



Climate Action Plan

**Targets and measures for reducing
direct and indirect greenhouse
gas emissions to net zero by 2040**

Contents

Introduction	4
Areas and packages of measures at a glance	8
Packages of measures in the building sector	16
Packages of measures in the mobility sector	34
Package of measures in the waste disposal sector	48
Packages of measures in the nutrition sector	52
Packages of measures in the consumption sector	58
Packages of measures in the agriculture and forestry sector	64
Appendix	70

List of tables

Table 1: Overview of sectors and packages of measures	9	of building materials" package of measures	Table 18: Measures for the "Shifting motorized individual transport towards eco-mobility" package of measures	39	Table 26: Measures for the "Reduce food losses" package of measures	54
Table 2: Main targets and indicators of the sectors and packages of measures	10	Table 10: Measures for the "Sufficient construction" package of measures	29	Table 27: Targets for 2040 for the "Strengthening healthy, climate-friendly nutrition" package of measures	56	
Table 3: Overview of the GHG emissions in 2022 and the prospective estimates for 2040 per sector	14	Table 11: Targets for 2040 for the "Optimization of electricity use" package of measures	30	Table 28: Measures for the "Strengthening healthy, climate-friendly nutrition" package of measures	57	
Table 4: Targets for 2040 for the "Heating replacement and expansion of thermal networks" package of measures	19	Table 12: Measures for the "Optimization of electricity use" package of measures	31	Table 29: Measures for the package of measures "Circular, climate-friendly consumption"	61	
Table 5: Measures for the "Heating replacement and expansion of thermal networks" package of measures	20	Table 13: Targets for 2040 for the package of measures "Expansion and procurement of renewable electricity"	32	Table 30: Measures for the package of measures "Circular, climate-friendly production"	63	
Table 6: Targets for 2040 for the "Reduction of the demand for thermal energy" package of measures	23	Table 14: Measures for the "Expansion and procurement of renewable electricity" package of measures	33	Table 31: Measures for the "Reduce agricultural GHG" package of measures	66	
Table 7: Measures for the "Reduction of the demand for thermal energy" package of measures	24	Table 15: Target for 2040 for the "Traffic avoidance" package of measures	36	Table 32: Measures for the "Climate-friendly livestock farming and crop production" package of measures	67	
Table 8: Measures for the "Circular construction" package of measures	26	Table 16: Measures for the "Traffic avoidance" package of measures	36	Table 33: Status of the indicators for 2022 and 2023 and target value in 2040	71	
Table 9: Measures for the "Optimization	28	Table 17: Targets for 2040 for the package of measures "Shifting motorized individual transport towards eco-mobility"	38	Table 34: Population development in the City of Zurich according to medium population scenario	73	

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The most important changes compared to the 2023 Climate Action Plan

- Twelve packages of measures to reduce indirect greenhouse gas emissions (GHG emissions) are presented for the first time.
- Two packages of measures to reduce direct GHG emissions in agriculture and forestry are described for the first time.
- The previous explanations in the chapters “Analysis of the status of target achievement” are integrated into the introductory texts of the packages of measures. The status of target achievement is now described in the Net Zero Progress Report.
- The initial value and target path for the electrification of motorized individual transport were adjusted (M3 package of measures). In the 2023 reporting year, the traffic volumes and the Zurich-specific drive mix for passenger cars could only be estimated. In the meantime, the 2022 drive mix has been determined and the initial value adjusted accordingly.
- The status of the indicators for 2023 is listed in the appendix. In the future, the current status of the indicators will be shown in the net zero cockpit.

Target and mission

On May 15, 2022, voters decided that the City of Zurich must reduce its direct greenhouse gas emissions (GHG emissions) in the city to net zero by 2040.¹ In terms of indirect GHG emissions, the target is to achieve a 30 % reduction per inhabitant for the entire city compared to 1990.² The city administration and its agencies will ensure that all measures within its sphere of influence for achieving these two targets are implemented by 2035 (with the exception of the heat supply sector, for which the target year 2040 applies). The implementation of the city administration's measures by 2035 is intended to support residents and businesses in the city to implement the necessary measures

by 2040 at the latest in order to jointly achieve the targets. For both targets for the entire city, i.e. reduction of direct and indirect GHG emissions, the city administration must define a reduction plan (hereinafter referred to as the Climate Action Plan) with measures that lead to at least a linear reduction in GHG emissions.³ The starting point of the linear reduction path is the GHG emissions in the year of the referendum on the city's climate protection targets in 2022 (reference year). The city administration has even more ambitious goals: by 2035, net zero direct GHG emissions by 2035 and reduction of the indirect GHG emissions by 30 % compared to 1990. Implementation strategies for reducing the city administration's GHG emissions are currently being developed on the basis of the city administration's GHG inventory.

This Climate Action Plan focuses on the entire city and describes the specific targets and the current and planned measures of the city administration for achieving net zero direct GHG emissions and for reducing indirect GHG emissions by 30 % per inhabitant compared to 1990.

Other components of reporting

The net zero cockpit provides detailed data on the direct and indirect GHG emissions of the entire city over several years. For direct emissions, the outlook also shows how GHG emissions will develop up to 2040 if the packages of measures in the Climate Action Plan are implemented as planned. The net zero cockpit also provides an interactive overview of all sectors, packages of measures and individual measures. In future, the list of indicators will also be supplemented with the current status.

Where the date situation allows, the Net Zero Progress Report provides an annual update on the status of target achievement at the level of the areas and packages of measures. If the GHG reduction targets are not achieved in one sector, existing measures must be strengthened or new measures introduced. In this case, a more detailed description and reporting on the implementation status of the measures is planned. New measures are added to the net zero cockpit in each case.

The appendix to the Climate Action Plan contains an overview table with all targets, indicators and, where the data situation allows, their status in 2022 and 2023.

[Website on climate protection reporting](#)

¹ Note: Net zero means that the city will reduce its direct GHG emissions as far as possible by 2040 and will offset the remaining unavoidable emissions to net zero through negative emissions.

² Municipal Code of the City of Zurich Article 10 and Article 152

³ Municipal Code of the City of Zurich Article 152a

Structure of the Climate Action Plan

The Climate Action Plan deals with the direct GHG emissions within the city limits and the indirect GHG emissions caused outside the city limits by the activities and consumption of the city's population. It looks at two levels: sectors and packages of measures. The reference year 2022 serves as the starting value for the linear reduction path for direct and indirect GHG emissions. The year 1990 is used to determine the 2040 target value for indirect GHG emissions. As part of the Climate Action Plan, the 2022 baseline value and, where possible, the 2040 target value are specified for each package of measures. The current status of target achievement for 2023 can be found in the list in the appendix.

Sectors level

A sector summarizes the GHG emissions of various emission sources in a thematic focus. The sectors are largely based on the emission sectors from the "Greenhouse Gas Protocol Standard" for cities⁴ In accordance with this, the GHG emissions of the City of Zurich are assigned to six sectors: Buildings, Mobility, Waste disposal, Nutrition, Consumption, and Agriculture and forestry. The direct and indirect GHG emissions for the reference year 2022 were calculated or estimated for each sector. In addition, estimates were made for individual past years, in particular for the year 1990. The development of direct GHG emissions was also estimated for each sector in accordance with the city's targets up to 2040.

Package of measures level

A package of measures consists of specific targets for reducing GHG emissions and associated measures by the city administration. In terms of their objectives and associated measures, the packages of measures are units within a sector that are as clearly distinguishable from one another as possible. The current Climate Action Plan defines a total of 20 packages of measures, 8 of which focus on direct and 12 on indirect GHG emissions.

Targets

In order to measure the impact, a main target and further goals are defined for each package of measures wherever possible. The goals show what the city is aiming for in order to achieve the net zero target. Specific indicators are used to measure progress. With the target set, the future development of direct GHG emissions up to 2040 is also estimated and presented in the City of Zurich's net zero cockpit.

Measures

The lists of measures show what the city administration is doing to achieve the respective goals. The steering committees and service departments responsible for the respective strategies and plans are responsible for selecting and describing the measures in the Climate Action Plan. The Climate Action Plan does not claim to be a comprehensive list of all measures – these can be found in the respective strategies. As the measures listed are within the city administration's sphere of influence, they must be implemented by 2035 in accordance with the municipal regulations⁵ They are to take effect by 2040 at the latest. The only exceptions are the measures in the area of heat supply, which must be implemented by 2040, and certain measures in the mobility sector, which are planned for implementation by 2030.

Questions on targets and measures

Two questions were and are particularly relevant for the development and annual review of the Climate Action Plan:

Are the targets at the level of the packages of measures sufficient to achieve the climate protection targets in total?

The objectives at the level of the packages of measures originate from municipal strategies, plans, resolutions or – if these have not yet been adopted – assessments by experts, and therefore reflect the current state of planning in the City of Zurich as far as possible. The targets are used

for the prospective estimation of direct GHG emissions for the entire city up to 2040. According to the 2024 reporting status, the specific targets of all packages of measures – if achieved – will result in net zero direct GHG emissions in the city's territory.

It is difficult to define specific, quantifiable targets for the reduction of indirect GHG emissions, as the involvement of the population and other key players in the direct or even global context in the implementation of climate protection measures has a major influence on the future development of indirect GHG emissions. Where possible, corresponding goals are currently being developed as part of strategies and resolutions. The overall target is to reduce indirect greenhouse gas emissions per inhabitant by 30 % compared to 1990. In relation to emissions in the reference year 2022, this corresponds to a reduction of almost 50 %. Indirect GHG emissions are not estimated prospectively. Global climate protection efforts are making products and services more climate-friendly and reduce indirect emissions. However, it is uncertain when and to what extent these emission reductions will be implemented and what proportion of them will have to be achieved through more climate-friendly behavior on the part of the population and the business community. Specific, quantitative target values are therefore missing from most packages of measures for indirect GHG emissions.

Are the measures in a package of measures sufficient to achieve its goals?

The responsible members of the City Council with their departments and committees are responsible for the planning, impact assessment and implementation of measures to achieve the defined goals. Using suitable indicators and the results of the GHG inventory, they analyze annually, together with the net zero project team of the Environmental and Health Protection Service Zurich (UGZ), whether the measures are actually achieving the desired effect. If the desired effect is not achieved, the responsible departments and committees decide how the measures can be accelerated, adapted or supplemented. This is explained in the Net Zero Progress Report.

The UGZ draws up an overall picture of the most important objectives and measures, discusses the assessments and plans of the service departments, and points out when the objectives and measures of the packages of measures are not sufficient overall for the reduction path. Reporting status 2024: While many measures to reduce direct GHG emissions are already planned and being implemented, there is a need for further measures to reduce indirect GHG emissions in all areas. The current measures will probably not be sufficient to reduce indirect GHG emissions by 30 % per inhabitant compared to 1990. As described in the "Measures" section, the city is also dependent on developments in the surrounding area to achieve its objectives.

⁴ WRI, C40 Cities & ICLEI (2014): [Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities](#)

⁵ [Municipal Code of the City of Zurich Article 152, Paragraph 3](#)

Areas and packages of measures at a glance

The following tables provide an overview of the sectors and their GHG reduction targets, as well as the packages of measures and the associated targets and indicators. The values for the reference year 2022 and the target year 2040 are shown. The status of the indicators in 2023 is listed in the appendix. From the end of 2025, the status of the indicators will be shown in the net zero cockpit.

Table 1: Sectors and packages of measures at a glance

Sector	Packages of measures for direct GHG emissions	Packages of measures for indirect GHG emissions
Buildings	G1: Heating system replacement and expansion of thermal networks G2: Reduction of the demand for thermal energy	G3: Circular construction G4: Optimization of building materials G5: Sufficient construction G6: Optimization of electricity use G7: Expansion of renewable electricity
Mobility	M1: Traffic avoidance M2: Shifting motorized individual transport towards eco-mobility M3: Compatible traffic management	M4: Climate-friendly international passenger transport M5: Climate-friendly domestic transport M6: Circulation-oriented, sufficient civil engineering
Waste disposal	EN1: CO ₂ capture and storage (CCS)	No packages of measures for indirect GHG emissions
Nutrition	No packages of measures for direct GHG emissions	E1: Reduce food losses E2: Healthy, environmentally friendly nutrition
Consumption	No packages of measures for direct GHG emissions	K1: Circular, climate-friendly consumption K2: Circular, climate-friendly production of consumer goods
Agriculture and forestry	L1: Reduce agricultural greenhouse gases L2: Climate-friendly livestock farming	No packages of measures for indirect GHG emissions

Table 2: Main targets and indicators of the sectors and packages of measures

Total: Targeted reduction in direct GHG emissions (incl. negative emissions) by 2040: 100 % targeted reduction in indirect GHG emissions of 30 % per inhabitant by 2040 compared to 1990 (corresponds to a reduction of approximately 50 % compared to 2022)

Building sector Targeted reduction in direct GHG emissions by 2040 compared to 2022: around 95 % Primary reduction target for indirect GHG emissions: 30 % per inhabitant by 2040 compared to 1990 (reduced by approximately 50 % compared to 2022); not broken down into individual sectors.			
Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Direct GHG emissions			
G1: Heating system replacement and expansion of thermal networks	100 % of the thermal energy comes from renewable energy sources, waste or waste heat. ⁶ Indicator: Share of thermal energy from renewable energy sources, waste or waste heat	23 %	100 %
G2: Reduction of the demand for thermal energy	The demand for thermal energy of all buildings in the urban area will drop by 20 % compared to the average value in 2018–2022. ⁷ Indicator: Demand for thermal energy of all buildings in the urban area (usable heat, absolute)	3,300 GWh	2,600 GWh
Indirect GHG emissions			
G3: Circular construction	GHG emissions during construction are reduced. Indicator: t CO ₂ -eq/inhabitant/year	1.7 t CO ₂ -eq	Reduction
G4: Optimization of the building materials	(Targeted indicator: GHG emissions for construction per m ² of floor area)		
G5: Sufficient construction			
G6: Optimization of use of electricity	Electricity consumption increases to a maximum of 3,850 GWh or per inhabitant by a maximum of 22 % compared to 2022. This electricity must be obtained from 100 % renewable sources. Indicator: Annual electricity consumption in the City of Zurich, total ⁸ and per inhabitant	2,724 GWh 6,150 kWh/inhab.	3,850 GWh 7,500 kWh/inhab.
G7: Expansion and purchase of renewable electricity	The renewable electricity production of ewz (Electricity Works Zurich) is sufficient to supply all ewz customers in the serviced area. Indicator: Share of renewable electricity for ewz customers	100 %	100 %
	PV solar power production in the urban area will increase to at least 120 GWh in 2030 and at least 300 GWh in 2040. Indicator: Solar power production in the urban area in GWh	43.7 GWh	300 GWh

6 Heat Supply Ordinance (WVV) of the City of Zurich, Art. 4, Para. 1: As of 2040, buildings are to be supplied with heat exclusively from fossil-free energy sources.
7 Energy planning for the City of Zurich: Estimate based on the “Municipal Energy Planning of the City of Zurich (Revision 2022) Energy Supply Planning Report”
8 Electricity consumption in the City of Zurich: Reported annually in the ewz Annual and Sustainability Report.

