Welcome to the CDP-ICLEI Unified Reporting System 2021

WWF OPCC Introduction

0. Introduction

(0.1) Please give a general description and introduction to your city including your city's reporting boundary in the table below.

	Administrative boundary	Description of city
Please complete	City / Municipality	The reporting boundary is the geographical administrative city boundary with scope 1 and scope 2 emissions are included. Tampere is a mid-sized inland city in south-western Finland, where weather conditions change significantly from year to year and winters can be severe. Climate emissions are affected by the fact that almost all household waste collected from the Pirkanmaa region is brought to Tammervoima waste incineration plant, which provides heat for the district heating network. Tampere center is situated in between two large lakes, which affects urban planning especially when it comes to traffic. The city is historically industrial but its economy has changed significantly since the 1990s. Factories used to be powered from the rapid that runs between the lakes Näsijärvi and Pyhäjärvi. Tampere is known for it's adaptability and innovation throughout its history of more than two hundred years. Today the city is a major hub for the Finnish ICT industry, but has also mechanical engineering and biotechnology among its prominent fields along with a lively start-up scene and open innovation platforms.

(0.2) If you have not previously submitted your Letter of Commitment to the Global Covenant of Mayors, either through the relevant regional covenant or through the Global Covenant secretariat, please attach the letter signed by an appropriately mandated official (e.g. Mayor, City Council) to this question.

City Details

(0.3) Please provide information about your city's Mayor or equivalent legal representative authority in the table below.

	Leader title	Leader name	Current term end year
Please complete	Mayor	Lauri Lyly	2021

(0.4) Please select the currency used for all financial information disclosed throughout your response.

EUR Euro

(0.5) Please provide details of your city's current population. Report the population in the year of your reported inventory, if possible.

Projected population from city's offical population projection

	Current population	Current population year	Projected population	Projected population year
Please complete	241,800	2021	278,462	2030

(0.6) Please provide further details about the geography of your city.

	Land area of the city boundary as defined in question 0.1 (in square km)
Please complete	689.59

1. Governance and Data Management

Governance

(1.0) Please detail sustainability goals and targets (e.g. GHG reductions) that are incorporated into your city's master plan and describe how these are addressed in the table below.

Sustainability goals and targets	Description
Emissions reduction targets	The City Strategy's guidelines for an urban and sustainably growing city are very significant for comprehensive planning. The aim is that by 2030, Tampere will be a pleasant, lively and carbon neutral city with 300,000 residents and a pioneer in smart and sustainable transport and urban development. The future locations of city growth will affect traffic, energy production and emissions. The Comprehensive Plans direct the densification of the community structure and growth primarily to the growth and vitality zone of the city strategy including the district centres and accessible public transport. The aim is to direct 80 % of the new housing to this zone and prioritize sustainable transport development in this zone. The whole sustainable transport network enlargement including tramway,

	local train and cycling is shown in the Comprehensive Plan. The centre areas will be made more pleasant by extending the walking environments and reserving space for new public transport connection parking facilities. District centres will be developed as versatile areas for housing, leisure, services and businesses. For the continuous planning work we have also developed in a consortium a calculation tool to evaluate emissions of the present and future urban structure and transportation. This includes traffic, heating, electricity, building and renovation emission estimation and visualization together with floor space, population and workplace count and location and urban zone classifications. The impacts of the urban structure on the implementation of carbon neutrality have been studied with the help of various city, society and technology development scenarios. Various investigations and analysis on sustainable development and carbon emission reduction possibilities have been carried out and published during and as a part of the comprehensive planning process.
Renewable energy targets	In the Comprehensive Plan there are pointed two zones where the soil and the bedrock in the area can be utilized in the heat collection of a centralized geothermal power plant. One of the areas is in the Hiedanranta suburban centre where a sustainable city growth for estimated 25 000 inhabitants has been planned and where a climate emission estimation was carried out with comprehensive planning personnel participation. The aim in Hiedanranta is that the suburban district will be carbon negative, i.e. it aims to remove more carbon dioxide from the air than it emits.
Water security targets	The target in the Comprehensive Plan is sustainable water resources management, which includes regulations for groundwater areas, stormwater and catchment areas. In groundwater areas the measures for the area must be planned and implemented in such a way that they do not weaken the quality of the groundwater or reduce the yield of the groundwater. Functions that may cause groundwater contamination may not be located to the area. Furthermore, in order to ensure the formation of groundwater, the clean stormwaters must be in filtrated into the soil and permeable surfaces must be favoured. The stormwaters must be conveyed away from the traffic areas that are located in groundwater areas. Stormwater management is regulated in the Comprehensive Plan according to the City of Tampere´s stormwater management programme. The treatment and conveyance of stormwaters must adhere to the following order of principles: 1. The generation of stormwater must be prevented, 2. The stormwaters must be infiltrated into the soil, 3. The stormwaters must be utilized and cleaned and 4. The stormwaters must be detained in the place where they generated before conveying them into an open channel, a waterbody or a stormwater sewer. In all catchment areas there are specific regulations how to manage stormwater flows, for example where the generation of stormwaters must be prevented and which lakes state must be preserved or improved or where you have to ensure the conveyance of good-quality water.

Waste management targets	In terms of waste management, the Comprehensive Plan is concentrated to demands of traffic and space of waste management. When the plot ratio exceeds e=0,8 in infill development, block-specific collection points for household waste should be created. In larger new areas you have to investigate the possibility of establishing a pipeline-based system for collecting household waste from the area.
Biodiversity targets	In the Comprehensive Plan the central park network creates the frame for recreation and biodiversity. These areas will be maintained and developed as unified, easily accessible recreational and green areas that are versatile in terms of activities and the natural environment. The areas which boast nature conservation values are nature conservation areas or objects. This network is complemented by indicative ecological connections, which are significant for the movements of animals and for the preservation of biodiversity. This continuation of the connection and its linkage to the central park network must be ensured.
Targets for nature-based solutions	Green areas and the green network of the city are the key factors in climate change mitigation and adaptation. Green areas as themselves act as nature-based solutions in climate change mitigation and adaptation. Green infrastructure for example absorbs stormwaters and helps prevent the heat island - effect in cities. In Master Plan green network includes a central park network and indicative ecological and recreational connections between the central park network. The areas of the central park network will be maintained and developed as unified, easily accessible recreational and green areas that are versatile in terms of the activities and natural environment. It is possible to locate structures meant for stormwater management in the central park area in accordance with more detailed plans. An indicative ecological connection is significant for the movements of animals and the preservation of biodiversity. The continuation of the ecological connection and its linkage to the central park network must be ensured. An indicative recreational connection can be a series of local recreational areas, that are mostly green/nature-based areas. In more detailed planning must be taken into account the sufficiency of the local recreational areas, the natural values and the continuation of the recreational and ecological connections.

(1.6) Please provide information on the overall impact of COVID-19 on climate action in your city.

	Impact of COVID-19 on climate action in your city	Comment
Response	No change on emphasis on climate action	No significant difference noticed comparing to previous years

(1.7) Please provide information specifically on the impact of the COVID-19 economic response on climate action in your city and synergies between COVID-19 recovery interventions and climate action.

	Impact of COVID-19 economic response on city's budget for financing climate action in your city	COVID-19 recovery interventions and climate action synergies	Explanation
Response	Increased finance available for climate action	Recovery interventions that focus on employment opportunities in green sectors	It seems that, whether due to the COVID-19 crisis or otherwise, there will be an increasing amount of financing available for climate work at least from outside of the city organisation. It is hard to tell, if for example the EU would be emphasizing green growth as much without the pandemic or not.

2. Climate Hazards and Vulnerability

Climate Risk and Vulnerability Assessment

(2.0) Has a climate change risk and vulnerability assessment been undertaken for your city?

Yes

(2.0a) Please select the primary process or methodology used to undertake the risk and vulnerability assessment of your city.

	Primary methodology	Description
Risk assessment methodology	Other, please specify Indicator-Based Vulnerability Assessment (IBVA) -method	A risk and vulnerability assessment was developed using the Indicator-Based Vulnerability Assessment (IBVA) –method and with the help of specialists interviews as a part of SECAP (Sustainable Energy and Climate Action Plan) for Covenant of Mayors for Climate and Energy commitment. The most significant climate risks in Tampere were identified. The city of Tampere is aiming to start to develop a centralized adaptation strategy. Regional collaboration is important for climate change adaptation and a number of measures have been defined in the Climate Strategy of the Tampere City Region. Addressing climate change adaptation activities in Tampere, it is necessary to take into account different circumstances and specificities of increasingly densely populated urban areas and the vast rural area of northern Tampere.

GCoM Additional Information

(2.0b) Please attach and provide details on your climate change risk and vulnerability assessment. Please provide details on the boundary of your assessment, and where this differs from your city's boundary, please provide an explanation.

Publication title and attach the document

Tampereen kestävän energian ja ilmaston toimintasuunnitelma (SECAP)

Web link

Year of publication or approval from local government

2019

Boundary of assessment relative to city boundary (reported in 0.1)

Same – covers entire city and nothing else

Explanation of boundary choice where the assessment boundary differs from the city boundary

Primary author of assessment

Consultant

Does the assessment identify vulnerable populations?

Yes

Areas/sectors covered by the risk and vulnerability assessment

Energy
Water Supply & Sanitation
Transport
Food and agriculture
Environment, Biodiversity and Forestry
Residential
Public health
Emergency Management
Land use planning
Tourism

Please explain

Climate Hazards

(2.1) Please list the most significant climate hazards faced by your city and indicate the probability and consequence of these hazards, as well as the expected future

change in frequency and intensity. Please also select the most relevant assets or services that are affected by the climate hazard and provide a description of the impact.

Climate Hazards

Extreme Precipitation > Rain storm

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

High

Current magnitude of hazard

High

Social impact of hazard overall

Increased incidence and prevalence of disease and illness
Increased demand for public services

Most relevant assets / services affected overall

Food & agriculture
Environment, biodiversity, forestry
Land use planning

Please identify which vulnerable populations are affected

Persons with disabilities
Low-income households
Persons living in sub-standard housing
Other, please specify

Extreme precipitation is particularly challenging in densely populated and built urban centers and residential areas with plentiful of impermeable surfaces. Heavy rainfall and heavy snowfall also causes challenges increasing the risk of accidents.

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

High

When do you first expect to experience those changes in frequency and intensity?

Immediately

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Impacts that are experienced so far are urban runoff floods, sewer network overflows, property damage and water pollution. Heavy rainfall was identified as one of the most significant climate risk in Tampere and in the future, heavy rainfall is expected to become more common. The proximity of the lakes and the large number of drainage systems will increase Tampere's exposure to heavy rainfall.
The stormwater runoff carries pollutants and lawn fertilizers directly to streams and rivers, where they seriously harm water quality and cause eutrophication.
Heavy rainfall also has an impact on agriculture, which is typical especially in the northern parts of Tampere. Heavy rainfall can cause crops to lodge and cause significant damage and economic losses.

Climate Hazards

Storm and wind > Severe wind

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

High

Current magnitude of hazard

High

Social impact of hazard overall

Increased demand for public services
Increased risk to already vulnerable populations
Increased resource demand

Most relevant assets / services affected overall

Energy
Water supply & sanitation
Transport
Information & communications technology
Environment, biodiversity, forestry

Please identify which vulnerable populations are affected

Elderly
Low-income households
Persons living in sub-standard housing
Other, please specify

People dependent on forestry are especially vulnerable since they can loose their livelihoods due to heavy storms. Also people living in rural areas can suffer more than other of e.g. power cuts.

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

High

When do you first expect to experience those changes in frequency and intensity?

