



Oslo

# Climate budget 2024

Proposition 1/2024

## Climate Budget 2024

Oslo aims to reduce its direct greenhouse gas emissions by 95 % by 2030 compared to 2009-levels. To steer towards this goal, the city council is working to meet annual emission limits presented in the climate budget. From 2009 to 2021, direct emissions have been reduced by 30 %. With the measures adopted in this climate budget, Oslo can achieve a reduction of about 63 % by 2030 compared to 2009. At the same time, there is potential to reduce emissions in Oslo by up to 79 % in 2030 if new, identified measures are adopted and implemented. The climate budget shows that large emission reductions are possible, but for Oslo to reach its climate goal, there is a need both to strengthen existing measures and to identify and implement new ones.

### Estimated emission development in Oslo towards 2030

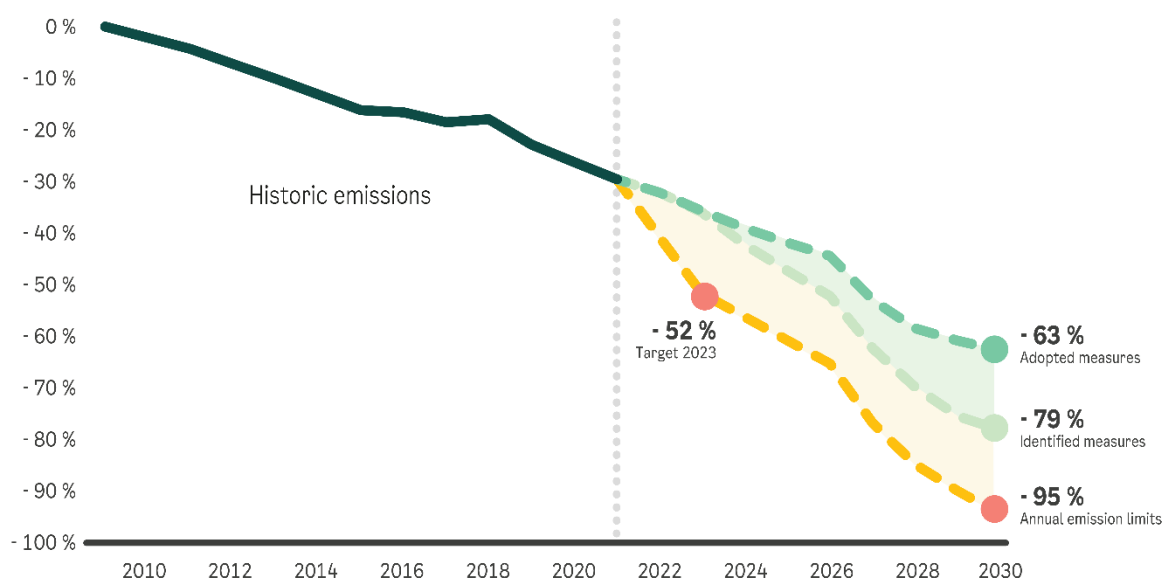


Figure 1: Estimated emission development towards 2030 as a result of adopted measures, potential for emission cuts if new, identified measures are adopted, and emission limit to reach the goal by 2030.

The City of Oslo uses the climate budget as a governance tool to systematize and target climate efforts. The climate budget is an integral part of the financial budget. Through the climate budget, climate efforts are placed on the agenda in all budget discussions and are included in the overarching budget documents. The responsibility for implementing measures and instruments is distributed among the municipal enterprises and involves reporting requirements on par with the rest of the financial reporting. The climate budget displays the measures and instruments being implemented to cut emissions within Oslo's borders (direct emissions). For the first time, the climate budget also includes emissions that occur outside of Oslo's borders, which are a consequence of the consumption of goods and services in Oslo (indirect emissions). The climate budget also describes key initiatives to achieve the goals in the Climate Strategy (case 109/20). The climate budget is presented for the entire financial plan period 2024-2027.

### The City Council's Enhanced Efforts to Cut Greenhouse Gas Emissions

Road traffic, waste incineration, and the use of diesel at building and construction sites accounted for nearly 90 % of the total greenhouse gas emissions within Oslo's borders in 2021. At the same time, Oslo has measures with the greatest emission reductions in the coming years in these sectors.

