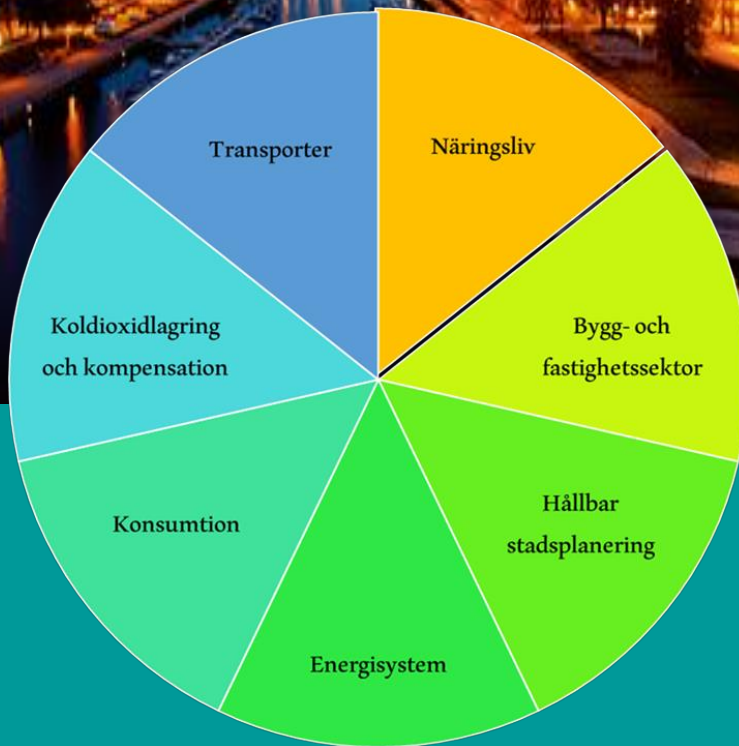


Climate Neutrality Action Plan Gävle municipality 2030



Summary

In 2022, a decision was made that Gävle would become a climate-neutral municipality by 2030. This is an ambitious goal and a crucial decision for Gävle to limit emissions within the framework of the Paris Agreement. Gävle has also decided that consumption-based emissions should be climate neutral in 2035, meaning emissions that Gävle municipality is responsible for through the consumption of its citizens, public entities, and companies wherever they occur in the world. The Consumption-based emissions amounted to 6,3 tons of CO_{2e} per person in Gävle 2022. Including public sector emissions and investments per capita emissions were 9 CO_{2e}. Since the territorial emissions and consumption-based emissions to some extent overlap, due to different calculation methods, we don't have separate actions since most actions address both categories.

This Climate Action Plan was endorsed in 2021 and is part of the work on MSP 2.0 (Environmental strategic program, version 2.0), where the plan outlines HOW the decided goals will be achieved. We are almost three years down the line implementing this plan and that's why many of the actions are already commenced. The action plan was at the time not costed for. Many of the actions are organisational and does not involve larger investments. The climate investment plan has therefore looked at both the actions in this plan and the costs estimated by our sectors and municipal companies needed to reach the goal.

A key factor in achieving results in the action plan is the municipality's ability to plan for the long term, prioritize and allocate resources. Another important aspect involves knowledge, education, and the ability to explain and create understanding. As a major procurer, employer, responsible municipality, and exploiter of land and development, Gävle municipality has a crucial task to reduce emissions from its operations, influence others in the right direction, and make it easier for businesses, citizens, and others to make the best environmental and climate choices. How the municipality acts are of great significance - both for each emission reduced and to demonstrate that a transition is possible. The Climate Action Plan highlights two areas that need prioritization in ongoing efforts:

- **Drastic Reduction in Transport Sector Emissions:** This involves a rapid transition to sustainable modes of travel such as public transportation, cycling, walking, and fossil-free vehicles. Expansion of public transportation and cycling infrastructure should continue, and more charging stations and renewable fuel stations should be added in the municipality.
- **Acceleration of Transition in the Construction Sector:** This focuses on most emissions originating from steel, cement, and transportation in the construction sector. The municipality aims to introduce mass management, construction material logistics, and set higher standards for fuel, materials, and recycling in the construction process.

The majority of emissions in Gävle municipality come from the transport sector. Therefore, one of the focus areas in the climate action plan is on measures in this area. Planning for a society that reduces the need for transportation, streamlines travel, and creates conditions for residents and businesses to refuel fossil-free or charge their electric vehicles is essential. These measures also contribute positively to other societal goals within Agenda 2030, such as goals related to good health and well-being, reduced inequality, sustainable cities and communities, sustainable industry, innovations, and infrastructure, to name a few.

The construction and real estate sector also have a significant tribute to the total emissions but mostly outside the geographical boundaries of the municipality. Mass management, construction work, and construction materials, especially steel and cement, are significant emission sources that have recently gained attention. While the municipality can influence these emissions in the planning process, some solutions require technological developments, such as fossil-free steel. The municipality also aims to actively work towards increased recycling in the construction sector to reduce the need for virgin material.

It has been challenging to estimate how much emissions can be reduced through the proposed measures. A significant part of the uncertainty is related to private car traffic.

Some of the measures in the action plan are already underway or can be initiated without further political decisions. Still, many need to be developed, scheduled, budgeted, and individually decided upon in the next phase, especially if they do not naturally fit into the current operations or require additional resources. New ideas, innovations, development, and new technology will be required, along with efforts to change behaviour and address soft issues to a greater extent.

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Gävle's transition: Current state

Gävle has pledged to achieve climate neutrality for the city by 2030. This commitment entails a substantial reduction in local emissions of greenhouse gases, encompassing carbon dioxide and methane, within the next years. This chapter outlines the current state and challenges associated with attaining climate neutrality and presents a strategic approach to accomplish this goal.

Strategies, plans & iterations

This chapter serves as a starting point to get an overview of the strategies and plans already in place. By identifying the gaps in current implementations, the municipality aim to understand where adjustments are required to align with our 2030 climate neutrality ambition. Through a careful analysis of our existing framework, we can formulate robust strategies, adapt plans, and engage in iterative processes that bridge the implementation gap and leads Gävle towards a sustainable and climate-neutral future.

The Environmental Strategic Program, MSP 2.0

The Climate Action Plan is a supporting document for the Environmental Strategic Program MSP 2.0, which elaborates on how the goal of a climate-neutral municipality will be achieved. The writings in ESP 2.0 regarding responsibility allocation apply to the Climate Action Plan.

The Environmental Strategic Program aims to guide and coordinate the environmental work of the municipal organization and contribute to enabling residents and businesses to be environmentally sustainable.

The first Environmental Strategic Program was adopted by the Municipal Council in June 2013, and work on implementation and execution has been ongoing since then. In 2019, the program was revised, where the program's seven goal areas were reworked into three: Climate-neutral municipality by 2035, Robust ecosystems, and Clean and toxin-free everyday life.



The following goals, indicators, and responsibilities are specified in the plan for a climate-neutral municipality. The indicators in MSP 2.0 will also be used to track the progress of the goal towards climate neutrality.

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Table 1. Goals, indicators, and responsibilities from MSP 2.0.

Goal	Target year	Indicators	Responsible for implementation
Gävle municipality is climate-neutral by 2030.	2030	1. Total CO2 emissions per inhabitant in Gävle as a geographical area. To be supplemented when new indicators for monitoring consumption and air travel are available.	All committees and boards
The market share of public transportation in the geographical area of Gävle municipality shall double by 2030 compared to 2006, relative to other motorized travel	2030	1. Market share of public transportation. 2. Registered trips per year and inhabitant (boarding) in Gävle municipality with traffic managed by X-trafik. 3. Registered trips with corporate cards.	Planning and Building Committee, Municipal Executive Board
The share of bicycle traffic in the geographical area of Gävle municipality shall increase by 100% by 2025 compared to 2012.	2025	1. Number of cyclists. 3 measurement locations in Gävle. 2. Placement in the Municipality Velometer, which is Cykelfrämjandet's national Cycling Ranking. 3. Travel habit survey conducted by X-trafik every month within Gävle municipality's geographical area.	Planning and Building Committee, Municipal Executive Board
The Gävle municipal group shall create conditions contributing to ensuring that the journeys and transports taking place within the geographical area of Gävle municipality are fossil-free by the year 2030.	2030	1. Percentage share of CO2 emissions from travel and transportation. 2. Percentage of fossil-independent vehicles in traffic. 3. Percentage of environmentally friendly vehicles according to the national definition in the geographical area, in %. 4. Percentage of renewable fuels in public transportation.	Planning and Building Committee, Municipal Executive Board
The fuel consumption of the Gävle municipal group, including procurements involving transportation, shall be 100% fossil-free by 2025. ¹	2025	This includes cars, light trucks, including work machinery, and heavy vehicles. 1. Share of renewable/fossil-free fuels of total consumption by Gävle Municipal Group. 2. Cost of fuel for Gävle Municipal Group. 3. Mapping of fuel usage from heavy vehicles and work machinery, as well as mapping of contracted transport.	All committees and boards
The Gävle municipal group shall create conditions contributing to a 30% reduction in residents' and businesses' carbon dioxide emissions from air travel by 2030.	2030	1. Statistics at the national level divided per respective municipality per capita. 2. CO2 equivalents per capita in Gävle from air travel	The Municipal Executive Board.

¹ Where possible, based on the availability of fossil-free fuels on the market within the geographical area of Gävle municipality.

Goal	Target year	Indicators	Responsible for implementation
The carbon dioxide emissions from air travel for Gävle municipality's employees shall decrease by 30% during the period 2018-2025.	2025	CO2 equivalents from air travel total/year.	All committees and boards
The business sector's and residents' energy consumption in buildings and facilities shall be fossil-free by 2030.	2030	1. Emissions to air of CO2. 2. CO2 tons from industry. 3. CO2 tons other than consumption.	Gävle Energi, Gavlegårdarna, Municipality Board
The energy consumption in Gävle municipality's properties with premises and housing shall be 30% more efficient by 2030 compared to 2009.	2030	1. Electricity use per m2 heated indoor space (Atemp refers to the sum of indoor area for each floor, attic, and basement heated to more than 10 °C) 2. District heating use per m2 heated indoor space	Planning and Building Committee, Municipal Executive Board
The capacity for the production of renewable electricity for Gävle Energi's power grid shall be expanded by 200% by the year 2035.	2035	Newly installed capacity of renewable electricity production (MW)	The Municipal Executive Board, Gävle Energi, The Urban Planning Committee
Of Gävle Municipality's electricity consumption, at least 10% shall be produced ² from solar panels by the year 2035.	2035	Installed capacity * performance ratio (900 kWh/kWp)	The Municipal Executive Board, Gävle Energi, Gavlegårdarna, Gavlefastigheter
The sale of locally produced biogas for fuel has increased by 35% from 2020 to 2025.	2025	Sales of locally produced biogas in kilograms	Eco gas and the Planning and Building Committee
The consumption and energy usage of residents and businesses (both within and outside Sweden's borders) should be resource-efficient and environmentally sustainable.	2035	1. Carbon dioxide equivalents per resident in Gävle based on consumption-based emissions ³ , tons/year per resident. 2. Total energy consumption in Gävle municipality as a geographical area in MWh. 3. Electricity consumption per resident within Gävle Energi's grid area, excluding activities connected to the regional electricity grid. 4. Business sector - Total electricity consumption	All committees and boards
In Gävle, construction and landscaping are carried out in an environmentally and climate-friendly manner, creating conditions for residents and businesses to live sustainably.	2035	The climate policy action plan ⁴	All committees and boards

² For example, through municipality-wide solar parks or on buildings, etc., with the caveat that laws and regulations regarding solar panels may change.

³ Currently, there are no metrics for consumption-based CO2 emissions

⁴ In the climate policy action plan, point number 15 assigns the Environmental Goals Delegation the task of preparing the issue of goals for consumption-based emissions.

Current policies, strategies, and regulations

Several relevant policies, strategies, and regulations contribute to Gävle municipality's Climate Action plan. Many municipalities and regions in Sweden have embraced individual voluntary targets or endorsed national and regional objectives. The legal responsibility of municipalities and regions for climate action is extensive and depends on governance and various specific laws.

GOVERNANCE AND SUPPORT GÄVLE

Table 2. Relevant policies, strategies and regulations.

Type	Level	Name & Title	Description	Relevance	Need for action
Strategy	Regional	Regional development strategy for Gävleborg 2020-2030	Attractive and accessible locations Socially beneficial, circular and bio-based economy Competitive business life and sustainable labour market High knowledge and ability to innovate Equal and egalitarian society	This strategy sets the regional agenda for the transition and how regional assets will be targeted towards a bio-based economy and Competitive business life	Implementation
Strategy	Regional	Energy and climate strategy for Gävleborg county 2020–2030	In Gävleborg, the carbon dioxide budget is not exceeded which is required to reach the Paris Agreement and is climate neutral by 2035.	With an ambitious regional goal and coordination, it is easier to collaborate in this area.	Implementation. Regional authority have little official influence on municipal actions but can coordinate the municipalities and develop common projects
Programme	Municipal	Environment strategic programme 2.0	The Environmental strategic program is divided into three target areas, which are climate-neutral municipality in 2030, robust ecosystems and clean and non-toxic everyday life.	The program contains the goals related to a decreased impact on climate change	Implementation
Plan	Municipal	Cycle plan 2020	The purpose of the cycle plan is for Gävle municipality to receive an up-to-date planning document for cycle traffic both for overview and detailed planning to achieve the goals to double cycling from 2018 to 2025.	Use to achieve the goals to double cycling from 2018 to 2025.	Implementation
Plan	Municipal	Energy plan 2024-2028	The Energy plan that describes the supply, distribution, and use of energy. Gävle municipality's energy plan also complements the municipality's environmental strategic program.	The energy plan includes an action plan for more efficient energy usage, increased share of fossil-free energy, and increased production of renewable energy. The energy plan addresses aspects of the transportation sector related to renewable fuel production and infrastructure for refuelling stations and charging points for renewable fuels.	To be decided in 2024
Strategy	Municipal	Traffic strategy (SUMP)	To form a cohesive strategy for how the traffic should develop so that	Road traffic is the main source of greenhouse gas emissions. To change travel habits, strong investments	Implementation

Type	Level	Name & Title	Description	Relevance	Need for action
			must achieve a sustainable, attractive society based on the three aspects of sustainability	in public transportation, walking, and cycling, as well as information and influence measures, are needed.	
Master plan	Municipal	Master plan	The Master plan shows Gävle municipality's will direction for how the municipality should develop in the direction of long-term sustainable land and water use up to the year 2030 and with an outlook towards the year 2050	The masterplan also relates to the climate goal and the technical infrastructure that is needed like fossil free energy production, efficient land use, nature reserves etc	that the principles of the masterplan is followed in every decision. The master plan is soon to be updated.
Policy	Municipal	Parking policy	Setting Parking targets for an attractive and accessible city and sustainable transport system	The policy aims to set parking targets to promote the transition of private car journeys to walking, cycling, or public transport.	To be decided in 2024
Plan	Municipal	Street structure plan	The street development plan is the first of its kind in Sweden. It is a way for the municipality to get a holistic approach across the streets, instead of trying to piece together fragmented mobility plans and urban development plans as a basis for various street projects.	The idea is that it should help Gävle carefully consider how the streets are distributed to promote public transport, walking, and cycling	To be decided in 2024
Programme	Municipal	Energy-optimized port cluster	Energy-optimized port cluster 2030 is a ten-year program with the main goal that the Gävle port cluster in time and pace reaches the requirements for CO2 reduction and energy efficiency that exist from both national and county level, and which are in line with the Paris Agreement.	The comprehensive programme from Gävle Port with its actions and timeline is a model for the municipality and other ports to be inspired by or copy.	Implementation
Plan	Municipal	Circuit plan 2021-2025 for Gävle municipality	of new natural resources and instead uses materials in a circuit. The plan must create a clear direction and good prerequisites for a sustainable use of resources and thereby contribute to fulfilling national and global sustainability goals. It should lead to clear improvements when it is about preventing waste, reducing toxins in the cycle, reuse, recycle and keep clean and tidy. Encompasses all types of waste and the measures needed to manage the waste in an environmentally and resource appropriate manner.	Contribute to a circular economy where we reduce withdrawals of new natural resources and instead uses materials in a circuit. The plan must create a clear direction and good prerequisites for a sustainable use of resources and thereby contribute to fulfilling national and global sustainability goals. It should lead to clear improvements when it is about preventing waste, reducing toxins in the cycle, reuse, recycle and keep clean and tidy.	Implementation

Gävle has a broad set of climate relevant policy that builds on the goals in the Environment Strategic programme. From that perspective nothing is missing to reach our goals. We now have to go from strategy to action. The environment strategic programme has a clear steering model where it is the managers who are responsible for the implementation and that measures contribute to the achievement of the goals. However, we have experienced that it can be difficult to handle these goals without knowledge and recourses to do so. Even if the steering model says that managers should request funding for measures, it is difficult to do so if you are not aware of exactly what measures are needed. Many actions in this plan demands new knowledge and working methods which can be difficult to develop within existing operation.

The politicians have given the organisation a mission to improve the steering model for our leading strategic programmes during 2024. Also, a portfolio-based working practice has been developed for development projects and will also be applied at the climate action plan, starting 2024.

Stakeholder engagement

While the action plan does not cover actions that other stakeholders need to undertake, the CCC has been based on the action plan adopted in 2021. The plan was developed broadly with the sectors and municipal companies to identify the actions that the municipal group can undertake, both to reduce the emissions from our activities and support the transition of civil society and business. In addition, the CCC is viewed as a governance tool through which Gävle will attempt to mobilise a broader group of stakeholders that can greatly support in the enacting the actions and expected outcomes. The action plan was open for consultation during three month and many of the suggestions from civil society where added to the plan.

When we joined Viable Cities in 2021 we applied for external funding to develop a local climate agreement since stakeholder engagement was something we needed to develop to enable us to reach our goals. Our local climate agreement, se next section, is our first attempt to a larger collaboration platform with business, associations, university and public entities. Gävle has a large number of associations, these are platforms which we want to use to engage with citizens.

A hurdle working with citizen engagement in climate issues is finding the right format and recourses. We are eager to follow and get inspired from other cities embarking on this journey. Citizens engagement is a typical area we would gratefully collaborate on within the NZC.

Governance innovation interventions

Achieving climate neutrality by 2030 requires more than just strategic plans; it demands innovative organizational and governance interventions. By focusing on organizational innovation, Gävle municipality aim to adapt our internal frameworks, enhance collaboration, and foster a culture of sustainability.

Gävle Climate Agreement.

The Gävle Climate Agreement is a mobilization where local businesses, associations, university, and public entities come together in a transformation arena for concrete collaboration in climate-driven business and operational development. All organizations operating in Gävle municipality and can sign and become a part of the Gävle Climate Agreement. The organizations that sign the agreement commit to working towards a climate neutral and attractive Gävle and support the goal of climate neutrality by addressing their organization's climate challenges. Additionally, the organizations are expected to contribute to spreading experiences, knowledge, and good practices to help other organizations in their transition efforts.

Gävle energi - Carbon capture and storage

Together with Gävle Port, Gävle Energy will investigate the possibility of capturing carbon dioxide at our combined heat and power plant, Johannes, and then transporting it to Gävle Port for temporary storage. The feasibility study could ultimately contribute to Gävle Energi achieving negative emissions, meaning that we remove more carbon dioxide from the atmosphere than we emit. The project has the potential to put Gävleborg on the map both nationally and internationally.

Locally produced biogas in Gävleborg.

Eco gas operates in a regional market, producing and selling vehicle gas to bus services, garbage trucks, taxis, businesses, and private individuals. The company is owned by Gästrike återvinnare and Gävle Energi. The gas produced comes from the Duvbacken wastewater treatment plant and the Forsbacka biogas facility.

