems in urban environments

Main climate actions

List and describe shortly main climate actions your organization is committed to that contribute to the goal of climate-neutral Tampere by 2030. If applicable, list also the estimated yearly CO2 reductions and the estimated need of investment.

Climate action	Estimated yearly CO2 reductions (kt CO2-ekv) and the reduction year (if applicable)	Estimated need of investments (€) and year (if applicable)
Carbon neutrality by 2030. Tampere Universities community has made a roadmap to achieve this goal.[3]		

[3] More detailed schedule and action plan is updated in the next update of this commitment

TAMPERE.
FINLAND

CLIMATE NEUTRAL TAMPERE 2030

ROADMAP

Tampere City Board 3 October 2022

TAMPERE

TABLE OF CONTENTS

PREFACE

Tampere bears responsibility for a sustainable future.

We engage in effective work on climate and biodiversity and want to be internationally known for these efforts.

We believe that, by providing the city residents with a smooth everyday life that helps them make sustainable choices, our appeal will grow even stronger in the future. We look to the future with confidence, as we know that we can achieve change. We strive for a just transition to a climate-friendly society.

Brexit, a global pandemic, Russia's war of aggression in Europe.

The events unfolding in the past few years have reminded us that our world can be turned upside down in the blink of an eye. The importance of being able to act together both locally and at the international level has also been proven. Additionally, the climate crisis and loss of biodiversity are simultaneously calling for both local and global solutions.

Every now and then, global political events and decisions seemingly take the form of something that occurs 'somewhere in the world'. This is, naturally, not the case. What is also clear is that climate change does not respect borders, although its effects are not distributed evenly.

By way of example, let us consider just some of the broader effects of our actions: by giving up oil heating in the buildings owned by the city (measure 4.4.2.), we reduce the use of fossil fuels – we have already given up using Russian fossil fuels; or as we have stepped up the use of Fairtrade products (for example, measures 5.4.7. and 5.6.11.), we have improved the everyday life and environment of foreign farmers.

Cities are assuming growing importance globally.

And they represent the largest share of climate emissions and of the consumption of natural resources – the challenges are similar across the globe.

Image 1. Anna-Kaisa Ikonen, Mayor

Tampere has always been known as a city where things get done. Here, words translate into deeds. The ability and confidence to act are natural features of the spirit of Tampere. Together we face all crises, and together we overcome them. We are prepared, and we adapt.

For us, the climate emergency implies action. Therefore, Tampere is in an advantageous position to serve as a climate pioneer, a developer of biodiversity and a circular economy trailblazer.

The budding role of pioneer is visible already: we joined the European Union's climate initiative for the first time in 2009. This climate initiative became global in 2016, and the following year Tampere signed the Covenant of Mayors for Climate and Energy follow-up commitment. 2019 saw us publish a climate budget as the first city in Finland to do so, and in 2020 the Carbon Neutral Tampere 2030 Roadmap made it to the final of the World Smart City Awards. This spring, Tampere was elected as one of the top hundred European cities striving for climate neutrality.

The green transition introduces changes and opens up opportunities.

One of the instruments whereby we are promoting a fair and just transition for residents and businesses towards a sustainable future is the Carbon-neutral Action development programme. As well as fostering biodiversity and the circular economy, this programme aims to achieve significant reductions in emissions from mobility and consumption.

Together, let us create a sustainable and boldly future-oriented Tampere.

Anna-Kaisa Ikonen
Mayor of Tampere

INTRODUCTION

You are holding in your hand the first update to the Climate Neutral Tampere 2030 Roadmap. This update, just like the original version from 2020, was drafted in cooperation between the various city units and subsidiaries. The Climate and Environmental Policy Unit was responsible for the drafting process. The purpose of the roadmap is to describe the city's path to achieving climate neutrality by 2030. In this update, the 236 measures set out in the original roadmap have been updated while adding a number of new measures. The new measures also feature climate actions by an increasing number of subsidiaries and public utilities. 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.

We present the measures under six themes, familiar from the original roadmap: urban planning, mobility, construction, energy, consumption, and nature. These themes derive from the City of Tampere's environmental policy, the Sustainable Tampere 2030 Guidelines. Additionally, this update adds to the roadmap a theme that traverses all six themes: coordination and monitoring of the city's climate efforts. The perspective employed in the original roadmap restricted itself to climate change mitigation, but this update also introduces climate change adaptation measures. The same decisive consideration remains, namely that these measures must not undermine the other – ecological, social, economic and cultural – dimensions of sustainable development. Several measures therefore contribute to many sustainable development goals.

In this roadmap, the themes are represented by different colours. The beginning of each theme presents a summary of the measures relating to that theme, together with the goals and the indicators used to monitor the achievement of the associated goals. Additionally, we also provide a snapshot of where we are at the moment. There are several sets of measures, or measure packages, under each theme: 37 in total. They cover the main sources of emissions that the city can influence. Phenomenon-based, the roadmap does not follow the administrative structure of the city. Therefore, several bodies may be responsible for a given measure. Climate change mitigation and adaptation require extensive cooperation both within the city and with stakeholders.

It is advisable to read the roadmap one full spread at a time. The left-hand side of a spread shows a card that illustrates the measure package, numbering the related measures and containing the applicable timetable and responsible parties as well as an indication of whether the measure promotes climate change mitigation or climate change adaptation. All timetables are presented by council term. The cards also show the more than 40 measures that have already been completed. This update elaborates the estimates that describe the cost level of the measures by providing a specific estimate for every measure. Similarly to the original Roadmap, the bottom section of the card displays an estimate of the emission reduction potential of the measure package concerned, as well as listing the benefits other than climate benefits associated with the measures. The cost and emission reduction potential estimates are represented by bullet symbols.

After an action card, the measure content is illustrated by providing case examples. In the updated version, the more precise emission and cost effects are brought together at the end of the roadmap, in section 5. 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 subsidiaries 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.

Additionally, for some measures, we calculate a cost-effectiveness figure, representing their economy. Cost-effectiveness denotes how much the emission reduction that a measure yields will cost per reduced emission reduction unit. The lower the cost-effectiveness, the more viable the measure is economically.

According to the roadmap impact analysis, the city's measures will achieve a 73% reduction in greenhouse gas emissions by 2030. It has not yet been possible to assess the impacts of all measures. The most important factors that remain excluded from assessment are the measures whereby we can affect the mobility choices of local residents through instruments such as town planning and transport system development.

The 80 per cent reduction required for climate neutrality is a challenging goal, and it necessitates ambitious and long-term 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.

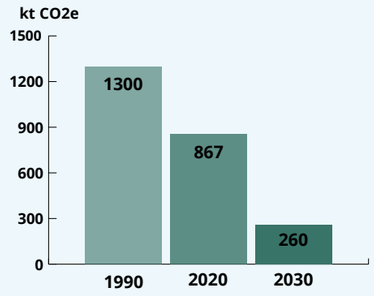
"The roadmap describes the city's steps to achieving climate neutrality by 2030."

Image 2. It should be borne in mind that many measures set out in the roadmap are also often taken for reasons that are not purely climate-related. The other benefits include a more comfortable, healthier and safer environment, the commercial opportunities brought about by technologies, the economic sustainability made possible by life-cycle thinking, and increased biodiversity. Image: Laura Vanzo.

SUMMARY

Goal

Climate Neutral Tampere 2030



Tampere's greenhouse gas emissions in 1990 and 2020. Goal 2030.

What?

80% + **20%**

Reduction of greenhouse gas emissions by 80%. Carbon sinks or offsetting 20%.

Why?

City of Action

The target is based on, for example: the Tampere Strategy 2030, the Sustainable Tampere 2030 Guidelines, the Covenant of Mayors for Climate and Energy, and the UN 2030 Agenda for Sustainable Development.

Future

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

How?

7 & **305**

Seven themes: coordination and monitoring of climate efforts, urban planning, mobility, construction, energy, consumption, nature. 305 measures.

Developing

We use the indicators and the results to develop the roadmap. We update the roadmap every two years.

Together

We created the roadmap together with the city's units, subsidiaries and public utilities. To achieve our goal, we also need to involve city residents, businesses and communities.

Climate Watch

Follow the progress of the measures in the Tampere Climate Watch: **ilmastovahti.tampere.fi.**

Result

73%

The city's measures described in the roadmap can achieve an emission reduction of some 73% by 2030. The full impact of all measures cannot be assessed yet.

Bio diversity

Lumo

Climate change and biodiversity loss are elements of the same crisis. See the Tampere Biodiversity Programme for actions that help save our nature.

HOW TO READ THIS ROADMAP

The beginning of each theme sets out the content, goals, indicators and starting points of that theme.

Each theme is represented by a unique colour, starting with a general description of the theme, followed by the action cards.

Benefit goal 2030: Key goals of the themes for 2030, based on the Sustainable Tampere Guidelines.

Description: Summary of the theme's goals and measures.

Goal 2030: Quantitative and qualitative goals for 2030.

Indicators: Indicators to monitor the achievement of the goals.

Introductory data: Strategic programmes and plans on which the Roadmap is based.

THEME 1. SUSTAINABLE URBAN PLANNING

THEME 1.

SUSTAINABLE URBAN PLANNING

Benefit goal:	The city will grow primarily into public transport zones and regional centres
Description:	Tampere is experiencing an annual growth of approximately 3,000 residents. The aim is to enable sustainable growth while preserving the quality and functionality of the urban environment. Town 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 aims 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. Land-use planning takes account of the conservation of biodiversity and adequate green belts. The growth which the city is experiencing creates increasing pressure to use forests and nature areas, and therefore it is absolutely necessary to carefully consider expanding any construction areas to green belts. Value-based information and indicators derived from ecosystem services will be used as part of the assessment of the content and effects of land-use planning.
Goal 2030:	• Residential floor area planned for the public transport zones and for the regional centres: 80% (2021), 85% (2025), 90% (2030). • Tampere city centre will have 15,000 new residents and 15,000 more new jobs in 2030 compared to 2015. • 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.
Indicators:	• Planned residential floor area in the public transport zones and in the regional centres (%) • Share of households (%) with a 300m or 700m distance to the key public services • Share of recreational areas of the total inner-city town planning area (%)
Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • Tampere City Region Construction Plan 2040 • Inner-city master plan 2040 • Five-star City Centre Development Programme • Hiedanranta Development Programme

Situational picture: Examples of the indicators whereby we measure achievement of the goals.

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2014	2015	2016	2017	2018	2019	2020	2021
Planned residential floor area in regional centres and public transport zones	%	65	70	77	59	77	21	70	94

After an introduction to the theme, each measure package has a dedicated action card containing the measures that relate to that package.

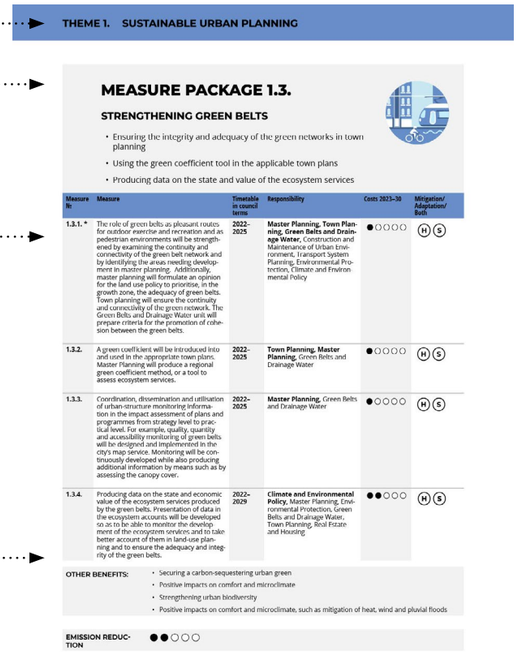
Theme number and title to which the action card relates.

Action card number, title and description

The measures, their timetable by council term and the responsible parties. The main responsible party is shown in bold, while the partners are displayed in normal text. The cost estimate of the measures, and an indication of whether the measure promotes climate change mitigation (H) or climate change adaptation (S). The adjacent pages show examples and impact analyses of the measures accompanied by an asterisk.

Action card's emission reduction estimate and benefits other than emission reduction benefits.

The order of magnitude of the emission reduction and cost estimate bullet symbols are shown in this table, found on page 19. Programming period refers to the number of years remaining until 2030.



THEME 1. SUSTAINABLE URBAN PLANNING

MEASURE PACKAGE 1.3.

STRENGTHENING GREEN BELTS

- Ensuring the integrity and adequacy of the green networks in town planning
- Using the green coefficient tool in the applicable town plans
- Producing data on the state and value of the ecosystem services

Measure Nr	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.3.1.*	The role of green belts as pleasant routes for outdoor exercise and recreation and as pedestrian environments will be strengthened by examining the continuity and connectivity of the green belt network and by identifying the areas needing development in master planning. Additionally, master planning will formulate an opinion for the land use policy to prioritise, in the growth zone, the adequacy of green belts. Town planning will ensure the continuity and connectivity of the green network. The Green Belts and Drainage Water unit will prepare criteria for the promotion of cohesion between the green belts.	2022–2025	**Master Planning, Town Planning, Green Belts and Drainage Water,** Construction and Maintenance of Urban Environment, Transport System Planning, Environmental Protection, Climate and Environmental Policy	●○○○○	H S
1.3.2.	A green coefficient will be introduced into and used in the appropriate town plans. Master Planning will produce a regional green coefficient method, or a tool to assess ecosystem services.	2022–2025	**Town Planning, Master Planning,** Green Belts and Drainage Water	●○○○○	H S
1.3.3.	Coordination, dissemination and utilisation of urban-structure monitoring information in the impact assessment of plans and programmes from strategy level to practical level. For example, quality, quantity and accessibility monitoring of green belts will be designed and implemented in the city's map service. Monitoring will be continuously developed while also producing additional information by means such as by assessing the canopy cover.	2022–2025	**Master Planning,** Green Belts and Drainage Water	●○○○○	H S
1.3.4.	Producing data on the state and economic value of the ecosystem services produced by the green belts. Presentation of data in the ecosystem accounts will be developed so as to be able to monitor the development of the ecosystem services and to take better account of them in land-use planning and to ensure the adequacy and integrity of the green belts.	2022–2029	**Climate and Environmental Policy,** Master Planning, Environmental Protection, Green Belts and Drainage Water, Town Planning, Real Estate and Housing	●●○○○	H S

OTHER BENEFITS:
- Securing a carbon-sequestering urban green
- Positive impacts on comfort and microclimate
- Strengthening urban biodiversity
- Positive impacts on comfort and microclimate, such as mitigation of heat, wind and pluvial floods

EMISSION REDUCTION ●●○○○

Orders of magnitude of the emission reduction estimates:

●○○○○	< 100 t CO_2e/year
●●○○○	100–1,000 t CO_2e/year
●●●○○	1,000–10,000 t CO_2e/year
●●●●○	10,000–50,000 t CO_2e/year
●●●●●	> 50,000 t CO_2e/year

Orders of magnitude of the cost estimates in 2023–2030

●○○○○	official duties or < EUR 100,000
●●○○○	0.1–1 million €
●●●○○	€1–10 million €
●●●●○	€10–100 million €
●●●●●	> €100 million €

DEFINITIONS AND ABBREVIATIONS

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.
Biofuels	Fuels made of organic materials such as wood, logging waste or plants.
BREEAM	Building Research Establishment Environmental Assessment Method, a certification issued to eco-efficient buildings or areas (similar to LEED).
CO_2/CO_2e	Carbon dioxide and the abbreviation for carbon dioxide equivalent, denoting the combined climate-heating effect of different greenhouse gases.
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%.
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.
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).
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.
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.
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 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 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.
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 which identifies the key topical climate measures as well as their cost effects and emission impact.
Climate emergency	In this Roadmap, climate emergency refers to the UN-defined situation where immediate action is needed to mitigate and stop climate change. The City of Tampere, too, notes the long-term climate emergency, the effects of which will be felt far into the future. For a decade now, the city has engaged in systematic climate work to reduce the impact of this emergency, continuously increasing the number of its climate measures. Additionally, climate emergency often refers to the climate emergency movement that took shape in Australia in the mid-2010s, urging cities and other organisations to take climate change mitigation action.
Climate change mitigation	The policies and actions 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 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 emissions	Climate emissions mean global warming emissions, such as carbon monoxide, methane and nitrous oxide.
IPCC	Intergovernmental Panel on Climate Change. The Panel analyses scientifically produced data on climate change to support decision-making.
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 makes life without your own car possible.
Circular economy	In a circular economy, products and materials as well as the value attached to them circulate in the economy for as long as possible. In this way, production and consumption generate the smallest possible amount of waste and loss.
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).
Energy efficiency agreement for municipalities (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.
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 (€/t CO2e). A negative value denotes both cost savings and an emission reduction.
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.
LUMO	Biodiversity from the perspectives of ecosystems, species and the genetic variation within species.
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.
Travel chains	Integration of different modes of transport into a smooth package.
Net present value	Net present value means adding up the investment costs and the operating costs of measures and discounting them to the present day. 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 imported 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.
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 in Hiedanranta.
Programming period	From the present moment up to 2030.
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.
Emissions trading price	The price paid for an emission allowance under the EU Emissions Trading System (€/t CO2e).
Marginal abatement cost	Illustrates the cost of reducing environmental negatives, such as pollution. Usually measures the cost of an additional pollution unit. The economic profitability of measures in relation to other measures is often illustrated on a marginal abatement cost curve.
Resilience	The ability to recover from changes, to adapt to them and, where necessary, to change.
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.
SECAP	The Sustainable Energy and Climate Action Plan, which is based on the Covenant of Mayors for Climate and Energy.
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.
Alternative/sustainable/ clean propulsion	Propulsion that replaces petrol and diesel, such as electricity, biogas, hydrogen, ethanol and renewable diesel.
Green coefficient	A town 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.
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.
Municipal waste	Wastes covered by municipal waste management, generated in the consumption of end products in households and also in enterprises, especially in the service sectors.

Image 3. 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. Image: Laura Vanzo.

SECTION 1. TAMPERE'S CLIMATE GOALS

Why do we have global warming?

Global warming, or the growing greenhouse effect, is one of the biggest global crises. It is caused by an increase in atmospheric carbon dioxide, which, like a greenhouse, heats the earth. Since the late 19th century, the rise in CO2 levels has accelerated as a result of increased use of fossil energy. The global average temperature has risen about one degree compared to pre-industrial times and in various scenarios is projected to rise some 2–5 degrees by the end of the century.

Global warming has a major impact both on societies and on the natural environment. In Finland, vegetation zones are retreating towards the north and flood risks and the operating conditions of forestry and agriculture are changing. Finland will experience significant effects through the global economy and through international politics. On the other hand, Finland can also stand to benefit if it succeeds in developing and exporting technology that mitigates climate change.

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 average temperature increase to well below 2°C compared to pre-industrial levels and to pursue measures to limit global warming to less than 1.5°C. The EU and Finland are also committed to this objective. However, the Intergovernmental Panel on Climate Change in April 2022 noted that emission reduction measures must be accelerated in order to achieve the objective.

The abandonment of fossil fuels, introduction of renewable 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. In addition to reducing greenhouse gas emissions, the management of the carbon storage in forests and in green infrastructure, and expansion of the carbon sinks, are important means to mitigate global warming.

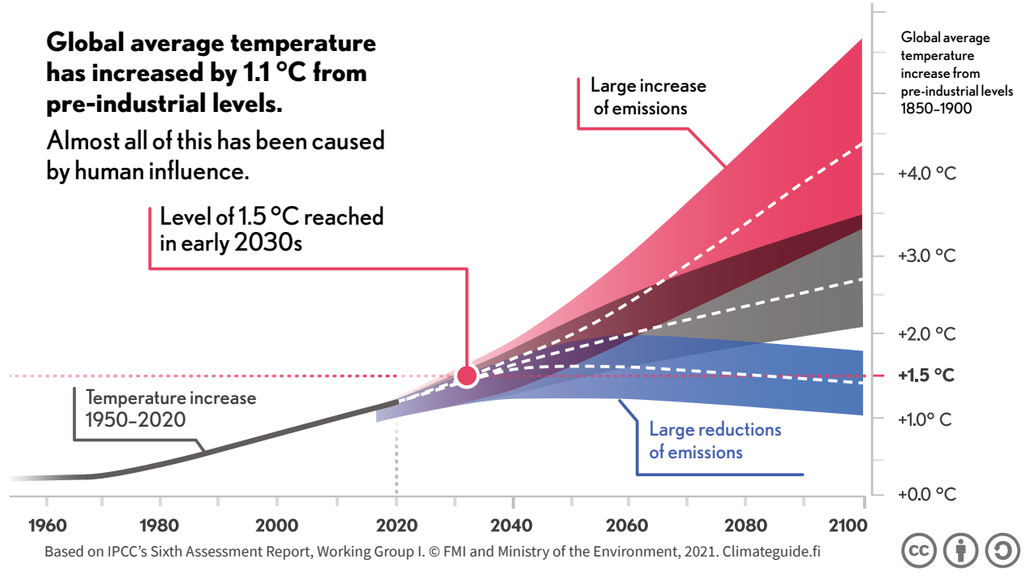


Image 4. Rise in global average temperature. Source: https://www.climateguide.fi/articles/infographics-based-on-the-ipccs-6th-assessment-report-part-1-illustrate-the-physical-science-basis-of-climate-change/

Climate change adaptation needed today

Apart from climate emission mitigation, it is vital to find ways to adapt to the changing environmental conditions brought about by climate change. Climate change adaptation means the ways and means to reduce the adverse effects that climate change has on society and on the environment. Climate change will bring about – and has already brought about – changes in how weather extremes, such as storms and heavy rains, occur as well as in related environmental conditions. In Tampere, too, this is apparent as increasingly slippery conditions in winter and hot weather conditions becoming more common in summer.

Adaptation measures strive to reduce the harm caused by these changes while promoting the capability of people, social activities and the environment to function under changed and evolving conditions. These adaptation measures include the construction of urban run-off reservoirs that prevent flooding following increased heavy rains, as well as the development of the city's risk management process and improving city residents' preparedness.

Adapting to evolving conditions is absolutely necessary despite successful 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. The ways in which we adapt to climate change may have to do with the physical characteristics of the urban structure, including (municipal) infrastructure, buildings, ecology and living environments, or with society's social characteristics and economy, such as resources, capabilities, approaches, and non-life insurance.

Cities playing a major role

Cities play a key role in mitigating and also in adapting to climate change, as people increasingly live in cities and, as a result, the majority of consumption and energy use 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. In spring 2022 Tampere was invited to join a network of one hundred European cities seeking to achieve climate neutrality by 2030, EU Missions: Climate-neutral and smart cities. This mission is one of the approaches promoted by the European Commission aiming to provide practical solutions to the most difficult common challenges.

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 is Carbon-neutral Action. Among the goals of this focus area is a 60% emission reduction from the 1990 level by the end of this council term (2025). In addition to the strategy, commitment to the climate neutrality goal is part of the Mayor's Programme for 2021–2025. According to the Mayor's Programme, the measures set out in the Tampere Climate Roadmap will be implemented.

Climate change in the city's financial processes

The City of Tampere employs a diverse range of methods to promote and monitor the progress of the climate work it carries out. In the city budget for 2020, Tampere introduced a climate budget element. The climate budget contains a breakdown of the city-level annual maximum emissions (the emissions budget) and the resources allocated by the City Group to the climate measures (the 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. The climate budget helps the city in its efforts to transparently highlight the progress it makes towards the climate neutrality goal and to assess whether the actions taken by the city are adequate to attain that goal. In the 2021 financial statements, the City of Tampere's reported climate budget operating expenditure totalled some 0.2 per cent of the city's total operating expenditure while

climate investments accounted for approximately 4 per cent of the city's total investments.

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 EUR amounts already in the budget phase and for which it is possible to monitor implementation.

Additionally, the environmental financial statements, compiled annually, reports the sums spent on climate change mitigation and adaptation and on the promotion of sustainable mobility. However, more comprehensibly than the climate budget, the environmental financial statements reports all sums referring to environmental protection, not merely those that refer to climate protection. Moreover, the environmental financial statements provides more precise data, as it also reports the sums not detailed in the budget.

Striving for a climate-neutral Tampere

On 18 June 2018, the City Council approved the Sustainable Tampere 2030 – Towards a Carbon-neutral City Guidelines, which link environmental policy, sustainable development and the climate neutrality goal set out in the Tampere Strategy while making policy on package implementation and monitoring.

The Sustainable Tampere Guidelines cover the themes that are key for 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.

ENVIRONMENTAL POLICY VISION
(Tampere city strategy 2030)

The Sustainable Tampere 2030 - Towards a carbon-neutral city

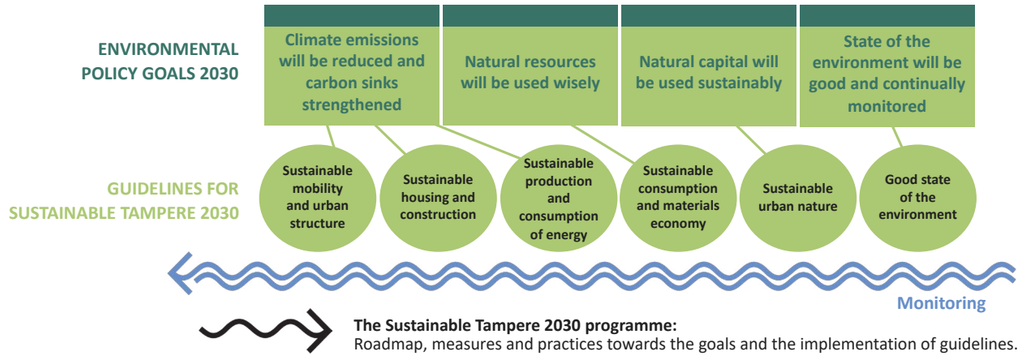


Image 5. Sustainable Tampere 2030 Guidelines

The Guidelines set a target state for each theme:

1. Sustainable mobility and urban structure:
Tampere will be a pioneer in sustainable urban planning, mobility and working methods. The city will be prepared for risks resulting from climate change. The living environment will be safe, healthy and comfortable.

2. Sustainable housing and construction:
Residential areas will be attractive and unique, and they will promote sustainable lifestyles and participation. Easy access to nature will promote the well-being of residents. With construction activities, we will create conditions for safe, healthy and comfortable living.

3. Sustainable production and consumption of energy:
Energy sources will be low in emissions. Energy will be utilised efficiently as smart heating, cooling and electricity networks, energy storages and smart buildings will work in conjunction with each other. In addition, smart solutions and energy services will decrease electricity and heating consumption peaks.

4. Sustainable consumption and materials economy:
The principles of circular economy will direct the use of materials. The city will support sustainable consumption solutions for its residents.

5. Sustainable urban nature:
Natural resources will be used sustainably, and carbon sinks will be 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 will be identified and managed throughout the entire city organisation. The state of the environment will be constantly monitored and improved. The monitoring data will be 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 divide 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 will be promoted through, among other measures, the separate Tampere Biodiversity Programme (LUMO) 2021–2030. A theme that cross-cuts all six themes, coordination and monitoring of the city's climate efforts, was added to the Roadmap.

The Sustainable Tampere 2030 Guidelines and this Roadmap implement the Sustainable Development Goals set out in the UN 2030 Agenda for Sustainable Development, and the City of Tampere is also committed to these Goals. While the measures set out in the Roadmap specifically address Sustainable Development Goals 7, 9, 11, 12, 13, 15 and 17, the starting point is that climate goals are pursued through integrated sustainable development, and climate action must not undermine the other Sustainable Development Goals. Similarly to the original Roadmap, the updated version will also be translated into English.

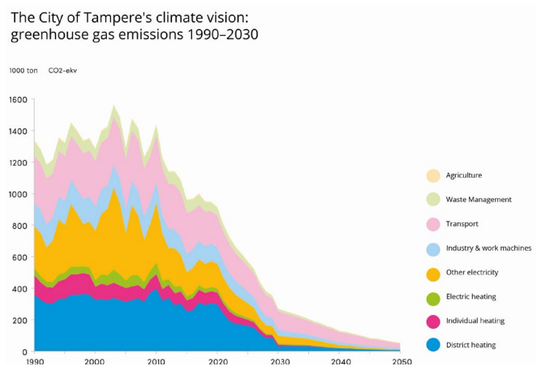


Image 6. The City of Tampere's climate vision: greenhouse gas emissions will decrease by 80% by 2030 compared to 1990.

Image 7. The Sustainable Development Goals set out in the UN 2030 Agenda for Sustainable Development.

SECTION 2. ROADMAP UPDATE

The Climate and Environmental Policy Unit, operating under the auspices of the Sustainable City group part of Urban Environment Services, was 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.

The roadmap was updated so that the groups and units of each service submitted their own proposals on how to update the existing roadmap measures and on adding new measures. Apart from the climate change mitigation measures, the updated edition also contains climate change adaptation and preparedness measures. This process was carried out during the winter and spring of 2022. On the basis of the proposals submitted, the Climate and Environmental Policy Unit updated this roadmap that covers the entire city. The city companies prepared their own climate neutrality roadmaps in 2020 and 2021. Some of the measures in them were added to the roadmap in the context of this update.

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. A plan to achieve this will be drawn up after 2025, when the impact of the emission reduction measures and the functioning of the offsetting schemes can be examined.

All emission reductions are calculated using a method commonly used by municipalities that is internationally comparable (in 2022, CO2 report). The calculations cover the global-warming emissions (carbon dioxide, methane, nitrous oxide) generated within the city of Tampere. Greenhouse gas emissions were aggregated to carbon dioxide equivalents (CO2e). Indirect emissions arising from sources such as the manufacture of goods and materials elsewhere and from their import into Tampere, or from Tampere city residents' travel outside the city, are not included in the calculations. However, the measures set out in the roadmap also aim to reduce these emissions.

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. For the measures included in these annual plans, reporting takes place three times a year in the context of strategy reporting. For all measures, the units update their data pertaining to the progress made directly in the Tampere Climate Watch service. 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.

Supplementing the emission reduction estimates, the roadmap also shows for every measure the rough cost estimates of their implementation (bullet symbols at each measure) as well as, where possible, the more detailed EUR investment (in section 5). It should be noted that these cost estimates only illustrate on a rough level the magnitude of the investments made in the measures. Therefore, they do not address issues such as the type of the cost savings or other benefits that the measures will generate. Regarding the measures already completed and those under Social Services and Health Care (to be transferred to the wellbeing services county), no rough costs estimates were prepared. By way of illustration, more detailed economy calculations and cost-effectiveness calculations, discussed in section 5, were performed in respect of 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, as well as 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 made possible by life-cycle thinking, and increased biodiversity. By way of example, the action cards display some of these.

IMPACT ANALYSIS LEGENDS SHOWN IN THE ACTION CARDS

Orders of magnitude of the emission reduction estimates:

- ●○○○○ < 100 t CO_2e/year
- ●●○○○ 100–1,000 t CO_2e/year
- ●●●○○ 1,000–10,000 t CO_2e/year
- ●●●●○ 10,000–50,000 t CO_2e/year
- ●●●●● > 50,000 t CO_2e/year

Orders of magnitude of the cost estimates in 2023–2030

- ●○○○○ official duties or < EUR 100,000
- ●●○○○ 0.1–1 million €
- ●●●○○ €1–10 million €
- ●●●●○ €10–100 million €
- ●●●●● > €100 million €

Image 8. Supplementing the emission reduction estimates, the roadmap also shows for every measure the rough cost estimates of their implementation as well as, where possible, the more detailed investment in euros. Image: Marko Kallio.