Mobility sector Targeted reduction in direct GHG emissions by 2040 compared to 2022: around 70 % Primary reduction target for indirect GHG emissions: 30 % per inhabitant by 2040 compared to 1990 (reduced by approximately 50 % compared to 2022); not broken down into individual sectors.			
Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Direct GHG emissions			
M1: Traffic avoidance	The length of the average daily commute by distance by motorized individual transport and public transport within the city decreases per inhabitant by 10 % compared to 2022 ⁹ Indicator: Average daily commuting distance within the city per inhabitant	21 km	19 km
M2: Shifting motorized individual transport ¹⁰ towards eco-mobility ¹¹	The proportion of distances traveled by motorized individual transport in the Modal split ¹² decreases to 15 %. ¹³ Indicator: Share of motorized individual transport in the modal split	25 %	15 %
M3: Compatible traffic management	The remaining passenger cars traveling in the city are 81 % hybrid or all-electric with regard to mileage. Indicator: Proportion of mileage of hybrid and all-electric passenger cars traveling in the city	5.8 %	81 %
	The public transport buses will be 100 % electrified by 2035. Indicator: Proportion of available seat kilometers in electrified public transport buses in the city (electric and trolley buses)	49 %	100 %
Indirect GHG emissions			
M4: Climate-friendly international passenger transport	GHG emissions from international passenger transport will be reduced. Indicators: Annual kilometers traveled by plane per inhabitant Share of “sustainable aviation fuels” in air traffic	9,800 km 0.1 % ¹⁴	Reduction Increase
M5: Climate-friendly domestic transport	GHG emissions in domestic traffic will be reduced. Indicators: Annual travel distance outside the urban area with motorized individual transport per inhabitant Proportion of hybrid and all-electric passenger cars owned by the urban population	4,600 km 5.5 %	Reduction Increase
M6: Sufficient and climate-friendly civil engineering	GHG emissions in civil engineering are reduced. Indicator: GHG emissions per renewed road surface	0.05 t CO ₂ -eq/m ²	Reduction

9 This goal is not congruent with the goal of the 2040 Urban Space and Mobility Strategy for reducing the distances traveled by the urban population (city of short distances).
10 According to the Mobility and Transport Microcensus, motorized individual transport includes cars, motorcycles, small motorcycles and motorbikes.
11 The environmentally friendly modes of transport (public transport, cycling and pedestrian traffic) are collectively referred to as eco-mobility or sustainable transport.
12 Modal split: The share of different means of transport (here: public transport, motorized individual transport, bicycle, pedestrian traffic) in the total volume of traffic.
13 2040 Strategy Urban Space and Mobility of the City of Zurich: The modal split share of eco-mobility in the city will increase to 85 % by 2040.
14 SAF Deployment (iata.org)

Waste disposal sector
 Targeted reduction in direct GHG emissions by 2040 compared to 2022: 214 %
 No indirect GHG emissions

Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Direct GHG emissions			
EN1: CO ₂ capture and storage (CCS)	From 2035, CCS will be used to capture and store 357,500 tons of CO ₂ per year. Of which 197,500 tons of CO ₂ are of biogenic origin and therefore negative emissions. Indicator: Amount of captured and stored CO ₂	0 t CO ₂ -eq	357,500 t CO ₂ -eq

Nutrition sector
 No direct GHG emissions
 Targeted reduction in indirect emissions by 2040 compared to 2022: 40 %

Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Indirect GHG emissions			
E1: Reduce food losses	Food losses per inhabitant will be reduced by 50 %. Indicator not yet defined	Indicator not yet defined	Reduction of 50 %
E2: Healthy, climate-friendly nutrition	The consumption of meat, poultry, fish and seafood per inhabitant per year will drop by 66 %. Indicator: Weekly consumption of meat, poultry, fish and seafood per inhabitant	1 kg	330 g

Consumption sector
 No direct GHG emissions
 Primary reduction target for indirect GHG emissions: 30 % per inhabitant by 2040 compared to 1990 (approximate reduction of 50 % compared to 2022); not divided into individual sectors.

Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Indirect GHG emissions			
K1: Circular, climate-friendly consumption	GHG emissions during consumption will be reduced. Indicator: Tons of CO ₂ -eq/inhabitant/year caused by consumption (Targeted indicator: t new consumption/inhabitant/year)	2.6 t CO ₂ -eq	Reduction
K2: Circular, climate-friendly production of consumer goods	GHG emissions from the production of consumer goods will be reduced. Indicator: Tons of CO ₂ -eq/inhabitant/year caused by consumption (Targeted indicator: t CO ₂ -eq per ton of consumer goods [average value for all goods consumed])		

Agriculture and forestry sector
 Targeted reduction in direct GHG emissions by 2040 compared to 2022: Unchanged
 Indirect GHG emissions from companies are not recorded.

Package of measures	Main target and associated indicator	Initial value in 2022	Target value for 2040
Direct GHG emissions			
L1: Reduce agricultural greenhouse gases	Negative emissions are generated in agriculture wherever possible. Indicator: t CO ₂ -eq/year of negative emissions	0 t CO ₂ -eq	Increase
L2: Climate-friendly livestock farming and crop cultivation	GHG emissions from agriculture will decrease. Indicator: t CO ₂ -eq/year	2,000 t CO ₂ -eq	Reduction

Table 3: Overview of GHG emissions in 2022 and the prospective estimates for 2040 per sector

Due to rounding, the sum of the individual sector values may deviate from the total emissions.

For indirect emissions, there are usually no sector-specific targets for 2040.

Sector	Direct GHG emissions			Indirect GHG emissions	
	Initial value in 2022	Negative emissions in 2040	Remaining emissions in 2040	Initial value in 2022	Remaining emissions in 2040
	Tons of CO₂-eq/year				
Buildings	590,000	0	40,000	1,200,000	not specified
Mobility	330,000	0	100,000	2,100,000	not specified
Waste disposal	140,000	-200,000	-150,000 ¹⁵	3,000	not specified
Nutrition	0	0	0	1,200,000	800 000
Consumption	0	0	0	1,200,000	not specified
Agriculture and forestry	2,000	0	<2,000	0	0
Total	1,060,000	-200,000	-10,000	5,700,000	3,500,000
	Tons of CO₂-eq/inhab./year				
Buildings	1.3	0	0.1	2.6	not specified
Mobility	0.7	0	0.2	4.7	not specified
Waste disposal	0.3	-0.4	-0.3	0.0	not specified
Nutrition	0	0	0	2.6	1.6
Consumption	0	0	0	2.6	not specified
Agriculture and forestry	0.0	0.0	0.0	0	0
Total	2.4	-0.4	0.0	12.6	6.7

¹⁵ In addition to the negative emissions, 95,000 tons of CO₂-eq are extracted and stored by CCS.

¹⁶ Initial trials with biochar for gathering experience and building knowledge are taking place as part of the L1 "Agricultural greenhouse gas sinks" package of measures.

Restrictions

Several emission sources, most of which are less significant today, are not covered by the 21 packages of measures. In terms of direct GHG emissions, these particularly include "F" gases (fluorinated gases, which are used in various applications in the buildings and mobility sectors and in industry). In addition, other negative emission technologies besides the capture and storage of CO₂ in the waste disposal sector are not yet included in this Climate Action Plan. Examples of these include the increased use of wood as a building material, direct capture of CO₂ from the atmosphere and storage (officially called Direct Air Carbon Capture and Storage [DACCS]) and biochar.¹⁶

In addition to the climate target, the municipal ordinance also includes the energy target "Reduction of primary energy demand to 2,000 watts per person by 2040" (2,000-watt society). The two energy and climate goals can only be achieved together and both require a sufficient, efficient and consistent use of energy.

Effect of climate protection measures

In most cases, the measures taken by the city administration do not lead directly to a GHG reduction, but enable and facilitate other stakeholders to reduce GHG emissions in their area of responsibility. For this reason, the Climate Action Plan also describes what other stakeholders – the population, companies, the canton or the federal government – must implement in order for the targeted GHG reduction to actually occur. One example of this dependency can be seen in the implementation of the federal government's 2050 Energy Strategy in the building sector: While the federal government sets the primary goals and basic conditions, the cantons are responsible for the concrete implementation in the building sector. They issue corresponding laws and ordinances, such as the model regulations of the cantons in the energy sector (MuKE). The city must take these cantonal requirements into account in its building and zoning regulations and can create additional incentives for energy-efficient construction and renovation on this basis. However, these measures will only have a real impact on the climate if homeowners implement the requirements and invest in energy-efficient technologies.

It is important to note that certain measures, when implemented, will initially increase GHG emissions in the short to medium term, i.e. they will have a negative impact on the GHG inventory, but will reduce GHG emissions in the long term. This means that the replacement of heating systems and the expansion of the thermal network initially lead to higher GHG emissions during implementation. In the longer term, however, this will lead to reduced consumption of fossil fuels and consequently to a reduction in GHG emissions.

Cross-sector measures

In addition to the measures mentioned in the following chapters, the city administration is implementing measures that are relevant to achieving the climate targets across the board and which cannot be assigned to individual packages of measures. These are:

- **Influencing favorable primary basic conditions:** The basic legal conditions at the municipal, cantonal and national and, in some cases, even at the international level are fundamental to achieving the goals at the package of measures level. In order to represent the interests of the city and work towards suitable basic conditions, the City of Zurich is in contact with the federal government, the canton and other cities. For example, the city takes part in consultations on cantonal and national legislation, sits on specialist committees and contributes to the development of standards.

- **Awareness-raising measures:** The city administration implements awareness-raising measures and campaigns on climate protection and provides information so that the population and other important stakeholders can reduce their GHG emissions. This includes supporting and participating in various awareness-raising and mobilization activities, the annual climate campaign, the [Climate Newsletter](#), the management of various information channels and the [Net Zero Walk](#).

- **The Climate Forum** functions as a meeting point and body for networking between municipal departments and multipliers from business, science, NGOs/associations, politics and the population. Building on the city's Climate Action Plan, it puts current fields of action on the agenda and brings together relevant people and current and future multipliers. [Climate Forum](#)

- **The KlimUp funding program and other collaborations** support early-stage start-ups and non-profit organizations that contribute to the urban climate target of net zero and/or the environmental goal of the intelligent use of resources. [Offers for support and cooperation](#)

- **With the net zero pilot district** in the Binz/Alt-Wiedikon area, the City of Zurich is seeking to gain insights into how voluntary commitment to achieving the city's climate target can be increased. Implementation in the district will begin in mid-2025. [Net zero pilot district](#)

- **At the Climathon** representatives from the public, business, science and politics come together in teams to develop new ideas for climate protection. The City of Zurich supports selected projects to reduce direct and indirect emissions. [Climathon](#)

Packages of measures in the building sector

- G1: Heating system replacement and expansion of thermal networks
- G2: Reduction of the thermal energy demand
- G3: Circular construction
- G4: Optimization of building materials
- G5: Sufficient construction
- G6: Optimization of electricity use
- G7: Expansion and purchase of renewable electricity

The building sector includes all emissions from the heat supply, construction activity and the electricity supply. The building sector is responsible for around 4 tons of CO₂-eq per inhabitant (direct and indirect GHG emissions), which corresponds to one quarter of the total GHG emissions per person.

Fossil-free heat for all buildings

Around a third of the emissions (1,3 tons of CO₂-eq/inhabitant) are caused by heating buildings with fossil fuels. In order to achieve net zero direct GHG emissions by 2040, the heat supply must be covered by fossil-free energy and the demand for thermal energy (usable heat) in the urban area must be reduced by around 20 % – taking into account the forecast population and economic growth. Indirect GHG emissions must be kept in mind for all construction measures. This means there should be a good ratio between the indirect GHG emissions generated by construction activities and the reduced GHG emissions during operation.

Building materials are responsible for emissions in the building sector

Two-thirds (2,6 tons of CO₂-eq/inhabitant) of building-related emissions are generated outside the urban area. Around three quarters of these are indirect GHG emissions in connection with new buildings and conversions, while a quarter comes from the provision of energy to operate the buildings. The high indirect GHG emissions in the building sector are largely attributable to the production of building materials.

There are currently no quantitative targets for the reduction of indirect emissions in this area. Nevertheless, GHG emissions must be reduced as much as possible in order to achieve the climate protection targets for the city as a whole. Indirect emissions are reduced by implementing packages of measures 3, 4 and 5. The contribution made by the individual packages of measures to reducing GHG emissions cannot be quantified and it varies depending on the construction project.

The model regulations of the cantons in the energy sector (MuKE) are currently being updated. To reduce indirect emissions in the building sector, it is important that the topic of embodied energy and indirect GHG emissions is anchored there. In this way, the city administration can take indirect GHG emissions in the construction sector into account more extensively for new and renovated buildings, based on a higher cantonal level.

Renewable electricity for ongoing electrification

The decarbonization of mobility and buildings will lead to an increase in electricity consumption. For this reason, the production of renewable electricity must be expanded rapidly while at the same time being used optimally. This is the only way to advance the electrification with renew-

able energies that is urgently needed to achieve the climate targets.

The packages of measures G1 and G2 aim to reduce direct emissions to net zero. The packages of measures G3 to G7 describe how indirect emissions can be reduced.

G1 package of measures: Heating system replacement and expansion of thermal networks

Replace around 20,000 fossil-fuel heating systems

In 2022, 19,800 fossil-fuel heating systems supplied heat and hot water for 55,000 buildings. In the reference year 2022, these caused 560,000 tons of CO₂-eq or just under 1.3 tons of CO₂-eq per inhabitant. By replacing heating systems, direct GHG emissions in the building sector can be reduced by over 90 % from 1.3 tons of CO₂-eq per person per year in the reference year 2022 to 0.1 tons of CO₂-eq per person in 2040. Both the number of oil and gas heating systems replaced and their output influence the reduction in greenhouse gases.

The revised CO₂ Act and the Climate and Innovation Act at the federal level, the revised 2022 Energy Act of the Canton of Zurich (EnerG) and the heat supply ordinance of the City of Zurich are the first relevant steps on the way to net zero direct GHG emissions in the building sector. Under the EnerG, fossil-fuel heating systems may no longer be installed if a renewable alternative is technically feasible and causes no more than 5 % additional costs over the life cycle compared to a replacement with a fossil-fuel heating system. Since the revised EnerG came into force, fossil-free heating systems (heat from renewable energy, waste or waste heat) have been installed almost exclusively.

How quickly fossil-fuel heating systems are replaced is in the hands of the property owners. The climate targets set can only be achieved if they replace all fossil-fuel heating systems with CO₂-neutral heating systems by 2040 or, in areas where there is no alternative energy source, operate the remaining gas heating systems with renewable gas. On average, 1,100 fossil-fuel heating systems need to be replaced by fossil-free heating systems every year. In addition to the federal and cantonal authorities, the city administration creates the necessary basic conditions and aims to accelerate the replacement of heating systems with its support programs and information and advice services (see Table 5).

Expanding and decarbonizing thermal grids

With the expansion of district heating (i.e. the thermal networks in accordance with the Heat Supply Ordinance [WVV 2022]), the City of Zurich is creating one of the most important alternatives to fossil-fuel heating systems in the city: by 2040, 60 % of the urban area is to be connected to a district heating network within the defined connection rate, and half of the demand for heat in the city is to be covered by district heating. In 2022 it was 20 %. By 2040, heat in district heating networks is also to be generated completely fossil-free. In 2022, around a third of the district heating was still generated using natural gas or heating oil.

Complex challenges must be overcome when expanding thermal grids. This includes securing the location for the necessary energy infrastructure or coordinating the pipeline construction work with other construction projects in order to minimize disruption. In this context, the expansion of thermal networks cannot be accelerated at will. This is why the urban measures for decarbonizing the heat supply will be implemented by 2040 and not, like the other measures, by 2035.

The decarbonization of thermal networks is also a major challenge. The construction of the third incineration line at the Hagenholz waste incineration plant by Entsorgung + Recycling Zürich (ERZ) will enable larger volumes of waste to be incinerated, allowing more district heating to be generated. As long as the CCS plants have not yet been installed, more GHG emissions will be produced. An overriding concept has been developed for the decarbonization of the grid-based heat supply. This provides for the use of

various technologies. At present, it is still unclear which scenario is to be implemented. The networking of grids, the use of large storage systems, or wood or renewable fuels (in the smallest possible quantities) as heat sources are conceivable.

The prospective estimate of the development of GHG emissions is based on the scenario that renewable gas is initially used for the future peak load remaining in all thermal grids. The scenario will be adjusted as soon as new information on the heat sources for peak load coverage is available.

Decommissioning and decarbonizing the gas supply

The gas distribution network is to be shut down gradually and to a large extent. In areas with a planned district heating expansion, the decommissioning of the gas distribution networks will be coordinated with the expansion of district heating. The city is committed to ensuring that fossil and certified renewable gas is only used for applications in which no other renewable or fossil-free energy sources are available. Fossil gas is no longer to be used in 2040, and certified renewable gases are to supply a maximum of 9 % of the heat in the city in 2040.

Reduction in demand for thermal energy is necessary

In principle, because of the limited availability of heat from renewable energy, waste or waste heat, complete decarbonization of the building sector is only possible with increased energy efficiency, i.e. if overall energy consumption is also reduced (see G2 package of measures).

