



Climate City Contract

2030 Climate Neutrality Investment Plan

2030 Climate Neutrality Investment Plan – Lahti

Lahti





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Glossary of Terms

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



1 Part A – Current State of Climate Investment

Part A “Current State of Climate Investment” is the **structural element** of the climate neutrality investment plan, putting the basis for the development of the plan through a detailed-oriented evaluation and assessment of your city’s existing financial policies and funding/financing activities.

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

This section represents the initial step of the 2030 Climate Neutrality Investment Plan (Investment Plan) and will require you to evaluate and assess previous and existing funding and financing for climate activities by field of action.

A-1.1: Textual element

Introduction

Cities and municipalities play a key role in fighting climate change, and Lahti has been a forerunner among European cities in the fight against climate change. Climate-neutrality was set as a goal of Lahti in 2009, when the first emission reduction targets were placed, and Lahti’s efforts to fight climate change resulted in Lahti being appointed as the European Green Capital for 2021. The work in Lahti continues as ambitious as before, in order to reach the climate goals set by the city. This investment plan, complementing the Action Plan of Lahti, plays an important role in mapping out the current status of investments and potential future investment needs, as well as identified barriers and risks of climate investments.

The city of Lahti has made three official climate-related main targets, that cover all three scopes defined by the Greenhouse Gas Protocol:

- 1) City’s own target: Carbon neutral by 2025, with 80% decrease in production-based emissions compared to 1990 and compensation for the remaining emissions. This target was set by the city board in 2019 and included in the city strategy by a Council decision in 2022 (scope 1). In absolute terms, the target for 2025 is 216 kt CO₂e.
- 2) As part of the national HINKU network (Towards Carbon Neutral Municipalities) Lahti targets to cut its use-based emissions by 80% by 2030 compared to 2007 levels (scope 1 and 2).
- 3) Reducing consumption-based emissions by 50% by 2030, compared to 2005, as defined in the targets of Fisu network (Finnish Sustainable Communities) (scope 1, 2 and 3).

The approach of Lahti is presented in figure 1. To reach these targets, it is necessary to make considerable investments by the city itself, its subsidiaries as well as by other stakeholders such as inhabitants and the private sector. In addition to the city’s own typical financial sources, a significant amount of national and EU funding is needed in the path towards net zero.

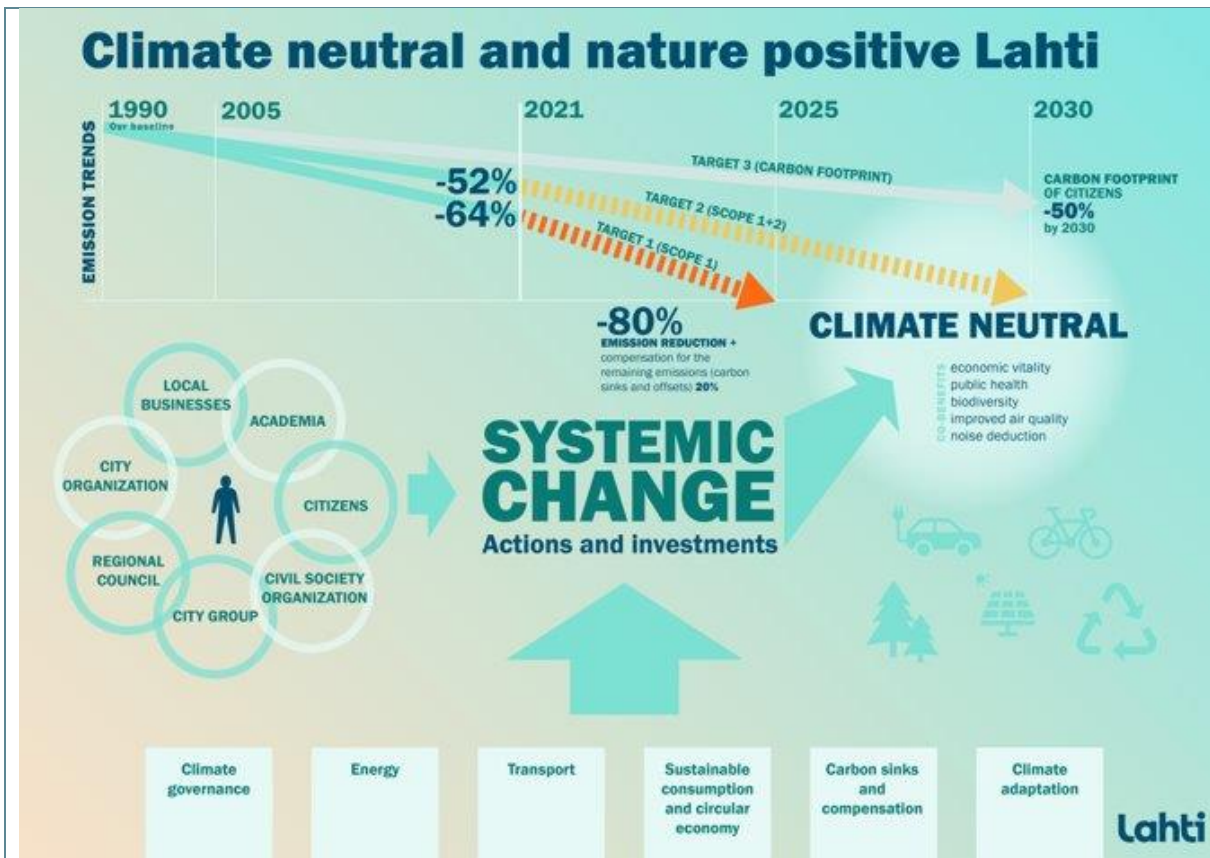


Figure 1. Lahti’s climate targets and vision of the systemic change to reach climate neutrality.

The environmental policies and strategies of Lahti are currently under development, with focus specifically on procurement, partnerships, as well as the link between financial management and climate governance. In the long run, climate actions also have a positive impact on the city’s economy and industries, such as enabling cheaper electricity and creating job opportunities. Lahti is profiled as a home to the circular economy and green technology companies, which already account for 8% of Lahti’s jobs. This in turn enables investment opportunities that have a positive impact on the city economy and trade.

Funding and financing of climate action

Existing funding of climate action in the City of Lahti is largely based on the city’s own budget resources and tax revenue (see table 2), but also on short-term and long-term loans (see table 3), when green investments are taken into consideration. Other minor sources of financing are typically project funding sources like EU, regional council, ministries, and other public institutions.

According to the City of Lahti’s environmental balance sheet for 2022, the costs and investments for environmental protection (including activities which primarily aim at promoting environmental protection or sustainable use of natural resources) were 7.8 and 2.4 M€, respectively, of which 1.6 and 1.7 M€ were for air quality and climate protection.

An essential part of the climate action of the City of Lahti is carried out by its subsidiaries, i.e. companies either fully or partially owned by the city. These companies include Lahti Energia Ltd (energy company), Lahden Talot Ltd (housing), Labio Ltd (biogas), Salpakierto Ltd (waste management and circular economy), LADEC Ltd (regional development company), and Päijät-Hämeen Ateriapalvelut Ltd (Meal Services of the Päijät-Häme region). These companies contribute to city budget, but also need economical input from the city, for example loan grantees and subventions in certain operations.

In 2023, the City of Lahti is prepared to lend 15 M€ for its subsidiaries, and further 20 M€ in 2024 - 2025. Estimate of dividends paid by these companies for the city is around 2.6 M€ in 2023. For example, Lahti Energia Ltd is expected to be capable to contribute with 1 M€ per year in 2023 – 2025 and Lahden Talot Ltd housing company with 0.5 M€.



Built environment

Mapping methods of reducing emissions in all phases of the construction process of a new building is already a deep-rooted practice in the processes of the City of Lahti. City-owned housing company Lahden Talot Ltd is an active and independent actor in climate investments, such as: heating control systems, ventilation upgrades, wastewater heat recovery, water saving solutions and solar power. It is also committed to the principles of the national level energy efficiency agreement (VAETS, Vuokra-asuntoyhteisöjen energiatehokkuussopimus), which also guides its investments.

The City of Lahti also makes climate investments in its own public buildings. EIB has been financing several school and kindergarten green building projects in Lahti over the past years. The financing rate has been max. 50%. Energy saving and sustainable construction solutions have been the main indicators in securing the financing. The construction projects of multi-purpose public buildings in Lahti are following green portfolio targets and this financing will be sought in coming years. For example, the portfolio and budget of four buildings is expected to exceed over 100 M€. In the near future, a so-called green investment portfolio will be compiled when construction projects are ready to seek financing. This typically means several public buildings to be built or renovated at the same time.

In 2021, City of Lahti established the Carbon Neutral Construction Development Center together with the city's subsidiaries, local educational institutions, and private companies. The Carbon Neutral Construction Development Center is actively implementing different types of climate projects and coordinating different kinds of construction projects. The city itself is financing the Centre (2023) with a sum of 99 316 €. Together with AKKE- financing (support for sustainable growth from the Regional Council of Päijät-Häme), the Centre has 248 289 € at its disposal.

Energy

Lahti Energia Ltd, a fully city-owned energy producer and distributor, is traditionally the biggest single investing unit in the city group with major impact on the development of Lahti's emissions. It produces both electricity and district heat; 80% of all households in Lahti are connected to its district heating network. Lahti Energia has already decreased the emissions from district heating by 70% from 1990 by shifting from charcoal combustion to biomass in 2019. The investments to green energy in the past two decades have been significant. In 2022, Lahti Energia Ltd made 14 M€ investments into climate measures, including low-carbon electricity and district heat production, electric transportation, and circular economy projects. Further low-carbon investments are expected by 2030. In 2025, a new electric boiler will be connected into the network, while future plans (yet to be confirmed) include an additional electric boiler, heat storage, and CO₂ capture. A considerable amount of the financing of Lahti Energia comes from the city budget, but financing for the new investments will be sought also from the EU Innovation Fund.

Lahti Energia Ltd closely cooperates with the private sector in the acceleration of green transition. In 2023, Lahti Energia launched a co-operated biogas reactor with a major brewery Hartwall Ltd. Furthermore, one of the biggest hydrogen production facilities in Finland is planned to start its production in Lahti in cooperation between Lahti Energia Ltd and Nordic Ren-Gas Ltd. This private investment amounts to 250 M€, but the decision regarding the investment is yet to be confirmed.

Lahti has also attracted several green energy business investments, including a 2.8 MW solar power plant at ISKU's furniture factory with a production capacity of 2 600 MWh per year.

