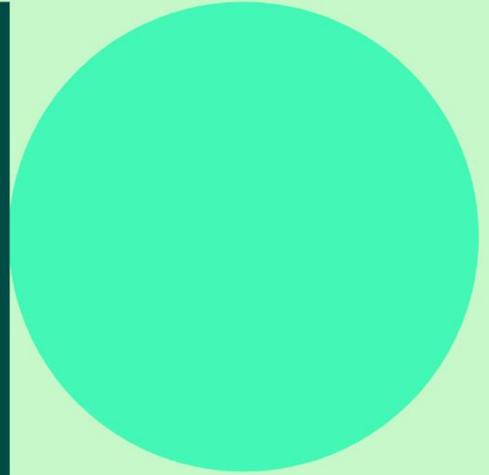




Oslo

Oslo's Climate budget 2023

English



Climate Budget 2023

In 2030, greenhouse gas (GHG) emissions in Oslo shall be reduced by 95% compared with 2009. The City of Oslo uses the climate budget as a governance tool in order to focus its climate work. The Climate Budget presents reduction targets and mitigation measures which are being implemented in Oslo to reduce emissions within the municipality, and describes important initiatives in order to achieve the emission reduction targets set out in the Climate Strategy (proposition 109/20). Responsibility for implementing mitigation measures is delegated to the relevant municipal entities and requires them to report on their mitigation measures in a similar manner to how they report on their finances. The Climate Budget covers the entire 2023-2026 economic plan period.

The City Council's new and strengthened initiatives for reducing GHG emissions in Oslo

In 2020, road transport, waste incineration and other mobile combustion (use of off-road diesel) accounted for almost 90% of all GHG emissions within Oslo's boundaries. The remaining emissions primarily originate from waterborne navigation, closed landfill sites and the heating of buildings. In this Climate Budget, the City Council has not only prioritised new and stricter measures aimed at cutting emissions from waste incineration and road transport in particular, it has also prioritised reductions in emissions from construction projects and the implementation of a major initiative within energy production and energy efficiency. The City Council has introduced many major new initiatives, but wishes to highlight the following four initiatives in particular below:

- Go-ahead for construction of a carbon capture facility at Klemetsrud
- Reduced ticket prices for public transport, new prices in the road toll ring, and exemptions for biogas and zero-emission heavy vehicles in the toll ring until 2027
- New emission reduction targets and new policy to reduce emissions from materials in buildings
- Major initiative relating to energy production and energy efficiency

In addition to these initiatives, it is worth noting that the uncertainty that has prevailed over whether the use of biofuels (over and above the required quantity in the national biofuel quota obligation) reduces greenhouse gas emissions is likely to be resolved, after the Storting adopted the following resolution during its consideration of the revised budget for 2022: *The Storting asks the Government [...] to develop, as soon as possible, a reporting system concerning the use of sustainable biofuels over and above the biofuels quota obligation which fulfil the sustainability criteria for biofuels and do not contain biofuels which entail a risk of deforestation. [...]*

Carbon capture at Klemetsrud incineration plant

In the spring of 2022, an agreement was signed between the central government, the City of Oslo and the new owners of the waste-to-energy facility at Klemetsrud (Hafslund Oslo Celsio), which will secure the full financing of carbon capture at the waste facility from 2026. Carbon capture at Klemetsrud will reduce fossil emissions from the facility by up to 94%, equivalent to just under 165,000 tonnes of CO₂ equivalents (eq) in 2030. Significant quantities of biogenic

CO₂ will also be captured, i.e. carbon from organic matter (such as wood, cardboard/paper and food waste). The carbon capture of both biogenic and fossil CO₂ at the waste facility at Klemetsrud can enable the City of Oslo to become a “carbon negative city” by 2030, as stated in the vision established in the Climate Strategy.

The City of Oslo is investing up to NOK 2.1 billion. (CAPEX), financed by external loans (rather than through the city treasury). The Intergovernmental Panel on Climate Change (IPCC) believes that carbon capture is a technology that the world needs if we are to achieve our climate targets. The City of Oslo wants to take its share of the responsibility by contributing to construction of this facility. The facility will not only be crucial in enabling Oslo to achieve its climate targets, it is also an important project for Europe and the rest of the world. Carbon capture on waste incineration is new technology, and transferring the technology may also help to reduce emissions from waste incineration in other countries.

Reduced ticket prices for public transport, new prices in road toll ring, and exemptions for biogas and zero-emission heavy vehicles in the toll ring until 2027

Throughout the pandemic, public transport made an invaluable contribution to keeping the country's wheels turning, enabling people to make essential journeys. Public transport lost market share to private cars, but it is now winning back more and more passengers. The City Council's goal is for more travel to take place by bicycle, walking and public transport rather than private cars. Price is one of the measures for achieving this goal. Those who have the least are overrepresented amongst those who are dependent on public transport. It is important that price does not become an obstacle to the use of public transport. The City Council is in dialogue with Viken County Council regarding price-related measures which can help to boost the competitiveness of public transport over cars. The City Council is proposing to launch a new flexible ticket product with an ongoing discount, along with an extension to the family discount to weekdays after 6pm.

Oslo Package 3 (O3) is an agreement between Oslo and Viken which sets out an overall plan for the development and funding of roads and public transport in Oslo and Akershus. The road toll ring serves a number of purposes. It is an important measure for funding vital transport projects, it helps to reduce car traffic, and it accelerates the transition to zero-emission and biogas vehicles.

In the spring of 2022, Viken County Council and the City of Oslo signed a new supplementary agreement to O3. A key element of this supplementary agreement is increased road tolls from 1 September 2022 and 1 January 2024. The agreement secures the development of the Fornebu metro line. Together with a new signalling and interlocking system and an upgrade of Majorstuen station, the capacity of the Oslo Metro network will increase. In addition to financing the agreement, the tariff changes will contribute to achieving the City Government's climate and traffic targets towards 2030. It is estimated that the tariff changes for light vehicles will cut traffic by around 10% in 2024 and GHG emissions by around 5 and 6% in 2023 and 2024 respectively.

For many years, the City Council has worked to ensure that biogas-powered heavy vehicles are exempt from tariffs in the road toll ring. From 1 September 2022, an exemption will finally be introduced following a decision set out in the supplementary agreement to Oslo Package 3. A key part of the supplementary agreement is that zero-emission heavy vehicles and biogas-powered vehicles are guaranteed an exemption for at least five years (until 2027). The decision

provides industry players with the predictability they need regarding operating costs when making investments in new climate-friendly technology and is expected to result in significant growth in sales of such vehicles. The effects of this decision on GHG emissions and traffic are in addition to the effects referred to above.

Reduce GHG emissions from materials in new and refurbished buildings by 30%

The City of Oslo, businesses and the population of Oslo contribute to GHG emissions outside the municipality's borders through, amongst other things, the purchase and transport of goods. These "indirect emissions" are not included in the municipal emission inventory prepared by the Norwegian Environment Agency, nor are they included in the Climate Budget and the measures referred to in the table "Mitigation measures and measures in the Climate Budget" (below). The City of Oslo is working to ensure that Oslo's indirect GHG emissions are significantly lower in 2030 than in 2020.

As regards the City of Oslo's own operations, emissions from material use in our buildings and infrastructure are estimated to account for up to 50% of indirect GHG emissions, and are thus the largest source of indirect emissions.

The City Council is now taking an important step forward in its efforts to reduce indirect emissions by setting a target of reducing GHG emissions from materials used in the municipality's new and refurbished buildings by 30%, compared with the emission levels for materials in FutureBuilt ZERO's baseline trajectory.

To achieve this goal, the City of Oslo must demolish fewer buildings, increase the reuse of materials when building and use more low-emission materials, such as wood and low-carbon concrete and steel. This will result in significant cuts in emissions from the production of materials used in the City of Oslo's buildings.

Before new construction projects are approved, the City Council will carry out a thorough assessment of whether buildings can be refurbished, before deciding to demolish and build anew, given that this is practical and beneficial for the climate. The assessment must be documented in connection with the preparation of a concept study or equivalent early-phase study.

The City Council is planning for the target to be revised in 2024. This may mean that the target is tightened further and that the quantified target is extended to cover new areas, such as the construction of infrastructure (streets and pavements, cycle paths, roads, water and sewerage, energy development, etc.). While gaining experience and improving the knowledge base required to quantify a climate target for materials in infrastructure projects, the City Government will employ climate requirements for materials in various infrastructure procurements, similar to what has been done for the procurement of asphalt.

Stronger focus on energy efficiency and solar energy

The extremely challenging energy situation in Norway and Europe, largely triggered by Russia's invasion of Ukraine, has dramatically increased the need to both reduce and streamline energy use, and generate more energy locally. The City Council wants to increase the municipality's efforts to improve energy efficiency and increase local energy production. Ensuring that government entities, residents and businesses use energy more efficiently will also free up energy for the electrification that will be needed in the transport and construction sectors to achieve the municipality's climate target of a 95% reduction in emissions by 2030.

It is important that the municipality takes the lead and steps up its efforts to streamline its own energy use and generate more energy locally. The City Council will therefore identify and implement new and strengthened energy-saving mitigation measures through the autumn of 2022 and on into 2023. The City Council is proposing to set aside an additional NOK 132 million in 2023 for energy efficiency measures and the installation of solar panels on its own buildings. Including VAT reimbursement, this will enable mitigation measures costing NOK 165 million to be funded. In addition, NOK 9 million has been incorporated into the adopted financial plan in 2023, meaning that a total of NOK 174 million has been allocated for this purpose in 2023. To ensure that energy planning in the municipality is followed up in a coordinated manner, the City Council is proposing that NOK 2 million be set aside in 2023, followed by NOK 4 million annually, to boost capacity and expertise relating to energy issues at the Agency for Climate through the establishment of a separate "energy entity" within the agency. The energy entity will be given a special role in coordinating interagency municipal work and ensuring good interaction between energy companies, authorities and developers, with regard to realising the municipality's goal of increasing local energy production and reducing the total energy consumption in Oslo by 10% by 2030.

In the particularly challenging energy situation that we find ourselves in at present, the City Council is looking to increase support for energy efficiency improvements and local energy production in households and businesses. A proposal has therefore been put forward to increase the Climate and Energy Fund's grant limit from NOK 120 million to NOK 150 million in 2023. The support rates for energy efficiency measures and the installation of solar cells will be increased to provide a particularly strong stimulus for the implementation of such mitigation measures. This increased support will initially be made time-limited to the end 2023 in order to stimulate rapid action. The City Council will continuously assess the need for further adjustments to the fund's priorities in this situation.

Oslo's climate targets

The five targets of Oslo's Climate Strategy towards 2030 are:

1. Oslo's GHG emissions in 2030 shall be reduced by 95% compared with 2009, with a secondary target of 52% in 2023
2. Oslo's natural environment shall be managed in such a way that natural carbon storage in vegetation and soil is protected and GHG removal in forests and other vegetation increases towards 2030
3. Oslo's total energy consumption in 2030 will be reduced by 10% compared with 2009
4. Oslo's capacity to withstand climate change will be strengthened towards 2030, and the city will be developed so that it is prepared for the changes projected by 2100
5. Oslo's contribution to GHG emissions generated outside the municipality will be substantially lower in 2030 than in 2020

Oslo shall become a city which is virtually free from GHG emissions and which is equipped to cope with the consequences of climate change. In Proposition 109/20, the Climate Strategy for Oslo towards 2030, Oslo's City Government adopted five main targets for its climate work,

explained in the box above. The Climate Strategy also includes a description of how these targets will be achieved. The Climate Budget covers mitigation measures and measures aimed at reducing emissions within Oslo's boundaries (target no. 1 in the strategy). The climate work relating to the remaining emission reduction targets is discussed in the final part of this Climate Budget.

If Oslo achieves its climate goals, the city will make significant contributions to both Norway's international climate commitments under the Paris Agreement and to the Government's goal of a 55% reduction in domestic emissions by 2030. This is set to become even more important in the future given the EU's decision to raise its ambition level to an emission reduction of 55% by 2030. However, Oslo is also dependent on strengthened regional and central government measures to achieve its climate targets.