Road traffic alone accounts for more than half of the emissions, and the city council will take an even more systematic approach to reduce emissions from transport.

The Climate Strategy for Oslo towards 2030 has five main goals. The city council has several initiatives that contribute to achieving these goals. At the same time, national policies have obstacles for Oslo to achieve its climate goal. Therefore, the city council will intensify efforts to secure local autonomy to implement a more ambitious climate policy, such as granting municipalities the authority to demand Zero-emission construction and building sites, introduce a zero-emission zone for road traffic, require payment for parking on private property, etc.

The consumption of the municipality, the business community, and the citizens result in significant emissions outside the municipality. These are called indirect emissions. Oslo municipality has decided that Oslo's indirect greenhouse gas emissions should be significantly lower in 2030 compared to 2020. To strengthen efforts to achieve this goal, measures to reduce indirect emissions are included in this climate budget for the first time.

The Climate Budget 2024 emphasizes the implementation and strengthening of existing measures for the reduction of direct greenhouse gas emissions, in addition to presenting an overview of measures that contribute to reducing indirect emissions.

Some of the key initiatives in the Climate Budget 2024 include:

- Transition to zero-emission transport
- Electrification of construction sites
- Ambitious climate provisions in the land-use part of the municipal master plan
- Energy initiatives that will provide enough power and effect for the transition to a zero-emission city
- Reducing the municipality's indirect emissions

### Transition to Zero-Emission Transport

All personal cars and vans in Oslo are to run on electricity or hydrogen by 2030, and all heavy transport must be zero-emission or use sustainable renewable fuels. From November 2024, all taxis operating within the borders of Oslo municipality must be zero-emission vehicles, according to the regulation on environmental requirements for taxi transport in Oslo.

Emissions from heavy transport are estimated to increase towards 2030 unless new policies ensure faster electrification. In 2024, establishing charging stations for trucks will be important, and the city council will therefore ensure a massive effort on publicly available fast chargers for heavy vehicles. The Climate and Energy Fund has granted approval for 55 fast charging points which, if realized, could provide a much better availability for public charging for heavy transport during 2024. The city council proposes to strengthen the development of fast charging for electric heavy transport and taxis. It is proposed to allocate 10 million in 2024 and 10 million in 2025. Furthermore, through the Oslo Package 3 agreement (an overall plan for the development and funding of roads and public transport in Oslo and Akershus county), the city council has ensured that the exemption in the toll ring for trucks on electricity, hydrogen, and biogas lasts until 2027. Through the Oslo Package 3 negotiations in 2024, the city council will work for an agreement that helps fulfill the municipality's traffic and climate goals while providing funds for the investment and operation of public transportation. The competitive conditions between electric vehicles and fossil-fueled vehicles should be maintained or increased (to the disadvantage of fossil-fuel vehicles). The city council is

also working for the government to allow zero-emission commercial transport (heavy and light vehicles) access to the public transport lanes if electric personal vehicles lose access to these lanes.

The city council continues to invest in public transportation. For the school year 2023/2024, the price for a 30-day ticket for children and young people has been reduced to NOK 299. The purpose is, among other things, to change travel habits for children and young people from car/parental driving to the use of public transport and to reduce traffic and greenhouse gas emissions. In the action program 2023–2027 for the urban growth cooperation and Oslo Package 3, Oslo's share will go to pedestrian, bicycle, and public transport measures. In 2024, the funds will go to, among other things, the operation of public transportation and upgrading of tram depots, a new signal and safety system for the subway, and upgrading and capacity increase at Majorstuen station. NOK 1.5 billion is allocated to the Fornebu Line, and further about NOK 1 billion for upgrades on the tram and subway. Priority measures in 2024 include the upgrade of the Ekeberg Line between Konows gate and Ekebergparken, upgrading of Tøyen subway station, and maintenance on both the tram and subway networks.

### Electrification of Construction Sites

Since 2019, Oslo Municipality has required that all construction and building operations on behalf of the municipality shall be fossil-free, and zero-emission solutions are rewarded. New assessments show that the requirement can have a greater effect than previously estimated. From 2020, Oslo has also required fossil-free construction sites for private and state actors through new regulatory plans. The legal basis for the requirement is contested. The city council will work for the national government to quickly send a clear legal basis for zero-emission construction sites out for consultation.