It is at the Forsbacka biogas facility the processing of the region's food waste takes place.

Bicycle initiatives for employers

The bicycle initiatives for workplaces in Gävle that want to create conditions for their employees to prioritize cycling throughout the year.

- **Winter cyclist-** The Winter Cyclist is a campaign targeting companies with the aim of encouraging more employees to choose the bicycle as their means of transportation, even during the winter. Those who accept the challenge are expected to cycle to and from work at least three days a week. All participants in the challenge receive equipment to safely and comfortably cycle during the winter.
- **Bicycle-friendly workplace** - "Bicycle-Friendly Workplace" is a project and competition for employers that aims to create a bicycle-friendly workplace. The purpose of the project is to encourage as many people as possible to cycle to and from work by having employers work towards becoming as bicycle-friendly as possible. The "Bicycle-Friendly Workplace" initiative runs continuously. This means that workplaces that take on the challenge can become more bicycle-friendly each year, at a pace that suits them best.
- **Green Travel Plan** - A green travel plan is an action plan to make travel within a company or organization more sustainable. The green travel plan includes both business trips, visits, and customer trips, as well as commuting to and from work.

Travel can become more sustainable by, for example, creating conditions for more people to walk, cycle, or use public transportation for work-related purposes and commuting to and from the workplace.

The Furniture Pool

A collaboration between Gävle Drift & Service and the Unit for Daily Activities (EDV). Our goal is to reduce the purchasing costs and environmental impact of Gävle municipality while creating job opportunities for individuals with special needs.

At the Furniture Pool, the municipality's operations can find used and refurbished furniture, as well as other items for their activities. It is also possible to donate used furniture and other items so that someone else can reuse them. An easy way to be kind to both your wallet and the planet.

Energy and climate consultancy

A difficulty lies in reaching all small and medium-sized companies where there is no internal environmental work or end customers setting demands. In those cases, Gävle municipality aim to enhance energy and climate consultancy to actively support these businesses. The municipality also plan to explore the possibility of working on a sector-specific basis, addressing the challenges within industries such as construction, transportation, or the food sector.

Gavlegårdarna environmental work

The municipal housing company Gavlegårdarna is continually working on initiatives related to energy efficiency, climate-neutral district heating, and solar panels to contribute to reduced environmental and climate impact. Gavlegårdarna was nationally recognized by Sweden's public housing association through the award for 'Best Climate Initiative - Fossil-Free 2030' in 2022.

Social innovation interventions

Another important part is to engage our community to contribute. Social innovation means using the smart thinking, creativity, and dedication of our residents. By fostering a culture of sustainability and inclusivity, Gävle municipality aim to inspire behavioural changes, encourage community participation, and build a shared commitment to climate action.

Learning for Sustainable Development (LHU)

The LHU aims to provide our children and students with better knowledge for sustainable societal development. To develop this knowledge, children and students should have the opportunity to act for sustainable development in real terms, in collaboration with the surrounding society, here and now. For this to happen, it is of the utmost importance that the surrounding society, our municipal group, our businesses, and other organizations provide opportunities for children and young people to participate and have influence in decisions that affect them, both big and small.

Sustainable Everyday Life

The Sustainable Everyday Life campaign is aimed at residents of Gävle municipality who want to contribute to a more sustainable Gävle. In the campaign, 32 households are participating, and during the period from May 2023 to April 2024, they will learn more about how to lead a good life within the limits of the planet.

The campaign's five focus areas are:

- The Car – Transportation and Travel
- The Steak – Food
- The Residence – Energy and Waste
- The Store – Consumption and Reuse
- The Stock Market – Investments and Savings

For each focus area, participants will meet, exchange experiences, and carry out activities together. The activities may include various daily life challenges, field trips, trial offers, and other offerings such as free energy advice.

Challenges and opportunities

Attaining climate neutrality goes beyond simply cutting emissions; it depends on discovering methods to secure funding for and finance the transition. Nevertheless, various systemic barriers confront cities as they embark on the financing journey. This chapter delves into both the challenges related to emissions and the financial obstacles, while also identifying potential opportunities.

Greenhouse Gas Emissions Baseline Inventory

The first climate neutrality goal was set in the Environment Strategic Programme 2.0. in 2020 with the target year 2035. No baseline year was determined but a climate budget which shows that emissions need to be reduced by 16.4% per year between 2020 and 2040. Consumption-based emissions was also included in the target for 2035. In 2022 it was decided that the territorial emissions should be net zero in 2030, to be in line with Viable Cities and Net Zero Cities. Since the baseline for the climate budget is 2020 and the Environment strategic programme was adopted then we will use the emissions from 2020 as our baseline for our 80% reduction in 2030.

Gävle has reduced CO₂e by 46% between 1990 and 2021. From 2015 Gävle has used the international reporting standard Greenhouse Gas Protocol for Cities (GPC). The system boundary for this inventory is the City's geographical boundary. No sectors or geographical areas have been excluded from the inventory. The energy statistics is provided by Statistics Sweden (Statistics Sweden (scb.se)) The Swedish Energy Agency are responsible for the compilation of the statistics.

Gävle uses the national emissions database (Nationella emissionsdatabasen | SMHI that collects Sweden's national territorial emissions of greenhouse gases and air pollutants broken down to county and municipality level. The data in the database is based on Sweden's official emissions statistics. The Environmental Protection Agency, which is responsible for both the

national emissions and the geographical distribution, reports emissions to the EU, the UNFCCC and the Air Pollution Control Convention. Total greenhouse emissions include:

- Carbon dioxide (CO₂) from fossil fuels
- Methane (CH₄)
- Nitrous oxide (N₂O)
- F-gases

Emission factors are calculated according to IPCC A5. Non fossil fuels are not included in the national emissions data base.

industrial back pressure	<u>404 322</u>		8 862			66 498	388 131			463 491
cogeneration plants	<u>45 880</u>									
Hydropower	<u>82 932</u>									
total fuel type	<u>537 200</u>		8 862			66 498	388 131			463 491
Emission factors										
Electricity (Nordic mix)	31.6 tonnes CO2e/GWh									
Road transport (mean value per vehicle-kilometre)	148 g CO2e/vehicle-kilometre									
Oil products	268.2 tonnes CO2e/GWh									

The emissions Gävle needs to reduce over the next years are displayed in Table 4 below. It contains territorial emissions from 2021.

Table 4. Baseline for greenhouse gas emissions.

Emission sector	Emissions 2020	Percentage of total
Buildings (own heating)	2,7 kt	1%
Electricity and district heating	3,4 kt	1%
Transport	178 kt	65%
Waste	14 kt	5%
Industry (energy and processes)	30 kt	11%
Agricultural, Forestry and Land Use (AFOLU)	9 kt	3%
Mobile machinery	24 kt	4%
Product use	12 kt	9%
Total	273 kt	100%

In assessing the greenhouse gas emission baseline for a municipality, it is crucial to look in to the contributions from various sectors.

The transport sector emerges as a dominant contributor, responsible for a substantial 64% of the municipality's greenhouse gas emissions. This encompasses emissions from vehicles, both public and private, as well as other modes of transportation. Addressing this sector requires comprehensive initiatives such as promoting public transportation, incentivizing electric vehicles, and developing sustainable urban planning to minimize reliance on traditional fossil fuel-powered transport.

The emissions from the industrial sector arise from both the energy consumption of machinery and processes, as well as the extraction and distribution of materials used in production. Implementing energy-efficient technologies, renewable energy adoption, and sustainable practices can significantly contribute to reducing emissions from industrial sources.

In the category of product use, emissions include volatile organic compounds from private and industrial use of solvents and paint, nitrous oxide from nitrous oxide, and emissions from other fluorinated gases. Measures such as the use of environmentally friendly products, improved management, and the implementation of sustainable materials and processes contribute to reducing climate impact.

The machinery category includes emissions from various mobile sources, such as construction equipment and other machinery. Transitioning to cleaner fuels, promoting

electrification, and optimizing machinery operations are potential avenues to mitigate emissions from this sector.

Waste management includes emissions from waste treatment processes. Implementing effective waste reduction, recycling programs play a pivotal role in mitigating emissions from this sector.

The emissions from buildings include heating and electricity for private and commercial buildings. This sector has very low emissions because the municipality has been working on energy issues for a long time, and both heating and electricity in buildings are almost completely fossil-free today.

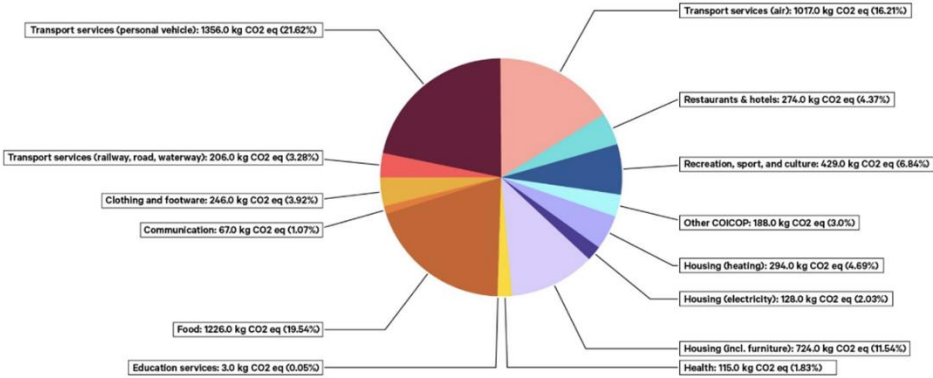
The agricultural category contains emissions from manure, soil cultivation, liming of fields, and emissions from animal digestion.

Understanding these sector-specific contributions provides a foundation for developing targeted and effective climate action plans. By strategically focusing on each sector's unique challenges, municipalities can work towards achieving a more balanced and sustainable greenhouse gas emission profile, thereby contributing to global efforts to combat climate change.

Consumption-based emissions

Gävle has a net zero goal for consumption-based emissions in 2035. Local data for consumption-based emissions was first made available in 2022 by Stockholm Environment Institute. They use economic input-output analysis broken down to municipal level to calculate the emissions. For 2022 the consumption-based emissions where 6,3 ton CO2e per capita in Gävle.

The figure illustrates the national average per sector.



Grafik: Mia Shu / SEI.

Since consumption-based emissions and the territorial emissions are calculated differently and also to some extent overlap we report them separately.

The city's emissions gap and residual emissions

The city's emissions gap refers to the disparity between the amount of greenhouse gases emitted and the desired level of emissions for environmental sustainability. It highlights the need for further reductions to meet climate targets. Residual emissions, on the other hand, are the remaining emissions that persist even after implementing mitigation measures. These may stem from sectors or activities that are difficult to decarbonize completely. Addressing both the emissions gap and residual emissions is crucial for effective climate action and achieving a sustainable future.

We have used ClimateView to estimate how much reduction existing national policy will reduce emissions. These were currently updated but might still be regarded with cautiousness.

Many of our existing policy builds on the Environment Strategic Programme from 2020 and it would be impossible to separate them from this action plan that was adopted in 2021. Column 5 represents the emissions that needs to be targeted by the action plan.

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Table 5. The city's emissions gap and residual emissions

The city's emissions gap and residual emissions	Baseline emissions	Emissions Reduction Target 2030		Emission reduction through other Action Plans		Emissions Gap (4) = (2) – (3)		Emissions reduction through the CCC Action Plan to address the Gap		Residual emissions (6) = (1) – (2)	
	2020	*Excluding residual emissions									
Buildings (Own heating)	2,7	2,16	80%	1	37%	1,2	43%	1,7	1%	0,54	0%
Electricity and district heating	3,4	2,72	80%	1,3	37%	1,5	43%	2,1	1%	0,68	0%
Transport	178	142,4	80%	112,1	63%	30,3	17%	65,9	24%	35,6	13%
Waste	14	11,2	80%	4,2	30%	7	50%	9,8	4%	2,8	1%
Industry (energy and processes)	30	24	80%	21,9	73%	2,1	7%	8,1	3%	6	2%
Agricultural, Forestry and Land Use (AFOLU)	9	7,2	80%	1,4	16%	5,8	64%	7,6	3%	1,8	1%
Product use	12	9,6	80%	1,9	16%	7,7	64%	10,1	4%	2,4	1%
Mobile machinery	24	19,2	80%	10,3	43%	8,9	37%	13,7	5%	4,8	2%
Ttotal	273,1	218,48		154,1		64,5		119	44%	54,62	20%

To address the remaining emissions and achieve climate neutrality by 2030, Gävle municipality needs to implement strategies for carbon capture and compensation.

National efforts are also underway to determine how to work on this in the future, and it is important to follow these developments. It will impact how Gävle should address the issue and may create economic conditions for it (see chapter Carbon capture and compensation for more).

Systemic barriers and opportunities

Embarking on the path toward climate neutrality by 2030 requires a comprehensive understanding of both systemic barriers and opportunities within Gävle Municipality. Identifying and overcoming these barriers is crucial for the successful realization of our ambitious climate goals. By strategically addressing systemic barriers and leveraging opportunities, Gävle municipality aim to create a resilient and sustainable community that leads the way towards a climate-neutral future.

Table 6 illustrates the systemic barriers, opportunities, and involved stakeholders for each Field of Action.

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Table 6. Systemic barriers and opportunities for each Field of Action.

Fields of action	Systemic barriers	Opportunities	Stakeholders
Transport & Mobility	<p>Municipal level:</p> <ul style="list-style-type: none"> • Behavioural changes are needed for several transitions in personal mobility. • Local resistance towards traffic measures to decrease demand for private transportation. • Many individual users that either need to change behaviour or invest in clean technology. • There are limited tools and instruments for the municipality to regulate transportation. • Multipolicy dependency- building cycling lanes does not in itself provide more bikers, accessibility, and price for parking for cars are also important factors, but the municipality tend to want to please all modes of travelling. • Multi actor dependency- Public transportation is organised on a regional and national level. • Lack of resources for infrastructure and communication measures for sustainable transportation modes and higher capacity in the public transportation network. • Investment in soft traffic measures is given lower priority and it is easy to de-prioritize when finances are limited. • To weak collaboration with regional public transportation provider (the region). • Lack of feasibility studies for developments. What is not identified in the order, there will also be no money for. It becomes more expensive to fix things afterwards and it takes longer before we get to the transition needed to reach climate goals and the 2030 agenda. 	<p>By promoting sustainable modes of transportation such as cycling, walking, and public transport, as well as electrifying transportation fleets and improving transport infrastructure, several opportunities arise for society to reduce its climate impact and enhance the quality of life for residents.</p> <p>Opportunities include promoting the use of sustainable transportation through infrastructure investments, creating incentives for the use of these alternatives, and raising public awareness of their benefits.</p> <p>To overcome obstacles, we need to offer attractive alternatives for car users, collaborate with various stakeholders for infrastructure development, and invest in charging infrastructure while providing economic incentives to promote the transition to electric propulsion.</p>	<p>Gävle municipality, Region Gävleborg, The Swedish Transport Administration, regional collaborations towards fossil free transportation</p>

Fields of action	Systemic barriers	Opportunities	Stakeholders
	<p>National level:</p> <ul style="list-style-type: none"> • A development towards increased transport efficiency is required. • Sweden's infrastructure expansion is driven by predictions indicating a rise in car traffic, resulting in investments that contribute to heightened emissions. • The Swedish Transport Administration needs to be tougher in their statement linked to new development and detailed plans that do not favor the possibility of walking, cycling and taking public transport. • The reduction obligation, mandatory mixing of a certain amount of biofuel with petrol and diesel, has been the most important steering tool to promote bio-based fuels. However, the development of the reduction obligation over the coming years is uncertain. 		
<p>Built environment & real estate sector</p>	<p>Municipal level:</p> <ul style="list-style-type: none"> • Additional cost for low carbon materials • Availability of low carbon materials • Immature market for used building material. • Lack of courage for high environmental requirements on building projects • Lack of knowledge and working methods to integrate climate aspects in the whole planning process • Investments in energy-efficient technologies and clean energy infrastructure can be costly and require long-term financial commitments from both the municipality and property owners. • Older buildings may require extensive renovations to achieve energy efficiency and climate neutrality. The implementation of innovative energy solutions may also require expertise and technical knowledge. 	<p>By promoting engagement from the private sector to develop a market for used building materials, opportunities for sustainable development within the construction sector are opened. This requires creating incentives for companies to participate, developing collaborative projects, and organizing training sessions.</p> <p>By investing in renovation for energy efficiency of buildings and infrastructure for renewable energy, such as wind power, or offering financial incentives for property owners investing in energy efficiency and renewable energy, the municipality can</p>	<p>The Swedish National Board of Housing, Building and Planning, National and local building and construction industry the entire chain from materials to construction and operation.</p> <p>Construction companies Construction wholesalers Consulting firms The Municipality</p>

Fields of action	Systemic barriers	Opportunities	Stakeholders
Consumption & circular economy	<p>National level:</p> <ul style="list-style-type: none"> Regulations governing the use of contaminated materials pose challenges to their reuse and result in significant transportation emissions. The Waste legislation makes it difficult to reuse certain materials. The majority of construction emissions originate from scope 3, with the production of building materials being the primary source of emissions. It is challenging for individual customers to influence this aspect. Establishing legal requirements for fossil-free production is imperative. Within the construction industry, there is no standardized definition of climate neutrality. Unclear or incomplete regulations regarding energy efficiency and renewable energy can pose obstacles for municipalities to achieve ambitious climate neutrality goals. 	<p>create opportunities for property owners to reduce their climate impact.</p>	
	<p>Municipal level:</p> <ul style="list-style-type: none"> Lack of knowledge and organisational capacity to use public procurement as a lever. Lack of tools to address consumption patterns from citizens The reduction obligation has been an important tool for promoting biofuels, but its development in the coming years is uncertain <p>National level:</p> <ul style="list-style-type: none"> There is a need for administrative accountability regarding resource efficiency and the circular economy. Lack of initiatives to improve the profitability of reusing, recycling, and repairing. There is a necessity to modify formal regulations, including waste legislation, building codes, or industry standards, which can at times impede a more effective or circular utilization of resources. 	<p>By promoting engagement from both private and public sectors to reduce waste and promote the reuse, repair, and recycling of materials and products, opportunities for sustainable development in waste and resource management are opened. This requires incentives for companies and households to participate, collaborative projects and education, as well as innovation in material recycling.</p>	<p>EU, National government, The National Agency for Public Procurement, NSR (municipal recycling company, Gävle municipality)</p>

Fields of action	Systemic barriers	Opportunities	Stakeholders
	<ul style="list-style-type: none"> The incineration tax on waste needs improvement, as evaluations indicate it has a limited effect in minimizing greenhouse gas emissions from waste incineration. Needs higher political priority. The EU has by far the most power to address consumption based emissions by legislation on how products can be produced and recycled. This cannot be pushed down to the local level and individual responsibility. 		
Energy Systems	<p>Municipal level:</p> <ul style="list-style-type: none"> Lack of organisational capacity to address energy question on an overall level to address climate change. Regional and national dependence to increased local transmission capacity. Installing Charging infrastructure for heavy duty vehicles will be a problem until 2032 Local resistance towards wind power <p>National level:</p> <ul style="list-style-type: none"> Increased transmission capacity for electricity between northern and southern Sweden is required for Gävle to have sufficient access to electric power. The potential we have in Gävle is above all offshore wind power. Short permit processes and an energy policy that promotes wind power would be beneficial. 	<p>By owning the local energy company, Gävle has the opportunity to change ownership directives and thereby steer energy policy towards sustainability and renewable energy. By leveraging the regional network, Arena Electric Power, Gävle can exert influence and collaborate with other regions to promote common goals for sustainable energy development. The development of a local transmission market opens up opportunities for diversification of energy sources and increased availability of renewable energy. By harnessing pressure from industries, Gävle can foster a better understanding of the need for wind power and thereby promote investments in wind energy projects and infrastructure.</p>	<p>The Swedish Energy Agency. The municipality, The Region, Local climate agreement Arena electric power (where producers, grid owners and municipalities are gathered)</p>
	<p>Municipal level:</p> <ul style="list-style-type: none"> Lack of knowledge surrounding efficiency measures. Lack of funding since there is not yet a functioning market. 	<p>By promoting the increase of green areas and integrating natural infrastructure into urban planning, as well as minimizing emissions from industries and energy</p>	<p>The Swedish Environmental Protection Agency, the provincial government The Swedish Board of Agriculture, The Federation of Swedish Farmers, Gävle municipality</p>

Fields of action	Systemic barriers	Opportunities	Stakeholders
Carbon capture & compensation	<p>National level:</p> <ul style="list-style-type: none"> • Increase the protection of productive forests with high natural values. • There is a need for supporting methods and tools to measure and evaluate carbon sinks. Natural carbon sinks are often associated with uncertainties linked to measurement uncertainty, additionality, permanence and carbon leakage. • There is a lack of guidance on how actors should consider the contribution of land use changes to greenhouse gas emissions in connection with land exploitation. 	<p>systems, opportunities for sustainable development and environmental protection are opened. Furthermore, the municipality needs to consider possibilities for the development of green roofs, economic incentives for industries, and the creation of green corridors for biodiversity.</p>	

Transport and mobility

The reduction obligation is a statutory obligation for fuel suppliers to reduce greenhouse gas emissions by blending a certain amount of renewable fuels into gasoline and diesel. Decisions on the reduction obligation are made by the government and implemented by the Swedish Transport Administration in collaboration with other authorities. This measure is of great importance for influencing the transition in transportation by promoting the use of environmentally friendly fuels, thereby reducing the climate impact from the transportation sector. By imposing requirements on fuel suppliers, the reduction obligation drives changes in the fuel market and stimulates investments in alternative fuels and technologies, which in turn promotes a transition to more sustainable transportation solutions.