Transport

Low carbon mobility investments in Lahti typically include bike lanes, roads and other facilities for sustainable mobility. Investments in bike lanes and infrastructure are also a substantial part of the Sustainable Urban Mobility Plan, SUMP. Furthermore, the City of Lahti launched the Mankeli electric city bike service in 2021 and there are nowadays 500 bikes available for citizens at an affordable rate. As a part of the Mission Pilot City Project portfolio, there is also a project for sustainable commuting to work, with a budget of 1 M€ for 2023-2025.

City of Lahti is the biggest financing municipality of the regional public transport cooperation authority Lahti Region Transport LSL (Lahden seudun liikenne). The transport commissioned by LSL operates mostly in the city and the nearby communities. The bus fleet consists of 92 buses, which reach a distance of around 8 million km per line per year. LSL started running 17 electric buses in the summer of 2021. More electric buses were obtained in 2022, giving Lahti a total of 32 electric buses in 2022, as well as 37 buses running on renewable biodiesel. Approximately two-thirds of Lahti's public transport currently runs on alternative propulsion systems. Furthermore, LSL got a funding of 280 000 € for further development of green mobility as



well as promotion of public transport in 2023. Regarding new developments, an innovative pilot project with autonomous electric buses will be introduced during 2023.

Regional development company LADEC, of which city of Lahti has 80% ownership, is active in developing new businesses in the Lahti region, e.g. a so-called Green Electrification of Mobility (GEM) Cluster. With the help of city financing, the company has succeeded to gather and maintain a cluster of around 40 companies active in RDI and production of green mobility solutions and services in Lahti and even abroad.

"The Lahti Last Mile project", which is a cooperation between LAB University of Applied Sciences and LADEC, focuses on planning and describing a new model of operation for transport of goods. The solutions will be planned together with courier companies, retail stores, charging infrastructure companies, representants of the city, and Lahti GEM cluster for electric transport.

In addition, LUT University has been active in the green mobility solutions sector, establishing a professorship in electric transportation systems (partly funded by the companies in GEM Cluster) and a related new master's programme.

Private sector

According to research carried out recently among the Swedish municipalities, it has been estimated that an average municipality can cover approximately 15% of the overall local investment needs to reach the net zero target. This means that a strong contribution by the corporate world, other public stakeholders and civil society will be needed to achieve essential investments and financial flows. As explained above, the City of Lahti has actively accelerated the low carbon development of the private sector in both energy and transport sectors.

The industries in Lahti are also investing in low carbon solutions. Examples include Wipak's investments in low-emission printing and laminating machinery and Kempower's new EV charger factory, to be opened in Mukkula in 2024. Such private investments not only help Lahti to decrease the emission in the region but have a wider impact outside of Lahti with their carbon handprint.

Summary of existing climate funding and financing

Table 1 presents a summary of the most relevant costs and investments of the city organization related to climate change mitigation in Lahti in 2022 or 2023 (planned). Costs are compared with the total budget of the City of Lahti (504 161 000 € for 2023) and investments to the total investments of the City of Lahti (78 136 000 €). The shares are not calculated for the costs or investments of the subsidiaries, which also are not included in the budget and total investment values above.

The nature of impact of actions included in table 1 on Lahti's climate-related targets vary; for example, the actions of Lahti Energia Ltd reduce the scope 1 emissions (i.e. emissions occurring within the city boundary) while the construction of wooden buildings by Lahden Talot Ltd contributes to reduction of scope 3 emissions when compared with traditional buildings.

In addition to the costs and investments presented in table 1, climate change mitigation is accelerated in several projects, examples of which are listed below.

1. Pilot project for autonomous public transport: 32 000 €, consisting of financial support (30 000 €) to the company responsible for the pilot, as well as own work by the city
2. Life-IP-Canemure (including Lahden Talot): 400 917 €
3. "Municipality Carbon sink" project ("Kuntanielu" in Finnish), considering compensation based on carbon sinks in the land use sector: 10 000 €
4. Lahti's climate budget: 70 000 €
5. Campaigners: 87 875 €
6. Go Green Routes: 505 000 €
7. Sustainable inclusion in Lahti: 125 000 €
8. Systemic Change Towards Sustainable Commuting in Lahti (City of Lahti, LAB, LUT, Päijät-Häme Wellbeing Services County), 1 000 000 €

Fields of Action	Sector Subsection	Planned project budget (% Current Budget Allocation)
Transportation	<i>Sustainable transport as well as land use planning and construction costs in Pippo-Kujala industrial and commercial site</i>	<i>14 100 000 € (2023, investments) 18% of total investments</i>



	<i>Actions related to the SUMP programme (Sustainable Urban Mobility Plan) including, e.g. electric city bikes ("Mankeli bikes") rental, construction of bike lanes, or planning costs related to safe and sustainable mobility</i>	64 100 000 € (2023–2030, total costs and investments) 8 012 500 € on average per year 1% of total costs and investments
	<i>Pedestrian and cycling routes to Pippo-Kujala (planning only)</i>	60 000 € (2023, costs) 0.01% of total costs
Built Environment	<i>Lahden Talot Ltd – city owned housing company and new wooden building objects</i>	3 030 000 € (2022, costs) 230 000 € (2022, investments)
	<i>Carbon Neutral Construction Development Center.</i>	248 289 € (2023, investments) 0.3% of total investments
	<i>Lahti city's own building and construction unit Tilakeskus and its green projects, such as shifting to low-emission energy in the city's buildings; energy efficiency improvements; dimmable lighting, etc.</i>	651 700 € (2022, costs) 0.1% of total costs
Energy Systems	<i>Projects of Lahti Energia Ltd, a subsidiary of the city of Lahti, such as recovery of waste heat in district heat production and increasing the amount of solar power</i>	6 129 549 € (2022, costs) 13 728 000 € (2022, investments)
Green Infrastructure and Nature Based Solutions	<i>Construction of green areas, such as parks and meadows</i>	2 916 000 € (2023, costs) 0.6% of total costs
Waste and Circular Economy	<i>Waste and circular economy activities of Salpakierto Oy, a subsidiary of the City of Lahti</i>	20 207 200 € (2022, costs) 230 000 € (2022, investments)

Table 1: Finance Sources By Field of Actions

1.2 Module IP-A2: Strategic Funding and Financing Evaluation

You will evaluate your city's existing financial policies to understand how they are currently managing the capital allocation towards net zero. This will include strategies in place and what your city has at its disposal to facilitate the transition. Your team should identify the forms of capital it has access to and which are specific to their climate neutrality targets.

A-2.1: Textual element

Climate budgeting in Lahti

The use of monetary resources for climate action in the City of Lahti has been monitored and reported annually, for example in Lahti's environmental balance sheet. However, there has not been a separate budgeting section for climate actions; financial allocations to different types of climate action have been included in different parts of the city budget.

In 2023, the City of Lahti will start planning and working on its first comprehensive climate budget in a project financed by the Ministry of the Environment, Finland. Climate actions will be integrated more effectively into the financial planning and monitoring of the city. Emission reduction potential of different types of actions will be determined more precisely, while resources and investment needs will be identified more clearly. Cost-benefit analyses are planned to be carried out where useful. These will be included in the budgetary estimates and reported in the financial statement of the city. The climate management will be integrated closely into the annual financial planning cycle. Through the new climate budget, the financial administration and all administrative branches of the city are expected to be committed in different actions in a very concrete way.



City of Lahti's efforts in the Mission for climate-neutral and smart cities programme will concentrate on energy and transportation sectors, which are the biggest sources of CO₂ emissions. The most considerable emission reduction impacts in these fields can be achieved through renewable energy production, energy saving and energy efficiency of the built environment, modal shift to sustainable mobility and electrification of mobility. These fields of action have also been identified as strategically important for the city, and the city with its subsidiaries and other partners has already implemented actions and secured financing for them (see table 1). In addition to these key areas, the new city climate budget will take into consideration a wider palette of climate actions to be implemented in the city.

Lahti takes national and international politics and policies into account in its climate budgeting. At a national level, the Climate Act and the Medium-term Climate Change Policy Plan aim at carbon-neutral Finland by 2035. National politics, policies and actions support the allocation of capital towards net zero in cities as well. Many EU climate policies and regulations are implemented locally in cities or have an impact on cities. These include, among others, the EU Emissions Trading System (ETS), the Fit for 55 package, the Energy Efficiency Directive and the RePowerEU program.

Funding strategies of the City of Lahti

The city budget includes financial strategies over a specified period of time in order to fund investments and projects e.g. in the climate program of the city. It includes the total costs of the projects, the funding sources that will be used to finance these projects and a breakdown by project, planned expenditures over time and even potential income produced by the action.

Until now, the climate action in the city administration and its branches have mainly been funded by the city's traditional income sources (see table 2) like taxes, user fees and rent, government transfers, service charges and fines. Together, these add up to 100% of the income sources for the city. Large scale investments have typically been funded by loans from commercial banks and Munifin (Municipality Finance Plc, which is owned by Finnish municipalities), the public sector pension fund Keva and the Finnish government.

The share of EU and national support funds in the city budget is rather modest and typically varies considerably year by year depending on the number of EU and nationally funded projects. However, the city of Lahti and its subsidiaries, active in climate action, have been rather successful in obtaining financial support from various sources (e.g. EIB) regarding investments in green building activities and low carbon energy production. At the same time, EU financing has been considered as somewhat complicated to apply for, and it has also not been always available when needed. It is expected that the city's new climate budgeting practices would support both project funding availability and access to funds.

Role of subsidiaries

The City of Lahti's subsidiaries are independent financial units, and they are obliged to obtain funding by themselves from various sources on the financial markets and they also have considerable income sources from their own business activities. The business income they gain are kept by themselves, not transferred into the city budget, except the possible annual profit distribution as explained in part IP-A1. This climate action related green income and profit is considerable in certain years especially in Lahti Energia Ltd and Labio Ltd (biogas producer). Lahti Energia Ltd is very active in reinvesting the green income into new climate action projects like hydrogen production or green electricity and district heat production.

Potential new funding sources and strategies

Reaching net zero requires the utilization of new types of funding sources and strategies. For example, funding sources like ELENA, or European Urban Initiative (EUI) could be considered as potential sources for municipal sustainable and energy efficient building and renovation activities. The City of Lahti and its own building and construction unit Tilakeskus, or Lahden Talot Ltd subsidiary could even consider activating a consortium with other stakeholders and partner organisations on the public housing business, to achieve a wider basket of housing and building objects to be funded with sustainability targets. It would also be possible to boost almost every building's clean energy production by installing solar panels on rooftops in the area and connecting them to the grid, which would also provide monetary savings in the longer run.

In the case of certain types of climate actions, formation of a partnership-owned company with for example, capital investors, could be the most effective solution for organizing and managing a new innovative activity. This type of action could be, for example, a green energy supply unit for the transport sector, where the city could have a minor investor shareholder and landowner facilitating role. This type of arrangement could open



new financial sources on the private financial market and public business support funding from various sources. City of Lahti could participate in this kind of climate action also through its subsidiaries.