Targets until 2040

Table 4: Targets until 2040 for the “Heating replacement and expansion of thermal networks” package of measures

The data shown here is still uncertain. It is expected to be adjusted by 2025 as part of the development of the 2040 heat supply concept. Energy values = final energy¹⁷

Main target

100 % of the thermal energy comes from renewable energy, waste or waste heat.¹⁸	
Initial value in 2022	23 %
Target value by 2040 Intermediate values in 2025, 2030, 2035	100 % 32 %, 72 %, 89 %

Further targets

49 % of the demand for heat of the entire building pool will be covered by thermal networks.¹⁹		100 % of the energy in the thermal networks is fossil-free.	
Initial value in 2022	19 % (690 GWh)²⁰	Initial value in 2022	67 %²²
Target value by 2040 Intermediate values in 2025, 2030, 2035	49 % (1300 GWh)²¹ 24 %, 33 %, 41 %	Target by 2040 Intermediate values in 2025, 2030, 2035	100 % 70 %, 95 %, 98 %

35 % of the demand for heat of the entire building pool will be covered by heat pumps.		7 % of the demand for heat of the entire building pool will be covered by wood and thermal solar collectors.	
Initial value in 2022	4 % (140 GWh)²³	Initial value in 2022	5 % (190 GWh)
Target value by 2040 Intermediate values in 2025, 2030, 2035	35 % (1000 GWh)²⁴ 9 %, 18 %, 27 %	Target value by 2040 Intermediate values in 2025, 2030, 2035	7 % (200 GWh)²⁵ 5 %, 6 %, 6 %

A maximum of 9 % of the heating energy demand is covered by decentralized gas heating systems.²⁶		100 % of the remaining gas demand will be covered by certified renewable gas.²⁷	
Initial value in 2022	53 %	Initial value in 2022	2 %²⁸
Target value by 2040 Intermediate values in 2025, 2030, 2035	9 % 46 %, 33 %, 21 %	Target value by 2040 Intermediate values in 2025, 2030, 2035	100 %²⁹ 3 %, 50 %, 75 %

100 % of the gas required for process energy and combined heat and power plants will be covered by renewable gas.	
Initial value in 2022	8 %
Target value by 2040	100 %

17 Note: The demand for heat that is currently covered by oil heating systems (710 GWh in 2022 or 19 % of the heat energy demand) is not included in this table. It is assumed that all oil heating systems will be replaced by renewable heating systems by 2040.
 18 Heat Supply Ordinance (WVV) of the City of Zurich, Art. 4, Para. 1: As of 2040, buildings are to be supplied with heat exclusively from fossil-free energy sources. The value for the reference year is a rough estimate that will be adjusted in 2024.
 19 Energy planning for the City of Zurich: Estimate based on the “Municipal Energy Planning of the City of Zurich (Revision 2022) Energy Supply Planning Report”
 20 The value only includes the ERZ district heating, while the target applies to all thermal networks.
 21 City Council Resolution (STRB) 1542/2022, Chapter 3.2.1: Estimate based on Appendix 2 (all values adjusted for heating degree days)
 22 The value relates only to the ERZ district heating network, while the target applies to all thermal networks.
 23 2000 watt monitoring (this is a rough estimate, as only around 20 % of heat pumps are currently recorded in the FETA data; it is therefore assumed that the value in the reference year is significantly higher)
 24 City Council Resolution (STRB) 1542/2022, Chapter 3.2.1: Estimate based on “Supplement 2, Energy Supply Planning Report”
 25 City Council Resolution (STRB) 1542/2022, Chapter 3.2.1 of the “Municipal Energy Planning of the City of Zurich (Revision 2022) ENERGY SUPPLY PLANNING REPORT.” Estimate based on Appendix 2. For the reference value, there is only data on the subsidized plants, which generally belong to the smaller plants. We therefore only state the target value; Wood energy position
 26 Note: Estimate by energy officer, based on Net Zero Basic Study by INFRAS.
 27 Note: Only decentralized gas consumption is taken into account here. Gas consumption for peak load coverage of thermal networks is included in the target for thermal networks.
 28 Note: According to the national greenhouse gas inventory, only domestic renewable gas is currently counted as renewable. The development of the share of gas from renewable sources is based on the assumption that European renewable gas will be recognized at a national level as of 2028. This explains the sharp rise in 2030.
 29 City Council Resolution (STRB) 1542/2022, Chapter 3.2.1: Estimate based on Appendix 2 (all values adjusted for heating degree days)

Measures taken by the city administration

Table 5: Measures for the “Heating replacement and expansion of thermal networks” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Municipal energy planning (ongoing task)	<p>With its municipal energy planning, the City of Zurich is laying an important foundation for the implementation of energy and climate policy goals in the building sector. Energy planning assesses future heating and cooling requirements as well as the supply of renewable energy and waste heat.</p> <p><small>City Council Resolution (STRB) No. 1542/2022 STRB No. 670/2024 2023 Energy Master Plan of the City of Zurich</small></p>
Coordination between urban and energy planning (ongoing task)	<p>Urban and energy planning are coordinated in order to make optimum use of the local potential for waste heat and renewable energy and to ensure that the grid-based energy supply can be operated economically in the long term.</p> <p><small>Office for Urban Development (AFS): Net Zero Action Plan 2020 Energy Master Plan of the City of Zurich</small></p>
Expansion of thermal networks (by 2040)	<p>By 2040, at least 60 % of the urban area will be connected to thermal networks. The municipal energy supplier is responsible for the planning, construction and operation of the thermal networks. The construction of the grids is carried out in close coordination with other municipal construction activities and municipal energy planning. The city administration uses informative and coordinating measures as well as financial incentives to ensure a high connection rate in residential areas with thermal networks.</p> <p><small>STRB No. 382/2021, Supplement 1 Heat Supply Ordinance (WVV) of the City of Zurich</small></p>
Decarbonization of the thermal networks (by 2040)	<p>According to the Heat Supply Ordinance, the thermal networks will be 100 % decarbonized by 2040.</p> <p><small>Heat Supply Ordinance (WVV) of the City of Zurich, Art. 16, Para. 2</small></p>
Expansion of 3rd incineration line at Hagenholz waste incineration plant (until 2027)	<p>Expansion of the capacity of the Hagenholz waste incineration plant (KVA) from two to three incineration lines by 2027. The incineration capacity of the Hagenholz waste incineration plant (KVA) will be increased from the current 240,000 to 360,000 tons per year. The project includes the creation of the technical prerequisites for the subsequent removal of CO₂ from the flue gas.</p> <p><small>GR No. 2023/16</small></p>
Energy consulting (ongoing task)	<p>The city advises property owners on replacing heating systems, on energy-efficient renovations and solar systems as well as on corresponding funding programs and approval procedures as part of the City of Zurich’s energy consulting and energy coaching services. An estimated 1,000 consultations on the replacement of heating systems are carried out every year.</p> <p><small>Ordinance on non-profit services in the context of climate and energy policy objectives (CF, AS 732.360) GR No. 2012/222 GR No. 2022/286 STRB No. 385/2021 and GR No. 2021/178</small></p>
Information platforms: EnerGIS and energy platform (ongoing task)	<p>The city provides relevant information online on EnerGIS and the energy platform on replacing heating systems and the options available for individual properties. All funding programs and advisory services are clearly presented on the energy platform.</p> <p><small>EnerGIS of the City of Zurich Energy platform of the City of Zurich</small></p>

Promotion of renewable energies (replacement of heating systems)

The city provides subsidies to support the conversion from fossil-fueled heating systems to climate-friendly solutions such as heat pumps and connections to a thermal network. In addition, since October 2022, subsidies have been granted for the early replacement of fossil-fuel heating systems.

Ordinance on non-profit services in the context of climate and energy policy objectives (CF, AS 732.360)

Decommissioning of gas distribution network (until 2040)

The gas distribution network will be largely decommissioned in stages in accordance with the Heat Supply Ordinance and gas strategy (excluding any gas supply for industrial high-temperature processes or peak load coverage of thermal networks). Decommissioning requires the development of CO₂-neutral energy sources. In April 2024, the decommissioning of the gas distribution network in Tiefenbrunnen and Altstetten-North between 2030 and 2034 was announced.

Implementing provisions for the Heat Supply Ordinance (WVV) of the City of Zurich | Gas strategy of the City of Zurich, Chapter 6 | STRB No. 1061/2024

Renewable gas (until 2040)

The municipal gas supplier will steadily increase the proportion of certified renewable gas to 100 % by 2040. Renewable gas is only to be used if no alternative climate-friendly solution is available.

Heat Supply Ordinance (WVV) of the City of Zurich, Art 16, Para. 1

Replacement of heating systems in municipal properties

The city administration is setting an example for the city’s properties in terms of efficient and consistent use of energy and is, for example, promoting the replacement of heating systems in its own properties.

STRB No. 404/2022

G2 package of measures: Reduction of the demand for thermal energy

The climate-friendly energy sources used locally are limited. To ensure that sufficient renewable energy and heat from waste or waste heat is available to replace fossil heating systems, the demand for thermal energy must also be reduced.

The demand for thermal energy has already fallen in recent years: from 3,700 GWh in 2010 to 3,300 GWh in 2022 (average value over 5 years in each case). Taking into account the forecast growth in population and jobs, a further re-

duction of 700 GWh or 20 % must be achieved by 2040. Because of population growth, this means an average reduction of 32 % per inhabitant.³⁰ The specific demand for heat (energy per square meter of floor space) is set to drop by 37 % by 2040 (compared to 2022).

Great potential with property owners

The direct potential for reducing GHG emissions lies with the property owners – the private, non-profit and public building owners. The targets can only be achieved if property owners increasingly modernize their buildings in terms of energy efficiency, optimize the operation of building technology, use space sparingly and utilize heat sparingly. In addition to the federal and cantonal authorities, the city administration is creating the necessary framework conditions.

³⁰ GR No: 2021–177

More and faster energy-efficient renovation

In order to reduce the demand for heat, more existing buildings need to be renovated more quickly. Specifically: The annual energy-efficient renovation rate for residential buildings is to increase from 1.25 % to 2.1 %, and for non-residential buildings from 1.75 % to 2.4 %. This applies to complete renovations as well as (partial) building shell renovations, whereby the indirect emissions of a renovation must be in a good ratio to the operational savings. The data on the energy renovation rate is still imprecise. From 2025, the heat supply concept should provide more precise information on the condition of the building shells.

New buildings have better energy efficiency than old buildings in need of renovation. While the cantonal energy law stipulates the requirements for new and replacement buildings, it provides very little incentive for energy-efficient renovations. The city administration therefore supports property owners with energy coaching and a specific funding program for the energy-efficient renovation of existing buildings.

The city attaches additional conditions to the funding to ensure that the renovations are socially acceptable and tenant-friendly. For example, they are intended to limit the financial impact on tenants as far as possible, prevent tenants from having to move, protect vulnerable population groups and curb additional pressure on the housing market.

Optimize building technology

Optimum operation of building technology can save a great deal of energy. The Cantonal Energy Act (Art. 13d) stipulates that the heating, ventilation, air conditioning, refrigeration, plumbing, electrical and building automation systems in non-residential buildings must be optimized within three years of commissioning. For residential buildings, the cantonal energy law does not contain any requirements for operational optimization.

The energy service provider ewz offers operational optimization and creates an additional incentive to save energy with the ewz efficiency bonus for large companies. The city supports private individuals with a specific heating optimization consulting service to help them optimize their heating in residential buildings.

Reduce land use

Sufficient and efficient use of the heated building area can further reduce the demand for thermal energy. In 2022, one inhabitant occupied an average of 54 m² of living space; by 2040, space consumption is expected to decrease by 7 % to 50 m². In non-residential buildings, the amount of space required per workplace is set to decrease by 6 % from 45 m² (2022) to 43 m² by 2040.

There is no obligation for private individuals to restrict land use. However, there are already examples of optimal space utilization: in non-profit housing construction, per capita residential space consumption is well below the urban average. The city's one-third target for non-profit housing therefore helps to reduce land use. It should be noted that the use of residential space tends to be lower in central locations.

In the city's own buildings, the city administration already adheres to various guidelines regarding the use of space in administrative buildings, and the Property Office of the City of Zürich (Liegenschaften) implements occupancy regulations for rental properties.

Use heat with restraint

The heat requirement can be reduced if the room temperature in winter is as low as possible and adapted to use. In today's building mix, reducing the temperature by 1 °C can save an average of 6 % of the required thermal energy.

The city is focusing on awareness-raising measures and setting a good example: there are specifications for the maximum room temperature in administrative buildings.

Targets until 2040

Table 6: Targets for 2040 for the “Reduction of the demand for thermal energy” package of measures

On account of the weather dependency of the demand for thermal energy, the average value over 5 years is considered in each case. The data shown here is still uncertain. It will be adjusted as part of the development of the 2040 heat supply concept.

Main target

The demand for thermal energy of all buildings in the city will decrease by 20 % compared to the 2018–2022 average ^{31, 32}		
	Usable heat (entire city, absolute)	Final energy (entire city, absolute)
Initial value in 2022	3,300 GWh (average value in 2018–2022) ³³	4,000 GWh (average value in 2018–2022)
Target value by 2040 Intermediate values in 2025, 2030, 2035	2,600 GWh 3,100, 3,000, 2,800 GWh	2,700 GWh 3,600, 3,400, 3,000 GWh

Further targets

The annual specific space heating requirement of the entire building pool will be reduced by 37 %.			Sufficient use reduces land use.		
	Annual specific space heating demand will decrease by 36 % for residential buildings	Annual specific demand for space heating will decrease by 39 % for non-residential buildings		Land use (floor space) decreases by 7 % for housing	Land use (floor space) decreases by 6 % for non-residential use
Initial value in 2022	101 kWh/m² floor area (Mean value in 2018–2022)	94 kWh/m² floor area (Mean value in 2018–2022)	Initial value in 2022	54 m² residential floor area/inhabitant	45 m² non-residential floor area/workplace
Target value by 2040 2025, 2030, 2035	64 kWh/m² 87, 79, 71 kWh/m ² floor area	58 kWh/m² 81, 72, 64 kWh/m ² floor area	Target value by 2040 2025, 2030, 2035	50 m² 53, 52, 51 m ² residential floor area/inhabitant	43 m² 45, 44, 43 m ² non-residential floor area/workplace

³¹ Note: These figures will be coordinated with the new 2040 heat supply concept from 2025.

³² This means a reduction in the demand for thermal energy (usable heat) of over 30 % per inhabitant.

³³ Note: Calculated from the final energy requirement for the heat supply according to energy statistics (mean value in 2018–2022: 4,000 GWh/a) and typical utilization rates of heating systems according to the Net Zero Baseline Study (INFRAS & Quantis 2020).

Measures taken by the city administration

Table 7: Measures for the “Reduction of the demand for thermal energy” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Energy consulting (ongoing task)	The city advises property owners on replacing heating systems, energy-efficient renovations and solar energy systems as well as on corresponding funding programs and approval procedures as part of the City of Zurich’s energy consulting and energy coaching services. The city also offers consulting on operational optimization and heating optimization to help property owners increase their energy efficiency. Energy consulting of the City of Zurich
Information platform (ongoing task)	The city provides relevant information online on the energy platform for energy-efficient renovation and heating optimization. Energy Platform of the City of Zurich
Funding program for energy-efficient renovation (until 2025)	The city supports the renovation of existing buildings with the funding program 2022–2025 energy-efficient renovation: around 500 renovations (energy-efficient renovation of the building shell with GEAK plus and energy-efficient renovation of windows and facades of listed and protected properties) can be funded by the city with a total of CHF 18 million until 2025. For the duration of the pilot program, it will be examined whether the funding program should be continued after 2025. GR No. 2021/361
Energy standards for special utilization plans and site developments (ongoing task)	The requirements for new buildings in standard construction are defined by the cantonal energy law. The city may impose stricter energy requirements for special utilization plans and site developments in accordance with Art. 8 Building and Zoning Code (BZO). Although special utilization plans and site developments only account for a small proportion of the construction projects approved each year, they can have an exemplary effect due to their high visibility. Building and Zoning Code (BZO 2016) of the City of Zurich
Cantonal target agreements and ewz efficiency bonus (ongoing task)	The city/ewz offers the ewz efficiency bonus to companies that conclude and adhere to a cantonal target agreement or a target agreement with the federal government. This supports companies in their efforts to increase energy efficiency. The requirements of the target agreements are set by the federal government and the canton. Today, almost all major consumers are already participating in the model. ewz subsidies
Eco Compass (ongoing task)	Every year, the Eco Compass offers over 100 small and medium-sized enterprises in the City of Zurich access to cost-effective immediate measures for optimizing their use of energy and resources by means of fast, individual consulting. Eco Compass of the City of Zurich

Promotion of non-profit housing construction	The use of residential space per capita in non-profit apartments is well below the urban average. According to the one-third-target, the proportion of non-profit apartments in rental apartments is to be increased to one third by 2050. This also indirectly leads to a reduction in land use. Municipal housing construction and the promotion of private non-profit housing associations are key measures for achieving the one-third-target. Housing Program of the City of Zurich Occupancy, consumption of living space in the City of Zurich GR No. 2022/86
Real estate standard 23 Milestones	In the “Meilenschritte 23” (23 Milestones) real estate standard, the city administration defines the requirements for municipal buildings much more stringently than the legal minimum, thereby setting an example for what is possible today in energy- and resource-efficient construction. The 23 milestones are part of the requirements for environmentally friendly, energy-efficient construction and apply to municipal building construction projects as well as to building construction projects of semi-public institutions, such as foundations and building leaseholders. Milestones 2023
Municipal properties (until 2035)	The city administration is setting an example for the city’s properties in terms of the efficient and consistent use of energy. One example is the minimum occupancy rate for municipal apartments. Department of Finance of the City of Zurich: Rental conditions for municipal apartments

G3 package of measures: Circular construction

One way to reduce indirect greenhouse gas emissions during the construction of buildings is through circular construction. Practically speaking, this means that the following three aspects are taken into account during construction:

- **Careful handling of the existing building materials:** Many “embodied greenhouse gas emissions” are embedded in the existing buildings. The GHG inventories of all variants – preservation, partial preservation, renovation, new construction – should therefore be examined and weighed against each other when continuing to build on the existing building stock.
- **Long service life of the buildings:** A long service life can be achieved, for example, through high-quality archi-

ecture, durable, long-lasting designs, durable materials or adaptable floor plans.

- **Construction method and the choice of materials for circular building:** For example, the reuse of building components, the recycling of building materials, the use of recyclable building materials or the separability of structures with different service lives can reduce GHG emissions, as fewer new building materials are required.