SECTION 3. WHERE WE ARE NOW

EMISSION DEVELOPMENT

Tampere's greenhouse gas emissions increased until 2010, but they have been decreasing since then, albeit the decline has slowed down in recent years. In 2020, total emissions were about 33% lower than in 1990, the baseline year. Emissions per capita showed a more clear decrease, for in 2020 they were some 52% lower than in 1990.

When interpreting the 2020 emissions, however, consideration should be given to the changes that took place in people's behaviour owing to the COVID-19 pandemic. It can be assumed that these changes will not be of a permanent nature, at least not to the same extent.

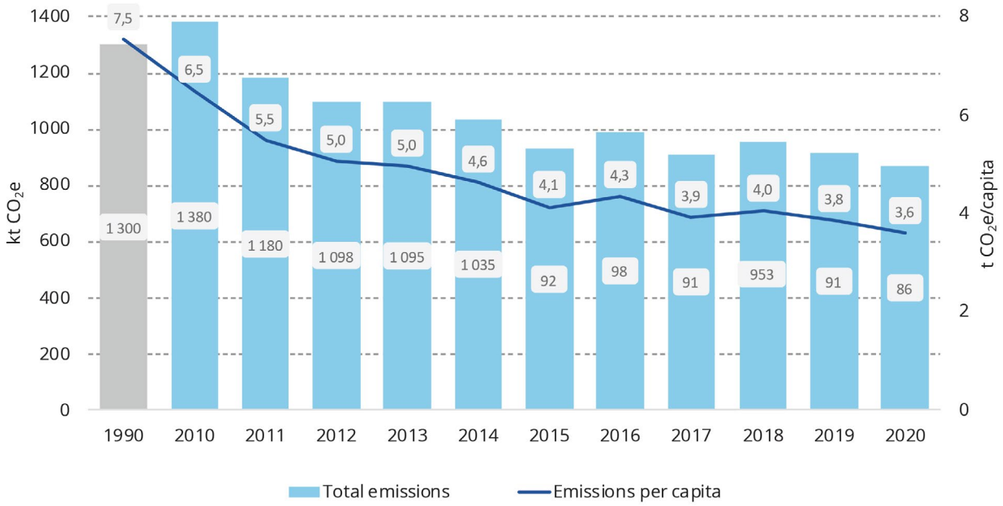


Image 9. Development of carbon dioxide emissions in Tampere in 1990–2020, including emissions from industry. Source: 2022 CO2 report.

The main sources of emissions in Tampere are district heating, road traffic, industry and work machinery. Additionally, electricity consumption by consumers, individual heating, and waste management are also major sources of emissions. Agriculture, on the other hand, plays only a minor role in Tampere.

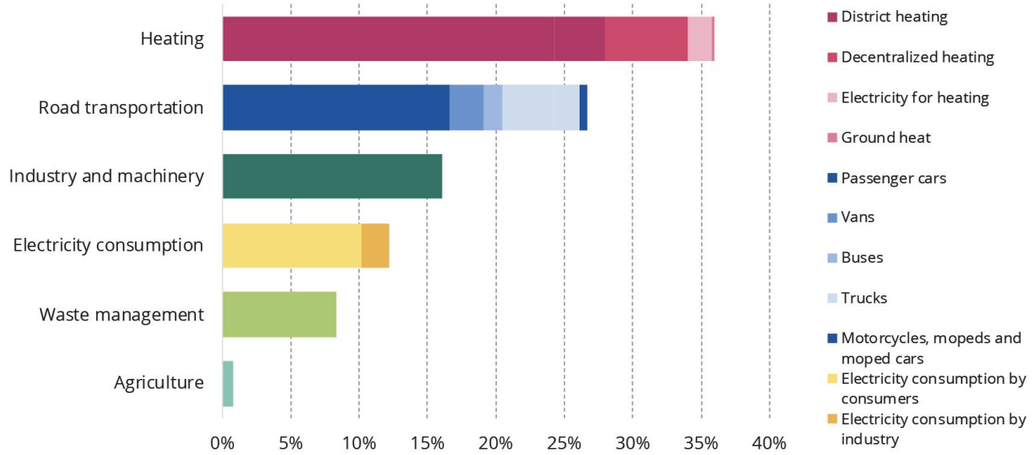


Image 10. Sources of greenhouse gas emissions in Tampere 2020. Source: Tampere 2022 CO2 report and Lipasto database, VTT

The need for emission reductions in different sectors in order to achieve an 80% reduction of total emissions is rather high. The table in Figure 11 shows the greenhouse gas emissions realised in Tampere for 2020 and for each sector the annual change required to achieve the goal. The expert judgement as to whether a sector is able to keep within the emissions budget is based on the relevant change need, the roadmap emission projection, and the known measures. Finally, the table displays the sector-specific percentage 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'.

	2020	Annual need for reduction	Stays in the budget	2022	2025	2030	Percentage change 2020-2030
District heating	242 744	-21 500	✓	190 000	105 000	28 000	-88 %
Decentralized heating	51 967	-4 800	!	53 000	33 000	4 000	-92 %
Electricity for heating	17 170	-1 000	✓	19 000	14 000	7 000	-59 %
Electricity for other purposes	88 156	-4 800	✓	93 000	73 000	40 000	-55 %
Electricity consumption by industry	17 680	-1 100	✓	20 000	13 000	7 000	-60 %
Industry and machinery	139 200	-10 000	!	92 000	75 000	39 000	-72 %
Agriculture	6 488	-200	✓	6 000	5 000	4 000	-38 %
Transportation	231 196	-11 600	✗	184 000	158 000	115 000	-50 %
Waste and wastewater	72 622	-5 700	✗	64 000	50 000	16 000	-78 %
Total (t CO2e)	**867 222**	**-60 700**		**721 000**	**526 000**	**260 000**	
Emission reduction in comparison to 1990	**-33 %**			**-45 %**	**-60 %**	**-80 %**	

Image 11. Tampere's sector-specific emissions budget for 2022, the emissions budget estimates for 2025 and 2030, and the average annual reduction need expressed as tonnes of carbon dioxide equivalents (t CO2e).

The situation in recent years, where the decline in emissions has slowed down, is partly explained by the fact that Tampereen Sähkölaitos has had a break from major investments in renewable energy. When the new unit of the Naistenlahti Power Plant, Naistenlahti 3, is launched at the end of 2022, emissions from **district heating** will experience a significant drop. Additionally, Tampereen Sähkölaitos is planning other investments in green district heat for the 2020s, including various non-combustion solutions.

Reducing emissions from **individual heating and from heating electricity** requires that detached houses and other individual buildings switch to renewable energy sources. This change is already taking place thanks to the increased popularity of heat pumps, among other reasons. In order to achieve the demanding goal set, the roadmap focuses on the provision of energy guidance to private property owners.

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 can and strives to improve the conditions that make it easier to choose sustainable mobility modes. Therefore, in the roadmap, the measures for sustainable mobility modes make up the largest single package.

Other electricity consumption can be reduced by improving the energy efficiency of electricity use and by increasing demand response. This is also largely in the hands of the city residents, but the city can promote it in its own activities and by enhancing energy counselling. The factor with the greatest impact on emissions from electricity is the national development of electricity production.

Reducing emissions from **industry and work machines** requires an active approach by businesses. 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.

Efforts are being made to reduce emissions from **waste management** by improving waste prevention, waste sorting and circular economy solutions. However, a high percentage of all emissions is generated by methane emissions from old landfills. Emissions from **agriculture and forestry** are low in Tampere, but forests play an important role as carbon sinks, and the measures in the roadmap aim to strengthen this together with the vitality of urban nature.

Tampere's carbon footprint

So far, the climate work carried out by Tampere has been focusing on emissions occuring in the geographic area of City of Tampere. Emissions from Tampere's and the city residents' **consumption** are studied increasingly, and a significant share of these emissions is generated outside the city borders. In 2021, together with 14 other municipalities, Tampere participated in the Kulma project, which calculated for each municipality the life-cycle emissions of energy consumption and construction, mobility, food and goods as well as products and services. As a result, it was shown that in 2020 emissions from Tampere's consumption totalled 8.1 t CO2e per resident, which is more than twice the emissions generated in the Tampere region. In future, emissions from consumption will be calculated on a regular basis in order to be able to monitor their development. A new development programme to be launched in 2022, Carbon-neutral Action strives to influence the emissions from city residents' consumption and mobility.

Additionally, in 2021 a rough model for calculating the annual emissions from **construction** was devised for Tampere, as well as carrying out the calculation for the year 2020. The results put the 2020 carbon footprint for construction at 206,000 t CO2e. Therefore, the carbon footprint for construction is of the same order of magnitude as the biggest sources of geographic emissions: transport and district heating. The majority of the emissions, 104,200 t CO2e, came from the use of concrete in buildings. Site operations generated 39,500 t CO2e, the majority of which derived from the use of light fuel oil. The construction of traffic networks resulted in 11,400 and civil engineering in 2,000 t CO2e of emissions.

CLIMATE NEUTRAL TAMPERE 2030 ROADMAP, RESULTS FOR 2020–2022

Everyone can follow the progress of the measures set out in the Climate Neutral Tampere 2030 Roadmap free of charge in a dedicated online service, the Tampere Climate Watch. The original roadmap approved by the City Board in August 2020 contained 236 measures in total. During the first two years, 18% of these (43 measures) were completed. The completed measures are also shown in this updated version of the roadmap. As for the remaining measures, nearly 50% of the measures are currently being implemented and more than one quarter are in the planning phase. 5% of the measures have not been started yet. Of all measures, it was reported that 72% are on track. The measures are scheduled by council term. It is estimated that 158 measures will be completed in the course of the current council term. Following the roadmap update, the number of measures increases to 305.

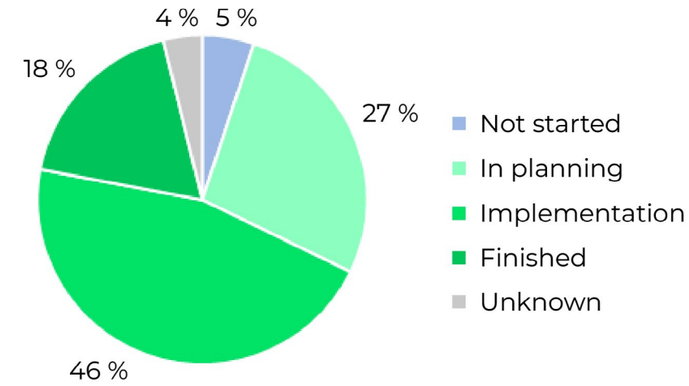


Image 12. Roadmap measures, results for 2020–2022.

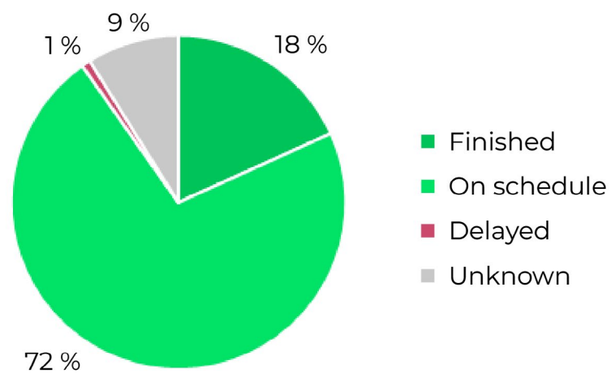


Image 13. Roadmap measures, timetable 2022.

SECTION 4. ROADMAP

The Climate Neutral Tampere 2030 Roadmap is based on the themes set out in the Sustainable Tampere Guidelines and on the benefit 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, divides into two parts: sustainable urban planning, and sustainable mobility. The roadmap update also added a theme that cross-cuts all earlier themes: coordination and monitoring of the city's climate efforts.

The seven benefit goals are implemented under 37 measure packages, containing a total of 305 measures.

ORGANISING ROADMAP IMPLEMENTATION

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 Action development programme. The roadmap action cards and emission calculation is updated as part of the Sustainable Energy and Climate Action Plan (SECAP) every two years.
2. Measures to be taken in the city organisation to promote climate change mitigation and adaptation, their emission reduction estimate and the financial resources budgeted for implementation (so-called climate budget) are included from the roadmap in the city's budget annually.
3. The annual targets and measures are included from the roadmap in the Services' annual plans. The services and their groups 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 Sustainable City Group is responsible for monitoring, reporting and updating the roadmap for the entire city.
5. The roadmap is published as an open digital platform at ilmastovahti.tampere.fi. The city's partners can provide information on their climate actions at the ilmastokumppanuus.fi website.

CLIMATE-NEUTRAL TAMPERE 2030 ROADMAP

Themes, benefit goals and measure packages

0. Coordination and monitoring of the city's climate efforts

1. Sustainable urban planning	2. Sustainable mobility		3. Sustainable construction	4. Sustainable energy	5. Sustainable consumption	6. Sustainable urban nature
Benefit goal 2030: The city will grow primarily into public transport zones and regional centres.	**Benefit goal 2030:** The modal share of sustainable mobility modes will be 69%.		**Benefit goal 2030:** New construction will be at zero-energy level and the carbon footprint of housing will be small.	**Benefit goal 2030:** Renewable energy will amount to 80%.	**Benefit goal 2030:** Consumption will be sustainable and the circular economy functional.	**Benefit goal 2030:** Urban nature and urban structures will bind carbon and preparations have been made for climate change.
1.1. Climate impact assessment	**2.1.** Tram transport	**2.6.** Road transport	**3.1.** New construction of city properties	**4.1.** Centralised renewable energy	**5.1.** Waste management	**6.1.** Carbon sinks of forests
1.2. Conditions for sustainable mobility	**2.2.** Local train transport	**2.7.** Transport equipment and work machines	**3.2.** Guidance of private new construction	**4.2.** Smart energy networks and services	**5.2.** Circular economy	**6.2.** Urban-green carbon sinks
1.3. Strengthening green belts	**2.3.** Bus transport	**2.8.** New mobility services	**3.3.** Renovation construction at city properties	**4.3.** Decentralised renewable energy and energy efficiency	**5.3.** Sustainable consumption	**6.3.** CO_2emissions from green and drainage construction
1.4. Five-star city centre	**2.4.** Public transport service level	**2.9.** Mobility management	**3.4.** Renovation construction at private properties	**4.4.** Giving up oil heating	**5.4.** Meals	**6.4.** Climate change adaptation measures
1.5. Carbon-negative Hiedanranta	**2.5.** Pedestrian and bicycle traffic		**3.5.** Wood construction		**5.5.** Procurement	**6.5.** Carbon offsetting
			3.6. Infrastructure construction		**5.6.** Raising environmental awareness	
			3.7. Use of recycled materials		**5.7.** Sustainable business and events	

THEME 0.

COORDINATION AND MONITORING OF CLIMATE EFFORTS

Benefit goal:	Tampere will be climate neutral in 2030. Tampere will take climate risks and change adaptation seriously.
Description:	Global warming is a crisis that affects people all around the world. Cities represent some 80 per cent 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 within the area of the city will be reduced by 80 per cent as compared to 1990 while offsetting the remaining 20 per cent. Climate change mitigation, as well as preparing for and adapting to the effects of climate change, call for a major cultural change. In order to achieve the goals, we need cooperation between residents, businesses, associations and communities. The City of Tampere's climate measures are collected in this Climate Neutral Tampere 2030 Roadmap. 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 to make a climate-friendly lifestyle possible for every Tampere resident. 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.
Goal 2030:	Climate emissions will have reduced by 80% as 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.
Indicators:	Climate emissions (CO2e) and the percentage reduced (%).
Introductory data:	• Tampere Strategy, and Mayor's Programme • Sustainable Tampere 2030 – Towards a Carbon-neutral City guidelines • Municipal energy efficiency agreement • Covenant of Mayors • Green City Accord initiative • 100 Climate-neutral and smart cities – EU Mission

Image 14. Global warming is a crisis that affects people all around the world. In their everyday work, cities continuously make decisions that can either decrease or increase emissions. Image: Laura Vanzo.

MEASURE PACKAGE 0.0.

COORDINATION AND MONITORING OF CLIMATE EFFORTS

- The climate efforts of the City Group will be coordinated
- The roadmap and the climate budget will be used to monitor the progress made with the climate efforts

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
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**	**Climate and Environmental Policy,** Finance unit, Strategy and Development unit	●○○○○	M A

Image 15. The city wants to make a climate-friendly lifestyle possible for every Tampere resident. Image: Laura Paronen.

THEME 1.

SUSTAINABLE URBAN PLANNING

Benefit goal:	The city will grow primarily into public transport zones and regional centres
Description:	Tampere is experiencing an annual growth of approximately 3,000 residents. The aim is to enable sustainable growth while preserving the quality and functionality of the urban environment. Town 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 aims 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. Land-use planning takes account of the conservation of biodiversity and adequate green belts. The growth which the city is experiencing creates increasing pressure to use forests and nature areas, and therefore it is absolutely necessary to carefully consider expanding any construction areas to green belts. Value-based information and indicators derived from ecosystem services will be used as part of the assessment of the content and effects of land-use planning.
Goal 2030:	• Residential floor area planned for the public transport zones and for the regional centres: 80% (2021), 85% (2025), 90% (2030). • Tampere city centre will have 15,000 new residents and 15,000 more new jobs in 2030 compared to 2015. • 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.
Indicators:	• Planned residential floor area in the public transport zones and in the regional centres (%) • Share of households (%) with a 300m or 700m distance to the key public services • Share of recreational areas of the total inner-city town planning area (%)
Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • Tampere City Region Construction Plan 2040 • Inner-city master plan 2040 • Five-star City Centre Development Programme • Hiedanranta Development Programme

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2014	2015	2016	2017	2018	2019	2020	2021
Planned residential floor area in regional centres and public transport zones	%	65	70	77	59	77	21	70	94

EXAMPLES AND IMPACT ASSESSMENTS

Sustainability of the urban structure 2040

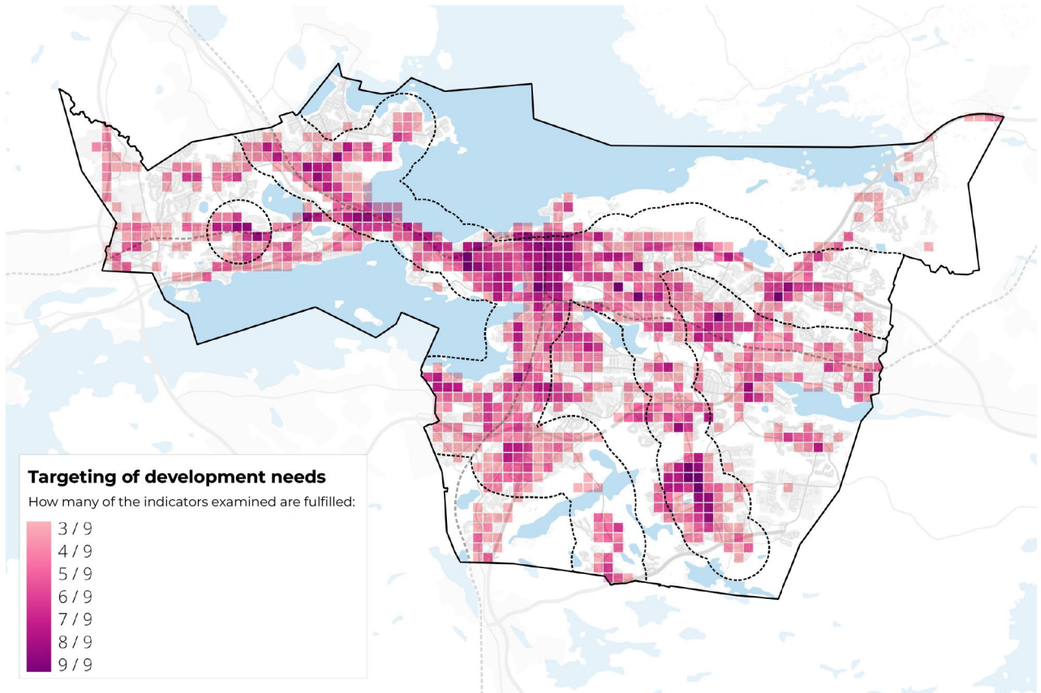


Image 16. The Tampere inner-city master plan evaluates the development of a sustainable urban structure under the following sustainable mobility and green-belt criteria, in particular: A) Number of neighbourhood recreational areas, B) Extent of traffic areas, C) Accessibility of large recreational areas, D) Sustainable mobility zones, E) Current density of urban structure, F) Anticipated densification of urban structure, G) Surface distribution within traffic areas, H) Density of sustainable mobility network, and I) Traffic-induced environmental disturbance. The map shows how many of the indicators examined are fulfilled. ©City of Tampere/Master Planning 2022.

MEASURE PACKAGE 1.1.

CLIMATE IMPACT ASSESSMENT

- Town planning requirements that seek climate neutrality will be developed
- New tools and approaches will be developed for the assessment of the climate impact of town planning

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.1.1.*	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 town 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 and SYKE).	**2022–2029**	**Master Planning,** Town Planning, Climate and Environmental Policy	●○○○○	M A
1.1.2.	Tampere contributes 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)	**2022–2025**	**Master Planning**	●○○○○	M
1.1.3.	In the context of the master plan and the general plans, the CO2 and energy-efficiency analyses prepared for the geographies (for example, Hiedanranta) will guide town planning and the terms and conditions that govern the allocation of plots. Account will be taken of the impact of the town plan on climate as a starting point for planning, and this approach will be recorded in the town planning quality manual. Data on the emission impact of zoned sites and of the entire package will be produced for the town planning programme. The climate and energy principles will be included as part of the land use policy content.	**2022–2029**	**Master Planning,** Town Planning, Climate and Environmental Policy, Real Estate and Housing, Building Control Department	●○○○○	M
1.1.4.	Procurement of town 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.	**2022–2029**	**Master Planning,** Town Planning, Transport System Planning, Climate and Environmental Policy	●○○○○	M
1.1.5.	Material balance planning will be continued in the town planning phase (at sites of more than 10,000 floor square metres) and soil management will be promoted by means of a monitoring tool.	**2022–2025**	**Town Planning,** Master Planning, Real Estate and Housing, Construction and Maintenance of Urban Environment	●○○○○	M
1.1.6.	Sustainability will be promoted in the evaluation criteria and objectives of design contests.	**2022–2025**	**Town Planning,** Master Planning, Real Estate and Housing, Transport System Planning, Green Belts and Drainage Water, Climate and Environmental Policy	●○○○○	M
1.1.7.	Town-plan requirements that seek climate neutrality will be developed. A method to assess low-carbon town plans will be developed together with other cities.	**2022–2025**	**Town Planning,** Master Planning, Climate and Environmental Policy	●○○○○	M

OTHER BENEFITS:

- Increasing awareness of alternative community development scenarios
- Enabling an economic and resource-efficient urban structure

EMISSION REDUCTION ●●●○○

Image 17. Tampere is experiencing an annual growth of approximately 3,000 residents. The aim is to enable sustainable growth while preserving the quality and functionality of the urban environment. Image: Laura Vanzo.

EXAMPLES AND IMPACT ASSESSMENTS

1.1.1.

Climate impact assessment of the inner-city master plan (council term 2017–2021)

In the context of updating the inner-city master plan, a climate impact assessment was carried out regarding the emission impact of land use changes, and a climate impact calculation tool was developed based on the Finnish Monitoring System of Spatial Structure (YKR). With regard to the urban structure, the main emission sectors are the energy use of buildings and passenger transport.

A key driver in emission development is the reduction of the specific emissions from district heat following the transition to lower emission energy production. As for construction, the most important factor is the energy efficient renovation of the old building stock, because new construction is rather energy efficient. Emissions from new construction can be affected, for example, through the choice of materials. The drive underlying the master plan guides towards structural reform, especially in evolving and mixed-function city-centre areas, where rising land values create room for housing companies to manoeuvre with their renovation and infill construction projects and thus also with energy efficiency improvement measures.

Growth that is based on sustainable mobility is made possible in the master plan particularly in the areas of the city-centre functions and in the Sustainable Growth Zone made up of hubs and public transport corridors, where a mixed structure and an efficient public transport system will in the best case scenario enable a smooth everyday life without owning a car.

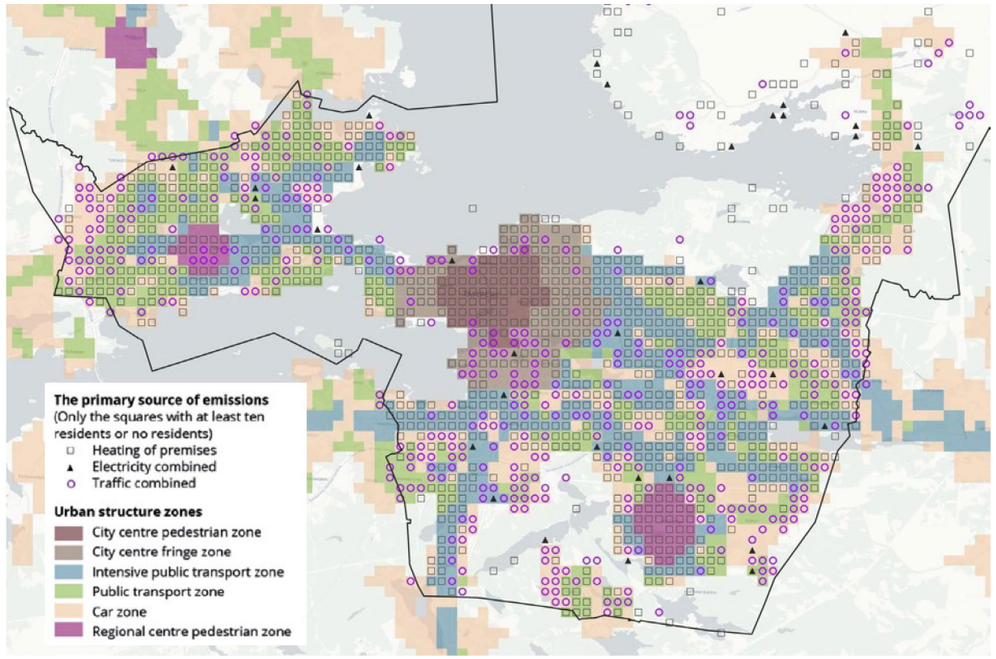


Image 18. Largest emission sources by grid, and urban structure zones 2019. The impact of the urban structure on emissions is reflected in the Tampere inner-city master plan's climate review, which divides the city into grids of 250 square metres. In the city centre, the regional centres and the intensive public transport zone, the biggest source of emissions is the heating of facilities, while in the car zone traffic is the biggest source. Source: Assessment of the climate impact of the future urban structure. Inner city master plan, council term 2017–2021. ©City of Tampere/Master Planning 2020.

Image 19. Tampere strives to support walking and cycling on everyday journeys. Image: Laura Vanzo.

MEASURE PACKAGE 1.2.

CONDITIONS FOR SUSTAINABLE MOBILITY

- The city's growth will be directed towards the city centre, the regional centres and along the main public transport routes
- The Suomi-rata (Finnish Rail) and local train transport will be promoted
- The comfort of the neighbouring environment and the accessibility of services on foot, by bicycle and using public transport will be developed
- Traffic planning will take account of the climate change risks

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.2.1.*	Planning will focus on the city centre, the regional centres and the main public transport routes, or the sustainable growth zone defined in the master plan.	**2022–2025**	**Town Planning,** Master Planning, Public Transport	●○○○○	M
1.2.2.	Data will be produced on the densification potential of the urban structure outside the tramway zone.	**2022–2025**	**Master Planning,** Public Transport, Town Planning, Real Estate and Housing	●○○○○	M A
1.2.3.	New areas and infill development will be planned using the targeted modal shares for sustainable mobility for 2030.	**2022–2025**	**Transport System Planning,** Master Planning, Town Planning	●○○○○	M
1.2.4.	Designing the high-speed rail link between Tampere and Helsinki (Finland Railway) as part of project company cooperation will be actively promoted, as will be renovation of the Main Line.	**2022–2029**	**Growth, Innovation and Competitiveness Services,** Master Planning, Town Planning, Public Transport, Transport System Planning	●●○○○	M
1.2.5.	In compliance with the inner-city master plan, land-use planning will take account of the space provisions for future local-train stations, how they will be accessible on foot and by bicycle, as well as park-and-ride car parks.	**2022–2025**	**Master Planning, Town Planning,** Public Transport, Transport System Planning	●○○○○	M
1.2.6.	Town planning will ensure adequate space reservations for pedestrian and cycling connections, for public transport stations and for nodes. The accessibility of public transport stops will be improved through town planning.	**2022–2025**	**Town Planning,** Public Transport, Transport System Planning	●○○○○	M
1.2.7.	Design of the service network and services, green and recreational services and public transport stops takes 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.	**2022–2029**	**Master Planning,** Town Planning, Service Network Planning, Real Estate and Housing, Transport System Planning, Public Transport, Green Belts and Drainage Water	●○○○○	M
1.2.8.	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.	**2022–2025**	**Transport System Planning,** Master Planning, Town Planning, Green Belts and Drainage Water, Construction and Maintenance of Urban Environment	●○○○○	M A
1.2.9.	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.	**2022–2025**	**Town Planning,** Master Planning, Green Belts and Drainage Water, Construction and Maintenance of Urban Environment, Transport System Planning	●○○○○	M A
1.2.10.	Opportunities will be explored to assess the climate effects of the city's road transport projects.	**2022–2025**	**Transport System Planning, Climate and Environmental Policy**	●○○○○	M A
1.2.11.	The traffic planning design guidelines will be examined from the perspective of adaptation while developing them according to the shortcomings observed. Access to knowledge about the climate change-induced risks that affect the urban structure will be developed. In respect of issues such as the need for space, traffic planning will take account of the changes brought about by climate change as well as of the relevant probable changes.	**2022–2029**	**Transport System Planning**	●○○○○	A
1.2.12.	In compliance with the lake and nature tourism roadmap, lake and nature tourism routes will be developed so that sustainable lake travel is possible by combining the low-emission water bus and cycling. An electronic series of maps will be created for the lake route.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Visit Tampere Oy, Ekokumppanit Oy	●●○○○	M

OTHER BENEFITS:	• Promoting a diverse urban environment • Enabling infill development • Strengthening the profitability of services and public transport
EMISSION REDUCTION	●●●●○

EXAMPLES AND IMPACT ASSESSMENTS

1.2.1.

City Strategy's zone of growth and vitality.