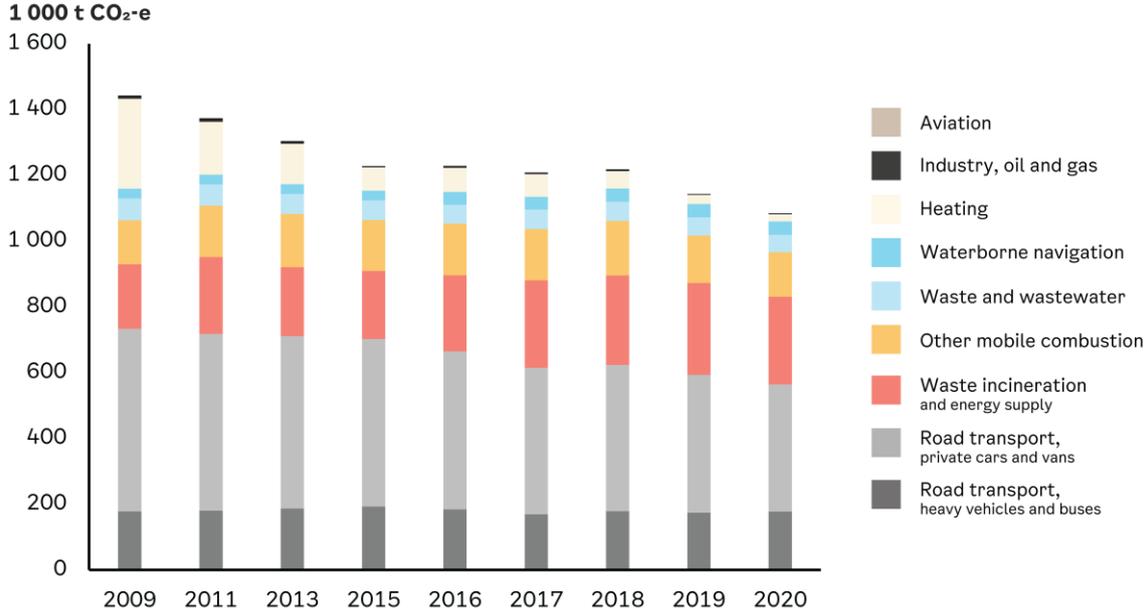
The need to work holistically towards all five targets in the Climate Strategy has become even more apparent as a result of the latest reports from the UN Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The IPCC now believes that the impacts that climate change will have on the natural environment are greater and more extensive than previously assumed. According to the IPCC, there is a brief window in which to act to ensure a liveable and sustainable future for all, and the next decade will be crucial. It is now believed to be more urgent than previously thought to limit and adapt to climate change, while at the same time achieving sustainable development. According to the IPCC, global emissions must peak by 2025 and be reduced by 43% by 2030 if we are to achieve the target of limiting global warming to 1.5°C.

The nature and climate crisis must therefore be understood and solved in conjunction. The IPBES points out that the degradation of nature caused by changes in land use is the main cause of the natural crisis. We are facing a mass extinction on a scale and at a pace unparalleled in history. According to the IPCC, land use changes are also a key cause of the climate crisis. The latest report from the IPCC shows that we need to view mitigation measures for reducing emissions together with measures aimed at adapting to climate change. According to the IPCC, preserving ecosystems will be fundamental to climate-resilient development. By including emission reduction targets for climate-resilient development in the climate strategy, Oslo has an excellent starting point for a comprehensive assessment of climate mitigation measures aimed at bringing about both emission cuts and adaptation to climate change.

Main target 1 of Oslo's climate strategy

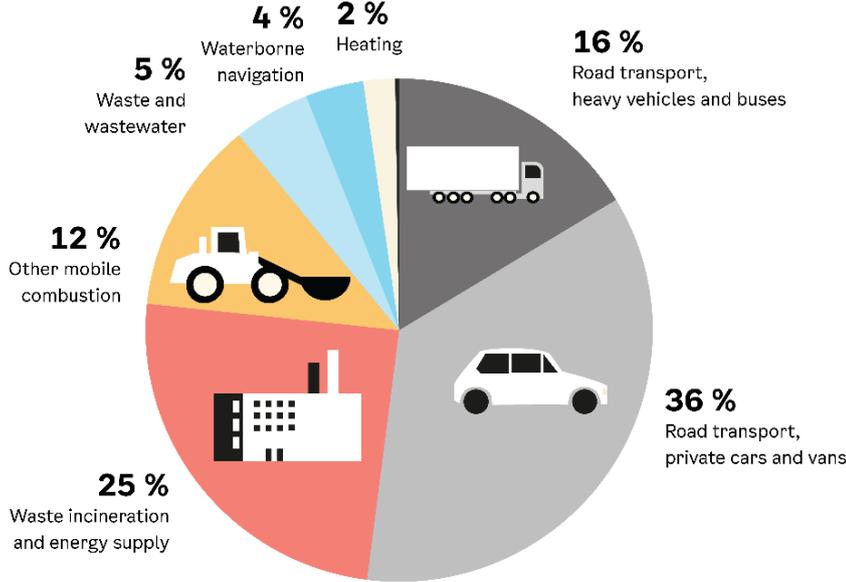
[The Norwegian Environment Agency's municipal emission inventory](#) is used as a basis in the Climate Budget. The most recent figures in the emission inventory concern 2020. The inventory has been updated back to 2009 as regards the years for which figures are available. [The Norwegian Environment Agency has not prepared an emission inventory for 2010, 2012 or 2014.](#) Although the Norwegian Environment Agency's emission inventory remains subject to considerable uncertainty, it is continually being improved. The most recently published emission inventory shows that emissions within Oslo's borders were reduced by 25% from 2009 to 2020. From 2019 to 2020, emissions fell by 5.2%, primarily as a result of an increase in the proportion of electric cars and a reduction in vehicle-kilometres. The reduction in vehicle-kilometres is the result of restrictions in connection with the COVID-19 pandemic. Preliminary analyses and national emission figures show that traffic levels have risen, which may indicate that, in 2021, we will not see emission reductions similar to those seen in 2020. In

2020, GHG emissions from the waste and waste water, industry, oil and gas, aviation, heating and road transport sectors were at their lowest level since 2009. This indicates that Oslo is well on the way to reducing its emissions, yet there is a long way to go to achieve the goal of a 95% reduction by 2030.



GHG emissions in Oslo by emission sector, 2009-2020

As the figure below shows, the largest sources of emissions in 2020 were road transport (52%), waste incineration and energy supply (25%, primarily the incineration of fossil waste) and other mobile combustion (12%).



GHG emissions in Oslo by emission sector, 2020

Main target 1 includes a secondary target that Oslo's GHG emissions will be reduced by 52% by 2023 compared with 2009. There is a substantial gap between the 25% emission reductions from 2020 and the 2023 target. The Norwegian Environment Agency's municipal emission inventory also does not capture the effect of all measures that have been implemented in Oslo. The emissions gap may therefore be less than the quantified level. Nevertheless, it is unlikely that the 2023 target will be achieved. The City Council is working purposefully to strengthen adopted measures and introduce new measures, in order to get as close as possible to the 2023 target and to achieve the 2030 target.

Aggregated effect of the Climate Budget 2023

With the measures that have been adopted in this Climate Budget, it is estimated that GHG emissions in Oslo will be reduced by 33% in 2023 and by 49% in 2026 compared with 2009 levels. The effect on the climate of the adopted measures is measured against a baseline trajectory prepared by CICERO, which estimates Oslo's emissions towards 2030, assuming that no further measures will be introduced after 2021.

Estimates of the emission-reducing effect of measures in the Climate Budget and developments in the baseline trajectory are subject to considerable uncertainty. Further information regarding the baseline trajectory can be found in Chapter 4 of the Appendix to the 2023 Climate Budget.

Proposed resolution

The City Council shall strive to achieve the emission limits year by year in order to achieve the 2030 target, and must therefore actively work to ensure the implementation of adopted measures, develop new measures and strengthen existing measures.

The table below shows the emission limits for the 2023 and 2026 economic plan period, as well as the expected emission-reducing effect of adopted measures, including the baseline trajectory.

Limits for GHG emissions in the City of Oslo 2023-2026

	2009 (baseline year)	2020 (inventory)	2023	2026
Historical emission cuts and baseline trajectory	0%	-25%	-28%	-32%
Adopted measures (incl. the baseline trajectory)	-	-	-33%	-49%
Emission level (tonnes CO ₂ eq)*	1,442,878	1,084,233	962,000	736,600
Emission limits	-	-25%	-52%	-73%
Difference between adopted measures and emission limits			19 pp.	24 pp.

**The figures are based on the latest available emission inventory from the Norwegian Environment Agency. These figures may change over time as a result of the Norwegian Environment Agency's method development and data access.*

Based on the above, the City Council proposes the following resolution for the Climate budget under Proposition 1:

The City Government calls on the City Council to reduce GHG emissions in accordance with the established emissions limits towards a 95% reduction in 2030. This entails an emission limit of -52% in 2023 and -73% in 2026, compared with the emission level in 2009. The City Government endorses the measures in the table "Mitigation measures and measures in the Climate Budget" in Proposition 1. As part of its ordinary reporting to the City Council, the City Government reports on the status of the measures and attainment of the emission limits in 2023 and 2026. The reporting is based on the status of the implementation of the measures, as well as the indicators for GHG emissions in Oslo, the "Climate Barometer".

Mitigation measures in the Climate Budget 2023–2026

The Norwegian Environment Agency's municipal emission inventory is used as a basis in the Climate Budget. See Chapter 2 in the Appendix to the Climate Budget 2023 for information on the emission inventory and emission developments from 2009-2020.

The table below (Tables 2.2a and 2.2b in previous climate budgets) shows adopted mitigation measures and measures in the Climate Budget, as well as estimated emission reductions during the economic plan period.

The effect of the measures includes emission reductions which occur within the geographical boundary of the municipality. Indirect emissions caused by the municipality or its inhabitants and businesses through their consumption are not included.

The calculations take account of anticipated emissions in the baseline trajectory during the same year. In other words, only the additional effect over and above the anticipated emission level in the baseline trajectory is shown. For example, almost the entire effect from current tariffs in the road toll ring is included in the baseline trajectory. In the table, only the effect of the tariff changes in the new supplementary agreement to Oslo Package 3, approved by the City Government on 22 June 2022, is presented.

Some measures overlap, i.e. they affect the same emission source. For example, many of the measures reduce emissions from cars. In such cases, the effect given in the table are adjusted to avoid double-counting.

For some of the measures, no emission reductions are estimated. This is either due to insufficient data or because the measures facilitate emission reductions and therefore cannot be quantified. For example, the installation of chargers for electric cars will not have a direct climate effect, but will encourage people to buy and use electric cars. The Climate Barometer supplements the emission-reduction estimates in the climate budget and provides an updated status on important climate-related indicators in Oslo, in addition to data on the sale of duty-free diesel during the years prior to 2021. The Agency for Climate is working to develop more indicators in the Climate Barometer to improve monitoring of the climate measures.

The method and assumptions used to calculate the impact of the measures in the table below are described in more detail in sections 4.2 and 4.3 of the Appendix to the 2023 Climate Budget.

Mitigation measures and measures in the Climate Budget

Emission sector/mitigation measure	No	Measures	Responsible	Effect 2023	Effect 2026
				(tonnes CO ₂ eq.)	
Waste incineration and energy supply					
Zero-emission production of district heating	1	Establishment of gas boiler for the production of district heating from landfill gas	REG*, EBY	200	300
Waste incineration with carbon capture	2	Carbon capture at the Klemetsrud facility	Hafslund Oslo Celsio/NOE	0	103 100
Waste and waste water					
Extraction of landfill gas	3	Maintenance of landfill gas facilities at Rommen and Grønmo	EBY*, REG	Not calculated	
Road transport					
Overarching measures	4	New tariffs in the road toll ring		17,200	18,200
	5	Procurement of zero-emission and fossil-free vehicles in the municipality	All*, UKE*	1,100	1,000
	6	Establishment of zero-emission zone in the Car-free city living area	BYM*, KLI	0	6,400
Reduced traffic	7	Incentives to promote cycling and walking (subsidies, climate-friendly commuting programme, infrastructure for cycling)	BYM*, KLI*	Facilitating mitigation measures	
	8	Improve public transport (improve accessibility, new trams, improvements to the Oslo Metro, etc.)	Ruter*, BYM*		
	9	Facilitate the use of sharing solutions (car sharing, e-bike sharing, etc.)	BYM*, Ruter*		
	10	Parking measures (increase tariffs, remove parking spaces, new parking regulations, etc.)	BYM*, PBE*	Not calculated	
	11	Reduce the transport of bulk materials and waste	KLI*, FOB*, UKE, Oslobygg, Port of Oslo, PBE, EBY, BYM, VAV		
Zero-emission cars	12	Establish charging infrastructure for cars	BYM*	Facilitating mitigation measures	
	13	Incentives for zero-emission taxis from 2025 (requirements, subsidies, charging infrastructure, etc.)	BYM*, KLI*	5,800	9,600
Zero-emission vans	14	Zero-emission requirement for goods deliveries on behalf of the municipality	All*, UKE*, KLI	900	400