Immediately

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Storms were identified as one of the most significant climate risks in Tampere. Impacts that are experienced so far are forest damage, power distribution faults, property damage and traffic problems. Storms can cause significant economic losses to forestry especially in late autumn and early spring, when the lack of snow and ground frost prevents the ability of the surface roots to attach firmly to the ground. Increasing damage risk from winter storms are expected.

Climate Hazards

Flood and sea level rise > Flash / surface flood

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

Medium High

Current magnitude of hazard

High

Social impact of hazard overall

Increased demand for public services

Most relevant assets / services affected overall

Energy
Water supply & sanitation
Transport
Food & agriculture
Information & communications technology
Emergency services
Land use planning

Please identify which vulnerable populations are affected

Low-income households
Unemployed persons
Persons living in sub-standard housing

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

High

When do you first expect to experience those changes in frequency and intensity?

Short-term (by 2025)

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Heavy rains together with stormwater floods and storms were identified as the most significant climate risks in Tampere. Intense rain saturates an urban drainage system. Surface flooding cause water erosion, pollution, damages on buildings and infrastructure, sewage overflows and street flooding. During flooding transport infrastructure, electricity distribution and other services and business operations can be directly or indirectly damaged. The impacts of flooding are most severe in the densely built areas, such as the city center. Surface flood poses especially challenges to densely built urban areas with plentiful of impermeable surfaces. These are often old areas built before modern urban drainage systems.

Climate Hazards

Extreme hot temperature > Heat wave

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

Medium

Current magnitude of hazard

Medium

Social impact of hazard overall

Increased demand for public services
Increased demand for healthcare services
Increased risk to already vulnerable populations
Increased resource demand

Most relevant assets / services affected overall

Energy
Environment, biodiversity, forestry
Residential
Public health

Please identify which vulnerable populations are affected

Children & youth
Elderly
Persons with chronic diseases
Persons living in sub-standard housing

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

Medium

When do you first expect to experience those changes in frequency and intensity?

Immediately

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

2018 was the hottest year in Finland’s history and average daily temperatures remained five degrees above normal readings throughout summer. Temperatures in Finland and in Tampere are expected to rise more and faster than Earth's globally averaged surface temperature. This will lead to a rising number and intensity of heat waves during the summer. The impact of temperature rising will be intensified by the heat island effect and intensification of land use within the city. Extreme hot temperatures poses challenges to public health (especially among the elderly and other vulnerable groups) and increase demand for energy during summer (due increased demand for cooling).
TAYS Central Hospital in Tampere is the largest hospital in Tampere region. In TAYS Central Hospital area buildings are completed in the 60's and do not meet current needs. Many of the hospital's key functions, such as emergency unit ,several operating rooms and the intensive care unit, are located in oldest buildings in TAYS Central Hospital area. There are still uncooled long-term care wards and during heat wave it is particularly difficult for patients. The planning of the new buildings has begun.
Also in older residential areas, where building are completed in the 50' and 60's, are usually houses that have not proper ventilation systems.

Climate Hazards

Extreme cold temperature > Extreme winter conditions

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

Medium

Current magnitude of hazard

Medium

Social impact of hazard overall

Increased incidence and prevalence of disease and illness
Increased demand for public services

Most relevant assets / services affected overall

Energy
Water supply & sanitation
Transport

Please identify which vulnerable populations are affected

Children & youth
Elderly
Persons with disabilities
Other, please specify

People with foreign background who are new to Tampere or Finland might not be used to extremely cold temperatures and are therefore less adapted.

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

Medium Low

When do you first expect to experience those changes in frequency and intensity?

Medium-term (2026-2050)

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Temperatures and rainfalls in Tampere are expected to rise in the winter and the rise is expected to be even more than in the summer. The temperatures during winter are expected to be near zero degrees more often causing icy conditions. Snow cover, ice and ground frost are decreasing causing that amount of precipitation during winter is increasing, stability of the soil is deteriorating,
adaptation of ecosystems is degrading, cloudiness increases and sunshine decreases. The growing need for salt application during winter which will increase harmful load to storm water runoff. Also extreme cold conditions may become more common, which

cause heating challenges, structural damage and difficult conditions for traffic.
Ground frost diminishes, there is less ground frost in snow-free areas (e.g. roads and yards) and general decrease in number of ground frost days and depth of ground frost, which poses challenges to maintenance of the structures (road, ditches, bridges and culverts) and condition of road network, particularly on smaller roads and gravel roads.
The decrease of frost may challenge forest management and harvesting in the winter and damage the roads leading to forestry sites. Absence of the ground frozen can lead damages on the roots of trees by forest machinery
and therefore makes some species susceptible to storm damage.

Climate Hazards

Water Scarcity > Drought

Did this hazard significantly impact your city before 2021?

No

Current probability of hazard

Medium

Current magnitude of hazard

Medium

Social impact of hazard overall

Increased demand for healthcare services

Most relevant assets / services affected overall

Water supply & sanitation
Food & agriculture
Environment, biodiversity, forestry

Please identify which vulnerable populations are affected

Elderly
Persons with chronic diseases
Other, please specify

People whos livelihoods depend on forestry or agriculture are especially vulnerable to droughts. Also people who live in more rural areas and are dependent on well water are especially vulnerable to droughts.

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

Medium

When do you first expect to experience those changes in frequency and intensity?

Medium-term (2026-2050)

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Drought periods increase and prolong and along with rising temperatures it cause that the heat island phenomenon is getting stronger, air humidity is increasing, destruction of key habitat, e.g. in forest fires, and health risks. Droughts are potentially harmful to water quality, caused periodic low groundwater levels, increase the need for irrigation in agriculture. Droughts could have an impact on water sectors, by reducing water supply and hydropower production. Drought can cause soil erosion and landslides. Periods of drought may also decrease tree growth.

Climate Hazards

Wild fire > Forest fire

Did this hazard significantly impact your city before 2021?

Yes

Current probability of hazard

Low

Current magnitude of hazard

Low

Social impact of hazard overall

Increased demand for public services
Increased demand for healthcare services
Increased risk to already vulnerable populations

Most relevant assets / services affected overall

Environment, biodiversity, forestry
Emergency services

Please identify which vulnerable populations are affected

Persons with chronic diseases
Persons living in sub-standard housing

Future change in frequency

Increasing

Future change in intensity

Increasing

Future expected magnitude of hazard

Low

When do you first expect to experience those changes in frequency and intensity?

Medium-term (2026-2050)

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future

Risk of forest fires may increase in Tampere when drought and heat waves become more common in summer. If forest fires become more common, fire can polluting the air with emissions harmful to human health. Forest fires may destroy timber and cause economic losses. Forest fires also may have the potential to overwhelm the capabilities of emergency services when taking place at the same time with other disasters.

GCoM Common Reporting Framework Reporting Requirements for European Cities

(2.2) Please identify and describe the factors that most greatly affect your city's ability to adapt to climate change and indicate how those factors either support or challenge this ability.

Factors that affect ability to adapt	Indicate if this factor either supports or challenges the ability to adapt	Level of degree to which factor challenges/supports the adaptive capacity of your city	Please describe how the factor supports or challenges the adaptive capacity of your city
Land use planning	Supports	Significantly supports	On general planning level, issues relating to the urban structure, the blue-green structure, security of supply and the safety and wellbeing of the population are taken into account. The urban run off program takes in consideration the increasing rainfall due climate change in city planning.
Resource availability	Challenges	Moderately challenges	Tampere has not had enough resources to develop a centralized adaptation plan or actions to advance climate change adaptation.
Budgetary capacity	Supports	Moderately supports	The Mayor of Tampere included in his budget proposal for 2020 the first Finnish climate budget for a city, which defines emission targets for different emission sectors in Tampere. Climate budget in Tampere has since been developed to include climate actions for the planning period and their costs. In the future, more features, like emissions impacts

			will be included. The climate budget offers a systematic way to illustrate how much the city is doing to mitigate and adapt to climate change, and report progress towards goals. Climate budget also enables the city to examine resources and evaluation related to adaptation.
Rapid urbanization	Challenges	Moderately challenges	Tampere is growing rapidly and there is constant pressure to urban compaction, which promotes relatively high density, mixing of land uses and intensification of urban functions. Urbanization and densification of urban areas poses challenges to adaptation as the impermeable surfaces and built areas are increasing which in turn increases urban flood risks and enhances the heat island effect. In some of the old city structure, absence of natural solutions weaken the qualitative management of runoff waters. In addition, it is harder to uphold green networks to maintain a pleasant urban environment and people's wellbeing.
Environmental conditions	Supports	Moderately supports	Tampere is promoting diverse ecosystems that are more resilient to changes e.g. via the urban tree policy. The urban tree policy aims to improve diversity of tree species planted and to ensure the preservation of urban trees in changing climatic conditions.
Political engagement / transparency	Supports	Moderately supports	The city strategy includes alignments such as good status of the environment and sustainable urban nature.

(2.3) Is your city facing risks to public health or health systems associated with climate change?

Yes

(2.3a) Please report on how climate change impacts health outcomes and health services in your city.

Area affected by climate change

Health systems (service provision, infrastructure and technologies)
Areas outside the health sector (e.g. agriculture, water and sanitation, transport, power generation, built environment)

Health-related risk and vulnerability assessment undertaken

Yes

Identify the climate hazards most significantly impacting the selected areas

Extreme Precipitation > Rain storm
Extreme Precipitation > Heavy snow
Storm and wind > Lightning / thunderstorm
Extreme cold temperature > Extreme winter conditions
Extreme cold temperature > Cold wave
Extreme cold temperature > Extreme cold days
Extreme hot temperature > Heat wave
Extreme hot temperature > Extreme hot days
Water Scarcity > Drought
Wild fire > Forest fire
Biological hazards > Water-borne disease
Biological hazards > Vector-borne disease
Biological hazards > Air-borne disease
Biological hazards > Insect infestation

Identify the climate-related health issues faced by your city

Heat-related illnesses
Mental health impacts
Direct physical injuries and deaths due to extreme weather events

Timescale of climate-related issues for the selected health area

Current

Please identify which vulnerable populations are affected by these climate-related impacts

Children and youth
Elderly
Persons with pre-existing medical conditions
Low-income households
Persons living in sub-standard housing

Please explain

Warming brings new alien species, plant diseases and species harmful to plants, this can cause edonomis losses to forestry and agriculture sectors but also decrease diodiversity. Pandemics are more likely when heat waves occur more often and

diseases and viruses spread more easily. Climate change poses challenges to public health and is connected to the health care system. Increased intensity and frequency of extreme weather events may cause additional pressure in emergency services and the health sector, particularly among the elderly and persons with chronic diseases. High temperatures will increase heat-related mortality and morbidity in the summer. When the temperature hovers around zero degrees more often, the risks of slipping injuries and traffic accidents may increase. Darker winters may increase cases of seasonal affective disorder.

3. Adaptation

Adaptation Actions

GCoM Common Reporting Framework Reporting Requirements for European Cities

(3.0) Please describe the main actions you are taking to reduce the risk to, and vulnerability of, your city's infrastructure, services, citizens, and businesses from climate change as identified in the Climate Hazards section.