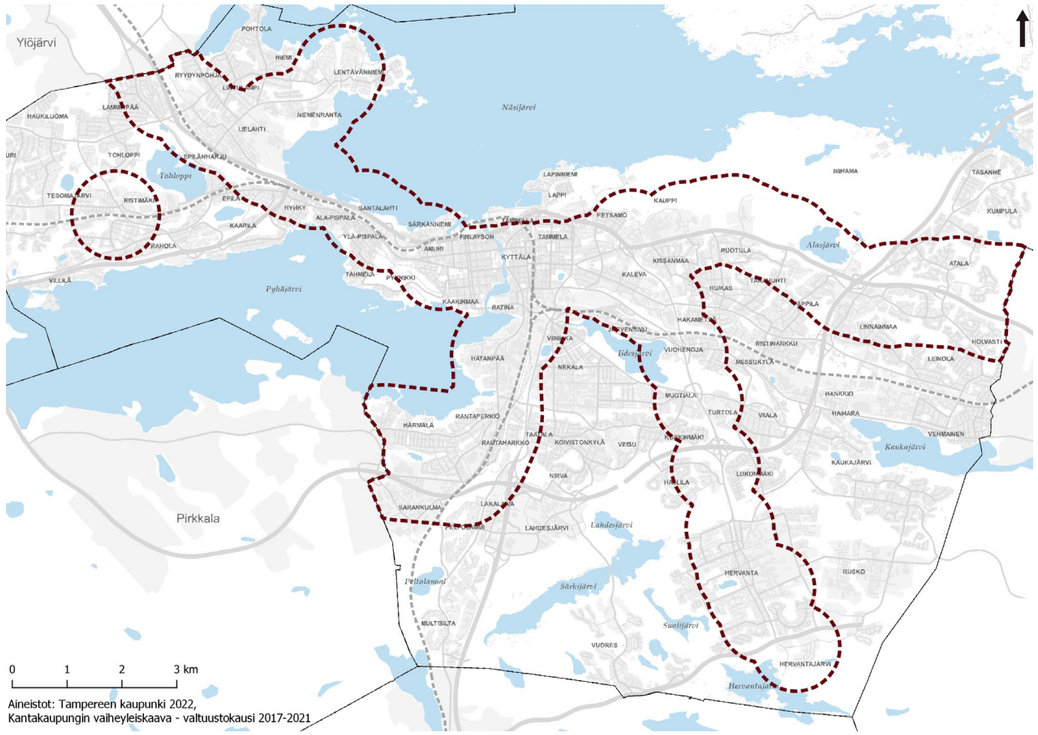


Image 20. Inner-city phased local master plan – council term 2017–2021, City Strategy's zone of growth and vitality into which the aim is to direct 80–90% of Tampere's population growth. ©City of Tampere/Master Planning 2022.

Of total inner-city growth, how much occurs in the growth and vitality zone

	2020-2035	2036-2040
Population increase Share of total growth		
Within the zone	**77 %**	**91 %**
Outside the zone	**23 %**	**9 %**
Increase in jobs Share of total growth		
Within the zone	**86 %**	**91 %**
Outside the zone	**14 %**	**9 %**

Image 21. Population growth and new jobs within and outside the growth and vitality zone according to the Draft inner-city master plan, council term 2017–2021. ©City of Tampere/Master Planning 2022.

MEASURE PACKAGE 1.3.

STRENGTHENING GREEN BELTS

- Ensuring the integrity and adequacy of the green networks in town planning
- Using the green coefficient tool in the applicable town plans
- Producing data on the state and economic value of the ecosystem services

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.3.1. *	The role of green belts as pleasant routes for outdoor exercise and recreation and as pedestrian environments will be strengthened by examining the continuity and connectivity of the green belt network and by identifying the areas needing development in master planning. Additionally, master planning will formulate an opinion for the land use policy to prioritise, in the growth zone, the adequacy of green belts. Town planning will ensure the continuity and connectivity of the green network. The Green Belts and Drainage Water unit will prepare criteria for the promotion of cohesion between the green belts.	**2022–2025**	**Master Planning, Town Planning, Green Belts and Drainage Water,** Construction and Maintenance of Urban Environment, Transport System Planning, Environmental Protection, Climate and Environmental Policy	●○○○○	M A
1.3.2.	A green coefficient will be introduced into and used in the appropriate town plans. Master Planning will produce a regional green coefficient method, or a tool to assess ecosystem services.	**2022–2025**	**Town Planning, Master Planning,** Green Belts and Drainage Water	●○○○○	M A
1.3.3.	Coordination, dissemination and utilisation of urban-structure monitoring information in the impact assessment of plans and programmes from strategy level to practical level. For example, quality, quantity and accessibility monitoring of green belts will be designed and implemented in the city's map service. Monitoring will be continuously developed while also producing additional information by means such as by assessing the canopy cover.	**2022–2025**	**Master Planning,** Green Belts and Drainage Water	●○○○○	M A
1.3.4.	Producing data on the state and economic value of the ecosystem services produced by the green belts. Presentation of data in the ecosystem accounts will be developed so as to be able to monitor the development of the ecosystem services and to take better account of them in land-use planning and to ensure the adequacy and integrity of the green belts.	**2022–2029**	**Climate and Environmental Policy,** Master Planning, Environmental Protection, Green Belts and Drainage Water, Town Planning, Real Estate and Housing	●●○○○	M A

OTHER BENEFITS:

- Securing a carbon-sequestering urban green
- Positive impacts on comfort and microclimate
- Strengthening urban biodiversity
- Positive impacts on comfort and microclimate, such as mitigation of heat, wind and pluvial floods

EMISSION REDUCTION ●●○○○

EXAMPLES AND IMPACT ASSESSMENTS

1.3.1.

Strengthening the significance of green belts

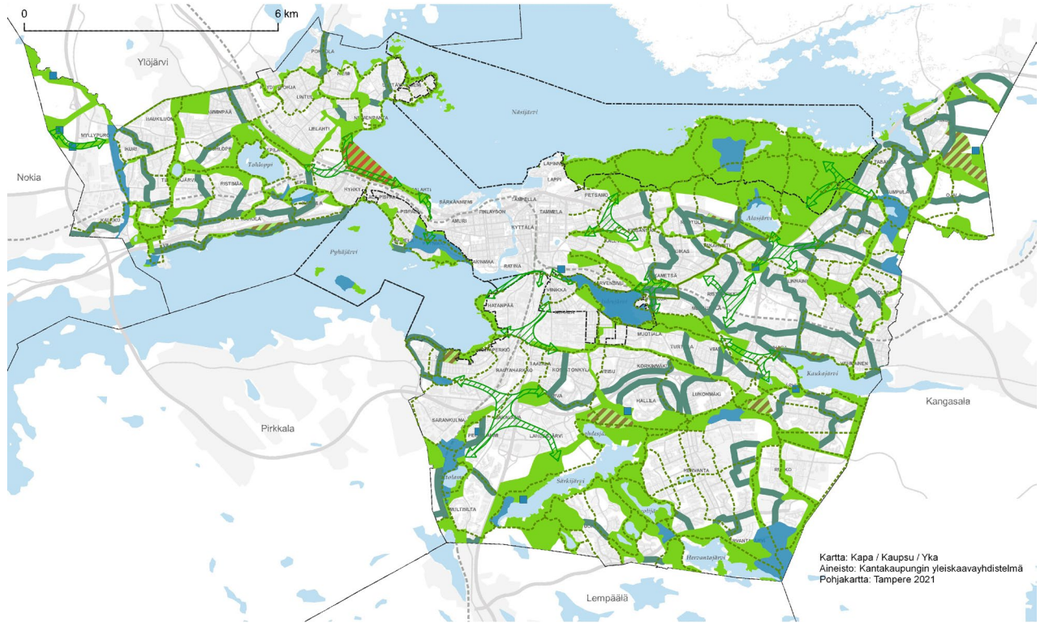


Image 22. Extract from the key entries of map 2 Green spaces and the leisure services of the Combined inner-city master plan. The central objective of the master plan is to ensure the preservation of the values of the central park network and the adequacy and accessibility by walking, cycling and public 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. ©City of Tampere/Master Planning 2022.

MEASURE PACKAGE 1.4.

FIVE-STAR CITY CENTRE

- Carbon footprint assessments will be carried out for all major city-centre development projects
- The Tampere station area will be developed as a hub for sustainable mobility, housing and jobs
- Sustainable event venues will be developed in the city centre
- Climate-neutral infill development will be promoted

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.4.1.	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.	2022–2025	**Five-star City Centre Development Programme**	●●○○○	M ((A))
1.4.2.	Carbon footprint calculations will be performed for all major development projects in the city centre (for example, Nokia Arena). The applicable calculation method will be developed together with the Climate and Environmental Policy unit, possibly taking into account emissions from heat production, electricity production, waste management, transport operations and travel with sufficient and necessary accuracy.	2022–2025	**Five-star City Centre Development Programme,** Climate and Environmental Policy	●●○○○	M
1.4.3.	Energy modelling will be carried out for the Tammela infill development area.	Complete	**Five-star City Centre Development Programme,** Climate and Environmental Policy		M
1.4.4.*	The Tampere 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. The densification of the urban structure of the area, the natural overlap of activities, good public transport connections combined with pedestrian and cycling routes and smooth travel chains will all contribute to the City of Tampere's climate neutrality goal.	2022–2029	**Five-star City Centre Development Programme,** Town Planning, Transport System Planning, Green Belts and Drainage Water	●●●●○	M ((A))
1.4.5.	Urban venues situated along good public transport routes in the city centre, such as Ratina Stadium, Nokia Arena, Tammela Stadium and Särkänniemi, will be developed.	2022–2029	**Five-star City Centre Development Programme**	●●●●○	M
1.4.6.	To encourage infill development, infill development sites in the city centre will be marketed as part of a communication campaign for housing companies in 2021.	Complete	**Climate and Environmental Policy,** Five-star City Centre Development Programme, Master Planning, Town Planning, Real Estate and Housing, Ekokumppanit Oy		M
1.4.7.*	Smart and sustainable construction will be promoted through design contests and development projects in areas such as Tammela, Viinikanlahti, the western city centre and the Tampere Deck.	2022–2029	**Five-star City Centre Development Programme,** Climate and Environmental Policy	●○○○○	M

OTHER BENEFITS:	• Promoting a diverse urban environment • Enabling infill development • Strengthening the profitability of services and public transport • Strengthening Tampere's attractiveness
EMISSION REDUCTION	●●●○○

EXAMPLES AND IMPACT ASSESSMENTS

1.4.4.

New station centre

Image 23. Renewal of the station area is the largest single project in city-centre development and of national significance, since Tampere is an important railway hub. The station centre area will be developed into a hub for rail, tramway and bus transport, to be surrounded by new apartments, offices and services as well as a new central park. The station centre promotes the city's climate neutrality goal by streamlining sustainable mobility and by creating an energy efficient, dense urban structure. The aim is to complete in 2027 the travel centre and the new station tunnel (pictured) where travellers can access the train platforms and the new travel centre directly from the tram stop. The first phase also involves the construction of the Station Park as well as residential and commercial premises. Image: City of Tampere/COBE/Lunden.

EXAMPLES AND IMPACT ASSESSMENTS

1.4.7.

New district in Viinikanlahti

Image 24. A residential area of about 3,000 inhabitants is currently being planned to replace the Viinikanlahti wastewater treatment plant, situated along the tram route and on the shore of Lake Pyhäjärvi. This large, new residential area provides an opportunity to implement a range of sustainable development solutions. The image shows 'Lakes & Roses', the winning work of the international design contest. The jury appreciated the great overall approach to urban and landscape architecture and the clarity of the cityscape. Working under a pseudonym, the winner was revealed to be Finnish architecture agency NOAN from Tampere. Image: City of Tampere/NOAN Architecture Studio.

MEASURE PACKAGE 1.5.

CARBON-NEGATIVE HIEDANRANTA

- A carbon-negative residential area will be designed for Hiedanranta
- New ways of sustainable mobility will be developed in Hiedanranta
- An energy system based on non-combustion energy production will be implemented in Hiedanranta
- The site-, block- and area-specific common facilities in Hiedanranta will be implemented under the new model
- Hiedanranta will serve as a development platform for new business and investment opportunities

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.5.1.*	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 town plan.	2022–2025	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy	●●○○○	M A
1.5.2.*	Hiedanrannan Kehitys Oy will prepare continuously developing sustainability criteria operating on market terms for the purpose of allocating plots in Hiedanranta. The targeted carbon emission reduction for house-building in the first blocks is 35% as compared to the 2021 level.	2022–2025	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy	●●○○○	M
1.5.3.*	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.	2022–2029	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy, Climate and Environmental Policy, Tampereen Sähkölaitos Oy	●●○○○	M
1.5.4.*	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 carbon emissions, of common facilities that serve residents better.	2022–2029	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy	●○○○○	M
1.5.5.*	Design of the Hiedanranta school and wellness centre will elevate carbon footprint to a key design indicator.	2022–2029	**Hiedanranta Development Programme,** Real Estate and Housing	●○○○○	M
1.5.6.*	The extraction and beneficial use of zero fibre will be put out to tender from 2022 onwards, so that the tendering process will strive to find an economic solution for zero-fibre utilisation that will improve the condition of the body of water and that will reduce climate risks.	2022–2025	**Hiedanranta Development Programme**	●●●●○	M
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	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy	●●○○○	M A
1.5.8.*	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.	2022–2025	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy, Transport System Planning, Public Transport	●○○○○	M

OTHER BENEFITS:

- Densifying the urban structure
- Promoting a diverse urban environment
- Strengthening the profitability of services and public transport
- Strengthening Tampere's attractiveness
- Developing new business

EMISSION REDUCTION ●●●○○

EXAMPLES AND IMPACT ASSESSMENTS

1.5.1. –1.5.8.

Carbon-negative Hiedanranta

Tampere has a vision to build Hiedanranta into a neighbourhood of 25,000 inhabitants that "produces more than it consumes". Within the framework of temporary Hiedanranta, a host of pilots have already been made possible, and currently the actual construction of Hiedanranta to meet the inhabitants' needs is about to be launched utilising the best expertise available. In the development of this area, the following will be the key objectives: sustainable modes of mobility, renewable energy solutions, the circular economy, and smooth everyday services that through the use of new digital solutions improve quality of life.

The tramway under construction will serve as the backbone of the traffic in this residential area. Already for the first blocks, a climate neutrality-enabling heat network, advanced on a global scale, will be installed in the area. The carbon footprint of house-building in the first districts will be more than 40% lower than the current level. The carbon footprint will be reduced on a systematic basis. Residents' common facilities and services will be realised as construction in the area progresses. The factory will enable a range of events for artisans and cultural operators.

Image 25. Conceptual rendering of Hiedanranta's construction plan. The picture shows central Hiedanranta, where the tram line will run next to the old factory area, the future commercial centre and central square. Image: City of Tampere/NOAN Architecture Studio.

THEME 2.

SUSTAINABLE MOBILITY

Benefit goal:	The modal share of sustainable modes of transport will be 69%
Description:	In Tampere, climate emissions from transport are mainly due to road traffic. Tampere residents make about 50% of their journeys by car, but in future the city's growth cannot rely on passenger cars as strongly as thus far. The city strives to heavily increase the modal share of sustainable options while decreasing the share of motoring. Sustainable mobility modes, public transport, walking and cycling are all priorities in the development of sustainable mobility. Increasing the modal share of sustainable modes of transport is a challenging goal, which requires sustained and determined action and also the allocation of resources for the development of sustainable mobility in order to improve conditions for pedestrian and bicycle traffic and for public transport. The service level of the Tampere region public transport system will be elevated to accommodate the percentage of daily urban mobility set out in the city's goals. The tramway is the single most significant project in terms of public transport system development, as it cuts the climate load by reducing energy consumption in transport and through the use of electricity instead of oil. Additionally, the tramway creates a framework for sustainable land use while promoting smart mobility that develops smooth travel chains and new transport services. The shift to emission-free bus transport, as well as smooth travel chains and new mobility services, will all promote the sustainability of the public transport system. Achievement of the modal share set out in the city's goal requires a general improvement in the service level. The conditions for pedestrian and bicycle traffic will be improved by streamlining the main cycling routes and by developing walking zones in the city centre and in the regional centres. The transport pricing reform is estimated to be not only the most effective but also the most cost-effective measure in terms of reducing emissions from car traffic. Additionally, halving the emissions from traffic requires that the the fleet be renewed and the share of alternative propulsion systems increased. New mobility services, such as car-sharing, demand-responsive transport, city bikes and electric scooters, supplement sustainable mobility, reduce the need to own and use private cars, improve the smoothness of residents' everyday life and facilitate the use of public transport. Mobility management is about encouraging sustainable mobility through efforts such as guidance, mobility plans, marketing, and the development and testing of new services. A large employer, the city is a trendsetter in these efforts.
Goal 2030:	• Modal share of public transport: 19% (2025), 21% (2030). • Modal share of walking: 31% (2025), 33% (2030). • Modal share of cycling: 13% (2025), 15% (2030). • Modal share of travel by car: 36% (2025), 30% (2030). • The number of journeys made by public transport in Tampere will increase 9% (2021), 22% (2025) and 44% (2030) from 2019. • The increase in car travel output will stop by 2025 and will start to decline despite population growth. • Percentage of vehicles with alternative propulsion systems in traffic use in Tampere: 5% (2021), 20% (2025), 35% (2030). • Percentage of alternative propulsion vehicles of the city organisation's vans: 0% (2021), 20% (2025), 100% (2030). • Level of outsourced low-emission propulsion transport services (bus and tramway line kilometres): 5% (2021), 35% (2025), 100% (2030). • Tampere will operate a comprehensive, diverse, efficient and low-emission public transport system consisting of a tramway, local trains, bus transport and smart travel chains connecting all mobility modes
Goal 2030:	• Walking and cycling will be smooth, attractive and safe mobility modes, separated on their own lanes in the city centres and on the main routes. Cycling will be the fastest mobility mode for journeys of under 3km. • 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.
Indicators:	• Modal share of public transport on an autumn weekday (%) • Modal share of walking on an autumn weekday (%). • Modal share of cycling on an autumn weekday (%). • Modal share of travel by car on an autumn weekday (%) • Level of outsourced low-emission propulsion transport services (line km) • Car travel output (km/person) • Percentage of vehicles using alternative propulsion systems of all cars owned by Tampere residents (%) • Percentage of vehicles using alternative propulsion systems of the city organisation's all passenger cars (%) • Percentage of vehicles using alternative propulsion systems of the city organisation's all vans (%)
Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • Tampere inner-city master plan 2040 • Tampere city-centre strategic partial master plan • Tampere Region Construction Plan 2040 • Tampere Tramway Development Programme • Tramway – the Way Forward in the Tampere City Region • Tampere City Region Local-Train Development Programme • Regional Walking and Cycling Development Programme 2.0 • Land Use, Housing and Transport Agreement (MAL Agreement) 2020–23 concluded between the state and the municipalities of the Tampere region and the Joint Authority of Tampere City Region • Vision and Targets of Walking and Urban Life 2030 • Action Plan for Electro-mobility • Tampere Parking Policy Guidelines 2019 • City of Tampere guidelines for personnel • Smart Tampere Programme • MaaS Vision 2030 for the Tampere region – a preliminary survey of mobility as a service activities

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2012	2016	2018	2019	2020	2021
Modal share of public transport on an autumn weekday	**%**	**17**	**13**				
Modal share of walking on an autumn weekday	**%**	**27**	**31**				
Modal share of cycling on an autumn weekday	**%**	**10**	**10**				
Modal share of motoring on an autumn weekday	**%**	**45**	**44**				
Percentage of cars using alternative propulsion systems	**%**			**1**	**2**		

MEASURE PACKAGE 2.1.

TRAM TRANSPORT

- The second section of the tramway, Pyynikintori–Santalahti–Lentävänniemi, will be constructed
- A project plan for the Tampere and Pirkkala tramway will be drafted
- A long-term public transport plan will be maintained in order to increase the number of passengers

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
1.1.2.*	The first section of the tramway (Hervanta–Pyynikintori–Tays) will be completed and will start operating in August 2021.	**Complete**	**Tramway development programme, Tampereen Raitiotie Oy,** Tramway Alliance		M
2.1.2.*	Traffic on the Hatanpää highway tramway section Koskipuisto–Sorin aukio square will start in 2021.	**Complete**	**Tramway development programme, Tampereen Raitiotie Oy,** Tramway Alliance		M
2.1.3.	The second section of the tramway will be constructed. Traffic on section 2A (Pyynikintori–Santalahti) will be launched on 7 August 2023 and the construction of section 2B (Santalahti–Lentävänniemi) will be completed in 2024.	**2022–2025**	**Tampereen Raitiotie Oy,** Tramway Alliance	●●●●○	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.	The Tampere and Pirkkala tramway project plan assignment will have been fully completed by 30 April 2023.	**2022–2025**	**Tampereen Raitiotie Oy**	●●●○○	M
2.1.6.	Target timetables for the other tramway lines will be defined during 2020–2023.	**Complete**	**Tampereen Raitiotie Oy**	○○○○○	M
2.1.7.	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.	**2022–2025**	**Public transport**	●○○○○	M
2.1.8.	All electricity for tramway transport will be produced by renewable energy sources.	**Complete**	**Tampereen Raitiotie Oy**		M
2.1.9.	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

OTHER BENEFITS:	• Increased service level, cost-effectiveness and modal share of public transport • Smooth everyday life and a comfortable street environment • Reduced number of road accidents • Expansion of the city-centre functions and densification of the urban structure • Tampere profiled as a European rail city • Overall economic advantages, economic benefits of densification of land use
EMISSION REDUCTION	●●●○○

EXAMPLES AND IMPACT ASSESSMENTS

2.1.1.–2.1.3.

Tram transport

Image 26. The operation of the first section of the tramway started in August 2021, and the second section is planned for completion in 2024–25. Image: City of Tampere.

MEASURE PACKAGE 2.2.

LOCAL TRAIN TRANSPORT

- Efforts will be made to increase local train transport in cooperation with the regional municipalities
- A local train transport user survey will be carried out to assess the emission impact

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.2.1.*	Local train transport will be expanded within the framework of the existing railway infrastructure by participating in the Nokia–Tesoma–Tampere–Orivesi–Lempäälä local train pilot (Ministry of Transport and Communications, regional local train pilot).	**Complete**	**Public transport**		M
2.2.2.*	The Tesoma local train halt will be built.	**Complete**	**Construction and Maintenance of Urban Environment**		M
2.2.3.*	A plan and a decision will be made as to the continuation of the local train services on the basis of the pilot. The city aims to increase local train transport in cooperation with the Ministry of Transport and Communications and the municipalities of the region. If this goal is achieved, traffic will be increased, for example, in the direction of Hankkio, and halts will be constructed at Hankkio and Messukylä.	**2025–2029**	**Public Transport,** Transport System Planning	●●●○○	M
2.2.4.*	Contributions will be made to drafting the Tampere region local 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
2.2.6.*	A local train transport user survey will be carried out to assess the emission impacts.	**2022–2025**	**Public Transport,** Transport System Planning, Climate and Environmental Policy		M

OTHER BENEFITS:

- Decreased use of private cars
- Improvement of air quality
- Reduced noise pollution
- Improvement of the public transport service level and of cost-effectiveness
- Densification of the urban structure

EMISSION REDUCTION ●●●○○

EXAMPLES AND IMPACT ASSESSMENTS 2.2.1. –2.2.6.

Expansion of local train transport

Image 27. Tampere is preparing for future increases in local train traffic by allocating in master planning halts and stations to local train transport. Image Inner-city phased local master plan, council term 2017–21. ©City of Tampere/Master Planning 2020.

MEASURE PACKAGE 2.3.

BUS TRANSPORT

- A new depot for TKL's buses will be constructed
- Some 40 electric buses will be purchased for TKL
- By 2030, bus transport will have fully transitioned to alternative propulsion systems

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.3.1.	Tendering models will be developed to support the climate goals.	**2022–2025**	**Public transport**	●○○○○	M
2.3.2.	Tampere City Transport's (TKL) production agreement will be amended to support the climate goals.	**Complete**	**Public Transport,** Tampere City Transport		M
2.3.3.	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.	A new depot will be built for TKL's buses, designed for the needs of new propulsion systems. Some 40 electric buses will be purchased for TKL.	**2022–2025**	**Public Transport,** Tampere City Transport	●●●●○	M
2.3.5.	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

OTHER BENEFITS:

- Decreased noise levels of public transport
- Reduced harmful local emissions
- Improvement of the image of bus transport, and fleet renewal

EMISSION REDUCTION ●●●●○

Image 28. A fleet of 26 electric buses operated by Pohjolan Liikenne arrived in Tampere in summer 2022. At the start of the winter traffic season in August, a total of 8 Tampere regional transport routes will be operated either on electricity or on renewable diesel. The aim is for bus transport to achieve a full switch to clean propulsion systems by 2030.
Image: Pekka Ohtokangas.

MEASURE PACKAGE 2.4.

PUBLIC TRANSPORT SERVICE LEVEL

- Short headways and fast journey times will be ensured on the public transport trunk lines
- Demand-responsive public transport will be developed for areas of low demand
- Public transport will be developed to be competitive in relation to car use

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.4.1.	Adequate headways on the trunk lines will be ensured (high headway + adequate number of seats).	**2022–2029**	**Public transport**	●●●●○	M
2.4.2.	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.	**2022–2029**	**Public Transport,** Transport System Planning	●●●○○	M
2.4.3.	Extension of the trunk lines to include additional connectivity.	**2022–2029**	**Public transport**	●●●○○	M
2.4.4.	Demand-responsive public transport for areas of low demand will be developed.	**2025–2029**	**Public transport**	●●○○○	M
2.4.5.	The quality of public transport will be developed by improving customer experience, by developing real-time communication to customers and in-house.	**2022–2025**	**Public transport**	●●●○○	M A
2.4.6.	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.	**2022–2029**	**Public transport**	●●●○○	M
2.4.7.	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.	**2022–2025**	**Public transport**	●●○○○	M
2.4.8.	Open data and interfaces enable smart information, payment and usage applications.	**2022–2029**	**Public transport**	●●○○○	M

OTHER BENEFITS:

- Improving the fluency and attractiveness of public transport
- Improving the competitiveness of public transport
- Enabling new mobility services

EMISSION REDUCTION ●●●●○

Image 29. The city strives to heavily increase the modal share of sustainable options while decreasing the share of motoring. Image: Laura Vanzo.

MEASURE PACKAGE 2.5.

PEDESTRIAN AND BICYCLE TRAFFIC

- City centres will be developed on a pedestrian-oriented basis into slow zones
- Cycle traffic solutions will be designed with an emphasis on quality
- High-quality bicycle parking facilities and spaces will be constructed in city centres
- The quality level of winter maintenance will be stepped up on the main cycling routes and in city centres

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.5.1.	A City of Tampere Cycling Development Programme, as well as a Walking and Urban Life Programme, will be drafted for decision-making and implementation. Additionally, the Walking and Cycling Development Programme 2.0 prepared for the city region will be implemented.	2022–2025	**Transport System Planning**	●○○○○	M
2.5.2.	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.	2022–2029	**Transport System Planning**	●●●○○	M A
2.5.3.	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 cycle traffic solutions will be designed with an emphasis on quality in compliance with the approved design guidelines.	2022–2029	**Transport System Planning**	●●●●○	M
2.5.4.	Bicycle parking opportunities will be increased by building a high-quality and safe bicycle parking facility in the city centre, taking into account the needs of different bicycles, including cargo bikes and opportunities for charging electric bicycles. The implementation of centralised bicycle parking facilities will be promoted in the city centre, for example following development of land use at Keskustori and at the railway station.	2022–2029	**Five-star City Centre Development Programme,** Transport System Planning	●●●○○	M
2.5.5.	In accordance with the relevant implementation programmes to be drawn up, the number of high-quality bicycle parking spaces will be increased in the public areas in city centres, along the main cycling routes, at public transport hubs, and at stops.	2022–2029	**Transport System Planning**	●●○○○	M
2.5.6.	The level of winter maintenance will be enhanced 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.	2022–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●○○○○	M A
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	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●○○○○	M A
2.5.8.	Bicycle parking at the city's service buildings will be improved in accordance with the guidelines set out in the Tampere parking policy in connection with renovations: at offices, 1 bicycle parking space per 100 m²; at comprehensive schools, 2 bicycle parking spaces per 3 pupils, frame-lock racks, and at least 30% of the spaces are covered. These instructions will be recorded in the design manual.	2022–2025	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●●○○	M

OTHER BENEFITS:

- Health benefits of walking and cycling
- Improved air quality
- Reduced noise pollution
- Increased comfort
- Financial benefits to consumers
- Mobility non-discrimination

EMISSION REDUCTION ●●●○○

Image 30. The conditions for pedestrian and bicycle traffic will be improved by streamlining the main cycling routes and by developing walking zones in the city centre and in the regional centres. Image: Laura Vanzo.

MEASURE PACKAGE 2.6.

ROAD TRANSPORT

- Increased use of electric cars will be facilitated by promoting the expansion of the charging network
- Sustainable delivery transports and urban logistics will be promoted
- The city's vehicles will transition to sustainable propulsion systems
- The conditions for implementing a low-emission traffic zone and congestion charges in the city centre will be investigated. 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.
- The parking policy and the parking regulation will be updated to support sustainable mobility

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.6.1.	It will be determined how to enable the expansion of the electric car charging network at the city's properties while examining the potential sites for gas filling stations in the context of the energy survey carried out as part of master planning.	**2022–2025**	**Transport System Planning, Master Planning**	●○○○○	M
2.6.2.	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
2.6.3.	Electric car charging stations will be introduced at the city's properties in accordance with the energy efficiency act and the act on electric vehicle charging stations, which entered into force in 2021.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●●○○	M
2.6.4.	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.	**2022–2025**	**Transport System Planning**	●○○○○	M
2.6.5.	The parking policy and, where necessary, the parking regulation will be updated to support sustainable mobility.	**2022–2025**	**Transport System Planning**	●○○○○	M
2.6.6.	The space freed up along streets will be used to improve the conditions for sustainable mobility modes, as parking in city centres is moved to multistorey car parks.	**2022–2029**	**Transport System Planning**	●○○○○	M
2.6.7.	The Smart Parking concept will be developed and the introduction of the concept promoted, for example in Tammela and elsewhere in city-centre parking.	**2022–2029**	**Five-star City Centre Development Programme,** Finnpark Oy	●●○○○	M
2.6.8.	Urban logistics will be developed in accordance with the Action Plan for Urban Logistics to be completed in 2022. Active cooperation with the key stakeholders in the sector will be ensured. The conditions for sustainable delivery transports in the urban environment will be improved while developing incentives to step up low-emission deliveries in, for example, the city's own transport operations.	**2022–2025**	**Transport System Planning**	●○○○○	M
2.6.9.	The potential to pilot charging options for heavy traffic will be investigated. Suitable sites and commercial models for permanent delivery-traffic charging stations within the city centre will be investigated.	**2022–2029**	**Transport System Planning**	●○○○○	M
2.6.10.	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		M
2.6.11.	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.	**2022–2025**	**Tampereen Infra Oy,** Tuomi Logistiikka Oy	●●○○○	M
2.6.12.	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.	**2022–2025**	**Tampereen Infra Oy,** Tuomi Logistiikka Oy	●●○○○	M

OTHER BENEFITS:

- Improved air quality
- Reduced noise pollution
- More efficient use of urban space
- Financial savings

EMISSION REDUCTION ●●●○○

MEASURE PACKAGE 2.7.