Another example of a new funding type is ESIR funding (EIB), which has been considered as a possible way to finance larger scale municipal public building investments including a full life cycle service management and maintenance. This approach would mean that the service producer was responsible for planning, construction, and maintenance the building in a climate friendly way for the next 20 years or more. Furthermore, the service producer would be paid only if the contractual climate targets were achieved during the whole establishment and maintenance period. This type of full life cycle service management and maintenance implementation could be useful also in certain climate action related infrastructure and transport solutions. The life cycle service approach would also allow a more flexible funding, as the costs are divided between several years to come.

As a new approach, the city could support transition to green transportation for example by establishing a rental service for green vehicles for transport companies. There have been some pilot projects of this kind in Finland, though with less success in the past years. However, new funding possibilities for partnership companies for this purpose might, in the future, include European venture capital funds (EuVECA), European Social Entrepreneurship Funds (EuSEF) and Recovery and Resilience Facility (RRF).

The regional development company LADEC, of which the City of Lahti is a major owner (80%), facilitates development projects with numerous private companies participating in clusters and networks. These client companies of LADEC are potentially in a good position to achieve public support and funding or even capital investors' funding. Possible funding source for these companies include green loans (sustainability linked loans), green market capital investment funds, the Finnish Climate Fund, institutional investors (growth and buyout, venture capital), Business Finland, InvestEU (NIB, Finnvera) and EIB. Direct investment and project funding for these companies involved in LADEC's processes can lever and multiply the financial contribution in a local climate action effort and result in greater CO₂ emission cuts, as the scalability of climate action in a network of facilitated companies is bigger than in a single company.

Income Category	City income	% of city budget
<i>Municipality tax / income tax (estimate 2023);</i>	206 785 000 €	47%
<i>Property taxes (estimate 2023)</i>	43 200 000 €	10%
<i>Corporate taxes (estimate 2023)</i>	29 331 000 €	7%
<i>Sales revenue (estimate 2023)</i>	24 195 300 €	5%
<i>Fees charged (estimate 2023)</i>	14 400 400 €	3%
<i>Grants and subsidies (estimate 2023)</i>	25 235 100 €	6%
<i>Rental income (estimate 2023)</i>	88 125 500 €	20%
<i>Other proceeds (estimate 2023)</i>	11 235 100 €	3%

Table 2: List of income sources for the city

Type	Size Range	Level	Description
<i>Government transfers</i>	87 372 000 € netto	<i>Public</i>	<i>Government transfers, current number, 2023</i>
<i>Loans</i>	9 100 000 € netto 81 000 000 € brutto	<i>Private/ public</i>	<i>New loans minus amortization of old loans, current number, 2023</i> <i>New loans only</i>
<i>Dividends paid by subsidiaries</i>	2 556 000 € netto	<i>Private/ public</i>	<i>current number, 2023</i>



<i>Other capital sources</i>	-132 400 € netto 481 600 € brutto	<i>Private/ public</i>	<i>Other capital income minus capital expenses</i> <i>All "other capital income", current number, 2023</i>
<i>Interest income</i>	- 7 879 000 € netto 13 536 000 € brutto		<i>income minus expenses, current number, 2023</i> <i>income only</i>

Table 3: List of capital sources for the city

1.3 Module IP-A3: Barriers to Climate Investment

You will need to evaluate and identify the range of structural, policy, economic, and financial barriers for capital deployment in support of climate action.

A-3.1: Textual element

Introduction

Reaching net zero requires investments by the City of Lahti, its subsidiaries, local companies, and other stakeholders. Table 4 presents the key barriers identified, some of which are also explained below.

Financing and funding climate action of the city

The financial needs of the city include investments, loan amortization and loans given to the city's subsidiaries. In 2023 new long-term loans amount to 81 M€ and correspondingly old long-term loans will be amortized by 72 M€. As a result, new debt will increase by 9 M€, and this has been set as an absolute limit in 2023. According to the budgeting plans for 2023-2025 new long-term loans will amount up to 268 M€ and old long-term debt will be amortized by 166 M€. Net debt will increase by 102 M€ between 2023-2025.

Further investments are needed to reach net zero, but at the same time, the City of Lahti is mapping out alternative solutions to avoid more debts, which is strongly supported by the city's political decision-makers. Finding alternative sources for funding may involve several challenges related to project or sector-specific issues, or to more general funding and financing related issues (see table 4). For example, there is a risk of rising financial costs in current green debt portfolio in the City of Lahti and partnering stakeholders.

Furthermore, financing the construction of public buildings and properties using loans may cause delays in the building process in case financial challenges are faced. These delays may, in turn, cause a delay in the emission reduction process if low-emission buildings cannot be put into use. A new model of financing, where capital investors build the properties and the city rents them, could be one solution to avoid those challenges.

The City's role in accelerating climate investments of the private sector

Several emission sources in Lahti are out of the city's direct control, and it may be challenging to engage private companies in climate investments. Incentives to do climate efforts in companies are often based on economic interests, so concrete energy or cost savings could be key elements to engage these stakeholders.

Public procurement is generally an efficient way of accelerating climate investments. However, ongoing service contracts (such as public transport, waste, maintenance etc.) and their duration have an impact on the short-term potential to accelerate climate action through procurement. For example, public transport has binding contracts with bus companies up to 2029 and therefore, public procurement criteria cannot be used as an incentive for greener fleet. However, these companies have already invested in new electric and gas vehicles in order to meet future requirements.

Challenges related to human resources, project preparation and coordination

Available human resources, recruitment capabilities and HR budgeting for experts like grant writers, project managers and consultants can sometimes act as a hinder for solid project portfolio construction. The smaller the organisation is, the bigger the challenge. Networking, consortiums, and facilitators could be potential



solutions to this, but even these need efforts to be utilized. Identifying local actors makes budgeting actions easier.

Accessibility of funds for project pre-planning and preparation activities is often a constraint. Certain funding up to 20 000 € can be applied from the Regional Council (public sector projects) and in the case of private companies, from Business Finland. This is not always known and needs attention among the potential applicants and facilitators.

Coordination of climate action and activities is needed. Information flow, shared indicators and operational synergies need special attention. It can, however, be challenging to find a suitable coordinator for a wide range of different actions, and coordination also needs to be financed. Quite often this challenge is tackled by appointing experts into several local management and steering groups.. Coordination could also be enhanced by funding the activities partially from a single and centralised local climate funding source – the money flow and follow-up would bring in the information. If for example, the Mission for climate-neutral and smart cities programme would appear locally as a partial funding source, it would obviously lead to a coordinated information flow of climate actions by 2030.

Examples of specific challenges related to green transportation and mobility

The city's transport and logistics vendors sometimes explain that they do not have access to emission free vehicles, because of e.g. financial challenges related to investing in electric vehicles. It seems that the possibility to lease the vehicles is not always considered as an option. In cases where leasing is more expensive than buying, it could be worth considering subsidizing the more expensive alternative. Leasing electric vehicles could also enable more frequent updates to the vehicle fleet compared to complete ownership of the fleet.

Bicycles can be too expensive for low-income households. This is especially true when it comes to electric bicycles, even though there might be a will to use them, for example, for commuting purposes. Procurement aid on socioeconomical grounds could work as a solution. Both EU and the city could be a part of assisting in providing the required economical resources. The target group could consist of e.g. students and unemployed inhabitants of the city. The system could involve a platform of reselling/recycling, which would prevent users from misusing the system.

Financial Barriers to achieving Climate Neutrality	Typology of Barrier	Description	Sector and stakeholders involved
<i>Using loans in order to fund climate investments</i>	<i>Financial</i>	<i>The city aims at decreasing its debt. Therefore, alternative financial sources need to be identified. Also, finding sources of capital (i.e., loans) can sometimes cause a delay in implementing a project. This in turn can mean that, for example, a new carbon-neutral building cannot be put into use, causing a delay in achieving a goal related to reduction of emissions.</i>	<i>The entire city and its sources of capital</i>
<i>Engaging private companies in doing climate investments</i>	<i>Structural</i>	<i>Not all private companies see a reason for doing climate investments. This is true especially if the investments do not meet</i>	<i>Both completely private companies and companies partially owned by the city.</i>



		<i>the economic interests of the company.</i>	
<i>Multi-year service contracts or investments which are preventing the city from doing new, climate neutral investments.</i>	<i>Economic/ structural</i>	<i>For example, if a public transport company has made big investments in and/or long contracts with a company that focuses on manufacturing diesel buses.</i>	<i>City of Lahti, LSL, vehicle manufacturers and importers</i>
<i>Available human resources</i>	<i>Structural</i>	<i>Lack of sufficient human resources can act as a hinder for agile portfolio construction. Many tasks related to climate investments seem to lack an answer to the "who should do this" question.</i>	<i>City of Lahti, private companies</i>
<i>Accessibility of funds and ability to apply for funding</i>	<i>Financial</i>	<i>Resources are needed for project pre-planning and preparation activities. Potential applicants do not always know where they can apply for funding for their projects.</i>	<i>City of Lahti, private companies</i>
<i>Coordination of implementing organisations and activities.</i>	<i>Structural</i>	<i>Lack of a coordinator and financing for coordination activities. Quite often this challenge is tackled by cross-appointment of experts into several local management and steering groups. However, a centralised coordination unit for local climate action could be a considerable asset.</i>	<i>City of Lahti, private companies</i>
<i>Lack of knowledge regarding possibilities to lease climate-smart solutions.</i>	<i>Structural</i>	<i>For example, if a private company does not know (or want to) lease the required equipment and is waiting for the funding to buy the equipment instead.</i>	<i>City of Lahti, city-owned companies, private companies</i>
<i>Not all households have the necessary resources to invest in climate-friendly solutions.</i>	<i>Socioeconomic</i>	<i>Electric cars and bikes can be too expensive for many people, leading to the fossil fuel powered vehicles to remain in use. The same goes for making residential buildings more energy efficient or changing to more climate friendly heating. Inhabitants may not afford a one-time investment, even though the investment would be</i>	<i>Inhabitants, financial institutions</i>



		<i>profitable in a longer perspective.</i>	
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Table 4: Barriers to Climate Investment



2 Part B – Investment Pathways towards Climate Neutrality by 2030

Part B “Investment Pathways towards Climate Neutrality by 2030” is in place to capture the actions and needs for mobilising and delivering the funding and financing needed for climate neutrality. This Part of the Investment Plan will be aligned with and build upon the Action Plan. In addition, each of these Plans are likely to entail multiple iterations over the course of the path to climate neutrality.