### Ambitious climate provisions in the land-use part of the municipal master plan

In June 2023, the city council presented a proposal for a revised land-use part of the municipal master plan, which is on external consultation in the fall of 2023. The proposal is expected to lead to significant emission reductions, which are important for achieving the municipality's climate goals. The plan proposal includes requirements for greenhouse gas calculations in construction projects, zero-emission construction sites, and local, environmentally friendly, and circular handling of materials, material selection, and reuse. Furthermore, the proposal contains emission requirements for materials, requirements for local renewable energy production, and common energy solutions, as well as requirements facilitating electric commercial transport. The plan also proposes requirements for climate adaptation and carbon storage, including further strengthening of nature and green areas.

### Energy Initiatives to Provide Sufficient Power and Impact for the Transition to a Zero-emission City

Oslo Municipality is making significant efforts in energy efficiency both in its own operations and in the city, through, among other things, subsidy schemes for solar panels. At the same time, it is crucial to ensure an energy system that is equipped for the electrification needed towards 2030, with enough power and impact. In the revised budget for 2023, 2 million NOK was allocated to the project "Energy Supply in the Zero-emission City," which will implement measures to ensure that Oslo has a suitable and flexible energy system by 2030. The project lasts until 2025 and is operated by the Climate Agency.

## Reducing the Municipality's Indirect Emissions

The direct greenhouse gas emissions (emissions inside Oslo's geographical area) are covered by international climate commitments like the Paris Agreement and requirements for national emission inventories. The Norwegian Environment Agency publishes municipal greenhouse gas accounts for the direct emissions. A country or municipality has the most measures to influence direct emissions. Hence, direct emissions have been prioritized in Oslo's climate budget. Oslo's indirect emissions are challenging to calculate and will also be another municipality's or country's direct emissions. However, the indirect emissions from Oslo are significantly larger than the direct ones, and consumption contributes to significant use of natural resources. Therefore, it is important to work to reduce the emissions we contribute to outside Oslo's borders. To strengthen the effort, measures to reduce indirect emissions are included in this climate budget for the first time, with associated reporting requirements. By including indirect emissions in the climate budget, the work will be more systematized, and direct and indirect emissions can be seen more in context. Several new measures that the municipality will work with to further reduce indirect emissions have been identified, and processes have been initiated to explore and develop these measures.

## Oslo's Climate Goals

Oslo aims to become a city nearly without greenhouse gas emissions and well-adapted to changing weather patterns resulting from climate changes. In case 109/20 Climate Strategy for Oslo towards 2030, Oslo City Council adopted five main goals for the climate effort, as listed below. The climate strategy also contains a description of how these goals will be achieved. The climate budget addresses measures and tools for reducing emissions within Oslo's borders and those we are responsible for outside Oslo's borders through our consumption (goals no. 1 and 5 in the strategy). Climate work for the remaining goals is mentioned further down but does not have measures and tools that are part of this climate budget.

The five goals in Oslo's climate strategy towards 2030 are:

1. Oslo's greenhouse gas emissions in 2030 shall be reduced by 95 % compared to 2009.
2. Oslo's nature shall be managed so that natural carbon stocks in vegetation and soil are preserved, and the uptake of greenhouse gases in forests and other vegetation is increased towards 2030.
3. Oslo's total energy consumption in 2030 shall be reduced by 10 % compared to 2009.
4. Oslo's ability to withstand climate changes shall be strengthened towards 2030, and the city shall be developed to be equipped for the climate changes expected towards 2100.
5. Oslo's contribution to greenhouse gas emissions outside the municipality shall be significantly lower in 2030 than in 2020.

The need to work holistically towards all the five goals in the climate strategy has been clearly set on the agenda by the IPCC and the IPBES's latest reports. The impacts of climate change on nature are larger and more comprehensive than previously assumed, and it is necessary to view emission cuts and climate adaptation in conjunction. According to the IPCC, there is a window of opportunity that closes at the end of this decade to ensure a livable and sustainable future for all.

According to the European Environment Agency (EEA), the consumption level globally has exceeded the Earth's carrying capacity by more than 50 % and must decrease. This applies, according to the IPCC, especially in wealthy countries like Norway. Production and transportation of products lead to significant emissions of greenhouse gases, water consumption, extraction of virgin raw materials, air pollution, and land use. The EU's work with producer responsibility schemes, eco-design regulation,

environmental product declarations, and the right to repair etc., can contribute to reducing consumption. Therefore, the city council will support a fast national implementation of these schemes.