	15	Incentives for zero-emission vans (establish/subsidies for charging infrastructure, freight consolidation centres, loading facilities, parking, etc.)	KLI*, BYM*		
Zero-emission-free/biogas buses	16	Procurement of zero-emission buses for public transport	Ruter*, MOS	14,000	20,700
	17	Procurement of zero-emission transport for persons with disabilities		800	800
	18	Incentives for zero-emission tour and express buses (establish/subsidies for charging infrastructure)	KLI*, BYM*, UDE, UKE	Not calculated	
Zero-emission/biogas trucks	19	Zero-emission requirement for trucks on assignments carried out on behalf of the municipality	All*, UKE*	2,400	14,000
	20	Incentives for zero-emission heavy transport in Oslo (exemptions inside the road toll ring, establish/subsidies for charging infrastructure, provision of land for energy stations, etc.)	KLI*, EBY, BYM*		
Other mobile combustion					
Zero-emission building and construction projects	21	Zero-emission requirement for municipal construction sites	All*, UKE*	11,900	14,800
	22	Fossil-free construction site regulation in zoning plans	PBE*, KLI*	17,900	38,600
Zero-emission machinery and motorised equipment	23	Facilitate zero-emission handling of goods and cargo at the Port of Oslo	Port of Oslo*	300	2,000
	24	Procurement of zero-emission machinery for the City of Oslo's machinery fleet	All*, UKE*	1,300	2,900
	25	Incentives for zero-emission motorised equipment and events (subsidies, electricity for events)	KLI*, BYM*	500	700
Waterborne navigation					
Zero-emission ferries on public transport services	26	Procurement of zero-emission high-speed ferries	Ruter*, MOS	0	1,400
Zero-emission berths	27	Establish shore power for container, tanker and cruise ships	HAV*, NOE	0	1,900
Aggregated effect of measures in the Climate Budget				74,300	236,800

* Indicates reporting responsibility

A brief description of adopted measures in each sector is presented below. By way of introduction, a description is given of the causes of emissions in the sector and what will be required in order to reduce these emissions further over and above the existing, adopted mitigation measures.

Waste incineration and energy supply

District heating in Oslo is primarily produced via waste incineration. With carbon capture from the largest waste facility in Oslo at Klemetsrud, emissions from this sector could be cut by around 60% in 2030. Smaller quantities of fossil fuels are still used for peak load in district heating production. There has been a significant decline in the use of fossil fuels, but there is still potential for further phasing out of natural gas in particular. Hafslund Oslo Celsio is actively working to identify solutions for 100% fossil-free district heating production. In order to reduce emissions over and above what will be achieved through the existing measures, the City Council has initiated work to assess measures aimed at reducing emissions from Hafslund Oslo Celsio's waste incineration plant at Haraldrud, and the municipality's own waste incineration plant at Haraldrud. The City Council is proposing to set aside NOK 5 million for a basis for decision-making and studies linked to the 65% recycling rate and zero-emission waste management in 2023.

Zero-emission production of district heating

1. Establishment of gas boiler for landfill gas

Gas boilers have been established at Klemetsrud and Tokerud to utilise methane gas from the landfills at Grønmo and Rommen in district heating production. In 2022, the Agency for Waste Management, in partnership with Hafslund Oslo Celsio, will commission the gas boiler at Klemetsrud, which will utilise methane gas from Grønmo landfill. The heat from the gas boiler will partly replace the use of natural gas and oil in district heating production.

Waste incineration with carbon capture

2. Carbon capture at Klemetsrud

From the summer of 2026, carbon will be captured from waste incineration at Klemetsrud under the auspices of Hafslund Oslo Celsio. The facility burns in excess of 380,000 tonnes of waste annually. The facility is expected to achieve the full treatment effect from 2028, equivalent to a reduction of just under 165,000 tonnes of fossil CO₂eq.

Waste and wastewater

Methane gas emissions from closed landfills is the principal source of methane emissions in Oslo. The facilities at Grønmo and Rommen both have systems for methane extraction (methane "capture"). The formation of methane in the ground diminishes over time as the waste gradually decomposes and no new waste is added to the landfills. Nevertheless, efforts must be made to increase the rate of methane gas extraction towards 2030. The captured methane gas is combusted to form CO₂, which has a significantly lower climate impact (see the discussion of how the landfill gas is used for district heating production under measure 1 above).

Extraction of landfill gas

3. Maintenance of landfill gas facilities at Rommen and Grønmo

The Agency for Real Estate and Urban Renewal has gas collection facilities at the landfill sites at Rommen and Grønmo. Continuous maintenance and upgrading are important to ensure high methane extraction rates at the facilities.

The City Council is increasing the allocation of operating funds by NOK 4 million annually during the economic plan period to safeguard the necessary operation and management of municipal landfills. The City Government is transferring responsibility for part of the gas facility at Grønmo and the Klemetsrud facility from the Agency for Waste Management to the Agency for Real Estate and Urban Renewal. An energy recovery solution has been established at the Klemetsrud facility, which will be commissioned in 2022. The City Council is allocating NOK 2 million annually from 2023 onwards to the operation of part of the gas plant. The allocations are earmarked through an increase in funding for municipal landfills.

Road transport

Emissions from road transport have steadily declined since 2009. This is primarily due to an increase in the proportion of electric cars and the increased use of biofuels. However, road transport still accounts for more than half of direct emissions in Oslo.

The road toll ring in Oslo has for many years helped to limit traffic volumes in the city and provided an incentive to choose zero-emission cars. Measures such as procurement requirements, parking fees, reserved parking spaces and exemptions from paying road tolls for zero-emission vehicles have been important measures for reducing emissions from road transport. If Oslo is to achieve the climate target in 2030, the entire car fleet and virtually all heavy vehicles used in Oslo must be either fossil-free or zero-emission. To contribute to this, measures that stimulate the transition from internal combustion engine (ICE) to zero-emission vehicles and help reduce traffic levels must be strengthened.

Overarching measures

4. New tariffs in the road toll ring

In the spring of 2022, new tariffs were negotiated and adopted for the road toll ring (the road user payment system). In addition to reducing traffic and providing incentives to use zero-emission vehicles, the road toll provides revenues that go to the funding of infrastructure specifically for public transport, cycling and walking. With the new tariffs, revenues will rise by NOK 5 billion for the period 2023-2026.

5. Procurement of zero-emission and fossil-free vehicles in the municipality

85% of the municipality's own vehicle fleet is zero-emission or runs on sustainable renewable fuel. This high proportion is the result of the City of Oslo's ambitious goal of achieving a zero-emission vehicle fleet. All enterprises in the City of Oslo purchase emission-free vehicles (cars, vans and heavy vehicles). If zero-emission-free vehicles are not an option, sustainable biofuels (preferably biogas) must be used.

The City Council is allocating NOK 39 million during the economic plan period to purchase new waste collection vehicles which are powered by biogas.

6. Establishment of zero-emission zone within the car-free city living area (excluding Grønland and Tøyen)

The City Council will introduce a zero-emission zone within the car-free city living area in the centre of Oslo from 2023. A zero-emission zone is a zone in which only electric, hydrogen and biogas vehicles are permitted. This is an effective measure for rapidly transforming the vehicle fleet in Oslo from ICE to zero-emission vehicles, and thereby cutting GHG emissions from road transport in Oslo. The Department of Urban Environment will be responsible for re-signage etc. in connection with the introduction of the zone.

Reduced traffic

7. Incentives to promote cycling and walking (subsidies, climate-friendly commuting programme, cycling infrastructure, better provision for pedestrians, etc.)

One of the most important measures for making Oslo a cycling city for all is an interlinked cycle path network. The Department of Urban Environment Agency is responsible for operating, maintaining, upgrading, building and developing new cycling infrastructure, and actively uses communication and campaigns to influence travel habits.

The Agency for Climate has several subsidy schemes aimed at private companies with the aim of better enabling employees to walk, run or cycle to/from work: *Safe bicycle parking at work, Active to work, Scrappage for parking*. This includes upgrading of changing rooms, charging stations for electric bicycles, and bicycle washing facilities. The Department of Urban Environment has also established a bicycle pilot for companies in Oslo, with the aim of finding effective solutions which inspire more people to cycle to and from work.

Since 2022, the City of Oslo has intensified its efforts to encourage more employees to commute and travel on business in a more active and climate-friendly way. All businesses in the City of Oslo have been asked to draw up plans which set out how they can contribute to this.

Through the shortcut project, the Department of Urban Environment is promoting walking by upgrading shortcuts which make it both easier and quicker to get around on foot. The project has so far resulted in upgrades to five shortcuts. New shortcuts will be constructed over the coming years, mainly around the Oslo Metro network.

The City Council is proposing to set aside NOK 2.5 million annually in 2023 and 2024 to increase the focus on safe bicycle parking. Furthermore, the City Council is also proposing to allocate NOK 62 million for road safety measures and NOK 68 million for traffic reduction in 2023 and 2024. This will involve measures such as the lowering of speed limits, road narrowing, the installation of speed humps and reallocating land use from cars to pedestrians, cyclists and public transport.

8. Improve public transport (improved accessibility, new trams, improvements to the Oslo Metro, etc.)

Thanks to many years of long-term and targeted investment, public transport in Oslo has now become a competitive alternative to the car. However, the use of public transport has yet to fully recover in the wake of the COVID-19 pandemic. The City Council will therefore step up its efforts to increase the share of journeys made by public transport, through among other things lower ticket prices for public transport. The development of the Fornebu metro line, a new signalling and interlocking system and the upgrading of Majorstuen station to increase its capacity are key infrastructure projects which will be given priority in the coming years. By 2024, Ruter will introduce new trams with space for more passengers.

Improved accessibility for city buses is an important part of the package of improvements to public transport. The Department of Urban Environment is responsible for establishing public transport lanes, altering areas for parking and goods delivery, and improving signage. The agency is also improving accessibility through the project "Vigorous accessibility measures", which will be continued in 2023. On behalf of Oslo Package 3's steering committee, Ruter is coordinating the work relating to an action plan for accessibility on the city's key transport arteries.

The City Council is proposing to set aside NOK 206.4 million in 2023 and NOK 215 million for the remaining years of the economic plan period to ensure that ticket prices for public transport are reduced. Furthermore, it is proposed to set aside an additional NOK 72 million, over and above the municipal deflator, to cover cost increases caused by extraordinary price rises in 2023.

9. Increased use of sharing solutions (car sharing, e-bike sharing, etc.)

By facilitating increased use of sharing solutions, the municipality is helping to ensure that residents have access to mobility services which reduce their dependence on owning a car. The aim of this is to reduce car use and the use of public road space for parking, while also giving citizens the freedom to choose the means of transport that best suits them at any given time.

The Department of Urban Environment is promoting the increased use of sharing solutions by reserving areas for parking for car-sharing vehicles, racks for the city bike scheme, and the rental of electric scooters and bicycles. The Department of Urban Environment is conducting a trial scheme where 600 public parking spaces have been reserved for car sharing. The City Council will reserve an additional 400 parking spaces for car sharing. The City Council is also considering solutions aimed at increasing the proportion of electric cars amongst car-sharing vehicles.

Ruter is also looking at how the provision of city bikes, electric scooters and other forms of shared mobility can be integrated into the Ruter app to enable seamless journeys to be made using several modes of transport. Ruter has several pilots aimed at shared mobility, where citizens gain access to car-sharing vehicles, electric cargo bikes and other relevant services, such as bicycle workshops. Ruter is also planning pilots with shared self-driving vehicles, as well as carpooling for passengers and goods.

10. Parking measures (removal of parking spaces, higher tariffs, new parking regulations, resident parking)

The municipality is prioritising accessibility for bicycles and public transport over parking spaces for cars, and re-prioritising streets away from parking to other purposes. Since 2015, the municipality has removed over 6,000 parking spaces. In addition, the City Council has increased parking fees in recent years in order to reduce car use. In 2023, the City Council will raise the parking fees in the inner-city area, partly because of the availability of the excellent public transport system. Fees are being lowered in outer-city areas. For a more detailed discussion of the fees, see the Department of Environment and Transport sector review.

The municipality has also introduced resident parking, a scheme where residents gain better access to and reduced annual prices for parking in their area, while visitors are required to pay a fee per hour. This is helping to reduce non-resident parking in residential areas, and making parking more predictable for those who live in the area.

The City Council has put forward proposals for new parking regulations which will be considered by the City Government in 2022. These regulations will provide guidance on the amount of parking that should be designated for cars and bicycles in new zoning plans. In the new parking regulations, the minimum limit for the number of parking spaces has been replaced with a maximum limit. In addition, a requirement has been introduced which will require at least 50% of parking spaces to have electric vehicle charging, along with requirements regarding the number and quality of bicycle parking places. Consideration

should be given to allocating up to 10% of the parking spaces in larger parking facilities for car sharing, and zoning plans should consider the possibility of shared use.