2.1 Module IP-B1: Cost Scenarios for Climate Neutrality

These are the actions and measures which make up the 2030 Climate Neutrality Action Plan that need to be costed. Given the Investment Plan needs to be practical, the measures defined within the Action Plan need to be tagged by how much they will cost for the city, considering implementation and operational costs, so the city budget can be adapted to include them.

Cities have the option to provide cost estimates at their own discretion on the measures disclosed in the Action Plan template as per table B-2.2 and in the Investment Plan template as per table B1.2. Given these cost estimates for the actions, cities can then include non-sectorial costs (the cost of the levers to implement these actions) these should be considered alongside the concrete actions.

B-1.1: Textual element

Introduction

The actions of the city of Lahti to reach climate neutrality by 2030 are presented in Lahti’s Climate Neutrality Action Plan, which in turn is based on the Lahti Climate Program 2023-2030 (Lahden ilmasto-ohjelma 2023-2030). The Lahti Climate Program 2023-2030 has been updated in spring 2023 and approved by the city board. Hence, the actions have political acceptance, but funding is not secured until the single action are in the city budget or when alternative funding is secured. Sectoral costing estimates are presented in table 5, and required funding and financing is also discussed below.

Energy

Investment needs in the energy sector are related to the production of carbon neutral electricity and district heat by Lahti Energia Ltd, production of renewable energy in buildings and potential expansion of biogas production by Labio Ltd.

In addition, there are investment needs in the private sector and households for energy renovations but these are not covered by the city.

Transportation

In terms of reducing emissions from transportation, the costs for implementing the city’s Sustainable Urban Mobility Plan (SUMP) have been estimated and included in Table 5. The largest share of these costs is marked for investments in pedestrian and biking infrastructure.

It has been estimated that electric car usage will grow fast in Lahti and according to estimates, the amount of fully electric cars in the city may exceed 8 000 - 9 000 in 2030. This will require investments by the citizens and also cause considerable needs for new infrastructure investments including planning, network and charging stations. There will be considerable investment needs also in cooperative housing units and detached houses for electric car charging stations. Residential city districts also need updated electricity network, cable lines and transformer infrastructure.

Accelerating climate investments of the private sector

In the near future LADEC could have a considerable role regarding energy sufficiency climate action among industrial and commercial companies in Lahti. The partnering companies in climate action organized by LADEC can contribute remarkably to the emission reductions in Lahti by 2030. LADEC’s project portfolio



needs financial support during the coming years, to facilitate and implement the foreseen climate actions, but the required amount of resources is yet to be confirmed.

City of Lahti together with LADEC are actively developing a considerable enlargement of Pippo-Kujala industrial and commercial site (app. 4 000 employees), which is located in the logistic hot spot aside a major highway crossing nearby the city centre. Development and construction of the site will require considerable investments in the coming years. This location is also excellent for establishing an electrical charging station for heavy transport trucks. This charging station in Lahti is planned to serve local transport companies as well as passing by heavy transport and it will be a part of the national electric charging stations network for heavy transport. This development process needs considerable investments in city planning and the overall electrical, network and road infrastructure of Pippo-Kujala. Improving the distribution of biogas and hydrogen for heavy transport is also considered in Lahti.

Sectoral costing table

Table 5 presents estimated costs, investment needs and direct emission reduction impacts of the actions which were estimated to have the highest emission reduction potential and/or highest expenses during the update of the Lahti Climate Program 2023-2030. In addition to the estimates gathered and prepared during the update of the program, some additional cost, emission reduction and cost-benefit estimates were made for the purposes of this plan. Information on estimated costs and investments presented in the city budgeting materials were also used in table 5.

There are still some uncertainties and risks related to funding of some of the projects. Furthermore, some of them do not yet have the required political support which increases uncertainties related to their implementation. The status of decision making, and securement of funding has been indicated in the table, where relevant. For example, the campaign year for sustainable mobility 2025 is a so-called bonus action which means that it is not yet decided how the campaign will take place and what the budget would be.

For many actions the investment or operational costs have not yet been estimated and they are therefore marked as "n/a".

The table does not cover all planned actions or strategies. More information on different actions, including those for the themes "waste and circular economy" as well as "cross-cutting" will be provided when climate budgeting work progresses. Furthermore, many of the actions needed to reach net zero require changes in policy and behaviour and are not directly linked to financial investments by the city and are therefore not included in the table.

Fields of Action	Action / Indicator	Implementati on Costs/Capex	Operational Costs	Direct impacts (Emission reductions)*	Indirect impacts (co-benefits)*
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<p>Transportation</p> <p><i>SUMP - all measures</i></p>	<p><i>Implementation of Lahti's Sustainable Urban Mobility Plan (SUMP), including e.g.</i></p> <ul style="list-style-type: none"> - cycle lane prioritization - promoting sustainable commuter mobility - development of cooperation between service network planning and traffic planning - low-emission public transport - enabling the distribution of alternative fuels - promotion of electric transportation 	<p>64.1 M€</p> <p><i>(total sum in 2023-2030, related to all SUMP measures)</i></p> <p><i>Political decision made, but financing not secured</i></p>		<p>0.4-1.3 ktCO₂e / year in 2023-2030</p>	<p><i>Positive health impacts, better air quality, reduction of noise pollution, improved traffic safety, economic benefits for inhabitants and the city, a more pleasant environment, equality in mobility, image benefits</i></p>
<p><i>Campaign year for sustainable mobility 2025</i></p>	<p><i>Implementing actions to reduce mobility-related CO₂-emissions</i></p>	<p><i>n/a</i></p> <p><i>Political decision made, but financing not secured</i></p>	<p><i>n/a</i></p>	<p>61.8 ktCO₂e by 2030 (requires several successful emission reduction experiments during the year 2025 and scaling up best solutions 2026-2030). This number is, in other words, not the direct reduction in emissions during 2025, but the goal for 2030.</p>	<p><i>Positive health impacts, better air quality, reduction of noise pollution, improved traffic safety, economic benefits for inhabitants and the city, a more pleasant environment, equality in mobility, image benefits</i></p>
<p><i>Electric cars</i></p>	<p><i>Increase the number of electric cars in the city</i></p>	<p>284.7 M€ (total sum in 2023-2030, assuming that there will be 8500 electric cars in the city in 2030, while there were 860 electric cars in 2022)</p> <p><i>(The investment cost of the same amount of new</i></p>		<p>9.3 ktCO₂e in 2030 when comparing emissions from gasoline and diesel cars to electric cars</p>	<p><i>Better air quality, less emissions. Reduced health costs due to reduced particulate matter emissions estimated at 0.07 M€.</i></p>



		<p>petrol cars: 174.1 M€)</p> <p>Investment mainly by inhabitants and the private sector</p>			
<p>Energy systems</p> <p>Electric boiler</p>	<p>Peak heat production with electric boiler (planned to be in operation in 2024, 60MW)</p>	<p>10 M€ investments related to electric boiler in operation in 2024</p> <p>Investment decision made.</p>		<p>2 ktCO₂e / year in 2024-2030</p>	<p>Better air quality, less emissions, increased energy self-sufficiency, development of new competencies and business, diversification of the energy system, image benefits, cost savings</p>
<p>Electric boiler and heat storages</p>	<p>Additional peak heat production with electric boiler and thermal energy storage</p>	<p>Classified (figures exist and that these can be provided upon request by the evaluators for the purpose of evaluation only)</p>		<p>8 ktCO₂e / year in 2026-2030</p>	<p>Better air quality, less emissions, increased energy self-sufficiency, development of new competencies and business, diversification of the energy system, image benefits, cost savings</p>
<p>CCU</p>	<p>Carbon capture in district heat production</p>	<p>Classified for Lahti Energia's part of the project. (figures exist and that these can be provided upon request by the evaluators for the purpose of evaluation only)</p> <p>The value of the investment in total is, when considering also the private investment, approx. 250 M€. Cost estimate, investment decision pending</p>	<p>Classified</p>	<p>43-85 ktCO₂e / year in 2026-2030</p>	<p>Better air quality, less emissions, increased energy self-sufficiency, new possibilities of the circular economy, development of new competencies and business, image benefits</p>



Solar panels	Solar energy production in city-owned real estates	1.7 M€ (total sum in 2023-2030) Cost estimate, assuming that solar panels on the roofs of new city-owned buildings would cover 2% of total electricity need in 2030 of city-owned buildings	-1.2 M€ (total sum in 2023-2030)	35 tCO ₂ e / year in 2025-2030	Better air quality, reduced emissions, increased energy self-sufficiency, diversification of the energy system, image benefits, cost savings
Biogas production capacity	Increasing the amount of biogas being produced	Classified (figures exist and that these can be provided upon request by the evaluators for the purpose of evaluation only) Cost estimate, no investment decisions made	n/a	2.5 ktCO ₂ e / year in 2025-2030 (If all natural gas used in industry was replaced with biogas, then the emission reduction would be 4.78 ktCO ₂ e / year in 2025-2030, assuming that the use of gas in industry remains at the 2022 level.)	Better air quality, reduced emissions, increased energy self-sufficiency, new possibilities of the circular economy, development of new competencies and business, diversification of the energy system, image benefits
Built environment	Lighting in public areas	0.7 M€ (total sum in 2023-2030)	-1 M€ (total sum in 2023-2030)	0.01-0.04 ktCO ₂ e / year in 2023-2030	Cost savings caused by energy saving for the city
	The carbon handprint of the built environment	n/a	n/a	30 ktCO ₂ e / year in 2025-2030	Reduced emissions, cost savings in the long run
	Implementation of energy renovations	84.0 M€ (if energy renovations are implemented in 10% of the buildings in the city). Investments mainly those of	n/a	2 ktCO ₂ e / year when energy renovations have been implemented	Employment impact 655 person-years, better air quality, reduced emissions, increased



		<i>inhabitants and companies.</i>			<i>energy self-sufficiency.</i>
<i>Green Infrastructure & Nature Based Solutions</i>	<i>Compensation</i>	<i>n/a</i>	<i>11.3 M€ (total sum in 2025-2030)</i>	<i>22-129 ktCO₂e / year in 2025-2030</i>	<i>Strengthening carbon sinks, image benefits, a more pleasant environment</i>
<i>Waste and Circular Economy</i>	<i>Implementation of Lahti's Circular Economy Roadmap</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
<i>Cross Cutting Costs</i>	<i>The work towards climate neutrality that is being made in the city organization, ie. coordinating, facilitating, and promoting climate work in the city.</i>	<i>n/a</i>	<i>Approx. 600 000 € / year</i>	<i>n/a</i>	<i>n/a</i>

*Referring to the Action Plan

**Indicative indicators

Table 5: Sectorial Costing

2.2 Module IP-B2: Capital Planning for Climate Neutrality

You will need to define your city's capital goals and how to achieve them. As you implement its programme the below sources of capital can be laid out as a starting point. These should be aligned with your city's goals and relevant to the actions selected. Ideally this will be a target and then you will optimise towards.