TRANSPORT EQUIPMENT AND WORK MACHINES

- The city's transport equipment and work machines will transition to sustainable propulsion systems

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.7.1.	For the purpose of drafting procurement of the city's transport equipment, work machines and construction contracts, a market survey will be conducted on the potential to increase alternative propulsion systems. 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.	2022–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●●○○○	(M)
2.7.2.	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 lorries (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)	2022–2025	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●●○○○	(M)
2.7.3.	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 work machines and in works contracts. The aim is for all transport equipment and work machines to run on low-emission propulsion by 2030.	2022–2029	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●●○○○	(M)
2.7.4.	Examination of the fuel used in teaching and in student transport and of alternative fuels, ensuring that the vehicles and machines are up to date; utilisation of public means of transport.	2022–2029	**Tampere Vocational College Tredu**	●○○○○	(M) (A)
2.7.5.	Tampere Water monitors the refuelling of My Diesel 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.	2022–2025	**Tampere Water**	●○○○○	(M)
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.	2022–2025	**Rescue Department**	●○○○○	(M)

OTHER BENEFITS:
- Improved air quality
- Health benefits
- Improved quality of equipment and fleet

EMISSION REDUCTION ●●●○○

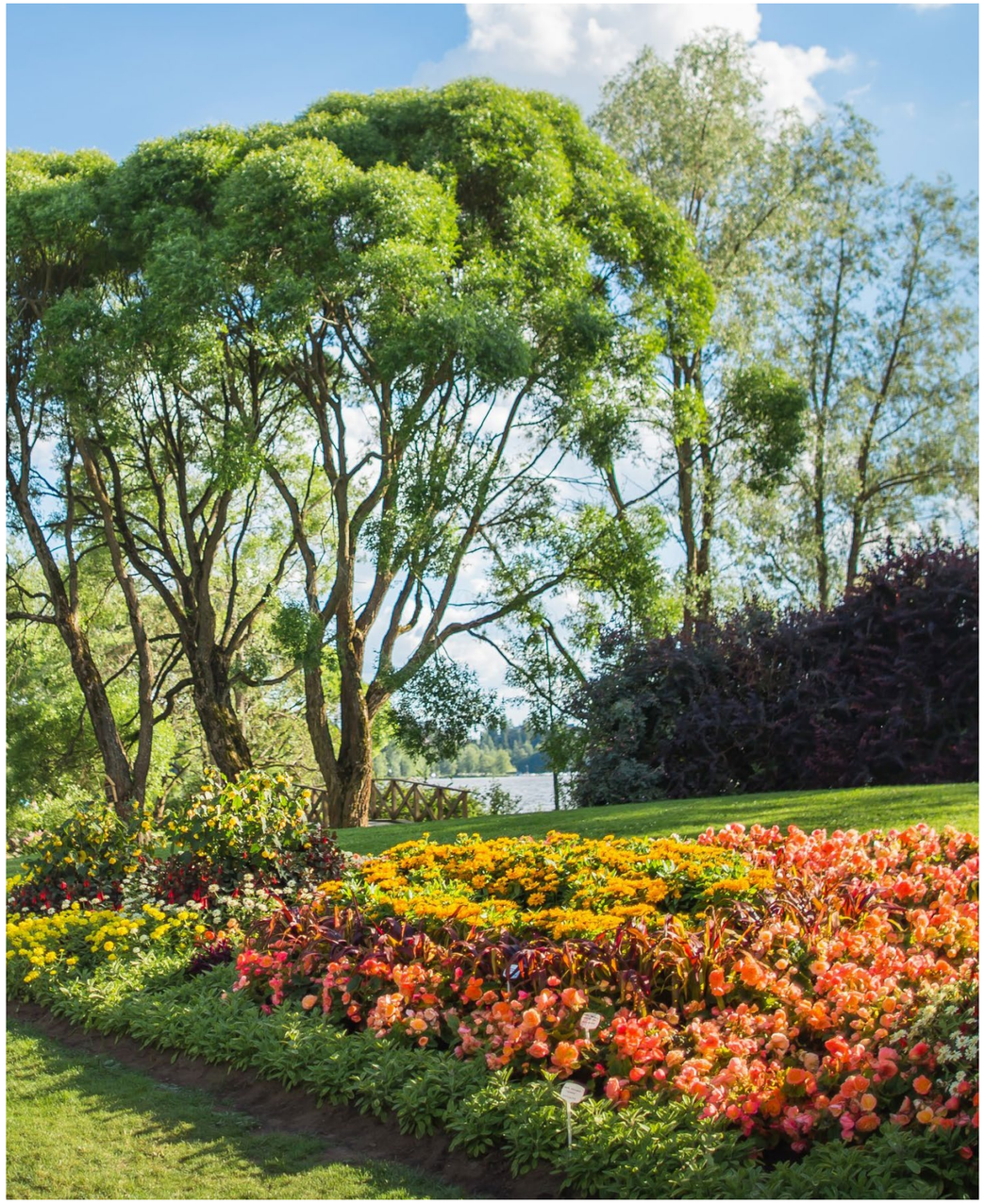


Image 31. In Tampere, the city's transport equipment and work machines will transition to sustainable propulsion systems
Image: Laura Vanzo.

MEASURE PACKAGE 2.8.

NEW MOBILITY SERVICES

- Autonomous transport will be developed as part of the public transport travel chains
- More services will be provided at key public transport hubs
- The proliferation of car-sharing services will be promoted
- The city bike system will be developed as part of the first and last mile solution for public transport
- At ports, the availability of biofuels and electricity charging stations will be developed

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.8.1.	The city bike system will be developed as part of the first and last mile public transport solution (moving to a public transport stop and from the stop to the journey destination). A docking city bike system will be introduced in 2021. During the term of the contract, the range of operation of city bikes will be expanded to cover regional centres while extending the the city bike season in spring and in autumn. A user survey will be conducted on the first and last mile solutions to assess the emission impact.	**2022–2025**	**Transport System Planning,** Public Transport	●●●○○	M
2.8.2.	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.	**2022–2025**	**Public Transport,** Transport System Planning, Business Tampere	●●○○○	M
2.8.3.	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. A plan will be prepared for the development of park-and-ride facilities. 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.	**2022–2029**	**Transport System Planning,** Public Transport, Construction and Maintenance of Urban Environment, Service Network Planning, Town Planning	●○○○○	M
2.8.4.	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).	**2022–2029**	**Public Transport,** Business Tampere, Climate and Environmental Policy	●●○○○	M
2.8.5.	Growth of car-sharing services will be facilitated through parking benefits while striving to open the city's own rides as part of the car-sharing services.	**2022–2025**	**Transport System Planning,** Tuomi Logistiikka Oy	●○○○○	M
2.8.6.	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.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●●○○○	M
2.8.7.	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 Särkäniemi town 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.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Real Estate and Housing	●●○○○	M

OTHER BENEFITS:

- Creation of new business opportunities
- Smoother and faster journeys
- Reduced need to own a car
- A more comfortable urban environment

EMISSION REDUCTION ●●●○○

Image 32. To supplement the tram, Tampere will develop autonomous transport as part of the public transport travel chains. Image: Laura Vanzo.

MEASURE PACKAGE 2.9.

MOBILITY MANAGEMENT

- Pilots to try out sustainable mobility modes will be provided to residents
- Schoolchildren and students will be encouraged towards sustainable mobility
- The public transport benefit provided to employees will be developed to be more flexible than at present
- Ways to solve congestion challenges will be investigated primarily by means of mobility guidance
- Use of public transport will be promoted by including a public transport ticket in event tickets
- Preparedness in traffic for exceptional weather conditions, and communication on exceptional weather conditions, will be developed

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
2.9.1.	A Sustainable Urban Mobility Plan (SUMP) will be prepared and the first measures launched.	**Complete**	**Transport System Planning**		M
2.9.2.	The city's mobility management efforts will be planned in the cross-sectoral mobility management coordination group. The group will agree on the annual mobility management priorities and key measures while ensuring related budgeting. The planning work will be linked to the board's annual plan drafting process.	**2022–2029**	**Transport System Planning,** Climate and Environmental Policy	●○○○○	M
2.9.3.	Ways will be investigated to tackle congestion challenges primarily through mobility management rather than by increasing motoring capacity.	**2022–2029**	**Transport System Planning**	●○○○○	M
2.9.4.	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.	**2022–2029**	**Transport System Planning,** Public Transport, Climate and Environmental Policy	●●●○○	M
2.9.5.	Sustainable mobility modes will be marketed to working-age people and workplace mobility management plans will be implemented in cooperation with the key employers.	**2022–2029**	**Public Transport,** Transport System Planning, Human Resources Unit	●●○○○	M
2.9.6.	Regional sustainable mobility plans will be implemented, for example with schools. Sustainable mobility by children, parents and personnel will be encouraged through communication. The safety of travel to and from day-care centres and schools will be promoted through mobility management. Communication on the environmental impact of drop-off traffic will be boosted. Early childhood education, pre-primary education and basic education will contribute to encouraging children, pupils, families and the day-care centre/school personnel towards sustainable mobility modes. Information packages on sustainable mobility will be prepared to assist families. Schools from basic education will participate in the Fiksusti kouluun programme.	**2022–2025**	**Early Childhood Education and Pre-Primary Education, Basic Education** Transport System Planning	●●○○○	M
2.9.7.	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. Shared bicycles and/or electric scooters will be made available for use by students and staff. Tredu will develop sports and exercise workshops.	**2022–2029**	**Upper secondary school education, Tampere Vocational College Tredu,** Tampereen Tilapalvelut Oy	●○○○○	M
2.9.8.	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.	**2022–2025**	**Sports, Exercise and Young People,** Public Transport, Five-star City Centre Development Programme	●●○○○	M
2.9.9.	Measures will be piloted to promote the sustainable mobility of personnel and, on the basis of the experience and impact gained, a more specific proposal will be made on further measures.	**2022–2025**	**Transport System Planning,** Human Resources Unit	●○○○○	M
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**	**Public Transport,** Human Resources Unit, Transport System Planning, Employment Services, Environmental Health, the Services	●●●○○	M
2.9.11.	Opportunities for flexible work practices, remote work and remote meetings will be improved.	**2022–2025**	**The Services, Human Resources Unit, Data Administration**	●○○○○	M
2.9.12.	It will be investigated how to prepare for disturbances, such as weather conditions, in advance and how to communicate about them to the city residents 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 exceptional weather conditions, not all buses will be operated.	**2022–2025**	**Transport System Planning,** Public Transport	●○○○○	A

2.9.13.	A personnel survey will be conducted on commutes and on car travel on working days. Sustainable mobility measures, presented in more detail in the sustainable mobility plan, will be promoted	**2022–2025**	**Tampere Water**	●●○○○	M
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**	**Tammenlehväsäätiö foundation**	●○○○○	M

OTHER BENEFITS:

- Positive health effects
- Improved air quality
- Reduced noise pollution
- More efficient use of urban space
- Increased comfort

EMISSION REDUCTION ●●●○○

Image 33. Sustainable mobility entails many benefits: positive health effects, improved air quality, reduced noise pollution, more efficient use of urban space, and increased comfort.
Image: Laura Vanzo.

Image 34. Tampere offers residents pilots to try out sustainable mobility modes. Image: Laura Vanzo.

EXAMPLES AND IMPACT ASSESSMENTS

Emissions from passenger transport in 2030

Sustainable mobility solutions in Tampere include the development of pedestrian-oriented city centres, development of the main cycling routes, expansion of the tramway in Tampere and regionally, and allocation of streets with a public transport focus, and development of smooth travel chains.

A climate impact assessment, which includes the scenario review pictured here, was carried out in connection with preparing the inner-city master plan, council term 2017–21. It illustrates the annual emissions from passenger transport after realisation of projected land use in the target year of climate neutrality, 2030. The review reveals a clear zonality of the urban structure and of mobility patterns, which is why emissions from city-centre residents remain low compared to the car zone in the inner city periphery.

On the other hand, emissions from mobility within the zone inside the ring road, well served by public transport, are also relatively high. One of the reasons for this situation is the excellent car accessibility that manifests itself especially around the Nokia motorway, which seems to affect the mobility mode choices made by the region's residents and employees in a way that impairs sustainable mobility. Particular attention should therefore be paid to the competitiveness of cycling and public transport in this zone in order to achieve the modal split shifts required by the emission reduction goals.

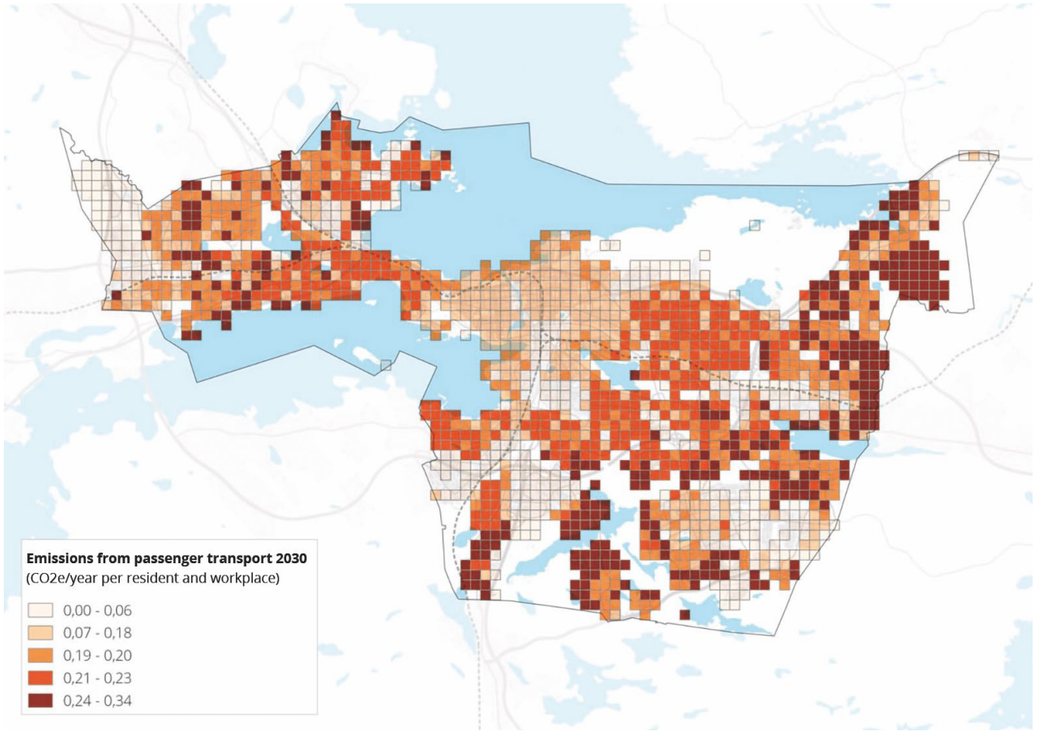


Image 35. The map shows the calculated emissions of passenger transport in 2030 by 250-square-metre grid, divided by the sum of the number of inhabitants and the number of jobs in each square. Emissions are highest in the car zone of the inner city periphery but also in the vicinity of the ring roads. ©City of Tampere/Master Planning 2020.

Image 36. The opportunities for sustainable mobility improved significantly in Tampere as tram traffic was launched in August 2021. Image: Laura Vanzo / Visit Tampere.

Image 37. Efforts are being made to develop walking and cycling in Tampere into smooth and safe mobility modes, for example by separating pedestrian and bicycle traffic to their own lanes in the city centre and by raising the quality level of the main regional cycling routes. Image: Visit Tampere Oy/Laura Vanzo.

THEME 3.

SUSTAINABLE CONSTRUCTION

Benefit goal:	New construction will be at zero energy level, and the carbon footprint of housing will be small
Description:	The climate burden of housing and services will be reduced through energy- and resource-efficient construction solutions and by increasing the use of renewable energy. Tampere will introduce a life-cycle assessment of construction emissions as part of planning and decision-making. Renovating the existing building stock will play an important role in improving the energy efficiency of housing and services. Wood construction will increase carbon sequestration in buildings while reducing indirect emissions from the production of materials. CO2 emissions from infrastructure construction will be reduced through effective soil management, such as by exploiting soil at source. 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. To enable this, data on the soil to be generated will be inventoried already at the planning stage.
Goal 2030:	• 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 efficiency of the city's service facilities will improve annually up to 2030. • The climate neutrality criteria in use in construction will be applied throughout the land-use process (town plans, plot allocation data, building codes, infill development, 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 Sähkölaitos can produce an equivalent amount of climate neutral heat. • Percentage of wooden apartment block construction from all new apartment blocks on plots allocated by the city (wooden frame and façade): 10% (2021), 15% (2025), 20% (2030). • 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 customers and operators to address climate and environmental issues.
Indicators:	• Percentage of energy class A of new residential buildings (%) • Energy consumption of the residential sector (kWh/resident) • Percentage of wood construction of all new apartment blocks on plots allocated by the city (%) • Energy consumption of the city's properties (total consumption/m2 and consumption/user) • Percentage of renewable heat and electricity of energy purchased by city for its properties. • Realised percentage for mass economy planning in all town plans (%) • Percentages of recovered materials in construction • Low-emission new materials (%), verification using CO2 calculations

Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • Energy efficiency agreement for municipalities and the state (KETS) • Wood Construction Promotion Programme • UUMA plan for use of recovered materials in groundworks

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2015	2016	2017	2018	2019	2020	2021
Percentage of energy class A of new residential buildings	**%**				**16**	**19**	**23**	**18**
Energy consumption of the residential sector	**kWh/resident**	**10,170**	**10,030**	**9,880**				

EXAMPLES AND IMPACT ASSESSMENTS

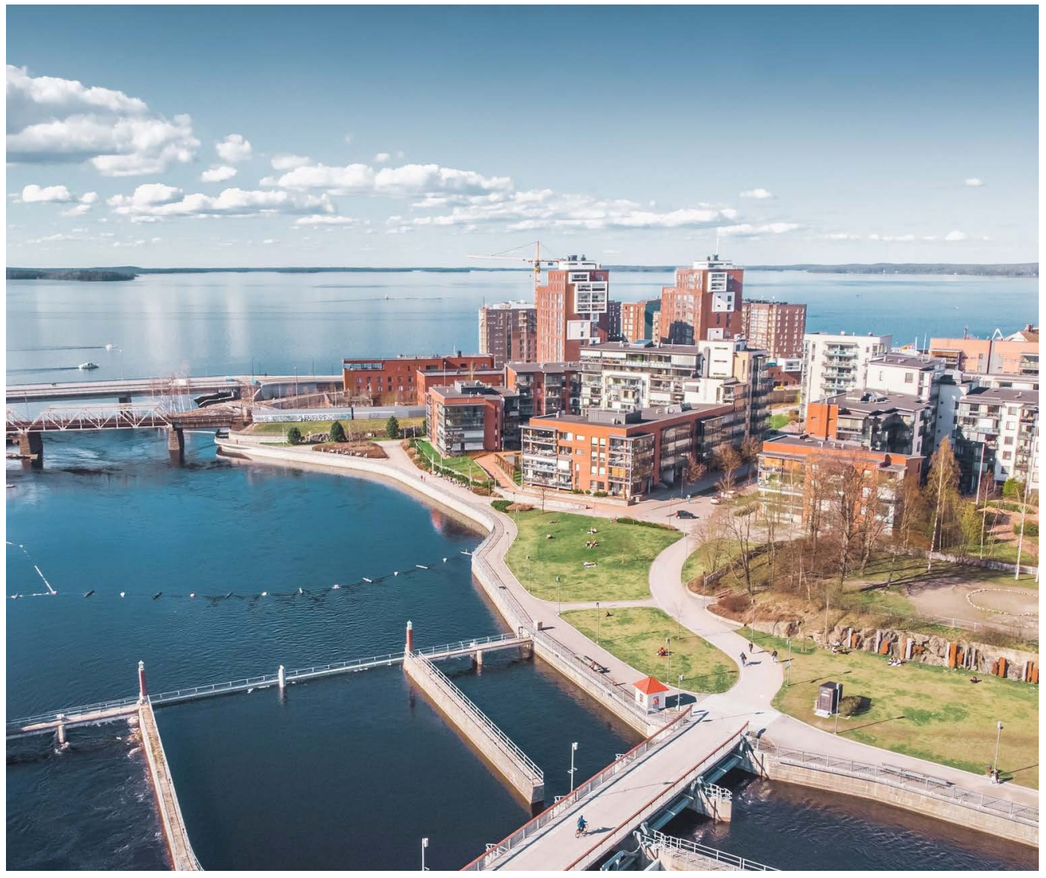


Image 38. A growing city builds a high volume of housing, services as well as urban infrastructure. Tampere will introduce climate neutrality criteria throughout the land-use process while calculating the carbon footprint of construction and minimising it, for example, through wood construction, energy efficient construction and by utilising recovered materials as much as possible. Image: Visit Tampere Oy/Laura Vanzo.

MEASURE PACKAGE 3.1

NEW CONSTRUCTION OF CITY PROPERTIES

- Making the use of all service-network facilities more efficient while reducing the carbon footprint
- Culture and Leisure Services buildings will strive for climate neutrality
- Demolition waste will be reused locally while increasing the recycling of building materials
- To support the planning of and decision-making in construction projects, the carbon footprint, carbon handprint, life-cycle costs and investment costs will all be calculated
- Facility design will take account of conversion flexibility and shared use
- Construction projects will increase the recycling of materials while stepping up low-carbon material choices
- The city's service buildings will take steps to prepare for climate change

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.1.1.	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.	**2022–2025**	**Real Estate and Housing,** Service Network Planning	●●○○○	M
3.1.2.	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.	**2022–2025**	**Real Estate and Housing,** Service Network Planning, Tampereen Tilapalvelut Oy	●●○○○	M A
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**	**Real Estate and Housing,** Service Network Planning, Early Childhood Education and Pre-Primary Education, Basic Education	●●○○○	M
3.1.4.	Where possible, conversion flexibility and shared use will be addressed in the design of the city's facilities. The temporal occupancy rate of city-managed properties will be improved by opening the premises to residents using digital solutions and by extending the self-use hours of these properties. Efficient use of space reduces the need for new facilities. For example, service hours at the wellness centres will be gradually increased, as will be the shared use of the city's own premises in culture and leisure services. Evening use of premises will also be increased and premises will be opened increasingly for city residents' independent activities (wellness centres, schools, youth and leisure facilities).	**2022–2029**	**Real Estate and Housing,** Service Network Planning, Tampereen Tilapalvelut Oy, the Services	●○○○○	M
3.1.5.	The carbon footprint, the carbon handprint 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.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●○○○	M
3.1.6.	In the implementation planning phase of construction projects, Tampereen Tilapalvelut Oy will calculate the life-cycle carbon footprint and the life-cycle costs as part of the implementation planning of construction projects while taking steps to prepare for the regulatory carbon footprint management that will enter into force in 2024.	**2022–2025**	**Tampereen Tilapalvelut Oy**	●●○○○	M
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).	**2022–2029**	**Sports, Exercise and Young People,** Real Estate and Housing	●●○○○	M
3.1.8.	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 (A)
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 will be 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**	**Real Estate and Housing,** Construction and Maintenance of Urban Environment, Tampereen Tilapalvelut Oy, Tampereen Infra Oy	●○○○○	M
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**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●○○○○	M
3.1.11.	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.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●○○○○	A

OTHER BENEFITS:

- More efficient use of resources and space
- Life-cycle savings

EMISSION REDUCTION ●●●○○

MEASURE PACKAGE 3.2

GUIDANCE OF PRIVATE NEW CONSTRUCTION

- Carbon footprint assessment will be introduced in plot allocation
- Land policy incentives will be developed to promote low-carbon construction
- Zero-energy construction and plus-energy construction will be promoted
- Sustainable and smart construction themes will be linked to plot application annually

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.2.1.	Carbon footprint assessment (testing, piloting, contests, commissioning) will be integrated as part of the current plot allocation process. This will start with residential construction plots while also being adopted for the commercial plots that are the most significant in terms of their scope.	**2022–2025**	**Real Estate and Housing,** Climate and Environmental Policy, Building Control Department	●○○○○	M
3.2.2.	The effectiveness of the infill development incentives mentioned in the land policy guidelines will be assessed in 2021 in the context of updating the housing and land policy guidelines for the next council term. On the basis of this assessment, the housing and land policy guidelines will be updated with the aim of providing more effective incentives to promote low-carbon construction.	**2022–2025**	**Real Estate and Housing,** Climate and Environmental Policy	●○○○○	M
3.2.3.	The impact of the home-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.	**2022–2025**	**Real Estate and Housing,** Climate and Environmental Policy	●○○○○	M
3.2.4.	Construction will be guided towards net zero energy construction and, in the long term, towards plus energy construction. Nearly-zero energy construction regulations will enter into force in all construction on 31 December 2020. Ways for the city to guide construction better than what the required level (class A or B) is will be investigated.	**2022–2025**	**Real Estate and Housing,** Climate and Environmental Policy, Tampereen Tilapalvelut Oy	●○○○○	M
3.2.5.	A communication campaign for housing companies will be organised to encourage infill development. The campaign will promote the city's land policy incentives for infill development and introduce good practices for combining refurbishment, energy refurbishment and infill development.	**Complete**	**Climate and Environmental Policy,** Five-star City Centre Development Programme, Master Planning, Town Planning, Real Estate and Housing, Ekokumppanit Oy		M
3.2.6.*	Each year, plot application programming will present the themes and areas of sustainable and smart construction, and the themes will be specified at the plot level in the context of the plot application process.	**2022–2025**	**Real Estate and Housing,** Climate and Environmental Policy	●○○○○	M

OTHER BENEFITS:	• More efficient use of resources • Life-cycle economic impacts • Development of sustainable construction know-how and business • Improved security of supply through decentralised energy production
EMISSION REDUCTION	●●●○○

EXAMPLES AND IMPACT ASSESSMENTS

3.2.6.

Sustainable and smart construction themes in the 2020 plot application programme:

- Year 2020: wood construction (plot allocation competition on the basis of the winning work of the housing reform competition), potential for shared use, shared services.
- Year 2021: wood construction, 'urban green' house, climate neutral residential block.
- Year 2022: smart energy building, circular-economy house.
- Years 2023–24: wood construction, energy positivity.
- Year 2025: renewable energy solutions required on plots not part of the district heating network, energy-positive buildings.

Image 39. In 2019, the Vuores zero-energy-block plot allocation competition, organised by the City of Tampere and the Energy Wise Cities project, was won by this block of wooden buildings designed by Rakennusyhtiö Lehto Asunnot Oy, LUO Arkkitehdit Oy, Insinööritoimisto Vesitaitoimisto Oy and Frei Zimmer. Image: LUO Arkkitehdit.

MEASURE PACKAGE 3.3

RENOVATION CONSTRUCTION AT CITY PROPERTIES

- Service buildings will be developed into virtual power plants
- Energy efficiency at service facilities will be improved on the basis of profitability calculations
- Tredu will develop its campuses in line with sustainable development

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.3.1.	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 Tilapalvelut's Enerkey emissions, and the level of emissions from construction will be estimated based on carbon footprint calculations and on Gaia's tool.	**2022–2025**	**Climate and Environmental Policy,** Real Estate and Housing	●●○○○	(M)
3.3.2.	The city will procure electricity and heat from renewable energy sources. The transition to renewable energy will take place in close cooperation with Tampereen Sähkölaitos.	**2022–2029**	**Tampereen Tilapalvelut Oy,** Real Estate and Housing	●○○○○	(M)
3.3.3.	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.	**2022–2025**	**Tampereen Tilapalvelut Oy,** Real Estate and Housing	●○○○○	(M)
3.3.4.	Solar window films will be installed on the windows at Tietotalo to reduce energy consumption.	**2022–2025**	**Tampereen Palvelukiinteistöt Oy**	●○○○○	(M) (A)
3.3.5.	The heat system of the Ikuri sports hall will be revamped in 2022.	**2022–2025**	**Tampereen Palvelukiinteistöt Oy**	●●○○○	(M)
3.3.6.	The façade windows at the Hepolaminkatu 10 building will be replaced.	**2022–2025**	**Tredu-Kiinteistöt Oy**	●●○○○	(M)
3.3.7.	The Metsätie building will undergo a local ventilation system renovation.	**2022–2025**	**Tredu-Kiinteistöt Oy**	●●○○○	(M)
3.3.8.	During 2017–2025, an energy saving project is 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.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy, Climate and Environmental Policy	●○○○○	(M)
3.3.9.	Service buildings and the city's land assets will be developed into virtual power plants for the district heating network and for the grid. Smart district heating will be introduced at the city's properties. This will promote the management of district heating consumption peaks and the smarter control of technical systems.	**2022–2025**	**Tampereen Tilapalvelut Oy,** Climate and Environmental Policy	●●●○○	(M)
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**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy, Service Network Planning	●○○○○	(M)
3.3.11.	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.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●○○○	(M)
3.3.12.	Influence will be exercised on the owners of the Tampere Vocational College buildings following the cultural change brought about by the strategy. The college will secure Sustainable Development Certification from OKKA Foundation by 2022 for two of its properties (Ajokinkuja and Santalahti). The aim is to certify as many properties as possible by 2030.	**2022–2029**	**Tampere Vocational College Tredu,** Tredu kiinteistöt Oy	●●○○○	(M) (A)

OTHER BENEFITS:

- Reduced property maintenance costs
- Economic impacts over the life cycle of buildings
- Improved comfort
- Fewer indoor air issues

EMISSION REDUCTION ●●○○○

MEASURE PACKAGE 3.4

GUIDANCE OF PRIVATE RENOVATION CONSTRUCTION

- Energy-efficient renovation construction will be promoted in cooperation with the city, businesses and housing companies

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.4.1.	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.	**Complete**	**Climate and Environmental Policy,** Ekokumppanit Oy		M
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**	**Climate and Environmental Policy,** Ekokumppanit Oy, Building Control Department	●○○○○	M

OTHER BENEFITS:	• Reduced property maintenance costs • Protecting the value of buildings • Improved comfort of living • Development of sustainable construction know-how and business
EMISSION REDUCTION	●●●○○

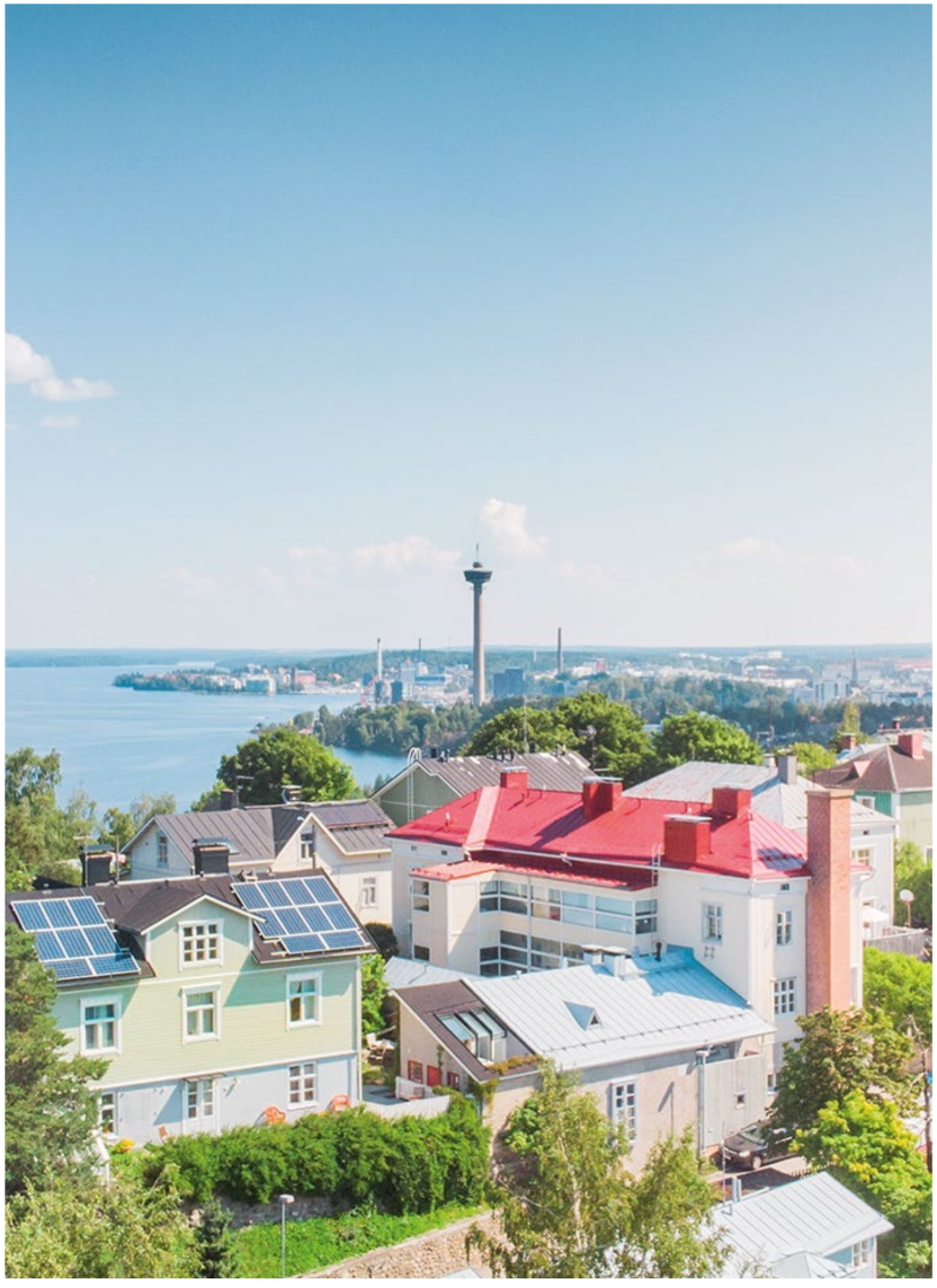


Image 40. In order for the climate neutrality goal to succeed, it is important to promote the energy renovation of buildings and a transition to renewable energy. Energy counselling is also a very cost-effective way to reduce emissions. Image: Visit Tampere Oy/Laura Vanzo.