In the case of the city’s existing properties, the focus is on preservation and only a few new buildings are being constructed. The city administration already applies the principles of circular construction to its own buildings: For example, a municipal [Pilot project at the Mööslistrasse kindergarten](#) showed that the reuse of building components saved around 30 % of GHG emissions. In early 2027, a new recycling center is expected to be built on the [Juch site](#), which will consist of a high proportion of recycled

components and save 40 % of GHG emissions compared to a conventional new building. Indirect emissions are to be reduced by implementing the G3, G4 and G5 packages of measures. It is not possible to quantify the contribution that circular construction makes to achieving this goal and it varies from one construction project to another.

Targets until 2040

There are no sector-specific target values for indirect GHG emissions in the building sector. Indirect GHG emissions from construction must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Measures taken by the city administration

Table 8: Measures for the “Circular construction” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Limits for greenhouse gas emissions and “embodied energy” during construction	As far as possible, the city administration is committed to limits for “greenhouse gas emissions during construction” and the “embodied energy” of buildings. Net Zero Action Plan (AfS)
Use land-use planning to align the net zero target with the BZO revision	As part of the upcoming revision of the BZO, it will be examined which relevant topics can be anchored in land-use planning under the current legal framework. If the review reveals a specific need to adapt the current building regulations, then these are to be adapted as part of the BZO revision. Building and Zoning Code (BZO 2016) of the City of Zurich
Periodically review and update energy standards for special utilization plans and site developments	The city administration can set more stringent energy requirements in special-use plans (design plans and special building regulations) and in site developments (in accordance with Art. 8 of the building regulations). The currently applicable requirements are to be reviewed for net zero conformity and updated if necessary. Circular Economy Implementation Agenda
Further development of the building pool taking all variants into account	As part of the activities of the Office for Urban Development, the variants preservation / partial preservation / renovation / new construction options are compared with each other and the advantages and disadvantages in relation to the project objectives and greenhouse gas emissions are shown. This is the case in particular for feasibility studies, competition procedures, test planning, master plans and development concepts.
Anchoring of the circular economy in standard construction and in special utilization plans	A review is being carried out to determine which specific topics of the circular economy could usefully be incorporated into standard construction methods and special utilization plans (design plans and special building regulations), what the current possibilities under building law are and which basic building law conditions might need to be adapted.

Develop a “net zero” publication for consulting	The publication should contain recommendations for building with the net zero target in mind and contribute to raising awareness. Designed as a compact, concise document, it will soon outline possible approaches, particularly with regard to indirect GHG emissions for construction with the net zero target.
Implementation agenda for circular economy in 2024–26	The implementation agenda for the circular economy includes 20 measures for promoting the circular economy in buildings and infrastructure, including an assessment tool for the CO ₂ footprint of buildings and construction variants, a digital component catalog for the city’s own reusable components, promotion of use, reuse and recycling of construction waste or pilot projects for the reuse of building components. “Circular Zurich” strategy Circular Economy Implementation Agenda
Real estate standard Milestones 2023	In the “Meilenschritte 23” (23 Milestones) real estate standard, the city administration defines the requirements for municipal buildings much more stringently than the legal minimum, thereby setting an example for what is possible today in energy- and resource-efficient construction. The 23 Milestones are part of the guidelines for environmentally friendly, energy-efficient construction and apply to municipal building construction projects and for building construction projects of semi-public institutions, such as foundations and building leaseholders. Milestones 2023
Develop “Best practice building renovation” in the context of net zero	Development of a publication with best practices for energy-efficient building renovation, which is used in consulting for homeowners.
Study contracts and research	The City of Zurich commissions studies and seeks an exchange with research in order to gain insights into the reduction of GHG in construction and make them available to the public. Building for net zero
Real estate strategy	The City of Zurich is one of the largest real estate owners in Switzerland. Due to its volume, the City of Zurich’s real estate portfolio is of considerable ecological, economic and social significance. The real estate strategy of the City of Zurich defines a resource-conserving approach to the properties in its own portfolio. For example, standards with implications for the urban real estate portfolio and user requirements in terms of satisfaction and sufficiency. Real estate strategy of the City of Zurich

G4 package of measures: Optimization of building materials

Use building materials with a small GHG inventory

In order to reduce indirect GHG emissions, the type and quantity of building materials used must be optimized. GHG-reduced building materials should be used wherever possible, such as renewable, regenerative materials. As the production of construction steel and cement (concrete) in particular still generates high GHG emissions, as little concrete as possible should be used and it should be used where it is most urgently needed.

Developments in the surrounding area: Targets for steel and cement production, but little progress to date

Steel and cement cause the most indirect GHG emissions in new buildings. The steel and cement industries have announced GHG reductions, but only limited results have been achieved so far. Technical solutions are available, such as the use of green hydrogen for steel production. So far, implementation has failed mainly because of the price and availability of fossil-free energy. Most of the cement comes from Switzerland. Ambitious targets have been set for Swiss cement production. In order to achieve this, however, a CCS infrastructure still needs to be established.

Targets until 2040

There are no sector-specific target values for indirect GHG emissions in the building sector. Indirect GHG emissions from construction must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Measures taken by the city administration

Table 9: Measures for the “Optimization of building materials” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Limits for greenhouse gas emissions and “embodied energy” during construction	See measures in G3 package of measures
Use land-use planning to align the net zero target with the BZO revision	
Periodically review and update energy standards for special utilization plans and site developments	
Develop a “net zero” publication for consulting	
2023 Milestones	
Study contracts and research	

G5 package of measures: Sufficient construction

and building technology, a moderate proportion of windows or durable cladding that has a low weight.

Targets until 2040

There are no sector-specific target values for indirect GHG emissions in the building sector. Indirect GHG emissions from construction must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Sufficient construction methods can reduce indirect GHG emissions during the construction of buildings. The aim is to ensure that buildings are economical in terms of their GHG emissions during construction, are compact and allow good utilization. This can be achieved, for example, by designing compact structures and planning economical, space-efficient floor plans. Other GHG reduction options include a slim primary structure, reduced substructures

Measures taken by the city administration

Table 10: Measures for the “Sufficient construction” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Limit values for “embodied energy” and greenhouse gas emissions during construction	See measures in G3 package of measures
Periodically review and update energy standards for special utilization plans and site developments	
Develop a “net zero” publication for consulting	
2023 Milestones	
Study contracts and research	
Recognize utilization potential: Mapping of underground parking spaces (municipal and private) and their vacancies	<p>Mapping of the existing, mainly underground parking spaces on private land (municipal and private) represents a basic planning and urban planning exercise that initially provides an overview of the existing situation.</p> <p>In areas with a very large number of parking spaces on private land, the number of public parking spaces could be reduced in favor of recreational areas, greenery, a continuous bicycle infrastructure, bicycle parking spaces, public transport, sharing offers, etc. Recording vacancies would also make it possible to locate and use the existing potential of parking facilities, e.g. for e-charging stations. Mapping helps to use existing parking facilities for the continued need for parking before new parking spaces are created on private land for this purpose. This will allow more areas for greenery, planting trees, unsealed surfaces, etc. to be created for new buildings in future.</p> <p>Net Zero Action Plan (AfS)</p>

G6 package of measures: Optimization of use of electricity

Total electricity consumption in the City of Zurich amounted to 2,724 GWh in 2022. It caused around 4 % of indirect GHG emissions or just under 0.5 tons per person.

The national Energy Act defines the following consumption targets: electricity consumption per person and year is to be reduced by 13 % by 2035 and by 5 % by 2050 compared to the level in 2000.

In the City of Zurich, despite ongoing electrification and a population growth of 23 %, absolute electricity consumption has been reduced by 4 % since 2000 (2,840 GWh) to 2,724 GWh in 2022. That is a reduction of 22 % per person. One reason for the significant reduction in the demand for electricity by 2022 is that ewz offers numerous measures

to increase energy efficiency in its supply areas, which are financed via non-profit services in the electricity tariffs. This not only comprises comprehensive energy consulting for private individuals and companies, special energy courses for teaching the efficient use of energy in everyday life and in companies. It also includes financial support for the purchase and use of efficient electrical systems and household appliances, modern heating systems and energy-saving lighting. In addition, companies that provably increase their energy efficiency receive an efficiency bonus on their electricity bill, which serves as an incentive to invest in energy-efficient measures. The use of intelligent networks (smart grids) is also becoming increasingly important for better coordinating electricity production and consumption and reducing power peaks.

The major challenge will be to keep electricity consumption per person as low as possible and in compliance with federal legislation despite the decarbonization of mobility and buildings (heating and cooling supply).

Target by 2040

Table 11: Target for 2040 for the “Optimization of electricity use” package of measures

Electricity demand per person will only increase by 22 % compared to 2022.	
Note: In this target, the national net zero consumption targets in Art. 3 of the Energy Act are applied to the City of Zurich in an adapted form: reduction of electricity demand per inhabitant by 5 % from 2000 to 2040. This means a maximum increase of 22 % per inhabitant from 2022 to 2040. Taking into account the forecast population growth, this means that the absolute electricity consumption for the entire city will increase from 2,724 to a maximum of 3,850 GWh per year between 2022 and 2040.	
Initial value in 2022	6,150 kWh per person and year
Target value by 2040 Intermediate values in 2025, 2030, 2035	7,500 kWh per person and year 6,370, 6,740, 7,100 kWh per person and year

Measures taken by the city administration

Table 12: Measures for the “Optimization of electricity use” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Efficiency bonus	The ewz efficiency bonus is intended to help companies contribute to energy savings.
Energy consulting for companies and private individuals	The city provides companies with uncomplicated, free energy consulting. It shows how energy consumption can be sustainably reduced without compromising on quality. Energy consulting
Funding for energy-efficient household appliances	The city provides financial support for the purchase and use of energy-efficient household appliances. Among other things, modern refrigerators, dishwashers and energy-saving lighting. ewz funding program
Public lighting	ewz is responsible for public lighting in the City of Zurich. The company endeavors to reduce unwanted light emissions as far as possible and to decrease electricity consumption. Press release dated June 29, 2022
Smart meters	Digital consumption measurement with smart meters is becoming a reality in Switzerland. By 2027, ewz will replace all conventional electricity meters in the City of Zurich and the Graubünden distribution grid with smart digital electricity meters free of charge. That amounts to around 40,000 to 60,000 meters per year. Digital energy consulting

G7 package of measures: Expansion and procurement of renewable electricity

Meet rising electricity demand with renewable electricity

Already today, Zurich’s municipal utility company (ewz) supplies its customers throughout Switzerland with 100 % natural electricity from renewable energy sources. The quality of electricity that large consumers in the city buy from other electricity suppliers can hardly be estimated today.

A massive expansion of electricity production from renewable energy sources (wind, water, sun) is necessary to cover the rising demand for electricity from the electrification of mobility and buildings and to replace nuclear power by 2034. With the adoption of the new national Energy Act, the reference values for renewable electricity production were converted into binding targets for the government authorities for the first time. Solar power production in Switzerland must increase fivefold from around 6 TWh in 2024 to around 30 TWh in 2035. It is to be supplemented by storage systems and smart grids to ensure a reliable, secure and sustainable energy supply. The PV strategy (STRB No. 893/2021) of the City of Zurich desig-

nates specific expansion targets both for the city and for the city’s own buildings.

Investments at home and abroad

In order to achieve the PV construction targets, the city administration is setting a good example for PV construction on the city’s own buildings and is supporting PV construction by private individuals with a comprehensive range of consulting and subsidies as well as solar products from ewz. It is campaigning at cantonal and national levels for the introduction of mandatory PV. Ewz is also investing in electricity

production from renewable sources (hydropower, wind power, biomass and photovoltaics) in Switzerland and abroad.

Indirect GHG emissions from renewable electricity are low

Of course, investments in the production of renewable electricity also lead to indirect GHG emissions. However, these are many times lower than the two alternatives of no decarbonization/electrification or the consumption of CO₂-intensive electricity, for example from coal- or gas-fired power plants.

Targets until 2040

Table 13: Targets for 2040 for the “Expansion and procurement of renewable electricity” package of measures

Main target

Ewz’s renewable electricity production is sufficient to ensure the basic supply of 100 % renewable electricity to all ewz customers in the service area.	
Note: The goal is to ensure a stable, reliable supply of 100 % renewable electricity in the City of Zurich at all times. The expected total demand of the City of Zurich in 2040 is around 3,850 GWh. Today it is difficult to estimate what proportion of this is covered by other energy suppliers and what proportion is covered by self-consumption (PV). ³⁴	
Initial value in 2022	100 % renewable electricity for ewz customers
Target value by 2040 Intermediate values in 2025, 2030, 2035	100 % throughout

Further targets

PV electricity production in the city increases to 300 GWh³⁵ annually		PV construction target for city-owned buildings: 20 GWh in 2030³⁶	
Initial value in 2022	43.7	Initial value in 2022	9.5
Target value by 2040 Intermediate values in 2025, 2030, 2035	300 70 %, 120 %, 210 %	Target value by 2030 Intermediate value 2025	20 13.5

³⁴ The term “self-consumption” is used for electricity that is produced by PV and consumed directly at the house without being fed into the grid.
³⁵ Report “PV construction in Zurich” (STRB No. 343/2023)
³⁶ PV Strategy (STRB No. 893/2021): The PV strategy, including expansion targets, was drawn up in 2021 and will be adjusted in 2025 to take current developments into account.

Measures taken by the city administration

Table 14: Measures for the “Expansion and procurement of renewable electricity” package of measures
 Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Electricity from hydropower	Electricity from hydropower will continue to be a mainstay. <i>Renewable energies from wind and solar power of ewz ewz Annual and Sustainability Report</i>
Expansion of electricity from wind energy	The expansion of wind energy plants is taking place in Switzerland and Europe. <i>ewz Annual and Sustainability Report</i>
Expansion of electricity from solar energy	PV systems are installed on buildings belonging to the city administration and private individuals in the city as well as in Switzerland and Europe. City 120 GWh/a (2030) and city administration 20 GWh/a (2030). The PV strategy was drawn up in 2021 and will be adjusted in 2025 to take current developments into account. <i>Report “PV Construction in Zurich” (STRB No. 343/2023) PV Strategy (STRB No. 893/2021)</i>
Support for PV construction of private individuals	The city administration supports PV construction by private individuals with a comprehensive range of consulting and subsidies as well as solar products from ewz. <i>Solar energy for companies: We accelerate your solar project Solar systems – benefit from environmentally friendly solar power Solar power for tenants in Zurich PV Strategy (STRB No. 893/2021)</i>

Packages of measures in the mobility sector

- M1: Traffic avoidance
(= reduction of travel distances)
- M2: Shifting motorized individual transport in the direction of eco-mobility
- M3: Compatible traffic management
- M4: Climate-friendly international travel
- M5: Climate-friendly domestic transport
- M6: Circular and sufficient civil engineering

Definitions

Eco-mobility: General summary of environmentally friendly means of transport (public transport, cycling and pedestrian traffic).

Motorized individual transport: Passenger cars, motorcycles, small motorcycles and motorbikes.
Internal traffic: Journeys that are made entirely within the urban area.

Source/destination traffic: Routes that start outside the urban area and end within the urban area, or vice versa.

Modal split: The share of different means of transportation (here: public transport, motorized individual transport, bicycles, pedestrians) of the total traffic volume.

The packages of measures in the area of mobility help to reduce GHG emissions from private transport, air traffic, freight transport and public transport. In urban climate accounting, civil engineering is also taken into account in mobility. However, it plays a subordinate role in relation to mobility.

In 2022, direct GHG emissions per inhabitant amounted to 0.74 tons of CO₂-eq/year and indirect emissions to 4.54 tons of CO₂-eq/year.

Air traffic has increased massively since 1990, while motorized individual transport has declined

To reduce direct GHG emissions, measures are being implemented to reduce travel distances and to shift motorized individual transport towards eco-mobility and electrification.

Air traffic is the main source of indirect GHG emissions. With 3.16 tons of CO₂-eq/inhabitant in 2022, it is the largest source of indirect GHG emissions in the transport sector. Flight distances have increased around fivefold since 1990, which has tripled GHG emissions despite efficiency improvements. This makes air traffic a key driver of the sharp rise in indirect GHG emissions for the entire city since 1990.

The distance traveled by motorized individual transport outside the city limits has fallen by a quarter since 1990, while

the distance traveled by public transport has risen by around 90 %. This trend is to continue with the measures available.

There are currently no quantitative targets for the reduction of indirect emissions in this area. Nevertheless, GHG emissions must be reduced as much as possible in order to achieve the climate protection targets for the entire city.

M1 package of measures: Traffic avoidance

A city of short distances

By changing spatial usage structures and strengthening district centers, travel distances and with them traffic volumes are to be reduced without sacrificing accessibility and quality of life. The distances include all journeys, regardless of whether they are made by motorized individual transport, by public transport, by bicycle or on foot. The reduction in commuting distances is achieved through a “city of short distances” with multifunctional district centers and by working more at home or close to home. The corresponding traffic planning processes and measures will only take effect in the medium to long term.