At the same time, the Swedish Transport Administration plays a central role in Sweden's transportation transition by planning, constructing, and maintaining transportation infrastructure. By promoting sustainable transportation solutions such as public transport, cycling, and walking, and supporting the transition to more environmentally friendly fuels and vehicles, the Swedish Transport Administration actively contributes to reducing climate impact and promoting a more sustainable transportation sector. The Swedish Transport Administration is also a driving force for innovation and research in the transportation sector to meet future challenges and needs.

Built environment and real estate sector

Stakeholders such as the Swedish National Board of Housing, Building and Planning, construction companies, construction wholesalers, consulting firms, and the municipality all play crucial roles in influencing the municipality's climate transition within the construction and infrastructure sectors.

The Swedish National Board of Housing, Building and Planning provides guidance and regulations for sustainable construction practices, while construction companies implement these practices in their projects. Construction wholesalers supply materials for construction projects, and consulting firms offer expertise in sustainable design and construction methods. The municipality sets policies and regulations regarding construction practices and may provide incentives for sustainable building initiatives.

Together, these stakeholders collaborate to drive the municipality's efforts toward a more sustainable and climate-resilient built environment.

Consumption and circular economy

The EU, the national government, the National Agency for Public Procurement, and NSR (municipal recycling company) can all influence the municipality's climate transition regarding consumption and waste. By establishing laws, guidelines, and sustainable principles, they can promote actions for waste reduction, recycling, and sustainable consumption. They can also provide financial support, create incentives, and provide infrastructure to facilitate the municipality's efforts to reduce its environmental impact and promote more sustainable waste management.

Energy systems

The Swedish Energy Agency can influence the municipality's climate transition in the energy sector by providing guidelines, resources, and support to promote renewable energy and energy efficiency. The region can play a central role by coordinating initiatives in the energy field and promoting collaboration between various stakeholders to maximize the effects of climate transition measures. Local climate agreements and collaborations, such as Arena Electric Power, enable joint efforts to reduce emissions and promote sustainable energy use within the municipality.

Carbon Capture and compensation

For this field of action there are several stakeholders that can influence and impact the barriers and opportunities.

The Swedish Environmental Protection Agency provides guidelines, resources, and support for projects aimed at capturing and compensating for carbon dioxide emissions. They also promote research and innovation in the field and provide financial support for project implementation.

The County Administrative Board coordinates and monitors the implementation of climate projects at the local level and ensures that the municipality follows national guidelines and goals for carbon uptake and compensation. They also provide technical support and expert advice to the municipality.

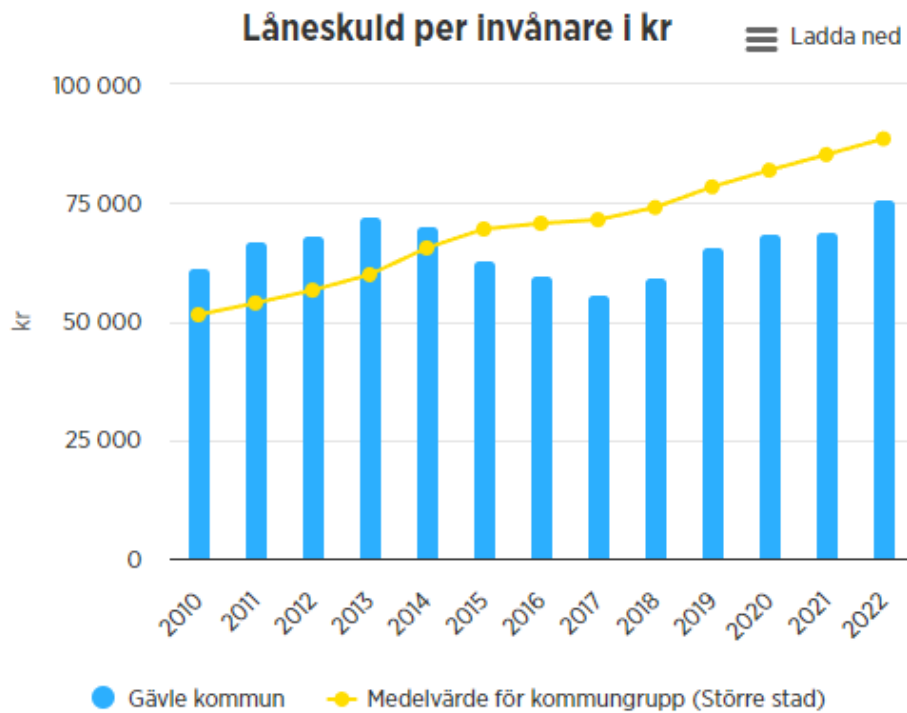
The Swedish Board of Agriculture promotes sustainable agricultural practices and land use that enhance carbon uptake in the soil, such as afforestation, land restoration, and the use of green ground cover plants. They also provide advice on the use of biogas and other renewable energy sources within the agricultural sector to reduce carbon emissions.

The Federation of Swedish Farmers educates and supports farmers in implementing methods for carbon uptake and compensation on their land. They also promote collaboration between farmers and other stakeholders to maximize the climate benefits of agricultural practices. In summary, these stakeholders play a vital role in promoting and supporting actions for carbon uptake and compensation at the local level, which is crucial for the municipality's climate transition.

Funding and financing the transition

In the quest for sustainable development and community well-being, Gävle places a significant emphasis on its financial capacity and management.

The citys- funding abilities



As seen above, the total debt of Gävle municipality and its' companies are around EUR 6.800/capita, per 2022-12-31. That debt level is lower per capita than the average of other comparable cities (bigger city), which on average is about EUR 8.200/capita. Kommuninvest lends money to its' member municipalities and regions and is the main lender to the vast majority of Swedens' municipalities and regions. The bottom line for Kommuninvest, in order to lend funds, is the debt level per capita. As the table above shows, Gävle does not have to worry about not being able to lend money.

If Gävle were to choose other sources of funding in the financial markets, the debt level would be the major criteria of which we are assessed and would therefore fall out favourable and have no problem to borrow there either. The reason Gävle funds itself via Kommuninvest is the fact that it cheapest, all costs considered and is the most efficient for Gävle municipality and its' companies.

The borrowing needs for both the municipality and the municipal companies are centralised to Gävles internal bank.

The access to money is therefore not a hurdle. The business case for the climate actions is. Many of them does not have an economic return that is feasible and therefore difficult to motivate. Like investments in low carbon materials in buildings, they are costly and does not add to energy efficiency or other qualities of the building.

Gävle has a couple of larger projects in the pipeline together with local industry. These will be PPP's and possibly also need external funding due to that new technology is tested.

Financial risks

Gävle has identified several financial risks reaching the climate goals. The economic feasibility of several of the investments needed poses a large risk, like BCCC and low carbon building materials. To abate those risks locally is also quite difficult due to their dependency on market conditions created nationally or internationally. The availability of biofuels, low carbon material and products also poses a risk which can be connected to market conditions.

Behavioural change poses a risk in several ways. Behavioural change is needed in the transportation system to reduce dependency on private cars. Behavioural change, or change in attitude, towards wind and solar power is also needed so we can introduce these energy sources on a larger scale.

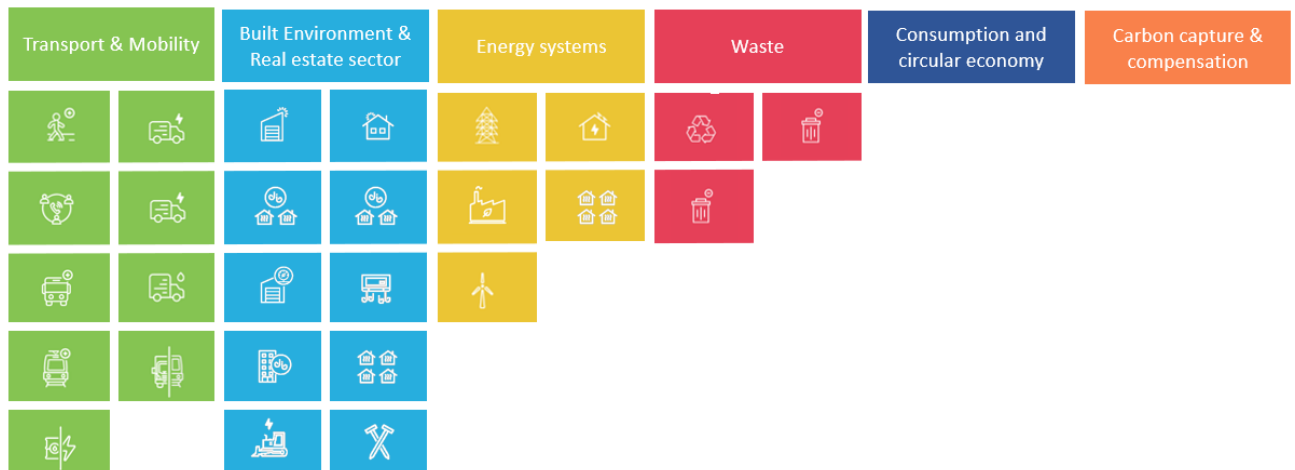
The economic downfall poses a risk to deploy climate action but also reduce emissions due to decreasing consumption. Less is being built and therefore emissions are avoided.

Supporting other stakeholders in financing

The Swedish law restricts municipalities from supporting other stakeholders, especially business. We can support associations if we do it according to all rules. Gävle does support associations but mainly connected to social sustainability which we have a yearly budget for. We have no budget to support climate projects now. Climate aspects could be added to the social projects budget as a possibility. A separate budget for climate action is not considered at the moment due to economic downfall.

Gävle Action plan; Framework

Gävle municipality is navigating its transformation through a well-defined strategic framework, which organizes the city's transition systematically by sectors and Fields of Actions. This strategic framework serves as a guide for analysing and monitoring the change process. It offers a structured overview of completed tasks, pending actions, and responsible parties. Through this transparent and inclusive framework, the city fosters collaborative efforts to realize its climate neutrality goals. The constituent parts of this framework are referred to as Transition Elements.



The Transition element- help by breaking down the challenge of a city into a discrete, manageable, transparent and incremental shifts. The Action Plan bases its transition on a framework with Transition Elements organised across Fields of Action.

Transition Element	
 e.g. Transport	<p>Carbon Abatement – The potential of reduction of carbon dioxide for the transition element (reduction compared to emission levels year 2030 if business-as-usual).</p> <p>Leading indicators – A measurable target for the action. Help the city to see and understand the progress</p> <p>Action – sets to to achieve a specific purpose or to solve one problem, such as a decision on an investment, a new policy, or an information campaign.</p> <p>Cost & Co-benefits – Investments that is needed and other indirect impact, for example less air pollution or reduction in</p>
Carbon abatement	
Leading indicators	
Actions	
Costs & Co-benefits	

Tool for developing the climate action plan

The action plan gathers potential baseline and transition elements from ClimateView, a Software as a Service (SaaS) platform designed to offer cities a comprehensive solution to the systemic challenge of addressing climate action. ClimateView efficiently manages data through ClimateOS. All data points within ClimateOS are sourced from open channels, encompassing specific national data such as mileage and housing square meters, as well as international research on sustainability. The pre-populated data points come with transparent and well-documented sources, ensuring reliability and accountability.

Transport & Mobility

The transportation sector accounted for 64% of emissions in Gävle according to the baseline 2021. This sector uses the most fossil fuels in the municipality. Fossil-free vehicles exist and have reached a reasonable price level; however, it takes a long time to transition an entire vehicle fleet. At the same time, private car usage is problematic from several perspectives in our urban areas, and the municipality should therefore implement measures that encourage the use of more efficient modes of transportation.

Encouraging carpooling through public transportation and reducing the need for road construction can have significant benefits for urban environments. By promoting shared rides and efficient use of public transit systems, cities can alleviate traffic congestion and decrease the demand for new road infrastructure. This not only reduces environmental impact but also frees up space within urban areas, allowing for the creation of more green spaces and recreational areas. Additionally, initiatives aimed at reducing reliance on private cars, such as limiting the availability of car parking spaces, can further contribute to the enhancement of urban landscapes and the overall quality of life for residents.

Alongside the municipality's work, Gävle port has an ongoing program to contribute to the transition of the transportation system. The port's overall goal is to reduce its climate impact by 80% by 2030 by optimizing energy use in land and sea transportation, as well as other port activities. Among other things, the port is investing in electrified railways, fossil-free terminal vehicles and cranes, and offering electricity connection for ships at all of the port's docks.

To reach climate neutrality by 2030, an acceleration is needed both for private and freight transportation. Figure 1 illustrates how the transition elements described in Table 7 can reduce the carbon footprint from mobility and transport.

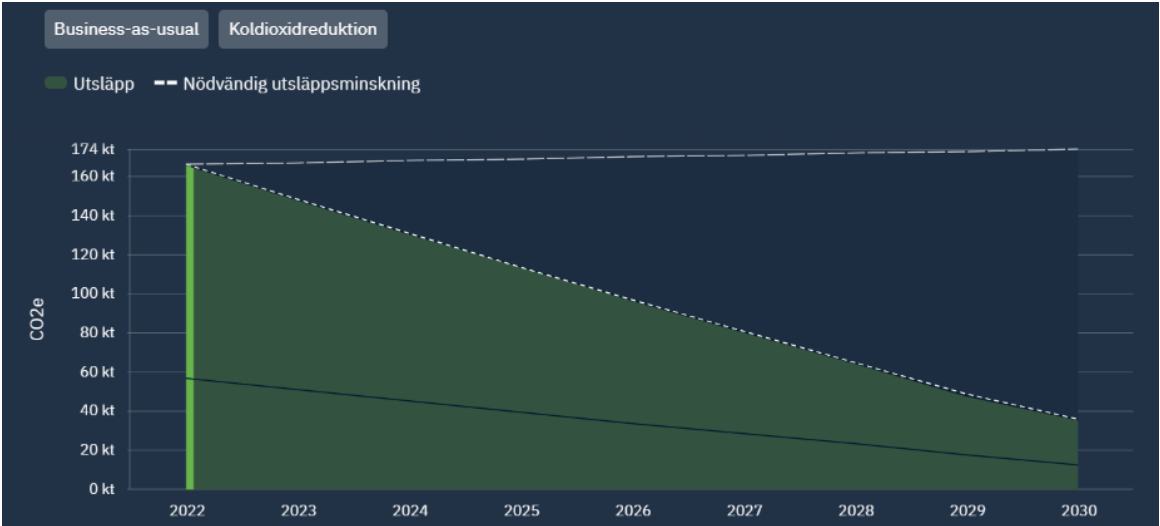








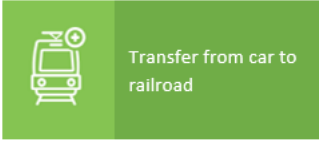


Figure 1. Illustrates how the transition elements can reduce the carbon footprint from mobility and transport.

The different transition element for private and freight transport are displayed in table X below with also describes the planned action costs, potential emission reduction and co-benefits.

Table 7. Transition element for transport

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 <p>Shift to electric vehicles</p>	Share electrical vehicles in the geographical vehicle fleet 2030	45%	50 kt	Air quality Reduced noise
 <p>Transfer from car to work from home</p>	The percentage of commuters with private cars shifting to working from home 2030.	15%	17 kt	Reduce accidents Less congestion
 <p>Shift to electric heavy trucks</p>	The percentage of kilometres driven by battery electric trucks instead of diesel trucks 2030.	45%	18 kt	Air quality Reduced noise
 <p>Increased proportion of walking and cycling</p>	The amount of trips (passenger km) done by walking or cycling 2030.	5 %	6 kt	Reduced noise Reduce accidents Less congestion Air quality Improved health
 <p>Increased proportion of commuting by electric bus</p>	The percentage of trips (passenger km) done by public transport by bus 2030.	8 %	9 kt	Reduced noise Reduce accidents Less congestion Air quality
 <p>Hydrogen for heavy trucks</p>	The percentage of kilometres driven by hydrogen trucks instead of diesel trucks	30%	12 kt	Air quality Reduced noise
 <p>Electric light trucks</p>	The percentage of kilometres driven by battery electric trucks instead of diesel trucks	45%	8 kt	Air quality Reduced noise
 <p>Transfer from heavy truck to electric railroad</p>	The percentage of kilometres that's shifted from using heavy diesel trucks to using transport by railway	15%	6 kt	Air quality Reduced noise Less congestion

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
	The percentage of trips (passenger km) done by railroad 2030.	8%	9 kt	Reduced noise Reduce accidents Less congestion Air quality

For mobility and transport there are more transition elements that have an impact on the reduction of emissions. For example:

- Eco driving
- Improved vehicle technology
- Increase renewable proportion in diesel and gasoline
- Route optimization for trucks
- Improved load factor for trucks

In Table 8 actions are described and connected to the transition elements. The table is divided in action that are already decided and action that's planned or under investigation.