In 2022, the municipality's enterprises were asked to consider whether parking spaces at municipal service centres could be removed and/or whether the installation of electric vehicle charging would be appropriate.

11. Reduction in the transport of bulk materials and waste

The municipality is actively working to reduce the transport of bulk materials and waste from construction sites in Oslo by increasing the reuse of materials produced either in municipal projects or internally within the city. The Agency for Improvement and Development is working to raise the level of awareness amongst the City of Oslo's buyers of bulk material transport services concerning how such materials can be reused.

The interagency municipal working group, which consists of the Agency for Planning and Building Services, the Agency for Climate, Oslobygg Oslo KF, the Oslo Port Authority, the Department of Urban Environment, Oslo Municipality Water and Sewage Administration and the Fornebu metro line, and the Pådriiv project in Hovinbyen, is exploring new solutions and logistics for the handling of bulk materials. The Agency for Real Estate and Urban Renewal procures land for bulk material handling at the request of relevant municipal entities.

In all new planning matters where it is relevant, the Agency for Planning and Building Services asks entities submitting proposals to present an account of issues relating to the handling of bulk materials. The Agency for Climate and the Agency for Planning and Building Services are working to procure land for local bulk material handling through planning processes, and assessing the scope to ensure that land is set aside for the handling of bulk materials. The Agency for Planning and Building Services has created a two-year position for a bulk material coordinator, commencing on 1 September 2022.

The Fornebu metro line is reducing the transport of bulk materials in its projects by stipulating that contractors must make climate-friendly choices in connection with deliveries of waste and bulk materials. Contractors are measured in terms of vehicle-kilometres in order to raise awareness of the number of vehicles, and local reception centres are used for bulk materials wherever possible.

Zero-emission cars

12. Establish charging infrastructure for cars

The provision of good charging infrastructure is crucial for electrifying the transport sector, and for the successful introduction of other measures such as zero-emission zones, climate requirements for the taxi industry and climate requirements in procurement. The Department of Urban Environment will install 150 ordinary charging points and ensure municipal involvement in ten fast and super-fast chargers around the city in 2023.

Through the Climate and Energy Fund, the municipality is offering subsidies for charging points for electric cars in housing cooperatives and jointly owned properties. This scheme is important in facilitating the transition to electric cars for everyone who needs access to a car, including those who live in housing cooperatives and jointly owned properties. Since the subsidy scheme began in 2017, around NOK 80 million has been distributed, which has enabled almost 55,000 charging points to be installed.

13. Incentives for zero-emission taxis from November 2024 (requirements, subsidies, charging infrastructure, etc.)

The municipality is helping to ensure that all taxis operating in Oslo are zero-emission by November 2024, in accordance with the [Regulations relating to environmental requirements for taxi transport in Oslo](#). In 2023, the Department of Urban Environment will install 12 new charging points which are specifically reserved for taxis, conduct pilots for fast charging, and facilitate the prioritisation of zero-emission taxis at taxi ranks. Through the Climate and Energy Fund, subsidies are being provided for home charging facilities for taxi drivers.

Zero-emission vans

14. Zero-emission requirement for goods deliveries on behalf of the municipality

The municipality requires all goods and services that are delivered to the City of Oslo to be transported using climate-friendly fuel. Requirements regarding vehicles and fuels must be stipulated either as a minimum requirement or as an award criterion in procurements. The requirements also apply to operating contracts. In procurements, emphasis is placed on the proportion of suppliers' vehicles that are either zero-emission and/or biofuel-powered (preferably biogas).

All agencies are responsible for applying the City of Oslo's standard climate and environmental requirements concerning transport when they procure goods and services. Climate and environmental requirements regarding transport are also stipulated in the municipality's construction contracts. The City Council has tightened the requirements so that all joint procurement agreements require/reward the transportation of goods and services using zero emissions/biogas. This work will continue in 2023.

15. Incentives for zero-emission vans (establish/subsidies for charging infrastructure, freight consolidation centres, loading facilities, parking, etc.)

The City of Oslo is facilitating the use of zero-emission vans by establishing charging infrastructure and prioritising parking spaces for electric commercial/goods and service transport vehicles. Once the 15 remaining commercial parking spaces have been converted to being reserved for electric vans in 2023, all commercial parking spaces in the city centre will be reserved for electric vans. Electric vans can pass the road toll ring free of charge, and can also use resident parking areas free of charge. The Agency for Real Estate and Urban Renewal is tasked with procuring land for freight consolidation centres on request.

The Department of Urban Environment is facilitating the transshipment of goods at Filipstad by securing access to electrical power and charging points at the three city logistics terminals. This reduces emissions as Posten, DHL and Schenker transfer consignments onto electric vans, which are then used for the final stage of delivery.

Through the Climate and Energy Fund, the municipality is providing support for charging infrastructure on commercial premises and fast chargers for electric vans.

Zero-emission/biogas buses

16. Use of zero-emission buses in public transport

Ruter has signed new bus contracts which will mean that all buses operating within Oslo will be electric by the end of 2023, with the exception of the route over the Ulvøybrua bridge, which is unable to support the greater weight of electric buses. Thus, all public transport in Oslo on land will be zero-emission, as the Oslo Metro and tram networks are already electric.

17. Procurement of zero-emission transport for persons with disabilities

Ruter has signed a new contract which will see special biogas and electric vehicles (primarily minibuses) continue to be used for transport services for people with disabilities (“TT services”) in Oslo. The service is aimed at those who are unable to use normal public transport services.

18. Incentives for zero-emission tour and express buses (establish/subsidies for charging infrastructure)

In procurements, Oslo requires buses that operate services on behalf of the municipality to be zero-emission. Electric coaches are already used on school transport services, and several companies have procured electric buses in order to operate services on behalf of the City of Oslo.

The Agency for Climate provides subsidies for trucks and buses through the Climate and Energy Fund. The Department of Urban Environment establishes publicly available fast chargers which are designed for use with heavy vehicles.

The exemption for biogas vehicles inside the road toll ring and the predictability resolution guaranteeing that zero-emission and biogas heavy vehicles will be exempt from the road toll ring through 2027 reduces the risk associated with investing in zero-emission buses for companies that drive a lot in Oslo.

Zero-emission/biogas trucks

19. Zero-emission requirement for trucks on assignments carried out on behalf of the municipality

In procurements, the municipality requires all vehicles used for transport in connection with the delivery of goods or services to the City of Oslo (including construction) to be powered by electricity, hydrogen or biogas. From 2025, this will apply as a standard requirement. This requirement has been important in getting the market for zero-emission heavy transport started.

Since 2020, the City of Oslo has required the fossil-free transport of bulk materials to and from construction sites in its own projects. In addition, award criteria are used to promote the use of electricity, hydrogen and biogas and to minimise distance travelled. All relevant enterprises stipulate requirements in new contracts where applicable.

20. Incentives for zero-emission heavy transport in Oslo (exemptions inside the road toll ring, access to public transport lanes, establish/subsidies for charging infrastructure, provision of land for energy stations, etc.)

The measures used to promote zero-emission heavy transport aim to reduce emissions from trucks in Oslo by accelerating the transition from diesel to electricity, hydrogen or biogas. The Department of Urban Environment will facilitate 20 new charging points intended for goods and service vehicles in 2023.

The Agency for Climate and the Agency for Real Estate and Urban Renewal are working to facilitate energy stations which offer recharging and refuelling with renewable fuels, such as biogas, hydrogen and fast charging. Through the Climate and Energy Fund, grant schemes have been established for fast-charging stations for heavy vehicles and biogas filling stations. The purpose of the schemes is to ensure the adequate provision of charging and refuelling facilities in the city. The schemes are in addition to the existing grant scheme for establishing charging facilities in a dedicated area for companies. In 2022, it was decided that biogas trucks should be exempt from charges inside the road toll ring, and a predictability resolution was passed

guaranteeing this exemption from charges through until at least 2027. Together with the Norwegian Public Roads Administration, the City of Oslo is reviewing how public transport lanes can be used to promote reduce traffic and GHG emissions, including whether electric trucks or trucks powered by biogas should be permitted to use public transport lanes.

The Agency for Climate has received funding from the *Klimasats* grant scheme to continue the work to make Oslo a pioneering city as regards zero-emission heavy transport. A key aspect of this work is to pursue a productive dialogue with the business community through, for example, networks such as Industry for Climate and the Green Land Transport Programme.

Other mobile combustion

Emissions from machinery which uses off-road diesel were at the same level in 2020 as in 2009. Despite this, emissions have declined since 2018. Thanks to Oslo's targeted efforts to reduce emissions from construction sites, emissions are expected to be reduced further over the coming years. As part of this, extensive infrastructure for charging both construction machinery and heavy transport must be developed, and the City Council has initiated work to assess how the municipality can facilitate this rapidly. At the same time, around half of emissions from other mobile combustion originates from machinery which is used away from construction sites. In order to further reduce emissions from the sector, it is important to identify where this machinery is actually used and what measures can be implemented to make these machines fossil-free or zero-emission. There is some uncertainty associated with this emission sector in the Norwegian Environment Agency's emission inventory, in addition to the fact that the effect of Oslo's climate mitigation measures will often not be reflected in the inventory.

Zero-emission building and construction projects

21. Requirements for zero-emission construction and engineering projects being carried out on behalf of the City of Oslo

The City of Oslo requires all machinery used at municipal construction sites in Oslo to use fossil-free fuel. From 2025, this requirement will be tightened further to specify zero-emission machinery. In current procurements, the municipality uses award criteria to reward zero-emission (incl. biogas) machinery and solutions. The Agency for Improvement and Development is responsible for following up these requirements.

22. Fossil-free construction site regulation in zoning plans

Since 2020, the City of Oslo has required all new zoning plans to be based on fossil-free construction. This requirement applies to both private and state developers. The Agency for Planning and Building Services is responsible for following up this requirement. It is very difficult to estimate the impact on emissions of this measure. Going forward, the municipality will consider how the requisite power supply can be made available before construction starts.

Through the Climate and Energy Fund, the grant scheme entitled *Mobile charging stations for construction sites* was launched in the spring of 2022. The scheme enables clients and contractors to receive grants for purchasing, hiring or leasing mobile charging stations for use on construction sites. The charging stations must have provision for energy storage and can be moved both internally within construction sites and between construction sites.

Zero-emission machinery and motorised equipment

23. Procurement of zero-emission machinery for the City of Oslo's machinery fleet

The City of Oslo is working to replace all its own machinery and vehicles in order to be zero-emission by 2025. This will require major investments in new equipment in the future. In the economic plan, the City Council is proposing to set aside NOK 100 million to replace machinery and vehicles used at waste facilities (recycling stations, etc.).

24. Zero-emission handling of goods and cargo at the Port of Oslo

The Port of Oslo is working to ensure that all operations and transportation relating to cargo handling in the port area will be zero-emission by 2025. In this context, cargo handling includes loading and unloading performed by cranes and machinery at the port, but not ship-mounted cranes and equipment.

25. Incentives for zero-emission motorised equipment and events

The municipality is working to reduce emissions from the use of diesel from smaller emission sources. The Department of Urban Environment is working to replace diesel generators with electricity at municipal sites which are hired out for outdoor events, such as concerts and festivals.

Through the Climate and Energy Fund, companies can apply for support for the purchase of electric motorised equipment, such as tractor lawn mowers, leaf blowers and small tractors. The motorised equipment that is purchased must have an output of at least 5 kW and replace up to 10,000 litres of diesel per year. ENOVA has a grant scheme for cases where the machinery that is purchased replaces more than 10,000 litres of diesel per year. Oslo's grant scheme thus complements ENOVA's grant scheme.

Waterborne navigation

Emissions from waterborne navigation accounted for around 4% of GHG emissions in Oslo in 2020. These emissions include waterborne commercial and passenger traffic within the municipality's borders. A series of mitigation measures have been implemented to reduce emissions in recent years: The Nesodden ferries and the ferries to the islands of the Oslo Fjord became electric in 2020 and 2022 respectively. The ferries on the route to/from Denmark began using shore power in 2019 (Vippetangen). Shore power facilities for cement ships were installed in 2021. To further reduce emissions, the City Council will establish more shore power facilities, as the largest emissions from waterborne navigation in Oslo originate from ships in port.

Zero-emission ferries on public transport services

26. Procurement of zero-emission high-speed ferries

During the summer of 2022, Viken County Council decided that Ruter should quickly commence the process of converting the existing high-speed ferries (Baronen and Baronessen) to electric power on the Slemmestad-Vollen-Oslo route. The ferries will be fitted with battery packs and the hulls will be extended to make room for the same number of passengers as at present, plus even more bikes (around 20). The new ferries will be ready for operation by 1 July 2024.