Textual element
<p>Capital planning for climate neutrality will build on the measures mentioned above in this document. The existing financial resources have been listed earlier in Part A. Capital sources add up to 124 880 600 € in total (2023) while the income sources at Lahti's disposal were 483 055 400 €.</p> <p>To meet the requirements for capital to finance all actions that have been planned as well as staying economically sustainable, new sources of capital need to be investigated. This includes both private sources of funding and an increased amount of EU funding. As can be seen in the table above, some of the actions that are now being planned are large investments that require a corresponding amount of capital.</p> <p>The potential national financial sources include equity capital, the state shared revenues, the state aid and loaning. In addition to the city's own and national funding, it is possible for cities to receive international funding, for example from the EU Structural Funds and the European Investment Bank (EIB).</p>



The main equity capital of Lahti consists of taxes, charges, and fees. The city covers part of its expenses with charges and fees, which are received for example from water and sewage companies. Lahti also receives shares of the participation costs, for example in the form of road expenses. Other equity sources of the city include wages for the works performed by the city to private businesses, rents and the associations that cities and municipalities found among themselves. State shared revenues are partly distributed to municipalities, including Lahti.

Cities have various ways of borrowing. These are mainly state banks granting loans with low interest rates and long terms; private banks; and municipal bonds issued.

Capital need	Possible Sources of Capital	Sector allocation
Classified	European Investment Bank, private funding institutions, the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI	Energy, electric boilers and heat storages Partly in the city group budget, partly bending
Full investment 250 M€. Lahti Energia's part classified.	Funding applied from EU Innovation Fund, EUI, Ministry of Economic Affairs and Employment. Other possible funding sources: European Investment Bank, private funding institutions, city subsidiaries, the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU,	Energy, CCU Cost estimate, investment decision pending
700 000 €	European Investment Bank, private funding institutions, city subsidiaries, the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI	Energy, lighting in public areas Partly in the city group budget
1 700 000 €	European Investment Bank, private funding institutions, city subsidiaries, the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI	Energy, solar panels Partly in the city budget
Classified	European Investment Bank, private funding institutions, city subsidiaries, the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI	Energy, biogas production capacity Cost estimate
48 600 000 €	European Investment Bank, private funding institutions, city subsidiaries (e.g. Lahden Seudun Liikenne), the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI	Sustainable mobility, transportation. (Includes both implementation costs/capex and operational costs.) Partly in the city budget but all funding until 2030 not secured yet.
15 500 000 €	European Investment Bank, private funding institutions, city subsidiaries (e.g. Lahden Seudun	Sustainable mobility, transportation. (Includes both



	<i>Liikenne), the Finnish Government (government transfers), Finnvera, Munifin, EuVECA, InvestEU, Eu Innovation Fund, EUI</i>	<i>implementation costs/capex and operational costs.) Funding not secured.</i>
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Table 6: Capital Planning

2.3 Module IP-B3: Economic and Financial Indicators for Monitoring, Evaluation and Learning

A range of financial policies need to be considered to execute the actions laid out in the 2030 Climate Neutrality Action Plan. You should align your city’s financial policies with their current process and capital allocation. This will depend on the actions selected and be drawn from possible financial tools to assist the transition.

B-3.1: Textual element

Generally, indicators used for the monitoring, evaluation and learning processes can consist of economic/ financial indicators or be related to emissions. Certain indicators are based on the financial statement of the city, additionally, more specific indicators can be used to measure progress in the action it self , such as calculating how many kilometres of new pedestrian and cycling routes have been built. Specific sectors or programs in the city include their own indicators, for example, the implementation of the Municipalities’ Energy Efficiency Agreement, to which Lahti is committed, is evaluated by the improved energy efficiency is as monitored through cost savings.

The work to make decisions regarding indicators is still a work in progress that will mainly be carried out in a near future. In this process, a system for monitoring, evaluation and learning (MEL) will be used to, follow up the execution of the plan and its elements, schedules, etc.

The volume of climate measures implemented in the transport sector will be measured, for example, by the share of electric bus traffic in the total bus traffic and increased public transport ticket revenue. In order to increase the options for low-emission transport, investments in public transport and electric charging points are needed. The city promotes its climate work by switching to low-emission alternatives for the city’s own vehicles and by encouraging its employees to move more sustainably with, for example, the employee bicycle benefit. In the field of mobility and transportation, indicators will thus consist of euros invested in electric buses, changes in the public transport user volumes, and construction of new pedestrian cycling routes. In addition, indicators related to EV charging points and bike usage volumes will illustrate if and how much the share of sustainable means of transportation are increasing.

The share of renewable energy sources in the production of district heat and in the production and procurement of electricity are important for increasing in order to achieve carbon neutrality. Investments and construction costs are examples of indicators of this carbon neutrality development. In the future, the goal is that all heat, cooling, steam and electricity used in the area will be carbon-neutrally produced. Investments to be made in a near future include electric boilers and storages, CCU, solar panels, and biogas production. These can all be counted as green investments and thus, work as indicators for green investments in the energy sector.

Oil heating in properties owned by the city, have been replaced mainly by district heating, The development from oil to geothermal heating, water-air heat pumps or district heating continues in privately-owned properties, and can be monitored by measuring the number of oil-heated buildings and their floor area and connection fees from buildings connected to district heating network. Emissions of the building stock can also be reduced through energy efficiency measures. Energy-saving measures bring savings in euros to the city.

The monitoring, evaluation and learning processes of the city’s climate work are extended to different sectors. In addition to the sectors mentioned above, for example, the city’s green areas and the organization of waste management are part of the city’s climate work, and the related indicators are to be monitored. The city’s investments are not only allocated to the built environment, but also, for example, on compensating emissions



and calculating the carbon footprint. The carbon footprint of all the city procurement is annually monitored and carbon footprint of events organized by the city are to be estimated.

The city uses an online platform Lahti Environmental watch for monitoring the progress in climate work. The following step is to collect baseline information for all new indicators from 2023 and bring these to the platform with information on responsibilities and technical details of the indicator. The persons responsible for reporting will get automatic notifications when it's time to report the indicator in the system. Once we are informed of the baseline we can set final targets for 2030 and intermediate targets where suitable. A workshop is planned for the autumn of 2023 for more detailed planning of the indicators, data collection and targets.

Fields of Action	Indicator	Indicator Unit	Indicator Baseline*	Indicator Target 2030*
Transportation	<i>Pedestrian and Cycling Infrastructure</i>	<i>construction of new pedestrian and cycling routes</i>	<i>162 km</i>	<i>n/a</i>
	<i>Public transport</i>	<i>euros invested in electric buses (in 2022 the proportion of electric buses of all buses was 33%, 31/92 buses)</i>	<i>33% of the value of all buses</i>	<i>50% of the value of all buses</i>
		<i>increasing the number of public transport customers (%)</i> <i>increasing the public transport ticket income</i>	<i>The pre-pandemic level</i>	<i>n/a</i>
	<i>Charging points for electric cars</i>	<i>- number of charging points</i> <i>- construction costs in euros</i>	<i>172 charging points</i>	<i>n/a</i>
	<i>City-owned vehicles</i>	<i>- euros used for low-emission vehicles owned by the city</i> <i>- annual savings in CO2-based motor vehicle taxes in euros</i>	<i>n/a</i>	<i>n/a</i>
	<i>Employee bike benefit</i>	<i>-euros allocated to bike benefit</i> <i>-number of acquired bikes</i>	<i>n/a</i>	<i>n/a</i>
	<i>City bike system</i>	<i>ticket revenue of the city bike system in euros</i>	<i>n/a</i>	<i>n/a</i>
Built Environment	<i>Energy efficiency in buildings</i>	<i>annual energy savings of buildings in euros</i>	<i>n/a</i>	<i>n/a</i>



	<i>Lighting</i>	<i>annual lighting energy savings in euros</i>	<i>n/a</i>	<i>n/a</i>
Energy Systems	<i>District heating</i>	<i>- buildings connected to district heating network / connection fees in euros - construction costs of heating network in euros</i>	<i>n/a</i>	<i>n/a</i>
	<i>Renewable energy</i>	<i>- Lahti Energia's investments in electric boilers and storages - investments in CCU technologies - city's investments in solar panels - city's investments in biogas production – the share of renewable energy sources in electricity in procurement, %</i>	<i>n/a</i>	<i>n/a</i>
	<i>Waste heat recovery, e.g. at wastewater treatment plants</i>	<i>the annual energy savings caused by waste heat recovery in euros</i>	<i>n/a</i>	<i>n/a</i>
Green Infrastructure and Nature Based Solutions	<i>Green areas</i>	<i>euros used annually for increasing and maintaining green areas</i>	<i>2 900 000 €</i>	<i>n/a</i>
Waste and Circular Economy	<i>Waste management</i>	<i>waste management fees</i>	<i>3 710 820 €</i>	<i>n/a</i>
	<i>Sale of the city's fixed assets for reuse</i>	<i>all sales revenue in euros</i>	<i>24 195 300 €</i>	<i>n/a</i>
	<i>Carbon footprint of all the city procurement</i>	<i>euros allocated to the calculations</i>	<i>n/a</i>	<i>n/a</i>
	<i>Carbon footprint of events organized by the city</i>	<i>euros allocated to the calculations</i>	<i>n/a</i>	<i>n/a</i>

*Indicative indicators

Table 7: Economic indicators by sector



Fields of Action	Indicator	Indicator Unit
General	<i>Total Public Capital Invested in Climate Actions</i>	<i>EUR m)</i>
	<i>Budget Assigned to Climate Action Projects</i>	<i>(%)</i>
	<i>Capital Invested in Climate Action Projects per Capita</i>	<i>(EUR k)</i>
	<i>Total Private Capital Invested in Climate Actions</i>	<i>(EUR m)</i>
	<i>Coverage of Climate Finance Gap</i>	<i>(%)</i>
	<i>Public to Private Capital Ratio</i>	<i>(0.00x)</i>
	<i>Emission Return on Invested Capital</i>	<i>(EUR m)</i>
	<i>Cost Coverage</i>	
	<i>Debt to Budget Ratio</i>	
Transportation	<i>Capital Investment</i>	<ul style="list-style-type: none"> - % of capital invested in green transportation (over the all-city budget) - total investments in euros - number of new transportation projects the city plans to invest in
	<i>Cost effectiveness (euros / tCO2 reductions)</i>	<i>unit of carbon reduced per euro spent in green transportation</i>
Built Environment	<i>Capital Investment</i>	<ul style="list-style-type: none"> - total sum of subsidies received for replacing oil heating in city properties in euros - investments in increasing energy efficiency of buildings
	<i>Cost effectiveness (euros / tCO2 reductions)</i>	<i>unit of carbon reduced per euro spent in climate-friendly built environment</i>
Energy Systems	<i>Capital Investment</i>	<ul style="list-style-type: none"> - Lahti Energia's investments in electric boilers and storages - investments in CCU technologies - city's investments in solar panels - city's investments in biogas production
	<i>Cost effectiveness (euros / tCO2 reductions)</i>	<i>unit of carbon reduced per euro spent in green investment in energy sector</i>
Green Infrastructure and Nature Based Solutions	<i>Capital Investment</i>	<ul style="list-style-type: none"> - investments in restoration and afforestation of city-owned land - investments in nature-based solutions, e.g. biochar -euros used annually by the city for compensation ("other compensation", excl. renewable, net carbon sinks, carbon