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Table 8. Actions for transport and mobility.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Decided	Mobility assessment	All municipal developments and constructions must have a prepared mobility assessment.	Governance & policy	2021	Increased proportion of walking and cycling, Increased proportion of commuting by electric bus, Improved urban planning	Strategic urban planning department Urban development department	Pilots are built according to recommendations in assessment	Reduced traffic growth in all our exploitations in comparisons with BAU
	Bicycle plan	Bicycle plan is implemented to achieve improved infrastructure and conditions for cyclists	Technology/ infrastructure	2020-2030	Increased proportion of walking and cycling	Strategic urban planning department Urban development department Citizens polls Citizens advisory board on biking	The net is step by step improved according to priority list	Bicycle net is coherent and safe in the whole municipality
	School transportation	Map out and implement measures for sustainable school transportation	Governance & policy	Ongoing	Increased proportion of walking and cycling, Increased proportion of commuting by electric bus,	Urban development department Education administration	A couple of schools are involved in projects at a time. Reduced traffic around involved schools.	New schools continuously involved in projects. Reduced traffic around involved schools.
	Creating conditions for renewable fuels and charging infrastructure	study to defined suitable places for renewable fuels and charging infrastructure. Guidelines for charging infrastructure	Technology/ infrastructure	2022 2022	Shift to electric vehicles (or biofuels)	Strategic urban planning Business consulting Urban development department Municipal companies	5 plots made suitable for renewable energy sales	10 plots made suitable for renewable energy sales
	Fossil free fuels in all municipal vehicles	implement measures and follow-up to ensure that municipal vehicles run on fossil-free fuel.	Technology/ infrastructure	2020	Shift to electric vehicles (or biofuels)	Municipal group	60% by 2023	Fossil free fuels in all municipal vehicles in 2025

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
	Bicycle campaign "winter cyclist"	Initiated in 2010 and is run by Gävle Municipality in collaboration with Region Gävleborg and other municipalities in the region. "Vintercyklisten" is aimed at businesses that want to provide employees with the opportunity to bike during the winter. The purpose is to improve participants' health and reduce the climate impact in Gävle.	Democracy/ participation Social innovation	2010- no end date	Increased proportion of walking and cycling	Urban development department Business life engagement to attract bikers to the campaign and business challenges	Increased number of participants each year	Normalize winter biking, that the difference between the winter and summer is not so substantial.
	Bike pool for the Gävle Municipality Group	In 2021, the project "Hojja Gävle" was initiated, which is an internal bike pool for the employees of Gävle Municipality. The aim of the project is to provide bicycles as an alternative to cars and thereby reduce the number of car journeys made for work purposes.	Democracy/ participation	2021	Increased proportion of walking and cycling	Gävle Municipal	Conditions are set and booking system steer towards sustainable travelling.	Bike is the most common means of transportation for employees when travelling within the city.
	Bicycle-Friendly Workplace Award	"Bicycle-Friendly Workplace" is an award for all workplaces that make it easy for employees to bike to and during work.	Democracy/ participation Social innovation	2020	Increased proportion of walking and cycling	Urban development department Business life engagement to attract business to implement measures to become a bicycle friendly workplace.	Reach out to the companies in the local CCC.	It is normalized that employers provide conditions for employees to commute by bike.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
	Digitization of municipal services	The digitization of municipal services is a way to reduce costs for the municipality, including reducing the travel requirements for both staff and citizens. This consequently contributes to reduced carbon emissions. The municipality is working systematically on the digitization of its services, but there is still much to be done.	Technology/ infrastructure	2021- ongoing	Increased proportion of non-travel (remote) meetings and services	Gävle municipality Citizens surveys	CO2 reduction is part of the digitalisation process.	Digitalisation of services are made where CO2 reduction is the main target.
	Mobility hubs	The municipality actively engages in the concept of mobility hubs in major residential construction projects. The purpose of the mobility hub is multifaceted, including reducing car traffic and parking in the area, making walking, cycling, and public transportation more attractive, decreasing overall parking spaces, and providing mobility services such as shared bicycles, cars, etc	Technology/ infrastructure	2020	Increased proportion of walking and cycling, Increased proportion of commuting by electric bus, shift to electric vehicles, Improved urban planning	Gävle parking service Gävle housing company Private housing companies	First mobility hub is built (2023)	Mobility hubs are standard when new areas are exploited.
	Climate and environmental requirement in procurements	Create conditions for climate and environmental requirements to be specified and monitored in the municipality's procurements. The purchasing department is actively involved in addressing environmental criteria in	Democracy/ participation	2021- ongoing	Transfer to railway, Transition to electric cars, Route optimization for freight transport, Increased load factor, Electrification of light trucks, Electrification of heavy trucks	Procurement department Regular Business dialogue	Overview of procured transports needs to be done in 2024. Measuring method is missing for the goal.	Procured transports are fossilfree in 2025 according to target

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
		procurement, such as when it comes to fossil-free fuels						
	Innovation procurement around Mobility as a Service (MaaS)	Mobility as a Service means that multiple modes of transportation and providers are integrated into a digital platform, such as an app, to offer an optimal range of services that promote mobility, making it easier to navigate around the city.	Democracy/ participation Social innovation	2023	Increased proportion of walking and cycling,	Urban development department Providers of MaaS services	First mobility Service is available (2022)	Mobility services continue to develop and connect to each other.
	Checklist	Develop a checklist for requirements for all land allocation and development projects aimed at achieving climate neutrality.	Democracy/ participation		Increased proportion of walking and cycling, Increased proportion of commuting by electric bus,	Strategic urban planning department Urban development department Municipal companies Business via local CCC building portfolio	Checklist requirements are tested in new exploitations.	Checklist improves the possibilities to sustainable travelling in all our exploitation projects.
	New traffic strategy	Develop a new traffic strategy aiming towards climate neutrality	Governance & policy	2025	Increased proportion of walking and cycling, Increased proportion of commuting by electric bus, Improved urban planning	Strategic urban planning department Urban development department Municipal companies Civil society	Plan is developed and adopted.	Plan is implemented.
	Investment process	Climate neutrality shall be weighted as part of the infrastructure investment process.	Finance & funding	n.d	All targets	Strategic urban planning department Urban development department Municipal companies	Model is developed.	Model is implemented.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Under investigation	Knowledge and behavioural change	Information campaigns targeting citizens for increased knowledge and changed behaviour	Social innovation		Increased proportion of walking and cycling, Increased proportion of commuting by electric bus,	Municipal group	This needs to be combined with other actions that gives incentives to changed behaviour like fees or improved infrastructure for biking.	Shift in behaviour
	Logistics centre	A construction material logistics centre is to be established and utilized by all major development projects	Technology/ infrastructure		Route optimization for light trucks, improved load factor light trucks	Strategic urban planning department Private sector	Create conditions	Launch when market is uprising again.
	Model for the management of materials.	Implement a model for the management of excavation materials to reduce transportation needs and increase reuse	Democracy/ participation, Technology/ infrastructure		Route optimization for light trucks	Strategic urban planning department Private sector	Create conditions	operating
	Coordinated goods distribution	Coordinated goods distribution is introduced, along with requirements for fossil-free final transportation.	Democracy/ participation		Route optimization for light trucks, Improved load factor light trucks, Electric light trucks, Improved vehicle technology, light trucks, Ecodriving of light trucks	Procurement department The Municipal organisation Private sector by trying to get more local products on offer,	Create conditions	operating
	Parking fees and the availability of parking	The availability of parking and the level of parking fees are crucial factors when it comes to the choice of transportation mode. In Gävle, parking fees and parking zones have remained unchanged for about 20 years, making it progressively cheaper to park in	Democracy/ participation, Technology/ infrastructure		Transfer from car to work from home, Increased the proportion of non-traveling (remote) meetings and services, Increased proportion of walking and cycling, Increased proportion of commuting by electric	Urban development department Gävle parking company Gävle city cooperation (association for centrally located business)	Implemented 2024	Reduced travelling by car in the centre

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
		the city over time. This significantly undermines the competitiveness of sustainable transportation modes and contributes to unnecessary traffic in the city center. In 2023, work will commence to review parking zones and fees to align them more closely with the municipality's overall goals.			bus, Transfer from car to railroad			
	Collaborate with employers and property owners to develop green travel plans	The green action plan is based on the premise that journeys can become more sustainable by creating conditions for more people to walk, cycle, or use public transportation for work-related travel as well as commuting to and from the workplace. Gävle Municipality has, until now, used Hemlingborg in Hemlingby as a pilot project for green travel plans, which includes a preschool, school, and care facility	Democracy/ participation,	2021	Transfer from car to work from home, Increased the proportion of non-traveling (remote) meetings and services, Increased proportion of walking and cycling, Increased proportion of commuting by electric bus,	Urban development department Employees Property owners	Plan is launched at our flagship project Hemlingborg	Inspirate and collaborate with business to develop green travel plans
	Develop an action plan to make the municipality group's and municipal employees' transports climate-neutral.	Develop a model for internal climate compensation for air travel. Commuter travel cards with salary deductions are introduced within the Gävle Municipality group.	Democracy/ participation	n.d	Transfer from car to work from home, Increased the proportion of non-traveling (remote) meetings and services, Increased proportion of walking and cycling, Increased	n.d	Model is developed and implemented	Air and car travel is reduced within municipal group.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
					proportion of commuting by electric bus, Transfer from car to railroad			
	Fully implement the four-step principle in infrastructure planning	<p>The four-step principle is applied to ensure effective resource management and to ensure that measures contribute to sustainable societal development.</p> <p>Rethink: The first step involves considering measures that primarily address the need for transportation and travel, as well as the choice of mode of transportation.</p> <p>Optimize: The second step entails implementing measures that lead to a more efficient utilization of existing infrastructure.</p> <p>Restructure: If necessary, the third step involves limited restructuring.</p> <p>Build New: The fourth step is implemented if the needs cannot be met in the previous three steps. This involves new investments and/or major restructuring measures.</p>	Democracy/ participation	ongoing	Increased proportion of walking and cycling, Increased proportion of commuting by electric bus,	Strategic urban planning department Urban development department Transport authority Region Gävleborg	Work process for how the model can be handled internally	The principles are fully implemented.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
	Environmental zones	Introduce environmental zones in the city centre (car-free areas, reduced speed limits, emission requirements for different zones).	Governance & policy	2024	Increased proportion of walking and cycling, Improved urban planning	Strategic urban planning department Urban development department	Pilot study	Environmental zones are introduced if pilot study shows that it is feasible
	Route optimization	Route optimization of the municipality's transports, home care, special transportation, school transportation, waste collection, etc. Some Route optimization exists, like waste collection, but it could be used in more areas.	Technology/ infrastructure	n.d	Route optimization	n.d	Overview of transports that are suitable for route optimization	Route optimisation executed.

The private transport accounts for approximately 65% of the emissions from transport and mobility and is an important key to reach the goal of carbon footprint reduction. To reach the goal there are numerous of action that needs to take place. For example, is the mobility shifting from car to bicycle or public transportation an important step for the citizens to contribute to the goal.

Figure 2 below illustrate the scenario for the private transport and how the Transition Element could contribute to reducing emissions by 2030.

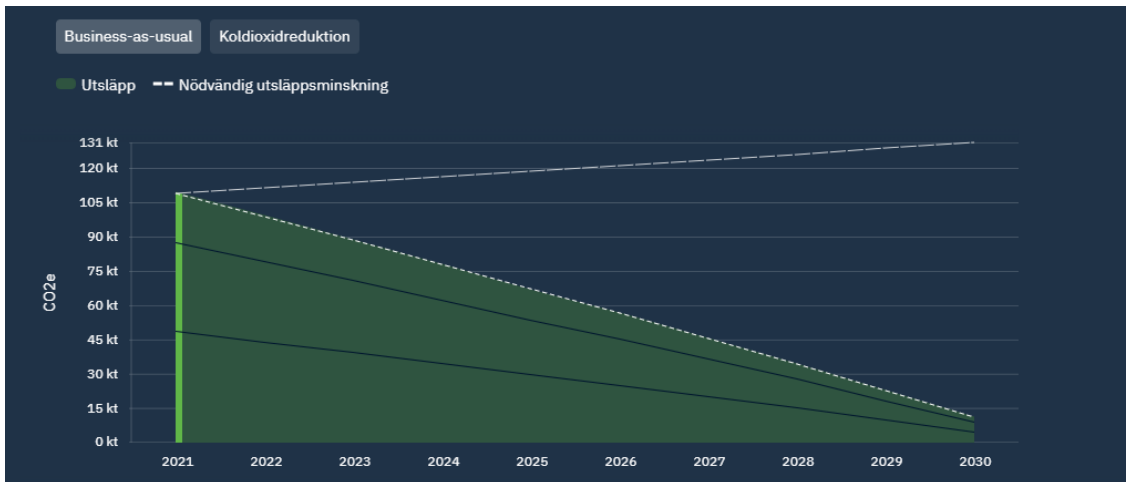


Figure 2. Illustrates how the transition elements can reduce the carbon footprint from private transport.

Regarding the freight transport Gävle municipality plan to work on reducing emissions by renewable fuels and electricity vehicles. Additionally, the municipality aim to optimize transport routes by coordinating logistical flows.

Figure 3 below illustrate the scenario for the freight transport and how the Transition Element could contribute to reducing emissions by 2030.

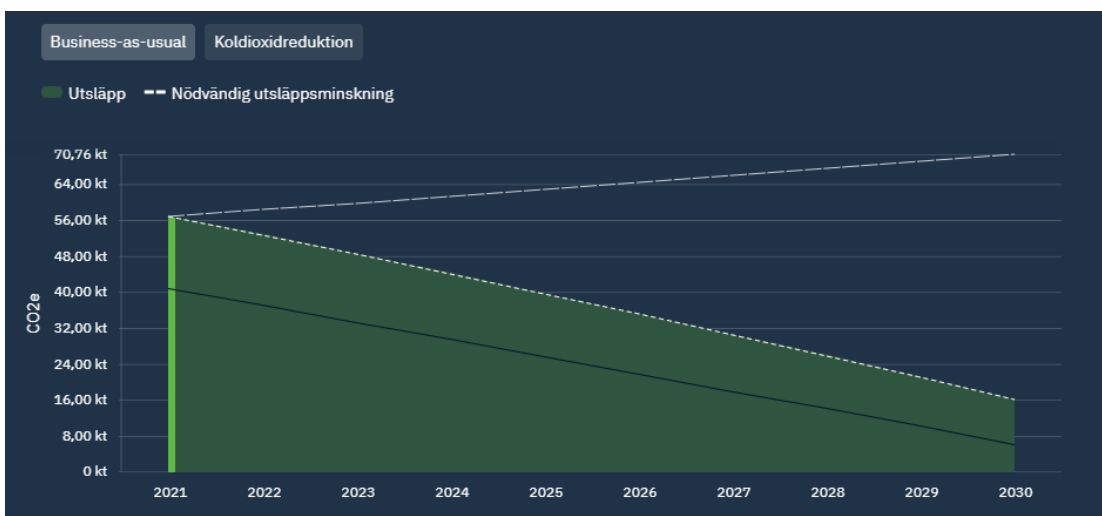


Figure 3. Illustrates how the transition elements can reduce the carbon footprint from freight transport.

Fuel Transition

For both private and freight transport, the fuel transition must take place to phase out fossil fuels in the transportation sector. The automotive industry has shifted course, and electrification is a reality. The question is more about how quickly the development will occur and how, during the transition phase, we manage the existing vehicle fleet, which has an expected lifespan beyond our ambitions to be climate-neutral by 2030.

Over the coming decade, a palette of renewable fuels will be needed for both existing and new vehicles, such as electricity, biogas, HVO (hydrotreated vegetable oil), ethanol, and bio-petrol. Pump laws partially regulate the availability of fossil-free fuels to the public, but fuel companies rarely invest heavily in biogas or hydrogen, which require substantial infrastructure investments. In Gävle, there is extensive work on the production and distribution of biogas for the transportation sector, but more fuelling and charging stations for renewable fuels are needed in Gävle. Existing fuel companies do not prioritize the issue, and therefore, these fuels are not widely marketed, with companies content to comply with legal requirements. Actors wishing to establish renewable refuelling stations find it challenging to access land and permits. The municipality needs to take a comprehensive approach to where we want vehicles to refuel in the future and demand the establishment of a range of renewable fuels at these locations. Currently, biogas stations are often located in unattractive places without services, and this needs to change. Biogas vehicles and other vehicles that can run on liquid biofuels such as ethanol and HVO will, for the foreseeable future, be cheaper than electric vehicles and are needed for all groups in society to transition, especially in rural areas where it is more challenging to replace the car with other means of transportation.

The development of electric cars depends on suitable charging infrastructure and hydrogen stations. At the national level, efforts have been made to ensure that the national charging infrastructure network complies with EU requirements, i.e., fast charging is available every 10 miles. The need for fast charging is significantly less compared to traditional tank infrastructure since electric cars charge at home for about 90%. Thus, the municipality's most crucial task is to ensure that it is possible to install charging stations where people live and at businesses and companies with their own operational vehicles (such as public transport buses). Pure electric cars already have a range of about 30 miles today, so the need for charging stations for employees and visitors will not be as significant except in industries like hotels that can attract visitors from longer distances.

In 2022, the municipality adopted guidelines for charging infrastructure that specify when, where, and how the expansion of charging infrastructure should be managed in public spaces. Hydrogen is still a relatively new phenomenon in the transportation sector but can be seen as a way to electrify the vehicle fleet, especially for heavier transports where batteries quickly become too heavy, such as in trucks, ships, and airplanes. Gävle Port has extensive plans for a hydrogen station as part of a broader electrification strategy for the entire port operation. However, producing hydrogen is not very efficient compared to using electricity directly in a battery. In the conversion of electricity to hydrogen, you lose between 30-40% of the energy. But in a future where energy production consists much more of solar and wind power, it may be worthwhile to store electricity as hydrogen when electricity prices are very low. The EU is heavily investing in hydrogen in the Green Deal initiative, and there is significant hydrogen interest in Gävleborg linked to the logistics sector, steel industry, and data centres.

Cycling

In 2020, a new cycling plan for Gävle municipality was adopted. The ambition is to double the number of trips by bicycle by 2025. The starting point is 5735 cyclists (in 2018), measured at Gävle city's measuring points. The goal is that one-third of all trips should be made by bicycle, one third by car, and one third by walking and public transportation. Gävle aims to be one of Sweden's best cycling cities by 2025, according to the rankings in Cykelfrämjandet's Kommunvelometer and Cyklistvelometer.

The cycling plan provides the municipality with current planning data for cycling, both for overall and detailed planning, serving as a tool for prioritization and economic assessments. It covers the entire cycling infrastructure, including a physical plan with a backbone network for cycling and proposals for places where cyclists' conditions need improvement, as well as principles for signage, bicycle parking, maintenance, and detailed design planning. The cycling plan is complemented with an action plan.

Parking

How parking is planned in new emerging neighbourhoods, how coordination of existing parking areas occurs, and what mobile services the facility and parking company can offer significantly affect the ability of Gävle municipality's residents to choose means of transportation other than fossil-fuel-driven cars. Continuing to build houses with garages in basements, as well as on the ground level, does not encourage alternative modes of transportation or create a pleasant car-free urban environment or help achieve Gävle municipality's environmental goals. Instead, it leads to inefficient resource use and high overall costs for parking, which will ultimately be borne by residents, whether they own a car or not.

To avoid situations that have arisen in the development of new neighbourhoods in Gävle, where new homes have been built without parking or agreements with other developers to build parking or implement mobility measures have not been fulfilled, there is a public interest in having the municipality's parking company, where necessary, oversee the work on developing the area's mobility and parking.

The development of the mobility concept in the municipality's mobility house and future mobility hubs creates favourable conditions for reducing car traffic in favour of alternative modes of transportation or fossil-free transportation. In many cases, it is not interesting for private developers to build mobility houses in residential areas, and therefore, Gävle Parking Service has developed the concept of parking purchases as a financing form for the construction of new facilities and can thus operate the houses profitably. How and where mobility houses are built in new neighbourhoods becomes crucial, where low parking ratios are managed through flexible systems and parking purchases. Mobility houses have a clear focus on mobility to encourage and enable modes of transportation other than cars and are a crucial piece in the municipality's efforts to achieve sustainable transportation.

With the "*park and ride*" concept, facilities can be placed so that it is easy to switch to other modes of transportation. For example, near a train or bus station for changing to a train, bus, bicycle, or similar. The mobility houses are simultaneously equipped with mobile services such as charging infrastructure, carpool solutions, bicycle parking, rental systems for electric

scooters, cargo bikes, parcel delivery, etc. Through these facilities, the municipality aims to simplify people's daily lives and simultaneously enable sustainable travel, reducing the need for travel.