MEASURE PACKAGE 3.5

WOOD CONSTRUCTION

- Sites that are suitable for wood construction will be zoned
- The city will allocate plots for wood construction across the city
- Wooden day-care, school and other service buildings will be constructed
- Infill development will guide the construction of additional floors from wood

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.5.1.	The town plan programme will define the planned sites that will promote the potential for wood construction. In accordance with the zoning programme 2022–2026, wood construction will be investigated, for example Areas on the western side of Lake Alasjärvi and Ojala.	**2022–2025**	**Town Planning,** Climate and Environmental Policy	●○○○○	M
3.5.2.	Guidelines will be prepared to promote wood construction in town planning.	**Complete**	**Town Planning,** Climate and Environmental Policy, Building Control Department		M
3.5.3.	Annually, plot application programming, which is based on the town plan programme, will define the areas where plots are allocated for wood construction. With the Isokuusi area in Vuores, the largest wood construction area in Finland, mainly complete, wood construction will be promoted in areas including Ojala and Västinginmäki in Lahdesjärvi. In these areas, the town plans will require wood construction, but the city will also enable wood construction in other areas.	**2022–2029**	**Real Estate and Housing,** Town Planning, Climate and Environmental Policy	●○○○○	M
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**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●●●○	M
3.5.5.	The annual investment plan will decide on the wood construction sites for infrastructure construction, including at planned sites. (Bridges, park structures, street-light poles, park construction competitions).	**2022–2025**	**Construction and Maintenance of Urban Environment,** Climate and Environmental Policy	●○○○○	M
3.5.6.	Infill development will guide the high-quality implementation of additional floors from wood.	**2022–2025**	**Town Planning,** Building Control Department, Climate and Environmental Policy	●○○○○	M

OTHER BENEFITS:

- Promoting diverse urban development
- Promoting wood construction expertise and business
- Promoting competition in building materials

EMISSION REDUCTION ●●●○○

Image 41. TOAS Kauppi. Image: Anna-Leea Hyry / City of Tampere.

MEASURE PACKAGE 3.6

INFRASTRUCTURE CONSTRUCTION

- An infrastructure construction carbon footprint calculation tool will be adopted
- Emission reduction demands will be set for materials, fleet and logistics
- The use, recycling and intermediate storage of soil will be intensified
- Tampere Water will include carbon footprint calculation as a permanent element in construction projects

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.6.1.	Tampere will follow and, where applicable, contribute to the development of the national infrastructure construction emissions database and emission calculation tools. The finalised calculation programmes will be introduced in 2023–2025. For major work sites, specific emission calculations will be carried out if it is not possible to employ the existing emission calculation tools. Project planning will also review the prefabrication procedures from the perspective of the carbon footprint. The use of ecological compensation will be piloted, for example, in large infrastructure projects. Tampere will participate in the UUMA4 project to develop the conditions and guidelines for implementing recovered materials and more climate neutral construction.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●●○○○	M
3.6.2.	Emission reduction requirements will be set for materials in site design for all major projects. At appropriate sites, emission reduction requirements (equipment, logistics) will be set in all tendering procedures for major regional construction projects.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●●○○○	M
3.6.3.	Greenhouse gas emissions and costs of various bridge solutions will be calculated. Research theses will be utilised.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●○○○○	M
3.6.4.	Efficiency with the use of soil in infrastructure construction will be increased while reducing soil transport by introducing soil balance policies to increase the soil recycling (soil bank, soil coordinator and soil analysis of town plans). The utilisation of soil within areas will be promoted by identifying needs in advance. A GIS-based soil database will be introduced as a tool. Soil recycling will be boosted by trialling and developing new processing methods. Soil coordination will focus on Tampere's soil while also engaging in regional cooperation.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Town Planning, Master Planning	●●○○○	M
3.6.5.	Participation by the city's Infrastructure Services in an open and mobile soil information platform (soil exchange or similar) will be promoted. This will be considered in ERP system procurement.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●○○○○	M
3.6.6.	The need for and impacts of soil intermediate storage areas will be investigated together with the planning unit and Real Estate and Housing. Areas for soil processing and storage will be designed, licensed and established in connection with all major new town plan areas and construction sites. The environmental permit process for the Kolmenkulma circular economy area will be launched in 2022 with the aim of starting operations from the beginning of 2024. Snow transport distances will be minimised by constantly developing the snow short-distance transfer network.	**2022–2029**	**Construction and Maintenance of Urban Environment,** Real Estate and Housing, Master Planning, Town Planning	●●●○○	M
3.6.7.	The city's own construction and planning sites will utilise natural landscapes and local structures.	**2022–2029**	**Construction and Maintenance of Urban Environment,** Town Planning Planning	●○○○○	M A
3.6.8.	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 reduce 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
3.6.9.	Steps will be taken to further the artificial groundwater facility project. A decision will be taken on the Rusko post-treatment and disinfection facility.	**2022–2025**	**Tampere Water**	●○○○○	M A
3.6.10.	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.	**2022–2025**	**Tampere Water**	●○○○○	M A
3.6.11.	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.	**2022–2025**	**Tampere Water**	●●○○○	M
3.6.12.	A designer will be asked to perform CO2e calculation in 2022 on all new investment projects in the network while agreeing on a system to monitor the CO2e emission calculations performed in the context of construction plans and renovation plans. The remaining work regarding the carbon footprint of the network's new construction and renovation will be commissioned in 2022. In 2025, 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.	**2022–2025**	**Tampere Water**	●●●○○	M

OTHER BENEFITS:

- Improved resource efficiency
- Life-cycle cost savings

EMISSION REDUCTION ●●●○○

MEASURE PACKAGE 3.7

USE OF RECYCLED MATERIALS

- Street construction will primarily use recycled material
- Demolition sites will step up the recycling of concrete

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
3.7.1.	The possibility to use recycled materials will always be assessed in the project and building design of public street and park areas. The use of recycled materials will be assessed both in terms of emission reductions and costs. In street plans, a transition will be made to adopt a model involving two alternative solutions, whereby the structural layers will primarily use recycled material, if available, and, secondarily, rock crush. The construction sites that use recycled materials (including recycled concrete, ash) will be mapped and listed annually. The use of recycled materials will be piloted, for example, in Hiedanranta. It will be determined whether recycled materials can be used in the Sammon valtatie cycling route extension.	**2022–2029**	**Construction and Maintenance of Urban Environment,** Climate and Environmental Policy, Hiedanranta Development Programme, Hiedanrannan Kehitys Oy	●○○○○	M
3.7.2.	An up-to-date database of recycled materials will be established and maintained.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●○○○○	M
3.7.3.	An operating model will be developed to enhance the recycling of concrete at the city's demolition sites. Advantage will be taken of the experience from the Kalevankulma site for this. In accordance with the town planning modification concerning Ahvenisjärvi school, it will be investigated whether the building elements of the school to be demolished can be utilised in construction as part of the ReCreate project.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Real Estate and Housing, Tampereen Tilapalvelut Oy	●○○○○	M
3.7.4.	A study will be carried out on the utilisation of the side aggregate produced in Teisko.	**Complete**	**Construction and Maintenance of Urban Environment**		M
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**	**Construction and Maintenance of Urban Environment**	●○○○○	M
3.7.6.	The use of recycled material will be facilitated at applicable sites in private construction on the city's rental plots.	**2022–2025**	**Real Estate and Housing**	●○○○○	M

OTHER BENEFITS:
- Improved resource efficiency
- Life-cycle cost savings

EMISSION REDUCTION ●●○○○

Image 42. Tampere will increase the use of recycled materials in street and park construction, thus promoting resource saving and the circular economy. Image: Business Tampere Oy/Mirella Mellonmaa.

THEME 4.

SUSTAINABLE ENERGY

Benefit goal:	Renewable energy to account for 80%
Description:	Emissions from the production of electricity and district heat in Tampere will be reduced significantly by switching energy sources to renewable energy. The main objectives of the energy transition carried out by Tampereen Sähkölaitos include increased use of domestic renewable energy, reduced greenhouse gas emissions and increasing the number of jobs in the wood supply chain in the Tampere region. 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. Replacing oil heating with a sustainable heat source, such as a heat pump, district heating or a biomass boiler, will reduce climate emissions significantly.
Goal 2030:	• Percentage of renewable energy of Tampereen Sähkölaitos's energy production: 49% (2021), 80% (2025), 90% (2030) • Reduction of greenhouse gas emissions from Tampereen Sähkölaitos's production as compared to 2010: 47% (2021), 80% (2025), 95% (2030) • The city will give up oil heating at its own properties by 2025 • The production of grid-connected solar energy will increase throughout the city to 20MW (around 0.2MW in 2020) • The use of oil in the individual heating of buildings will have stopped
Indicators:	• Percentage of renewable energy of Sähkölaitos's production (%) • Emissions from centralised energy production (t CO2e) • Distribution of heating methods of buildings (%) • Emissions from oil heating (t CO2e) • (Number of) grid-connected solar panel systems in the Tampere region and their combined power (MW)
Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • Tampereen Sähkölaitos Group's strategy, Energy transition to the future

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2014	2015	2016	2017	2018	2010	2020	2021
Percentage of renewable energy of Sähkölaitos's production	**%**	**27.3**	**31.3**	**38.7**	**47**	**43.5**	**45.1**	**50.5**	**46**
Emissions from centralised energy production	**kt CO2**	**624**	**562**	**521**	**493**	**527**	**503**	**424**	**502**
Grid-connected solar panel systems in the Tampere region	**pcs**	**27**	**44**	**70**	**132**	**214**	**380**	**555**	**710**

EXAMPLES AND IMPACT ASSESSMENTS

Between 2010 and 2030, carbon dioxide emissions from Tampereen Sähkölaitos's production will decrease by 95%.

2010	2015	2020	2025	2030
983 kt CO2	**562 kt CO2**	**468 kt CO2**	**191 kt CO2**	**53 kt CO2**
Rehabilitation of hydroelectric power plants	Tammervoima Waste-to-Energy Plant	Kaupinoja District Cooling Plant	**New technologies New products and energy savings**	**Carbon offsetting**
Sarankulma Pellet Heating Plant	Hervanta Woodchip Heating Plant	**Naistenlahti 3**	**Waste heat, and heat pumps**	**Geothermal plant**
	Flue gas scrubbers	**Electric boiler**	**Traditional and virtual district heat battery**	**Shutdown of Lielahti Gas Power Plant**

The percentage of renewable energy of Tampereen Sähkölaitos's production will increase to 90% by 2030.

2010	2015	2020	2025	2030
10%	**35%**	**49%**	**80%**	**90%**

Energy procurement by and CO2 emissions from Tampereen Sähkölaitos

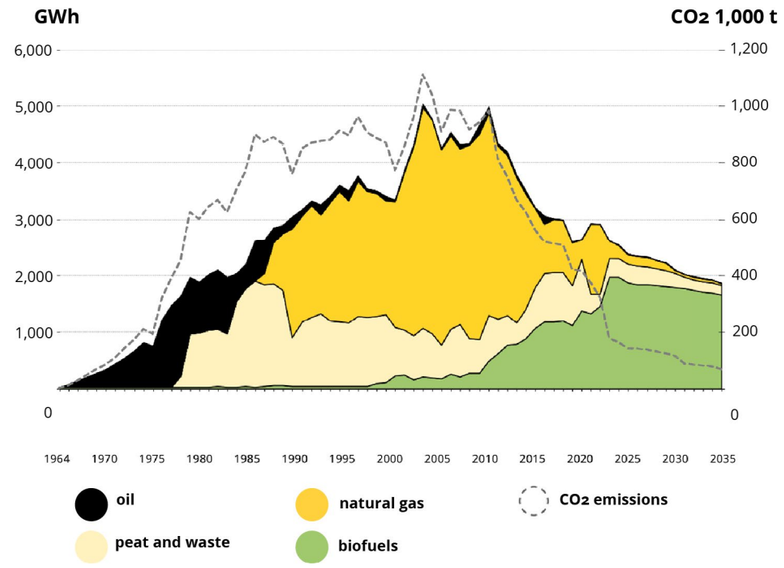


Image 43. Tampereen Sähkölaitos Oy's energy strategy 2010–2030.

MEASURE PACKAGE 4.1

CENTRALISED RENEWABLE ENERGY

- Naistenlahti Power Plant will be converted to using biofuels
- Steps will be taken to prepare for the introduction of geothermal heat
- The Lielahti Natural Gas Power Plant will be shut down
- Tampereen Sähkölaitos will promote the introduction of non-combustion and carbon negative district heat

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
4.1.1.	The Naistenlahti 2 power plant unit will be converted (2020–22), allowing the new Naistenlahti 3 Power Plant to use 100% renewable biofuels in future.	**2022–2025**	**Tampereen Sähkölaitos Oy**	●●●●○	(M)
4.1.2.	The technology at geothermal installations will be developed in cooperation with other actors.	**2022–2029**	**Tampereen Sähkölaitos Oy**	●●○○○	(M)
4.1.3.	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.	**2022–2025**	**Pirkanmaan Jätehuolto Oy,** Tammervoima Oy	●●○○○	(M)
4.1.4.	The Lielahti Natural Gas Power Plant will be shut down.	**2025–2029**	**Tampereen Sähkölaitos 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.	**2022–2029**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●●○○	(M) (A)
4.1.6.	Tampereen Sähkölaitos will promote the introduction of non-combustion and carbon negative district heat in Tampere.	**2022–2029**	**Tampereen Sähkölaitos Oy**	●●●●○	(M)
4.1.7.	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.	**2022–2029**	**Finnpark Oy**	●○○○○	(M)

OTHER BENEFITS:

- Modernisation and extension of the lifespan of Naistenlahti Power Plant
- Versatile and economical range of fuels
- Utilisation of local renewable energy

EMISSION REDUCTION ●●●●●

MEASURE PACKAGE 4.2

SMART ENERGY NETWORKS AND SERVICES

- Street lighting will be upgraded into smart LED technology
- New, smart energy technologies will be developed

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
4.2.1.	Tampereen Sähkölaitos's services for demand response and energy saving will be further developed and marketed to customers.	**Complete**	**Tampereen Sähkölaitos Oy**		(M)
4.2.2.	Introduction of a district heat battery in Tampere will be investigated.	**2022–2029**	**Tampereen Sähkölaitos Oy**	●●●○○	(M)
4.2.3.	Smart grid and virtual power plant technologies will be developed and piloted.	**2022–2025**	**Tampereen Sähkölaitos Oy**	●●○○○	(M) ((A))
4.2.4.	The city's street lighting will be converted to use LEDs and smart light control will be implemented by 2025.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●●●○○	(M)

OTHER BENEFITS:

- Developing new skills and business
- Reduced life-cycle costs in street lighting
- Diversification of the energy system

EMISSION REDUCTION ●●●○○

Image 44. Tampereen Sähkölaitos will promote the introduction of non-combustion and carbon negative district heat.
Image: Laura Vanzo.

MEASURE PACKAGE 4.3

DECENTRALISED RENEWABLE ENERGY AND ENERGY EFFICIENCY

- New energy systems will be promoted by plot allocation means
- The potential for solar panels and heat pumps will be investigated at all sites constructed
- Tampereen Sähkölaitos will promote the expansion of solar energy
- The subsidiaries part of the City Group will install solar panels and improve energy efficiency

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
4.3.1.	The piloting of new decentralised energy systems will be promoted in the plot assignment 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.	**2022–2025**	**Climate and Environmental Policy,** Real Estate and Housing	●○○○○	(M)
4.3.2.	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. The potential to install solar panels will be investigated in the context of renovations and energy renovations, for example in primary schools, upper secondary schools and Tampere Vocational College Tredu's properties, as well as in culture and leisure facilities. In school buildings, solar panel and energy saving data will also be used in teaching.	**2022–2029**	**Real Estate and Housing,** Education and Learning Services, Upper secondary school education, Tampere Vocational College Tredu, Sports, Exercise and Young People, Tampereen Tilapalvelut Oy	●●●○○	(M)
4.3.3.	Renovation of the heating system of the Vaahterakuja 1 building using an exhaust air heat pump, and renovation of the heating systems of the Leirintäkatu 2 and Perkiönkatu 85 buildings using ground source heat pumps.	**2022–2025**	**Pirkan Opiskelija-asunnot Oy**	●●○○○	(M) ((A))
4.3.4.	Tampereen Sähkölaitos will promote increased use of solar energy through means such as by expanding the Tarastenjärvi Solar Power Plant, by selling solar energy installation packages and by participating in remote solar energy production systems, such as Ilokkaanpuisto.	**2022–2029**	**Tampereen Sähkölaitos Oy**		(M)
4.3.5.	The energy efficiency of air conditioning will be stepped up at Hämeenpuisto.	**2022–2025**	**Finnpark Oy**	●●○○○	(M)
4.3.6.	Solar panels will be installed on the roof of Tuomi Logistiikka at Särkijärvenkatu in 2023.	**2022–2025**	**Tampereen Palvelukiinteistöt Oy**	●○○○○	(M)
4.3.7.	Särkänniemi will implement its energy efficiency roadmap. For example, lighting will be made more energy efficient through annual additions and in the context of new construction.	**2022–2025**	**Tampereen Särkänniemi Oy**	●●○○○	(M)
4.3.8.	Tredu-Kiinteistöt Oy will commission the construction of solar power plants at the following sites: Hepolamminkatu 10 L and 10 S, Pallotie 5, Santalahdentie 10 and Finnentie 39.	**2022–2025**	**Tredu-Kiinteistöt Oy**	●●○○○	(M)
4.3.9.	Electrical energy will be switched from fossil energy to renewable energy.	**2022–2025**	**Tampereen Messu- ja Urheilukeskus Oy**	●○○○○	(M)
4.3.10.	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**	●●○○○	(M)
4.3.11.	Investigation of the potential to introduce a solar power system to serve as the energy source for Tammenlehväkeskus.	**2022–2025**	**Tammenlehväsäätiö foundation**	●○○○○	(M)
4.3.12.	A 'Future inner-city energy solutions' survey will be conducted. Decentralised energy production and storage solutions and grid needs in a densifying urban structure.	**2022–2025**	**Master Planning,** Climate and Environmental Policy, Tampereen Sähkölaitos Oy	●○○○○	(M) ((A))

OTHER BENEFITS:	• Development of new services and business • Decreased life-cycle costs • Diversification of the energy system • Image benefits
EMISSION REDUCTION	●●○○○

MEASURE PACKAGE 4.4

GIVING UP OIL HEATING

- The city will give up oil heating and encourage oil heaters to switch to renewable energy

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
4.4.1.	Housing oil heating hubs will be identified in order to be able to more effectively encourage and guide towards switching to a new heating method. An operating model will be established to support detached homes that use oil heating to switch to a new heating method. Building-owners will be guided towards taking advantage of the relevant government subsidies.	**2022–2025**	**Climate and Environmental Policy,** Ekokumppanit Oy, Building Control Department	●●○○○	M
4.4.2.	Oil heating will be given up in the city's own buildings by 2025. Efforts will be made to take advantage of government subsidies.	**2022–2025**	**Real Estate and Housing,** Tampereen Tilapalvelut Oy	●●○○○	M

OTHER BENEFITS:

- Increased energy self-sufficiency
- New services and business models
- Decreased local emissions

EMISSION REDUCTION ●●●●○

Image 45. The city will give up oil heating and encourage oil heaters to switch to renewable energy. Image: Laura Vanzo.

THEME 5.

SUSTAINABLE CONSUMPTION

Benefit goal:	Consumption will be sustainable and the circular economy functional
Description:	Recycling and utilisation of materials both foster the circular economy, which aims to create economic value from fewer materials while preserving the materials and the value attached to them in the economy for as long as possible. In practice, this means that material efficiency must be improved, the product life cycle increased and climate emissions reduced following decreasing consumption of natural resources. Effective recycling of materials is a prerequisite for a circular economy. The EU Waste Directive aims to increase the recycling rate of municipal waste to 60% by 2030. 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. Food production 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. Sustainable development and responsibility aspects are key principles in the city's investments, projects and procurement activities. By promoting sustainable procurement, both cost savings and reduced greenhouse gas emissions can be achieved. Procurement of the city's services and materials takes into account the life-cycle climate impact and other environmental impacts. In procurement, the city sets requirements for carbon dioxide emissions, energy efficiency, renewable energy, material efficiency, recyclability, harmful substances and other sustainable development aspects. 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. Sustainable consumption is possible only if there are sustainable products and services on the market. Through a platform-based and ecosystemic approach, the city's industrial policy promotes new businesses and sustainable events that are based on climate neutrality, ecological investment, cleantech and the circular economy.
Goal 2030:	• Municipal waste recycling rate: 50% (2021), 55% (2025), 60% (2030). • The circular economy business will have expanded and the re-use of raw materials increased. • Biomass processing, nutrient recycling and the development of new high-level products from biomass will all have become more efficient. • Environmental criteria and life-cycle impacts will be taken into account, where applicable, in the most climate-relevant city procurements. • Percentage of Voimia units offering vegetarian options: 50% (2023), 70% (2030). • The amount of food waste at Voimia kitchens will have decreased. • Transacting through digital channels will be possible for 50% of the city's services.
Indicators:	• Recovery rate of organic and recyclable wastes (%) • Composition of mixed waste • Percentage of procurements involving environmental criteria of city's all procurements (%) • Amount of food waste at Voimia kitchens (%) • Percentage of Voimia units offering vegetarian options (%) • Number of digital services in relation to total number of services

Introductory data:	• EU and Finnish regulations on waste recycling • Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines • City of Tampere Circular Economy Plan

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2014	2015	2016	2017	2018	2010	2020	2021
Percentage of procurements involving environmental criteria of city's all procurements	**%**				**25**	**33**	**39**	**23**	**29**
Amount of mixed household waste	**kg/resident**	**180**	**182**	**178**	**173**	**168**	**165**	**167**	**167**

EXAMPLES AND IMPACT ASSESSMENTS

Image 46. In order to promote sustainable consumption, the City of Tampere organises events such as the Green Week, which has become a very popular second-hand market for goods. The development of sharing economy services and green procurement are an important element in sustainable consumption. Image: Ekokumppanit Oy.

MEASURE PACKAGE 5.1

WASTE MANAGEMENT

- The obligation to sort waste will be tightened
- The incentive element of waste fees to encourage waste sorting will be strengthened
- Separate collection of textile waste will be stepped up
- Sorting of construction waste will be boosted
- Waste-sorting opportunities will be enhanced at city-owned properties
- The waste vacuum collecting system network at ports will be improved

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.1.1.	The waste management regulations will be so updated by 2022 that separate collection of organic waste, plastic, metal, glass and cardboard will become mandatory for every building consisting of five housing units or more.	**2022–2025**	**Waste Management Authority**	●○○○○	M
5.1.2.	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.	**2022–2025**	**Waste Management Authority**	●○○○○	M
5.1.3.	The incentive element of waste fees will be strengthened to improve the sorting of organic and recyclable waste.	**2022–2029**	**Waste Management Authority,** Pirkanmaan Jätehuolto Oy	●○○○○	M
5.1.4.	The potential for weight-based waste fee invoicing will be investigated while taking the applicable measures.	**2022–2029**	**Waste Management Authority, Pirkanmaan Jätehuolto Oy**	●○○○○	M
5.1.5.	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.	**2022–2029**	**Pirkanmaan Jätehuolto Oy**	●●○○○	M
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**	**Pirkanmaan Jätehuolto Oy**	●●○○○	M
5.1.7.	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. The separate collection of waste will be expanded at the city's properties at least as required by the waste management regulations.	**2022–2025**	**Real Estate and Housing,** Pirkanmaan Jätehuolto Oy, Tampereen Tilapalvelut Oy, Early Childhood Education and Pre-Primary Education	●●○○○	M
5.1.8.	Recycling opportunities will be increased at school buildings, also for students. Besides the climate neutrality goal, this also has an educational aspect.	**2022–2025**	**Upper secondary school education,** Pirkanmaan Voimia Oy	●○○○○	M
5.1.9.	Placement of recycling containers in compliance with the amendments of the new Waste Act.	**2022–2025**	**Tampereen Särkänniemi Oy**	●○○○○	M
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**	**Tammenlehväsäätiö foundation**	●○○○○	M
5.1.11.	Town plans will take account of the developments in waste management and of all new collectable wastes. Alternative ways to organise waste management (such as through neighbourhood collection) will be investigated in the larger housing town plans.	**2022–2025**	**Town Planning,** Pirkanmaan Jätehuolto Oy	●○○○○	M
5.1.12.	The city's construction sites will organise 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.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy, Climate and Environmental Policy	●○○○○	M
5.1.13.	The potential for organising neighbourhood collection and block-by-block collection in existing residential areas will be investigated following the more stringent separate-collection obligations.	**2022–2025**	**Pirkanmaan Jätehuolto Oy,** Building Control Department, Transport System Planning, Green Belts and Drainage Water	●○○○○	M
5.1.14.	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.	**2022–2025**	**Construction and Maintenance of Urban Environment**	●○○○○	M

OTHER BENEFITS:

- Cost savings through more efficient recycling and better utilisation of materials

EMISSION REDUCTION ●●○○○

MEASURE PACKAGE 5.2

CIRCULAR ECONOMY

- Circular-economy business areas will be developed in Tarastenjärvi and Kolmenkulma.
- Tampereen seudun keskuspuhdistamo will utilise the energy content of sludge.
- Hiedanranta will develop urban circular-economy solutions
- City residents' circular-economy competence will be boosted from the perspective of jobs, careers and business opportunities

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.2.1.	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.	**2022–2025**	**Business Unit,** Business Tampere Oy	●●●○○	M
5.2.2.	The Kolmenkulma 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.	**2022–2025**	**Business Unit,** Business Tampere Oy	●●●○○	M
5.2.3.	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
5.2.4.	Waste collection vehicles will switch to using biogas.	**2022–2029**	**Pirkanmaan Jätehuolto Oy**	●●○○○	M
5.2.5.	Tampereen Seudun Keskuspuhdistamo Oy will build the Sulkavuori Central Treatment Plant. The sludge generated at the treatment plant will be treated in a biogas plant under construction, and the biogas recovered will be utilised at a good overall efficiency to meet the central treatment plant's electricity and heat needs. Approximately 50% self-sufficiency in terms of electricity and 100% self-sufficiency in terms of heat will be achieved through biogas utilisation.	**2022–2029**	**Tampereen Seudun Keskuspuhdistamo Oy**	●●●●●	M
5.2.6.	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**	**Hiedanranta Development Programme,** Hiedanrannan Kehitys Oy, Climate and Environmental Policy		M A
5.2.7.	A business model will be developed whereby the soil disposal areas of Rusko and Myllypuro will be developed into circular economy hubs. (Recycling of aggregates and other materials used in construction.)	**2022–2025**	**Construction and Maintenance of Urban Environment**	●○○○○	M
5.2.8.	An operating model will be developed to recycle for reuse materials and supplies left over from the city's construction sites.	**2022–2025**	**Construction and Maintenance of Urban Environment,** Tampereen Infra Oy	●○○○○	M
5.2.9.	In the tendering of projects in 2022, Tampereen Tilapalvelut will pilot the adoption of the requirements set out in the Green Deal for Emission-free Construction Sites. On the basis of the experience gained in the pilot and in the market dialogues, the city will decide whether to join the Green Deal for Emission-free Construction Sites in 2022.	**2022–2025**	**Tampereen Tilapalvelut Oy,** Real Estate and Housing Tampereen Infra Oy	●○○○○	M
5.2.10.	The KIERTO project will help boost the 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.	**2022–2025**	**Employment services**	●○○○○	M

OTHER BENEFITS:

- Cost savings through more efficient recycling and better utilisation of materials
- Development of new innovations and local business
- Improved state of the water system
- Enabling city growth

EMISSION REDUCTION ●●●○○

MEASURE PACKAGE 5.3

SUSTAINABLE CONSUMPTION

- Digital customer services and tools will reduce the need for travel, and they will make the use of facilities more efficient while reducing material consumption
- The shared use of goods will be increased
- The carbon footprint of the increasing use of information technology will be reduced