Climate hazards

Extreme Precipitation > Rain storm

Action

Stormwater management policy

Action title

The urban runoff -program of Tampere

Status of action

Operation

Means of implementation

Infrastructure development
Policy and regulation

Co-benefit area

Enhanced resilience
Enhanced climate change adaptation
Improved resource security (e.g. food, water, energy)
Resource conservation (e.g. soil, water)

Sectors/areas adaptation action applies to

Building and Infrastructure
Spatial Planning
Water

Action description and implementation progress

The urban runoff -program of Tampere (2012) takes in consideration that climate change increases rainfall and extreme weather conditions. The stormwater plan will be updated in the near future, flood risks prepared for and the waters directed as rainfall increases. Rain storms was also taken in to consideration as a part of SECAP. The management of runoff waters and floods is one of the pioneering sectors in which plenty of research has been carried out of the risks and their impacts. The city of Tampere has improved nature based solutions for urban wate management and will develop natural stormwater management systems. A pilot project will be implemented for the planning of Green Areas and Storm Water Management areas with the aim of minimising carbon emissions. Carbon emissions will be calculated and form the basis for choosing design solutions.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

https://www.tampere.fi/liitteet/h/6Aw930Whg/Tampereen_hulevesiohjelma.pdf

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Climate hazards

Extreme hot temperature > Heat wave

Action

Biodiversity monitoring

Action title

The City of Tampere Green Factor Method

Status of action

Operation

Means of implementation

Co-benefit area

Enhanced resilience

Enhanced climate change adaptation

Reduced GHG emissions
Improved resource quality (e.g. air, water)
Improved public health
Ecosystem preservation and biodiversity improvement

Sectors/areas adaptation action applies to

Building and Infrastructure
Spatial Planning
Water
Public Health and Safety

Action description and implementation progress

The green factor method was adopted in Tampere in 2019. The aim of the green factor is to ensure green efficiency in the blocks. It is a calculation tool that will be used, in the local detailed planning phase, for steering the reference planning of the blocks. At the building permit phase, the fulfilling of the green factor will be one permit condition. The importance of green surfaces for various ecosystem services will be emphasised as cities become more and more compact. Vegetation and vegetation-covered surfaces reduce flood risk, improving stormwater management, act as carbon sinks, mitigate the urban heat island phenomenon in the urban areas, bind particulate matter and pollutants, and improve the aesthetic, comfort and health effects of urban area. The role of green belts will be strengthened. Detailed Planning tool to ensure sufficient green area on plots while preventing stormwater flooding. The green stormwater describes how much the plot has vegetation and water detention solutions in relation to the area of the plot.

Finance status

Majority funding source

Local

Total cost of the project (currency)

44,000

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

https://data.tampere.fi/data/fi/dataset/tampereen-viherkerroin

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Climate hazards

Flood and sea level rise > Flash / surface flood

Action

Flood mapping

Action title

Preliminary assessment of stormwater flood risks

Status of action

Operation

Means of implementation

Assessment and evaluation activities

Co-benefit area

Disaster preparedness
Enhanced climate change adaptation

Sectors/areas adaptation action applies to

Building and Infrastructure
Spatial Planning
Water

Action description and implementation progress

The City of Tampere has investigated the occurrence of flood risks in the city area in 2018. Preparedness for flood risks include mapping of flood risk areas (continuous measure), defining of regional measures to limit the construction of flood risk areas, and investigion of the risk of heavy rainfall in built areas and planning of preparedness measures.
The Act on Flood Risk Management obliges all municipalities in Finland to undertakes a preliminary assessment of flood risks caused by stormwater and meltwater, designates significant stormwater and meltwater flood risk areas and prepares flood hazard maps and flood risk maps for the areas.

Finance status

Finance secured

Majority funding source

Local

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

https://www.tampere.fi/tampereen-kaupunki/ajankohtaista/tiedotteet/2018/09/13092018_3.html

Climate hazards

Storm and wind > Severe wind

Action

Tree planting and/or creation of green space

Action title

The update of the forest management operating model.

Status of action

Pre-implementation

Means of implementation

Policy and regulation

Co-benefit area

Enhanced resilience
Enhanced climate change adaptation
Reduced GHG emissions
Improved resource quality (e.g. air, water)
Ecosystem preservation and biodiversity improvement

Sectors/areas adaptation action applies to

Agriculture and Forestry
Public Health and Safety

Action description and implementation progress

The City of Tampere will update the forest management operating model for years 2021-2030. New forest management operating model aims that forest management at diverse forest nature that adapts to climate change. More emphasis will be placed on the adaptation of forests to climate change, role as carbon sinks and the impact of forests on the wellbeing of residents.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

https://www.tampere.fi/asuminen-ja-ymparisto/ymparisto-ja-luonto/metsat/metsat2030.html

Climate hazards

Flood and sea level rise > Flash / surface flood

Action

Other, please specify

Action title

Tampere city design manual

Status of action

Pre-implementation

Means of implementation

Assessment and evaluation activities

Co-benefit area

Enhanced climate change adaptation
Improved access to data for informed decision-making

Sectors/areas adaptation action applies to

Spatial Planning

Action description and implementation progress

The green efficiency of public areas will be promoted by developing new tools for the zoning process, such as a city design manual. Tampere city design manual is a handbook that includes everything related with town planning and realises the alignmetns and goals set for the design of public spaces in Tampere.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

Climate hazards

Extreme hot temperature > Heat wave

Action

Community engagement/education

Action title

Regional and cooperation will be developed between different actors in adapting to climate change.

Status of action

Pre-implementation

Means of implementation

Stakeholder engagement

Co-benefit area

Enhanced climate change adaptation
Improved access to data for informed decision-making

Sectors/areas adaptation action applies to

Energy
Building and Infrastructure
Spatial Planning
Agriculture and Forestry
Water
Waste
Public Health and Safety

Action description and implementation progress

Climate change adaptation requires cooperation. Regional collaboration is important for climate change adaptation and a number of measures have been defined in the Climate Strategy of the Tampere City Region. Preparing cooperation models for municipalities and sectors for extreme situations. Define adaptation measures and recommendations for different sectors of municipalities, and plan and agree on cooperation between different sectors and municipalities.

In autumn 2019, the City of Tampere launched development work in the form of cross-administrative cooperation, the aim of which is to develop a tool and an operating model to support the adaptation work of the sectors. In the initial phase, work will be carried out interactively with pilot sites to make the tool as easy and useful as possible. Work will be carried out in the future on the basis of continuous improvement. The aim is for the sectors to include climate change risk management and adaptation as part of their regular everyday work.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

Climate hazards

Extreme Precipitation > Rain storm

Action

Incorporating climate change into long-term planning documents

Action title

Climate change adaptation measures focusing on the most important risk areas for the city will be planned and implemented.

Status of action

Implementation complete but not in operation

Means of implementation

Assessment and evaluation activities

Co-benefit area

Enhanced resilience
Disaster preparedness
Enhanced climate change adaptation
Improved public health
Improved resource security (e.g. food, water, energy)

Sectors/areas adaptation action applies to

Energy
Building and Infrastructure
Spatial Planning
Agriculture and Forestry
Water
Waste
Public Health and Safety

Action description and implementation progress

Assessed impact of the highest level of climate risks on different sectors in Tampere, their likelihood, impact level and timetable. Actively monitoring of research results and forecasts on climate change and then revision of guidelines based on new information.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

Climate hazards

Extreme Precipitation > Rain storm

Action

Nature-based solutions policy (e.g. street trees, green roofs)

Action title

The urban tree policy of the City of Tampere

Status of action

Operation

Means of implementation

Policy and regulation

Co-benefit area

Enhanced resilience
Enhanced climate change adaptation
Reduced GHG emissions
Improved resource quality (e.g. air, water)
Improved public health
Ecosystem preservation and biodiversity improvement

Sectors/areas adaptation action applies to

Building and Infrastructure
Spatial Planning

Action description and implementation progress

In 2020 the urban tree policy of the City of Tampere was published. The urban tree policy aims to e.g. diversify urban tree species, secure ecosystem services provided by urban trees and ensure the preservation of urban trees in changing climatic conditions.

The city of Tampere maintain and develop greenspaces via land use planning. Well planned greenspaces enhance urban environments and have several advantages such as storm water management, cooling effect, improving the well-being of citizens and reduction of the risk of flash flooding.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

https://www.tampere.fi/tiedostot/t/IkRMbrAjz/KaupunkipuulinjausTampere.pdf

Climate hazards

Storm and wind > Severe wind

Action

Public preparedness (including practice exercises/drills)

Action title

Preparedness plan for risk situations

Status of action

Implementation

Means of implementation

Capacity building and training activities
Assessment and evaluation activities
Monitor activities

Co-benefit area

Disaster preparedness
Enhanced climate change adaptation
Improved resource security (e.g. food, water, energy)

Sectors/areas adaptation action applies to

Energy
Building and Infrastructure
Spatial Planning

Water
Public Health and Safety

Action description and implementation progress

Collecting information on extreme situations as a basis for measures and planning measures on the basis of information. Expand the emergency preparedness plan regarding to the risks related to climate change, ensure information and alert systems and draw up guidelines for public authorities and private households. Ensuring the operational security of sectors vital to the functioning of society in exceptional situations, maintaining the preparedness to prevent and repair flood and storm damage, and checking the sustainability of existing structures.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

Climate hazards

Extreme Precipitation > Rain storm

Action

Stormwater capture systems

Action title

Diverting water as the amount of precipitation is rising.

Status of action

Implementation

Means of implementation

Infrastructure development

Co-benefit area

Enhanced climate change adaptation

Sectors/areas adaptation action applies to

Spatial Planning

Water

Action description and implementation progress

The diverting of water will be planned, taking into account increased amount of precipitation and heavy rainfall. The dimensioning of sewers and drainage systems willl be checked and a regional plan for the management of storm water will be drawn up.

Finance status

Majority funding source

Total cost of the project (currency)

Total cost provided by the local government (currency)

Total cost provided by the majority funding source (currency)

Web link

Adaptation Planning

GCoM Common Reporting Framework Reporting Requirements for European Cities

(3.2) Does your city council, or similar authority, have a published plan that addresses climate change adaptation and/or resilience?

Yes

GCoM Additional Information

(3.2a) Please provide more information on your plan that addresses climate change adaptation and/or resilience and attach the document. Please provide details on the boundary of your plan, and where this differs from your city's boundary, please provide an explanation.

Publication title and attach the document

Sustainable energy and climate action plan (SECAP) of Tampere under the Covenant of Mayors for Climate and Energy (CoM)

SECAP-raportti_Tampereen_kaupunki_9_12_2019.pdf

Web link

https://www.tampere.fi/tiedostot/s/jIcx1qanz/SECAP-raportti_Tampereen_kaupunki_9_12_2019.pdf

Sectors/areas covered by plan that addresses climate change adaptation

Energy
Transport (Mobility)
Building and Infrastructure
Spatial Planning
Agriculture and Forestry
Water
Waste
Public Health and Safety

Climate hazards factored into plan that addresses climate change adaptation

Extreme Precipitation > Rain storm
Storm and wind > Severe wind
Extreme cold temperature > Extreme winter conditions
Extreme hot temperature > Heat wave
Water Scarcity > Drought
Flood and sea level rise > Flash / surface flood

Year of adoption of adaptation plan by local government

2019

Boundary of plan relative to city boundary (reported in 0.1)

Same - covers entire city and nothing else

If the city boundary is different from the plan boundary, please explain why

Stage of implementation

Plan in implementation

Type of plan

Integrated mitigation / adaptation

Has your local government assessed the synergies, trade-offs, and co-benefits, if any, of the main mitigation and adaptation actions you identified?

Yes

Describe the synergies, trade-offs, and co-benefits of this interaction

The Mayor of Tampere has stated that mitigation and adaptation measures must be compatible. This simultaneous consideration of partly conflicting objectives requires careful planning and monitoring of impacts. Nature based solutions e.g. the sustainable maintenance of ecosystems or the construction of new ecosystems such as green roofs, benefit both mitigation, by reducing greenhouse gas emissions, and adaptation by helping us to adapt to the impacts of climate change. Nature based solutions also provide benefits for human well-being, biodiversity and air quality. Green spaces, such as parks and nature-based solutions, sequester carbon and reduce energy consumption in buildings via urban heat island effect mitigation, in addition to biodiversity

enhancement. Development of urban green areas can also encourage walking. On the other hand, preserving space for urban green areas could increase GHG emissions from transport and housing by reducing urban density.
Using renewable energy sources reduce GHG emissions and improve local air quality. Energy production may be at risk for damage during extreme weather events exacerbated by climate change.