To achieve the goals in the environmental strategic program, a crucial control mechanism is the fee level for the city's street parking spaces. The fees form the basis for opportunities to create space in the street and increase incentives to choose alternative modes of transportation. The current fee level (especially in 2 SEK and 5 SEK zones) makes it challenging to create incentives for choosing other modes of transportation. When fees are introduced for workplace parking in central locations to encourage alternative modes of transportation, the current fee level often leads to choosing the usually cheaper option of parking on the street rather than changing transportation methods. Current fee levels also do not generate to a sufficient extent the cash flow needed to reinvest in sustainable parking solutions and an expanded charging infrastructure in the city. Collaborating, coordinating, and sharing existing workplace parking spaces are also essential measures. Both market prices and mobile services can be introduced here to both clarify the cost of parking and encourage alternative modes of transportation, but also to create conditions for electric vehicles and pool cars.

Signage and information for our parking facilities need improvement to reduce the need for street parking and unnecessary search traffic among those who choose to drive to the city.

Public Transport

An essential measure is to, together with Region Gävleborg as the public transport authority, review and develop the main transit network in Gävle as the city grows in both existing and new districts.

Over the past decade, significant changes have occurred in Gävle's development. Entirely new residential areas have been developed, and several large workplace areas have been added, schools have changed their focus, been established, and moved. Meanwhile, only minor changes have been made to the city bus traffic. In 2004, a public transport system was introduced, which today's network is still largely based on, in turn based on a route network analysis from 1999. Various efforts for the existing public transport system have been implemented, such as the reconstruction of the central station, Bus Rapid Transit (BRT) measures for line 2, increased frequency for specific lines, etc. However, the more significant structural changes that occur, the more urgent the need for a more comprehensive route network analysis becomes. The purpose of the route network analysis is to ensure that public transport offers travel opportunities based on identified needs and a current market analysis. It should also serve as support for the planning and development of the city and its infrastructure in general and specifically for various traffic and implementation agreements.

As guiding documents and support for these development efforts and for the development of public transport in Gävle, there are the municipal traffic strategy and other planning guidelines, as well as the regional traffic supply program. However, there is a lack of a directional document with a strategic perspective for the development of city bus traffic in Gävle going forward, equivalent to a public transport strategy. The public transport strategy should describe the direction and place in the transportation system that public transport is expected to take in the city, when planning new residential areas, and transforming existing

commercial areas. The work should also include goal descriptions and relevant measures at the interface between public transport, special transportation, and school transportation at the municipal level.

Freight Transport

For the heavy freight transport, there are economic advantages to increasing the filling rate in trucks. Many companies have actively worked on this over the past decade to increase their competitiveness. In many cases, the filling rate could increase even more through coordination outside the individual company, where companies have not progressed as far. At the same time, a relatively new transport sector is emerging due to the increased e-commerce, where the number of light trucks delivering to the end customer has increased dramatically, such as deliveries of grocery bags. Coordination between these companies is currently limited.

The municipality can play a role in coordinating freight transport. Several municipalities already coordinate municipal goods flow by collecting all goods in a central location, which is then distributed to the businesses. In 2020, we initiated a pre-study on how this could be organized in Gävle. Results from other municipalities show that this measure reduces costs, decreases truck movements, and thus reduces emissions, up to 80% in the best-case scenario where requirements for fossil-free fuels are imposed.

Some municipalities have also introduced coordinated construction logistics with good results. It is based on the same principle as coordinated freight transport but for construction materials. Since Gävle is in an expansive phase where much new construction will take place, there will be a significant transportation need. The region is simultaneously building a new hospital in Gävle and has also indicated a need for coordinated construction logistics. By coordinating these transports from a central point, we can reduce the number of truck movements, emissions, and also the need for space for construction materials at the construction site. A pre-study on this is also being developed in 2020. How we could eventually connect or otherwise coordinate commercial goods flows will be an important question in the ongoing work. Technically, it is possible, but achieving profitability in coordination has been a challenge in other cities.

Efficiency

Finally, the transportation itself needs to become more efficient. This involves both coordinating passenger and goods transport, as well as making the vehicles themselves more energy-efficient. The trend of increasingly larger personal vehicles in Sweden contrasts strongly with our ambitions for energy efficiency, space efficiency, carbon neutrality, equality, and safety. The transition to electric vehicles will result in some energy efficiency due to the efficiency of electric motors being 85–95%, compared to the combustion engine's 25–40%. However, electric cars take up as much space as regular cars and require the same infrastructure in terms of roads and parking. This infrastructure is both expensive and generates significant emissions. Considering that an average car is parked about 90% of the time, the car is the least efficient way to organize transportation in our cities.

From this perspective, we need to develop modes of transportation that are more efficient, such as public transport, shared services, walking, and cycling. In the wake of digitization,

new ride-sharing and car-sharing services are also emerging, which can become more attractive if the municipality chooses to reduce the attractiveness of driving and owning a car in urban areas, similar to other cities.

Built Environment & real estate sector

Gävle is growing, and the construction needs are not easily reconciled with the ambitious climate goals of the municipality. Most emissions from construction are not included in the territorial emissions but Gävle has decided to include them in our action plan even if we don't know exactly how big they are for the municipality since we have the power to influence them to a large degree.

According to the industry's own roadmap to achieve fossil freedom, the climate impact potential of the construction and civil engineering sector can be roughly halved by 2030 with existing technology. However, to achieve net-zero or beyond, technological shifts and the commercialization of innovations are needed.

It is challenging to reduce the emissions by 2030 from a life cycle perspective when the municipality needs to continue to upgrade housing and infrastructure as the city grows and the population increases. Figure 4 illustrates how the transition elements for buildings energy consumption can be reduced over the years while the business-as-usual emissions increase.

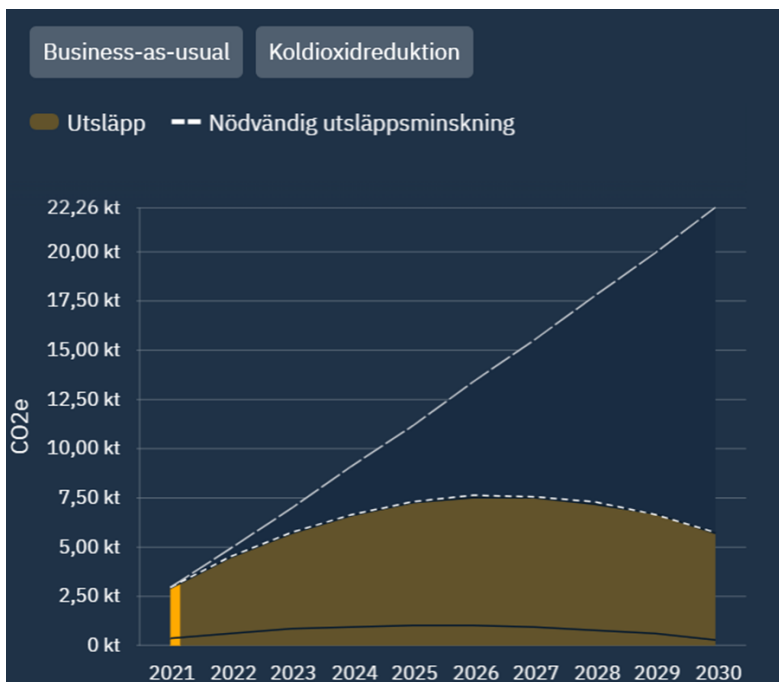












Figure 4. Illustrates how the transition elements can reduce the carbon footprint from buildings energy consumption.

The different transition elements for the built environment and real estate sector are displayed in Table 9 below. Due to the difficulty in assessing emissions from the construction, no indicator has been set for that transition element.

Table 9. Transition element for built environment and real estate sector

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 Reduce carbon footprint from construction	No indicator has been set	-	-	Energy efficiency, circular economy
 Heat pumps in single-family residential buildings	Proportion of single-family housing heated with direct electricity, oil or natural gas converted to heat pumps year 2030.	60%	9 kt	Air quality, Energy efficiency
 Electrification of mobile machinery	Proportion of mobile machinery activity shifted to electrical machinery year 2030.	25%	6 kt	Reduced noise Air quality
 Heating single-family residential buildings with renewable solid biofuels	Proportion of single-family homes heated with direct electricity, oil or natural gas converted to renewable biofuels year 2030.	20%	3 kt	Air quality, Energy efficiency
 Shift to district heating in single-family houses	Proportion single-family houses heated with oil, natural gas or direct electricity converted to district heating year 2030.	5%	1 kt	Air quality, Energy efficiency
 Heating of commercial buildings with renewable solid biofuels	Proportion of commercial buildings heated with direct electricity, oil or natural gas converted to renewable biofuels year 2030.	37%	1 kt	Air quality, Energy efficiency
 Heat pumps in commercial buildings	Proportion of commercial buildings heated with direct electricity, oil or natural gas converted to heat pumps year 2030.	45%	1 kt	Air quality, Energy efficiency
 Shift to district heating in commercial buildings	Proportion commercial buildings heated with oil, natural gas or direct electricity converted to district heating year 2030.	15%	527 t	Air quality, Energy efficiency

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 Retrofitting of single-family residential buildings for energy efficient heating	Proportion of single-family housing achieving efficiency target 30% year 2030.	20%	470 t	Air quality, Energy efficiency
 Retrofitting of commercial buildings for energy efficient heating	Proportion of commercial buildings achieving efficiency target year 2030.	15%	36 t	Air quality, Energy efficiency

Climate requirements are set with associated penalties, it is crucial that the requirements are clear. An alternative could be to give the contractor a certain "time" to incorporate the requirements, for example, when acquiring new vehicles or machinery. It is also important for the municipality to specify what a climate effort entails or the type of policy required to submit a bid.

Material reuse is still in its early stages in the construction industry, requiring new ways of working, which may involve longer working hours and special tools. An alternative could be for the client, before procurement, to investigate whether there are building materials that can be reused, for example, at a reconstruction depot, and "provide it" for the assignment. This way, bidders will calculate based on the same conditions.

In 2020, the construction industry developed recommendations for procurement requirements regarding the climate. The municipality can use these recommendations as a starting point for further developing procurement requirements that align with climate goals.

All construction must also create conditions for residents and businesses to live environmentally sustainably by minimizing water and energy use, optimizing recycling, and contributing to sustainable travel, among other things.

In Table 10 actions are described and connected to the transition elements. The table is divided in action that are already decided and action that's planned or under investigation.

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Table 10. Actions for built environment and real estate sector.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Decided	Checklist	Develop a checklist for requirements for all land allocation and development projects aimed at achieving climate neutrality.	Technology/ infrastructure	2024	Reduce carbon footprint from construction, land use, energy, waste.	Strategic urban planning department Urban development department Municipal companies Private companies through local CCC	Checklist requirements are tested in new exploitations.	Checklist contributes to reduced emissions from building process in all our exploitation projects.
	Introduce requirements for reducing climate impact in construction work.	Material selection for new construction and renovation should be based on life cycle analysis. The municipality is examining how requirements can be imposed.	Technology/ infrastructure	2024	Reduce carbon footprint from construction.	Strategic urban planning department Urban development department Municipal companies Private companies through local CCC	Requirements are tested in new exploitations.	Requirements contributes to reduced emissions from building process in all our exploitation projects.
	Climate calculation mode	Implement that a climate calculation model is used in all development projects undertaken by the municipality.	Technology/ infrastructure	2023	Reduce carbon footprint from construction.	Strategic urban planning department Urban development department	Develop and implement model	The model is applied to all development projects.
	Energy efficiency in existing buildings	Gävle municipality is reviewing an updated energy plan for Gävle properties	Technology/ infrastructure	Continuously	Retrofitting of single-family residential buildings for energy efficient heating,	Gävle municipal companies	Continuous energy efficiency measures in housing stock	Energy efficiency goal is reached
	Sustainable heat supply	Densify and expand the district heating network and investigate potential regional interconnections.	Technology/ infrastructure	continuously	Shift to district heating in single-family houses	Gävle energy company	Continuous expansion of district heating	Reduced electricity use for heating or other sources of heating

Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome	
	Energy performance, requirements for district heating as a heating option	Investigate the possibility of imposing requirements on the choice of heating system for new construction and possible renovations in properties not owned by the Gävle Municipality Group. Requirement for district heating in new construction if possible.	Technology/ infrastructure	n.d	Heating single-family residential buildings with renewable solid biofuels, Heat pumps in single-family residential buildings, Shift to district heating in single-family houses, Heating of commercial buildings with renewable solid biofuels, Heat pumps in commercial buildings, Shift to district heating in commercial buildings	Gävle energy company Strategic urban planning department	Continuous expansion of district heating	Reduced electricity use for heating or other sources of heating
Under investigation	Requirements for machinery	To impose requirements for reducing climate impact in construction work.	Organisational	2024	Electrification of mobile machinery	Urban development department Municipal companies Market dialogue	Requirements are developed and tested	All machinery is subject to the requirements
	Calculate the climate impact of all new construction projects	The choice of materials for new construction and refurbishment	Organisational	For some of the materials 2023	Electrification of mobile machinery,	Strategic urban planning department Urban development department	materials are being calculated	Choices are based on life cycle assessment

Action name	Description	Systemic levers	Implementation	Concerns Transition Element/target	Stakeholders/stakeholder engagement	Early outcome	Late outcome
and aim for climate-neutral buildings by 2035.	should be based on life cycle analysis.			Reduce carbon footprint from construction	IVL Swedish Environmental Research Institute		
Gävle municipality builds and sets requirements for passive houses.	Requirements are based on operational energy but should be supplemented with calculations for construction.	Organisational	n.d	Electrification of mobile machinery, Reduce carbon footprint from construction	Municipal housing and real estate companies	The Municipal housing company builds its first passive. (due to economic downfall no projects will start in the coming years)	More passive houses are built
Reuse of construction materials and plan for future dismantling and reuse	Investigate increased use of reused building materials after renovation or demolition.	Technology/ infrastructure	2024-2025	Reduce carbon footprint from construction	Municipal housing and real estate companies Private market through local CCC building portfolio	Form a coalition with business to create conditions for reuse	Infrastructure for reuse in place

Energy

The energy use in the form of heat and electricity in our properties is currently almost fossil-free. However, continued efficiency in existing properties and in new constructions is crucial. Electricity and heat should be sufficient for more activities and residents in the future without increasing environmental impact. With a changing energy system and increased electricity demand, it is also essential to consider when during the day and throughout the year electricity is used. This is to avoid peak loads that currently, in some cases, lead to the activation of fossil backup power or imports. With new technology that can regulate energy use in our properties, it becomes easier to control electricity consumption throughout the day, based on electricity network availability, making it more evenly distributed over the day. However, some investments are required to implement this technology.

Gavlegårdarna participates in the Public Housing Climate Initiative, which consists of three focus areas: peak loads and renewable energy, supplier requirements, and climate-smart housing. The overall goals are a fossil-free public housing sector by 2030 and 30% lower energy consumption by 2030 (compared to 2007).

Material

In 2022, the National Board of Housing, Building, and Planning (Boverket) introduced requirements for climate declarations in building construction. This standardizes calculations of building climate impact, making it easier for the municipality to compare different projects and actors, gradually raising requirements. It is crucial to start measuring emissions in construction projects, gather more knowledge and experience, and find good calculation methods and approaches. Gavlefastigheter currently calculates the frame and foundation's climate impact in new constructions, as it is a requirement in the environmental building certification that the company always follows.

The Environmental Assessment Tool of the Construction Sector is currently used as an aid in this process to obtain indicators of life cycle analyses for each material used. Certification will continue to be an important tool to monitor development, set requirements, and ensure the quality of the company's new constructions. They also perform the first climate calculation of an entire building as a step in further developing the work. Climate calculations will be essential for choosing materials with low carbon dioxide emissions. A long-term, step-by-step effort will be needed to move towards climate neutrality, focusing on reducing major sources of emissions initially. There are two important tracks to achieve this: using more recycled materials in the construction process and replacing materials with high climate impact with those with low climate impact. For example, wood can replace steel and concrete to a much greater extent than is currently done in Gävle. Therefore, Gävle municipality should develop efforts to increase reuse in the construction sector and set higher requirements for the use of wood or other materials with low climate impact.

Gavlegårdarna and Gavlefastigheter continuously work on energy efficiency, optimization, and user collaboration to reduce energy consumption in their properties. Gavlefastigheter has

its own energy plan, regularly revised, and is a crucial piece to achieve goals in the energy field. Gävle Energi creates favorable conditions for residents and businesses to make good energy choices through renewable district heating and electricity and collaborates with property companies to develop and streamline systems.

Reuse and Waste

As the materials in our buildings have a high environmental impact, the proportion of recycled materials in new construction or renovation needs to increase. There is also a need for more efforts to prevent unnecessary waste during construction. New construction always entails significant climate impact, and we need to consider renovating and modernizing buildings more frequently instead of demolishing them.

Requirements can be imposed to design newly produced materials to facilitate reuse during future dismantling. The use of space may need to change, finding more flexible solutions to reduce the number of renovations. Gävle municipality aims to increase collaboration with the construction industry to identify/create platforms and methods to promote reuse in the construction sector.





Waste management when an area is operational is also crucial to minimize climate impact. In 2021, Gävle municipality adopts a new circular economy plan that creates conditions for this. Waste management can be both a waste and raw material issue. Regardless, around 50 percent of the goods transported in Stockholm County consist of gravel, sand, stone, and soil. The figure can be expected to be similar in Gävle. Methods to manage these masses more efficiently need to be developed, involving matching supply and demand and finding places where masses can be temporarily stored. However, waste legislation hinders the development of circular business models and limits recycling in construction and civil engineering structures. Today, significant amounts of soil and excavation materials are transported to landfills instead of being locally recycled in facilities. Greater consideration of the purpose of the masses should be taken into account when granting recycling permits for waste masses, considering environmental pollutants that the end use may contribute, such as those from road traffic.


Energy systems

The energy sector is undergoing a significant transformation as the fossil-free society emerges. While electricity and district heating production itself are almost fossil-free in Sweden, especially in Gävle, the entire system is undergoing a transformation. In the long term, nuclear power is likely to be phased out after 40 years of operation, which is the estimated lifespan, and replaced with more intermittent energy sources such as wind and solar. At the same time, society needs to transition to a fossil-free transportation sector and industry, where electrification is the most relevant technology for both transportation and industry. To meet changing production methods and new electricity needs, much needs to happen in terms of technology development, investments in power grids, and legislation.

From a climate perspective, it is crucial that energy consumption is based on combustion to the least extent possible, as combustion always involves carbon dioxide emissions. The extent to which biofuels should be considered entirely climate-neutral is debated and depends on the time perspective. For Gävle, the time perspective is 15 years, while the replenishment of biomass is mostly around 50-100 years.

Table 11. Transition element for energy systems.

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 Adequate Capacity in Power Grids	The capacity for the production of renewable electricity for Gävle Energi's power grid will be expanded by the year 2035	200% *	Not evaluated	Increase delivery reliability and minimize delivery interruptions.
 Increased proportion of solar power	The percentage of Gävle Municipality's electricity consumption should be produced from solar cells by the year 2035.	10% *	Not evaluated	Air quality Economy
 Locally produced biogas	The percentage of the sale of locally produced biogas for fuel has increased from 2020 to 2025	35% *	Not evaluated	Air quality Economy
 Increased proportion of wind power	No indicator has been set	-	Not evaluated	Air quality

Field of actions: Transition Element	Indicator	Target Potential	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 <p data-bbox="335 414 550 481">Increased production of district heating</p>	No indicator has been set	-	Not evaluated	Air quality Economy

* Not a transition target in Climate View. This target is set internal.