Long distances due to commuter traffic

According to the Mobility Microcensus, people travel an average of 3.5 km a day in domestic traffic. For source/destination traffic, the figure is around 22 km.³⁷ The goal of avoiding or reducing the length of journeys therefore has a major impact on GHG emissions, especially for source/destination traffic. If only the length of trips were reduced (without shifting and improving the motorized individual transport), a reduction of 80–95 % of vehicle kilometers would be needed to achieve the net zero target according to model estimates. This is not realistic with the current measures and the given basic conditions. It is therefore necessary to implement all three packages of measures (avoidance, relocation and compatible processing).

Various traffic planning and urban development planning and infrastructure measures are crucial to shortening travel distances. The population, organizations and companies in the City of Zurich can also contribute to shortening commuting distances by offering and/or using local and decentralized services and work locations wherever possible.

Target by 2040

Table 15: Target for 2040 for the “Traffic avoidance” package of measures

The average daily distance traveled by motorized individual transport and public transport within the city will decrease per inhabitant by 10 % compared to 2022.³⁸	
Status in reference year 2022	21 km/person/day
Target value by 2040 Intermediate values in 2025, 2030, 2035	19 km/inhab./day 20.5, 20, 19.5 km/inhab./day

Measures taken by the city administration

Table 16: Measures for the “Traffic avoidance” package of measures

Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
High-quality internal development in central locations	<p>High-quality internal development in central locations is the most important contribution of structure planning to the net zero target. Among other things, it enables more efficient use of existing infrastructures, a generally more resource-conserving urban development with a focus on eco-mobility, and a more climate-friendly mobility. This can in particular result in a reduction in the number and length of the distances traveled.</p> <p><small>Regional Structure Plan of the City of Zurich Municipal Structure Plan of the City of Zurich for Urban Area, Countryside, Public Buildings and Facilities (SLöBA) Municipal Structure Plan of the City of Zurich for Transportation</small></p>
Examination of a determination of additional areas with ground floor usage	<p>The stipulation of ground floor usage in additional square and street spaces in accordance with Art. 2 and Art. 6a of the Building Regulations promotes the polycentric urban structure with vibrant district centers and good district supply in accordance with the concept of a city of short distances.</p> <p><small>Municipal Structure Plan for the City of Zurich for Urban Area, Landscape, Public Buildings and Facilities (SLöBA), Chapter on district centers and urban axes</small></p>
Integral district analysis incl. district blocks	<p>Implementation of district blocks: Implementation of district blocks on the basis of the findings from the pilot project. District blocks are traffic-reduced, free of motorized through traffic and bordered by urban axes. They stand for a socially and traffic-friendly climate that focuses on collaboration. Activities within the district blocks are primarily covered by pedestrian and bicycle traffic. Individual sections are designed to be car-free (delivery/supply/disposal guaranteed). Safe routes to school and a waste disposal infrastructure are promoted that can be reached easily and barrier-free on foot and by bike.</p> <p><small>“2040 Urban Space and Mobility” strategy</small></p>

³⁸ This objective is not congruent with the objective of the 2040 Urban Space and Mobility Strategy for reducing the distances traveled by the urban population (city of short distances).

Implement accompanying measures for the extension of the northern bypass	<p>Implementation of measures for shifting through traffic to the national roads.</p> <p>Possible measures include stronger dosing at the existing gatekeeper systems, increasing the passage resistance (narrowing of lanes, reduction of road widths, etc.), stronger prioritization of public transport.</p> <p><small>2022 Traffic Surveys of the City of Zurich</small></p>
Unlock the city center	<p>Car-free city center with the idea that access to parking structures and access for residents, handling of goods, waste disposal, emergency services, etc. are permitted.</p> <p><small>“2040 Urban Space and Mobility” strategy</small></p>
Revision of hierarchies of road network	<p>Definition of a supply-oriented traffic volume framework as a basis for the projects (e.g. without through traffic, based on the average hour instead of the peak hour).</p> <p><small>“2040 Urban Space and Mobility” strategy</small></p>
Solutions for urban logistics and commercial traffic	<p>Optimization of urban logistics and commercial traffic and ensuring supply and disposal: Development of in-depth concepts (2040 Urban Logistics Concept and Delivery and Commercial Traffic Concept recorded in 2040 Urban Logistics and Commercial Transport Strategy).</p> <p><small>Concepts and strategies as a basis, implementation still pending</small></p>
Traffic control and traffic management	<p>Stronger management of traffic peaks, taking into account the resulting effects (e.g. resulting congestion areas).</p> <ul style="list-style-type: none"> – Passage of emergency services, exploration of leeway for additional public transport preference – Revision of road network hierarchies and definition of a supply-oriented traffic volume framework as a basis for the projects (e.g. without through traffic, based on average hour instead of peak hour) – Anchoring reduction target -30 % motorized individual transport (total trips compared to today) – Implementation paradigm shift, understanding traffic volumes as an influenceable variable – Car-free city center with the idea that access to parking structures and access for residents, handling of goods, waste disposal, emergency services, etc. are permitted <p><small>Draft available; consolidation in 2024</small></p>
Implementation of mobility management of city administration	<p>With around 28,000 employees, the City of Zurich plays an important role as an employer. The city administration examines and implements suitable measures to promote pedestrian traffic, cycling and public transport on the way to work and for business trips.</p> <p><small>Internal mobility management concept for mobility contribution for employees as of 2025</small></p>

M2 package of measures: Shifting motorized individual transport in the direction of eco-mobility

This package of measures comprises the objectives and measures for shifting traffic from motorized individual transport to public transport, cycling or pedestrian traffic (= eco-mobility). The measures focus on the supply side of sustainable transport, such as the expansion and continuous improvement of public transport, as well as the provision of attractive and safe cycling and pedestrian traffic infrastructures. The shift is also supported by an optimal networking of the means of transportation. The processes and measures are implemented over a longer period of time and are therefore only effective in the medium to long term.

Hesitant trend towards shifting

An increase in the modal split of eco-mobility by at least ten percentage points by 2022 was envisaged in the

“Städteinitiative” and anchored in the municipal code (Art. 154 Para. 1) in 2012. This means that the percentage share of public transport, pedestrian traffic and cycling in the total volume of traffic in the urban area should have been increased by at least ten percentage points within ten years. The distances traveled within the city are decisive in terms of total traffic. According to the current frequencies of the bicycle counting station evaluations and the uncertain but nevertheless available microcensus data from 2021, a clear increase in bicycle traffic can be assumed. This is further facilitated by the consistent implementation of preferential cycle routes.

The direct potential and with it the responsibility for shifting mobility towards eco-mobility lies with all individuals, organizations and companies that move around the city.

Their task is to increase the proportion of journeys made on foot, by bike or by public transport by 2040. In addition to the federal and cantonal authorities, the city administration is creating the necessary framework conditions (see measures).

Targets until 2040

Table 17: Targets for 2040 for the “Shifting motorized individual transport towards eco-mobility” package of measures

Main target

The share of distances traveled by motorized individual transport in the modal split will drop to 15 %. ³⁹	
Status in 2015⁴⁰	25 % motorized individual transport share of modal split
Target value by 2040 Intermediate values in 2025, 2030, 2035	15 % 21 %, 19 %, 17 %

³⁹ Note: Goal based on the City of Zurich’s 2040 Urban Space and Mobility Strategy

⁴⁰ Note: As the evaluation of the 2021 Mobility and Transport Microcensus (MZMV) is not representative due to pandemic effects, the 2015 MZMV is used. The next microcensus evaluation in 2025 will show how the situation has developed.

Further targets

The proportion of distances traveled by public transport in the modal split increases to 45 %.		The proportion of distances covered by bike in the modal split increases to 15 %.	
Status 2015	41 % share of public transport in modal split	Status 2015	8 % share of bicycles in the modal split
Target value by 2040 Intermediate values in 2025, 2030, 2035	45 % 43 %, 43 %, 44 %	Target value by 2040 Intermediate values in 2025, 2030, 2035	15 % 11 %, 12 %, 14 %
The proportion of distances traveled on foot in the modal split remains at 25 %.			
Status 2015	26 % share of pedestrian traffic in the modal split		
Target value by 2040 Intermediate values in 2025, 2030, 2035	25 % 26 %, 25 %, 25 %		

Measures taken by the city administration

Table 18: Measures relating to the “Shifting motorized individual transport towards eco-mobility” package of measures

Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
District blocks	See measure in M1 package of measures
Expansion of public transport services	Definition and gradual implementation of network development until 2040 on the basis of the 2050 Public Transport Vision. Examination and implementation of further expansion of services, in particular the expansion of cross-city services. Closing gaps in the network and interfaces to multimodality promote the use of eco-mobility. <small>VBZ Network Development Strategy “2040 Urban Space and Mobility” strategy</small>
Accompanying measures for the extension of the northern bypass	See measure in M1 package of measures
Road safety strategy	<ul style="list-style-type: none"> – Ensuring a situation-specific, safe infrastructure according to road users and traffic volume – Promotion of coexistence between road users, promotion of engineering, education and enforcement – Improving school route safety <small>“2040 Urban Space and Mobility” strategy</small>

Implementation of cycle routes (by 2030)	Simple, safe cycling infrastructure promotes the use of bicycles for all age groups. Bicycle frequencies are increasing, new user groups are using bicycles and eco-mobility is being strengthened. <i>The cycle routes of the City of Zurich</i>
Zurich bike rental system	Expansion of the bike rental system (more stations, more bikes, wider range of services such as cargo bikes) with the involvement of neighboring municipalities (in coordination with the promotion of multimodality). Development of further user groups, thereby strengthening eco-mobility. <i>2030 Cycling Strategy of the City of Zurich Range of measures and Züri Velo 2.0 Tender</i>
City paths+	<ul style="list-style-type: none"> – Definition of “increased quality” and development of requirements for design, quality of stay and accessibility to open spaces – Creation of an interconnected network of footpaths with enhanced quality of stay (as defined in the municipal structure plan) – Joint prioritization with regard to implementation <p>Concept in development, aiming to implement first pilot connections in 2024</p>
Offer multimodality	Develop a concept with definition of criteria for hubs and their location and equipment (mobility offer, furnishings, etc.). Stronger networking of means of transport (also beyond municipal boundaries), connection with other neighborhood services (recycling etc.). <i>“2040 Urban Space and Mobility” strategy</i>
Implementation of mobility management of city administration	See measure in M1 package of measures

M3 package of measures: Compatible traffic management

This package of measures describes the goals and measures that lead to the remaining motorized traffic being handled in a sustainable manner (i.e. energy-efficient, renewable, quiet and clean). Electromobility and the stabilization of traffic flow play a key role here.

The remaining motorized traffic that cannot be avoided and shifted should develop as follows so that GHG emissions can be reduced:

- Smaller, lighter, cleaner and quieter vehicles
- Fewer vehicles through higher vehicle occupancy (pooling), sharing of vehicles and bundling of goods transports
- Energy-efficient, renewable drive technologies, e.g. electromobility

Avoiding and shifting traffic are key components of a sustainable transportation system. They require transport and spatial planning, legal and social adjustments and therefore also time. The necessary reduction in vehicles and transport services is part of the avoidance and a prerequisite for achieving the target of 81 % electrification of motorized individual transport mileage by 2040. The 81 % includes the following vehicles: battery-powered vehicles, plug-in hybrid vehicles, fuel cell vehicles. Electromobility is basically available today and is a partial solution for reducing GHG emissions.

New registrations of electrified vehicles are increasing every year

New registrations of hybrid or all-electric vehicles are increasing every year. In 2022, 20 % of newly registered vehicles in the City of Zurich were all-electric and an additional 8 % were plug-in hybrids. However, replacing the existing vehicle fleet with all-electric and climate-neutral drives will take some time.

The path to an emission-free bus fleet

According to the electric bus strategy of the Zurich Transport Authority (VBZ), the goal is for public transport buses to be largely emission-free by 2030. At this point, some hybrid buses will still be in use. The complete electrification of the bus fleet in accordance with the decommissioning and procurement plan is to be achieved by 2035.

Climate-friendly commercial transport

The target of net zero direct GHG emissions also applies to urban logistics and commercial transport. The financial hurdles for converting fleets are high and will be a challenge for small and individual companies until 2040. The “Urban Logistics and Commercial Transport” strategy

shows how the supply of goods and commercial transport in the City of Zurich is to be ensured efficiently, reliably and climate-neutrally in the long term. The sub-concept “Efficient, climate-neutral and environmentally friendly handling of freight and commercial traffic” is currently being prepared.

The direct potential for the compatible traffic management lies with users and owners of motorized vehicles moving around the city and with the owners of parking spaces. It is their task to increase the proportion of electrified vehicles and charging options by 2040. In addition to the federal and cantonal authorities, the city administration is creating the necessary basic conditions (see measures).

Targets until 2040

Table 19: Targets for 2040 for the “Compatible traffic management” package of measures

Main targets

Electrification of motorized individual transport by 2040 In terms of mileage, 81 % of the remaining passenger cars in the city are hybrid or all-electric (of which 46 % are battery electric vehicles, 33 % plug-in hybrid vehicles, 2 % fuel cell vehicles).	
Status in reference year 2022	5.8 %
Target value by 2040 Intermediate values in 2025, 2030, 2035	81 % 18 %, 39 %, 60 %
Electrification of public transport by 2035 The public transport buses will be 100 % electrified by 2035. ⁴¹	
Status in reference year 2022	49 % (electric and trolley buses)
Target value by 2040 Intermediate values in 2025, 2030, 2035	100 % 67 %, 88 %, 100 %

⁴¹ Zurich Transport Authority (VBZ) of the City of Zurich: Benefits of electrification, “VBZ bus fleet by drive type” section; Note: The proportions of different buses shown on the website refer to seat kilometers and were converted into vehicle kilometers for the calculation of GHG emissions.

Further targets

<p>Electrification of freight transport by 2040 The mileage of light commercial vehicles traveling in the city is 59 % hybrid or all-electric (48 % battery electric vehicles, 9 % plug-in hybrid vehicles, 2 % fuel cell vehicles).</p>		<p>Electrification of freight transport by 2040 The mileage of heavy commercial vehicles traveling in the city is 23 % hybrid or all-electric (7 % battery-powered vehicles, 3 % plug-in hybrid vehicles, 13 % fuel cell vehicles).</p>			
Status in reference year 2022	1 %	Status in reference year 2022	0.5 %		
Target value by 2040	59 %	Target value by 2040	23 %		
Intermediate values in 2025, 2030, 2035	2 %, 12 %, 33 %	Intermediate values in 2025, 2030, 2035	4 %, 11 %, 17 %		
<p>Electrification of construction machinery and special vehicles by 2040 50 % of construction machinery for building construction and civil engineering and of special industrial, agricultural and forestry vehicles are electrified. If electric construction machinery and special vehicles are not available, they are powered by fuels from renewable sources.</p>					
Status in reference year 2022	0 %				
Target value by 2040	50 %				
<p>Increasing the efficiency of vehicles until 2040 The efficiency of the vehicle fleet is developing according to the forecasts of the Handbook for Emission Factors (HBEFA), e.g.</p>					
	Fuel consumption of gasoline cars will be reduced by 32 %.	Electricity consumption of electric cars will be reduced by 3 %.	Fuel consumption of diesel delivery vans will be reduced by 29 %.	Fuel consumption of diesel trucks will be reduced by 27 %.	Electricity consumption of electric buses will be reduced by 19 %.
Status in reference year 2022	0 %	0 %	0 %	0 %	0 %
Target value by 2040	32 %	3 %	29 %	27 %	19 %
Intermediate values in 2025, 2030, 2035	7 %, 19 %, 26 %	1 %, 3 %, 3 %	6 %, 16 %, 23 %	5 %, 12 %, 21 %	6 %, 15 %, 17 %

Measures taken by the city administration

Table 20: Measures for the “Compatible traffic management” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Promotion of the charging infrastructure	Charging infrastructure on private land and possibly public land (currently under political discussion) is a basic prerequisite for achieving the goal of electrification. The city is promoting the expansion of the charging infrastructure with the 2,000-watt subsidies. Together with the new cantonal funding program, this will cover around 30 % of the investment costs for the charging infrastructure. The cantonal development program is a framework loan of CHF 50 million. The framework loan should be exhausted by the end of 2025 / beginning of 2026. It is currently unclear what the future holds for cantonal funding. <small>ewz subsidies</small>
Implementation of overall e-mobility concept (as soon as a corresponding City Council resolution is available)	According to the overall electromobility concept, testing e-cargo bikes, e-taxis, etc. are possible measures. Implementation of electric bus strategy and trolley bus strategy.
Deepening net zero and energy demand in urban logistics and commercial transportation	As of 2024, a concept with target values, implementation path and measures will be defined. <small>Urban logistics and commercial traffic of the City of Zurich</small>
Vehicle policy of the city administration	By 2030, 90 % of the mileage of company vehicles (excluding public transport vehicles) is to be covered by renewable energies. At the end of 2023, the proportion of vehicles with alternative drive systems across the entire fleet of over 2000 vehicles already amounted to around 24 %. <small>City Council Resolution (STRB) 327/2022</small>

M4 package of measures: Climate-friendly international passenger transport

The M4 package of measures describes measures that focus on reducing and decarbonizing air traffic and strengthening buses and trains for international passenger transport. These measures therefore contribute to the reduction of indirect GHG emissions. Air traffic is by far the largest source of indirect GHG emissions in the mobility sector. For Zurich’s urban population,

air traffic accounted for around 81 % of indirect GHG emissions from mobility in 2023. In addition, the distance traveled by air has been increasing continuously since 1990. The only exception to this trend is the Covid-related slump in 2019–2022.