		<i>footprint caused by building and construction)</i>
	<i>Cost effectiveness (euros / tCO2 reductions)</i>	<i>unit of carbon reduced per euro spent in green infrastructure and nature-based solutions</i>
Waste and Circular Economy	<i>Capital Investment</i>	<ul style="list-style-type: none"> - investments to implement circular economy measures - investments in waste management - investments in calculating the carbon footprint of all the city procurement and events organized by the city
	<i>Cost effectiveness (euros / tCO2 reductions)</i>	<i>unit of carbon reduced per euro spent in waste and circular economy</i>

Table 8: Financial indicators by sector



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

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

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

You will need to optimise the allocation of capital between both public and private sources across the portfolio outlined in the Action Plan to meet the cost of the actions identified for reaching climate neutrality over time.

C-1.1: Textual element

Reaching climate goals of the city is strongly affected by national and international (climate) policies. National policies include those in the new Government Programme (2023) while international policies are mostly those of the EU (e.g. RePowerEU and EU Taxonomy). Policies work in both ways: they can function as something that enables a certain climate action, but in some cases policies can also work as a disadvantage, making it more difficult for the city to acquire climate financing and reach its climate goals. However, such obstacles created by existing policies, should not stop the city from coming up with unique solutions.

At the national level, the Climate Act and the Medium-term Climate Change Policy Plan aim at carbon neutral Finland by 2035. National level policies and actions support capital allocation towards net zero also in the cities, but there are increasing uncertainties about the continuation of the support under the recently elected government.

Many EU climate policies and regulations are implemented at the city level or have an impact on the cities. These include, but are not limited to, the EU emissions trading system (ETS), The Fit for 55 package, Energy Efficiency Directive and RePowerEU programme. The RePowerEU programme was launched by the European Commission after the energy crisis caused by Russia's invasion to Ukraine and it aims at saving energy, producing clean energy, and diversifying energy supplies. In other words, phasing out fossil fuels that have at least partially been of Russian origin in the past.

Implementation of national and EU level regulations often have cost implications and may require investments. Albeit potentially requiring more resources in the initial stage, the long-term effects on the local economy will usually be of positive nature, not to mention the effects on health or other environmental matters. For instance, measures carried out due to energy efficiency regulations reduce operational costs in cities. Also implementation of the RePowerEU programme will require a lot of investments towards low-emission energy generation, sustainable solutions for the built environment and so on even before 2030, but in the long run these investments will be profitable.

New policies and regulations related to climate change can also affect the operations of companies in cities and, along with that, the economy of cities. For example, the EU taxonomy requires certain financial and non-financial actors to report on their activities based on a common definition of environmentally sustainable activities, including climate change mitigation. The taxonomy aims at redirecting capital flows towards such activities.

The change in market and the economy also affects implementation of the city of Lahti’s Investment Plan. Climate-related regulation and initiatives can raise the costs of raw materials (such as steel) and energy and lead to new taxes and tariffs, changing the economic environment in which the cities and businesses operate. If the capital environment weakens, R&D investments may decrease, as well as opportunities for utilizing low-carbon technologies. At the same time, inability to adapt to a carbon-neutral economy threatens the wealth in cities. For this reason, it is important to follow the development of technology to ensure the right timing of investments and divestments.



Climate work of the city of Lahti is strongly guided by the goal of carbon neutrality. The target means that production-based emissions are reduced to 80% of the 1990 level, and the rest removed by sinks and/or compensated in other ways. Achieving the goal strongly affects the operation of the entire city and must also be taken into account in decisions regarding the city's economy.

The Lahti Climate Program was updated in 2023, focusing especially on climate change mitigation measures and the evaluation of their effects. At the same time, the emission calculations were revised, and detailed emission scenarios were drawn up for the years 2025-2030. As a new, additional approach, the monitoring of consumption-based emissions, i.e., the carbon footprint of citizens, was introduced. The parts of the plan concerning adaptation to climate change, assessments of risks and vulnerabilities, and adaptation measures are from 2019. Since the plan has a strong impact on the city's operations and budget, the costs of the most significant measures have been estimated in the plan and included accordingly in this Investment Plan. A more detailed climate budget system is being prepared to be introduced in the cities budgeting in 2024.

Lahti's Sustainable Urban Mobility Plan (2019) and Lahti's Circular Economy Roadmap (2022) with their measures complemented by the Climate Program. In the update, the essential parts of Lahti's Carbon Sink and Carbon Compensation Plan (2020) were also brought into the Climate Program. In addition, the plans of the city's subsidiaries, such as Lahti Energia, Lahden Talot, Lahti Aqua, Salpakierto, Päijät-Hämeen Ateriapalelut, and Labio Oy have been taken into account in the Climate Program.

Climate Policy	Description of the policy (sector, targeted audience, etc.)	Intended Outcome for Capital Formation
<i>The Lahti Climate Program 2023-2030</i>	<p><i>The plan includes the measures to achieve the city's carbon neutrality target, as well as calculations and scenarios for reducing emissions.</i></p> <p><i>The climate program also contains, for example, carbon sink and carbon compensation measures.</i></p>	<i>The costs of the most significant measures have been estimated in the plan.</i>
<i>Lahti's Sustainable Urban Mobility Plan</i>	<i>SUMP (Sustainable Urban Mobility Plan) is an Action Plan based on the guidelines of the European Commission. The plan implements the city of Lahti's strategy through urban mobility and encourages a shift towards more sustainable forms of mobility.</i>	<i>According to the Climate Program, the cost estimate for the actions of the SUMP plan to be implemented during the years 2023-2030 is 64.1 M€.</i>
<i>City of Lahti Procurement Plan 2023-2026</i>	<i>The plan outlines the city's procurement policies, which take circular economy and climate into account.</i>	<i>The proportion of requests for tenders promoting carbon neutrality is monitored.</i>
<i>Plans of the city's subsidiaries</i>	<i>Plans and measures of the city's subsidiaries, such as Lahti Energia, Lahden Talot, Lahti Aqua, Salpakierto and Labio Oy, require investments and have an impact on the city's emissions. The plans of these subsidiaries have been taken into account in the Climate Program.</i>	<i>For example, in the case of Lahti Energia, new energy solutions and significant investments are needed. Furthermore, the price of energy can affect the economy of the city and its residents.</i>
<i>Lahti's Circular Economy Roadmap</i>	<i>The roadmap guides the city from a linear economy towards a circular economy and zero waste including measures, indicators and responsible parties.</i>	<i>The Roadmap vision includes that the promotion of circular economy is part of the budget of the city and its subsidiaries.</i>



<p><i>The national Climate Act</i></p>	<p><i>The emission reduction targets are -60% by 2030, -80% by 2040 and -90% but aiming at -95% by 2050, compared to the levels in 1990. According to the Act, Finland must be carbon neutral by 2035 at the latest.</i></p>	<p><i>The Act enables the development of a stable investment environment towards net zero in cities.</i></p>
<p><i>The Government Programme 2023</i></p>	<p><i>Finland is committed to the objectives of the Climate Act. The Government will focus its climate action on generating cost-effectiveness, technology neutrality and sustainable business while recognising the importance of a long-term approach across parliamentary terms for attracting investments.</i></p>	<p><i>The policy is expected to promote sustainable private investments in the city.</i></p>
<p><i>The Government Programme 2023</i></p>	<p><i>Finland will be a leader in clean energy: Businesses will be offered stable and predictable operating conditions to promote the green transition and cleantech investments and attract new business to Finland.</i></p> <p><i>The Government will explore and, as far as possible, implement the extension of the scope of the infrastructure derogation in the interest deduction limitation with respect to large-scale energy projects. The Government will explore the need and possibilities for the central government to participate in financing solutions for strategic investments primarily through instruments in the form of guarantees or capital investments.</i></p>	<p><i>The policy is expected to promote investments related to large-scale energy projects in the city.</i></p>
<p><i>The Government Programme 2023</i></p>	<p><i>Clean Energy Finland -projects</i></p>	<p><i>The national level investment support is 160 M€. The support is expected to bring clean energy investments to cities.</i></p>
<p><i>The Government Programme 2023</i></p>	<p><i>The Government will ensure that the regulatory and permit processes for solar power parks are uniform, flexible and predictable throughout the country.</i></p> <p><i>The up-to-dateness of the determination of the tax values of the structures of solar power plants is checked, ensuring that the solar power plant is not subject to a disproportionately higher property tax than wind power.</i></p>	<p><i>Solar power parks are expected to become more common due to improved profitability and accelerated permit processes also in the cities.</i></p>
<p><i>The Government Programme 2023</i></p>	<p><i>The government continues the MAL agreement (land use, housing and transport) procedure with the largest urban regions. The agreements focus specifically on</i></p>	<p><i>The link between meeting the objectives of MAL agreements and financing the investments will be strengthened. The Government Programme 2023 includes</i></p>