The energy plan developed for Gävle Municipality describes the energy goals adopted in the environmental strategic program, MSP 2.0, as well as focus areas and planned measures. In Table 12, an overall selection of the activities included in the energy plan is described.

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Table 12. Actions for energy systems.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders /stakeholder engagement	Early outcome	Late outcome
Decided	Investigate solar panel park or rooftop panels to reach 10% goal.	Investigate the possibility of building a solar panel park together within the companies Gävle Energi and Gavlegårdarna. This is done within the framework of the work related to the Law on Energy Mapping in Large Enterprises (EKL) that GEAB must adhere to.	Technology/ infrastructure	2024	Increased proportion of solar power	Gävle housing and real estate companies Gävle energy company	Investment plan is developed	10% goal is reached
	Creating conditions for new energy solutions in urban planning	Collaboration in early planning processes with Energy company and university	Technology/ infrastructure	2021	Increased proportion of solar power	Strategic urban planning department Gävle housing and real estate companies Gävle energy company University of Gävle	Routines for collaboration in early processes established Research projects initiated	Results from research projects applied in planning process together with energy company.
	Collaborate locally and regionally on electricity grids and grid capacity.	Dialogue with regional grid owners and the Swedish National Grid in their overall planning. Also, businesses, the municipality, grid companies, and authorities need to collaborate to a greater extent. This is to better meet the existing needs.	Democracy/ participation	2021	Adequate Capacity in Power Grids	Region Gävleborg Other municipalities in the region Grid companies Civil society organisations	Find common pathways to solve capacity problems in the overlying grid.	Actions executed
	Energy issues in the planning process.	The new planning strategy focusing on sustainability in the Comprehensive Plan is tasked with coordinating how collaboration on energy issues should be addressed in the planning process. For example, the issue of how the municipality should address future needs for energy storage and electricity production needs to be investigated.	Democracy/ participation	2025-2026	Adequate Capacity in Power Grids, Increased proportion of solar power	Strategic urban planning department Gävle energy company consultation with citizens	Pilot studies to determine how energy issues should be handled in the masterplan	An updated masterplan

Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders /stakeholder engagement	Early outcome	Late outcome
Advisory services	Actively work with energy and climate advice for residents and businesses in Gävle.	Social innovation	ongoing	Adequate Capacity in Power Grids, Increased proportion of solar power	Strategic environment department Citizens business	Scale up the services via local CCC	Reduced heating from electricity in single houses, increased installation of solar, energy efficiency measures in industry
Increased biogas production in existing facility	Inventory the availability and promote increased use of substrates for biogas production. Implemented during the year 2023	Democracy/ participation Technology/ infrastructure	2023	Locally produced biogas	Gästrike Ekogas The five municipalities who owns Gästrike ekogas	Inventory finished	The sale of locally produced biogas for fuel has increased by 35% from 2020 to 2025.
Increased biogas production	Investigate the possibility of expanding biogas production at the Ekogas facility in Forsbacka through facility expansion	Democracy/ participation Technology/ infrastructure	n.d	Locally produced biogas	Gästrike Ekogas The five municipalities who owns Gästrike ekogas	Feasibility studies conducted	A decision is made to build a second gas bell
Losses in the electricity grid	Reduce losses in the transmission of electricity in the grid. Some examples include the design and sizing of overhead lines, underground cables, and transformers, reactive power levels, operational changes, and the location of production facilities.	Technology/ infrastructure	ongoing	Adequate Capacity in Power Grids	Gävle energy company	Long term plan for reduction of losses	Investments are continually made in the gride to reduce losses in the transmission.
Resilience in the electricity grid	Gävle Energi annually establishes a risk and vulnerability analysis as well as an action plan for the security of supply in the electricity grid. Based on all the risks that need to be addressed within 8 years, an action plan is then created. This work is carried out because society is heavily dependent on a reliable electricity grid.	Democracy/ participation	ongoing	Adequate Capacity in Power Grids	Gävle energy company	Established risk and vulnerability analysis and action plan	Action plan executed

Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders /stakeholder engagement	Early outcome	Late outcome
Develop systems	Develop a systems perspective for future energy production, distribution, and consumption. Worked into the energy plan	Governance & policy	2024	Adequate Capacity in Power Grids	Municipal group referral procedure with business, civil society, academia	Plan is adopted in 2024	A working structure to execute plan is developed.
Create conditions for establishment of windpower	Create planning conditions for the establishment of (offshore) wind power in the municipal. A new plan for wind power needs to develop due to changed market conditions where wind turbines hight has increased significant since the last plan. This creates conditions for more places to establish wind turbines.	Technology/ infrastructure	2025	Adequate Capacity in Power Grids	Strategic urban planning department Urban development department Local authority Citizens dialogue	Plan is developed together with stakeholders	A thematic supplement to the master plan for wind power is adopted
Introduce requirements for the use of waste heat	Examine if it's possible to impose requirements for the use of waste heat according to the law	Governance & policy	2025	Adequate Capacity in Power Grids	Strategic urban planning department Gävle energy company University of Gävle	Pilot study with stakeholders	Introduce requirements if possible
Development of the district heating and cooling system	The municipality continues its work to develop the district heating and cooling system in the municipality.	Technology/ infrastructure	ongoing	Adequate Capacity in Power Grids	Strategic urban planning department Gävle energy company University of Gävle	Long term plan Pilot studies	District heating and cooling continues to be feasible for heating in new and established areas.

Adequate Capacity in Power Grids

The capacity in power grids, both concerning supplying power to the system and delivering power to customers, is strained in many areas. In Gävle, we are also approaching such a situation.

The electricity industry has developed a roadmap that also encompasses Gävle Energi's work on the power grids. According to this plan, Gävle Energi should:

- Meet society's increasing demand for fossil-free electricity, when and where it is needed.
- Collaborate locally and regionally on power grids and grid capacity.
- Continuously upgrade and develop the power grids.
- Develop products and services that make it more attractive for customers to contribute to the system's benefit.

This is to be achieved through:

- Involvement and acceptance that the technical infrastructure must be given space and has significance for society.
- Involvement and interaction between power grids, customers, and stakeholders for an efficient and reliable power grid.

The power issue is also influenced by how we sell electricity. Today, contracts are very static and unnecessarily lock up a lot of power. With the smart/connected technology available today, it is possible to create new business models to optimize energy consumption. The power tariff that Gävle Energi is introducing is a step in that direction, but there are further steps to take.

Increase the percentage of solar power

Gävle municipality has a relatively low installed solar cell capacity compared to other similar municipalities. The municipality aims for 10% of the municipal group's electricity consumption to be produced by solar cells by 2035. Solar cell technology has the significant advantage of producing electricity locally on a property and reducing the amount of purchased electricity for the property. From an economic standpoint, this is positive for the property owner as purchased electricity includes transmission costs, other fees, and energy tax. Therefore, high self-use of produced electricity should be sought, and properties suitable for solar cell installations should be prioritized today, both in terms of suitability for placing solar cell systems and based on appropriate electricity consumption in the property.

Battery storage to store produced solar electricity and increase the share of self-used electricity is available on the market today, but the technology is still too expensive for commercial breakthrough. Another technology is to use batteries in electric vehicles to act as property storage, but here too, the technology needs to be developed, and costs need to decrease before the technology is economically viable. Solar cells will be part of the future

energy system, but today the technology should be installed on suitable properties. New technology with battery storage (both stationary and electric vehicles) needs to be introduced when the technology is mature, but also the cost development of solar cell parks should be monitored. The technology and cost development of solar cell and battery technology will bring new opportunities for excellent solar cell installations, but the basis of solar cell development should be on properties with high self-use of solar-produced electricity.

The possibility for wind power

Gävle has favourable physical conditions for (offshore) wind power in several respects. Onshore, but primarily offshore, there are suitable locations that do not conflict with other national interests. Since the power extraction in the Mälardalen region is partially hindered by capacity challenges just south of Gävle, large-scale electricity production in Gävle would mean economic advantages. New offshore wind parks can achieve production levels approaching that of a nuclear power reactor. Companies with high electricity consumption and ambitious sustainability goals that also want proximity to the Stockholm region will be interested in Gävle. Simultaneously, offshore wind power can play a crucial role in the transformation of Gävle Port's operations and the associated freight flows, especially when the port's capacity is to be doubled and simultaneously become one of Sweden's most sustainable ports.

Gävle can, primarily, create conditions for the establishment of wind power by identifying suitable locations. This is done within the national mission, likely to be implemented in 2021, where a new wind mapping will be carried out regionally. Efforts to increase acceptance for wind power will also be crucial to facilitate wind power establishments. The business community itself needs no push, as many wind power companies show interest in establishing themselves here.

Energy-efficient port cluster

Gävle Port, an important logistics hub in central Sweden and one of Sweden's largest ports, also wants to become a hub for renewable energy in the future, where energy is stored, produced, converted, and distributed. During the period 2018-2022, the port doubles its capacity, something that drastically affects energy usage. This expansion includes plans for electrification of various units and delivering shore power to ships. From 2019 to 2025, the need for power will increase from 19 GWh and 2.2 MW to 260 GWh and 36 MW, and it needs to happen in a sustainable way. "Energy-efficient port cluster" is the port's program between 2020 and 2030 aimed at providing direction and progress in energy and sustainability efforts by creating a platform for companies and other organizations in the cluster and driving active program leadership and coordination. The major challenge for the transportation sector, including the Gävle port cluster, is to rapidly integrate an emerging energy system based on renewable energy sources with an existing logistics system.

Four primary areas of focus have been defined:

- Future-proof physical infrastructure (e.g., tank and charging infrastructure, shore power for ships)
- Streamline port-wide activities and processes (develop, digitalize)
- Ensure electricity supply and develop Gävle port as a hub for renewable energy (meet future power needs in the area, investigate the conditions for developing a microgrid for energy management, develop ways to capture and store energy)

- Establish Gävle port as a physical hydrogen hub for a regional hydrogen system

The program and its underlying projects are expected to have a leverage effect on adjacent processes, activities, and geographical areas/segments. If conditions for energy-efficient logistics are created early, starting/ending at Gävle port, the opportunities for the entire logistics flow (the entire stretch of freight transport) to become fossil-free and more energy-efficient faster increase, and good examples spread and knowledge is disseminated to other nearby logistics and industrial hubs.

Waste

Waste corresponds to 5% (2022) of Gävle's total emissions. Gävle is the major owner of a regional waste treatment company for household waste, Gästrike Återvinnare. Gästrike Återvinnare is also the owner of the biogas plant which treat the regional food waste. However, the residue waste from Gävle is incinerated in Bollnäs municipality (which implies that these emissions burden their territorial emissions). The majority of waste emissions in Gävle is therefore from leaking landfills. These are difficult to influence in a cost-effective way but will subdue over time. We have yet to learn more about the nature and size of these emissions.

Municipalities in general work “end-of-pipe with the waste issues and we therefore want to stress the importance of policy on EU/ national level to prevent waste from occurring in the first place.

In Gävle's Environmental Strategic Program, goals and indicators have been established to increase recycling and reduce waste within the municipality. To break down the goals further Gävle has an ambitious waste plan, or as we call it: Circuit plan 2021-2025 for Gävle municipality. The plan consist of five goal areas as stated in Table 13. For each subgoal municipal companies and/or municipal sectors are defined that should work towards these goals.


Table 13. Goals for waste



PREVENT WASTE OF RESOURCES	Prevent food waste Prevent single-use plastic items Prevent construction and demolition waste Prevent electrical waste Prevent household waste	The amount of total food waste that is thrown away in care, care, preschool and school must decrease by 15% from the year 2020 to 2025. By 2025, 50% of the disposable items that are made of plastic and used within municipal operations phased out or replaced with reusable items, compared to the year 2020. År 2025 har hushållsavfallet minskat med 20 procent jämfört med 2015.
REDUCE TOXINS IN THE NATURAL CYCLE	No hazardous waste in residual waste Hazardous waste from businesses Purchase products without hazardous substances	The share of hazardous waste (including electrical waste) in residual waste must be reduced by 50% from 2018 to 2025
REUSE	More bulky waste for reuse via recycling centres Use and buy in used products Reusing and repairing gadgets Reuse and repair of construction and demolition waste Repair of textile/work clothes	The proportion of bulky waste that is handed over for reuse via recycling centres must increase, and we thereby contribute to moving the bulk waste up the waste ladder. Target value: Increase by 25% from the year 2020 to the year 2025
RECYCLE	Reduce the amount of residual waste Increase sorting and recycling of food waste Increase sorting and recycling of packaging and newspapers	The amount of residual waste must be reduced by 15% from 2020 to 2025, calculated per person.

	<p>Ask for recycled plastic</p> <p>Increase recycling of solid waste at recycling centres</p> <p>Develop sludge strategy</p> <p>Increase sorting and recycling of textiles</p>	<p>By 2025, at least 75% of food waste will be sorted out.</p> <p>The sorted food waste has a purity of at least 99% in the bags.</p> <p>Of all used packaging and magazines that arise, the proportion that is sorted out and recycled increase.</p> <p>Target value:</p> <p>By 2025, at least 70% will be sorted out.</p> <p>The amount of bulky waste that goes to landfill must decrease from 7.9 kg/person to 3.9 kg/person from 2020 to 2025.</p> <p>The amount of bulky waste that goes to incineration must decrease from 35 kg/person to 27 kg/person from the year 2020 to 2025.</p> <p>The proportion of textiles in residual waste must decrease by 30% from 2020 to 2025</p> <p>The amount of textiles collected at recycling centers must increase from 3.6 kg/person to 4.5 kg/person from 2020 to 2025</p>
KEEP IT CLEAN AND TIDY	<p>Increased security</p> <p>Increase the number of participants in litter picking days</p> <p>Well-functioning handling of littering matters</p> <p>Recurring litter measurements</p> <p>Increase the number of sustainable events</p>	<p>The number of rubbish items per 10 m2 should decrease compared to previous years i</p> <p>Keep Sverige Rent's litter measurements.</p> <p>The number of participants in the municipality who participate in Håll Sverige Rent's annual campaign "Garbage collection days" will increase compared to 2020 when the number of participants was 14,414.</p>

Table 14 presents the goals from the Environment Strategic programme related to reduced waste, as transition elements.

Table 14. Transition element for waste.

Field of actions: Transition Element	Indicator	Target Potential (compared to business-as-usual year 2030)	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 <p>Increased recycling</p>	Proportion of waste going to landfill or incineration recycled year 2030.	20%	3 kt	Reduced littering, improved natural environments, increased economy.

Field of actions: Transition Element	Indicator	Target Potential (compared to business-as-usual year 2030)	Direct impacts (emission reductions compared to business-as-usual year 2030)	Co-benefits
 <p>Decreased proportion of household waste</p>	<p>The amount of household waste per inhabitant in Gävle Municipality (food waste, residual waste, newspapers, packaging, and bulky waste) should decrease from the year 2015 to the year 2025. *</p>	<p>20% *</p>	<p>Not evaluated</p>	<p>Reduced littering, improved natural environments, increased economy.</p>
 <p>Decreased proportion of food waste</p>	<p>The total amount of food waste discarded within healthcare, elderly care, preschool, and school facilities within the Gävle Municipality group is to be reduced from the year 2020 to the year 2025. *</p>	<p>15% *</p>	<p>Not evaluated</p>	<p>Reduced littering, improved natural environments, increased economy.</p>

* Not a transition target in Climate View. This target is set internal.

As we embark on the journey towards climate neutrality by 2030, a series of proactive activities have been outlined to minimize the climate impact stemming from consumption and waste. These initiatives are designed to address various facets of our community, fostering sustainability and responsible environmental stewardship.

In Table 15 actions are described and connected to the transition elements. The table is divided in action that are already decided and action that's under investigation.

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Table 15. Actions for waste.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Decided	Checklist	Develop a checklist for requirements for all land allocation and development projects aimed at achieving climate neutrality.	Democracy/ participation	2024	Increased recycling	Strategic urban planning department Urban development department Municipal companies Private companies through local CCC	Checklist requirements are tested in new exploitations.	Checklist contributes to reduced emissions from waste handling in all our exploitation projects.
	Environmental requirements in procurement	Create conditions for climate requirements to be specified and monitored in all procurement processes	Democracy/ participation	Continuously	Increased recycling	The municipal group Business dialogue	Knowledge is developed how to reduce waste through procurements	Our procurements contribute to waste reduction
	Gävle Municipality will continue to be an annual member of "Håll Sverige Rent" (Keep Sweden Tidy).	Membership in "Håll Sverige Rent" enables all target groups in the Environmental Strategic Program to participate in the annual litter-picking days and access educational materials. Gävle's preschools and schools can use the Green Flag.	Democracy/ participation Social innovation	Continuously	Increased recycling, decreased proportion of household waste, Decreased the amount of food waste	The municipal group Associations Business life	Gävle has won the national price for many years and the ambition is to continue this good work	Gävle continues to be the city with the most engaged citizens on annual litter-picking days

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders/stakeholder engagement	Early outcome	Late outcome
	Gävle Municipality will develop a chemical and plastic plan and implement the proposed measures.	Coordinate and clarify the decisions, actions, and resources needed to raise awareness of the chemicals being used. It also aims to phase out chemicals that are harmful to humans and the environment. Regarding plastic, it is crucial to reduce the amount of plastic, and the plastic used should be bio-based or recycled and recyclable - "Right plastic in the right place." The Chemical Plan involves the three target groups of the program: Gävle Municipality group, residents, and businesses.	Governance & policy	n.d.	Increased recycling, Decreased proportion of household waste	n.d	Plan is developed	Measures are implemented
Under investigation	Circular economy plan	Method for considering the circular economy plan early in the planning process is being developed.	Learning & capabilities	2025	Increased recycling, Decreased proportion of household waste	Strategic urban planning department Urban development department Gästrike recycle company. Business via CCC	Pilot study Measures developed	Measures executed

Develop Circular Business Models

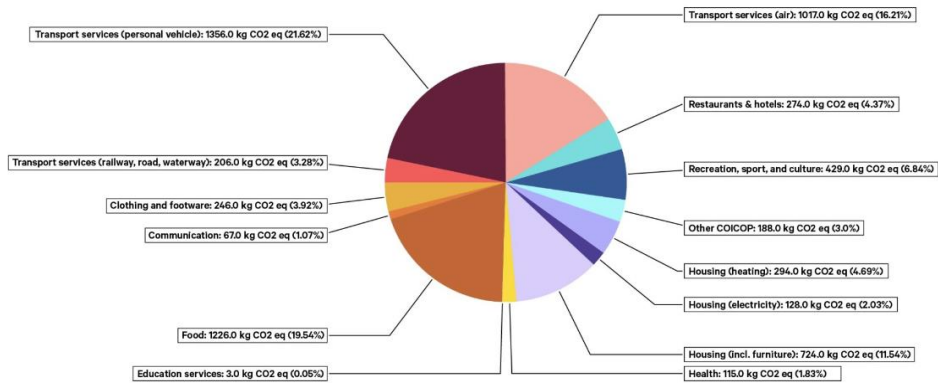
Circular economy entails that all materials used in our economy are part of a closed-loop and do not become waste, as is currently the case. Developing a circular economy is necessary for our planet's resources to be sufficient as the population grows and living standards rise. A circular economy requires new business models, where the EU and the state play a crucial role in creating economic incentives for this. For instance, leasing appliances increases manufacturers' incentive to create products that last longer and are easy to repair. A municipality can act as a lever in this by demanding new types of business models for the products we purchase. An essential aspect of circular business models is that products are used and repaired as much as possible before re-entering the cycle. The Furniture Pool, a collaboration between Gavle Drift & Service and the Daily Operations Unit (EDV), is a good example of increased circularity where used furniture is matched with new users. Many other products could potentially develop similar concepts in the future.