Zero-emission berths

27. Establish shore power for container, tanker and cruise ships

The Port of Oslo is in the process of establishing shore power facilities at Sydhavna for container and cruises vessels. It is planned that the facilities will be phased in from 2024 onwards. Work has begun to ensure that car-carrying vessels and tankers use shore power while moored in Oslo. Shore power replaces the use of diesel generators while the ships are in port. Nevertheless, the ships will continue to use some diesel power for heating purposes, even though they are connected to shore power. In addition to reducing GHG emissions, shore power helps to reduce air pollution and noise levels.

New appropriations for climate mitigation measures 2023–2026

Operation

				Amounts in thousands
Name	2023	2024	2025	2026
Transfer of pressurised landfill gas at Grønmo*	2,000	2,000	2,000	2,000
Cost growth due to price rises	72,000			
Lower public transport prices	206,400	215,000	215,000	215,000
Stronger focus on safe bicycle parking	2,500	2,500		
TOTAL	282,900	219,500	217,000	217,000

*The City of Oslo manages four closed landfills: Grønmo, Rommen, Langøyene and Stubberud. The City Council is increasing the allocation of earmarked operating funds by NOK 4 million annually during the economic plan period to safeguard the necessary operation and management of the landfills.

Investment

				Amounts in thousands
Name	2023	2024	2025	2026
Reduction in traffic	40,000	28,000		
Road safety measures	25,000	37,000		
TOTAL	65,000	65,000		

Operations - self-funding

				Amounts in thousands
Name	2023	2024	2025	2026
Follow-up study concerning 65% recycling rate and zero-emission waste management	5,000			
TOTAL	5,000			

Investment – self-funding

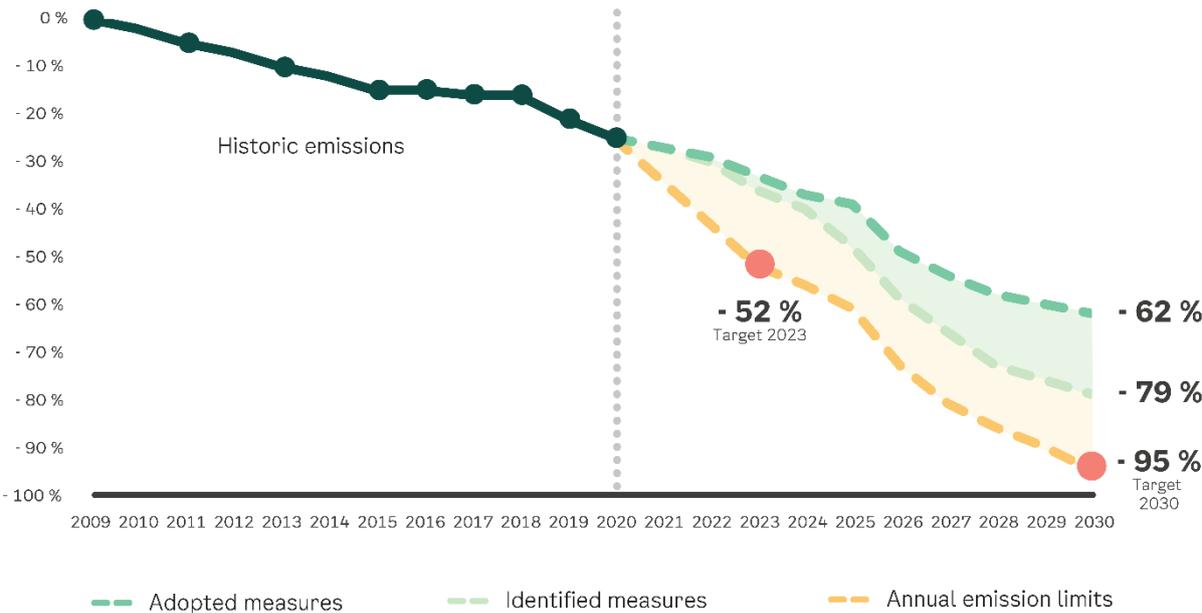
				Amounts in thousands
Name	2023	2024	2025	2026
Purchase of new refuse collection vehicles (biogas)			10,100	28,900
Transition to zero emissions - construction machinery and vehicles	17,500	33,800	48,200	
TOTAL	17,500	33,800	58,300	28,900

Opportunities for goal attainment towards 2030

The figure below shows the expected development in emissions towards 2030 based on the current situation, potential emission reductions using new, identified measures, and the politically established emission limits. The estimated development in GHG emissions based on the current situation, which includes newly adopted measures in the Climate Budget is expected to result in a reduction of 62% in 2030 compared with 2009 levels. As the figure shows, the effects of the measures in this Climate Budget will not be sufficient to achieve the

climate targets for 2023 or 2030. The City Council will continue its efforts to strengthen the use of measures and adopt completely new measures over the coming years.

The calculations for both adopted and identified measures are subject to considerable uncertainty, uncertainty which increases the further forward into the future that is being estimated. The effect of the measures may be greater than is assumed here, or it may be lower if the measures are not followed up adequately. High petrol prices, electricity prices, the COVID-19 pandemic, the war in Ukraine, etc. may alter the underlying assumptions behind the calculations and result in a different outcome than in the chart.



Anticipated development in emissions towards 2030 as a result of adopted measures, the potential for emission cuts through new, identified measures, and emission limits

In addition to the anticipated development in emissions as a result of adopted measures, the figure also includes the potential effect of identified measures. Identified measures are measures that have not yet been adopted, but which, when implemented, will contribute to reductions in emissions in Oslo. These have been identified in Oslo's Climate Strategy (Proposition 109/20), in Klimakur 2030 and in the Action Plan for the Port of Oslo (Proposition 352/18). All measures known to the Agency for Climate that are relevant for reducing Oslo's emissions are included.

Most of the identified measures are not expected to have any effect until 2024/2025 at the earliest, as it will take time to adopt and implement them, and it also often takes time for measures to achieve their maximum emission-reducing impact. If all identified measures are implemented in full, it is estimated that this could result in emission reductions of up to 79% in 2030 compared with 2009 levels. However, the design of many of the measures has not been clarified either locally or nationally, and the final form of the measures may have a different effect than is indicated by the analysis.

Many of the identified measures are national, or can only be implemented if Oslo is given sufficient freedoms by the central government. In order to close the emissions gap towards 2030, Oslo is therefore dependent on a strengthened national climate policy. The Norwegian government must eliminate barriers which prevent emission cuts in the major cities and reinforce the use of measures over and above what is set out in the government's Climate Plan.

The table below shows the identified measures that are included in the figure above. The effect indicated in the table is the isolated impact of each measure and cannot be aggregated because many of the measures could impact the same emission source (double-counting). Double-counting of effects is taken into account in the figure above. Measures that do not have an estimated effect are either a prerequisite for or facilitate reductions in emissions.

As a basis for the work relating to the Climate Budget, the Agency for Climate has drawn up roadmaps for emission trends in Oslo. The roadmaps provide an overview of adopted measures, possible new identified measures and the reduction in emissions that is necessary in each emission sector (e.g. road transport) in order to attain the overall climate target for 2030. For a more detailed description of the roadmaps, the identified measures and calculations, see section 5.2 of the Appendix to the Climate Budget 2023.

Identified measures and estimated isolated effect

Sector	Measures	Estimated isolated effect [tonnes CO₂eq]
Road transport	Higher charges inside the road toll ring (difference of up to NOK 100 between fossil fuel and electric vehicles)	45,000
	Zero-emission zone within Ring 2	20,000
	CO ₂ tax for road transport of NOK 2,000/tonne in 2030 without compensatory measures	45,000
	Increase in the biofuel quota obligation to 40% in road transport in 2030	20,000
	Access to public transport lanes for zero-emission/biogas-powered heavy vehicles	
	Areas for charging and refuelling infrastructure	
Waste incineration and energy supply	Household waste from the City of Oslo is treated in a waste incineration facility with carbon capture and storage	45,000
	Sorting facility for household waste from the City of Oslo	20,000 - 30,000
	Reduce emissions from incineration of industrial waste at Hafslund Oslo Celsio's plant at Haraldrud	20,000 - 30,000
	Increased textile recycling	3,000 - 4,000
	Improved sorting of plastic waste in other countries and municipalities (the EU's revised Waste Framework Directive)*	7,000 - 16,000
	District heating without the use of fossil fuels	1,000 - 11,000
Other mobile combustion	Requirement for all construction sites to be zero-emission by 2030	10,000 - 15,000
	CO ₂ tax of NOK 2,000/tonne in 2030 for construction projects	1,000
Waterborne navigation	Zero-emission requirement for international ferries	10,000 - 12,000
	Differentiated port fees	1,000
	Requirement for zero-emission solutions at port	5,000 - 7000
	Cooperation with other cruise ports on common requirements regarding shore power	1,000 - 3,000
	Replace the use of heating oil on ships in port with renewable alternatives	4,000 - 5,000
Heating	National ban on the use of gas for heating purposes	14,000

* Some household and commercial waste from other municipalities and countries is incinerated in Oslo

Climate transformation

The fight against climate change is one of the City Council's highest priorities. At the same time, climate mitigation measures also have many other important effects, such as cleaner air, better public transport, safer routes to school and a business sector that is better equipped to compete in a world with increasingly stringent climate policies.

The City of Oslo is working strategically at several levels to ensure that emissions are reduced and new opportunities presented by the green transition are utilised. The transition to the zero-emission city has been under way since the current City Council took up office in 2015, and many major changes have taken place since then.

In order to achieve the emission reduction targets set out in the Climate Strategy, it is essential that both the business sector and citizens themselves have the opportunity to take part in the transition. The City of Oslo will therefore facilitate climate-friendly innovation and restructuring through a close cooperation between the municipality and the city's business community, researchers, organisations and citizens. At the same time, climate mitigation measures must be formulated so that they help to create a socially sustainable city which offers equal opportunities to all.

The work relating to climate change in Oslo is not being carried out in a vacuum, as Oslo is dependent on national, regional and international efforts in order to succeed. The municipality is also dependent on the business sector and the population being involved in the transition. The municipality is therefore participating in a number of collaborative projects, such as Smarter Transport in the Oslo Region (STOR). This project is a collaboration between the City of Oslo's Department of Urban Environment, Ruter and the Norwegian Public Roads Administration, and aims to improve existing and trial new transport services in close cooperation with businesses and residents.

The City Council is aiming to ensure that climate mitigation measures help to create a socially sustainable city which offers equal opportunities to all. Oslo is aiming to become a zero-emission society at the same time as differences are eliminated and everyone is able to have a decent working life. The Paris Agreement places a strong emphasis on a fair transition. The City of Oslo is actively working to ensure that grant schemes, amongst other things, reach the entire population, including low-income groups and both large and small businesses.

In Oslo, distributional effects must be assessed in all propositions that are submitted to the City Council and City Government. Section 6.2 of the Appendix to the Climate Budget 2023 presents an assessment of the distributional effects of measures to promote climate-friendly transport and construction sites, as these measures have a major impact the population and the business sector. Overall, the transport measures contribute to a redistribution of resources away from those who have access to a car to those who do not. The requirements imposed on the construction industry will result in increased costs for the entire industry, and may be more challenging for smaller players to implement.

A more detailed description is given below of how the City of Oslo is facilitating the involvement of the population and the business sector in the restructuring process. The role of central government and the work of the municipality internationally are also highlighted.

The role of the population

In order to achieve the necessary climate transition to a zero-emission city, the population must change their habits and make climate-friendly choices in their everyday lives. The most

important thing the City of Oslo can do to contribute to this is to facilitate urban development which promotes more efficient and climate-friendly transport. In order to reduce car use in the city, the City Council is facilitating urban life, green areas, pedestrians, cyclists, travel by public transport, and improved accessibility for public transport. Through long-term and targeted initiatives, public transport has been developed over a period of many years to become a genuine competitor to the car. Car traffic in Oslo has declined over time, but the COVID-19 pandemic has led to the development of a special situation for both public transport and car traffic.

At the same time, the municipality is also working in a number of areas to help ensure that the population is involved in the green transition, including targeted grant schemes and communication. Through the Climate and Energy Fund, the municipality runs a number of support schemes which are aimed at the general population, such as grants for solar panels, home insulation and charging infrastructure for housing cooperatives and jointly owned properties. These grant schemes are marketed and organised so that everyone receives information and has the opportunity to apply for grants.