	<p><i>ensuring the conditions for regional growth and accessibility through infrastructure and housing production investments. MAL agreements will be linked to the national transport system plan.</i></p> <p><i>Urban areas will be encouraged to increase the density of the urban form, promote public transport, cycling and walking, and prevent segregation.</i></p> <p><i>Together with six other cities in the area, the City of Lahti and the Regional Council of Päijät-Häme, has a MAL- agreement with the Finnish government, creating a foundation for promoting climate actions efficiently</i></p>	<p><i>investment support to MAL agreements.</i></p>
<p><i>The Government Programme 2019</i></p>	<p><i>In Finland, the use of fossil fuel oil for heating will be gradually phased out by the beginning of the 2030s.</i></p> <p><i>ARA (The Housing Finance and Development Centre of Finland) offers grants to municipalities, residents and communities for changing the form of heating from oil to a more sustainable one in the properties they own.</i></p> <p><i>Replacing oil or gas heating in private houses is also financed through the ELY (Centre for Economic Development, Transport and the Environment) and tax credit for household expenses.</i></p>	<p><i>The municipalities, residents and communities have been able to apply for ARA and ELY grants to switch to low-emission forms of heating since 2020.</i></p>
<p><i>The act banning the use of coal for energy generation in 2029</i></p>	<p><i>Coal-fired power and heating generation will be banned as of 1 May 2029.</i></p>	<p><i>Programme of Prime Minister Sanna Marin’s Government 2019 included supporting investments to replace coal, 90 M€ during the budget planning period.</i></p>
<p><i>Land Use and Building Act (927/2021), (132/1999)</i></p>	<p><i>New construction and large-scale renovations will be subject to a minimum requirement of renewable energy. In construction projects, it must be ensured that at least 38 percent of the calculated purchased energy used in a new building or a building undergoing large-scale renovation is renewable, if it is technically, functionally and economically feasible.</i></p>	<p><i>These requirements ensure investments in renewable energy in new construction and large-scale renovations.</i></p>
<p><i>KIRA, the programme on a low-carbon built environment</i></p>	<p><i>The programme on a low-carbon built environment offers a total of 40 M€ funding in 2021–2023 to support Finnish companies and other organisations in developing</i></p>	<p><i>Funded projects have concerned, for example, development of climate and energy impact assessment and solutions for low-carbon suburban development.</i></p>



	<i>low-carbon solutions related to the built environment. Municipalities and other public procurement entities can receive funding for innovative public procurement.</i>	
<i>Green Finance</i>	<i>MuniFin (Municipality Finance Plc) Green Finance is aimed at financing climate- and environment-friendly investments. The terms of green financing are otherwise the same as those of MuniFin other financing, but Green Finance is more affordable for the customer than a regular loan or leasing. The greener the project, the cheaper the financing.</i>	<i>MuniFin's Green Finance can be used to finance the city's climate projects.</i>
<i>EU Directive on Energy Efficiency and Energy Efficiency Act</i>	<i>The Energy Efficiency Directive (EU/27/2012) entered into force on 4 December 2012 and its amendment (EU/2018/2002) on 24 December 2018. The Energy Efficiency Directive lays down energy efficiency targets at the EU and national level, the national energy saving obligation and measures and obligations to promote energy efficiency. As part of the Fit for 55 Package, the Commission submitted its proposal on the Energy Efficiency Directive recast on 14 July 2021. The target to reduce energy consumption by 32.5% in the EU will be tightened to 36–39% and the target will become binding. Based on the Commission's formula for Member States, Finland would need to limit final energy consumption to 255 TWh by 2030.</i>	<i>These requirements encourage investments to be directed to improving energy efficiency and, for example, energy-efficient construction.</i>
<i>The Renewable Energy Directive, (RED II; 2018/2001).</i>	<i>Finland has announced that it aims for a renewable energy share of at least 51 percent in 2030. The RED II directive also requires that 14 percent of the energy used by transport in the member states is renewable energy by 2030.</i>	<i>The Directive encourages directing investments to renewables and stabilizes the investment environment.</i>
<i>EU emission trading system (ETS)</i>	<i>A cap, or limit, is set on the total amount of certain GHGs that can be emitted by the factories, power plants and other installations in the system. The cap is reduced over time so that total emissions reduce. The system allows trading of emission allowances so that the total emissions of the installations and aircraft operators stays within the cap and the least-cost measures can be taken to reduce emissions. (Directive 2003/87/EC, Delegated Decision (EU)</i>	<i>The system can bring investments in low-carbon technologies to ETS power plants and other installations. Revenues from the sale of the allowances are put into the social fund. The social climate fund will provide support to vulnerable groups.</i>



	<p>2020/1071 and Delegated Regulation (EU) 2021/1416.)</p> <p>The Fit for 55 package aims to reform the EU ETS by making it more ambitious. New provisions include:</p> <ul style="list-style-type: none"> -inclusion of emissions from maritime transport -faster reduction of emissions allowances in the system and gradual phasing-out of free allowances for some sectors -implementation of the global carbon offsetting and reduction scheme for international aviation (CORSIA) 	
The Fit for 55 package	The European Climate Law makes reaching the EU's climate goal of reducing EU emissions by at least 55% by 2030 a legal obligation.	The Innovation Fund (IF) and Modernisation Fund (MF) already existing in the EU ETS are retained in the Fit for 55 package and increased, while a new Social Climate Fund (SCF) is introduced.
EU legislation on buildings and construction	<p>The Energy Performance of Buildings Directive EPBD; 2010/31, 2018/44. Construction-related matters such as construction product approvals, the environmental impacts of buildings and the energy efficiency of buildings and construction products.</p> <p>The legislation contains, for example, regulations for urban buildings to utilize solar energy. From 2027, each new government building or private office building larger than 250 square meters must have solar panels.</p>	Legislation guides investments for more environmentally friendly buildings and construction. The renewal of Europe's building stock is expected to reduce energy bills and help curb climate change.
EU structural funds	Funding comes from three funds that complement each other: European social fund plus (ESF+), European regional development fund (ERDF) and Just transition fund (JTF). The funds support, for example, the transition to a green, sustainable and digital economy.	The cities may can apply for these funds.
EU green bond standard	The European Green Deal of 11 December 2019 underlined the need to better direct financial and capital flows to green investments. The European green deal investment plan of 14 January 2020 announced that the Commission would establish an EU green bond standard (EUGBS).	Green bonds offer a source of low-cost capital earmarked for climate-friendly municipal projects. EU-wide standard encourages market participants to issue & invest in EU green bonds and improve the effectiveness, transparency, comparability & credibility of the market.



<p><i>EU Taxonomy (2020/852/EU)</i></p>	<p><i>The EU taxonomy is a cornerstone of the EU's sustainable finance framework and an important market transparency tool. It helps to direct investments to the economic activities most needed for the transition, in line with the European Green Deal objectives. The taxonomy is a classification system that defines criteria for economic activities that are aligned with a net zero trajectory by 2050 and the broader environmental goals other than climate.</i></p>	<p><i>Taxonomy accelerates investments towards net zero cities.</i></p>
<p><i>RePowerEU</i></p>	<p><i>In response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine, the European Commission is implementing the RePowerEU Plan.</i></p> <p><i>Launched in May 2022, RePowerEU is helping the EU to save energy, produce clean energy and diversify its energy supplies.</i></p>	<p><i>Cities have a significant role in accelerating the energy transition described in the RePowerEU plan.</i></p> <p><i>RePowerEU Plan entails additional public and private sector investment by 2027.</i></p>
<p><i>G20 Hamburg Climate and Energy Action Plan for Growth</i></p>	<p><i>With the G20 Hamburg Climate and Energy Action Plan for Growth, the G20 (with the exception of the US) decided on clear measures for implementing the Paris Agreement and commencing the global energy transition in line with the goals of the 2030 Agenda for Sustainable Development.</i></p>	<p><i>One of the key outcomes of the Climate and Energy Action Plan was the pledge to create an enabling environment that is conducive to making public and private investments consistent with the goals of the Paris Agreement.</i></p>

Table 9: List of climate policies to enable capital deployment

3.2 Module IP-C2: Identification and Mitigation of Risks

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

C-2.1: Textual element

Several risks might stand in the way of the City of Lahti reaching climate neutrality. Risks can, for example, be of structural, economical, or technical nature. Furthermore, changes in the political environment or weakening of the national or EU climate policies may also act as risks in case they, directly or indirectly, hinder the possibility of the city to reach its goals. Identification of risks is important so that the city can mitigate the risks or plan alternative pathways to reach climate neutrality. Mitigation of risks may also require financial resources, which should be considered in the budgeting process.

As seen in the table below, many risks are directly or indirectly related to human nature, behaviour, opinions or decision making. For instance, new means of energy generation (and especially their locations) tend to be a hot topic involving "not in my backyard" discussions.



Lack of financial resources for mitigation actions or capital to invest in new and climate-friendly technology is another important factor which may significantly hinder emission reduction. Even though this Investment Plan includes information on capital planning for climate neutrality, not all costs or investment needs have been exactly estimated. In addition, despite of general political support for climate work and actions, the implementations relies on financing which has not been secured for all actions, including for the “sustainable mobility year 2025”. Furthermore, actions additional to those included in the Investment Plan and Action Plan will most likely be needed from the city, inhabitants, private companies, and other stakeholders to reach climate neutrality. Failure to identify and implement the required additional actions would hinder the achievement of the climate neutrality target.

Fields of Action	Sectoral Project	Risks Identified	Description of Risk	Mitigation of Risk
Transportation	<i>Increasing the use of sustainable means of transport, e.g. SUMP</i>	<i>Stakeholders' engagement risk</i>	<i>The inhabitants of the city stick to their old means of transport instead of changing to more sustainable alternatives</i>	<i>Effective communication, understanding stakeholders' needs. Support (e.g. financial) for changing to climate-friendly solutions.</i>
	<i>Infrastructure for sustainable transport, e.g. biking infrastructure in Lahti</i>	<i>Climate risk</i>	<i>Weather and climate risks cause challenges to road infrastructure; slipperiness, road maintenance problems and the risk roads collapsing increases.</i>	<i>Road maintenance, preparation for additional maintenance costs, distribution of maintenance resources to affected areas, real-time communication of impaired conditions to users and maintenance</i>
	<i>Increasing the use of electric vehicles in line with Lahti Climate Program 2023-2030</i>	<i>Asset transition risk</i>	<i>Transition risks are mainly caused by changes in the price of assets that result from the transition to a more carbon-neutral society. Electric vehicles tend to be valuable assets, but the transition will entail some uncertainties regarding asset transition. Electrification of the car fleet is, for example, likely to influence the value of gasoline cars.</i>	<i>Monitoring the development of car pricing, switching from fossil fuel powered vehicles to electric ones at an early stage</i>
	<i>Increasing the use of electric vehicles in line with Lahti Climate Program 2023-2030</i>	<i>Economic risk</i>	<i>Acquisition and maintenance costs of the vehicles and infrastructure required (for electrification). Impact on electricity price</i>	<i>Ensuring sufficient electricity generation capacity and resources for maintenance and development of charging infrastructure.</i>