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.3.1.	Transacting through digital channels will be made possible for 50% of the city's services. 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.	**2022–2025**	**The Services, Data Administration,** Administration Unit	●●●○○	M
5.3.2.	Digital tools will be used to reduce unnecessary work mobility. The aim will be to increase telework in all activities where telework 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.	**2022–2025**	**The Services, Data Administration,** Administration Unit	●●●○○	M
5.3.3.	Data Administration 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.	**2022–2025**	**Data Administration, the Services,** Administration Unit	●○○○○	M
5.3.4.	Särkänniemi will digitise its procurement of chemicals.	**2022–2025**	**Tampereen Särkänniemi Oy**	●○○○○	M
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.	**2022–2029**	**Data administration**	●○○○○	M
5.3.6.	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. Digitalisation will address the management of the entire documentation life cycle.	**2022–2025**	**Administration Unit,** Group units, the Services and Public utilities	●●○○○	M
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**	**Culture**	●○○○○	M
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. Tampere Vocational College Tredu will host a permanent book exchange market. Libraries will investigate the process to discard library materials and will 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 versatility of use of sports and exercise equipment.	**2022–2029**	**The Services,** Tampere Vocational College Tredu	●○○○○	M
5.3.9.	Digitalisation, such electronic ticketing and service products, as well as streamlining of internal processes, will reduce the carbon footprint.	**2022–2025**	**Tampereen Särkänniemi Oy**	●●○○○	M

OTHER BENEFITS:

- Cost savings
- City residents' increased independent activity

EMISSION REDUCTION ●●○○○

MEASURE PACKAGE 5.4

MEALS

- Events organised by Culture and Leisure Services will make vegetarian options available on an equal footing with other options
- Day-care centres and schools will increase the availability of vegetarian options
- Upper secondary schools will serve vegetarian options as the first dish on the line
- Pirkanmaan Voimia will step up the use of plant proteins while reducing food waste
- The city's hospitality functions will favour locally sourced food
- City residents' awareness of sustainable and healthy food and of the opportunities to produce food in the urban environment will be raised

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.4.1.	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.	**2022–2025**	**Pirkanmaan Voimia Oy**	●●●○○	M
5.4.2.	Voimia will serve Nordic Ecolabel meals.	**2025–2029**	**Pirkanmaan Voimia Oy**	●●●●○	M
5.4.3.	Meals for children and young people will be manufactured 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.	**2022–2025**	**Pirkanmaan Voimia Oy**	●●○○○	M
5.4.4.	Environmental-friendly logistics will be promoted by diversifying the propulsion systems used in transport operations.	**2025–2029**	**Pirkanmaan Voimia Oy**	●●●●○	M
5.4.5.	Voimia sites will reduce food waste from the meals of all customer groups while exploring new opportunities to utilise waste food and to make the best possible use of any possible waste food.	**2022–2025**	**Pirkanmaan Voimia Oy**	●○○○○	M
5.4.6.	The Hävikkimestari application will be introduced at all Voimia facilities while using knowledge-based management to reduce waste and to include customers.	**2022–2025**	**Pirkanmaan Voimia Oy**	●○○○○	M
5.4.7.	In the restaurant services of the Culture and Leisure Services and at camps and events, vegetarian food will be included as an option on 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 Fair-trade products and comprehensive vegetarian options.	**2022–2025**	**Sports, Exercise and Young People,** Pirkanmaan Voimia Oy	●○○○○	M
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.	**2022–2025**	**Early Childhood Education and Pre-Primary Education, Basic Education** Pirkanmaan Voimia Oy	●○○○○	M
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 on the line.	**2022–2029**	**Upper secondary school education,** Pirkanmaan Voimia Oy	●○○○○	M
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 responsible meals and well-being.	**2022–2025**	**Tampere Vocational College Tredu,** Pirkanmaan Voimia Oy and other food service operators	●○○○○	M
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**	**Social Services and Health Care**		M
5.4.12.	All catering for the meetings, conferences and events organised by the city will strive for the lowest possible carbon footprint. The Fusilli project will produce the more detailed guidelines.	**2022–2029**	**Climate and Environmental Policy,** Group units, the Services	●○○○○	M
5.4.13.	The city's hospitality functions will prefer locally sourced food.	**2022–2029**	**Strategy and development**	●○○○○	M
5.4.14.	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.	**2022–2025**	**Climate and Environmental Policy**	●○○○○	M

5.4.15.	In cooperation with Ekokumppanit, city residents' awareness of sustainable and healthy food and of the opportunities to produce food in the urban environment will be raised.	**2022–2025**	**Climate and Environmental Policy,** Ekokumppanit Oy	●○○○○	M
5.4.16.	The number of edible and pollinator-friendly plants in the urban environment will be increased through measures such as utilisation of the green coefficient. The map service will be updated, mentioning the fruit trees and fruit-bearing shrubs that the city residents can freely utilise.	**2022–2025**	**Climate and Environmental Policy,** Green Belts and Drainage Water	●○○○○	M A
5.4.17.	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 method.	**2022–2025**	**Climate and Environmental Policy,** Basic Education, Ekokumppanit Oy	●○○○○	M A

OTHER BENEFITS:

- Health effects
- Image benefits
- Economic savings from reduced food waste

EMISSION REDUCTION ●●●○○

Image 47. The city's hospitality functions will prefer locally sourced food. Image: Laura Vanzo.

MEASURE PACKAGE 5.5

PROCUREMENT

- Gradually tightening criteria will be set for procurements that are significant in terms of climate impact
- Implementation of climate and environmental criteria in procurements will be monitored while developing the competence of those responsible for procurements

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
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. The most significant climate and environmental negatives of procurements will be investigated while striving to integrate calculation as part of financial accounting and financial reporting. Ways will be investigated to monitor the inventory data of goods in real time (such as by using an app).	**2022–2029**	**The Services,** Climate and Environmental Policy, Tuomi Logistiikka Oy, Administration Unit	●○○○○	(M)
5.5.2.	Procurements will pay attention to low-carbon solutions and to those that promote the circular economy while considering the sustainable exploitation of natural resources. In particular, the procurement of energy, transport services, public transport services, vehicles, construction, equipment, machinery and food services will be subject to progressively stricter requirements, for example in regard to energy efficiency, fuel consumption, renewable energies and/or the carbon footprint. As for gifts to mark employee birthdays and to reward employees, the number of non-material alternatives will be increased.	**2022–2029**	**The Services,** Climate and Environmental Policy, Tuomi Logistiikka Oy, Administration Unit	●○○○○	(M)
5.5.3.	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.	**2022–2029**	**Climate and Environmental Policy,** Administration Unit	●○○○○	(M) (A)
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**	**Administration Unit,** Climate and Environmental Policy, Tuomi Logistiikka Oy	●○○○○	(M)
5.5.5.	Cooperation will be increased on sustainable procurement themes with other cities and expert organisations.	**2022–2029**	**Administration Unit, Climate and Environmental Policy,** Tuomi Logistiikka Oy	●○○○○	(M) (A)
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**	**Social Services and Health Care**		(M)
5.5.7.	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, Basic Education,** Tuomi Logistiikka Oy		(M)
5.5.8.	Investigation of the carbon footprint of the key process chemicals and the potential to reduce it.	**2022–2025**	**Tampere Water**	●○○○○	(M)

OTHER BENEFITS:

- Health effects
- Image benefits
- Economic savings from reduced food waste

EMISSION REDUCTION ●●●○○

MEASURE PACKAGE 5.6

RAISING ENVIRONMENTAL AWARENESS

- A sustainable future approach will be implemented at day-care centres and comprehensive schools.
- Climate issues will be a key element of the education content in upper secondary schools and in vocational studies
- Eco-support activities will be developed, and climate campaigns and sustainable development events will be organised for the city residents
- City residents' eco-social education will be promoted through communication and training events

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.6.1.	In Social Services and Health Care, communication and training will take account of climate issues. For inclusion in the annual plan, the Social Services and Health Care management team (Sote-jory) will decide a target that supports climate neutrality. In this way, the theme will be taken up in management and in communication.	**2022–2025**	**Social Services and Health Care**		(M) (A)
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 in 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**	**Sports, Exercise and Young People**	●○○○○	(M) (A)
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.	**2022–2025**	**Early Childhood Education and Pre-Primary Education, Basic Education**	●○○○○	(M) (A)
5.6.4.	Together with HAMK Häme University of Applied Sciences and the Fusilli project, basic education will commission a research thesis to investigate the state and volume of environmental education at comprehensive schools in Tampere. On the basis of these data, the concept of eco-social education will be explained and drawn closer to the daily life of schools. Teachers' and principals' know-how will be stepped up while providing concrete approaches for schools to implement the objectives of eco-social education in their own way across various subjects in their own operating culture.	**2022–2025**	**Basic Education,** Climate and Environmental Policy	●○○○○	(M) (A)
5.6.5.	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 (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 activity. 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**	**Upper secondary school education**	●○○○○	(M) (A)
5.6.6.	Tampere Vocational College will create sustainable education and management and a sustainable operating culture at Tredu. Sustainable education will be created by introducing a sustainable development/ responsibility learning pathway among the courses offered, by integration of the circular economy and sustainability in all education, through eTredu, and in online teaching. A sustainable approach will be created by removing unecological machines and equipment, such as printers, while examining the consumption of paper. The sorting of waste will be ensured and studies of sorting continued while striving to reduce waste. Staff training and communication will create sustainable management. Steps will be taken to ensure that sustainable development is part of the daily processes. Measurement of the carbon footprint at Metsätie by 2023.	**2022–2029**	**Tampere Vocational College Tredu**	●●○○○	(M)
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**	**Climate and Environmental Policy,** Human Resources Unit	●○○○○	(M) (A)

5.6.8.	The city will promote residents' sustainable consumption in 2021–25 under the Carbon-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, Fairtrade Week, Climate Week, Cycling Week, Mobility Week, and Energy Saving Week. Ekokumppanit Oy will organise environmental and energy saving advice activities for residents.	**2022–2029**	**Climate and Environmental Policy,** Ekokumppanit Oy	●●●○○	M A
5.6.9.	A natural-management guide for residents will be compiled.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	M A
5.6.10.	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
5.6.11.	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**	**Tammenlehväsäätiö foundation**	●○○○○	M
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**	**Rescue Department**	●○○○○	M

OTHER BENEFITS:

- The economic and social impact of sustainable development in addition to ecological effects.
- Image benefits

NOT POSSIBLE TO PREPARE AN EMISSION ESTIMATE

Image 48. Climate issues will be a key element of the education content in upper secondary schools and in vocational studies. Image: Laura Vanzo.

MEASURE PACKAGE 5.7

SUSTAINABLE BUSINESS AND EVENTS

- Climate-business ecosystems will be developed
- The city's projects will be opened up as development platforms for low-carbon business
- The rental policy for outdoor event venues will be revamped and aligned with sustainable development
- A public transport ticket will be enabled for event-goers
- Advantage will be taken of green financing in the city's investments where applicable
- Steps will be taken to further develop the ESG aspects of the city's investment activity

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
5.7.1.	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).	**2022–2025**	**Growth, Innovation and Competitiveness Services,** Business Tampere Oy, Hiedanranta Development Programme, Hiedanrannan Kehitys Oy	●●○○○	(M) (A)
5.7.2.	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.	**2022–2025**	**Growth, Innovation and Competitiveness Services,** Business Tampere Oy	●○○○○	(M)
5.7.3.	The organisation of responsible 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 in line with sustainable development. These measures will be integrated as part of the experience economy development programme.	**2022–2025**	**Attractiveness and Lobbying,** Business Tampere Oy, Visit Tampere Oy	●○○○○	(M)
5.7.4.	A chain of participation and mobility that favours public transport will be created by providing event-goers with a free-of-charge public transport ticket.	**2022–2025**	**Attractiveness and Lobbying,** Public Transport	●●●○○	(M)
5.7.5.	Särkänniemi will introduce a joint ticket with Nysse.	**2022–2025**	**Tampereen Särkänniemi Oy**	●○○○○	(M)
5.7.6.	Visit Tampere Oy will seek environmental certification while also helping and guiding partner companies to seek certification (such as the Sustainable Travel Finland label).	**Complete**	**Visit Tampere Oy**		(M)
5.7.7.	Tampereen Messu- ja Urheilukeskus will adopt a certified environmental system by 2025.	**2022–2025**	**Tampereen Messu- ja Urheilukeskus Oy**	●○○○○	(M)
5.7.8.	The Climate Partnership operating model will be launched, whereby the city invites companies and communities to implement the Climate Neutral Tampere goal on a cooperation basis and in ways that are appropriate for each of them. Post-launch, the activities will be continued and developed.	**2022–2025**	**Climate and Environmental Policy,** Business Tampere Oy	●●○○○	(M) (A)
5.7.9.	Advantage will be taken of green financing at applicable sites while directing investments towards choices and packages that enable green financing.	**2022–2029**	**Ownership Steering,** Finance unit, Climate and Environmental Policy	●○○○○	(M) (A)
5.7.10.	Särkänniemi will revamp its CO2 calculation. The arrival carbon footprint investigations will be performed using new software and surveys. The carbon footprint of a travel day will be calculated and, based on that, enhancement measures will be taken.	**2022–2025**	**Tampereen Särkänniemi Oy**	●○○○○	(M)
5.7.11.	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 index.	**2022–2029**	**Ownership steering**	●○○○○	(M)

OTHER BENEFITS:

- The economic and social impact of sustainable development in addition to ecological effects.
- Facilitating new business
- Image benefits

NOT POSSIBLE TO PREPARE AN EMISSION ESTIMATE

THEME 6.

SUSTAINABLE URBAN NATURE

Benefit goal:	Urban nature and urban structures will bind carbon and preparations will have been made for climate change.
Description:	The desire is to keep forests and the green infrastructure of the urban environment functional and vibrant even as the city grows. This will trap carbon from the atmosphere while mitigating climate change. In addition to the carbon-sink and carbon-storage impact, forests and green infrastructure provide a wealth of other benefits, such as habitats for different species, well-being and a pleasant environment for urban residents, as well as helping to adapt to climate change through regulation of drainage water and through a cooling effect. The forests owned by the city (about 7,500 hectares, of which about 7,000 hectares in Tampere) account for some 20% of all forests in the city area. The majority of city-owned forests are located around housing, used for outdoor exercise and recreation. Some areas are protected. Commercial forests measure just over 1,000 hectares. The trees and soil of the city's forests have a large carbon stock, which in 2019 corresponded to about six years' total emissions. This stock will grow by about one million tonnes of CO2 by 2030. According to Tapio Oy's report, the carbon sink in the trees and soil of the forests that the city owns totals 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 decrease already during this decade as forests age and their growth slows down. Forest management aims to increase the diversity and varied structure of forests. This will support the recreational use of forests while also helping prepare for global warming, which increases the risk of plant diseases. The carbon sink in forests and in the urban green will be strengthened in the management of forests and green belts.
Goal 2030:	• Greenhouse gas emissions from urban landscaping will have been reduced by 80%. • The carbon sink impact of the forests and urban green infrastructure in the Tampere region will cover a significant percentage of the emission offsetting need. • The carbon sink in the city-owned forests (growing stock and soil) will cover about 20% of the emission offsetting need of the 2030 goal. • The greenhouse gas emissions not sequestered by carbon sinks will be offset in a manner to be determined separately.
Indicators:	• Annual growth of and harvesting in city-owned forests (m3) • Carbon sink impact of the forests in the Tampere region (CO2 t) • Amount of green belts in master plans and town plans in the inner-city area (m²/resident) • Ecosystem services provided by green belts • Emission impacts from urban landscaping
Introductory data:	• Tampere Strategy 2030 • Sustainable Tampere 2030 Guidelines

SITUATIONAL PICTURE: REALISED INDICATORS

Indicator	Unit	2014	2015	2016	2017	2018	2010	2020	2021
Percentage of areas zoned as recreational areas of the total inner-city town planning area	%	26.4	26.5	26.2	26.2	26.2	26		
Annual growth of the city's forests	m3						47,451	46,666	45,662
Annual harvesting in the city's forests	m3						20,011	15,765	12,098
Amount of inner-city green belts in town plans and master plans	m2/ resident					220	219	215	210

EXAMPLES AND IMPACT ASSESSMENTS

Image 49. The City of Tampere owns approximately 7,000 hectares of forests in its region. Forest management aims to increase diversity while supporting the carbon sinks and the recreational use of forests. Image: Visit Tampere Oy/Laura Vanzo.

MEASURE PACKAGE 6.1

CARBON SINKS OF FORESTS

- The city's forest management will strengthen the carbon sinks
- Adaptation of forests to climate change will be strengthened
- Uneven-aged forest management will be favoured in the city's forests

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
6.1.1.*	In the management and use of the city's forests, the aim will be to strengthen the carbon sinks. The measures to strengthen the carbon sinks are set out in the 2022–2030 forest management approach. 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.	**2022–2029**	**Real Estate and Housing**	●○○○○	(M) (A)
6.1.2.*	Carbon sequestration will be increased in suitable areas through means such as by planting trees. The intention is to plant more trees than are felled in 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.	**2022–2029**	**Green Belts and Drainage Water,** Climate and Environmental Policy, Real Estate and Housing, Tampereen Infra Oy, Environmental Protection	●●○○○	(M) (A)
6.1.3.*	The adaptation of forests to climate change will be strengthened: The aim in forest management will be to diversify the tree species structure and the age structure while taking steps to prepare for forest damage by maintaining the vitality and health of the growing stock.	**2022–2029**	**Real Estate and Housing**	●○○○○	(A)

OTHER BENEFITS:

- Positive ecosystem impacts
- Well-being and a pleasant environment for city residents

NO EMISSION REDUCTION, ENABLES EMISSION OFFSETTING

EXAMPLES AND IMPACT ASSESSMENTS

6.1.1.–6.1.2. Development of forest carbon stocks and carbon balance

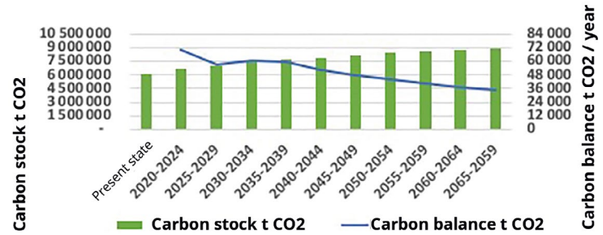


Image 50. The carbon stock of forests owned by the City of Tampere is currently 6 million tonnes of carbon dioxide. By 2030, this stock will increase by about one million tonnes. The carbon balance, which describes the amount of carbon sequestration in forests, is currently around 60,000 tonnes of carbon dioxide annually, but this is projected to decrease in the coming decades as the city's forests age and their growth slows down. Image: City of Tampere.

Adaptation of forests to climate change will be strengthened

6.1.3. Percentage of forest types of the total area

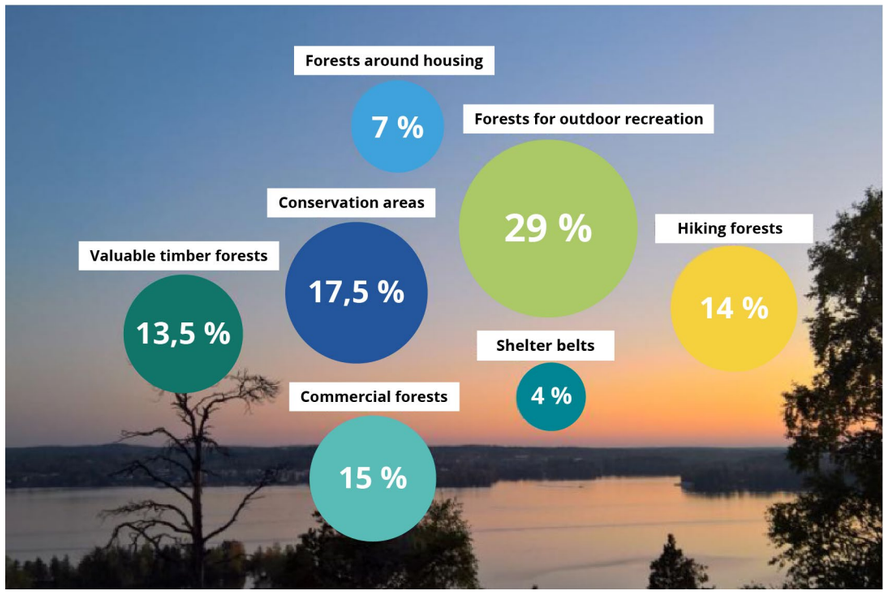


Image 51. The City of Tampere's forest management approach describes the forest type-specific objectives that guiding management and use. The forest types respond to residents' different forest management needs. Additionally, they also maintain natural variation. Image: City of Tampere.

MEASURE PACKAGE 6.2

URBAN-GREEN CARBON SINKS

- Preference will be given to sustainable local plant species
- Sites set out in the nature conservation programme will be protected
- Ways will be sought to increase carbon sequestration in the city's green belts
- A green roof policy will be compiled

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
6.2.1.	The Green Belt Programme will be updated (for example, in the choice of plant species, preference will be given to sustainable, local, biodiversity-friendly and easy-to-manage species; urban tree policy). The Programme will also examine climate change adaptation. The update will strive to seek ways to increase carbon sequestration in the city's town-planned green belts.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	M A
6.2.2.	For the research area selected, the i-Tree project will define 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 investigation will support the goals set out in the urban tree policy to increase the number of trees.	**Complete**	**Green Belts and Drainage Water**		M A
6.2.3.	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 belts.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	M A
6.2.4.	The growth conditions of urban trees and the treatment of drainage water will be improved, including by building biocarbon substrates. Test sites will be constructed to monitor the results. Niemenranta was selected as the first test site, and plans have been completed on how to take advantage of drainage water there in the substrates of urban trees. The test structure also features a measurement arrangement.	**2022–2025**	**Green Belts and Drainage Water**	●●○○○	M A
6.2.5.	The green efficiency of public areas will be promoted by developing new tools for the zoning process, for implementation planning and for construction, such as the green coefficient and a city design manual. The design guidelines prepared for nature-based drainage water solutions will be included as part of the manual.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	M A
6.2.6.	An urban trees and boulevards survey will be carried out. On the basis of this survey, an action plan will be compiled to increase the number of urban trees.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	M A
6.2.7.	A green roof policy will be compiled while deciding on a pilot. (See Measure 3 in the LUMO programme.)	**2022–2025**	**Green Belts and Drainage Water,** Real Estate and Housing, Tampereen Tilapalvelut Oy, Building Control Department, Climate and Environmental Policy, Master Planning, Town Planning, Environmental Protection, Pirkanmaa Rescue Department	●○○○○	A
6.2.8.*	Steps will be taken to prepare the protection of the sites set out in the nature conservation programme.	**2022–2029**	**Environmental Protection**	●○○○○	M A

OTHER BENEFITS:
- Positive ecosystem impacts
- Well-being and a pleasant environment for city residents

NO EMISSION REDUCTION, ENABLES EMISSION OFFSETTING

EXAMPLES AND IMPACT ASSESSMENTS

6.2.8. Tampere's nature conservation areas

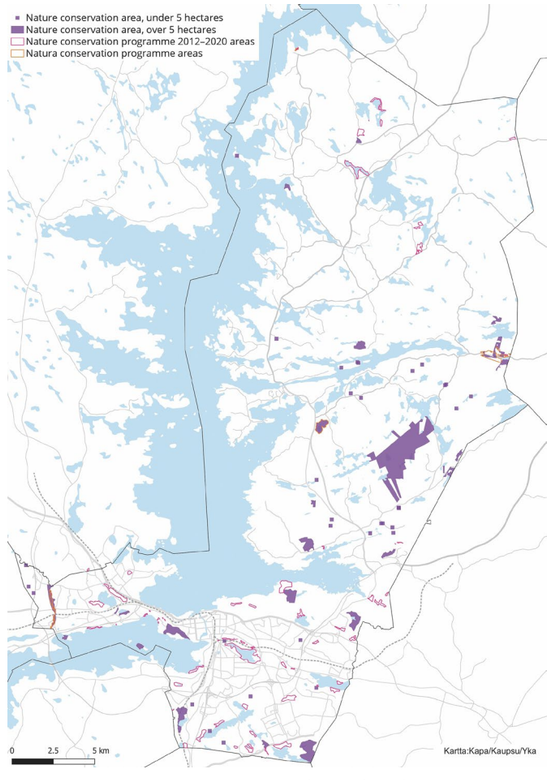


Image 52. Tampere's nature conservation areas, sites indicated in the nature conservation programme that have not yet been protected, and areas covered by the Natura conservation programme. The delimitations of the realised nature conservation areas are taken from the draft inner-city master plan, council term 2017–2021, and from the draft strategic master plan of Northern Tampere. Due to the character of the master plan, the delimitations have been generalised. In addition to traditional protection as discussed in the Nature Conservation Act, conservation through the use of town plans and master plans, a High Conservation Value Forest management classification and, in individual cases, other applicable means will be used to safeguard the nature values of the sites included in the nature conservation programme.
Image: City of Tampere.

MEASURE PACKAGE 6.3

CO2 EMISSIONS FROM URBAN LANDSCAPING AND DRAINAGE CONSTRUCTION

- The Sustainable Environmental Construction Guidelines will be implemented in urban landscaping
- Low-emission machines will be deployed.

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
6.3.1.	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 Belts and Drainage Water Unit. A pilot under the KESY approach will be carried out in the Niemenranta 3 town plan green belt.	**2022–2025**	**Green Belts and Drainage Water,** Climate and Environmental Policy		M
6.3.2.	A report will be prepared on low-emission maintenance methods (fleet, waste management, logistics, winter maintenance).	**2022–2025**	**Construction and Maintenance of Urban Environment, Tampereen Infra Oy**	●○○○○	M
6.3.3.	Low-emission machinery will be taken into use in maintenance and construction.	**2022–2025**	**Tampereen Infra Oy**	●●○○○	M
6.3.4.*	The carbon calculations for the Unalab project demos will be performed in 2022. Calculations will also be part of the design of green belts and drainage water sites.	**2022–2025**	**Green Belts and Drainage Water,** Climate and Environmental Policy	●○○○○	M A

OTHER BENEFITS:

- Positive ecosystem impacts
- Well-being and a pleasant environment for city residents

EMISSION REDUCTION ●●○○○

EXAMPLES AND IMPACT ASSESSMENTS

6.3.4. Development of natural drainage systems

Image 53. Natural drainage systems are being actively developed in Tampere. For example, one of the largest drainage areas in Finland, which also serves as a recreational area for residents, has been built in Vuores. Water quality and flow are monitored by automatic measurements throughout the year. Measurements provide information on the ability of the current drainage system to purify drainage water and to reduce flows. The Urban Nature Labs project piloted urban drainage water management through nature-based systems in collaboration with city residents throughout the city, for example in Hiedanranta. Image: City of Tampere.

MEASURE PACKAGE 6.4

CLIMATE CHANGE ADAPTATION MEASURES

- A climate change adaptation approach will be defined.
- The drainage water programme will be updated while taking steps to prepare for flood risks by routing waters and by drawing up a drainage system building code for home-owners.
- Information and solutions will be produced as to how adaptation should be considered in land-use planning.
- Capabilities will be created to form a situational picture between the various relevant actors and to distribute it under different disturbances

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
6.4.1.*	A climate change adaptation approach will be defined in 2022, identifying the key actors, their roles and how to promote the adaptation efforts 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.	**2022–2025**	**Climate and Environmental Policy,** Strategy and Development	●●●●○	A
6.4.2.	The Puulajikokeilu 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.	**2022–2029**	**Green Belts and Drainage Water,** Tampereen Infra Oy	●●○○○	A
6.4.3.	The drainage programme will be updated while taking steps to prepare for flood risks and routing waters as rainfall increases. A catchment area survey will be carried out to support the programme.	**2022–2025**	**Green Belts and Drainage Water,** Climate and Environmental Policy	●○○○○	A
6.4.4.	The operation of the City of Tampere's drainage water network will be modelled.	**2022–2025**	**Green Belts and Drainage Water**	●○○○○	A
6.4.5.	A building code will be prepared, containing construction instructions for the drainage systems of buildings. This code will be in line with the drainage programme.	**2022–2025**	**Green Belts and Drainage Water,** Building Control Department	●○○○○	A
6.4.6.	Town plans and master plans will take account of space reservations for climate change adaptation structures: drainage water, snow storage, multi-purpose areas and water reserves.	**2022–2029**	**Green Belts and Drainage Water,** Town Planning, Construction and Maintenance of Urban Environment	●○○○○	A
6.4.7.	Snow space guidelines will be prepared, modelled on those drafted by Oulu; adequate snow storage space will be provided for in land-use planning.	**2022–2025**	**Green Belts and Drainage Water,** Town Planning, Building Control Department, Transport System Planning, Construction and Maintenance of Urban Environment	●○○○○	A
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.	**2022–2029**	**Climate and Environmental Policy,** Master Planning, Green Belts and Drainage Water	●○○○○	A
6.4.9.	Information and solutions will be produced as to how adaptation should be considered in land-use planning; for example, urban heat island, floods, network for water issues, canopy cover, and the regional green coefficient.	**2022–2025**	**Master Planning,** Climate and Environmental Policy, Town Planning, Green Belts and Drainage Water	●●○○○	A
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.	**2022–2029**	**Rescue Department**	●○○○○	A
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**	**Rescue Department**	●○○○○	A
6.4.12.	Data analytics will be developed to prepare for sudden and foreseeable changes in the operating environment.	**2022–2029**	**Rescue Department**	●○○○○	A
6.4.13.	The Rescue Department's in-house preparedness for disturbances of an extended duration will be developed.	**2022–2029**	**Rescue Department**	●○○○○	A

OTHER BENEFITS:

- Improved environmental safety and reduced risks
- Adapting to a changing climate can bring savings in the future

NO EMISSION REDUCTION

EXAMPLES AND IMPACT ASSESSMENTS

6.4.1. Climate risk impacts in Tampere

Image 54. The hazards to which the city of Tampere is exposed include climate risks, their development in the coming decades as well as the sectors and populations that are vulnerable to these risks. The right-hand side column shows a specialist estimate of how the risk level will develop as compared to the risk assessment carried out in the 2019 SECAP report. Estimates about this development are shown for the risks that were assessed in the 2019 SECAP report. The increased amount of information on risks and on their effects underlies risk level development.