The City of Oslo is also running a number of campaigns to promote the grant schemes and disseminate information concerning climate solutions and the role of the city in the climate work. Several of the initiatives are aimed at children and young people, including Klimaskolen.no, which is an online portal that is available to schools for educational purposes. Every year, Oslo's climate pilots give lectures to around 5,500 students in lower and upper secondary schools. The website Klimaoslo.no will help to raise awareness of the effect of climate mitigation measures, inspire and mobilise people to do their bit by presenting practical examples of climate transition. The Agency for Waste Management is also running information campaigns to increase recycling rates in households.

The Agency for Climate's annual [climate survey](#) indicates that many people have made climate-friendly choices during the year, and that they are likely to implement climate-friendly mitigation measures in the future. Compared with 2021, there has also been an increase in the number of people who have improved the energy efficiency of their homes, who use a climate-friendly mode of transport to get to work or school, and who have switched to an electric car, reduced the amount of meat they eat, and cut their food waste and consumption. The survey also indicates that there is broad and stable support for Oslo's climate goals, and that 58% of people believe that the efforts being made to achieve the climate goals are making the city a better place in which to live. At the same time, there is growing concern amongst the population that Oslo is not well-equipped to cope with climate change and extreme weather events.

The role of business and industry

The business sector plays a key role in enabling Oslo to achieve its climate goals. In particular, Oslo's business community can influence emissions by investing in zero-emission transport, developing solutions for a circular economy, and stipulating requirements for suppliers. In particular, the financial sector can contribute to restructuring through its investment strategies, if it is oriented in a way that promotes climate-friendly solutions.

The Agency for Climate's Climate Survey for 2022 indicates that more and more companies are taking part in the green transition. The proportion of companies seeing new commercial opportunities in the transition to a greener economy almost doubled between 2018 and 2022 (from 14% to 27%). The proportion of companies that consider it important to be seen as climate- and environment-friendly by their customers rose by twelve percentage points over

the same period (from 71% to 83%). Almost one in five companies now maintain an emission inventory.

The City of Oslo is working purposefully to contribute to the climate transition in the business sector. The strategy here is to lead the way by reducing emissions from its own enterprises and projects, while the municipality is also working closely with the private sector to promote transition and green competitiveness. The City of Oslo has a productive dialogue with pioneering businesses through its own *Næring for klima* (Business for climate) network, which has 140 member businesses from across a wide range of sectors. Amongst other things, the cooperation enables the municipality to adapt its own grant schemes and incentives for climate-friendly transition to needs in the business sector. Oslo is also working with other actors, including Skift, the Eco-Lighthouse, Klimapartnere and the UN Global Compact, to improve climate accounting in the business sector. In 2022, Business for Climate launched a partnership for members in collaboration with the national Klimapartnere network. Partners receive assistance in preparing an [emission inventory](#) and submit annual reports to Business for Climate.

Much of the business community in Oslo is innovative and at the forefront of the climate transition. A number of major companies have taken on the role of leading the Green Shift and demanded stronger climate action from the national authorities through, for example, the *Skift – Næringslivets klimaledere* (Skift – Business Climate Leaders) climate network. Major players such as Posten, DHL and DB Schenker distribute goods emission-free from their own distribution centres at Filipstad, and Oslobuss is showing that tour bus operators can also switch to using zero-emission vehicles.

The business sector must help to boost demand for reused and recycled materials in order to bring about the transition to a more circular economy. In the construction industry, digital platforms and reuse centres can become important tools for promoting the use of construction materials. The retail sector also plays a key role in the transition to a more circular economy, with more sharing arrangements and higher rates of reuse.

The transition to zero-emission goods and service vehicles will be crucial if Oslo's climate goals are to be achieved. Through the project entitled 'Pioneering city for zero-emission heavy transport', the municipality is working closely with the business community to accelerate the transition to zero-emission heavy transport. By the end of 2022, Everfuel and Gasum will have established energy stations which offer hydrogen, biogas and charging at the municipality's sites in Kjelsrud and Ryen. These will be important for both commercial transport and taxis. As of 1 September 2022, 30% of trucks (over 3.5 tonnes) sold in Oslo are powered by electricity or biogas, almost three times the proportion for Norway as a whole.

The transition necessary to achieve Oslo's climate targets is very comprehensive. Despite many good climate mitigation measures and examples of future-oriented solutions and businesses amongst Oslo's business community, the solutions still need to be disseminated on a large scale, and even more businesses must take the steps that are needed. The transition to a zero-emission society also requires expertise and resources which not all companies possess. Small businesses in particular may need assistance in order to make the necessary changes. The operators who have progressed furthest in re-aligning their strategy and taken the lead in introducing new solutions will be best equipped to retain access to markets and capital as climate regulations imposed by the EU, greater weighting of climate risk in the finance sector and stricter climate requirements for procurements are escalated over the coming years.

The role of central government

In order to achieve its own climate goals, Oslo is dependent on national framework conditions and climate policy. At the same time, central government is also dependent on municipalities facilitating emission reductions if Norway is to achieve its climate goals and fulfil its international commitments.

The central government has its own measures which are vitally important for Oslo's climate goals and establishes the framework in which municipalities can conduct their own climate policy, through legislation, among other things. The City of Oslo is working with central government to create more room for implementation of local climate mitigation measures, and to ensure an adequate level of ambition at national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party with regard to new policy developments, and establishing clear expectations for national authorities. Some examples are presented below of key climate mitigation measures where Oslo wants to encourage cooperation and greater effort on the part of central government.

More legal room for manoeuvre:

- The Planning and Building Act must be reviewed and strengthened as a climate tool for the municipalities
- Central government must establish the legal framework for Oslo and Bergen to introduce a pilot project with a zero-emission zone, as already planned.
- Municipalities should be given legal powers to set specific climate requirements for commercial bus routes and require private operators to charge for parking

Tax policy:

- Central government should increase the one-off registration tax on ICE vehicles and ensure that the leasing of ICE vehicles becomes less attractive, in order to stop sales of ICE vehicles by 2025, in line with the Storting's goal
- Central government should increase the carbon tax for waste incineration in order to provide sufficient incentives to reduce emissions from waste incineration

Financing/investment:

- Key public transport projects in Oslo are underfunded. Price and cost rises in recent years for infrastructure projects, including the Fornebu Line, make this situation more precarious. Central government must prioritise investments in and operation of public transport, and give less priority to investment in roads which generate growth in car traffic towards the cities and do not contribute to attainment of the climate and road transport goals.
- There is a need for a charging strategy which will secure the development of a holistic infrastructure for electric vehicles. As publicly available charging infrastructure for heavy vehicles is virtually absent in Norway as of 2022, heavy vehicles must be given extra emphasis in the charging strategy.
- Central government support through ENOVA and the Klimasats grant scheme should be increased

Other measures:

- Make the climate targets a guiding principle for assignments for the transport agencies that will form the basis for the new National Transport Plan
- Central government should establish a common standard for corporate emission inventories
- In order to achieve the other main goals of the climate strategy, there is a need for:
 - A better framework which will make it easier and more profitable to exchange locally produced energy in neighbouring areas
 - A clearer national framework for stormwater management, for example by clarifying responsibilities
 - Better framework conditions for a circular economy, for example in order to increase sorting and material recycling, especially plastic waste from the private sector

International work

International cooperation plays an important role in the City of Oslo's work relating to the climate. Firstly, international cooperation presents the municipality with an opportunity to bring about greater diversity in the solutions that are used to achieve the adopted climate goals. Secondly, the cooperation is important for developing global markets which demand emission-free technology. Thirdly, international cooperation is an opportunity for Oslo to contribute on the international stage with solutions where Oslo is a leader.

In Europe, Oslo works particularly closely with the EU. Oslo has applied for, and been awarded, the status of one of the EU's 100 climate-neutral cities. Participating cities can apply for funding from Horizon Europe, the EU framework programme for research and innovation. Given that Norway has an agreement to implement the climate target for 2030 in cooperation with the EU, the EU's climate policy becomes even more important as a framework than was previously the case. Oslo has therefore been actively working to influence the EU's major climate package "Fit for 55", which was presented in July 2021, both through Eurocities and through input to the Norwegian government. Oslo is also participating in a number of other cooperation arenas, such as the EU project MOVE 21, an innovation project for testing new mobility and logistics solutions.

Globally, there is a demand for knowledge concerning Oslo's experiences and results. In the autumn of 2020, the municipality established a closer collaboration with C40 – a global climate network for cities – which aims to further develop and share climate solutions in areas where Oslo is a leader, with a particular focus on zero-emission construction sites, climate management and climate budgets. During 2022, Oslo was the lead city in C40's pilot concerning climate budgets. This pilot has helped cities such as London, Paris, Los Angeles, Rio de Janeiro and Mumbai to develop their first climate budgets.

Through Eurocities, the Carbon Neutral Cities Alliance (CNCA) and Local Governments for Sustainability (ICLEI), Oslo is helping to grow markets for new climate solutions and drive better national and international framework conditions for the implementation of climate mitigation measures. In order to boost demand for zero-emission machinery, Oslo is participating in forums such as C40 Clean Construction and the EU Big Buyers Initiative, where we both share experiences from zero-emission construction sites and work to encourage more

cities to stipulate requirements in public procurements. Manufacturers of machinery are also actively represented in this context.

The City of Oslo's follow-up of the climate strategy

Oslo's climate strategy towards 2030 (Proposition 109/20) contains five overarching objectives, along with 16 associated priority areas. Implementation of the strategy is a prerequisite for achieving Oslo's ambitious climate targets, contributing to emission reductions outside the boundaries of the City of Oslo, and ensuring that Oslo is equipped to meet climate change. In the annual budgets, the City Council must show how the climate strategy is being followed up. A brief description is given below of the key initiatives in 2023 and the work that will be done during the economic plan period under the main targets (main target 1 is discussed in the previous chapters, as it forms part of the Climate Budget).

In addition to the review below, there are also a number of cross-cutting initiatives and development projects under the auspices of the municipality which will help to meet several of the targets in the Climate Strategy. For example, Bykuben, Oslo's centre for urban ecology, is working to promote climate-friendly urban development and sustainable urban life.

Land use section of the municipal master plan

Revision of the City of Oslo's land-use section in the municipal master plan in accordance with the visions set out in the societal section for a greener, warmer and more creative city with room for everyone will be pivotal to fulfilment of the Climate Strategy. One of the main aims behind the revision will be to contribute to attainment of the target of a 95% reduction in GHG emissions in the municipality through urban development along the Metro network and the prioritisation of development from the "inside out", along with the facilitation of a robust city in the face of climate change. Land-use priorities and provisions in the land-use section of the municipal master plan also represent important prerequisites if Oslo is to achieve its climate targets.

In order to bring about a successful climate transition, land must be made available for climate-friendly infrastructure, such as charging, freight consolidation and bulk material handling. Successful densification will require community functions, biodiversity, watercourses and green areas in the local environment to be safeguarded and strengthened. As part of the work relating to the land-use section of the municipal master plan, the City Council will facilitate these considerations at an overarching level. New process requirements linked to climate will provide predictability for the players concerned. This will be necessary for the transition to a zero-emission city.

Climate management

The City Council Declaration dating from 22 October 2019 states that "The City Council will highlight climate impacts and distributional consequences in all relevant propositions submitted to the City Council. Furthermore, priority area 14 of the Climate Strategy reads as follows: "The City of Oslo's system for climate management will be developed further. [...] Considerations relating to emission reductions and a changing climate shall be taken into account in all relevant decisions".

Against this background, the City Council has decided that climate impacts must be examined, where relevant, in matters that are to be decided by the City Council or the City Government.

The City Council and City Government must be aware of the consequences of their decisions. The municipality has a good overview of sources of GHG emissions and mitigation measures and measures for reducing emissions, including in the Climate Budget. At the same time, there is a need for a system which also indicates whether decisions will lead to an increase in emissions or greater vulnerability to climate change.

The Agency for Climate has drawn up a guide for assessing the climate impact of cases. This will be shared with all the municipality's enterprises and used to assess climate impacts in case documentation for consideration by the City Council and City Government.

The Agency for Planning and Building Services has developed a tool for calculating the climate effect of the municipal master plan's land-use section and submitted plans, which will be used to assess the climate impact of transport, land use and buildings in context. This is in addition to a set of climate criteria for use in the consideration of planning and building applications.

The City Council has previously stipulated that climate assessments of budget input and planning matters must be carried out. The City Council is working to revise the Standard Specification of Requirements for the City of Oslo (SKOK). SKOK applies to various types of purpose-built buildings, and consideration is being given to stricter environmental and climate requirements, amongst other things. With the City Council's decision that climate assessments must be highlighted in all other propositions that are submitted to the City Council and City Government, the municipality is further developing the management system for climate.