Primary author of plan

Dedicated city team

Description of the stakeholder engagement processes

With the support of benviroc Oy, the City of Tampere prepared and implemented an action plan and plan for climate change mitigation and adaptation, the SECAP. Workshops were organised for stakeholders and experts. The city of Tampere is aiming to start to develop a centralized adaptation strategy.

Adaptation Goals

(3.3) Please describe the main goals of your city's adaptation efforts and the metrics / KPIs for each goal.

Adaptation goal

Sustainable urban planning: The living environment will be safe, healthy and attractive.

Climate hazards that adaptation goal addresses

Extreme Precipitation > Rain storm
Storm and wind > Severe wind
Extreme cold temperature > Extreme winter conditions
Extreme hot temperature > Heat wave
Water Scarcity > Drought
Flood and sea level rise > Flash / surface flood

Target year of goal

2029

Description of metric / indicator used to track goal

A methodology will be developed for assessing the climate impacts of the urban structure, which will 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 to a map service. The tool will be used to assess the impact of the master plan and to program town plans.

Does this goal align with a requirement from a higher level of government?

Yes, and it exceeds its scale or requirements

Select the initiatives related to this adaptation goal that your city has committed to

Comment

Preparations have been made for the risks brought about by climate change.

Adaptation goal

Environmental safety is improved and risks are reduced.

Climate hazards that adaptation goal addresses

Extreme cold temperature > Extreme winter conditions
Water Scarcity > Drought
Flood and sea level rise > Flash / surface flood

Target year of goal

2030

Description of metric / indicator used to track goal

Number of green spaces in master plans and town plans in the inner-city area (m² per resident), ecosystem services provided by green spaces.

Does this goal align with a requirement from a higher level of government?

Yes, and it exceeds its scale or requirements

Select the initiatives related to this adaptation goal that your city has committed to

Comment

Space allowances for climate change adaptation structures will be taken into account in plans: stormwater, snow storage, multi-purpose areas and water reserves.

Adaptation goal

Urban nature is diverse and can adapt to climate change.

Climate hazards that adaptation goal addresses

Extreme Precipitation > Rain storm
Storm and wind > Severe wind
Extreme cold temperature > Extreme winter conditions
Extreme hot temperature > Extreme hot days
Water Scarcity > Drought
Flood and sea level rise > Flash / surface flood

Target year of goal

2030

Description of metric / indicator used to track goal

The draft programme will be made available in early 2021 and the programme will be completed by the end of spring 2021. Measures to achieve these objectives will be prepared during the process.

Does this goal align with a requirement from a higher level of government?

Yes, and it exceeds its scale or requirements

Select the initiatives related to this adaptation goal that your city has committed to

Comment

The city of Tampere is currently preparing a biodiversity programme (LUMO programme) for 2021-2030. The LUMO-programme aims to promote biodiversity in a growing city and in a condensing urban structure, and that the urban nature is diverse and more resilient to the impacts of climate change. One of the main goals is that urban nature is diverse and can adapt to climate change.
Nature is not only located in nature reserves or outside cities. Yards, parks, wasteland, ditches, roofs, roadside zone, street trees and nearby forests are all different kinds of natural habitats that can provide habitats for a diverse range of species. By taking care of the diversity of local nature, we will also take care of the ecosystem services it provides. Other programmes or operating plans that the city of Tampere have regarding green spaces are the urban structure and environment plan (Rosoisesti kaunista) 2025 and a nature conservation programme 2012-2020.

Adaptation goal

Biodiversity is secured and urban green has been increased.

Climate hazards that adaptation goal addresses

Extreme Precipitation > Rain storm
Storm and wind > Severe wind
Extreme cold temperature > Extreme winter conditions
Extreme hot temperature > Heat wave
Water Scarcity > Drought
Flood and sea level rise > Flash / surface flood

Target year of goal

2030

Description of metric / indicator used to track goal

Diversity and structure of forests.

Does this goal align with a requirement from a higher level of government?

Yes, and it exceeds its scale or requirements

Select the initiatives related to this adaptation goal that your city has committed to

Comment

Sustainable Tampere 2030 is the climate program of Tampere. Sustainable Tampere 2030 -programme states that by 2030 biodiversity is secured and urban green has been increased. The forests and urban green space are intended to remain functional and vibrant even as the city grows. This will sequester carbon from the atmosphere and mitigate climate change.The carbon sink of forests and urban green will be strengthened by, among other things, increasing the diversity and different structure of forests. In addition to the carbon sink effect, forests and green areas provide many other benefits: they provide habitats for different species, well-being for urban dwellers and help adapt to climate change through regulation of urban runoff and provision of a cooling effect.

Adaptation goal

Adaptation to climate change is attached to all urban planning, planning and construction steering and infrastructure development solutions.

Climate hazards that adaptation goal addresses

Extreme Precipitation > Rain storm
Storm and wind > Severe wind
Extreme cold temperature > Extreme winter conditions
Extreme hot temperature > Heat wave
Water Scarcity > Drought
Wild fire > Forest fire
Flood and sea level rise > Flash / surface flood

Target year of goal

2030

Description of metric / indicator used to track goal

Does this goal align with a requirement from a higher level of government?

Yes

Select the initiatives related to this adaptation goal that your city has committed to

Comment

4. City-wide Emissions

City-wide GHG Emissions Data

(4.0) Does your city have a city-wide emissions inventory to report?

Yes

(4.1) Please state the dates of the accounting year or 12-month period for which you are reporting your latest city-wide GHG emissions inventory.

	From	To
Accounting year dates	January 1, 2019	December 31, 2019

(4.2) Please indicate the category that best describes the boundary of your city-wide GHG emissions inventory.

	Boundary of inventory relative to city boundary (reported in 0.1)	Excluded sources / areas	Explanation of boundary choice where the inventory boundary differs from the city boundary (include inventory boundary, GDP and population)
Please explain	Same – covers entire city and nothing else	Emissions from industries involved in the EU Emission Trading Scheme (EU-ETS) as well as the AFOLU sector are excluded from the inventory.	The inventory has been made using the Covenant of Mayors SECAP methodology, which recommends excluding emissions from industries involved in the EU Emission Trading Scheme. In the case of Tampere this means the factory of Metsä Board Tako. Following the methodology of the Covenant of Mayors also emissions from the AFOLU sector are excluded from the inventory.

(4.3) Please give the name of the primary protocol, standard, or methodology you have used to calculate your city's city-wide GHG emissions.

	Primary protocol	Comment
Emissions methodology	Other, please specify Covenant of Mayors Guidebook "How to develope a Sustainable Energy and Climate Action Plan"	The City of Tampere monitors it emissions annually following a nationally widely used method called the CO2-report. In addition to that the city has committed to the Covenant of Mayors and developed its Sustainable Energy and Climate Action Plan following the CoM methodology. Following this methodology the city has calculated its emissions from BEI 1990 , MEI1 2016 and MEI2 2019. The CoM methodology is very similar to the methodology used in the CO2-report and the CO2-report calculations have been modified to follow the CoM methodology.

(4.4) Which gases are included in your city-wide emissions inventory?

CO2
CH4
N20

GCoM Additional Information

(4.5) Please attach your city-wide inventory in Excel or other spreadsheet format and provide additional details on the inventory calculation methods in the table below.

Document title and attachment

Tampere_SECAP_CoM-Europe_reporting_template_MEI2_2019

Tampere SECAP_CoM-Europe_reporting_template_MEI2_2019.xlsx

Emissions inventory format

I have attached my inventory in a format other than the GPC

Web link

https://www.covenantofmayors.eu/support/library.html

Emissions factors used

IPCC

Global Warming Potential (select relevant IPCC Assessment Report)

IPCC 2nd AR (1995)

Please select which additional sectors are included in the inventory

No additional sectors included

Population in inventory year

238,140

Overall level of confidence

High

Comment on level of confidence

GCoM Common Reporting Framework Reporting Requirements for European Cities

(4.6a) The Global Covenant of Mayors requires committed cities to report their inventories in the format of the new Common Reporting Framework, to encourage standard reporting of emissions data. Please provide a breakdown of your city-wide emissions by sector and sub-sector in the table below. Where emissions data is not available, please use the relevant notation keys to explain the reason why.

	Direct emission	If you have no	Indirect emission	If you have no	Emissions	If you have no	Please explain any

	s (metric tonnes CO2e)	direct emissions to report, please select a notation key to explain why	s from the use of grid-supplied electricity, heat, steam and/or cooling (metric tonnes CO2e)	indirect emissions to report, please select a notation key to explain why	occurring outside the city boundary as a result of in-city activities (metric tonnes CO2e)	emissions occurring outside the city boundary to report as a result of in-city activities, please select a notation key to explain why	excluded sources, identify any emissions covered under an ETS and provide any other comments
Stationary energy > Residential buildings	39,571		292,799			NE	Upstream emissions (scope 3) have not been estimated
Stationary energy > Commercial buildings & facilities	6,412		212,844			NE	Upstream emissions (scope 3) have not been estimated
Stationary energy > Institutional buildings & facilities	979		43,019			NE	Upstream emissions (scope 3) have not been estimated
Stationary energy > Industrial buildings & facilities	48,726		75,188			NE	Excludes emissions from industrial plants under EU ETS. Upstream emissions (scope 3) have not been estimated.

Stationary energy > Agriculture		IE		IE		NE	All electricity use is included under buildings. All light fuel oil use included under industry.
Stationary energy > Fugitive emissions		NE		NE		NE	Fugitive emissions have not been estimated.
Total Stationary Energy	95,690		623,850			NE	
Transportation > On-road	238,217			IE		NE	All electricity use is included under buildings. Upstream emissions (scope 3) have not been estimated.
Transportation > Rail		NE		IE		NE	All electricity use is included under buildings. Upstream emissions (scope 3) have not been estimated. Direct emissions from rail

							transportation are minor and have not been estimated.
Transportation > Waterborne navigation		NE		IE		NE	All electricity use is included under buildings. Other emissions from navigation have not been estimated.
Transportation > Aviation		NE		NE		NE	Emissions from aviation have not been estimated.
Transportation > Off-road		IE		IE		NE	All electricity use is included under buildings. All light fuel oil use is included under industry. Scope 3 emissions have not been estimated.
Total Transport	238,217			Combination of notation keys		NE	

Waste > Solid waste disposal	65,398			N/A		NO	Includes emissions from waste generated and treated in Tampere and excludes emissions from waste generated outside Tampere but treated in Tampere.
Waste > Biological treatment	4,564			N/A		NO	Includes emissions from waste generated and treated in Tampere and excludes emissions from waste generated outside Tampere but treated in Tampere.
Waste > Incineration and open burning		NO		N/A		NO	
Waste > Wastewater	6,900			N/A		NO	Includes emissions from waste generated and treated in Tampere and excludes emissions from waste generated

							outside Tampere but treated in Tampere.
Total Waste	76,861			N/A		NO	Includes emissions from waste generated and treated in Tampere and excludes emissions from waste generated outside Tampere but treated in Tampere.
IPPU > Industrial process		NO		N/A		NO	
IPPU > Product use		NE		N/A		NE	Emissions from product use have not been estimated.
Total IPPU		Combination of notation keys		N/A		Combination of notation keys	
AFOLU > Livestock		NE		N/A		N/A	
AFOLU > Land use		NE		N/A		N/A	
AFOLU > Other AFOLU		NE		N/A		N/A	
Total AFOLU		NE		N/A		N/A	Emissions from AFOLU have not been estimated.