Since Oslo presented its first climate budget for 2017, the municipality has made significant progress in its climate work. This is visible in the estimates for the development of greenhouse gas emissions towards 2030 with adopted measures, presented in each climate budget. The estimates from the Climate Budget 2021 to today are shown in the figure below. They clearly show that the municipality's climate efforts are moving in the right direction with each climate budget. The climate budgets from the years before 2021 are not included, as it is not appropriate to compare with previous years due to a significant change in the greenhouse gas accounting in 2021.

### Expected development of GHG-emissions because of adopted measures in the Climate budgets for 2021 to 2024

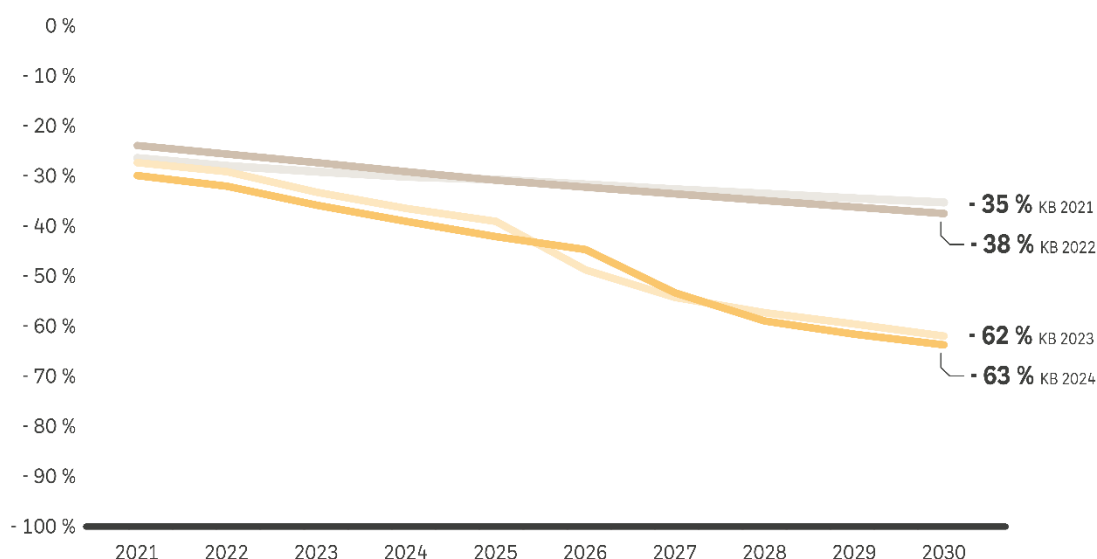


Figure 2: Estimates for GHG-emission development in the Climate budgets for 2021, 2022, 2023 and 2024 as a result of adopted measures.

There are several reasons why the projections towards 2030 have changed between the climate budgets. The phase-in of electric passenger cars has progressed faster than expected, and there has been a faster technological development for electric and biogas-powered heavy vehicles and construction machinery. In 2019, it was decided that all construction and building operations on behalf of the municipality must be fossil-free and that zero-emission solutions would be rewarded (city council case 1019/19). New assessments show that the requirement can have a greater effect than previously estimated. In 2020, requirements for fossil-free construction sites in new regulatory plans were adopted. In 2022, Oslo financed and started the construction of a carbon capture facility at Klemetsrud that will capture up to 95 % of the emissions from the waste incineration plant. These measures have led to significant changes in the projections from the Climate budget 2021. Some of the changes in the projections are also due to an increasing number of measures being calculated over the period.

Oslo collaborates with neighboring counties and municipalities through, among other things, the urban growth agreement, Oslo Package 3, the Oslo Region, the Eastern Norway Cooperation, as well as with the other major cities in Norway through a separate climate network and the KS city network. Since its introduction in 1990, Oslo's toll ring has been one of the city's most important climate measures by limiting traffic and reducing the share of private cars. Environmentally differentiated toll rates have also been an important incentive for the electrification of road transport.