Approaches for reducing flight emissions
The potential for reducing indirect GHG emissions from air traffic is therefore huge. Approaches to reducing emissions include reducing air travel, for example by replacing business trips with video meetings. Shifting to more climate-friendly means of transport requires the development and expansion of competitive flight alternatives in international train and bus transport. Air traffic can be handled more sustainably with a more efficient, climate-friendly aircraft fleet or by

replacing fossil fuels with sustainable alternatives (Sustainable Aviation Fuels [SAF]).

City administration intends to make the most of its leeway

The Zurich city administration has less influence over the indirect greenhouse gas emissions of international passenger transport than it does over domestic commuter and leisure traffic. However, the high, increasing climate impact of flying shows the importance of making international passenger transport more climate-friendly. The city administration intends to make maximum use of its leeway and develop a strategy for international travel with a focus on air travel. In addition, a reliable data basis for air traffic with

the highest possible temporal resolution is to be created. The city’s travel policy, which comes into force on January 1, 2025, and only allows flights in justified individual cases, is an exemplary demonstration of how cross-border travel can be implemented without flying wherever possible.⁴²

Targets until 2040

There are no sector-specific targets for indirect GHG emissions in the mobility sector. Indirect GHG emissions from mobility must be reduced as far as possible in order to achieve the primary target of a 30 % reduction in GHG emissions compared to 1990.

Measures taken by the city administration

Table 21: Measures for the “Climate-friendly international passenger transport” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Monitoring air traffic	The most accurate annual monitoring of passenger kilometers and the associated GHG emissions from air traffic possible enables the targeted development and review of reduction measures.
Development of measures	On the basis of the findings from monitoring, measures to avoid, shift and improve air traffic will be developed and implemented.
Sustainable events	Through cooperation with event organizers, measures will be developed so that participants can make their arrival and departure as sustainable as possible, and the appropriate infrastructures for this will be created.
Eco Compass	The Eco Compass is an advisory service offered by the City of Zurich and supports small and medium-sized companies in making their operations more sustainable, also with regard to mobility. <i>Eco Compass</i>
Travel policy of the city administration	With its travel policy, the city administration is setting an example by showing how indirect GHG emissions can be avoided in international travel. <i>Press release on travel policy</i>
Monitoring motorized individual transport GHG emissions outside urban area	Robust basic data for the indirect emissions of motorized traffic, i.e. passenger kilometers driven outside the urban area and the resulting GHG emissions, is a prerequisite for a meaningful impact analysis and the development of measures. Here as well, the data has so far been based on the 5-year mobility microcensus; however, a one-year-monitoring is desired and required. As part of industry partnerships and innovation projects, alternatives to the microcensus are being examined to map the indirect motorized individual transport emissions of the urban population in order to determine the actual situation as quickly as possible and with a high temporal resolution.

⁴² Press release on travel policy

M5 package of measures: Climate-friendly domestic transport

The M5 package of measures focuses on commuter traffic and leisure mobility within Switzerland and on reducing motorized domestic transport (MDT) for Zurich’s urban population.

In 2023, MDT outside the urban area contributed 14 % to indirect GHG emissions in the mobility sector. Annual mobility (distance traveled) fell by 24 % between 1990 and 2023 according to microcensuses for motorized individual transport.

Measures for direct GHG emissions also have an impact outside the urban area

The M5 package of measures is strongly oriented towards the M1–M3 packages of measures for reducing direct GHG emissions. The measures described in M1–M3 are aimed at reducing the volume of traffic within the city limits, shifting traffic in the direction of eco-mobility and handling motorized individual transport in a compatible manner. These measures also have an impact outside the urban area, and consequently reduce indirect GHG emissions. City dwellers who buy an electric car, for example, also drive it outside the city limits.

With this in mind, the “2040 Urban Space and Mobility” strategy focuses primarily on reducing direct GHG emissions in accordance with the M1–M3 packages of meas-

ures. However, as described above, the ranges of measures contained in the strategy at a regional and city level in particular also have an impact beyond the city limits and reduce indirect GHG emissions.

In the M1–M3 packages of measures, the following measures in particular will lead to a reduction in motorized individual transport and its GHG emissions outside the urban area:

- Electrification of motorized individual transport and promotion of charging infrastructure
- Modal split target and promotion of bicycles
- Traffic and mobility management geared towards climate protection that networks and combines different means of transportation (multimodality)

It is difficult to quantify the extent to which the M1–M3 packages of measures also have an impact in the M5 package of measures. Electrification of the vehicle fleet outside the urban area leads directly to a reduction in indirect GHG emissions during vehicle operation. However, if there is a shift to public transport within the city limits, this does not mean that more public transport will be used outside the city.

Targets until 2040

There are no sector-specific targets for indirect GHG emissions in the mobility sector. Indirect GHG emissions from mobility must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Measures taken by the city administration

Table 22: Measures for the “Climate-friendly domestic transport” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Sustainable events	Through cooperation with event organizers, measures will be developed so that participants can make their arrival and departure as sustainable as possible, and the appropriate infrastructures for this will be created.
Eco Compass	The Eco Compass is an advisory service offered by the City of Zurich and supports small and medium-sized companies in making their operations more sustainable, also with regard to mobility. <i>Eco Compass</i>

Travel policy of the city administration	With its travel policy, the city administration is setting an example of how indirect GHG emissions can be avoided in national travel. Press release on travel policy
Measures from the urban space and mobility strategy for the region	In the “2040 Urban Space and Mobility” strategy, the ranges of measures at the regional and city level also have an impact beyond the city limits and reduce indirect GHG emissions. “2040 Urban Space and Mobility” strategy

M6 package of measures: Circular, sufficient civil engineering

Civil engineering includes road and rail construction as well as pipeline construction. The necessary expansion of the thermal networks for decarbonizing the heat supply is therefore just as much a part of civil engineering as, for example, work on the bicycle network infrastructure, the water supply, the sewage system or the electricity supply. In the reference year 2022, civil engineering projects caused around 12,300 tons of CO₂-eq (0.05 tons of CO₂-eq/m²) of indirect GHG emissions.⁴³ These are mainly caused by the production and use of building materials. Based on a report on the GHG emissions of urban civil engineering construction projects, four approaches were developed for reducing GHG emissions in civil engineering: 1) “build less,” 2) “build leaner,” 3) “replace/optimize materials,” and 4) “optimize transport/logistics/processes.”

Approach 1 “build less”: aims primarily at strategic change. In the future, fewer building materials and construction processes should be used in the further development and maintenance of urban infrastructure. This includes measures for optimization of construction coordination, optimization of the service life of materials and components, minimization of the sealing of surfaces and taking construction costs into account when making strategic decisions on the further development of infrastructure. The current quality requirements for public spaces must also be scrutinized by the purchasers, and the users (population and politicians) must be sensitized. In order to incorporate the idea of sufficiency in the early project phases of civil engineering projects, the City of Zurich quantifies the GHG emissions of road construction projects and analyzes the greatest potentials for reduction.

Approach 2 “build leaner”: The Civil Engineering Office strives to minimize the use of materials for construction work as early as the project planning stage.

Approach 3 “replace and optimize materials”: The optimized production and reuse of construction materials can contribute to the reduction of indirect GHG emissions in road construction projects. The choice of the most GHG-intensive construction materials (concrete, asphalt) is to be even more closely aligned with the respective construction task, and CO₂-optimized materials as well as materials with an increasing proportion of recycled content should be given preference. In addition, the choice of materials for the pipelines will be reviewed as part of the maintenance and renewal strategy.

Approach 4 “optimize transport, logistics and processes”: The focus is on the optimized use of energy and materials in construction planning and execution. In particular, supply chains, transport logistics and material processing are to be optimized. This can be achieved, among other things, by adjusting the criteria for awarding contracts for construction services and master builder services. It is expected that all four approaches can make important contributions to reducing direct and indirect GHG emissions in civil engineering projects. However, it is difficult to estimate the quantitative effect of the approaches on the reduction of GHG emissions.

Targets until 2040

There are no sector-specific targets for indirect GHG emissions in the mobility sector. Indirect GHG emissions from mobility must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Measures taken by the city administration

Table 23: Measures for the “Circular, sufficient civil engineering” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Development of an implementation strategy for each service department involved in civil engineering	The respective strategies take into account the four approaches of build less, build leaner, replace and optimize materials, and optimize transport, logistics and processes.
Inclusion of sustainability criteria in the procurement process for construction services and construction work as specific award criteria	As part of an ongoing working group, the “Sustainability” criteria for awarding contracts are being substantiated.
Piloting and promoting more climate-friendly building materials	Evaluation of more climate-friendly building materials (for example in the area of asphalt pavements, concretes and materials used for pipelines). During operation, the more climate-friendly material is measured against conventional building materials.
Monitoring of civil engineering projects	Based on the report on GHG emissions from urban construction projects in civil engineering, detailed information from all service departments involved in road construction projects is to be collected and evaluated. GHG inventory in civil engineering

⁴³ GHG inventory of the Zurich city administration, status quo analysis and outlook. EBP 2024; pipelines and rail construction are only partially included in this figure.

Package of measures in the waste disposal sector

EN1: CO₂ capture and storage (CCS)

EN1 package of measures: CO₂ capture and storage (CCS)

In order to reduce GHG emissions to net zero city-wide, negative emissions are necessary in addition to the measures to reduce direct emissions. This enables unavoidable GHG emissions to be offset.

Negative emissions are most efficiently achieved by capturing CO₂ at large, so-called point sources such as incineration plants.

This package of measures describes the efforts for CO₂ capture and storage (CCS) at the following point sources:

- In the **sewage sludge recycling plant (KSV) at the Werdhölzli site**, around 90,000 tons of dewatered sewage sludge from the Canton of Zurich's wastewater treatment plants are incinerated every year. This produces around 22,000 tons of CO₂ per year, which is released into the environment via the smokestack. As sewage sludge is of biological origin, the CO₂ produced during incineration is considered 100 % climate-neutral. The capture and long-term storage of CO₂ from the sewage sludge recycling plant therefore results in so-called negative emissions. According to a feasibility study, CO₂ captured from the flue gas of the sewage sludge utilization plant can achieve an efficiency of around 90 %. This means that around 20,000 tons of CO₂ can be captured each year. Of this, 94 % or around 18,800 tons of CO₂ can be stored permanently. They are considered to be negative emissions.

- The **Werdhölzli biogas treatment plant** is located on the same site as the Werdhölzli sewage sludge recycling plant and has the potential to capture a further 5,000 tons of CO₂. Of this, 94 % or around 4,700 tons of CO₂ can be stored permanently. They are considered to be negative emissions.

- **Hagenholz waste recycling plant:** Waste incineration plants emit considerable amounts of CO₂. Around 50 % of this CO₂ is of biological origin due to the biogenic content of the waste, and is therefore climate-neutral. The capture and storage of this CO₂ results in negative emissions. As part of the planned expansion of the third incineration line, the technical requirements for capturing CO₂ are to be created at the Hagenholz waste incineration plant. The efficiency of future CO₂ capture and storage at the Hagenholz waste incineration plant is estimated at 85 %.

The planning of measures for CO₂ capture and storage is on track. On September 22, 2024, the voting population approved the bill "CO₂ capture on the Werdhölzli site, one-time expenditure of CHF 35,474 million and CHF 14,212 million annually" with 75.6 %. This referendum ensured that the city's ability to offset negative emissions continues to be guaranteed. This is also to be the case in the future. In order to transport and permanently store the enormous quantities of CO₂ (over 350,000 tons per year), a transport infrastructure and suitable basic conditions for financing, infrastructure and business models are required. Building infrastructure and ensuring it internationally is not the sole responsibility of the city. The city is aware of this fact and is involved in national committees to find a solution as quickly as possible.

Targets until 2040

Table 24: Targets 2040 for the "CO₂ capture and storage (CCS)" package of measures

Main target

As of 2035, 357,500 tons of CO ₂ will be captured and stored annually using CCS. Of these, 197,500 tons of CO ₂ are of biogenic origin and therefore negative emissions.		
	Total CO ₂ capture and storage	Of this total negative emissions
Status in reference year 2022	0 t CO ₂ /year	0 t CO ₂ /year
Target value by 2040	357,500 t CO ₂ /year	197,500 t CO ₂ /year
Intermediate values in 2025, 2030, 2035	0, 23,500, 357,500 t CO ₂ /year	0, 23,500, 197,500 t CO ₂ /year

Further targets

<p>The Werdhölzli sewage sludge recycling plant emits 22,000 t CO₂ annually. Of this 20,000 tons of CO₂ are captured and 18,800 tons are stored. As this is 100 % biogenic CO₂, these are negative emissions.</p>		<p>The Werdhölzli biogas processing plant emits 5,900 tons of CO₂ per year. Of this, 5,000 t of CO₂ are captured and 4,700 t are stored. As this is 100 % biogenic CO₂, these are negative emissions.</p>	
	<p>CO₂ capture and storage at the Werdhölzli sewage sludge recycling plant</p>		<p>CO₂ capture and storage at the Werdhölzli biogas processing plant</p>
Status in reference year 2022	0 t CO₂/year	Status in reference year 2022	0 t CO₂/year
Target value by 2040	18,800 t CO₂/year	Target value by 2040	4,700 t CO₂/year
Intermediate values in 2025, 2030, 2035	0, 18,800, 18,800 t CO ₂ /year	Intermediate values in 2025, 2030, 2035	0, 4,700, 4,700 t CO ₂ /year

<p>Every year, 334,000 tons of CO₂ are captured and stored at the Hagenholz waste incineration plant. Of these, 52 % are of biogenic origin and therefore negative emissions.</p>		
	<p>Total CO₂ capture and storage at the Hagenholz waste incineration plant⁴⁴</p>	<p>Of this negative emissions from the Hagenholz waste incineration plant</p>
Status in reference year 2022	0 t CO₂/year	0 t CO₂/year
Target value by 2040	334,000 t CO₂/year	174,000 t CO₂/year
Intermediate values in 2025, 2030, 2035	0, 0, 334,000 t CO ₂ /year	0, 0, 174,000 t CO ₂ /year

44 Note: A total of 343,000 tons of CO₂-eq/year are captured at the Hagenholz waste incineration plant. For the downstream processes of liquefaction, interim storage, transport and storage, an estimated 9,000 t of CO₂-eq/year escape into the atmosphere. These emissions occur outside the urban area and are therefore recorded as indirect emissions. The amount of carbon dioxide permanently stored underground is 334,000 t of CO₂-eq/year.

Measures taken by the city administration

Table 25: Measures relating to the “CO₂ capture and storage (CCS)” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
CCS Werdhölzli sewage sludge recycling plant	<p>The Werdhölzli sewage sludge recycling plant produces around 22,000 tons of CO₂ per year, which is released into the environment via the smokestack. An efficiency of around 90 % can be achieved during the capture process. This means that around 20,000 tons of CO₂ can be captured. Of this, 94 % or around 18,800 tons of CO₂ can be permanently stored. They are considered to be negative emissions. The plan is to realize the plant by 2028 at the latest.</p> <p><small>Voting documents from September 22, 2024: Template 5: CO₂ capture at the Werdhölzli site</small></p>
Werdhölzli CCS biogas processing plant	<p>The biogas processing plant, which is located on the same site as the sewage sludge recycling plant, has the potential to capture 5,000 tons of CO₂. Of this, 94 % or around 4,700 tons of CO₂ can be stored permanently. They are considered to be negative emissions.</p> <p><small>Voting documents from September 22, 2024: Template 5: CO₂ capture at the Werdhölzli site</small></p>
Hagenholz CCS waste recycling plant	<p>Following the construction of the third incineration line, 330,000 tons of CO₂ will be captured and stored. Of these, 52 % are of biogenic origin. This results in potential negative emissions of 170,000 tons of CO₂ per year.</p> <p><small>Press release from the City of Zurich dated January 18, 2023: Capacity expansion of the Hagenholz waste recycling plant</small></p>
Transport infrastructure and storage	<p>The city reports its requirements for a reliable transportation infrastructure and the corresponding legal safeguards (contracts) for international transport and permanent storage to the federal and cantonal authorities, and is committed to finding a solution in the near future.</p>

Packages of measures in the nutrition sector

E1: Reduce food losses

E2: Strengthening healthy, climate-friendly nutrition

There is virtually no food production within the City of Zurich. In addition, the direct GHG emissions caused, for example, by cooking, storage, transport and disposal of food, are covered by other sectors. The direct GHG emissions from nutrition are therefore negligible.