Generation of grid-supplied energy > Electricity-only generation		NO		N/A		NO	
Generation of grid-supplied energy > CHP generation	457,961			N/A		N/A	Emissions from generation of electricity and heat in CPH plants located in Tampere.
Generation of grid-supplied energy > Heat/cold generation	28,154			N/A		N/A	Emissions from generation of district heat in Tampere, excluding CHP generation.
Generation of grid-supplied energy > Local renewable generation		IE		N/A		N/A	Emissions from electricity and heat generation using biomass included under CHP generation and heat/cold generation.
Total Generation of grid-supplied energy	486,115			N/A		N/A	
Total Emissions (excluding	410,768		623,850	N/A		NE	

generation of grid-supplied energy)							

(4.8) Please indicate if your city-wide emissions have increased, decreased, or stayed the same since your last emissions inventory, and describe why.

	Change in emissions	Primary reason for change	Please explain and quantify changes in emissions
Please explain	Decreased	Other, please specify	The main reason is that the use of fossil fuels in energy production have decreased. The total emissions in Tampere have decreased 5 % between 2016 and 2019 and 30 % between 1990 and 2019.

(4.9) Does your city have a consumption-based inventory to measure emissions from consumption of goods and services by your residents?

	Response	Provide an overview and attach your consumption-based inventory if relevant
Please complete	In progress	During 2021 the City of Tampere has participated in a project where a method to calculate consuption-based emissions has been developed. Pilot calculations are yet to be made and the results of the consumption-based inventory will be available in september/october 2021.

City-wide external verification

(4.12) Has the city-wide GHG emissions data you are currently reporting been externally verified or audited in part or in whole?

Do not know

Historical emissions inventories

(4.13) Please provide details on any historical, base year or recalculated city-wide emissions inventories your city has, in order to allow assessment of targets in the table below.

Inventory date from

January 1, 1990

Inventory date to

December 31, 1990

Scopes / boundary covered

Other, please specify

The emission inventory was made following the same boundaries as for 2019. See question 4.2.

Previous emissions (metric tonnes CO2e)

1,469,611

Is this inventory a base year inventory or a recalculated version of a previously reported inventory?

Base year inventory

Methodology

Other, please specify

Covenant of Mayors Guidebook "How to develope a Sustainable Energy and Climate Action Plan"

File name and attach your inventory

SECAP_Template_Tampere_02092019. The Baseline year inventory can be found on the page named "BEI".

SECAP_Template_Tampere_02092019.xlsx

Web link

https://www.covenantofmayors.eu/about/covenant-community/signatories/overview.html?scity_id=11764

Comments

The City of Tampere completed its Sustainable Energy and Climate Action Plan, SECAP in 2019 (https://www.tampere.fi/tiedostot/s/jIcx1qanz/SECAP-raportti_Tampereen_kaupunki_9_12_2019.pdf). Developing the SECAP emission inventories were calculated for baseline year 1990 and monitoring year 2016.
The SECAP was developed following the Covenant of Mayors Guidebook "How to develop a Sustainable Energy and Climate Action Plan".

Inventory date from

January 1, 2016

Inventory date to

December 31, 2016

Scopes / boundary covered

Other, please specify

The emission inventory was made following the same boundaries as for 2019. See question 4.2.

Previous emissions (metric tonnes CO2e)

1,092,168

Is this inventory a base year inventory or a recalculated version of a previously reported inventory?

Other, please specify

The City of Tampere has calculated its emissions following the SECAP methodology for the baseline year 1990 and two monitoring years 2016 and the most recent inventory for 2019 inserted in this CDP report.

Methodology

Other, please specify

Covenant of Mayors Guidebook "How to develope a Sustainable Energy and Climate Action Plan"

File name and attach your inventory

Same file as the previous question. SECAP_Template_Tampere_02092019. The first monitoring year inventory can be found on the page named "MEI1".

Web link

https://www.tampere.fi/tiedostot/s/jIcx1qanz/SECAP-raportti_Tampereen_kaupunki_9_12_2019.pdf

Comments

Results of the emission inventories for BEI 1990 and MEI1 can be found in Tampere SECAP (link above) on page 31.

GCoM Emission Factor and Activity Data

(4.14) State if the emissions factors and activity data used to calculate your cities emissions are accessible within the attached emissions inventory in question 4.5. If so, please describe where these are located within the attached inventory.

Emissions factors and Activity Data Reported

Emissions factors and activity data accessibility

Emissions factors and activity data are accessible within the attached inventory in question 4.5

State the location of emissions factors and activity data within the attached inventory in question 4.5

Emission factors can be found in the attached Excel file on the page named "CO2-GHG emissions" in table C1 named "Please insert the CO2 emission factors adopted (t/MWh).

5. Emissions Reduction

Mitigation Target setting

GCoM Common Reporting Framework Reporting Requirements for European Cities

(5.0) Do you have a GHG emissions reduction target(s) in place at the city-wide level?

Base year emissions (absolute) target

(5.0a) Please provide details of your total city-wide base year emissions reduction (absolute) target(s). In addition, you may add rows to provide details of your sector-specific targets, by providing the base year emissions specific to that target.

Sector

All emissions sources included in city inventory

Where sources differ from the inventory, identify and explain these additions / exclusions

The City of Tampere monitors its emissions annually following a nationally widely used method called the CO2-report. The boundary is slightly different to the inventory presented in the CDP-report.

Boundary of target relative to city boundary (reported in 0.1)

Same (city-wide) – covers entire city and nothing else

Explanation of boundary choice where the inventory boundary differs from the city boundary (include inventory boundary, GDP and population)

Base year

1990

Year target was set

2017

Base year emissions (metric tonnes CO2e)

1,469,611

Percentage reduction target

80

Target year

2030

Target year absolute emissions (metric tonnes CO2e) [Auto-calculated]

293,922.2

Percentage of target achieved so far

37.5

Is this target considered to be your cities most ambitious target?

Yes

Does this target align with the global 1.5 - 2 °C pathway set out in the Paris Agreement?

Yes - 1.5 °C

Select the initiatives that this target contributes towards

Global Covenant of Mayors for Climate & Energy

Does this target align to a requirement from a higher level of government?

Yes, but it exceeds its scale or requirement

Please describe your target. If your country has an NDC and your city's target is less ambitious than the NDC, please explain why.

The city of Tampere's goal is to achieve climate neutrality by 2030. We aim to reduce climate emissions by 80 % in comparison to 1990 emissions while compensating the remaining 20 % with regional carbon sinks. This is more ambitious than the national target and there is no requirement from the national level to have a local target.

(5.1) Please describe how the target(s) reported above align with the global 1.5 - 2 °C pathway set out in the Paris agreement.

According to WWF's methodology used in One Planet City Challenge Tampere's target for 2030 is more than our fair share. Since the strategic target is essentially to be climate neutral in 2030, this is also in line with long term net zero targets.

(5.2) Is your city-wide emissions reduction target(s) conditional on the success of an externality or component of policy outside of your control?

Yes

(5.2a) Please identify and describe the conditional components of your city-wide emissions reduction target(s).

In order to reach targets in space heating, traffic and industrial emissions, actions are required also from the citizens, the local industry and the national government. For example to speed up the change from oil boiler heating to renewable sources in buildings, a financial incentive is required and in Finland these incentives come from the national government.

When it comes to traffic, the city can do actions that will guide people to choose more sustainable modes of transport, but when it comes to sustainable fuels and electric mobility, the national goverment needs to implement policies to make the change. The city can mainly support the change through building appropriate infrastructure.

The local industry needs also to be involved and making green investments and energy efficiency improvements to reach their emission targets. For this, the city of Tampere has set up a partnership program in cooperation with the local economic development agency, Business Tampere.

(5.3) Does your city-wide emissions reduction target(s) account for the use of transferable emissions units?

No

Mitigation Actions

GCoM Common Reporting Framework Reporting Requirements for European Cities

(5.4) Describe the anticipated outcomes of the most impactful mitigation actions your city is currently undertaking; the total cost of the action and how much is being funded by the local government.

Mitigation action

Mass Transit > Improve rail, metro, and tram infrastructure, services and operations

Action title

Implementation of a new public transport system - a modern tramway, first part

Means of implementation

Infrastructure development

Implementation status

Implementation complete

Start year of action

2016

End year of action

2021

Estimated emissions reduction (metric tonnes CO2e)

1,300

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Per year

Co-benefit area

Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)
Social community and labour improvements
Economic growth
Job creation

Improved resource quality (e.g. air, water)
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours

Action description and implementation progress

A modern tramway is the most important investment in developing the public transport system in Tampere. It reduces energy use and replaces fossil diesel with electricity. Building a tramway makes it possible to develop a dense urban structure in the city based on sustainable mobility. The first section of the tramway was completed in the summer of 2021 ahead of schedule and 30 milj. Euros under the cost estimates due to the alliance agreement that was used for the construction. The tramway starts operating regularly in August 2021.

Finance status

Finance secured

Total cost of the project

270,000,000

Total cost provided by the local government

215,000,000

Majority funding source

(Sub)national

Total cost provided by the majority funding source (currency)

55,000,000

Web link to action website

https://raitiotieallianssi.fi/in-english/

Mitigation action

Energy Supply > Low or zero carbon energy supply generation

Action title

Renewable energy production - Naistenlahti 3 biomass power plant

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2020

End year of action

2022

Estimated emissions reduction (metric tonnes CO2e)

126,000

Energy savings (MWh)

Renewable energy production (MWh)

900,000,000

Timescale of reduction / savings / energy production

Projected lifetime

Co-benefit area

Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)
Greening the economy
Promote circular economy
Job creation
Improved resource quality (e.g. air, water)
Improved resource security (e.g. food, water, energy)
Resource conservation (e.g. soil, water)

Action description and implementation progress

The Naistenlahti 2 power plant unit will be converted (2020–22), allowing 100% renewable biofuels to be used in
the new Naistenlahti 3 Power Plant in future. The power plant is currently using partially peat and partially biofuel. Both the current and the new plant produce both district heating and electricity. During with the conversion process, there is a plan to study possibilities for carbon capture and use or storage.

Finance status

Finance secured

Total cost of the project

160,000,000

Total cost provided by the local government

Majority funding source

Other, please specify

Main investment by the local energy utility, additional financing from the national government renewable energy grants.

Total cost provided by the majority funding source (currency)

Web link to action website

https://naistenlahti.fi/en/

Mitigation action

Water > Wastewater to energy initiatives

Action title

Sulkavuori central waste water treatment plant

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2018

End year of action

2025

Estimated emissions reduction (metric tonnes CO2e)

4,370

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Co-benefit area

Reduced GHG emissions
Greening the economy
Promote circular economy
Job creation
Improved resource quality (e.g. air, water)
Ecosystem preservation and biodiversity improvement

Action description and implementation progress

Tampereen Seudun Keskuspuhdistamo Oy will build the Sulkavuori Central Treatment Plant. The plant will also treat wastewater from several municipalities surrounding Tampere. The sludge generated at the treatment plant will be treated in a biogas plant, and the biogas recovered will be used with a good overall efficiency to meet the electricity and heat needs of the waste water treatment. Approximately 50% self-sufficiency for electricity and 100% self-sufficiency for heat will be achieved through the use of biogas.