In 2022, higher toll rates were adopted, as well as exemptions for heavy biogas-driven vehicles through the Oslo Package 3. It was also decided that the exemption for biogas and the existing exemption for heavy vehicles on electricity and hydrogen shall last until 2027. Such predictability for tariff exemptions in the coming years reduces financial risk for the business sector and is an important incentive to choose zero-emission vehicles.

The business sector plays a crucial role in solving the climate and nature crisis. To achieve the municipality's climate goals, there is close collaboration between the business community and the municipality, especially through the Business for Climate network. The network has 150 members from various industries. Members of Business for Climate provide the municipality with information used to develop targeted subsidy schemes and incentives for climate-friendly transition in the business sector. In recent years, the municipality has emphasized the development of charging infrastructure to develop the market for zero-emission heavy transport and introduced requirements for the use of fossil-free technology in the municipality's procurement. This has contributed to the transition to zero-emission and biogas vehicles in Oslo proceeding faster than expected, and the estimates for the phase-in of zero-emission vans and heavy transport have therefore been adjusted in the Climate Budget 2024.

Climate measures aimed at the business sector, such as environmental requirements for taxi licenses and requirements aimed at the construction industry, will have different implications for large and small businesses. Especially for small actors, the requirements can pose an economic burden in the transition phase to zero-emission solutions. To avoid uneven distribution because of the measures, the municipality works, among other things, to establish charging infrastructure and has subsidy schemes to reduce the costs of transition and increase the degree of innovation. The results from the Climate Survey 2022 show that businesses' attitudes towards climate measures from the municipality have moved in a positive direction. For example, 63 % report that they are positive to a heavier weighting of environmental and climate considerations in public tenders (compared to 45 % in 2018).

International cooperation gives the municipality access to solutions to achieve our climate goals and an opportunity to showcase our solutions globally. The municipality therefore actively participates in forums such as C40, the Carbon Neutral Cities Alliance (CNCA), the International Council for Local Environmental Initiatives (ICLEI), Eurocities, and the EU's mission for 100 climate-neutral cities. After Oslo initiated a Clean Construction Forum in C40 in 2019, 47 cities are now part of the program. Through the initiative, the solutions and measures Oslo has within zero-emission construction sites are spread globally, while the municipality gets the opportunity to discuss the best approach to new material requirements and reuse. The cooperation also contributes to increasing demand for zero-emission machines, which creates larger markets and lowers costs.

Oslo has also been a "lead city" in C40's pilot on climate budgets. The pilot has, among other things, resulted in London publishing its first climate budget after Oslo's model in 2023, and New York will present its first climate budget in 2024.

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 national climate goals. At the same time, Oslo depends on strengthened national measures to achieve this. Oslo is therefore actively working to expand the local scope for climate measures and to establish better framework conditions for climate-friendly transition.

The city council is committed to ensuring that climate measures contribute to creating a socially sustainable city with equal opportunities and decent work. All proposals for new climate measures from Oslo's entities are to include an assessment of distribution effects and potential mitigating measures. Vulnerability to climate changes is included in the Strategy for Reducing Social Inequalities in Oslo, which was addressed by the city council in the autumn of 2023 (186/23), and in the new public health strategy, climate and environment is an area of effort.

The New Oslo Model, which concerns standard requirements in Oslo municipality's procurements, came into effect on September 1, 2023. The Oslo Model is designed to ensure that Oslo municipality is a socially responsible and efficient purchaser, with requirements to safeguard human rights, decent working conditions, as well as climate and environmental considerations.

By facilitating increased urban life, green spaces, pedestrians, cyclists and improved accessibility for public transport, the municipality contributes to making it easier to make climate-friendly choices in everyday life. The city council has made significant efforts to keep public transport prices competitive and to increase the share of public transport journeys after the pandemic. In 2023, the prices for single tickets in public transport were reduced for the first time in 15 years. The price of monthly passes for children and youth was also reduced, and all asylum seekers can travel for free on public transport in Oslo and Viken county. The share of public transport journeys is back to roughly the same level as before the pandemic.

An important part of a fair climate transition is to include the citizens in processes that concern them. The organization UngOrg arranges the annual youth hearing on behalf of the City of Oslo, and in 2023 the theme was climate. The survey shows that young people feel they do not learn enough about the climate at school. Nearly 60 % of the youths responded that politicians should have shown the same decisiveness in addressing the climate crisis as they did during the corona pandemic, and more than half agree that those living in Oslo should do more to reduce climate emissions.