	<i>Increasing the use of electric vehicles in line with Lahti Climate Program 2023-2030</i>	<i>Technical risk</i>	<i>Operational reliability of electric vehicles and availability of parts</i>	<i>Ensuring working logistics</i>
	<i>Increasing the use of electric vehicles in line with Lahti Climate Program 2023-2030</i>	<i>Safety risk</i>	<i>Electric vehicles are almost silent, which may increase collision risk with pedestrians and cyclists. Issue is being addressed by legislation.</i>	<i>Legislation, traffic safety measures</i>
<i>Built Environment</i>	<i>Increasing the amount of buildings with a low carbon footprint in line with Lahti Climate Program 2023-2030</i>	<i>Economical risk</i>	<i>Recent cost increases also in the building sector may reduce willingness and ability of companies to commit to building climate-friendly properties.</i>	<i>Subsidies, promoting R&D of materials that are both cost-effective and sustainable</i>
<i>Energy Generation</i>	<i>Decreasing the amount of logging to increase carbon sinks in line with Lahti Climate Program 2023-2030</i>	<i>Policy- related and economical risk</i>	<i>Use of wood as fuel or resource for bio-based products may put pressure to increase logging activity.</i>	<i>Ensure sustainable management of city's own forests; provide information and encourage forest owners to protect carbon sinks</i>
	<i>Use of biomass in energy production, e.g. in Kymijärvi III Bio energy plant</i>	<i>Regulatory risk</i>	<i>Changes in classification of biomass as a carbon neutral fuel</i>	<i>Follow regulatory framework development; shift to non-combustion renewables</i>
	<i>New fossil-free electricity plants (such as wind or solar power plants) in line with Lahti Climate Program 2023-2030</i>	<i>Technical / regulatory risk</i>	<i>Difficulties in finding locations that are suitable for new forms of energy generation as well as accepted among the general public</i>	<i>Informing the general public about the pros and cons and low risks associated with new technology.</i>
	<i>Low-emission energy generation in line with Lahti Climate Program 2023-2030</i>	<i>Technical/ administrative risk</i>	<i>Delays in the building process and commissioning of new facilities for energy production.</i>	<i>Ensuring smoother building permit processes. Ensuring sufficient communication and use of participatory methods to address the concerns of inhabitants early in the planning process.</i>
	<i>Low-emission energy generation, e.g. production of solar power in all city-owned properties</i>	<i>Technical risk</i>	<i>Availability of necessary parts and installation services in projects, e.g. solar panels.</i>	<i>Ensuring working logistics. Identifying installation service needs in advance. Prioritization of known suppliers when signing new</i>



			<i>service contracts with private actors.</i>
	<i>Low-emission energy generation or carbon capture and storage in line with Lahti Climate Program 2023-2030</i>	<i>Market-specific/ technical risk</i>	<i>Generally failed investments in new technologies.</i>
	<i>New policies in particular at the EU level</i>	<i>Economical risk</i>	<i>For example, carbon pricing mechanisms, supporting low-emission energy sources and energy efficiency may cause effects on financial markets.</i>
			<i>Sharing experiences with other cities and private sector actors, cooperation with, for example, research institutes and universities, risk assessment in connection with the investment plan.</i>
			<i>Ensuring sufficient versatility in energy sources and technological solutions as well as in sources of capital, following the development of relevant policy and provision of information to relevant actors in the city</i>
<i>Green infrastructure and Nature Based Solutions</i>	<i>Increased amount of vegetation in the city area (e.g. Lahti's Programme for green spaces (Viheralueohjelma))</i>	<i>Policy-related risks</i>	<i>Conflict of interests between increased vegetation in public areas and more compact building or land use planning.</i>
	<i>Increased amount of vegetation in the city area</i>	<i>Technical risk</i>	<i>Fitting both vegetated roofs and solar panels on the same roofs can be challenging.</i>
	<i>Increasing vegetation carbon sinks, e.g. forestry, street trees</i>	<i>Climate/ environmental risk</i>	<i>Slower vegetation growth than expected; natural disturbances affecting growth</i>
			<i>Pay attention to green areas in the land use and building planning process. Try to direct the building of new residential or office districts to regions with no significant green areas.</i>
			<i>Searching for and piloting innovative solutions; prioritization of solutions depending on the properties of the target building.</i>
			<i>Different kinds of trees/plants have different growth rates. Focus on variation in the selection of trees when planning green areas and planting new trees.</i>
<i>Waste and Circular Economy</i>	<i>Improved reuse and recycling, e.g. implementation of</i>	<i>Capacity and capability risks</i>	<i>Lack of experience among different actors</i>
			<i>Development of competence among companies in the waste</i>



	<i>Lahti's Circular Economy Roadmap</i>			<i>management, reuse and recycling business. Providing information regarding recycling possibilities for the city inhabitants.</i>
	<i>Improved reuse and recycling, e.g. implementation of Lahti's Circular Economy Roadmap</i>	<i>Technical or safety risk</i>	<i>Lack of knowledge on different materials and substances</i>	<i>Cooperation with, for example, research institutes, universities, and companies, sharing experiences with other cities</i>
<i>Cross-cutting</i>	<i>Promoting climate work of stakeholders</i>	<i>Reputation risk</i>	<i>Pressure of e.g. companies to look climate-friendly may lead to greenwashing. Reputation risk if the city is promoting climate action of such companies.</i>	<i>Careful consideration of how to promote the climate work of companies</i>
	<i>Stakeholder engagement, e.g. companies, organizations, civil society</i>	<i>Stakeholder engagement risk</i>	<i>Getting all stakeholders to work in the same direction is hard to achieve and is also time-consuming</i>	<i>Campaigns, information, co-operation between different stakeholders. Enable stakeholders to meet and plan long-term actions and strategies together.</i>
	<i>Increased number of climate-friendly solutions</i>	<i>Regulatory and stakeholder engagement risks</i>	<i>Goals in Lahti Climate Program 2023-2030 are different from the goals and strategies of private companies</i>	<i>Reach mutual solutions together with the companies, encourage smart solutions and prove that they are viable also for the companies' point of view</i>
		<i>Economical risk</i>	<i>Some companies may experience existential threats during global transition to a greener economy. Company bankruptcies or new companies entering the market also have an impact on the city's economy.</i>	<i>Encourage companies to prepare for the market shift e.g. by adopting climate-friendly solutions; identify the effects of high-risk companies on the city's economy</i>
	<i>Lahti's climate work and related media visibility</i>	<i>Reputational risk (also positive)</i>	<i>The effectiveness of climate action affects the image of the city and its attractiveness</i>	<i>Systematic monitoring of media coverage and preparation of plans to mitigate risks such as</i>



				<i>negative social media attention; sharing successes of the climate work in the media</i>
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Table 10: List of Project level Risks

3.3 Module IP-C3: Capacity Building and Stakeholder Engagement for Capital and Investment Planning

You should assess and finally work to develop internal capacity and capabilities, working with both internal and external stakeholders to accelerate the transition to climate neutrality by 2030.

C-3.1: Textual element

In general, the City of Lahti has good conditions and capacities for planning, implementing, and funding initiatives and actions related to reaching climate neutrality. The financial planning of climate work has been less systematic but the climate budgeting will bring a change. The city is currently working in a direction that allows climate actions and their required financing to be updated annually in the city budgeting process, which will further increase knowledge about the link between strategies/actions and financing. The system will ensure that capital needs of climate actions will be brought in the budgeting process timely to secure the financing. Climate budget is a new system for Lahti and will require capacity building of the environmental specialists but also of the finances department. In addition, all staff members responsible for climate actions need to be informed and educated about the new procedures.

Both environmental specialists as finance department will need to improve their capacity to identify external funding possibilities and readiness to apply from different financing instruments.

In order for the City of Lahti to reach climate neutrality, close co-operation with different stakeholders is required. Co-operation makes it easier to acquire and ensure funding necessary to implement different actions, strategies and programmes that are being planned or carried out in the city. Co-operating with stakeholders creates an environment where everybody looks for win-win situations and mutual solutions to, sometimes complex, problems.

In Lahti, the expert transition team and the steering level transition teams as well as the climate working group of the region are important platforms for peer-learning and planning of joint projects

In addition, involving different stakeholders helps in spreading knowledge and information about the challenges and possible solutions. If every stakeholder involved in the green transition process is well informed and on the same page, both funding and actual actions will be easier. Involving all relevant stakeholders, from city inhabitants to ministries and international companies/organizations, is worth its input.

The city of Lahti already has a rigid network of companies working closely with the city. By utilizing these networks and further improving co-operation on other levels, accelerating the transition will be easier. Stakeholder engagement as part of the preparation of the CCC is expected to further strengthen the co-operation. The city has an action portfolio, that has been developed together with different stakeholders, such as the private sector. In the area of environment and climate work, the city has always emphasized collaboration. There is, thus, a strong tradition of stakeholder engagement in the activities related to capital and action planning. The skills and capabilities related to these areas are considered good both in the city and among its stakeholders, and key stakeholders already have a strong intention to work on climate and environment-related matters.

Stakeholders involved	Network	Influence	Interest	Level and type of Engagement
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<i>City of Lahti and its departments</i>	<i>Responsible for internal finances and dividing resources in the city</i>	<i>Control of city- level finances and strategies</i>	<i>All city resources, income and expenses</i>	<i>Control of most of the economic traffic and resources</i>
<i>Ministry of the Environment, Finland</i>		<i>Control of some of the financial sources directed towards the city</i>	<i>Sustainable development, funding, reaching the climate neutrality target of Finland</i>	<i>Committed to assisting in reaching climate goals</i>
<i>Transition team steering group</i>				<i>Responsible for steering the Mission work ; portfolio design</i>
<i>Climate Working Group of Päijät-Häme</i>	<i>Regional network for climate experts in different organisations</i>		<i>Climate-neutral Päijät-Häme region by 2030</i>	<i>Peer learning, joint projects</i>
<i>Lahti Energia</i>		<i>District heating in the Lahti area</i>	<i>Sustainable and profitable energy production</i>	<i>Owned completely by the city of Lahti</i>
<i>Ladec</i>	<i>Lahti region businesses</i>	<i>B2B services, assisting local businesses in business development matters</i>	<i>Financial benefits, success of local businesses</i>	<i>Partially owned by the city</i>
<i>Private companies and industrial clusters Energy Cluster)</i>	<i>Working in different groups to reach win-win solutions in the green transition. E.g. Green electrification of mobility Cluster (GEM), Grain Cluster,</i>	<i>Working towards climate neutrality together with the city</i>	<i>Financial benefits, image, own sustainability targets; GEM: increasing the business around green mobility in Lahti; Grain cluster: circular economy in food industry and farming; Energy Cluster: new innovations and increased business in energy sector)</i>	<i>Private companies</i>
<i>Civil organisations, city inhabitants, third sector</i>	<i>Different organisations that co-operate with the city (e.g. Environmental activist, nature protection groups, Student organisations, Sport clubs, advocacy organisations)</i>	<i>Working towards climate neutrality together with the city</i>	<i>Reduced pollution, cleaner water, environmental protection, etc.</i>	<i>Civil organisations; third sector</i>

Table 11: Stakeholder Engagement Mapping