Finance status

Finance secured

Total cost of the project

242,000,000

Total cost provided by the local government

Majority funding source

(Sub)national

Total cost provided by the majority funding source (currency)

Web link to action website

https://www.keskuspuhdistamo.fi/

Mitigation action

Waste > Improve the efficiency of waste collection

Action title

SEAP - Tammervoima waste to energy CHP plant

Means of implementation

Infrastructure development

Implementation status

Operation

Start year of action

2013

End year of action

2016

Estimated emissions reduction (metric tonnes CO2e)

60,000

Energy savings (MWh)

Renewable energy production (MWh)

470,000

Timescale of reduction / savings / energy production

Projected lifetime

Co-benefit area

Improved resource efficiency (e.g. food, water, energy)
Social community and labour improvements
Economic growth
Job creation
Improved resource security (e.g. food, water, energy)
Shift to more sustainable behaviours

Action description and implementation progress

Added value to regional economy: 20000000 €/a

Finance status

Finance secured

Total cost of the project

111,000,000

Total cost provided by the local government

Majority funding source

(Sub)national

Total cost provided by the majority funding source (currency)

Web link to action website

https://tammervoima.fi/voimalaitos/english/

Mitigation action

Mass Transit > Improve rail, metro, and tram infrastructure, services and operations

Action title

Local train transport

Means of implementation

Infrastructure development
Assessment and evaluation activities
Development and implementation of action plan

Implementation status

Implementation

Start year of action

2020

End year of action

2025

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Co-benefit area

Reduced GHG emissions
Improved resource quality (e.g. air, water)
Improved public health
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours

Action description and implementation progress

The local-train traffic will be expanded within the framework of the existing railway infrastructure by participating in piloting new local train lines in cooperation with the Ministry of Transport and Communications in 2020-2021. The city will invest in building one additional train stop in Tesoma for the local trains.
A plan and a decision will be made on the continuation of 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 and new stops will be constructed.
Tampere will also contribute to a regional master plan for local train transport in the region and develop common ticketing products for bus and
train services.

Finance status

Feasibility undertaken

Total cost of the project

1,800,000

Total cost provided by the local government

Majority funding source

Local

Total cost provided by the majority funding source (currency)

Web link to action website

Mitigation action

Mass Transit > Improve fuel economy and reduce CO2 from bus and/or light rail

Action title

Conversion of bus traffic to low emission

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2020

End year of action

2030

Estimated emissions reduction (metric tonnes CO2e)

24,600

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Per year

Co-benefit area

Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)
Greening the economy
Job creation
Improved resource quality (e.g. air, water)

Action description and implementation progress

On the basis of a an assessment on fuel sources, guidelines will be drawn up for the conversion of bus traffic to low emission by 2030. The guidelines will be issued in 2020. The guidelines will also help prepare for the implementation of the 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 lternative 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.

Finance status
Feasibility undertaken

Total cost of the project

Total cost provided by the local government

Majority funding source
Local

Total cost provided by the majority funding source (currency)

Web link to action website

Mitigation action
Outdoor Lighting > LED / CFL / other luminaire technologies

Action title
Street lighting conversion into LEDs

Means of implementation
Infrastructure development

Implementation status
Implementation

Start year of action
2019

End year of action

2025

Estimated emissions reduction (metric tonnes CO2e)
180

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Per year

Co-benefit area

Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)

Action description and implementation progress

The city's street lighting will be converted into LEDs and smart light control will be implemented by 2025. Further sections are being planned.

Finance status

Feasibility finalized, and finance partially secured

Total cost of the project

6,100,000

Total cost provided by the local government

Majority funding source

Local

Total cost provided by the majority funding source (currency)

Web link to action website

Mitigation action

Buildings > Switching to low-carbon fuels

Action title

Giving up oil heating in the city's own buildings

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2020

End year of action

2025

Estimated emissions reduction (metric tonnes CO2e)

980

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Per year

Co-benefit area

Reduced GHG emissions

Improved resource efficiency (e.g. food, water, energy)

Action description and implementation progress

Oil heating will be given up in city-owned buildings by 2025. Efforts will be made to make use of government subsidies.

Finance status

Feasibility finalized, and finance partially secured

Total cost of the project

1,900,000

Total cost provided by the local government

Majority funding source

Local

Total cost provided by the majority funding source (currency)

Web link to action website

Mitigation action

Mass Transit > Improve rail, metro, and tram infrastructure, services and operations

Action title

Implementation of a new public transport system - a modern tramway, second part

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2021

End year of action

2024

Estimated emissions reduction (metric tonnes CO2e)

900

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Co-benefit area

Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)
Greening the economy
Job creation
Improved resource quality (e.g. air, water)
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours

Action description and implementation progress

Construction of the second section of Tampere tramway has begun in 2021 and will start operating fully in 2024.

Finance status

Finance secured

Total cost of the project

84,800,000

Total cost provided by the local government

Majority funding source

Local

Total cost provided by the majority funding source (currency)

Web link to action website

Mitigation action

Waste > Recycling or composting collections and/or facilities

Action title

Biogas plant for household organic waste

Means of implementation

Infrastructure development

Implementation status

Implementation complete

Start year of action

2018

End year of action

2021

Estimated emissions reduction (metric tonnes CO2e)

1,900

Energy savings (MWh)

Renewable energy production (MWh)

25,000

Timescale of reduction / savings / energy production

Per year

Co-benefit area

Improved resource efficiency (e.g. food, water, energy)
Greening the economy
Promote circular economy
Improved resource security (e.g. food, water, energy)

Action description and implementation progress

Pirkanmaan Jätehuolto Oy will build a biogas plant in Koukkujärvi, and the biogas produced will be used as transport fuel, or it can be used in the production of electricity and heat. The material generated in the process will also be used as a soil improver that can be further processed into various fertiliser products. One bag of biowaste will equate roughly to 400 g of Finnish rye bread and 4 km of driving with a car using biogas. The plant will begin operation in 2021

Finance status

Finance secured

Total cost of the project

23,000,000

Total cost provided by the local government

Majority funding source

Other, please specify

The main bulk of the investment comes from the local waste management company with a 4,55 milj. support from the ministry of economic affairs and employment

Total cost provided by the majority funding source (currency)

Web link to action website

https://pjhoy.fi/palvelut/bio/biolaitos/

Mitigation action

Energy Supply > Low or zero carbon energy supply generation

Action title

Developing technology of geothermal installations

Means of implementation

Infrastructure development

Implementation status

Implementation

Start year of action

2020

End year of action

2030

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Co-benefit area

Enhanced resilience

Reduced GHG emissions

Improved resource efficiency (e.g. food, water, energy)
Job creation

Action description and implementation progress

Geothermal energy from the depths of the earth, is expected to become a new, environmentally friendly way of producing district heat, as long as sufficient information and experience is gained first. In 2020, a consortium of 15 Finnish city energy companies set up a consortium to study its potential and to research and develop technologies for it . The initiative to this cooperation came from the local power utility in Tampere.
The aim of the Urban Heat Consortium is to drill answers to geothermal energy utilization and drilling engineering questions. As a pilot project, a three-kilometer deep well drilling will be carried out by Tampereen Sähkölaitos. As a year-round district heating distribution hub, Tampere's Tarastenjärvi is well suited as a demonstration environment for a new type of energy production. The drilling operator is Thermo Rock and its technical implementation involves the Korean drill manufacturer HanJin D&B. The project has high expectations, which are primarily focused on the development of thermal power and automation technology, as well as the scalability of the technology.

Since many questions still remain unaswered, it is not yet possible to estimate costs or impacts of the project. Yet, if the technology becomes successful, it has the potential to replace burning fuels in district heating almost entirely.

Finance status

Pre-feasibility study status

Total cost of the project

Total cost provided by the local government

Majority funding source

Total cost provided by the majority funding source (currency)

Web link to action website

https://kaupunkilampo.fi/en/

Mitigation Planning

GCoM Common Reporting Framework Reporting Requirements for European Cities

(5.5) Does your city have a climate change mitigation or energy access plan for reducing city-wide GHG emissions?

Yes

GCoM Additional Information

(5.5a) Please attach your city's climate change mitigation plan below. If your city has both mitigation and energy access plans, please make sure to attach all relevant documents below.

Publication title and attach document

Carbon neutral Tampere 2030 roadmap

Carbon_Neutral_Tampere_2030_Roadmap.pdf

Web link

https://www.tampere.fi/en/smart-tampere/sustainable-tampere-2030.html

Focus area of plan

Climate change mitigation plan

Year of adoption of plan by local government

2020

Areas covered by action plan

Energy
Transport (Mobility)
Building and Infrastructure
Spatial Planning
Waste

Boundary of plan relative to city boundary (reported in 0.1)

Same – covers entire city and nothing else

If the city boundary is different from the plan boundary, please explain why and any areas/other cities excluded or included

Stage of implementation

Plan in implementation

Has your local government assessed the synergies, trade-offs, and co-benefits, if any, of the main mitigation and adaptation actions you identified?

Yes

Describe the synergies, trade-offs, and co-benefits of this interaction

The Mayor of Tampere has stated that mitigation and adaptation measures must be compatible. This simultaneous consideration of partly conflicting objectives requires careful planning and monitoring of impacts. Nature based solutions e.g. the sustainable maintenance of ecosystems or the construction of new ecosystems such as green roofs, benefit both mitigation, by reducing greenhouse gas emissions, and adaptation by

helping us to adapt to the impacts of climate change. Nature based solutions also provide benefits for human well-being, biodiversity and air quality. Green spaces, such as parks and nature-based solutions, sequester carbon but also reduce energy consumption in buildings via urban heat island effect mitigation, in addition to biodiversity enhancement. Development of urban green areas can also encourage walking. On the other hand, preserving space for urban green areas could increase GHG emissions from transport and housing by reducing urban density. Using renewable energy sources reduce GHG emissions and improve local air quality. Energy production may be at risk for damages during extreme weather events exacerbated by climate change.

Description of stakeholder engagement process

Creating the carbon neutral Tampere 2030 roadmap was focused on engaging all of the units of the city organisation itself as well as city-owned companies and other such organisations. By involving as many city employees as possible it was ensured that the units would commit to turning the roadmap actions into reality. In order to cover all emission sources, the city is now working on engaging both citizens and the private sector to commit to a common target and make changes on their behalf.

Primary author of plan

Dedicated city team

Comment

6. Opportunities

Opportunities

(6.0) Please indicate the opportunities your city has identified as a result of addressing climate change and describe how the city is positioning itself to take advantage of these opportunities.

Opportunity	Describe how the city is maximizing this opportunity
Development of waste management-sector	Waste is managed regionally by a company called Pirkanmaan Jätehuolto (PJH) owned in part by the city. They cooperated with the local power utility to invest in a waste incineration plant that was commissioned in 2016. It burns the general household waste and produces both electricity and district heating to the city. Currently PJH is building a new biowaste treatment center situated close to the border of Tampere in neighboring Nokia. The center will treat all biowaste from the region and produce biogas and fertilizer. One collected bag of biowaste will produce roughly 400 g of rye bread and allow for a biogas car to drive 4 km. PJH will use the biogas to power its own garbage collection vehicles and sell the remainder to the gasgrid to be used as traffic fuel. The production corresponds to about 2 % of Tampere's traffic energy consumption. There are two business areas being built with focus on circular economy. One

	of them is shared with the cities of Nokia and Ylöjärvi. The above mentioned biowaste treatment plant is located there. The other one is close to the waste incineration plant, Tammervoima in Tarastenjärvi.
Development of clean technology businesses	The biggest urban development area in Tampere, Hiedanranta, is a former paper factory and brownfield area just 4 km from the city center with a tramway connection planned. The area is planned to have 25 000 inhabitants and 10 000 jobs in the future. The old factory area is already developed as a test bed for solutions to sustainable energy and circular economy. There are ongoing or finished demonstrations of renewable energy, biocarbon production, dry toilets and recycling the nutrients as fertilizer, vertical farming, algae growing etc. Currently there is funding from the Ministry of Economic affairs and Employment to build an ecosystem of sustainable and smart energy and to create a new kind of energy system in the area, relying on local production, but being a part of the city-wide energy system. This would combine Tampere's history as a frontrunner in energy solutions to the skills of the IT hub that it is today and create new business as well as sustainable urban infrastructure.
Development of sustainable transport sector	Tampere is investing in a tramway that will replace some heavily trafficked bus routes. The city plans to be carbon neutral in 2030, which means at least halving current traffic emissions. This is made very challenging by the strong growth rate of the city. One tram can accommodate about three busloads of passengers. Compared to the current bus fleet, it moves residents more comfortably, accessibly, reliably and safer even in peak traffic hours. Above all, the tramway has a significant impact on land use opportunities. The tram is a permanent, attractive traffic route in the city. Thanks to it, offices and services create natural places outside the city center, which can be easily reached by public transport. The tramway also allows for more frequent residential construction along the route, allowing efficient and reliable public transport to become part of more and more everyday life. The city has decided to plan at least 80 % of new urban residential areas close to the center, local centers and main public transport routes.