Goal 2 Oslo's natural environment shall be managed in such a way that natural carbon storage in vegetation and soil is protected and the GHG removal in forests and other vegetation increase towards 2030

Safeguarding of carbon sinks and increasing uptake of GHG in forests and vegetation apply to both the construction zone and Marka. According to the Norwegian Environment Agency's emission inventory for forestry and other land use, uptake in forests increased from 106,000 tonnes CO₂eq in 2010 to 113,000 tonnes CO₂eq in 2015, equivalent to an increase of 6.5% (7,000 tonnes CO₂eq). At the same time, emissions of around 20,000 tonnes of CO₂eq were caused by land degradation. Thus, the statistics show that CO₂ emissions associated with land degradation exceed the CO₂ uptake of forests. Although these statistics are subject to considerable uncertainty, it is anticipated that the next publication, which will be available during 2022, will be improved in a number of respects.

Oslo will manage forested land in a way which has a positive effect on the climate, biodiversity and outdoor recreation. In this context, 'climate' means that forests are less vulnerable to climate change, that carbon sinks are protected, that the uptake of CO₂ is increased and that efforts will be made to use timber for durable, high-quality products. The City Council for Environment and Transport has approved 13 mitigation measures concerning the management of the City of Oslo's forests which take these considerations into account. The most comprehensive and important principle is that the City Council will continue its efforts to convert the forest to multiaged and mixed forests with a higher proportion of pine and deciduous trees. This is a method of forest management which simulates the natural development of the forest through, among other things, selective harvesting and natural rejuvenation. In 2023, further work will be carried out to operationalise the mitigation measures in cooperation with the Agency for Climate and the Department of Urban Environment. Examples of mitigation measures include increasing the cycle period prior to logging, determining the overall logging level and thinning intensity based on climate

considerations, assessing more climate-optimal utilisation of timber from thinning, and continuing and further developing the work relating to wetland restoration.

It is furthermore assumed that the destruction of wetlands should not take place, and that deforestation should only take place when compelling reasons indicate that it is appropriate. Wetland contributes many benefits, such as carbon sequestration, flood mitigation, biodiversity and important landscape elements for outdoor recreation. Since 2007, the City of Oslo has restored over 400 acres of marshland and gained considerable experience and knowledge in the discipline which will be developed further.

Furthermore, an assessment will be made as to how, through the stipulation of requirements in procurements, the municipality can grow demand for slow-growing and sustainable timber of larger dimensions, which in turn can contribute to durable, high-quality timber products, and with an increase in the proportion of timber which is utilised.

Within the building zone, a number of strategic initiatives and projects have been initiated which will bring us closer to achieving our targets. On behalf of the Agency for Climate, NIBIO has created a map showing the areas in the construction zone where there is carbon uptake and emissions in the construction zone, along with the capacity of these areas to tackle climate change, such as regulating temperature and delaying precipitation.

Goal 3 Oslo's total energy consumption in 2030 will be reduced by 10% compared with 2009

Total energy consumption includes the consumption of electricity, district heating, wood-firing, heating oil/kerosene and petroleum products in the transport sector. No official combined energy inventory is currently compiled for Norwegian municipalities. Together with Stavanger, Bergen and Trondheim, the City of Oslo has asked the national authorities to establish a national energy inventory for Norwegian municipalities. The municipal has compiled figures for energy consumption based on statistics from Statistics Norway, the Norwegian Environment Agency's municipal emission inventory and the Norwegian District Heating Association. The figures do not include biofuel use in the municipality. The calculations show that total energy consumption in Oslo fell by 13% during the period 2009 to 2020, excluding biofuels. At the same time, the population has grown by 20%, indicating that energy consumption per inhabitant has decreased further. The decrease is considered to be due to improvements in energy efficiency as a result of the transition to electric cars and a shift away from the use of heating oil for heating buildings to more energy-efficient solutions. Electricity consumption has remained fairly stable over the period and accounted for 66% of total energy consumption in 2020. Electricity consumption is expected to increase as a result of electrification across numerous sectors.

Due to the high price of electricity and the challenging energy situation in Europe, the City Council wants the municipality to further step up its efforts to increase energy efficiency and production. In May, the European Commission presented a plan (REPower EU) which, if adopted, will see massive investment in solar energy across Europe and Norway, such as solar panels on all new public buildings by 2026, and on existing buildings by 2027. The Commission is also proposing to raise its target for reducing energy consumption from 9% to 13%, excluding biofuels. The City Council is proposing to set aside an additional NOK 132 million in 2023 for energy efficiency measures and the installation of solar panels on its own buildings. Including VAT reimbursement, this will enable mitigation measures costing NOK 165 million to be funded. In addition, NOK 9 million has been incorporated into the adopted financial plan in

2023, meaning that a total of NOK 174 million has been allocated for this purpose in 2023. By ensuring that the municipality's enterprises, inhabitants and businesses both adopt more energy-efficient solutions and produce more local energy, energy will be freed up for the massive electrification process that will be needed in the transport and construction sectors in order to achieve the goal of a 95% reduction in emissions by 2030.

The Climate Strategy also includes an aim for a higher proportion of the energy that is consumed in Oslo to be produced locally. The municipality already produces compressed biogas from sewage sludge at Bekkelaget treatment plant, as well as liquefied biogas from sewage sludge at Slemmestad (Veas), and biogas is produced from Oslo's food waste at the Romerike biogas facility.

To ensure that energy planning in the municipality is followed up in a coordinated manner, the City Council is proposing that NOK 2 million be set aside in 2023, followed by a further NOK 4 million annually thereafter, in order to establish an energy entity within the Agency for Climate. The work relating to energy issues will impact on many enterprises in the municipality as regards urban development, new-build, existing buildings, access to electrical power for charging purposes, and district heating and cooling. The energy entity will be given a special role in coordinating multiagency municipal work.

In the particularly challenging energy situation that we find ourselves in at present, the City Council is looking to increase support for energy efficiency improvements and local energy production in households and businesses. A proposal has therefore been put forward to increase the Climate and Energy Fund's grant limit from NOK 120 million to NOK 150 million in 2023. The support rates for energy efficiency measures and the installation of solar cells will be increased to provide a particularly strong stimulus for the implementation of such mitigation measures. This increased support will initially be made time-limited to the end 2023 in order to stimulate rapid action. The City Council will continuously assess the need for further adjustments to the fund's priorities in this situation.

This increased support will be time-limited through to the end of 2023, in order to stimulate swift action and avoid draining the fund of resources too rapidly.

Goal 4 Oslo's capacity to withstand climate change will be strengthened towards 2030, and the city will be developed so that it is prepared for the changes projected by 2100

One of the greatest challenges for Oslo as a result of climate change is increasingly frequent episodes of torrential rain and subsequent stormwater and urban flooding. To meet this challenge, the municipality has adopted a stormwater action plan (Proposition 291/19). The work relating to stormwater management is coordinated by the Agency for Planning and Building Services. The ongoing work to develop thematic maps for stormwater and urban flooding will create an invaluable source of data in efforts to ensure safe stormwater management in Oslo. The municipality is preparing a guide for stormwater management, which will be an important tool in the dialogue with developers and private individuals. The Agency for Planning and Building Services is revising the regulations concerning the blue-green factor. This is a tool which is used to safeguard blue-green structure (waterways and green areas) in construction projects in the city.

Oslo Municipality Water and Sewage Administration is continuing its important work relating to stream openings. Hovinbekken will be opened up as part of the upgrade of Klosterenga park, with completion scheduled for 2023. Oslo Municipality Water and Sewage Administration is

carrying out a preliminary project in partnership with the Department of Urban Environment concerning opening-up of the Bakåsbekken stream in Furuset. The Agency for Climate coordinates pilot projects aimed at delaying stormwater (forested land retains rainwater) by safeguarding bottom vegetation in Marka.

Appropriate land management will be important in Oslo's efforts to become a climate-resilient city. The ongoing work on the land-use section of the municipal master plan is laying foundations which will enable Oslo to be developed so that it can cope with climate change. Pivotal to this are planning provisions relating to risk and vulnerability analyses and work to safeguard waterways and green areas in the construction zone. Safeguarding the city's natural waterways and green areas is important for urban nature, natural stormwater management, temperature regulation and experience qualities. Bykuben's project "Oslo Trees", which aims to plant 100,000 more trees in the city, represents an important contribution to this work. A total of NOK 9.5 million has been set aside annually to the "Oslo Trees" project in the economic plan.

The City Council is committed to safeguarding biodiversity and creating robust ecosystems in order to facilitate nature's own ability to adapt to climate change. The Agency for Climate and the Department of Urban Environment have initiated a pilot project to reintroduce eelgrass in the Oslo Fjord. Eelgrass plays a key role as a habitat for the fry of many species, improves water quality and prevents erosion. The successful reintroduction of eelgrass will have positive impacts on biodiversity and carbon uptake and storage. The Department of Urban Environment is also carrying out extensive work aimed at preventing and combating non-indigenous species which will find it easier to gain a foothold in a changing climate.

Goal 5 Oslo's contribution to GHG emissions generated outside the municipality will be substantially lower in 2030 than in 2020

The City of Oslo, businesses and the population of Oslo contribute to GHG emissions outside the municipality's borders through, for example, the purchase and transport of goods. These "indirect emissions" are not included in the Norwegian Environment Agency's municipal emission inventory. The City of Oslo is working to ensure that Oslo's GHG emissions outside the municipality are significantly lower in 2030 than in 2020. In the future, the City Council will follow up the work relating to indirect emissions in a more systematic way through, among other things, the use of a set of indicators; see the proposal for a preliminary set of indicators below. The municipality has been awarded NOK 1.5 million from the Klimasats grant scheme to develop a management system to reduce indirect emissions. Amongst other things, this will entail further developing the indicators in order to be able to monitor developments in these emissions (see the further discussion of the indicators below).

[The City Council's new and strengthened initiatives for reducing GHG emissions outside the municipality](#)

Reduce GHG emissions from materials in the municipality's new and refurbished buildings by 30%

The City Council is now taking an important step forward in its efforts to reduce indirect emissions and has set a target of reducing GHG emissions from materials used in the municipality's new and refurbished buildings by 30%, compared with the emission levels for

materials in FutureBuilt ZERO's baseline trajectory. Find out more about this under "new/strengthened" initiatives in the introduction to the Climate Budget.

Climate requirements in procurements

The City of Oslo is a major buyer and makes purchases worth just under NOK 30 billion annually. The City Council is working to ensure that the municipality facilitates redesign, repair, refurbishment, upgrading and second-hand purchases in joint purchase agreements concerning furniture, textiles and ICT. The municipality (represented by the Agency for Improvement and Development) is furthermore working to develop a tool which can measure emissions caused by the municipality's purchases. This could become an important tool in the municipality's systematic work to reduce emissions from its purchases. Environmental declarations on products can provide useful and comparable information, making it easier to choose the most environmentally and climate-friendly products. In 2023, the City of Oslo will continue to work on implementing environmental declaration requirements in procurements.

Sustainable food, reduced meat consumption and reduced food waste

The City Council is working to halve food waste in its own enterprises and per inhabitant by 2030. Meat consumption by the municipality's own enterprises will be halved by the end of 2023, and the proportion of fruit, vegetables, legumes and seasonal goods will be increased amongst municipal enterprises. The City Council will continue to work to establish new joint purchase agreements concerning food which will underpin the goals.

The City Council is investing in plant-based food in order to safeguard climate, nature, food security, self-sufficiency, health and animal welfare.

From January 2022, vegetarian food will be the standard choice at the municipality's meetings and events. Furthermore, the City Council will facilitate learning, concentration and motivation in Osloskolen by offering free, healthy and sustainable school meals from the start of the 2022–2023 academic year in upper secondary schools, and from the start of the 2023–2024 academic year in lower secondary schools. This scheme will cover a total of 36,900 pupils. In the 2022-2025 Economic Plan, NOK 40 million was incorporated for school meals in upper secondary schools annually from 2023 onwards. It is now proposed that this be increased by a further NOK 19 million, to NOK 59 million annually. In the 2022-2025 Economic Plan, NOK 28 million was incorporated for school meals in upper secondary schools annually from 2023, rising to NOK 56 million annually from 2024 onwards. It is now proposed that this be increased by a further NOK 15 million to NOK 43 million in 2023, and by NOK 19 million to NOK 75 million annually from 2024 onwards.