Risk factor	Probability	Level of impact	Expected change in strength	Expected change in frequency	Time span	Vulnerable sectors	Vulnerable population groups	Change in risk level cf. SECAP
Extreme heat	!!	!!	↑	↑	►	buildings, energy, water, agriculture and forestry, the environment and biodiversity, health, rescue services	children, the elderly, disabled, long-term sick, low-income households, people living in dilapidated buildings	remained the same
Torrential rain	!!!	!!	↑	↑	►	buildings, transport, water, land use planning, agriculture and forestry	low-income households, people living in dilapidated buildings	remained the same
Rain	!!!	!!	↑	↑	►			–
Snow	!!	!!	↑	↑	►			–
Fog	!	!	↑	↑	►			–
Hail	!	!	↑	↑	►			–
Floods and sea level rise	!!	!!	↑	↑	►	buildings, transport, water, land use planning, agriculture and forestry, rescue services	low-income households, people living in dilapidated buildings	remained the same
Stormwater flooding	!!!	!!	↑	↑	►			increased slightly
Flooding of water bodies	!!	!!	↑	↑	►			remained the same
Drought and water shortage	!!	!!	↑	↑	►►	water, agriculture and forestry, the environment and biodiversity, health	people whose livelihoods depend on agriculture and forestry	–
Storms	!!	!!	↑	↑	►	buildings, transport, energy, agriculture and forestry, rescue services, information and communication	low-income households, those living in dilapidated buildings, those earning their livelihoods from agriculture and forestry	decreased slightly
High wind	!!	!!	↑	↑	►			–
Thunderstorms	!!	!!	↑	↑	►			–
Biological risks	!!	!!!	↑	↑	►	water, agriculture and forestry, the environment and biodiversity, health, rescue services	children, the elderly, disabled, long-term sick	–
Water-borne diseases	!!	!!!	↑	↑	►			–
Vector-borne diseases	!!	!!!	↑	↑	►			–
Air-borne diseases	!!	!!!	↑	↑	►			–
Insect-borne diseases	!!	!!!	↑	↑	►			–
Ecosystem changes	!!	!!!	↑	↑	►			–
Extreme cold	!	!	↑	↑	►►►	buildings, energy, rescue services	children, the elderly, disabled, long-term sick, low-income households, people living in dilapidated buildings	decreased slightly
Landslides	!	!	↑	↑	►►►	buildings, transport, agriculture and forestry, rescue services	low-income households, people living in dilapidated buildings	remained the same
Wildfires	!	!	↑	↑	►►	agriculture and forestry, the environment and biodiversity, health, rescue services	people whose livelihoods depend on agriculture and forestry	remained the same
Chemical changes	!!	?	?	?	►►			–
Freeze-thaw cycle	!!	!!	↑	↑	►	buildings, transport, health	the elderly	–
Reflective effects	!!	?	?	?	►	energy, health, tourism	All population groups	–
	!: low !!: moderate !!!: high ?: unknown	!: low !!: moderate !!!: high ?: unknown	↑: increasing ↓: decreasing ?: unknown	↑: increasing ↓: decreasing ?: unknown	►: short-term (20–30 years) ►►: medium-term (2050–) ►►►: long-term (2100–) ?: unknown			-: risk not assessed in the 2019 SECAP report

MEASURE PACKAGE 6.5

CARBON OFFSETTING

- The remaining emissions will be offset through the carbon sinks of forests and other emission offsetting methods
- The offsetting of flights will be developed

Measure №	Measure	Timetable in council terms	Responsibility	Costs 2023–30	Mitigation/ Adaptation/ Both
6.5.1.	A plan will be established to offset the emissions that cannot be reduced by 2030. The offsetting methods to be investigated include the carbon sinks in forests, in green infrastructure and in wood construction as well as purchasing carbon offset credits from elsewhere in Finland or from abroad.	2025–2029	**Climate and Environmental Policy,** Real Estate and Housing, Green Belts and Drainage Water	●○○○○	M
6.5.2.	The flights used by the city's employees and elected officials will be offset on an annual basis. The subject of offsetting will be selected based on reliability and the benefit derived.	2022–2029	**Climate and Environmental Policy**	●○○○○	M

OTHER BENEFITS:

- Comfort of the urban environment
- Ecosystem services
- Economically efficient emission reductions

EMISSION REDUCTION ●●●●●

Image 55. The remaining emissions of the Tampere region will be offset through the carbon sinks of forests and other carbon offsetting methods. Image: Laura Vanzo.

SECTION 5. EMISSION PROJECTION AND COSTS

CLIMATE NEUTRAL TAMPERE 2030 ROADMAP EMISSION PROJECTION

Major measures about to be completed – still some way to go to achieve goals in many sectors

In cooperation with specialists representing various sectors, the Climate and Environmental Policy Unit prepared an assessment of the future trend of the city's climate emissions. The basic principle of the projection is the assumption that the current trend will continue in all the data used for emission calculation. These data include, for example, the consumption of heating energy and electricity and the emission factor for heating and electricity. The impacts of measurable national changes, such as changes in emissions from energy production and the new propulsion systems adopted in vehicles, were added to the current trends. On this basis, the Current Development projection was created, also covering the impact of the measures that are clearly about to be completed, such as the construction of the Naistenlahti 3 power plant and the tramway currently under construction. By adding to Current Development the impacts of some of the measures designed in the roadmap, it was possible to arrive at the roadmap emission projection (Projection KT2030).

The measurable roadmap measures can achieve an emission reduction of around 73% by 2030 (Figure 56). However, it is impossible to estimate the impact of many measures, as it was not possible to produce data on their impact. The most important factor in the transport sector that remains excluded from the assessment are the measures whereby we can affect the mobility choices of city residents. This is why, despite updating the measures and increasing their number, the emission reduction impact as compared to the first (2020) roadmap edition has improved only by about one percentage point. However, the emission reduction that can be achieved under Current Development has meanwhile risen from 61 per cent to 69 per cent, largely owing to the measures about to be completed, with the biggest single impact coming from the Naistenlahti power plant. This positive development reflects that the targeted measures have translated into effective action.

Sustainable Tampere 2030 Roadmap emission projection, May 2022

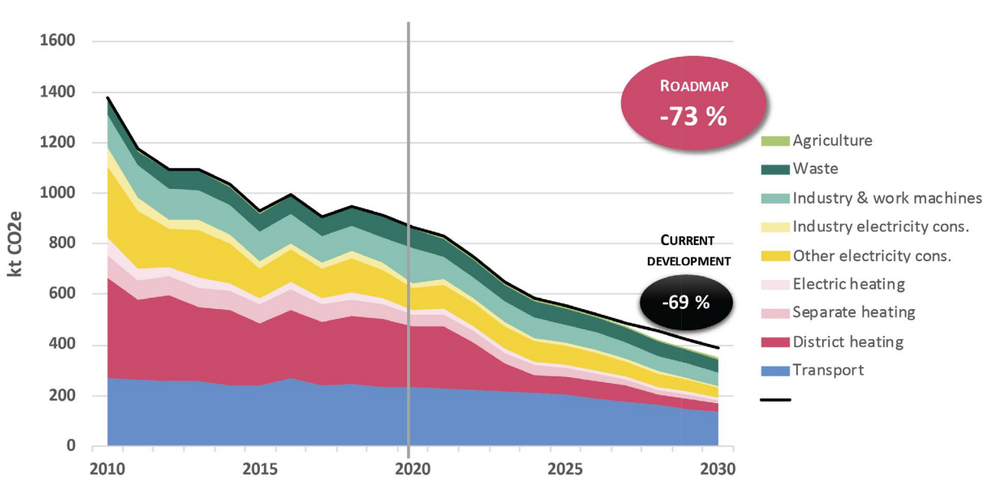


Image 56. Tampere's actual climate emissions in 2010–2020, and a projection prepared based on current development and the measures set out in the Climate Neutral Tampere 2030 Roadmap. Apart from national development, Current Development includes the key climate measures taken in Tampere that are already about to be realised.

The projection results indicate that, by implementing this roadmap, the emission goal will be attained for other electricity consumption, for industrial electricity consumption, and for electric heating. District heat falls only slightly short of the goal, while oil heating, industry and work machines fall considerably short of the goal. In 2030, the traffic and waste management sectors will be the sectors remaining furthest from the goal. For a more detailed analysis of each sector, see Appendix 1.

Achieving the climate neutrality goal requires not only measures by the city but also broad participation by city residents and businesses. Additionally, emissions from industry, logistics and oil heating must also be cut drastically. Furthermore, where the regional functions are concerned, the existing landfills in particular play a key role, and it would be good to find ways to further mitigate emissions from these landfills. In turn, developing sustainable mobility to be easier, faster and more attractive also requires participation from city residents.

ktCO2e	Year	Sum	Traffic	District heating	Separate heating	Electric heating	Other electricity use	Industry electricity cons.	Industry and work machines	Waste management	Agriculture
Relised	1990	1301	290	347	124	40	134	126	144	88	9
	2018	952	247	266	67	28	133	31	102	71	7
Projection	2030	348	135	37	11	9	39	6	54	51	6
Goal	2030	260	115	28	4	7	40	7	39	15	5

Image 57. Results of the emission projection for the measures set out in the Climate Neutral Tampere 2030 Roadmap, by sector and compared with the actual figures for 1990 and 2020 and with the goal laid down in the 2022 climate budget.

What steps to take to reduce the remaining 7%?

1. Emissions from **traffic** must decrease significantly faster, also including a modal shift to sustainable mobility
   - Deficit 20–40 kt CO2e
2. **Oil consumption** by industry, construction and other work machines (such as maintenance) must be reduced more rapidly
   - Deficit ~17 kt CO2e
3. **Oil heating** must end both in residential and in industrial buildings
   - Deficit 7–10 kt CO2e
4. Emissions from existing **landfills** must be investigated more closely and mitigated
   - Deficit 10–35 kt CO2e
5. **District heat** production still needs more solutions to cut emissions
   - Deficit ~8 kt CO2e

ESTIMATED COST OF ROADMAP MEASURES

Rough cost estimates, represented by bullet symbols, were prepared for every measure discussed in the roadmap. Additionally, more precise cost needs for 2023–2030 were estimated for some of the measures (Appendix 2, Figure 75). These cost estimates are based on the original Carbon Neutral Tampere 2030 Roadmap compiled in 2020 and on updated data. Additionally, the same table also shows the emission reduction potential for every measure for which it was possible to estimate this potential.

For the measures that were estimated, the City Group's total investment in 2023–2030 stands at some EUR 496 million. As for operating expenditure, the total cost of the roadmap measures in 2023–2030 comes to some EUR 100 million. For the city organisation, excluding all subsidiaries, the respective figures are EUR 246 million and EUR 99 million. A large share of this sum is already included in the current budgetary framework. Regarding the measurable individual measures, the emission reduction potential totals some 190,000 t CO2e.

However, these estimated costs that the measures incur cannot be treated as a 'price tag' for the Climate Neutrality Roadmap, as they contain a large number of major projects that are carried out largely for non-climate-related reasons and the projects would be implemented in any case. The roadmap therefore does not entail additional costs for projects, but projects nevertheless have significant positive climate impacts. Additionally, the estimates are based solely on the financial input needed to implement the measures and take no account of any possible cost savings that the measures may generate.

In the case of the subsidiaries part of the City Group, in particular, for the measures to be implemented they must be economically profitable and based on the development of business operations or be derived from legislative requirements. Increasingly, climate investments prove to be a good solution commercially and they bring a competitive advantage, which has led to the mainstreaming of climate-friendly activities.

COST-EFFECTIVENESS OF THE EXAMPLE MEASURES

The economic profitability of measures in relation to other measures is often illustrated on a marginal abatement cost curve. The example measures selected from the roadmap are illustrated on curves (Figure 58 and Figure 59) where the x axis displays the emission reduction potential of the measures in 2030 (t CO2e) while the y axis shows the measure's cost-effectiveness, or economy (€/t CO2e). The curve shows the measures in the order of their cost-effectiveness, placing the most cost-effective measures at the left-hand edge of the curve.

Cost-effectiveness illustrates the price of the emission reduction that a measure incurs, expressed in the calculations as per tonne of reduced greenhouse gas emission (€/t CO2e). A negative cost-effectiveness figure means that the measure, in addition to an emission reduction, generates cost savings through, for example, reduced energy or maintenance costs. The greater the negative cost-effectiveness is, the more profitable it is to implement that measure. A positive cost-effectiveness figure means increased costs. The width of the column illustrates the measure's emission reduction potential – the wider the column, the greater the emission reduction potential.

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 overall economic performance, but they entail uncertainty as to, for example, how the price development taking place over the coming years will be assessed.

Example measures examined	(the example measures are not always exactly identical to the measures set out in the roadmap but provide an understanding of the economy of the measure in question)
Outdoor lighting (measure 4.2.4)	95% of the city's outdoor lighting will be replaced with smart control LED lights by 2025.
Solar panels (measure 4.3.2)	The amount of solar energy produced at the city's buildings is expected to increase tenfold linearly by 2030, meaning that in the target year (2030) the annual capacity is expected to be 630 kWp while annual production is expected to be 567 MWh.
Renovation construction (measure package 3.3)	All buildings owned by the city will be renovated to be 20% more energy-efficient than the minimum legal requirement.
New construction (measure package 3.1)	All new buildings owned by the city will be constructed to be 20% more energy-efficient than the minimum legal requirement.
Cars (measure 2.6.11)	The number of the city organisation's cars using different propulsion systems will develop over the period examined (2023–2030) such that in 2025, 30% of cars will be electric and 10% will be gas-powered. By 2030, 70% of all cars will run on electricity and the remaining 30% on biogas.
Vans (measure 2.6.12)	The number of the city organisation's vans using different propulsion systems is assumed to develop over the period examined (2023–2030) such that in 2025, 10% of vans will be electric and 10% gas-powered. By 2030, 75% of all vans will run on electricity and the remaining 25% on biogas.
Oil heating (measure 4.4.2)	The city's buildings will replace oil heating with water to air heat pump systems by 2025.
Public transport (measure 2.3.3)	The number of Nysse's buses using different propulsion systems is assumed to develop over the period examined (2023–2030) such that in 2030, 50% of the bus traffic will be electric, 40% renewable diesel-powered and 10% biogas-powered.
Work machines (measure 2.7.3)	The city's own work machines will linearly switch to renewable diesel such that it will be used exclusively by 2030.

Of the measures examined, based on the calculations made, all measures with the exception of work machines are economically profitable, meaning 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 profitable 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, while on the other hand the costs of saving energy can, following increasing electrification, be considerable compared to expenses such as fuel costs. It is also worthwhile to implement measures that are significantly inexpensive, even if they incur some costs. Often they in any case also create other benefits besides reducing emissions.

If an investment's life cycle goes beyond the 2030 carbon neutrality target year, only the share of the investment costs in the examination period 2023-2023 will be taken into account in the calculations. For example, for an investment made in 2025 with an economic life span of 25 years, 20% is considered, for (2030–2025)/25=20%. The calculations employ a discount rate of 4 per cent, which is used to convert future cash flows to present value 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 (BEIS 2019) 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 Carbon Neutral Tampere 2030 Roadmap (Nieminen 2020, in Finnish). The calculations have been updated, and further information regarding them is available from the City of Tampere's Climate and Environmental Policy Unit.

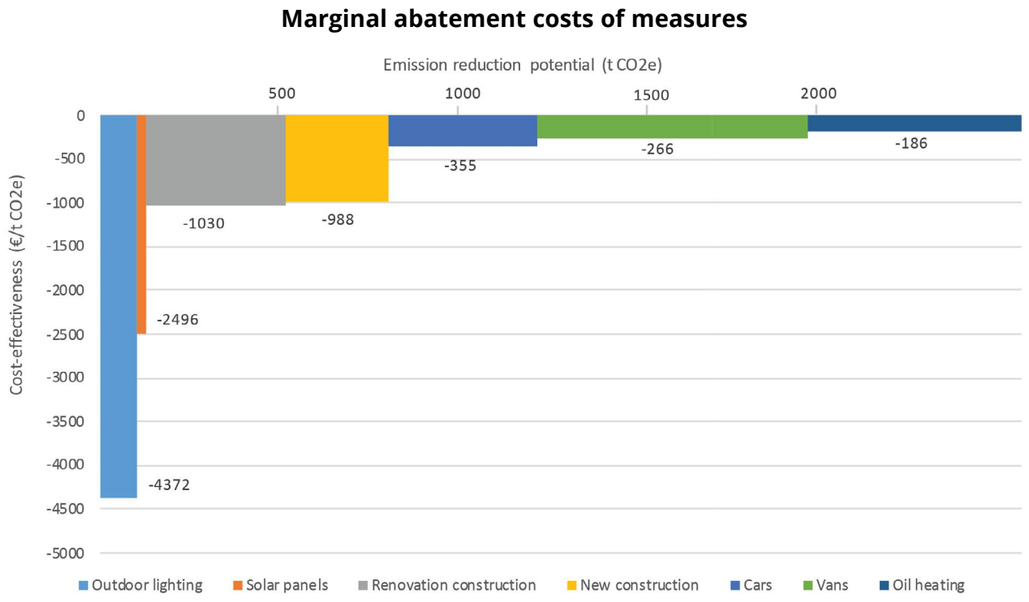


Image 58. The roadmap marginal abatement costs for the following example measures: outdoor lighting, solar panels, renovation construction, new construction, cars, vans, and oil heating. The y axis of the diagram shows the measure cost-effectiveness (€/t CO2e) and the x axis the emission reduction potential in 2030 (t CO2e).

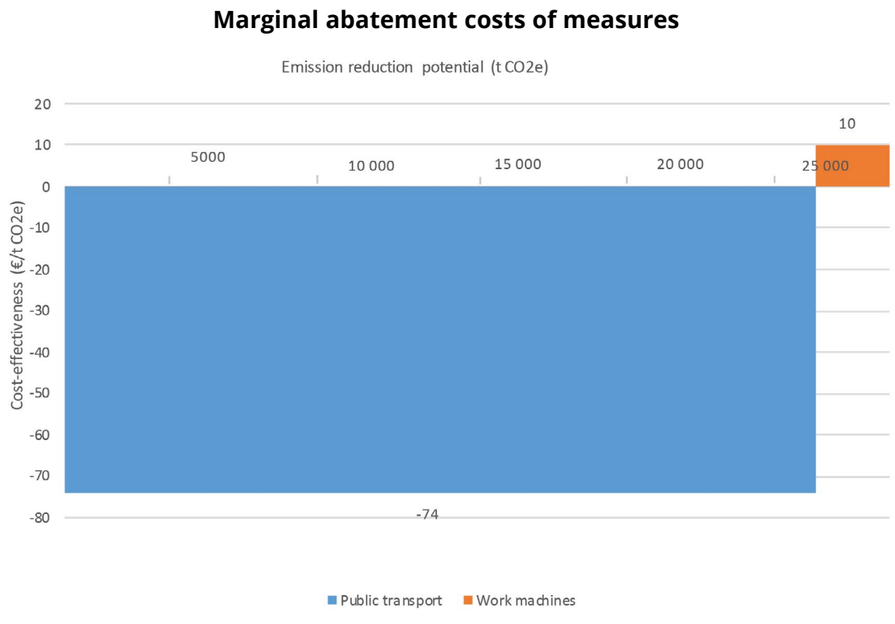


Image 59. The roadmap marginal abatement costs for the following example measures: public transport and work machines. The y axis of the diagram shows the measure cost-effectiveness (€/t CO2e) and the x axis the emission reduction potential in 2030 (t CO2e).

COSTS OF CLIMATE CHANGE IN FINLAND AND TAMPERE

The national KUITTI project published in spring 2022 assessed the direct and indirect impacts from climate change that will incur costs for Finland. According to the project final report, climate change will result in increasing costs in Finland through developments such as floods and disturbances in power distribution while affecting the conditions for and profitability of forestry and agriculture, increasing health care costs from heatwaves and vector- and waterborne diseases as well as affecting several different ecosystem services. Climate change mitigation and adaptation can help reduce these impacts and the resulting costs.

Overall, the KUITTI project estimates that the annual economic cost of weather extremes in Finland will come to approximately EUR 90 million. When assessing the harm people experience based on other than direct monetary compensation, the annual cost in Finland is estimated to be about EUR 400 million. In relative terms based on population, the corresponding figures for Tampere would be around EUR 4 and 18 million annually, respectively. However, these estimates only cover some of the negative impacts. It should also be noted that such quantitative economic evaluations contain a high degree of uncertainty and require a lot of specification and choices by experts.

The costs of greenhouse gas emissions from Tampere, including the negative impacts described above, can also be assessed on the basis of the emissions trading price or the social cost of carbon dioxide. Assuming that emissions in the coming years will develop in accordance with Tampere's emissions budget, and the cost of a ton of carbon dioxide is at the level of the average price of the emission allowance in 2021 (about €54/t CO2e), the negative impacts (or costs) from emissions in 2022 would be about 40 million euros, and only about 14 million euros in 2030 after an 80% reduction in emissions. (Figure 60). In reality, the emissions trading price is likely to go up considerably in the future, and in early 2022 the price has fluctuated between €60–100 per tonne of carbon dioxide emissions.

If the same estimate is made with higher prices for a ton of carbon dioxide, using estimates of €100/t CO2e and €150/t CO2e in the example calculations, the annual harm by emissions would be €72-108 million in 2022 and €26-39 million in 2030. A higher price of CO2e better reflects the real negative impacts from emissions, i.e. the social cost of carbon. Several estimates of such a price have been made, but there is no consensus on the correct level. In the United States, 51 dollars (approx. 50 euros) per ton of carbon dioxide is used as the social price of carbon in the calculations of the projects. The Intergovernmental Panel on Climate Change has suggested that to stay in the Paris Agreement, the price of carbon in 2030 should be between $135 and $5500/t CO2e (about €130 and €5400/t CO2e).

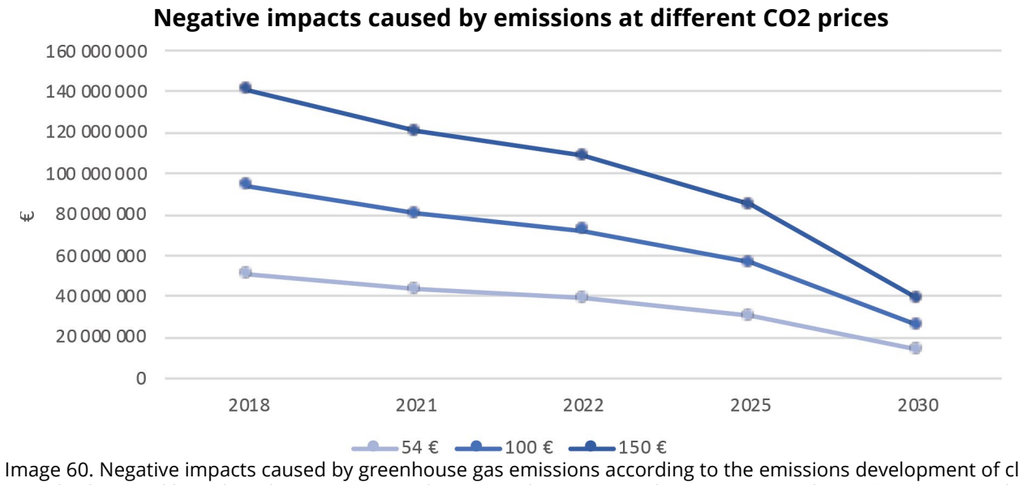


Image 60. Negative impacts caused by greenhouse gas emissions according to the emissions development of climate budget, and based on the emissions trading price (the average value in 2021 was about €54/t CO2e) and hypothetical higher prices reflecting the negative impacts of carbon (100 and 150 €/t CO2e).

The relevant question is not merely how much will it cost to implement the Climate Neutral Tampere 2030 Roadmap.

A MORE RELEVANT QUESTION MAY BE:

How much will it cost if we do not invest in climate change mitigation and adaptation?

It is estimated that the cost of greenhouse gas emissions in Tampere in 2022 could be almost **110 million euros.**

Image 61. Climate change brings about direct and indirect negatives that will incur costs to Finland. Image: Laura Vanzo.

THE CHALLENGE OF MODAL SHIFT AND IMPACT ASSESSMENT

ON THE TRANSFORMATION OF MOBILITY HABITS

Estimates on the need to transform our mobility habits are outlined in two distinct ways. The emission projection used here assumes that Current Development has already taken the propulsion system shift for 2030 as far as it can go. Despite this, emissions must be cut further by some 20 kt CO2e. If the necessary emission reduction is achieved solely by reducing the output from cars running on fossil petrol, the transformation would mean that car travel must be cut by some 180 million kilometres, corresponding to approximately 18.6% of the current car travel output (Figure 62). It should be noted that in this rough example, only illustrating the scale of the transformation, the emissions or output of any other vehicles remain unchanged.

Output from traffic in the emission projection

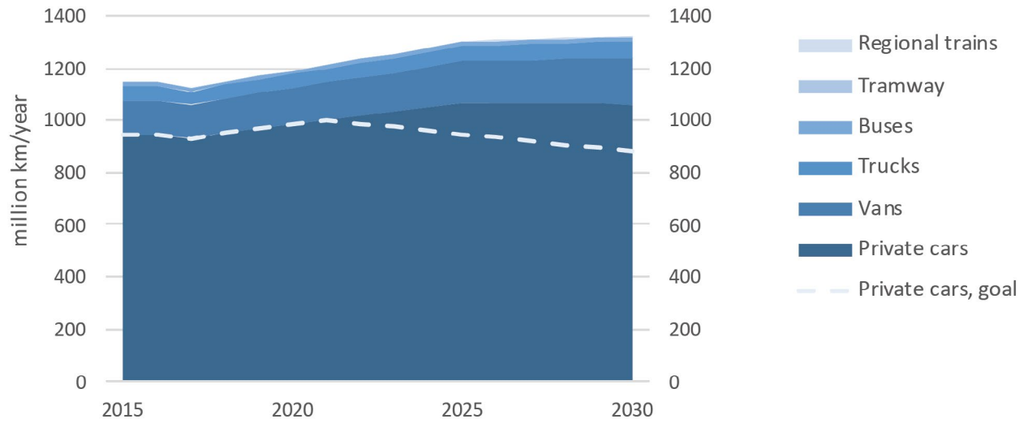


Image 62. The traffic output used in the emission projection. The dotted line shows an example of how the car travel output would develop if the climate neutrality goal were reached solely by reducing the share of cars in mobility choices.

On the other hand, it was assessed how the mobility choices made by city residents should develop in order to achieve the sustainable mobility goal: In 2030, 69% of all journeys will be made using public transport, on foot or by bicycle. Below is a calculation of the mobility outputs for different mobility modes, prepared assuming that the 2030 sustainable mobility mode goal will be attained. In this example, the output of public transport more than doubles while car travel experiences a decline of about 10%. Additionally, walking shows an increase of 33% and cycling nearly doubles. It should be borne in mind that this mobility is for people living in Tampere, whereas the previous example (Figure 63) concerns all mobility within the geographical region of Tampere.

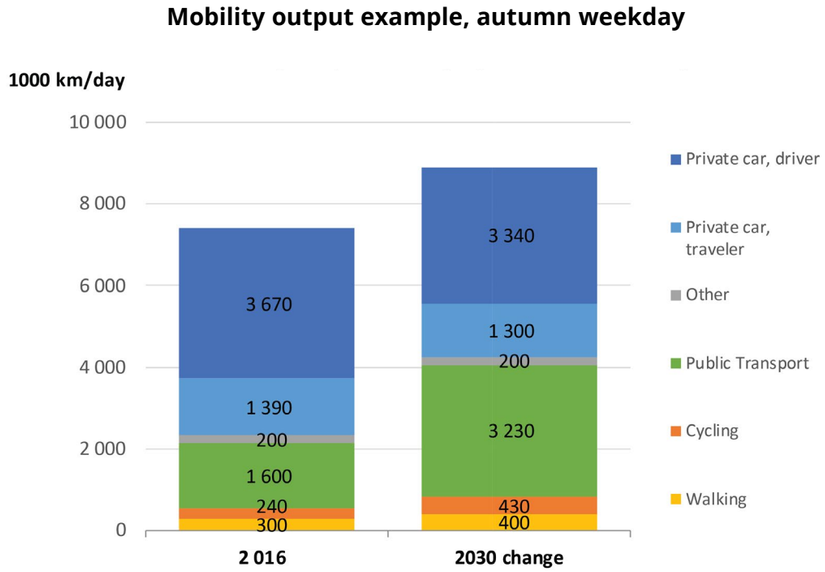


Image 63. Example estimate of how the journeys made by people living in Tampere and, consequently, mobility outputs could develop in order to achieve the 69% modal split goal for sustainable modes of mobility.

COST–BENEFIT ANALYSIS OF MOBILITY MODAL SPLIT

In a cost–benefit analysis, Tampere has prepared a comprehensive estimate of the EUR impacts of the shift in the modal split that supports the climate neutrality goal as well as how well they match. This was undertaken so that the impacts of the climate measures taken could be assessed beyond emission reductions and direct costs or cost savings.

To reach the carbon neutrality target, it is estimated that the share of sustainable transport modes in Tampere should increase from the current 54% to 69% by 2030 (Figure 64). Originally, this analysis was included in a Master's thesis (Joronen 2020) and it concerned cars, walking and cycling (consult this thesis for more information on the calculation method and the assumptions). The estimate was later supplemented to also cover public transport. For more detailed information on the calculations, contact the City of Tampere's Climate and Environmental Policy Unit.

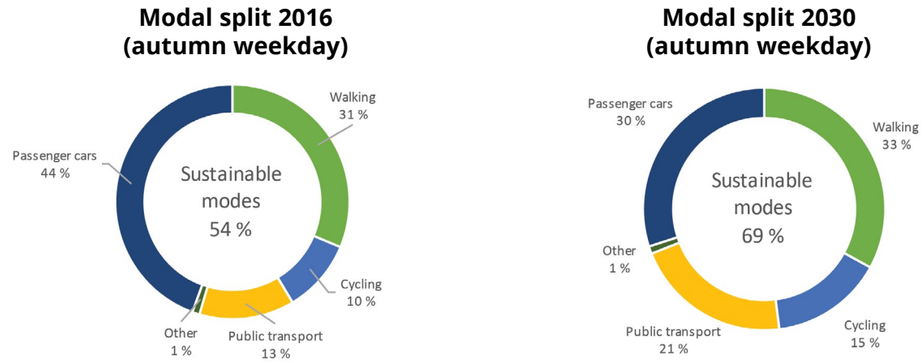


Image 64. The modal split in 2016 and the targeted modal split in 2030.

The calculations compare the costs and benefits arising from the targeted modal split shift compared to current development, with due consideration of the growth of the city's population. The impacts take account of the costs and benefits experienced by the city organisation from infrastructure investment and maintenance as well as from the operation of and ticket sales proceeds from public transport; by individuals from vehicle, travel time and health related impacts; and more generally by society regarding health, 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.

The analysis is based on the city's estimates of the development of the travel outputs (passenger-kilometres/year) of the different mobility modes up to 2030 and on the passenger-kilometre-specific unit values of the different cost items and benefits items, which are based on bibliographic sources and calculations prepared by the City of Tampere's Climate and Environmental Policy Unit. The examination compares targeted development with current development, and the results show the difference between these two.

When looking together at the city's economy, individuals, and wider society, the total cost from more sustainable mobility in the period 2023–2030 is 175 million euros and the corresponding total benefit is 1,014 million euros (Image 65). According to the estimate, a total net benefit of 840 million euros would result from moving towards more sustainable mobility, which is approximately 105 million euros on an annual basis, meaning that society would benefit from moving to a more sustainable mode of transportation.