Collaboration

(6.2) Does your city collaborate in partnership with businesses and/or industries in your city on sustainability projects?

Yes

(6.2a) Please provide some key examples of how your city collaborates with business and/or industries in the table below.

Collaboration area	Type of collaboration	Description of collaboration

Energy	Project delivery - Public Private Partnership	Tampere is converting and old paper plant area called Hiedanranta into ra residential area for 25 000 inhabitants and aiming to have 10 000 jobs in the area too. As this brownfield area has no existing infrastructure, it is suitable for a new energy system test bed. An energy vision for Hiedanranta was created in cooperation with the city, the local energy utility and researchers from the university and the research center VTT. The city then proceeded to put together an energy collaboration project with other Finnish cities to define and pilot smart energy solutions for cities. The Energy Wise Cities project aimed to boost the role of the participating cities towards international example areas of energy-efficient housing, zero-energy construction, diversified energy systems, energy efficiency monitoring and end user guidance. The integration of energy systems together with intelligent energy control enable open regional energy platforms and the development of flexible energy ecosystems. The future Hiedanranta is still in the process of urban planning, but the old factory buildings in the house a bunch of organisations, enterprises and experiments in the field of sustainability. There area smart energy systems for buildings, a new kind of concept for heat storage (Polar Night Energy), biocarbon production (Carbofex), dry toilets and nutrient cycles, vertical farming and nature based solutions. Currently the city is runnning a programme funded by the ministry of Economic affairs and Employment aiming to create ecosystems around energy solutions that would make smart buildings and blocks that can produce and store at least part of their own energy, with energy networks to balance the consumption and production in the area. This will involve all different kind of energy and ICT technologies being combined together. Tampere has a strong position in energy technology, district heating networks and ICT, so combing the three should produce interesting solutions that can be applied in many places.
Waste	Circular economy business model support	The cities of Tampere, Espoo and Turku are working together to develop new solutions of circular and sharing economy for urban environments through the KIEPPI project. Goal of the project is to develop Hiedanranta in Tampere, Kera in Espoo and Tiedepuisto in Turku into sustainable neighbourhoods that generate new business and jobs based on circular economy and the sharing economy.

		The end result of the project is a partnership model of a carbon-neutral district, in which the various material flows needed for urban growth circulate in the regional economy as much as possible and consuming as little resources as possible. The project brings together circular economy solutions that support the development of neighborhoods that are sustainable and attractive with their residents, jobs and services. The main target group is companies offering products and services for the circular and sharing economy. They will be offered opportunities to develop and pilot solutions in real environments. In addition, the target group is other companies promoting sustainable development, the scientific community and citizens. The project has produced several pilots in Tampere including circular economy in infrastructure construction, urban food production and sustainable, healthy green-blue structures. Each pilot included cooperation with either researches, NGOs or companies.
Transport (Mobility)	Project delivery - Public Private Partnership	Tampere is investing in a tramway that has a significant impact on the mobility system and land use planning as well as emissions. Tampere Tramway is being built and implemented according to the alliance model. An alliance is a cooperation model in which the implementing parties, builders and designers commit to the client's project at the earliest possible stage. Tampere Tramway's track infrastructure and depot, traffic and maintenance will all be implemented using the alliance model. The partners in the Tramway Alliance are the City of Tampere, VR Track Oy, YIT Rakennus Oy (construction), and Pöyry Finland Oy (planning). Tampere Tramway Ltd and the City of Tampere are the client parties in the Tramway Alliance. Working in alliance contracting model, all the parties are responsible for the project's planning and construction and they share the risks and benefits. The alliance allows for a shared project organisation, which keeps the focus on the resolution of problems instead of creating new ones. Alliances are characterised by solidarity and innovation, which helps improve quality and safety and influence the environment. Since the key control elements include a jointly agreed target cost and bonuses can be increased by reaching a cost level below the target, the model aims a curbing costs of big infrastructure investments. It also created common understanding on the big

		picture of urban development between different actors in the area.

Finance and Economic Opportunities

(6.5) List any mitigation, adaptation, water related or resilience projects you have planned within your city for which you hope to attract financing and provide details on the estimated costs and status of the project. If your city does not have any relevant projects, please select 'No relevant projects' under 'Project Area'.

Project area

Renewable energy

Project title

Bio-CCU transforming the local energy production and transportation into carbon negative sector coupling society

Stage of project development

Pre-feasibility/impact assessment

Status of financing

Project not funded and seeking full funding

Financing model identified

No

Identified financing model description

Project description and attach project proposal

The city is cooperating with the local power utility to study the possibilities of carbon capture and storage or use in the biomass CHP-power plant Naistenlahti 3. A promising technology has emerged in Finland by Q Power ltd for making methane out of the carbon captured. Producing synthetic methane from the flue gas of a biomass plant would make for a significant amount of alternative fuel for traffic or heat and power production. This would reduce emissions greatly, improve resource efficiency significantly and replace imported fuels with local ones thus improving energy security and resilience.

Total cost of project

Total investment cost needed

8. Energy

(8.0) Does your city have a renewable energy target?

Yes

(8.0a) Please provide details of your renewable energy target(s) and how the city plans to meet those targets.

Scale

City-wide

Energy sector

All energy sectors

Target type

Renewable energy generated (percentage)

Base year

2010

Total renewable energy covered by target in base year (based on target type specified in column 3)

Percentage renewable energy of total energy in base year

5

Target year

2030

Total renewable energy covered by target in target year (based on target type specified in column 3)

Percentage renewable energy of total energy in target year

90

Percentage of target achieved

50

Comment

This target is for the energy produced in the city of Tampere by the local power utility Tampereen Sähkölaitos. They provide all the district heating in the city and cover about one third of the city's elecricity demand. Currently 50 % of the energy production is renewable (2020).

Scale

Local government operations

Energy sector

Electricity

Target type

All electricity consumed (percentage)

Base year

2010

Total renewable energy covered by target in base year (based on target type specified in column 3)

Percentage renewable energy of total energy in base year

0

Target year

2015

Total renewable energy covered by target in target year (based on target type specified in column 3)

Percentage renewable energy of total energy in target year

100

Percentage of target achieved

100

Comment

This target is for the electricity consumed by the city organisation. All the electricity consumed is bought as Green electricity.

(8.1) Please indicate the source mix of electricity consumed in your city.

Electricity source

Coal

0

Gas

39

Oil

0

Nuclear

0

Hydro

6

Bioenergy (Biomass and Biofuels)

16

Wind

11

Geothermal

0

Solar (Photovoltaic and Thermal)

1

Waste to energy (excluding biomass component)

3

Other sources

24

Total - please ensure this equals 100%

100

Total electricity consumption (MWh)

1,857,000

Year data applies to

2019

What scale is the electricity mix data

Utility mix reported

Comment

Other sources stands for peat, which is used in combined heat and power production. The local production, which is represented in the production mix is 660 000 MWh. Out of the reported 1 857 GWh of consumption, and estimated 214 GWh of electricity is used for heating along with 19,3 GWh for ground-source heat pumps.

(8.1a) Please indicate the source mix of thermal energy (heating and cooling) consumed in your city.

Thermal energy consumption

Coal

0

Gas

17

Oil

10

Bioenergy (Biomass and Biofuel)
44

Geothermal
2

Solar (Thermal)
0

Waste to energy (excluding biomass component)
7

Other sources
20

Total (auto-calculated)
100

Total consumption (MWh)
2,432,000

Year data applies to
2019

What scale is the thermal energy mix data
City-wide mix reported

Comment
Mix combines district heating (1933 MWh), oil boilers in buildings (224 MWh), Natural gas boilers in buildings (9 GWh), wood heating in buildings (208 GWh) and ground source heat pumps (19,3 GWh of electricity corresponds roughly to 58 GWh of heat). .

(8.2) For each type of renewable energy within the city boundary, please report the installed capacity (MW) and annual generation (MWh).

	Installed capacity (MW)	Annual generation (MWh)	Year data applies to	Comment
Solar PV	1.7	1,500	2020	Maximum installed capacity of all the solar panels connected to local electricity network. Annual generation is an estimate based on the installed capacity and the assuming the panels in Finland will operate 900 hours at peak load capacity
Solar thermal				
Hydro power	20.4	32,000	2019	

Wind	0		2019	None within the city limits. The local power utility owns wind power plants at the South-Western coast of Finland.
Bioenergy (Biomass and Biofuels)	250	960,000	2020	38 MW Sarankulma wood pellets + 60 MW Hervanta wood chip boiler + 70 % of Naistenlahti 2 plant 180 MW + 50 % of Tammervoima waste incineration plant 52 MW
Geothermal		58,000	2019	No specific statistics exist as geothermal is used in individual buildings. We have an estimate of the electricity consumption, but the capacity is not clear. The generation is assumed to be three times the electrcity consumption.
Other, please specify				

(8.3) Does your city have a target to increase energy efficiency?

Yes

(8.3a) Please provide details on your city's energy efficiency targets.

Scale

Local government operations

Energy efficiency type covered by target

Reduce total energy consumption (in MWh)

Base year

2017

Total energy consumed/produced covered by target in base year (in unit specified in column 2)

Target year

2025

Total energy consumed/produced covered by target in target year (in unit specified in column 2)

Percentage of energy efficiency improvement in target year compared to base year levels

7.5

Percentage of target achieved

14

Plans to meet target (include details on types of energy in thermal /electricity)

Energy efficiency measures in the city-owned building stock as well as efficiency increases in the use of buildings.

Please indicate to which energy sector(s) the target applies (Multiple choice)

Public facility

(8.4) Please report the following energy access related information for your city.

Energy access

Electrification ratio of the city

100

Average electricity consumption per commercial establishment (MWh/annum)

Average electricity consumption per residential household (MWh/annum)

11.5

Average unit price of electricity (Currency unit as specified in 0.4/MWh)

0.17

Percentage of electricity distributed, but not billed

Percentage of city population with access to clean cooking

100

Comment

(8.5) How many households within the municipal boundary face energy poverty? Please select the threshold used for energy poverty in your city.

Energy Poverty

Number of households within the city boundary that face energy poverty

Threshold used for energy poverty

Do not measure energy poverty within the municipal boundary

Comment

Energy poverty in Finland does not have a defined threshold. Since energy prices and energy poverty are low , it is not in the center of energy policy in the area.

10. Transport

(10.0) Do you have mode share information available to report for the following transport types?

Passenger transport

(10.1) What is the mode share of each transport mode in your city for passenger transport?

Please complete

Private motorized transport

48

Rail/Metro/Tram

0

Buses (including BRT)

12

Ferries/ River boats

0

Walking

31

Cycling

7

Taxis or shared vehicles (i.e. for hire vehicles)

0

Micro-Mobility

1

Other

1

Comment

These values were obtained from the 2016 Traficom Tampere regional publication.

(10.3) Please provide the total fleet size and number of vehicle types for the following modes of transport.