Reduced traffic with fewer cars and less road building

The City Government has adopted a goal of reducing traffic by one third compared with 2015. Reduced traffic results in reduced direct and indirect emissions. Making it less attractive to own your own car can take cars off the road, and thus reduce emissions from their manufacture. The City Council will not build major new roads/motorways, and it will work to scale down existing roads and reallocate land from road transport to green purposes. This will also help to reduce indirect emissions, including those from the manufacture of asphalt, etc. For more information about traffic reduction measures, see the discussion of the adopted policy measures in the Climate Budget (above). The City Council is proposing to set aside NOK 1 million in 2023 and NOK 1 million in 2024 for a pilot scheme where two districts use car-sharing services on the market, rather than their own vehicles. By requesting car-sharing services, the municipality is helping to build up the market for the car-sharing vehicles. An

increase in the number of car-sharing vehicles could help to reduce indirect emissions. In addition, the City Council is proposing to set aside a total of NOK 4.5 million during the period 2023-2025 to establish a fleet management tool for vehicles and machinery in the City of Oslo's enterprises. Furthermore, NOK 0.5 million will be set aside annually from 2024 for operation of the tool. A fleet management tool which provides an overview of the vehicles and machines that are in use and their location, booking status, etc. will make it easier to share the municipality's 1,500 vehicles and 2,000 machines.

Indicators for consumption-based GHG emissions

The City of Oslo is working to develop a set of indicators for consumption and indirect emissions from the municipality's enterprises, the city's population and the business sector. Transport, construction materials, meat consumption, food waste, electronics, furniture and fixtures and fittings have all been identified as important categories that the municipality will focus on in order to reduce indirect emissions. The purpose of the indicators is to obtain a better basis for measuring developments in indirect emissions and consumption with respect to the targets in the Climate Strategy and the Strategy for Sustainable and Reduced Consumption. The indicators will also contribute to the development of targeted policy measures. However, the indicators will not necessarily provide any information on trends in total consumption and overall indirect emissions in Oslo.

In a study, NORSUS et al. calculated indirect emissions from purchases of goods and services in the municipality's enterprises, as well as indirect emissions from mobility from the municipality's enterprises, residents and business sector. Partly on the basis of data from the study, the Agency for Climate has developed a preliminary set of indicators for indirect emissions (see Table 2.4, which provides a general overview):

Transport – population and business

According to NORSUS et al., indirect emissions from cars and commercial vehicles in Oslo amounted to almost 870,000 tonnes CO₂eq in 2019. This figure includes emissions from the production of fuel and the manufacture and maintenance of vehicles and infrastructure (e.g. materials for road building). According to the Norwegian Environment Agency's emission inventory, direct emissions from cars and commercial vehicles in Oslo amounted to around 530,000 tonnes CO₂eq in the same year. These calculations were performed using different methodologies and delimitations and are therefore not comparable. The figures for indirect emissions are subject to considerably greater uncertainty than those for direct emissions in the Norwegian Environment Agency's emission inventory. Nevertheless, the figures confirm that emissions from the manufacture of cars and road building result in substantial GHG gas emissions, and the key mitigation measures for reducing indirect emissions from transport are to cut the number of cars on the roads of Oslo and reduce road building.

- Indicators for the number of cars in use by the general population and the business sector are included in the preliminary set of indicators. No figures to enable the development of an indicator for reduced road building are currently available

NORSUS et al. calculated the emissions from air travel by Oslo's inhabitants and businesses as being 140,000 and 15,000 tonnes CO₂eq respectively in 2019. This figure includes production emissions and fuel combustion, in addition to emissions relating to the manufacture and maintenance of aircraft and infrastructure. The underlying data for aircraft emissions is significantly weaker than that for car emissions, and intercontinental travel is not included in the calculations. Irrespective of the uncertainties, these figures show that emissions from air

travel are substantial, and that it would help to reduce indirect GHG emissions if people in Oslo and businesses were to fly less frequently.

- An indicator based on questionnaire surveys will be used to measure developments in air travel amongst the business sector and the general population, even though this indicator is considered to be subject to some uncertainty. No more robust underlying data is currently available, but the Agency for Climate is working on this.

Transport/vehicles – the municipality's enterprises

Indirect emissions from the municipality's own vehicles and machinery were estimated to amount to around 3,500 tonnes CO₂eq in 2019. Reduced numbers of vehicles and machines and reduced road building will help to reduce indirect emissions. The municipality's enterprises already submit reports on the number of vehicles and machines.

- Indicators for the numbers of vehicles and machines in the municipality and an indicator for the proportion of municipal roads constructed using climate-friendly asphalt are included in the preliminary set of indicators. Underlying data and a definition of what constitutes climate-friendly asphalt must be developed. This may change over time as the manufacturing process and use of materials evolves.

The report from NORSUS et al. showed that municipal air travel emitted 140 tonnes CO₂eq in 2019. These figures are very uncertain and are based on bookings through the travel agency Berg-Hansen. However, not all municipal employees book flights through this framework agreement.

- An indicator for municipal air travel will be included in the final set of indicators, but the data must be developed further to make it meaningful to follow developments.

Construction materials

GHG emissions from materials for buildings and infrastructure are estimated to account for up to 50% of the indirect emissions generated by municipal enterprises. The new target of reducing GHG emissions from materials in new and refurbished buildings by 30% will therefore be very important for reducing indirect emissions from municipal enterprises.

- The percentage GHG reduction from construction materials in the municipality's new and refurbished buildings will be included as an indicator in the preliminary set of indicators.

Meat consumption and food waste

It is estimated that the production of food purchased by the municipality's enterprises generated around 12,000 tonnes CO₂eq in 2019, with the highest proportion of emissions originating from purchases of meat, which generates more than 3,000 tonnes of CO₂eq per year. For the inhabitants of Oslo, there are no good sources of data which provide any information on trends in meat consumption, although data can be obtained through the annual Climate Survey.

Food waste also results in substantial greenhouse gas emissions and is not very resource-efficient, and it is therefore relevant to monitor developments in food waste. Food waste is challenging to measure, but for residents, the quantity of discarded food waste and the proportion of food waste which is sorted are indicators which will supplement each other and

provide a picture of developments over time. It is also challenging to measure reductions in food waste from the municipality's enterprises. It is very resource-intensive to systematically weigh food waste for all the municipality's enterprises throughout the year.

- Indicators for kg of purchased meat per year and kg of food waste per user in municipal enterprises are included in the preliminary set of indicators. For inhabitants, indicators for kg of food waste discarded, proportion of sorted food waste, and reduction in meat consumption are included in the preliminary set of indicators.

Electronics

Purchases of electronics in the municipality resulted in emissions of around 7,400 tonnes of CO₂eq in 2019. Laptops accounted for the largest share of emissions.

- Indicators for the reuse of PCs and mobile phones respectively are included in the indicator set. In the further development of the indicators, consideration will be given to whether it would be appropriate to include indicators for this for the general population and the business sector.

Furniture and interior fittings/fixtures

Emissions from the municipality's purchases of furniture and interior fixtures and fittings amounted to around 1,800 tonnes CO₂eq in 2019. Institutional furniture accounted for the largest contribution to GHG emissions during the period. In the further development of the indicators, consideration will be given to whether it would be appropriate to include indicators for furniture and interior fixtures and fittings, for both the municipality's operations and the general population.

General consumption

Quantifying indirect emissions from consumption by Oslo's inhabitants is challenging due to the lack of reliable data sources. Statistics Norway (SSB) now conducts a survey to determine what households in Norway spend their money on. SBB's consumer survey was last conducted in 2012. The new survey is expected to provide information on consumption by Oslo's inhabitants.

- 'Kilograms of waste per inhabitant' provides a certain amount of information on consumption by inhabitants, and indicators for total household waste, textile waste and plastic waste are included in the preliminary set of indicators. The proportion of reuse and material recycling of household waste, including sorted glass/metal in particular, is also included in the indicator set

[Preliminary indicator set](#)

The following table presents a preliminary set of possible data sources, along with an assessment of the quality of the data sources and the maturity of the indicators. Indicators that are considered to be mature have known data sources that can be obtained annually. In the case of indicators which are considered to be immature, it will be necessary to investigate further in order to determine whether any data sources are available. Data sources that are considered to be uncertain are those where the Agency for Climate is not sufficiently familiar with the data and is unable to assess whether the quality is good or poor. The Agency for Climate will continue to develop the indicators in 2022-2023.

The data sources for the indicators for the municipality's own enterprises are the most reliable and precise. In addition, within these categories, the municipality has the most measures for influencing indirect emissions. However, it is at city level that indirect emissions are greatest and where new policies will have the most benefit. It will therefore be important to have good measures and indicators which can also measure developments for both the general population and the business sector.

Once the set of indicators has been completed, it will be published on klimaoslo.no or the municipality's website. Reports based on the indicators must be submitted at least once a year, and the results will be published on the municipality's website/Klimaoslo by 1 June 2023.

Preliminary set of indicators for indirect emissions

Sector/ emission source	Proposed indicator	Data source	Data source quality	Maturity
Population and business sector				
Transport	Number of cars in Oslo per 1,000 inhabitants	SSB table 07849 Oslos Statistikkbank	High	Mature
	Number of commercial vehicles per 1,000 inhabitants	-	-	Immature
	Number of private flights per inhabitant per year	The Agency for Climate's Climate Survey Oslos Statistikkbank	Low	Mature
	Number of work-related flights per inhabitant per year	The Agency for Climate's Climate Survey Oslos Statistikkbank	Low	Mature
General consumption	Kg household waste per inhabitant per year	Oslo's environmental status Oslos Statistikkbank	High	Mature
	Kg textile waste per inhabitant per year	Oslo's environmental status Oslos Statistikkbank	Uncertain	Mature
	Kg plastic waste per inhabitant per year	Oslo's environmental status Oslos Statistikkbank	Uncertain	Mature
	Proportion of reuse and material recycling of household waste	Oslo's environmental status	High	Mature
Food/food waste	Kg food waste discarded per inhabitant per year	Oslo's environmental status	High	Mature

		Oslos Statistikkbank		
	Proportion of sorted food waste per year	Oslo's environmental status	High	Mature
	Proportion of inhabitants who have reduced their own meat consumption	The Agency for Climate's Climate Survey	Low	Mature
Operation of the municipality				
Transport and vehicles	Number of vehicles in municipal entities	Reporting from UKE	High	Mature
	Number of machines in municipal entities	Reporting from UKE	High	Mature
	Number of flights (per employee) per year	Reporting from UKE	Low	Mature
	Proportion of municipal roads constructed using climate-friendly asphalt (reused asphalt and/or plant-based binder)	-	-	Immature
Construction materials	Percentage GHG reduction from construction materials in the municipality's new and refurbished buildings	Reporting by Oslobygg	Uncertain	Mature
Food/ Food waste	Kg of purchased meat per year	Reporting from UKE (the Ministry of Local Government and Regional's system)	High	Mature
	Kg food waste per user	Reporting from entities	Low	Immature
Electronics	Proportion of reused PCs	Reporting from UKE	Uncertain	Mature
	Proportion of reused phones	Reporting from UKE	Uncertain	Mature

New appropriations for climate mitigation measures which underpin emission reduction targets 2, 3, 4 and 5 in the Climate Strategy

Indirect emissions

Operation

				Amounts in thousands
Name	2023	2024	2025	2026
Common fleet system for Oslo (vehicles and machinery)		500	500	500
Piloting of car sharing as a service for the City of Oslo's vehicles and machinery	1,000	1,000		
Free healthy and sustainable school meals in upper secondary schools	19,000	19,000	19,000	19,000
Free healthy and sustainable school meals in lower secondary schools	15,000	19,000	19,000	19,000
TOTAL	35,000	39,500	38,500	38,500

Investment

				Amounts in thousands
Name	2023	2024	2025	2026
Common fleet system for Oslo (vehicles and machinery)	1,500	1,500	1,500	
TOTAL	1,500	1,500	1,500	

Energy measures

Operation

				Amounts in thousands
Name	2023	2024	2025	2026
Energy efficiency improvements - insulation of loft spaces	15,000			
Establish an energy entity to ensure coordinated follow-up of energy planning in the municipality	2,000	4,000	4,000	4,000
TOTAL	17,000	4,000	4,000	4,000

Investment

				Amounts in thousands
Name	2023	2024	2025	2026
Energy efficiency improvements - insulation	40,000			
Upgrading and establishment of automation, room control and ventilation control	19,500			
Replacement of heat exchangers and fans	7,500			
Energy conservation (ENØK) pool	50,000			
TOTAL	117,000			

The City Council is proposing to set aside an additional NOK 132 million (15+117) in 2023 for energy efficiency measures and the installation of solar panels on its own buildings. Including VAT refunds, this will enable NOK 165 million of financing for various measures. In addition, NOK 9 million has been incorporated into the adopted economic plan in 2023, which means that a total of NOK 174 million has been allocated for this purpose in 2023.

Climate adaptation

Operation

				Amounts in thousands
Name	2023	2024	2025	2026
Oslo Trees - safeguard local species diversity and reduce GHG emissions	9,500	9,500	9,500	9,500
TOTAL	9,500	9,500	9,500	9,500