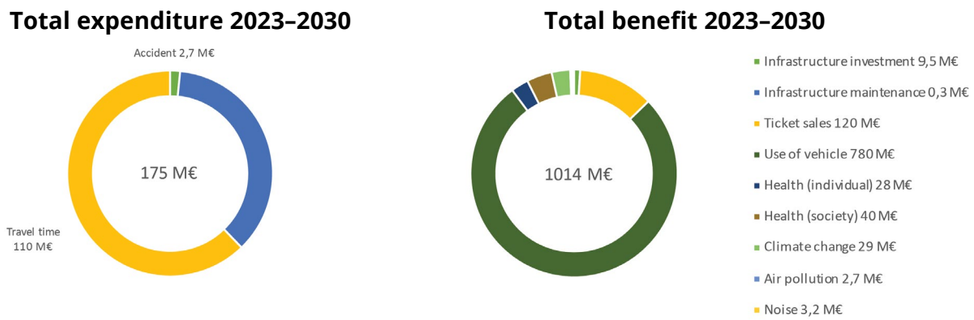


Image 65. Total expenditure and total benefit from the targeted modal split compared to current development.

Of the total expenditure, 36% will be incurred by the city, 62% by individuals and 2% by society. The most significant cost arises from individuals' increased travel time and from increased traffic operation costs incurred by the city. Of the total benefit, 13% will be incurred by the city, 80% by individuals and 7% by society. The most significant benefits are the cost savings to individuals from vehicle use and the increased proceeds from ticket sales accruing to the city. Additionally, individuals and society will achieve significant health benefits, and society will benefit from the reduced impact of climate change.

According to this examination, the Tampere city organisation's net benefit from the targeted mobility mode shift totals EUR 66 million in 2023–2030. The increase in costs is mainly due to the operation of public transport (EUR 63 million) and the benefits come from increased proceeds from public transport ticket sales (EUR 120 million). In addition, benefits will also be derived from a reduced level of road investments (EUR 9.5 million).
The net benefit to individuals from the targeted mobility mode shift will come to up to EUR 700 million in 2023–2030. Increased costs are due to longer travel times as a result of an increase in slower mobility modes (EUR 110 million) while the benefits arise mainly from a decrease in car-related operating costs (EUR 780 million). Additionally, individuals will benefit from improved health and longer life expectancy (EUR 28 million).

The examination suggests that the net benefit to society from the targeted mobility mode shift will be EUR 72 million in 2023–2030. Increased costs are solely due to a higher number of cycling and pedestrian accidents (EUR 2.7 million) while the benefits arise mainly from the effects of increased walking and cycling on healthcare costs and on a decreasing amount of sick leave (EUR 40 million), from reduced climate change negatives (EUR 29 million) and from reduced air pollution (EUR 2.7 million) and noise pollution (EUR 3.2 million).

SECTION 6. CONCLUSION

This second edition of the Climate Neutral Tampere 2030 Roadmap presents more than 300 climate measures by the City of Tampere, 75 of which promote not only climate change mitigation but also climate change adaptation and preparedness. What is more, the roadmap now also contains an increasing number of measures by the city's companies and public utilities. Similarly to the first edition of the roadmap in 2020, this update was also drawn up in cooperation with the services and units.

A great many of the measures contain climate actions big and small, undertaken for a variety of reasons. These are included and highlighted in the roadmap from the perspective of climate impacts. For some of the measures, the costs and the direct impact on climate emissions are small, yet serve as good examples and reinforce the growing river of change from small streams. These include purchasing electric cars or solar panels for the city, increasing the share of vegetarian food in schools and staff canteens, increasing recycling and the use of recycled materials, and wood construction. Many of the measures set out in this roadmap have an indirect impact on climate emissions, enabling city residents to live, use energy, move and use services sustainably. Tampere is determined in its efforts to guide the growth that the city is experiencing to central areas and along the trunk routes of public transport. The tramway will densify the city while also making energy efficient housing and a car-free everyday life possible. Smooth mobility services, digital services and a well-functioning circular economy all make it easier for city residents to make sustainable everyday choices. The impact of these measures is significant, but we will witness it only in the longer term, and it is very difficult to assess in advance the scope of that impact.

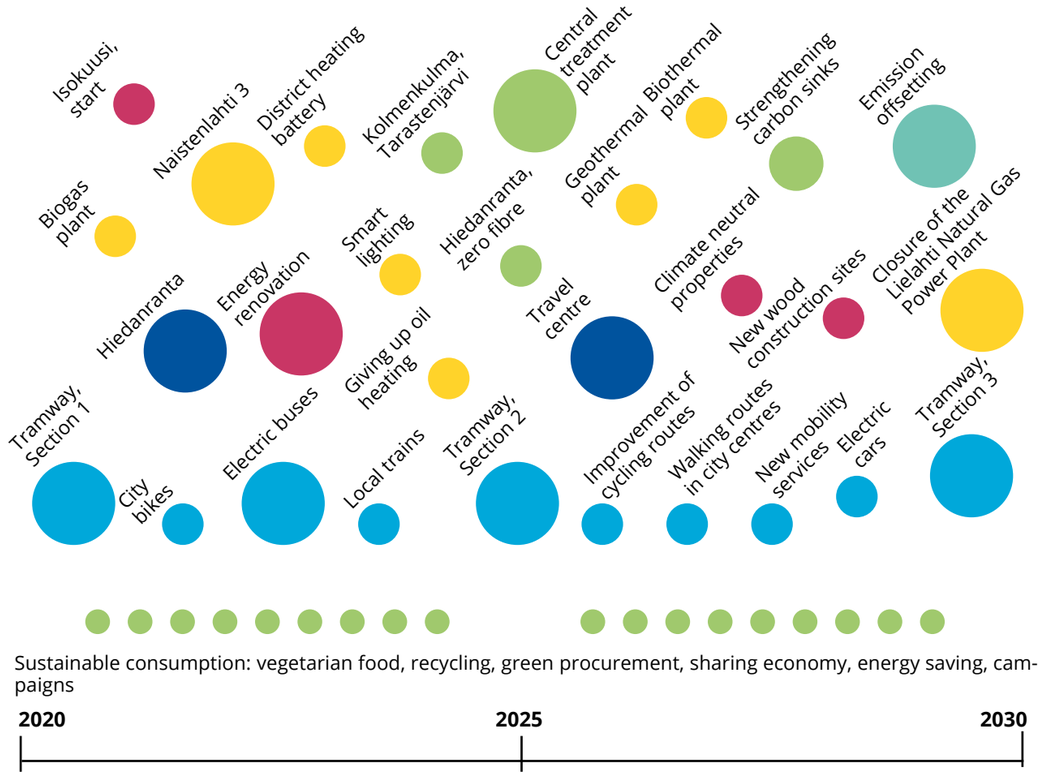


Image 66. Roadmap measures on a timeline. Large balloons represent major investments and emission reduction measures, while medium-sized balloons represent smaller climate actions and small balloons represent changes in the practices of everyday life.

Adapting to evolving conditions is absolutely necessary despite successful mitigation measures. The later we launch the adaptation measures, the more costly this will be in economic and human terms. Adaptation measures strive to reduce the harm caused by these changes while promoting the capability of people, social activities and the environment to function under changed and evolving conditions. These adaptation measures include the construction of urban run-off reservoirs that prevent flooding following increased heavy rains, as well as the development of the city's risk management process and improving city residents' preparedness. 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 an open website, the Tampere Climate Watch.

The measurable measures set out in the roadmap can achieve an emission eduction of around 73% by 2030. However, it is impossible to estimate the impact of many measures, as it was not possible to produce data on their impact. The most important factor in the transport sector that remains excluded from the assessment are the measures whereby we can affect the mobility choices of city residents. Although the emission reduction impact from the measures improved by only about one percentage point over the first (2020) roadmap edition, the emission reduction that can be achieved under Current Development rose from 61 per cent to 69 per cent. This positive Current Development reflects that the targeted measures have translated into effective action. It was projected that the transport and the waste management sectors will remain furthest from the goal.

Additionally, the progress made with climate efforts is monitored in the city's budget, in which a climate budget section details the annual city-level maximum emissions and the resources allocated to climate measures by the City Group. In the 2021 financial statements, the City of Tampere's reported climate budget operating expenditure totalled some 0.2 per cent of the city's total operating expenditure while climate investments accounted for approximately 4 per cent of the city's total investments. However, the Climate Neutral Tampere 2030 Roadmap contains more detailed information than the climate budget. Instead of basic activity, it places heavier focus on policy recommendations and contains measures that are more detailed than the climate budget.
For the roadmap measures assessed, the city organisation's total investment in 2023–2030 comes to some EUR 496 million and the figure for operating expenses is approximately EUR 100 million. A large share of this sum is already included in the current budgetary framework. However, these estimated costs of the measures cannot be treated as a 'price tag' for the Climate Neutrality Roadmap, as they contain a large number of major projects that are carried out largely for non-climate related reasons.

The roadmap therefore will not necessarily incur any additional costs, but projects will nevertheless have significant positive climate impacts. Additionally, it must be considered that the cost estimates are based on the financial input needed to implement the measures and they take no account of any possible cost savings that the measures may generate. However, as an example, this edition of the roadmap shows economic calculations for a few measures, as well as an estimate of the costs of modal shift in relation to their benefits.

Increasingly, climate investments turn out to be economically profitable solutions, which is why climate-friendly action has become more popular in the 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 in climate change mitigation and adaptation. It is estimated that the cost of greenhouse gas emissions in Tampere in 2022 could be almost 110 million euros.

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 a delightful number of them has already been taken. Achieving our goal will require major changes in many areas, including giving up oil heating, improving the energy efficiency of old buildings and replacing the propulsion systems of transport vehicles and work machines. 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 more than 100 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 to the climate neutrality goal from the entire city organisation. At Tampere, this goal is being made part of the operating culture while ensuring that it is addressed increasingly in operational and financial planning. In particular, further investment is needed to promote sustainable transport and to improve the energy efficiency of buildings.

The roadmap is intended to be updated on a regular basis. It will provide an opportunity to assess the achievement of the goal and, if necessary, to step up measures. In the context of the update, 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 67. The measurable measures set out in the roadmap can achieve an emission reduction of around 73% by 2030. Image: Laura Vanzo.

ROADMAP ASSESSMENT FOR KEY EMISSION SECTORS

The projected **emissions from traffic** show a decrease of some 100 kt CO2e over 2020, while the achievement of the climate neutrality goal set out in the emissions budget would require an additional decrease of some 20 kt CO2e. The projection assessment includes a very optimistic view of the development of the new propulsion systems adopted. In the absence of reliable methods, it was not possible to assess any individual measures that strive to affect people's mobility behaviour. Therefore, the goal can be achieved by investing in influencing the shift in the modal split. An estimate is shown later as to how the modal split should develop.

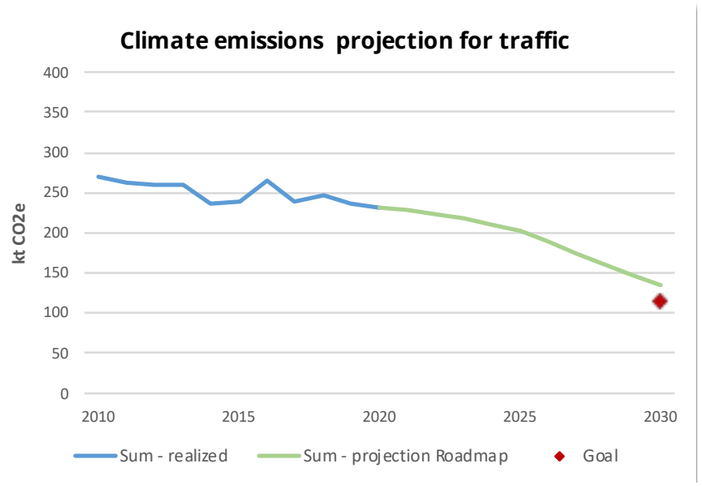


Image 68. A more detailed picture of the roadmap projection of climate emissions from traffic

The emission projection includes all transport investments modelled for Tampere and the resulting change in traffic outputs. Electric cars are expected to become so popular that up to 30% of the output from cars in 2030 will be from cars running on electricity. Since the future traffic output without all investments is not calculated, no Current Development projection was calculated for traffic.

Additionally, account is taken of the reduced emission factors of all propulsion systems following technological development and as the distribution obligation of biofuels is increased. Public transport will run entirely on low-emission propulsion in 2030, in accordance with the public transport propulsion survey completed in early 2020. The adoption of new propulsion systems elsewhere than in public transport mainly relies on measures at national level, which is why the realisation of this shift is surrounded by a high degree of uncertainty.

The fact that some of the measures are only in the investigation phase must also be considered in the traffic emission estimate. For example, the roadmap mentions the use of parking fees and speeding up journey times on public transport, but in the absence of more specific plans the related impacts cannot be assessed.

It is difficult to assess the measures that promote the shift in mobility modes in some other way except by listing what the roadmap contains. These measures number more than 60 (Figure 69). The shift is slow, however, which is why these measures need to be taken decisively and communicated broadly so that the climate neutrality goal will be achieved.

	Measure package	Number of measures
Increasing the share of sustainable mobility modes	1.2 Conditions for sustainable mobility	**12**
	2.5 Pedestrian and bicycle traffic	**8**
	2.9 Mobility management	**14**
Expanding the portfolio of public transport and mobility services	2.1 Tram transport	**9**
	2.2 Local train transport	**6**
	2.3 Bus transport	**5**
	2.4 Public transport service level	**8**
	2.8 New mobility services	**7**
Curbing the growth of road transport	2.6 Road transport	**4**

Image 69. Summary of roadmap measures to promote a shift in mobility modes.

The reduction achieved in respect of emissions from **district heat** is near the goal but still falls some 10 kt CO2e short (Figure 70). Sähkölaitos estimates that the long-term action plan will achieve its goal, and the difference is ultimately due to the different methods employed to calculate the emissions. In both cases, achievement of the goal requires that Tampereen Sähkölaitos will, after the upgrade of the Naistenlahti power plant, also focus future investments on renewable energy, non-combustion production and novel smart heat and grid solutions. The estimate for district heat is based on the assumption that emission development will be in line with Sähkölaitos's long-term action plan (measures described on pages 86–87).

A model similar to that used by Tampereen Sähkölaitos, adjusted by the city's population projection, was used to estimate the future consumption of district heat. The model roughly takes account of the removal of buildings, moderate renovation construction, the new construction necessitated by population growth, and shifts from one heat source to another.

Current Development already covers the completion of the Naistenlahti power plant and the transition to renewable fuel (Measure 4.1.1). The Projection KT 2030 calculation takes account of Sähkölaitos's long-term action plan (Measures 4.1.2–4 and 7), the broad achievement of the energy-saving potential of renovation construction through guidance (Measure package 3.4) as well as Finnpark's energy efficiency measure 4.3.5.

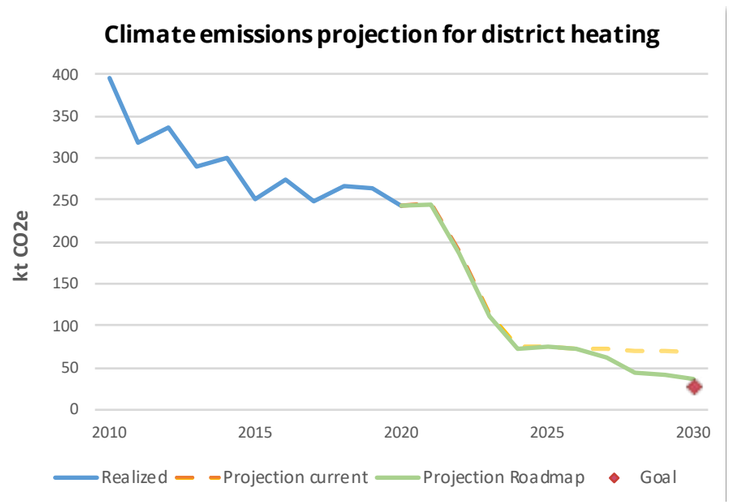


Image 70. The roadmap climate emission projection for district heat. The goal is identical to the preliminary emissions budget for 2030.

Reducing emissions from **individual heating (mainly oil heating)** to the target level set out in the emissions budget requires that all buildings that use oil heating must adopt other sources of heat more rapidly than at present. At the moment, 11.4 kt in climate emissions remains in this projection while the goal is to attain a near-zero level (Figure 71). The climate budget seeks to achieve a level of 4 kt CO2e. The pace of change has accelerated in recent years, which may be related to the financial support and guidance on giving up oil heating provided by the state. Today oil heating is still used to a significant degree in detached houses and industrial buildings.

No specific measures are included in Current Development. The Projection KT 2030 calculation contains measure package 4.4, assuming that residential buildings, in particular, will give up oil heating and the city's own buildings will stop using oil as planned by 2025. In this projection, oil heating will still be used in service and industrial buildings.

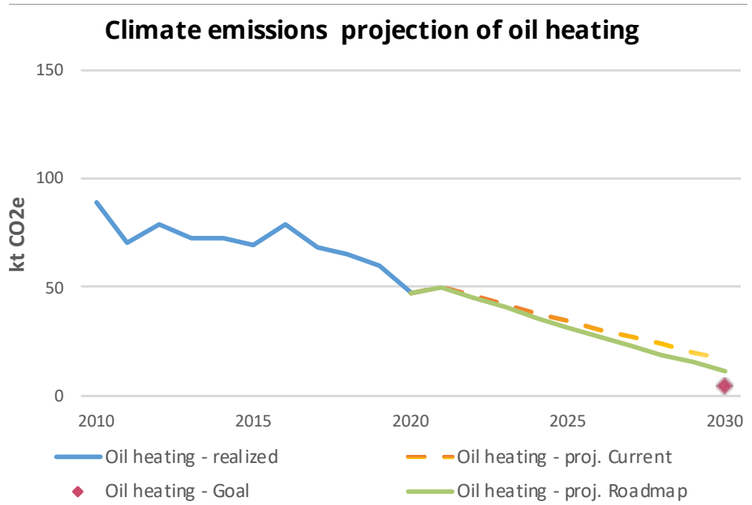


Image 71. The roadmap climate emission projection for oil heating. The goal is identical to the preliminary emissions budget for 2030.

The realised figures for **other electricity consumption, electric heating, and industrial electricity consumption** set out in the emissions budget will be achieved if consumption continues to develop at the current rate (Figure 72). The projected consumption is based on the current consumption per capita, which is decreasing by about 40 kWh, or by about one per cent, annually. However, total consumption is on a moderate increase following population growth. The reduction in emissions is therefore mainly due to a significant reduction in the national electricity emission factor, which is also influenced by the investments made by Tampereen Sähkölaitos. Energy efficiency measures will keep the consumption growth under control while electricity consumption is at the same time growing, especially in traffic but also in industry and in heating.

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 renewable sources of energy.

The only factor included in Current Development is the development of the national emission factor for electricity. The Projection KT 2030 calculation includes the energy efficiency estimate set out under measure package 3.4, Finnpark's energy efficiency measure 4.3.5 and, from measure package 4.3, the estimate of the growth of solar power at buildings as well as Tredu-Kiinteistöt's measure 4.3.8 to step up solar power.

Additionally, climate emissions from the electricity consumption of electric heating and of industry will achieve the set goal. The projection for electric heating takes account of making renovation construction more efficient. Electric heating also includes the electricity consumption of ground source heat pumps, which will grow following the replacement of oil heating.

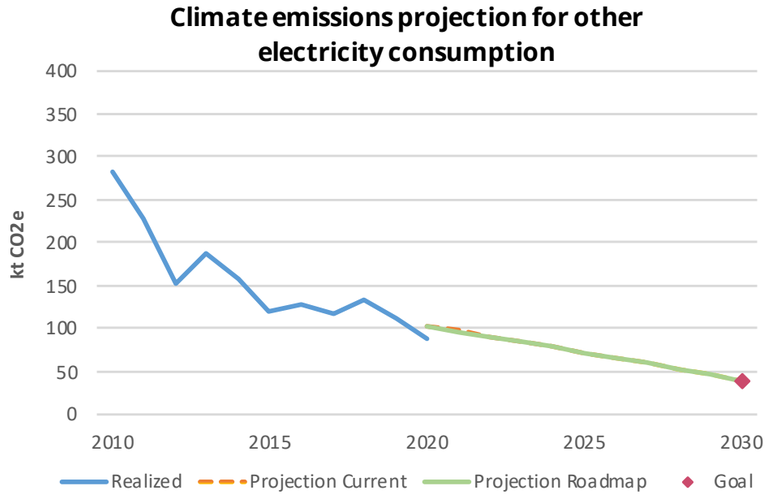


Image 72. The roadmap climate emission projection for other electricity consumption. The goal is identical to the preliminary emissions budget for 2030.

The realised figure for emissions from **industry and work machines** has unexpectedly gone up in 2020 (Figure 73). This projection has not been adjusted yet owing to the uncertainty surrounding the situation. In other respects too, it has not been possible to project with high accuracy emissions from industry, since they depend on how much businesses purchase fossil fuels. The rise in emissions is due to increased procurement of fuel oil, which might have to do with the crisis brought about by the global COVID-19 pandemic that broke out in 2020. In any case, achievement of the goal will require that measures be taken, in particular, in industry and at construction sites.

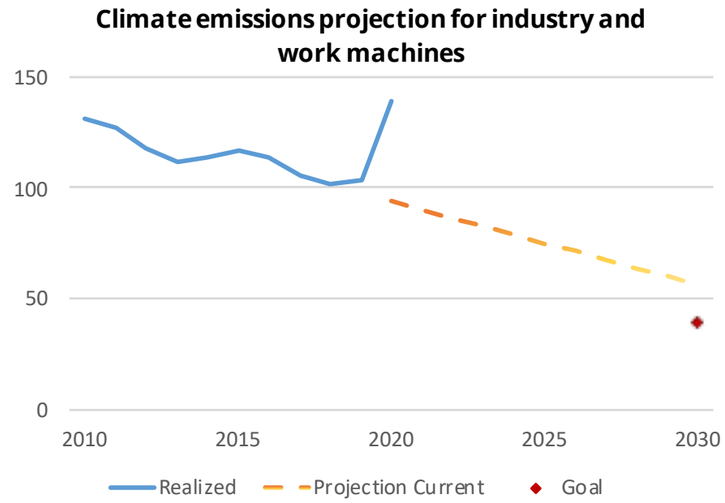


Image 73. The roadmap climate emission projection for industry and work machines. The goal is identical to the preliminary emissions budget for 2030.

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 projection will not achieve the 2030 goal (Figure 74). It is appropriate to employ new models and measurements to further specify this calculation. Waste management and the Sulkavuori Central Treatment Plant also produce 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 the circular economy activities.

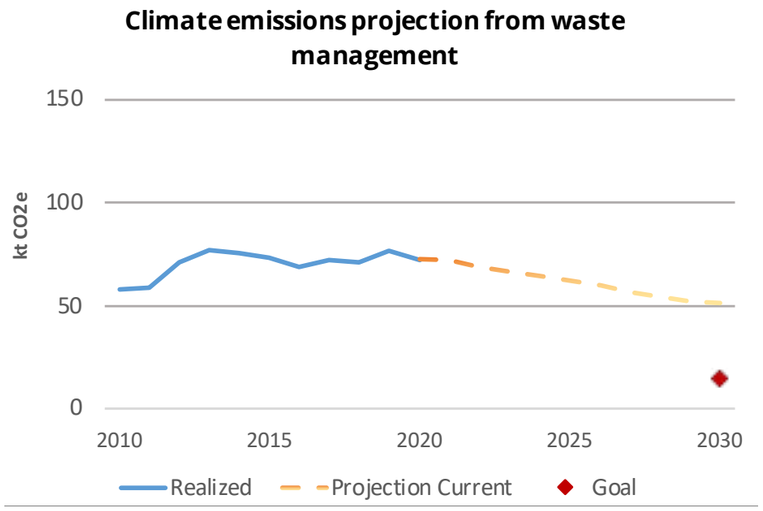


Image 74. The roadmap climate emission projection for waste management. The goal is identical to the preliminary emissions budget for 2030.

DETAILED ROADMAP EMISSION AND COST ASSESSMENT

Measure №	Measure title	Investments, total, 2023–2030 (EUR)	Operating expenditure, total, 2023–2030 (EUR)	Emission reduction in 2030, tCO2e (or in some other year reported)
1.4.1	Impact analysis of city-centre development projects	60,000	160,000	
1.4.2	Carbon footprint calculations for city-centre development projects		160,000	
1.4.4	Development of station area	69,850,000	1,600,000	
1.4.5	Development of city-centre event venues	55,478,000		
1.5.6	Utilisation of zero fibre	20,000,000		
1.5.7	Sustainable business operations in Hiedanranta		425,000	
2.1.2	Tramway traffic Koskipuisto–Sorin aukio		32,800,000	
2.1.3	Second tramway section	47,300,000	1,200,000	680 (2024–2025)
2.1.8	Green electricity for tram transport		52,000	660 (2022)
2.2.1	Local-train transport pilot		2,536,000	
2.2.3	Local-train transport plan	5,000,000	1,200,000	
5.2.2	Common ticketing for bus and train services		200,000	
2.3.2	Climate goals for TKL production agreement		800,000	
2.3.3	Low-emission bus transport			In Tampere city region 24,600, In Tampere 14,800
2.3.4	New bus depot	13,800,000		
2.4.1	Adequate headways for public transport		4,000,000	
2.4.2	Speeding up journey times for public transport		6,000,000	
2.4.3	Expansion of public transport trunk lines		800,000	
2.4.4	Development of demand-responsive public transport		2,400,000	
2.4.5	Development of public transport quality			
2.4.6	Development of public transport ticket system		8,140,000	
2.4.7	New payment methods for public transport		300,000	
2.4.8	Open public transport data			
2.5.2	Pedestrian-oriented development of city centre and regional centres	8,000,000		
2.5.3	Improvement of main cycling routes	39,250,000		
2.5.4	Bicycle parking facility	3,600,000		
2.5.5	Increasing number of bicycle parking spaces	800,000		
2.5.6	Winter maintenance of cycling and walking routes		800,000	
2.5.8	Bicycle parking at service properties	2,000,000		
2.6.1	Electric car charging network		20,000	
2.6.3	Electric car charging stations at properties owned by city	600,000		
2.6.4	Congestion charges		70,000	
2.6.11	Procurement plan for cars owned by city		250,000	420
2.6.12	Procurement plan for vans owned by city		250,000	730
2.7.3	Procurement plan for transport equipment, work machines and works contracts			2140
2.8.1	Development of city bike system		1,540,000	
Measure №	Measure title	Investments, total, 2023–2030 (EUR)	Operating expenditure, total, 2023–2030 (EUR)	Emission reduction in 2030, tCO2e (or in some other year reported)
2.9.2	Action plan for mobility management			
2.9.3	Traffic congestions and traffic management			
2.9.4	Marketing of sustainable mobility to residents		4,400,000	
2.9.5	Marketing of sustainable mobility to workplaces			
2.9.6	Sustainable mobility in school transport			
3.1.2	Use data for service facility network		175,000	
3.1.3	More efficient use of space		150,000	
3.1.4	Sharing of facilities		60,000	
3.1.5	Carbon footprint of construction projects	640,000	80,000	
3.1.6	Carbon footprint calculator pilot for construction projects	320,000		
3.1.9	Utilisation of demolition waste		40,000	
3.2.1	Allocation of plots, and carbon footprint		29,000	
3.2.2	Housing and land policy guidelines		20,000	
3.2.3	Energy efficiency of home-builders		30,000	
3.2.6	Plot application programming		120,000	
3.3.8	Energy-saving projects for school buildings		50,000	
3.3.9	Virtual power plants	150,000	0	
3.3.11	Property management reporting		150,000	
3.3.12	Sustainable development certificate of Tredu OKKA Foundation		160,000	
3.4.1	Energy counselling for housing companies and residents		2,160,000	
3.5.4	Wood construction of schools and day-care centres	16,000,000		
3.7.6	Use of recycled materials in private construction		16,000	
4.1.1	Naistenlahti 3 power plant	18,200,000		160,000 (2022–2024)
4.1.4	Closure of natural gas power plant			6,800 (2017)
4.1.5	Connecting buildings to district cooling network	1,100,000		
4.2.2	District heat battery	6,000,000		
4.2.4	LED street lighting	3,000,000		120
4.3.1	Decentralised energy systems		80,000	
4.3.2	Solar panels and air-to-water heat pumps of buildings	6,160,000		16
4.3.5	Finnpark's energy project in Hämeenpuisto			150 (2025)
4.3.8	Solar power plants to Tredu buildings			60 (2023–2025)
4.4.2	Giving up oil heating	600,000		160
5.1.1	Update of waste management regulations		10,560,000	
5.1.2	Collection of biowaste		13,160,000	
5.1.8	Promotion of recycling potential in upper secondary school buildings	3,000	24,000	
5.2.5	Sulkavuori Central Treatment Plant	178,000,000		
5.4.10	Tredu meals		30,000	
5.6.6	Sustainable development at Tredu		210,000	
5.7.4	Public transport ticket for events		2,800,000	
		495,900,000	100,200,000	187000–197,000

Image 75. Estimated costs and emissions of the roadmap measures (sums in dark grey concern several measures).

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- Tramway Development Programme.
- Smart Tampere Development Programme.
- Five-star City Centre Development Programme.

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Examination of roadmap drafts in management teams:

- Group administration management team 23 August 2022
- Urban Environment Services management team 24 August 2022
- Growth, Innovation and Competitiveness Services 31 August 2022
- Education and Culture Services 31 August 2022
- City management team 13 September 2022

Frontpage photo:
Visit Tampere Oy/Laura Vanzo

Roadmap layout:
Booming Strategies & Marketing

MEASURES REMOVED DURING UPDATE PROCESS

The roadmap update process removed three measures that were included in the first version. These measures were removed because they are included in the other measures or because there is no need for them.

Theme	Measure package	Measure number in 2020 Roadmap	Measure	Time-table	Responsible party	Reason for removal
Sustainable mobility	Pedestrian and bicycle traffic	**63**	The pedestrian and bicycle network will be supplemented by adding missing underpasses and connections. More room will be provided for pedestrians and cyclists during roadworks compared to the current situation while improving accessibility.	**2020–2029**	Transport System Planning	This item is included in the other measures.
Sustainable energy	Centralised renewable energy	**149**	An investment will be made in a new biomass heating plant if the project is found to be viable.	**2022–2025**	Tampereen Sähkölaitos Oy	On the basis of the 'Fuel-free and carbon-negative district heating' survey, it is likely that there will be no need for this measure; instead, the heat demand will be covered by non-combustion solutions.
Sustainable consumption	Circular economy	**179**	As part of the construction of Hiedanranta, a solution will be developed for the removal and utilisation of the zero-fibre sludge at the bottom of Lake Näsijärvi as energy and/or material on an industrial scale.	**2022–2025**	Hiedanranta Development Programme, Hiedanrannan Kehitys Oy	This item is included in the other measures.

Image 76. The roadmap update process removed three measures that were included in the first version (Figure 79).
These measures were removed because they are included in the other measures or because there is no need for them.

Image 77. The achievement of the climate neutrality goal requires commitment from the entire city organisation. Image: Laura Vanzo.

TAMPERE.
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“Tampere is internationally known for its impressive work on climate and biodiversity. Making sustainable choices is easy here – our appeal comes from the smoothness of everyday life.”

Tampere Strategy 2030

TAMPERE