	Number of private cars	Number of buses	Number of municipal fleet (excluding buses)	Number of freight vehicles	Number of taxis	Transport Network Companies (e.g. Uber, Lyft) fleet size	Customer-drive carshares (e.g. Car2Go,	Comment

							Drivenow) fleet size	
Total fleet size								
Electric								
Hybrid								
Plug in hybrid								
Hydrogen								

(10.5) Does your city have a low or zero-emission zone or restrictions on high polluting vehicles that cover a significant part of the city? (i.e. that disincentivises fossil fuel vehicles through a charge, a ban or access restriction)

No

12. Food

Food Consumption

(12.0) Report the total number of meals that are annually served and/or sold through programs managed by your city (this includes schools, hospitals, shelters, public canteens, etc.).

Total meals served or sold through programs managed by your city

Number of meals

12,000,000

Cities facilities

Schools

Hospitals

Other, please specify

children's day care centres and services of care sector

Comment

Carbon footprint for meals served is 13 500 t CO2-ekv/year and 1,2 kg CO2-ekv per meal. The share of food is 90% of total carbon footprint (other are transport and place of business)

(12.1) What is the per capita meat and dairy consumption (kg/yr) in your city?

Meat consumption per capita (kg/year)

Kg/Year/Capita

580,000

Year data applies to

2019

Is your city calculating emissions associated with this consumption?

Yes

Comment

The number the annual amount that Pirkanmaan Voimia Ltd has purchased meat and meat products in 2019 (not per capita). Carbon foodprint for meat was ca 4990 t CO2-ekv in 2019. Pirkanmaan Voimia Ltd is a company produces and organize meal services and is partly owned by the City of Tampere.

Dairy consumption per capita (kg/year)

Kg/Year/Capita

1,930,000

Year data applies to

2019

Is your city calculating emissions associated with this consumption?

Yes

Comment

The number the annual amount that Pirkanmaan Voimia Ltd has purchased dairy and dairy products in 2019 (not per capita). Carbon foodprint for dairy was ca 2900 t CO2-ekv in 2019. Pirkanmaan Voimia Ltd is a company produces and organize meal services and is partly owned by the City of Tampere.

Sustainable Food Policies and Actions

(12.3) Does your city have any policies relating to food consumption within your city? If so, please describe the expected outcome of the policy.

	Response	Please describe the expected outcome of the policy
Please complete	Yes	Pirkanmaan Voimia Ltd is a company produces and organize meal services and is partly owned by the City of Tampere. Under Pirkanman Voimia's Climate Roadmap, it is estimated that 50% of carbon emissions generated from the food could be avoided by 2030 for example by replacing beef, rice and green-house plants with more climate friendly options. Their goal is that 90% of meals they serve in 2030 are climate friendly and the amount of food waste will be reduced 90% to 2030 compared to year 2021. Pirkanmaan Voimia's environmental targets are that they commit to the environmental objectives of the City of Tampere, such as Carbon Neutral Tampere 2030 and they reduce food waste and increase the amount of vegetarian food to be served.

(12.4) How does your city increase access to sustainable foods?

Do you subsidise fresh fruits and vegetables?

Action implemented

No

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

Do you tax/ban higher carbon foods (meat, dairy, ultra-processed)?

Action implemented

No

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

Do you use regulatory mechanisms that limit advertising of higher carbon foods (meat, dairy, ultra-processed)?

Action implemented

No

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

Do you use regulatory mechanisms that limit the sale of higher carbon foods (meat, dairy, ultra-processed)?

Action implemented

No

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

Do you incentivise fresh fruit/vegetables vendor locations?

Action implemented

Yes

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

The consumption of beef will be gradually reduced and replaced with vegetable protein, broiler and fish. Vegetarian food option is available for students every day in upper secondary schools and vocational education institutions. Day-care centres and schools have a vegetarian food day once a week and vegetarian food is available daily on request. Vegetarian food is mainly lacto-ovovegetarian in school, i.e. it contains not only

vegetarian products but also milk and eggs. In 2020, forty schools and day care centres started an experiment that offers two lunch options every day: vegetarian food and non-vegetarian food. This approach will be gradually expanded so that by 2022 at the latest, vegetarian food will be available as one of the lunch option in all day-care centres, schools and educational institutions in Tampere. In 2019 9% in catering services had a vegetarian option, the target for 2030 is that 90% of them have a vegetarian option.

Do you have programs/policies/regulations on food surplus - either food surplus recovery and redistribution, or food waste avoidance programs (i.e. Love Food/Hate Waste)?

Action implemented

Yes

Please provide details and/or links to more information about the actions your city is taking to increase access to sustainable foods

In Tampere, the total amount of food waste is 5.2 million kilograms per year. The amount of food waste will be reduced 90% to 2030 compared to year 2021. Every day, 38,000 school meals are prepared for students in Tampere, with an average of 342 kg of food loss per day. Pirkanmaan Voimia Ltd has several methods to prevent food waste. Pirkanmaan Voimia Ltd is using CGI Waste Manager to help to minimize food waste. In 2019 in Tampere they generated an idea of that food left over from school meals would be served on the school children's side of the afternoon. Staff in all of day care centres and schools in Tampere have the opportunity to buy left over food. Kitchens are handing over waste food to food aid both warm and cool food. Pirkanmaan voimia is also using ResQ Club -app in some places to reduce food waste by selling leftover food to consumers via the app. Teachers in home economics classes at school are teaching kids knowledge and skills how to avoid food waste, for example leftovers recipes.

13. Waste

(13.0) What is the annual solid waste generation in your city?

	Amount of solid waste generated (tonnes/year)	Year data applies to	Please describe the methodology used to calculate the annual solid waste generation in your city
Please complete	105,000	2020	We know that the amount of municipal solid waste that Pirkanmaan Jätehuolto collected in 2020 from the entire Pirkanmaa Region is 228 000 tonnes. Pirkanmaan Jätehuolto is a company that handles the statutory waste management services of 17 municipalities in Pirkanmaa Region. There are over 520 000 residents in the Pirkanmaa region over 240 000 of which live in Tampere. Solid waste generation in Tampere can be estimated by

			calculating the amount of waste per person in Pirkanmaa region and multiplying by residents in Tampere.

14. Water Security

Water Supply

(14.0) What are the sources of your city's water supply?

Surface water, from sources located fully or partially within city boundary
Surface water, from sources outside the city boundary (by water transfer schemes)
Ground water

(14.1) What percentage of your city's population has access to potable water supply service?

100

(14.2) Are you aware of any substantive current or future risks to your city's water security?

Yes

(14.2a) Please identify the risks to your city's water security as well as the timescale and level of risk.

Water security risk drivers	Anticipated timescale	Estimated magnitude of potential impact	Estimated probability of impact	Risk description
Increased water stress	Current	Less Serious	Low	Water stress is a potential risk to ground water sources due to increased and intensified droughts. However this does not pose a significant risk because Tampere has also 2 surface water banks and one artificial groundwater plant.
Declining water quality	Medium-term (by 2050)	Less Serious	Medium-low	Increased rain and precipitation can cause degradation of quality surface waters in future. Dystrophic levels of surface waters are controllable via processing, even though processing causes incremental costs. Rising temperatures during summer time spur the growth of blue-green algae.
Inadequate or ageing water	Current	Less Serious	Medium	Tampere Water waterworks have long-term plans for new investments, repairs and replacements. Tampere

supply infrastructure				Water is aware of buildings in need for renewal.
Higher water prices	Current	Less Serious	Low	The building of new central purification center and the increasing amount of different requirements putting upward pressure on prices. Climate change can put pressures on prices if the quality of raw water decreases and the maintenance of infrastructure are more expensive.
Environmental regulations	Current	Less Serious	Medium-low	New regulations put pressures on intensification of processes and demand for investments. Also in some cases environmental regulations and the law of conservation of nature require reduction of water intakes.
Increased water demand	Current	Less Serious	Low	During droughts demand for water and water consumption increases. Tampere has several water sources including 2 surface water sources.
Drought	Current	Less Serious	Low	Increased and intensified droughts are potential risks to ground water sources and can decrease the ground water levels. Tampere has several water sources including 2 surface water sources.
Energy supply issues	Current	Less Serious	Medium-low	Storms and severe winds can cause black-outs or power cuts. Tampere Water waterworks cooperating with Tampereen Sähkölaitos, the local power utility, to ensure reliability performance during incidents. In some locations, there are also stand-by generators.
Rationing of municipal water supply	Current	Serious	Medium	Acts of water supply and wastewater purification require environmental permits. Environmental impact evaluation project, environmental impact assessment and environmental permit process can take up to 10 years to complete. Long processes, huge influence of residents, conflict between different interests or laws are potential risks.

				For example in some destinations the law of conservation of nature require reduction of water intakes and have a conflict with water demand.
Severe weather events	Current	Less Serious	Low	Storms can cause black-outs and power cuts which can disturb water distribution. Tampere Water waterworks cooperating with Tampereen Sähkölaitos, the local power utility, to ensure reliability performance during incidents. The capacity of water reservoir are good and water towers store enough water to last for 6-10 hours.
Ecosystem vulnerability	Current	Less Serious	Low	Water extraction could have an impact to a ecosystems dependent on ground water. Groundwater extraction can be replaced by surface water extraction. Ecosystems are also vulnerable to incidents and hazards such as tanker truck accidents.
Change in land-use	Current	Serious	Medium	Nature conservation areas put pressures on water supply infrastructures. Costs from changes in land use, but also increase in requirements and conflicts in the future.
Pollution incidents	Current	Serious	Medium	Possibility of tanker truck accidents in river basin, road traffic or drainage system. At the Lake Julkusjärvi groundwater extraction plant has a permit of exception because old industrial waste is being mobilised due to land management. Contaminated land with high concentrations does not pose risks to human health, because there are two sources of water exstraction, resulting in dilution of concentrations. In total there are 2 surface water sources and 5 groundwater sources in the city's feedwater system.
Other, please specify	Current	Less Serious	Medium	Investments require money and labour. It is important that the funding is secured.

Inadequacy of economic or human resources				
Other, please specify Wrong kind of political guidance	Medium-term (by 2050)	Less Serious	Low	Political guidance does not address the needs of water supply and all decisions made are not right for water supply from that point of view.

Water Supply Management

(14.3) Please select the actions you are taking to reduce the risks to your city's water security.

Risks

Adaptation action

Other, please specify

Risk management

Status of action

Operation

Action description and implementation progress

The maintenance of contingency and emergency plans and disruption training are part of risk management. The contingency plan is from 2019.

Risks

Adaptation action

Diversifying water supply (including new sources)

Status of action

Pre-implementation

Action description and implementation progress

The artificial groundwater project, Tavase, will further improve the supply of water in exceptional conditions.

Risks

Adaptation action

Other, please specify

Risk management

Status of action

Monitoring and reporting

Action description and implementation progress

Tampereen Vesilaitos use Granite Risk Management tool to identify and assess risks, implement corrective measures, and to monitor results and deliver on set goals.

Risks

Adaptation action

Other, please specify

Water safety plan and sanitation safety plan

Status of action

Monitoring and reporting

Action description and implementation progress

Water safety plan (water supply included) and sanitation safety plan including risks assessment from 2017 are updated regularly.

(14.4) Does your city have a publicly available Water Resource Management strategy?

Yes

(14.4a) Please provide more information on your city's public Water Resource Management strategy.

Publication title and attach document

Tampereen kaupunki ja Tampereen Vesi: Tampereen kaupungin vesihuollon kehittämissuunnitelma

Year of adoption from local government

2020

Web link

https://www.tampere.fi/tiedostot/t/vwtgg5zFz/Vesihuollonkehittamissuunnitelmaluonnos.pdf

Does this strategy include sanitation services?

Yes

Stage of implementation

Strategy in implementation

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