In 2021, the municipality will conduct a pre-study on circularity to explore the possibility of creating more circular flows in the municipality.

Consumption & circular economy

Gävle municipality aims to achieve zero consumption-based emissions by 2035. Consumption-based emissions amounted to approximately 6 tons per person in 2022. Three-fifths of the total emissions come from households, while the remaining two-fifths come from public consumption and investments. Public consumption consists of goods and services, such as those purchased by schools, hospitals, and authorities to conduct their operations. Investments encompass emissions related to the purchase of buildings, machinery, computers, valuables, and inventory investments.

The following table provides more specific information on what household consumption consists of and the proportion of emissions associated with it.



Grafik: Mia Shu / SEI.

There are no transition elements set for consumption and circular economy. Gävle Municipality has nevertheless developed various actions to implement to reduce climate impact, as presented below in Table X. These action are not included in the investment plan due to that the costs are insignificant.

Table 16. Actions for Consumption and circular economy.

	Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Decided	Create conditions for climate requirements to be set and followed up in all procurements	The municipality shall allocate personnel resources to drive this and ensure that there is competence within the procurement unit to set environmental requirements for circular economy and functional procurements	Governance & policy	n.d	-	Procurement unit Environmental Strategy Unit	Develop a requirement model for climate performance in procurement We set climate requirements and follow up on all prioritized procurements	We set climate requirements and follow up in all procurements
	Climate-smart food	Serving climate-smart food in municipal operations.	Social innovation	2020	-	Meal service	Introduce meal planning organization. Project to develop menus that align with the goals of the Environmental and Health Policy Program (MSP) and the food policy. Explore the possibilities of collaborating with Sodexo to encourage them to serve more climate-smart food.	Develop stringent requirements for climate-smart food ahead of new procurement or bringing meal services back into municipal operation.

Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Climate requirements on invested capital	Make sure that invested capital doesn't have a negative effect on climate	Finance & funding	n.d	-	Financial department Environment strategic department	Examine the invested capital available and whether it aligns with the municipality's sustainability ambitions	Implement model for climate requirements on investments, divestments
Continue developing education for sustainable development (LHU)	The LHU aims to provide our children and students with better knowledge for sustainable societal development. To develop this knowledge, children and students should have the opportunity to act for sustainable development in real terms, in collaboration with the surrounding society, here and now.	Social innovation	2014	-	Education department	Continue to develop and improve our work in teaching our 17,700 pupils competences for Sustainable development.	Continue to develop and improve our work in teaching our 17,700 pupils competences for Sustainable development.
Circular business models	In collaboration with the business sector, create conditions for circular business models in the municipality.	Democracy & participation	2021	-	Environmental Strategy department Strategic urban planning department Business via CCC	Explore the role the municipality can play in the development of circular business models, in collaboration with HIG (University of Gävle) and the business sector.	Initiate an investigation and develop concepts regarding a more advanced circular economy, such as a reuse gallery, and identify existing and potential pools for development

Action name	Description	Systemic levers	Implementation	Concerns Transition Element	Stakeholders/stakeholder engagement	Early outcome	Late outcome
Reduce consumption-based emissions	Develop knowledge and application of methods for behaviour change.	Learning & capabilities	n.d	-	Environmental Strategy department	Identify when, where, and how the municipality can work on behaviour change to reduce consumption-based emissions	The municipality's advisory services are developed to address consumption-based emissions
Reduce consumption-based emissions	Reduce consumption-based emissions by developing employees' ability to consider the climate perspective in their service provision, especially in their interactions with citizens and businesses.	Governance & policy	n.d	-	Municipal group	Conduct climate inventories in each operation to identify opportunities to inform/influence businesses and residents towards more climate-friendly behaviour.	Initiate the implementation of measures identified in the climate inventory

Procurement

Public consumption-based emissions can be controlled through public procurement. Generally, only a few municipalities have made significant progress in this, and there is a lack of standardized methods and statistics. A survey conducted by the Stockholm Environment Institute shows that 50% of the 119 responding municipalities have not assessed the environmental or climate impact of the municipality's purchases. 30% have no information on how such follow-up is done, and approximately 60% feel that there is a lack of resources in terms of time, expertise, and knowledge about the climate impact of purchases to carry out such an effort. The Procurement Authority will publish climate indicators for several types of purchases in 2021. They use a spend analysis, commonly used by many organizations, to understand their organization's purchasing and supplier patterns. In collaboration with SVALNA, Gävle Municipality will measure the consumption-based emissions from the municipal group's consumption using a similar method to spend analysis. By mapping these emissions, we gain better control over the municipal group's emissions, identify significant contributors, and define measures needed to reduce emissions from our purchases. Furthermore, the Procurement Authority has already provided substantial support for municipalities wishing to set sustainability requirements for their purchases.

Communication and Behaviour

Within the framework of Gävle Municipality's work with the environmental strategic program, the importance of working with behavioural changes has been highlighted and increasingly understood. It has been acknowledged that work on behavioural changes related to environmental and climate issues cannot be underestimated. It is crucial to understand that this is not just about "small" behaviours, such as choosing organic bananas over conventional ones, but about how each of us, through our life choices and societal engagement, can also influence the necessary large-scale change. Learning for Sustainable Development (LHU) aims to provide our children and students with action competence for sustainable societal development. Action competence here means "An ability, based on critical thinking, to take responsibility and act together with others for a better world." To develop action competence, our children and students need to practice this skill here and now, during their preschool and school years. It is crucial that children and students have the opportunity to act for sustainable development in reality, in collaboration with the surrounding society, here and now. To make this possible, it is of utmost importance that the surrounding society, our municipal group, our companies, and other organizations provide opportunities for children and young people to participate and have influence in decisions that concern them, both large and small

A neighbourhood planned today will be their home in the near future. According to the Convention on the Rights of the Child, which is now law in Sweden, the adult world is obliged to give children and young people the opportunity to participate and have influence in matters that concern them. Here, we still have work to do in Gävle Municipality to achieve this, but several initiatives, such as the Youth Influence network, strive to facilitate this development.

LHU is the most powerful tool the municipality has to influence the behaviour of Gävle's residents in a sustainable direction by:

- Contribute to all areas within the environmental strategic program by teaching them, where action competence for our 17,700 children and students for sustainable development is central.
- Our 3,300 employees are action-competent and good role models for our children and students.
- Contribute to parents, relatives, and friends of our 17,700 children and students developing sustainable behaviours.

With the support of the environmental strategic program, a development project related to LHU (Learning for Sustainable Development) was initiated in 2014. The overall work has, since the fall of 2020, mainly focused on managing the good work carried out so far. To enable Education Gävle to contribute even better to the goals of the Environmental Strategic Program 2.0, to create additional action competence regarding climate issues, and also to the Municipal Board's new mission to work for increased external financing, renewed and expanded development work related to LHU is needed.

The municipality is a major purchaser of food, where there is great potential to serve climate-smart menus in schools and other facilities. Gävle has successfully worked to reduce food waste and the climate impact of food for an extended period, but the lack of a food organization and much of the catering being outsourced makes it challenging to drive a more systematic climate effort for the diet. The proportion of vegetables still needs to increase, providing more economic space to buy organic and locally produced meat.

The municipal group needs to more prominently showcase and communicate what we do in the climate field. This can increase knowledge and motivation among residents to live more sustainably. As a municipality, we can also create conditions for citizens to live more sustainably and involve them in sustainability efforts. By offering sustainable living environments, mobility services, reuse and repair options, etc., we can facilitate wise choices for citizens. We need to develop a deeper collaboration with our citizens, where one approach could be through broad meetings in each neighbourhood with various stakeholders on the theme of how we reduce emissions in Gävle, similar to the approach taken in Botkyrka, where each neighbourhood has a sustainability plan developed by citizens. Workplaces, landlords, and associations (sports, churches, etc.) can challenge each other to build solar energy, promote car-sharing, reduce waste, and create a positive spiral for the transition.

Residual emissions

In certain areas, achieving zero emissions will be challenging due to factors that are difficult to influence. This includes emissions from agriculture and waste (methane from landfills). It may also involve certain production processes that are challenging to make completely fossil-free. These emissions can be compensated for through other types of measures. National efforts are also underway to determine how to work on this in the future, and it is important to follow these developments. It will impact how we in Gävle should address the issue and may create economic conditions for it.

Storage in Forests and Soil

This may involve creating conditions to establish wetlands or to sequester carbon in agricultural land through various measures such as agroforestry or the use of crops with high carbon sequestration capacity. The municipality can also actively address this issue in its management plans for nature, aiming not only to conserve trees and vegetation but also to promote biodiversity by integrating natural habitats and ecosystem services into urban planning. This includes creating green spaces and corridors for wildlife, which not only contribute to our well-being by providing access to nature and green areas but also have positive effects on air and water quality and climate adaptation by reducing the risk of floods and erosion.

Carbon Capture and Storage during the Combustion of Biofuels

It may also involve the capture and storage of carbon dioxide during the combustion of biofuels at larger bio-fired combined heat and power plants. The process is called bio-CCS (Bioenergy Carbon Capture and Storage). The Swedish Energy Agency has granted Gävle Kraftvärme support to investigate the possibility of capturing carbon dioxide at the Johannes Combined Heat and Power Plant and then transporting it to Gävle Port for interim storage. The feasibility study could ultimately contribute to Gävle Energi achieving negative emissions, meaning that we remove more carbon dioxide from the atmosphere than we emit. The BCCS would capture equivalent to ca 1/3 of Gävle's current emissions meaning well above the 20% residue emissions.

International Compensation

In the national effort, a framework will also be created for how we could compensate for emissions abroad. However, Gävle should primarily focus on the local opportunities we have to influence emissions and take advantage of the compensation possibilities available here. We should also assess the emissions that might still be present in 2035 and their magnitude.

Implementation, Monitoring, and learning process

The implementation of the Strategic Environmental Programme plays a major role in achieving the municipality-wide goal of "An ecologically sustainable and climate-neutral municipality". The climate action plan is a complement to the Strategic Environment programme and follows the same principles for implementation and monitoring.

Selected indicators from the Strategic Environmental Programme are linked to the municipality-wide goal "An ecologically sustainable and climate-neutral municipality" and will be included in the Gävle municipal group's annual follow-up of activities.

The steering group for the Strategic Environmental Programme is the Public Works Committee. The Public Works Committee is placed under the Municipal Executive Board. The Strategic Environmental Programme is to be implemented, executed and followed up in all the municipal group's operations. The programme must be updated every term of office.

The municipal government is responsible for the programme's timetable and for disseminating, revising and following up the programme. Initially, this also includes anchoring the programme for the three target groups it is aimed at.

Within the Gävle municipal group, it is the managers who are responsible for the implementation and that measures contribute to the achievement of the goals. The annual business plans must contain a description of how the business intends to work to meet the overall goal "An ecologically sustainable and climate-neutral municipality" and other goals within the environmental strategy programme.

Gävle Climate agreement and the regional environment forum (which is led by the Regional authority) are important governing arenas to co-create climate actions and pathways forward collectively. The Region's regional development strategy is to a large degree aligned with Gävle's goals and we use each other as levers in our respective roles. The local climate agreement is non-exclusive, every organisation can take part. Even if the agreement is managed by Gävle we are operating in a regional context and have the ambition to strengthen that role since we are the only part with resources to do so at the moment. An exiting part will be to discover how we can develop governance models, that takes off in the agreement, together with the other municipalities in the region.

Resources for implementation

The Strategic Environmental Program is one of four strategic programs: Gävle Master Plan, Business Program, Strategic Environmental Program and Social Sustainability Program. All programs are at an overall level governing the municipal group.

Committees and boards must implement measures with the funds given in the framework and on their own initiative. Each committee, company and organization must manage and monitor its activities in its regular process and budget so that the objectives are achieved.

The Municipal Executive Board is responsible for monitoring, coordinating and supporting processes that increase target fulfilment in the Group. This is done with various resources such as competence support, prioritization of strategic initiatives and financing of specially designated projects.

Collaboration with other organizations, authorities and the business community is crucial to achieving the objectives. Important resources for implementation are also state and regional initiatives.

Monitoring of the program

The Strategic Environmental Program's indicators and measures are to be followed up annually in an environmental report. The Municipal Executive Board is responsible for the annual overall follow-up.

Climate-neutral municipality, robust ecosystems and clean and non-toxic everyday life have one or more indicators that show whether the target is being met.

In the program, responsible committees and boards have been designated for targets and/or follow-up of indicators. Each committee and board reports to the Municipal Board for the objectives for which they are responsible. The follow-up must be presented both verbally and digitally by the responsible committees and boards.

Each year a “story telling meeting” is organized cross sectorial to share good practice and challenges to meet the goals. The first environmental accounts carried out may be supplemented with indicators and the current situation in cases where they are missing.

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of the City Gävle

15 March 2024



The content of this document reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.





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Introduction

Gävle embarked on an ambitious journey with our first environmental strategic programme in 2013 and managed to drastically reduce emissions during the years to come. In 2020 Gävle decided to become climate neutral in 2035 including both territorial and consumption-based emissions in our second Environmental Strategic Programme. To be able to achieve such a bold goal Gävle developed a climate action plan that was endorsed in 2021. With these decisions at hand, we understood that we would need to collaborate with others to be able to reach our goals. We came across the Swedish initiative Viable Cities and decided to apply and was one of the 14 lucky cities to join their second round. Viable Cities made it possible for us to scale up climate action, with external financing, knowledge, methodology and inspiration. Being part of Viable cities motivated us to apply for the EU Cities mission. Hereby we would be able to share experience with cities outside the Swedish context. It is easy to get stuck in the policy context of your own country which doesn't make you see possibilities beyond that. The EU context also involves us getting in touch with new expertise and funding that can help us towards the goal.

While the action plan does not cover actions that other stakeholders need to undertake, the CCC has been based on the action plan adopted in 2021. The plan was developed broadly with the sectors and municipal companies to identify the actions that the municipal group can undertake, both to reduce the emissions from our activities and support the transition of civil society and business. In addition, the CCC is viewed as a governance tool through which Gävle will attempt to mobilise a broader group of stakeholders that can greatly support in the enacting the actions and expected outcomes.

The action plan was not cost calculated in 2021. Most actions are not heavy investments but are organisational or working practices that needs to change to be able to steer towards climate neutrality. This organisational change does however in some cases imply costs or investments further down the line for sectors, municipal companies or business. In the investment plan we have tried to estimate those costs for the municipal companies.

Due to our existing action plan the CCC process mainly involved developing the climate investment plan. We have worked together on the template with the investment heavy parts of the municipal organisation and included the energy, waste, housing, real estate, harbour, and water municipal company. Working with the climate investment plan has been a very rewarding learning trajectory which we might never had started without the Cities Mission. It has brought together parts of the organisation that normally never meet and has delivered new insights to many of us.

Gävle has decided that one cannot look at the financial need for the action plan alone, you need to look at all the investments the municipality does to be able to catch all the future emissions. One step in that direction is to try to make all our investments green loans, since most of our investments are not investments connected to the action plan, like social housing, cultural meeting places, schools, infrastructure, etc.

Parallel to the investment plan process, Gävle launched its local climate agreement. The Gävle Climate Agreement aims to become a collaborative arena that brings together the public sector, academia, associations, and businesses to join forces to contribute to a climate-neutral, attractive and competitive Gävle. More than 60 stakeholders have signed the contract since December 2023.

Actors who sign the Gävle Climate Agreement support the goal of a climate neutral and competitive Gävle by 2030. Climate-neutral Gävle refers to the geographical area of Gävle municipality. The undersigned organisation, undertake to:



- map, annually monitor and report greenhouse gas emissions for operations within Gävle municipality's geographical boundaries to the Gävle Climate Agreement.
- develop an action plan to reduce their climate impact, annually update the action plan and annually report on the measures implemented to the Gävle Climate Agreement.

The actors in Gävle Climate Agreement were not engaged in the investment plan due to that it was in the process of being launched and it was too early to do such an exercise. The Climate Agreement has the ambition to work as a lever for private investments towards climate neutrality based on the actor's action plans that are due to be developed.

Gävle has a long experience working with climate action. The efforts with the largest impact on CO2 emissions so far has been:

- Decarbonize district heating (residue heat from large industry)
- Fossil free energy production (Gävle produced 33% of the energy need in the municipality 2020. The imported energy is mainly fossil free due to that the Swedish energy mix consist of water, nuclear and wind mainly.)
- Building a biogas production plant for regional biodegradable waste.
- Transportations from the municipal group fossil free in 2025.

We joined the mission to be able to scale up our efforts to reach climate neutrality. We need to scale up both in terms of knowledge and resources. It is also an opportunity to learn from and contribute to other cities in Europe and to the European level. Not all the answers are out there yet, and we hope to see more collaborations across nations on difficult matters. Like many of us relatively small cities matchmaking with other cities and organised learning sessions are important since we have too little time to dig into everything that is out there. The transition labs that Viable Cities organises are a very good example of that and it would be fantastic if we could meet up with just a few of the cities in the nearby region.

Having access to external funding is key for us to be able to scale up our local climate agreement. The possibilities are in principle endless if we have human resources to put in here.

Goal: Climate neutrality by 2030

We have a strong and ambitious sustainability work with the support of three strategic programmes: Environmental Strategic Programme, Social Sustainability Programme and Business Development Programme. In 2020, Gävle adopted the Environmental Strategic Programme 2.0, with the goal of becoming climate neutral by 2035 and has developed a carbon budget and a climate action plan as a tool to achieve the goal. The governance of Gävle Environmental Strategic Programme, and thereby the climate goals, is very well establish throughout the organisation. All department managers have the responsibility to work in line with the goal, and annually provide an accounting report on how and with what results they have done this to the city council. In 2022 the goal was adjusted to climate neutrality in 2030 to be in line with NZC and Viable Cities. The target for consumption-based emissions remains 2035 though.

The subgoals for the climate neutrality goal are:

- *The market share of public transport in Gävle municipality's geographical area will double by 2030 compared to 2006.*
- *The share of bicycle traffic in Gävle municipality's geographical area will increase by 100 % by 2025 compared to 2012.*



- *The Gävle municipal group will create conditions that contribute to the travel and transport that takes place within Gävle municipality's geographical area being fossil-free by 2030.*
- *The Gävle municipal group's fuel consumption, including procurements where transport is included, will be 100 % fossil-free by 2025.*
- *The sale of locally produced biogas for fuel has increased by 35 % from 2020 to 2025.*
- *Carbon dioxide emissions from air travel for Gävle municipality's employees will be reduced by 30% during the period 2018-2025.*
- *The energy consumption of businesses and residents in properties and facilities will be fossil-free by 2030.*
- *Energy use in the Gävle municipality group's properties with premises and housing will be 30% more efficient by 2030 compared to 2009.*
- *The power capacity for the production of renewable electricity for Gävle Energi's electricity network will be expanded by 200% by 2035.*
- *At least 10% of the Gävle municipal group's electricity use will be produced from solar cells by 2035.*
- *Residents' and businesses' consumption and energy use within and outside Sweden's borders will be resource efficient and climate sustainable by 2035.*
- *Gävle builds and constructs in an environmentally and climatically sustainable manner and creates the conditions for residents and operators to live in an environmentally sustainable manner by 2035.*

The target for 2030 cover the entire administrative territory of the municipality. There are no ETS facilities within the administrative territory of the municipality. Gävle has a harbour and emissions from the shipping is generally not included in territorial emissions. However, the harbour has its own climate action plan which include some of the emissions from shipping since they to some degree can influence these. Gävle's 2030 target is further in line with the climate neutrality definition pursued by the Cities Mission, where approximately 20% of emissions can be compensated for in 2030.