Indirect GHG emissions from nutrition, on the other hand, contribute significantly to the City of Zurich's GHG emissions with around 2.6 tons of CO₂-eq per inhabitant per year. Nutrition therefore accounts for around 18 % of the GHG emissions caused by the urban population. Around one-third of this is generated by the food processed in catering operations and two-thirds by the food sold in stores in the City of Zurich. The agricultural production of food, and especially animal products, is particularly important. Downstream processes such as transport, packaging and distribution, on the other hand, have little influence. Around two-thirds of nutrition-related emissions are generated abroad.⁴⁵

The City of Zurich's nutrition strategy, which has been in place since 2019 and was updated in 2024, aims to reduce nutrition-related GHG emissions per inhabitant by 40 % by 2040 compared to 1990. This goal is based on the federal government's Climate Strategy for Agriculture and Nutrition.⁴⁶ The [Nutrition strategy of the City of Zurich](#) proposes the implementation of three central approaches to achieve this goal: reduction of food waste, promotion of healthy, environmentally friendly nutrition, and preference for sustainable products. The first two approaches are particularly relevant for the reduction of GHG emissions and are presented below as a package of measures.

The preference for sustainable products is the third central approach of the City of Zurich's Nutrition strategy. However, their direct influence on GHG emissions is not always clear. For example, products with an organic label require fewer resources for production, but usually also produce a lower yield. Nevertheless, products with labels such as organic and Fairtrade make an important contribution to reducing the overall environmental impact. Among other things, they promote resource-efficient, environmentally friendly agriculture and contribute to the protection of biodiversity. Their promotion is therefore of great impor-

tance for a sustainable city, but was not included here as a climate-relevant package of measures.

E1 package of measures: Reduce food losses

The production of food generates high greenhouse gas emissions. In Switzerland, around one-third of all food is thrown away across the entire food chain, which corresponds to 330 kg per person per year. Avoidable food losses in private households are estimated at around 90 kg per person per year.⁴⁷ For the urban population of Zurich in 2024, this amounts to around 40,000 tons of avoidable food loss. In addition, a further 10,000 tons are generated in the city's catering industry, based on the urban population. Avoidable food losses are therefore responsible for around 20 % of nutrition-related GHG emissions in Zurich.⁴⁸ The package of measures aims to significantly reduce food losses by 2040 in order to protect the environment and achieve the city's climate targets. The goal is to reduce these quantities by 25 % by 2030 and 50 % by 2040 (-4 % per year with the base year 2024) in accordance with the federal government's food waste action plan.⁴⁹

Reducing food loss requires the active participation of all citizens, companies and institutions. The population can contribute to achieving the goal through conscious shopping and cooking habits, correct storage and better planning. Companies, especially in the catering industry, are required to optimize their planning, train their staff and sensitize their guests. In addition, better networking between producers and consumers can help to ensure that surplus goods can be sold and consumed in a timely manner.

The City of Zurich supports various initiatives and companies that have set themselves the goal of minimizing food waste in the city – such as the Madame Frigo platform for passing on surplus food. The city also carries out various awareness-raising and educational measures on food waste for the population in order to raise awareness. These

⁴⁵ Switzerland's environmental footprints (FOEN 2022)

⁴⁶ 2050 Climate Strategy for Agriculture and Food

⁴⁷ What is food waste? – foodwaste.ch

⁴⁸ C. Beretta & S. Hellweg (2019): Food losses in Switzerland: Quantities and environmental impact. Final scientific report, October 2019. ETH Zurich

⁴⁹ The fight against food waste: Federal Council launches action plan (admin.ch)

include the “Climate à la carte” campaign, providing information brochures, conducting courses at the hotel management school and holding events on the subject.

The city administration is setting a good example: Since 2020, data on avoidable food losses in municipal catering establishments has been collected annually and the establishments have been trained accordingly. Since then, avoidable food losses in adult meals have been reduced by over one-third. The internal administrative target of reducing the production volume to less than 10 % should be achievable through the measures.⁵⁰

Targets until 2040

The amount of avoidable food waste generated in the city, including catering, will drop by 25 % by 2030 and by 50 % by 2040 (-4 % per year with the base year 2024).⁵¹ At present, neither a measurement method nor an indicator has been devised that can be used to determine the development of the amount of avoidable food waste in the City of Zurich. In future, avoidable food waste is to be recorded in both private households and the catering industry.

Measures taken by the city administration

Table 26: Measures for the “Reduce food losses” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Promoting climate-friendly and healthy catering in the city	The catering industry sells around 40 % of all food consumed in the City of Zurich. It therefore has a major impact on the climate and the environment. The city administration promotes sustainable catering with consulting services and activities and campaigns that are implemented together with the catering industry. These include, for example, the charter for sustainable catering or the “Climate à la carte” campaign. <small>Charter CO₂ Quick Check Menu database</small>
Raising awareness of the population: Climate-friendly, healthy food and food waste	Only informed consumers can make targeted decisions. Awareness campaigns, information materials and events communicate the benefits of sustainable food. In cooperation with partners (e.g. Food Zurich, Zürich Food Forum, district associations), the population is addressed and informed at events, in the district, in the media and on the Internet. <small>Zurich Food Forum Food Zurich</small>
Reducing food waste in households and the catering industry	Campaigns and information materials sensitize the population and companies to the importance of avoiding food waste. In addition, the city promotes initiatives such as food sharing to put surplus food to good use. By optimizing waste management, the environmental impact of food disposal is to be minimized. <small>Food Save Market Madame Frigo Too good to go Food Save Banquet</small>

⁵⁰ What the City of Zurich wants to achieve

⁵¹ The fight against food waste: Federal Council launches action plan (admin.ch)

Anchoring topics relating to sustainable nutrition in vocational and further training	The city promotes further training courses in the area of sustainable nutrition and food waste for professionals in the catering industry. Vocational schools are supported in the provision of information and teaching materials. Specific training programs for trainees raise awareness of the importance of sustainable nutrition and ensure that future professionals can implement sustainable practices in their professional fields. <small>Support</small>
Reduction of food waste in the municipal catering establishments	The municipal catering establishments measure their food waste annually and take individual measures to reduce it. <small>Monitoring Kitro</small>
Anchoring topics on sustainable nutrition in school education	Skills in the areas of sustainable and healthy nutrition are to be taught in schools as part of education for sustainable development. Workshops and courses in collaboration with partners provide practical skills for preparing healthy meals and create the basis for long-term behavioral changes. The city administration is examining how it can promote offers that convey the climate protection goals on a broad scale. A pilot project has been running since 2024. <small>Support</small>

E2 package of measures: Strengthening healthy, climate-friendly nutrition

Animal products have a much higher emission intensity than plant-based foods. Although they account for less than a fifth of total food purchases in terms of volume, they are responsible for around half of the nutrition-related emissions from food purchased in the city. Although the majority of nutrition-related emissions are generated in agricultural production, the leeway for individual action to reduce emissions at the production level is limited. A healthier diet with less meat and animal fat and fewer foods with low nutritional value, such as alcohol and sweet or salty snacks, is therefore particularly effective. This benefits both health and the climate. According to a study by Agroscope,⁵² a diet based on the recommendations of the Swiss Society for Nutrition could save a good 50 % of food-related GHG emissions in Switzerland. In addition, a

healthy, environmentally friendly diet has the potential to indirectly reduce emissions in other areas, such as the health sector.

The transition to a healthy, environmentally friendly diet requires the active participation of all citizens, companies and institutions. The population can contribute to this change through conscious eating habits and the increased consumption of healthy, mainly plant-based foods. Companies, especially in the catering and retail sectors, are called upon to educate their customers, offer healthy and sustainable products and consequently also to promote change in local agriculture through a change in demand. Everyone is also called upon to avoid food imported by plane wherever possible.

The City of Zurich promotes healthy, environmentally friendly nutrition through various measures, such as the “Klima à la carte” information campaign, networking events such as Food Zurich, advisory services and the CO₂ Quick Check for catering operations (see list of measures).

⁵² Environmentally friendly, resource-conserving nutrition: Detailed analysis for Switzerland. (agroscope.ch)

In its own catering establishments, the City of Zurich acts as a role model in promoting sustainable nutrition. In municipal facilities, the range of plant-based dishes is being expanded and sustainable procurement guidelines are being implemented. Companies are also supported with targeted measures, such as training on the topics of “nose to tail” and plant-based nutrition. The GHG emissions of

all purchases are recorded annually and communicated to the companies. A constant dialog with the companies helps to accompany the implementation. In addition, innovative measures are being tested, such as the “Climate Price” pilot project, in which the CO₂ footprint of the menus is shown in the price in order to raise awareness of the impact on the climate.

Targets until 2040

Table 27: Targets for 2040 for the “Strengthening healthy, climate-friendly nutrition” package of measures

Main target

Meat consumption per capita is decreasing by two-thirds. Based on Switzerland-wide consumption in 2022, which amounted to just under 1 kg per person per week, a target value of a maximum of 330 g per week is to be achieved by 2040.⁵³

Status in reference year 2022	1 kg
Target value by 2040 Intermediate values in 2025, 2030, 2035	330 g 870 g, 650 g, 440 g

Further target

Reducing the consumption of “empty calories” such as alcohol or sweet and salty snacks.

Status in reference year 2022	Indicator not yet defined
Target value by 2040 Intermediate values in 2025, 2030, 2035	Reduction

⁵³ Target is based on the recommendations of the [Swiss Society for Nutrition](#).

Measures taken by the city administration

Table 28: Measures for the “Strengthening healthy, environmentally friendly nutrition” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Promotion of climate-friendly, healthy catering in the city	See measures in E1 package of measures
Sensitization of the population: Climate-friendly, healthy nutrition and food waste	
Anchoring topics on sustainable nutrition in school education	
Anchoring topics relating to sustainable nutrition in vocational and further training	
Promoting a climate-friendly, healthy nutrition in the municipal catering services	The city administration, with its approximately 165 municipal catering establishments, plays an exemplary role. It has developed sustainability standards for the procurement of food, which are binding for all catering services. Catering specialists receive training and offers for further training on sustainable nutrition. Municipal catering services are expanding their range of plant-based meals and focus on regional and seasonal products. Through the introduction of incentive systems, municipal catering services are supported in achieving their sustainability goals. <small>Life cycle assessment for shopping cart</small>

Packages of measures in the consumption sector

K1: Circular, climate-friendly consumption

K2: Circular, climate-friendly production of consumer goods

In the entire city's GHG inventory, consumption includes all goods and services that are not already covered by the other sectors. Relevant categories of goods in the area of consumption include clothing, electrical appliances and home furnishings. However, consumption also includes the use of services such as hotel accommodation, cultural events and hospital visits.

Consumption-related GHG emissions are generated almost exclusively outside the city limits, as the production sites and supply chains are distributed worldwide. Accordingly, these are indirect GHG emissions. These consumption-related emissions amounted to a total of 2.6 tons of CO₂-eq per inhabitant and year in 2023. Around two-thirds of consumer emissions are caused by the production of the goods. The remaining third is attributable to the services provided.

Circular economy and new business models play a key role

Closing loops requires, for example, business models that focus product design on repairability and durability and systematically use recyclable materials. This involves developing a sustainable range of products, intensifying the use of goods (sharing, renting), extending the service life of products (resale, repair) or reusing parts that are still usable. The City of Zurich was the first Swiss city to adopt a circular economy strategy with "Circular Zurich".⁵⁴

Relevant consumer behavior

The consumer behavior of the urban population is relevant for achieving the target. This applies all the more to the slow pace of change in production conditions. The purchasing power of consumers is an important factor in consumer behavior. It plays a decisive role in determining the type and quantity of goods consumed. The high average income of the population of Zurich compared to the rest of Switzerland or the canton as a whole results in higher consumption-related GHG emissions.⁵⁵ It is therefore important to implement measures that promote climate-friendly consumer behavior.

Zurich is dependent on national and global conditions

To achieve the climate target for indirect GHG emissions, it is necessary to rethink the way resources are used. The necessary changes can only be achieved through joint efforts and targeted measures by the population, the business community and the city administration.

Consumer goods usually come from outside the urban area, making the prevailing conditions there relevant. The same applies to services that are frequently used outside the city limits. Production and supply-side conditions are determined by regulations at the cantonal, national and international level.

Various guidelines and strategies have been drawn up at the cantonal and national level to support the city's climate targets. These include the [Canton of Zurich's circular economy strategy](#), target agreements with companies and industry solutions on various topics, amendments to the Federal Constitution and the Environmental Protection Act. At the international level, the EU has adopted a series of concepts and guidelines for reducing consumption-related GHG emissions. Examples of this are the European Green Deal⁵⁶ and the EU Circular Economy Action Plan.⁵⁷

Reduction targets are in place, but measures often remain vague

A reduction in GHG emissions can be expected for consumer goods such as clothing, furniture and electrical appliances. Factors driving this reduction include electrification and efficiency gains in production, as well as a shift towards alternative materials. Some companies have ambitious reduction targets. However, these usually have a target year of 2050, i.e. they are too late for Zurich's 2040 climate target. And they are often not yet sufficiently clear about the feasibility of the necessary measures.

Evaluations of international climate policy⁵⁸ show that the current efforts and national basic conditions in key production countries such as China, Turkey, South Korea and Vietnam are not yet ambitious enough to achieve the target of the Paris Climate Agreement.

⁵⁴ Circular Zurich

⁵⁵ Average urban and rural GHG inventories for 2014 broken down by source of emissions, source: Pang et al. (2020).

⁵⁶ The European Green Deal – European Commission (europa.eu)

⁵⁷ Circular Economy Action Plan – European Commission (europa.eu)

⁵⁸ The so-called Policy Adoption Gap, source according to (INFRAS 2024) e.g. Fransen et al. (2023)

K1 package of measures: Circular, climate-friendly consumption

Consumed goods and services have an important history

Consumer goods cause GHG emissions from the extraction of raw materials to production and transport logistics. The same applies to services: behind a night in a hotel, a visit to a swimming pool or a movie theater, there are energy and material flows that also cause greenhouse gases.

The indirect GHG emissions caused by the provision of a good or service are also known as embodied GHG emissions. These embodied emissions are purchased together with the product. The longer a product lasts and is used, the better the overall environmental performance of the product over its entire useful life. Accordingly, the quantity and frequency of consumption also has a major influence on the embodied emissions caused.

Digitalization is becoming increasingly noticeable

The energy consumption of our data processing accounts for an increasing proportion of the impact of our lifestyle on the climate. The trend towards increasingly AI-supported processes means that, despite efficiency gains in server technology, our information processing and inquiries on mobile and stationary IT devices are leading to a sharp rise in energy consumption and the resulting GHG emissions.

A large proportion of consumer goods come from abroad

Production conditions abroad and their further development are highly relevant. Efficiency increases in production are to be expected because of the objectives of countries and large suppliers. However, the measures to achieve the objectives are not yet sufficient. Extending the service life of consumer goods therefore plays a key role in achieving this goal.

Renting and sharing instead of owning

One focus is on improving the useful life and intensity of use through offers to rent, share, repair, reuse and recycle goods. Particularly for products that are not used intensively, approaches to renting or sharing can lead to a reduction in new consumption without any significant reduction in convenience. Through maintenance, repair and reconditioning, products that are now disposed of prematurely are used longer.

In order to ensure the durability and repairability of goods, it is important that corresponding products are available and known. On the other hand, consumers must be sufficiently informed and sensitized to ask for these kinds of products. The city can play a supporting role here, but has no direct influence on the purchasing decision.

Targets until 2040

There are no sector-specific target values for indirect GHG emissions in the area of consumption. Indirect GHG emissions from consumption must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Main target: New consumption by inhabitants decreases through more conscious consumption and measures to extend the lifespan of consumer goods.

Consumption-related GHG emissions are used as an **indicator**. It would make sense to measure the status of target achievement with the indicator “tons of new consumption per inhabitant.” However, this is not possible with the data currently available.

Further target: Reliable consumption data to define quantitative targets and corresponding reduction measures.

Measures taken by the city administration

Table 29: Measures for the “Circular, climate-friendly consumption” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Examination of possible steering effect	Examine what steering options the city administration has in favor of climate-friendly consumer goods and services.
Circular economy campaign	Information campaign on the circular economy (e.g. AI Bot; circular-economy information tool) Portfolio of Recycling Measures 1.0
Recycling center pilot project: Reuse of products that are still usable	Recycling centers with the aim of processing more products for reuse and offering them on the second-hand market. Portfolio of Recycling Measures 1.0
Waste reduction consulting for companies and organizations	Municipal consulting services for businesses on the subject of waste are being expanded. Eco Compass Portfolio of Recycling Measures 1.0
Half-day course on resources for schools	Introduction of an additional half-day course for schools on the topic of resources. Portfolio of Recycling Measures 1.0
Improving the data situation in the area of consumption	More reliable consumption data (quantity/volume-based) will be compiled to determine and coordinate targets and measures per product category (textiles, electronics, etc.) and per solution approach (sharing, second-hand buying/selling, repairing, etc.).