Since Gävle has no production of fossil fuels we have everything to gain on the transition. Gävle has a strong bio-based economy already based on wood/paper products. Production facilities for biobased fuels are planned connected to residue from these industries. Decreasing the dependence on fossil fuels will strengthen the local economy and make us less vulnerable to international fluctuations.

The conditions for offshore wind power are good in Gävle and will create opportunities for more industrial development in the area eventually.

The transition in the transportation sector must go hand in hand with a decrease in private transport if we are to realize the potential of benefits like increased public health, safety, social justice, and an attractive city. Electrification alone will only reduce local CO2 emission but have no other benefits.

The transition to a circular economy will decrease waste and create business opportunities to circulate material more locally which also can decrease the need for transportation.

Strategic priorities

The Climate Action Plan highlights two areas that need prioritization in ongoing efforts:

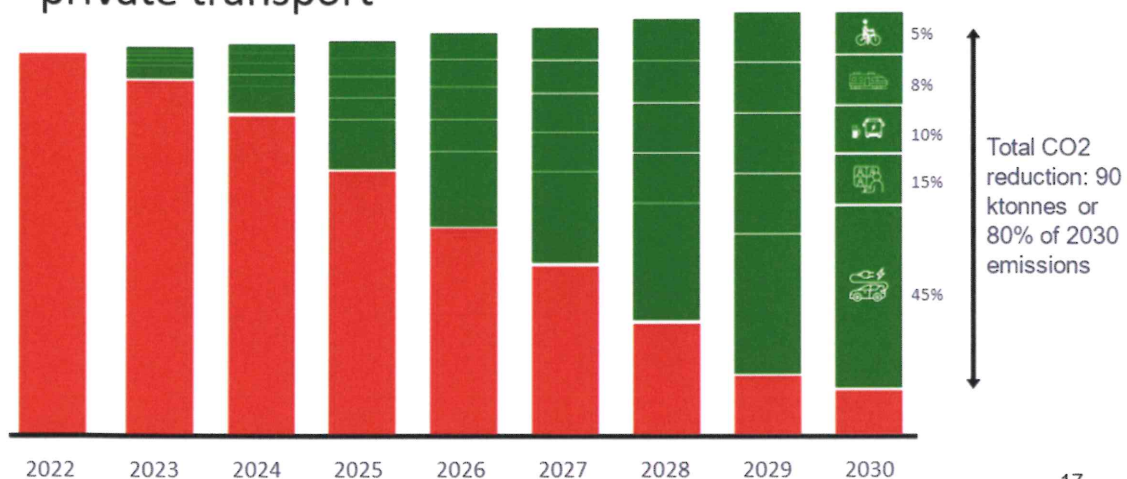
- **Drastic Reduction in Transport Sector Emissions:** This involves a rapid transition to sustainable modes of travel such as public transportation, cycling, walking, and fossil-free vehicles. Expansion of public transportation and cycling infrastructure should continue, and more charging stations and renewable fuel stations should be added in the municipality.



- Acceleration of Transition in the Construction Sector: This focuses on most emissions originating from steel, cement, and transportation in the construction sector. The municipality aims to introduce mass management, construction material logistics, and set higher standards for fuel, materials, and recycling in the construction process.

Together with ClimateView we are developing transition maps until 2030 per sector. The transition map for private transportation was just completed.

The distribution between the transitions for private transport



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The transition in private transport will be monitored yearly by using Google data that we process and import into ClimateView. Heavy transportation will also be monitored by Google data, but the transition map is not yet completed.

The municipality has many tools to influence transportation modes, volume's and to some degree fuels. The action plan contains 23 actions in this area.

Our key strategy is to:

- Reduce attractiveness of private transportation in the city (parking fees, re-routing)
- Increase attractiveness of sustainable transportation modes (increase space for these modes in the street structure, improve security and signposting, building missing links)
- Continue to build charging infrastructure in strategic places and secure effect for the private market to build along main roads.

In the coming years we will increase our efforts for campaigning and citizens forum for sustainable transportation modes. We have secured EU Interreg funding for a larger biking pilot and campaign during the coming years. After years of significant investments in bicycle infrastructure without any growth in biking we need to change tactics. Investments are still needed, but they need to be complemented with other activities too - like campaigning and citizens engagement.



Region Gävleborg is an important stakeholder, since they provide all public transportation in the regional area. Gävle municipality does not determine the price and supply of public transport which means that we have to establish a better collaboration to reach our goals.

Heavy transport will be targeted in the local climate agreement and to some degree commuting. Gävle's action plan contains actions that reduce our transportation needs by coordination of goods and masses. In 2025, all our procured transportation needs are supposed to be fossil free and we need to put extra effort into securing that.

The construction sector is more difficult to monitor since we target consumed based emissions mainly. The data we have available now is from Stockholm Environment Institute who provided all municipalities in Sweden with an input output analysis of their Municipal consumption-based emissions. There is at the moment no satisfactory way of including these in ClimateView, and the availability of data further on is uncertain. Further efforts will be made to develop this.

The local climate agreement will be our main arena to tackle emissions from the construction sector. The building and construction portfolio has the following working groups (some yet to be launched) to reach across the whole spectrum and lifecycle of construction:

- Planning, specification, and procurement
- Architects' Forum
- Recycling market
- Choice of building materials
- Construction site (e.g.: machinery, sorting) and transport.
- Climate calculations
- Climate neutral facilities
- Property forum (energy, material selection, renovation/extension)
- Climate proofing/ climate adaptation

Important actors here are construction firms, consulting firms, architects, property-owners /developers, producers of building materials, the regional waste company, municipal housing and real estate company and the Gävleborg region. We have a strong representation from these sectors in the local agreement.

Internally, Gävle is developing a framework to set requirements for CO2 emission in our development projects. We are also exploring methods to include CO2 calculations in early planning processes.

Process and principles

The Environmental Strategic Programme 2.0 is the governing document for the climate goals. The climate action plan was developed to support the organisation to reach the goal by offering more detail on the pathways to carbon neutrality. We are two years into the implementation of our climate action plan, that's why many of the actions are completed or started already in the action plan we deliver to NZC. The action plan will not be updated before a new Environmental Strategic Programme is adopted.



The municipal government is responsible for the programme's timetable and for disseminating, revising and following up the programme. Initially, this also includes anchoring the programme for the three target groups it is aimed at. (Gävle municipal group (sectors, municipal companies, and municipal associations), residents of Gävle municipality and the business community in Gävle municipality)

Within the Gävle municipal group, it is the managers who are responsible for the implementation and that measures contribute to the achievement of the goals. The annual work plans must contain a description of how the business intends to work to meet the overall goal "An ecologically sustainable and climate-neutral municipality" and other goals within the Environmental Strategic Programme.

Gävle has been monitoring the Environmental Strategic Programme since 2014. Since 2020, 29 indicators are followed on the climate neutrality goal. We are in a process of reducing and adjusting these since more accurate ways of measuring progress are more widely available. We also collaborate with ClimateView to constantly refine our monitoring towards the goal. We have started a process to make transition scenarios for each sector, starting with transportation that is our main challenge.

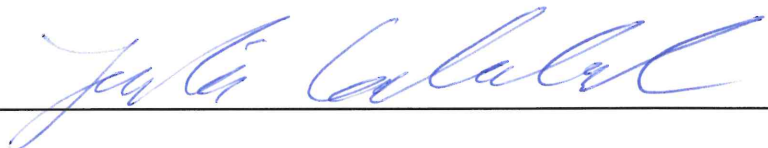
During 2024 a climate portfolio will be developed to systematize our working process with the climate action plan. The climate portfolio will not replace the existing steering model but support it until the next Environmental Strategic Programme is implemented, probably in 2026. The portfolio will make it easier to acquire resources from the rest of the organisation to climate action, since we are moving towards portfolio steering in general in the municipality. The next Environmental Strategic Programme can be integrated in a larger context since there are ideas to make one overarching strategic document that includes environment, social and economic sustainability.

By joining Viable Cities and NZC we want to be part of developing multi-level governance. Local action cannot alone solve climate change due to the global economic system we are operating in. In Sweden municipalities has very few effective tools to influence the private sector except from the 11% of the emissions from public procurement. To create multilevel steering multilevel understanding is key. How can tools we have on different levels interact and enhance each other?

Date of signature: 14.03.2024

Name: Julia Cederstrand

Signature:



Deputy Mayor of the City of Gävle



Signatories

The table below enlists the signatories¹ who are committing to this CCC, and thereby to help the city achieve its goal to reach climate neutrality by 2030. Specific agreements that articulate the details of the climate action(s) between the municipality and signatories are added to the individual contracts in Appendix 1 (see sample in section 6). The number and relevance of signatories' commitments is likely to increase over time.

Name of the signatory (organisation)	Sector / Domain / Level of operation ²	Legal form	Name of the responsible person	Position of the responsible person
Byggkonstruktören AB	Construction / Regional	Corporation	Hasse Hemlin	CEO
Knowit Gävleborg AB	Consulting, digitisation / IT / Europe	Corporation	Dijar Ismail	Project manager Construction
Gävle Hamn AB	Logistics, harbour / Transportation / Local	Corporation, owned by Gävle municipality	Hans Reinikainen	CEO
Sh bygg, sten och anläggning AB	Construction / Regional	Corporation	Fredrik Svanbom	CEO
			Linda Astner	Head of Sustainability
			Elin Frisk	Environmental specialist
			Dalia Ramzi	CEO
SEB	Bank / Finance / Northern Europe	Bank corporation	Jens Malm	Contracting Manager
			Magnus Lohe	Project manager
Arkitektgruppen i Gävle AB		Corporation	Josefin Lindström	Office manager
			Christin Carlsson	Office manager

¹ Climate City Contract signatories may be individuals or organisations. They ideally include national and/or regional governments, for example concrete agreements/ commitments made through the multi-level governance engagement processes supported by NetZeroCities, CapaCities, and other emerging national level initiatives.

² Please mention if the organisation is active at local, regional, national, or international level.



	Architect / Construction / Regional			Sara Axnander	Construction engineer
Gävlefastigheter	Properties & buildings / Local	Corporation, owned by Gävle municipality		Felicia Minicz	Architect
				Per-Arne Vahlund	CEO
				Lina Bornegrim	Dep. manager Property Development
				Sanna Jägbrant	Environmental coordinator
Gävle parkeringsservice	Parking facilities / Transportation / Local	Corporation, owned by Gävle municipality		Stephan Carlbauum Jonsson	CEO
				Maria Stikå	Business developer
				Fredrik Olsson	Business developer
				Anders Wallner	CEO
HSB Södra Norrland	Housing / Regional	housing association		Håkan Dahlberg	Business Area Manager
				Marcus Kupari	Chief consultant Construction & Energy
				Maria Rylander	CEO
Valbo trä AB	Construction / Local	Corporation		Sara Westberg	Head of Sustainability
Kontrollbolaget Norr AB	Architect & Construction consulting / Construction / Local	Corporation		Viktor Lundin	CEO
				Pernilla Lundin	CFO & CMO
				Petra Olofsson	Architect
Gefle IF Fotboll	Sports club / Local	Association		Daniel Kraft	Club manager
				Agneta Edin	Project manager
Ramudden	Traffic- & safety consulting / Transportation / International	Corporation		Elin Skörvald Li	Head of Sustainability Sweden
Svenska Termoträ AB	Insulation products / Construction / National	Corporation		Reidar Berglund	CEO
				Henrik Åström	CEO
Fastighetssnabben	Properties & buildings / National	Association		Malin Gustafsson	Head of Sustainability
Skanska	Construction / International	Corporation		Johan Holm	Business developer



Högskolan i Gävle	University / Local	State-owned	David Nordberg	Head of Climate and Sustainability Project manager
ColabitOil	Renewable fuel / Transportation / Northern Europe	Corporation	Jan-Henrik Larpers Gunilla Mårtensson Ola Eriksson Magnus Nyfjäll	Vice Principal Professor - Environmental Science CEO
Värdeskaparna of Sweden AB	Consulting	Corporation	Stefan Eriksson	CEO
Everenergy AB	Solar energy / Construction / National	Corporation	David Lukinius	CEO
Röda Korset	Aid organisation, second hand / International	Association	Pär Almer Anders Jansson Gladh	Chairman
Länsförsäkringar Gävleborg	Insurance / Finance / Regional	Insurance company	Per-Ove Bäckström Ann-Sofie Wesslén-Weiler	CEO Head of Sustainability
Smurfit Kappa	Manufacturing industry / International	Corporation	Oskar Wästlund Viktor Rask Tomas Åsberg	General Manager Gävle HSQE-Admin
Hela Människan	Aid organisation, second hand / National	Association	Sten-Erik Clara Bergel Jansson Jenny Lundberg Fröjd	Chairman Vice-chairman Organisation developer
Länsstyrelsen Gävleborg	Governmental authority/ Regional	State-owned	Per Bill Christoffer Carstens Karin Perman	Governor Dep.manager Sustainable Development Coordinator energy & climate



			Ola Nyberg	Coordinator Agenda 2030 & National environmental goals
Diös Fastigheter AB	Buildings & Properties / National	Corporation	Jennie Järverud Jens Nygren	Business manager Gävle Project manager
AB Gavlegårdarna	Housing/ Local	Corporation, owned by Gävle municipality	Cathrine Holgerson Mats Åström Alexandra Bankander	CEO Head of Environment Sustainability developer
A TEA	Digitisation / IT / International	Corporation	Tomas Mörth Tomas Danbäck Kristina Lind Markus Berglund	Regional manager North General manager Atea Gävle Ambassador of Sustainability Consultant manager
Afry	Consulting / Construction, Transportation, Energy / International	Corporation	Lisa Trevitt Max Allemo	Group Manager & Senior Environmental and Sustainability Consultant Office manager Gävle
Enerco group AB	Manufacturing industry / National	Corporation	Main Hermansson	Chief of communication and sustainability
Tyréns Sverige AB	Consulting / Construction, Transportation, Urban planning / International	Corporation	Camilla Mattsson Anna Sjöström	Head of Sustainability Sweden Environmental & Sustainability Consultant
Maxim Arkitekter AB	Architect / Construction / Local	Corporation	Karolina Dahlberg Clara Vikberg	Partner & Architect Architect
Skoog arkitekter AB	Architect / Construction / Regional	Corporation	Andreas Wallström	CEO
Bokrut AB	Consulting	Corporation	Ulf Delén	Founder & Owner
Bylero		Corporation	Markus Birgersson	CEO



	Consulting / Urban planning / National		Eva Lif	Dep. manager Gävle & head of Sustainability
Folkteatern Gävleborg	Theatre / Culture & Entertainment / Local	municipal associations	Adam Knapasjö	COO
Veidekke	Construction / International (Scandinavia)	Corporation	Krister Olsson	Regional manager
Hifab	Consulting / Properties & Urban planning / National	Corporation	Elin Mattson	Business manager/project manager
Sustainable innovation	Research	non-profit research organisation	Thomas Sundén	CEO
NCC	Construction / International (Northern Europe)	Corporation	Tove Malta	Business manager Gävle
			Peter Halvarsson	Project manager Gävle
			Anna Sporre	Environmental coordinator
Schneider Electric Sverige AB	Energy / Construction / National	Corporation	Hampus Svedin	Business developer
			Sara Sjödin	Sustainability solution Manager
Matla Bygg- och projektledning AB	Consulting / Construction & Project management / Local	Corporation	Mattias Larsson	Project & Construction manager
			Lillianne Axelsson	Project manager
Gästrike Återvinnare	Recycling & Waste management / Regional	Municipal association	Anna-Karin Jakobsson	Director
			Elsa Hort	Head of Environment
C24 Bygg Kompaniet AB	Retailer / Construction / Regional	Corporation	Matias Printz	Head of Environment & Sustainability
BiodrivMitt	Network / Transportation / Regional	Association	Lennart Sjögren	Vice-chairman
SENAB	Supplier furniture & interior / International (Northern Europe)	Association	Cristian Dahlén	Head of Sustainability
			Cecilia Sjöblom	Sales Advisor
			Frida Engberg	Sales Advisor
		Association	Karin Svärd Hertel	Founder & Owner



Greengoat Hållbarhetsbyrå AB	Consulting / Sustainability / Local		Åsa Sund	Founder & Owner
Fastpartner AB	Properties & buildings / National	Association	Fredrik Thorgren Simon Hellström	Regional Manager Business Area Manager
Greencon Energi & Miljö AB	Consulting / Energy / Local	Association	Magnus Hedin	CEO
Gevalia	Manufacturing Industry / National	Association	Caroline Granzell Andreas Vendell	Environmental Strategist Site manager
M3A arkitektur AB	Architect / Construction / Local	Corporation	Jimmy Westin Malin Lindgren Anette Forslund	She-lead Owner & Architect Owner & Architect
Briab	Safety solutions / Risk assessment in urban planning / National	Corporation	Andreas Johansson	Chief Consultant Gävle

Gävle Climate Agreement

Agreement 1: Period 2023-2026

The Gävle Climate Agreement is a local transition arena where public organisations, academia, associations and the business community work together to create a climate neutral and competitive Gävle.

Introduction

Gävle municipality has adopted the mission "Climate neutral Gävle 2030 - with a good life for everyone within the planet's boundaries". This means that by 2030, every Gävle resident should be able to live a good life with a high quality of life and minimal climate impact within the planet's boundaries.

To succeed, we all need to reduce greenhouse gas emissions and develop the municipality in a way that is ecologically, socially and economically sustainable for current and future generations. All companies, organizations and public organizations in Gävle municipality need to act together to accelerate the transition towards climate neutrality.

Particularly large challenges are within the transport and construction sectors. The transport sector's emissions account for about two-thirds of Gävle municipality's geographically linked carbon dioxide emissions and those of the construction sector continue to be resource-intensive and waste-generating with great opportunities for reduced environmental and climate impact.

The Gävle Climate Agreement is a gathering of forces with the aim of working towards a common goal where each actor adopts its own action plans to minimize its climate impact. The local climate agreement with its signatories constitutes Gävle's transition arena. Together, we show climate leadership and work to ensure that Gävle is at the forefront of the transition. In the arena, we can develop new collaborations, find innovative solutions and find new business opportunities that create the conditions for both us and future generations to live a good life within the planet's boundaries.

The common goal

Actors who sign the Gävle Climate Agreement support the goal of a climate-neutral¹ and competitive Gävle by 2030.

Membership

Signing the agreement means membership in the Gävle Climate Agreement for period 1, which runs from the autumn of 2023 to the autumn of 2026.

As a member, the organization gets the opportunity to network, share and take part of knowledge, experiences and good examples with other members of the Gävle Climate Agreement. The Gävle Climate Agreement is a democratic organization where each member holds one vote at the members' meetings and it is the members who decide the direction of the Gävle Climate Agreement, such as which focus and working groups should be active.

As a member of the Gävle Climate Agreement, we also take responsibility for:

- start a climate-driven business and operational development in Gävle
- actively participate in the joint work of the climate agreement
- Whenever possible, take leadership in areas where our organization has a high level of expertise
- get more actors to join the Gävle climate agreement.

Commitments

We, as the undersigned organization, undertake to:

- map, annually follow up and report our greenhouse gas emissions² for operations within Gävle municipality's geographical boundaries to Gävle Climate Agreement.
- develop an action plan to reduce our climate impact, annually update the action plan and annually report on the measures implemented to the Gävle Climate Agreement.

Duration of the contract

The climate agreement is renewed every three years. The next renewal will take place in 2026.

Signature

Organization

Name in block letters

Date

¹ Climate-neutral Gävle refers to the geographical area of the municipality of Gävle.

² This means:

direct emissions from the company's own operations, e.g. factories, trucks and machinery;

indirect emissions, e.g. purchased electricity, heating and cooling;

other indirect emissions, from purchased materials, product use, waste management, business travel, etc.

For questions about calculating emissions, please contact the Gävle Climate Agreement.