K2 package of measures: Circular, climate-friendly production of consumer goods

The circular economy also promotes local added value

An economy geared towards circular products and production has the potential to create a high-quality range of products and services. The circular economy makes an important contribution to reducing the impact on climate change, biodiversity, water consumption and other environmental impacts. However, the focus is also on positive socio-economic effects, such as job creation, increased resilience, economic development, promotion of innovation and greater consumer satisfaction.

As more production cycles will have to be closed in the future, materials and product components will increasingly be available regionally, and ideally will be reprocessed and processed further into new goods locally or regionally. This kind of cycle-oriented local goods production creates local jobs, brings us closer to our customers and reduces transportation routes.

Opportunity for Zurich's companies

Zurich is an innovative location with close proximity to universities. The City of Zurich Urban Development Department promotes start-ups in the cleantech sector

and supports local and sustainable businesses (e.g. via the "Made in Zurich Initiative" association). In addition to its contribution to climate protection and the intelligent use of resources, the circular economy is also growing in economic importance. Preserving the value of products, materials and resources strengthens local and regional added value.

To promote the repair and recycling scene, we work together with existing repair providers wherever possible. The aim is to create a wide range of different circular economy services (upcycling and repair).

Targets until 2040

There are no sector-specific target values for indirect GHG emissions in the area of consumption. Indirect GHG emissions from consumption must be reduced as far as possible so that the overall target of a 30 % reduction in GHG emissions compared to 1990 can be achieved.

Main target: Circular, resource-saving materials, designs and production processes are used and corresponding business models are practiced.

Consumption-related GHG emissions are used as an indicator. It would make sense to measure the status of target achievement using the indicator tons of CO₂-eq per ton of consumer goods (average value across all goods consumed). However, this is not possible with the current data availability.

Measures taken by the city administration

Table 30: Measures for the "Circular, climate-friendly production" package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Examination of steering options	Examine what steering options the city administration has in favor of climate-friendly consumer goods and services.
Extension of the Eco Compass with circular-economy design module	Municipal low-threshold advisory services for small and medium-sized enterprises (SMEs) to be expanded and supplemented with a specific circular-economy module. Portfolio of Recycling Measures 1.0
"House for Culture and Recycling Management"	Concept for the synergy potential of cultural and commercial recycling management in a joint "House for Culture and Recycling Management" in a building formerly used for industrial purposes. Portfolio of Recycling Measures 1.0
Contributions to the promotion of circular urban production	Contributions to the "Made in Zurich" initiative for promoting urban production. Portfolio of Recycling Measures 1.0
Sustainable public procurement	Sustainable and climate-prioritized procurement by the municipal administration reduces the city administration's GHG emissions and contributes to demand and the development of a circular economy market.
Promoting of sustainability in the textile industry and raising awareness in consumption	Development of one or more formats for building reach, strengthening the dialog and activating various stakeholders in the textile industry for more sustainability. Portfolio of Recycling Measures 1.0

Packages of measures in the agriculture and forestry sector

L1: Reduce agricultural greenhouse gases

L2: Climate-friendly livestock farming and crop cultivation

Agriculture and forestry are particularly hard hit by climate change. It also contributes globally with considerable greenhouse gas emissions. The federal government's national climate strategy for agriculture and nutrition published in 2023 includes a 40 % reduction in GHG emissions from national agricultural production by 2050 compared to 1990. The Canton of Zurich has also set climate targets in its cantonal climate strategy. By 2030, emissions from agriculture and forestry are to be reduced by 30 % compared to 1990, and by 45 % by 2040. Agriculture only accounts for an extremely small proportion (<1 %) of the GHG emissions generated in Zurich's urban area. The almost 2,000 tons of CO₂-eq direct GHG emissions that are produced annually in Zurich's agricultural sector come largely from livestock farming. This is because methane is emitted during the digestion of ruminant animals. Further direct emissions occur in the field, influenced by tillage practices and fertilization. Indirect emissions from agriculture are not relevant because indirect emissions from business activities are generally not included in the City of Zurich's GHG inventory. Urban forestry is not currently the focus of climate reporting.

Postulate 2021/34 calls on the City Council to examine how urban agriculture can be geared towards the net zero target. A study⁵⁹ carried out by the Research Institute of Organic Agriculture (FiBL) in 2023 documents the status quo (methodology according to IPCC guidelines) of urban agriculture and shows that an alignment with the net zero target is possible in various places. Conflicting objectives with other sustainability indicators cannot be ruled out, but there are also measures with synergy potential. The most important approaches and core measures were identified. A detailed plan of measures can be found in Pfeifer et al. 2024: Modellierung und partizipative Massnahmenfindung für die Klimaschutzstrategie der Landwirtschaft der Stadt Zürich.

L1 package of measures: Reduce agricultural greenhouse gases

Zurich's agriculture has the potential to store carbon in the soil (especially in the short term). The preservation of organic soil matter, grassland management and the use of biochar are important tools. However, the actual CO₂ storage is very context-specific and the storage potential of grassland in Switzerland has not been conclusively clarified.

The preservation of organic soil matter is prioritized. The protection of grassland and optimized grassland management are the two central approaches here. The Juchhof municipal estate is participating in the federal program "adequate soil cover." Various methods of regenerative agriculture are being explored: direct sowing, undersowing, incorporation of straw and transfer mulch. The "Black Goes Green" research project is investigating the use of biochar and its effects on yield stability, carbon storage and the water retention of the soil. Biological, chemical and physical indicators of soil quality are also monitored.

Grün Stadt Zürich (GSZ) is committed to the further development of alternative grassland management (without fodder production) and the generation of knowledge in this area. Where possible, research projects are initiated and financial resources are made available for this purpose. It is being determined whether it is possible to assume responsibility for outstanding direct payments in the case of grassland management without fodder production.

Target by 2040

There are no quantitative targets for this package of measures. The qualitative goal is to build up knowledge on the use of biochar.

Measures taken by the city administration

Table 31: Measures for the “Reduce agricultural GHG” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Developing alternative grassland management further	If fewer ruminant animals are kept, alternative utilization concepts for grassland are needed to ensure the continued production of food. <i>Pfeifer et al. 2024</i>
Using biochar	According to current knowledge, biochar is relatively stable and only decomposes slowly. The “Black Goes Green” research project at the Juchhof for gathering experience and building up knowledge is underway. The Juchhof is testing its own pyrolysis plant for the production of biochar or for heating purposes. <i>Pfeifer et al. 2024</i>
Promoting agroforestry	GSZ promotes agroforestry projects in urban areas and realizes its own agroforestry. <i>Pfeifer et al. 2024</i>
Monitoring the humus content of urban soils	The humus content of urban soil is measured. <i>Pfeifer et al. 2024</i>
Support for non-urban landlords	Interested farms are supported in determining the humus content in soils and in corresponding monitoring. Grün Stadt Zürich also lends machines to interested farms for permanently covering soil. <i>Pfeifer et al. 2024</i>

L2 package of measures: Climate-friendly livestock farming and crop cultivation

Focus on less livestock farming and crop production

GSZ is committed to generating knowledge about climate-friendly nutrient sources as a substitute for farmyard manure and the further development of alternative forms of farming without livestock farming. Farm animals (especially ruminants) are reduced as far as possible in the entire city and their numbers are optimized at farm level. Appropriate management concepts and managers are a prerequisite. To ensure that a reduction in the number of livestock in the city does not lead to a relocation of livestock

farming outside the city limits, it is also important to take measures in the area of consumption that promote a climate-friendly, balanced diet (see [Nutrition Strategy of the City of Zurich](#)). In addition, incentives are provided for optimized pasture management and investments are made in the barn/manure storage infrastructure.

With the leasing of the Adlisberghof farm (2023), management concepts with approaches to livestock-free grassland management were sought and found. Before the Leimbihof was leased out again (2024), management options with no or reduced livestock and dual-purpose breeds were examined. There are currently no alternative management concepts; the Adlisberghof concept cannot be applied in Leimbach. Dairy farming therefore remains part of the Leimbihof’s farming concept, but with a reduced number of animals.

Targets until 2040

There are no quantitative targets for this package of measures.

Qualitative goals are:

- Overall operational optimization
- Adjust number of livestock in the right places
- Improve barn infrastructure
- Generate knowledge for expanding the fertilizer cycle

Measures taken by the city administration

Table 32: Measures for the “Climate-friendly livestock farming and crop production” package of measures
Unless otherwise specified, the measures must be implemented by 2035.

Measure	Description
Establish comprehensive farm consulting services	Effective, context-specific climate protection on farms requires holistic farm optimization. GSZ finances comprehensive consulting on the sustainable orientation of urban agriculture. <i>Pfeifer et al. 2024</i>
Adjustment of number of livestock for ongoing leases	In the case of ongoing farm leases, alternative branches of livestock farming or extensification are periodically examined with overall farm consultations and, where necessary, financial support from the city is examined. <i>Pfeifer et al. 2024</i>
Adjustment of livestock for new leases and investments	For new leases and prior to major investments in livestock barns, farming options with no or reduced livestock and dual-purpose breeds are examined. Holistic management concepts with no or reduced livestock farming are preferred and, where necessary, financial support from the city is examined. Research and advice are invested in such management concepts.
Adjustment of livestock for leases to private farms	Private farms are offered consulting. The leasing of individual plots of land to private farms will no longer be subsidized in the future. When leasing, preference is given to organic and livestock-extensive farms. No leases are granted to farms that are located outside the usual local farming distance (maximum driving distance of approx. 6 km).
Promote optimized pasture management / increase grazing	Grazing is promoted with financing for consulting or consolidation.
Increase useful life	At the annual meeting, GSZ asks about registration for the production system contribution “Longer useful life for cows.”
Optimize feeding for monogastric animals	GSZ initiates partnerships between farms and the food industry.
Improve stable management	Where necessary, GSZ invests in the barn infrastructure to reduce the formation of ammonia (e.g. steeper slopes, slotted channels).

Cover slurry storage facilities	GSZ covers all slurry storage facilities in its possession before the legal deadline.
Expand the fertilizer cycle	To cover the nutrient requirements of crop production, fermentation residues from biogas plants are increasingly being applied to agricultural land – similar to slurry – to supply nutrients to the crops. Other alternative fertilizers, for example from human excrement, are another way of better closing the city's internal cycles. GSZ is committed to improving the quality of biogas slurry wherever possible and is initiating a project with suitable partners. Where possible, GSZ contributes to the generation of knowledge about fertilizers from feces.
Promote alternatives to fossil-fuel powered vehicles and machines	GSZ is electrifying (or via other alternative drive forms) its own agricultural vehicles and machinery. New technologies are tested and GSZ is committed to their further development. GSZ creates incentives for conversions, new buildings and renovations, for example by installing charging stations.
Measures for conservation agriculture	With the incorporation of biomass (e.g. straw), the carbon bound in the biomass can enrich the soil carbon stocks, which is why this should be practiced increasingly. Reduced tillage protects the soil structure and life in the soil.

Status of the indicators 2023

Table 33: Status of the indicators for 2022 and 2023 and target value in 2040

Package of measures	Indicator and unit	Initial value in 2022	Value in 2023	Target value for 2040
G1: Heating system replacement and expansion of thermal networks	Share of thermal energy from renewable energy sources, waste or waste heat	23 %	24 %	100 %
G2: Reduction of the demand for thermal energy	Demand for thermal energy of all buildings in the city (GWh/year usable heat absolute, average over 5 years)	3,300 GWh	3,240 GWh	2,600 GWh
G3: Circular construction	Indirect GHG emissions in the building sector in t CO ₂ -eq/inhabitant/year	1.7 t CO ₂ -eq	not specified	Reduction
G4: Optimization of the building materials				
G5: Sufficient construction				
G6: Optimization of use of electricity	Absolute electricity demand in GWh/year	2,724 GWh	2,693 GWh	3,850 GWh
	kWh electricity demand/inhab./year	6,150 GWh	6,024 GWh	7,500 GWh
G7: Expansion and procurement of renewable electricity	Share of renewable electricity for ewz customers	100 %	100 %	100 %
	PV electricity production in GWh/year	44 GWh	47 GWh	300 GWh
M1: Traffic avoidance	Average daily commuting distance within the city per inhabitant (km/inhab./day)	7,700 km	not specified	6,900 km
M2: Shift of motorized individual transport in the direction of eco-mobility	Share of motorized individual transport in the modal split	25 %	not specified	15 %
M3: Compatible handling of traffic	Proportion of mileage of hybrid and all-electric passenger cars traveling in the city	5.8 %	7.9 %	81 %
	Proportion of available seat miles in electrified public transport buses in the city (electric and trolley buses)	49 %	55 %	100 %
M4: More climate-friendly international passenger transport	Annual travel distance outside the urban area by motorized individual transport (km/inhabitant/year)	9,700 km	9,800 km	Reduction
	Share of "sustainable aviation fuels" in air traffic	0.1 %	0.2 % ⁶⁰	Growth
M5: Climate-friendly domestic traffic	Annual travel distance outside the urban area by motorized individual transport (km/inhabitant/year)	4,600 km	4,600 km	Reduction
	Proportion of hybrid and all-electric cars owned by the urban population	5.5 %	7.2 %	Growth
M6: Sufficient and climate-friendly civil engineering	t CO ₂ -eq/m ² of renewed road surface	0.5 t CO ₂ -eq	not specified	Reduction

⁶⁰ IATA sustainable aviation fuels

Package of measures	Indicator and unit	Initial value in 2022	Value in 2023	Target value for 2040
EN1: CO ₂ capture and storage (CCS)	Amount of captured and stored CO ₂ (t CO ₂ -eq)	0 t CO ₂ -eq	0 t CO ₂ -eq	360,000 t CO ₂ -eq
E1: Reduce food losses	Indicator not yet defined	not specified	not specified	Reduction by 50 %
E2: Healthy, climate-friendly nutrition	Weekly consumption of meat, poultry, fish and seafood in kg/inhabitant/week	1 kg	not specified	0.33 kg
K1: Circular, climate-friendly consumption	Indirect emissions caused by consumption in t CO ₂ -eq/inhab./year	2.6 t CO ₂ -eq	2.6 t CO ₂ -eq	Reduction
K2: Circular, climate-friendly production of consumer goods				
L1: Reduce agricultural greenhouse gases	Negative emissions in agriculture in t CO ₂ -eq/year	0 t CO ₂ -eq	0 t CO ₂ -eq	Growth
L2: Climate-friendly livestock farming and crop production	Direct GHG emissions from agriculture in t CO ₂ -eq/year	2,000 t CO ₂ -eq	not specified	Reduction

Data basis and process for development of the Climate Action Plan

Data basis for the description of objectives and measures

The data used in the Climate Action Plan and for the prospective estimates of GHG emissions generally come from three sources, which are listed in descending order of reliability and informative value:

1. Urban strategies or plans
2. Assessments by the responsible municipal experts
3. Baseline study “net zero greenhouse gas emissions of the City of Zurich”⁶¹

The data, targets and measures may generally change over time as strategies and plans are developed or updated, so that more accurate and up-to-date data becomes available. For example, a new model is currently being developed for estimating the future heat supply for the building pool, which will be available from the end of 2024. The resulting data on buildings will be more accurate than the currently available basis for calculation. More detailed data is also being compiled for the area of mobility in the 2040 Urban Space and Mobility strategy.

Process for developing the Climate Action Plan

The description and analysis of the measures is generally carried out by the steering committees and responsible service departments of the individual strategies and plans. They also provide information on the impact of the meas-

ures in a package of measures and the status of target achievement. Finally, the Climate Action Plan, together with the Net Zero Progress Report and the monitoring of GHG emissions, is being reviewed by the environmental strategy committees and approved and published by the City Council.

The process is coordinated by the Net Zero Project Team of the Environmental and Health Protection Service Zurich (UGZ). The UGZ’s Net Zero Project Group prepared the structure for this first Climate Action Plan and provided the data for the target values and prospective estimates of GHG emissions. This took place in collaboration with the Energy Officer (Energy Master Plan), the Civil Engineering Office (Urban Transport 2040), the Office for Urban Development and Waste Disposal + Recycling Zurich (ERZ). The responsible steering groups and service departments reviewed the targets and measures set out in the Climate Action Plan, adjusted them where necessary and finally approved them.

Assumptions on population development

Until 2023: Population at the end of the year⁶²
 From 2024: Population development according to the medium scenario⁶³

The emission figures are adjusted (where relevant) to the updated population figures and forecasts.

Table 34: Population development in the City of Zurich according to the medium population scenario

Year	2010	2015	2020	2022	2023	2025	2030	2035	2040
Inhabitants	385,468	410,404	434,736	443,037	447,082	460,600	487,800	503,900	515,200

⁶¹ INFRAS & Quantis (2020): Basic report “net zero greenhouse gas emissions of the City of Zurich”

⁶² Statistics of the City of Zurich: [Population and population development](#)

⁶³ Statistics of the City of Zurich: [Population scenarios](#)

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energy360
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Financial Administration of the City of Zurich (FVW)
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Real Estate City of Zurich (IMMO)
Property Office of the City Zurich (LSZ)
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