The Climate Survey 2023 shows that climate-friendly behavior is common among many of the residents in Oslo. Most people use public transport in their daily lives, reduce food waste, and choose electric cars – if they own a car. They also want to cut down on consumption, energy use, and the consumption of meat. 70 % of the respondents support the municipality's climate goals, and 75 % answer that it is important for Oslo to become a city that is more resilient to climate changes.

Through the Climate and Energy Fund, the municipality has several support schemes aimed at the population, such as subsidies for solar panels, insulation of homes, and charging infrastructure for housing cooperatives and condominiums. Additionally, Oslo Municipality has several initiatives aimed at children and youth. For example, Oslo's climate pilots give lectures to about 5,500 students in middle and high schools annually, and Klimaskolen.no is a competence portal with resources for climate and environmental education for teachers.



## Emission Development

### Direct Emissions

The Norwegian Environment Agency publishes an annual municipal greenhouse gas inventory for municipalities that shows the development of emissions within Oslo's borders (direct emissions). The latest figures in the greenhouse gas inventory are for 2021. The inventory shows that direct emissions in Oslo have been reduced by 30 % from 2009 to 2021. From 2020 to 2021, emissions decreased by 4,6 %, partly due to an increase in the share of electric cars.

### Development of GHG-emissions in Oslo from 2009-2021

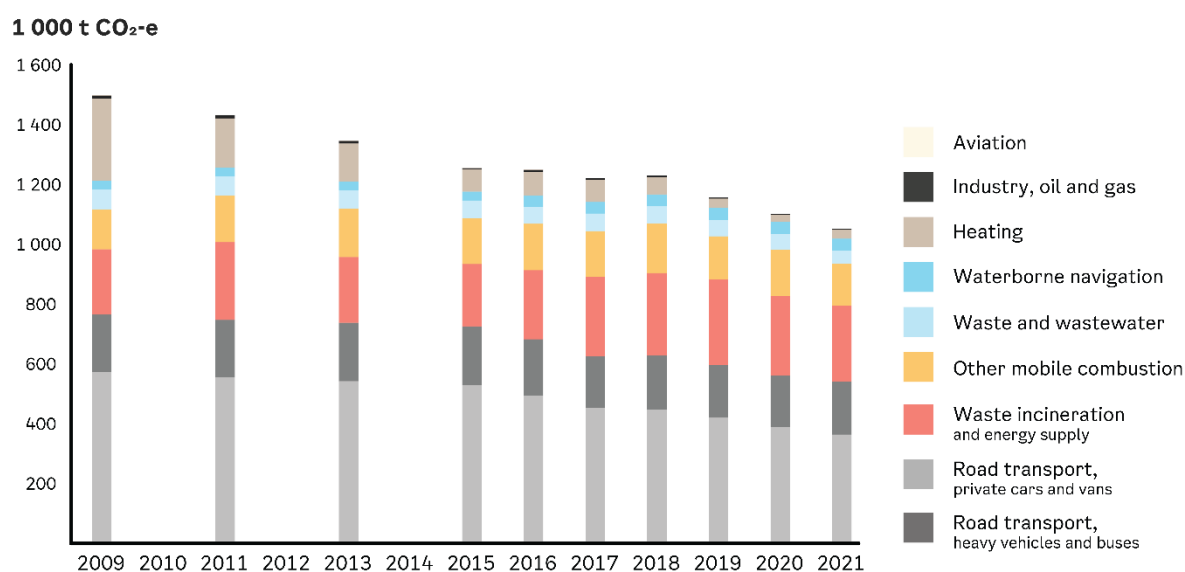


Figure 3: Greenhouse gas emissions in Oslo divided by emission sector, 2009-2021. Source: The Norwegian Environment Agency's municipal greenhouse gas inventory for municipalities.

As illustrated in the figure below, the largest sources of emissions in 2021 were road traffic, waste incineration, and energy supply (primarily from the incineration of plastic waste) and other mobile combustion. For more detailed information about the greenhouse gas inventory and the development of emissions from 2009-2021, see Chapter 2 in the Annex to the Climate Budget 2024.

## GHG-emissions in Oslo in 2021, divided by emission sectors

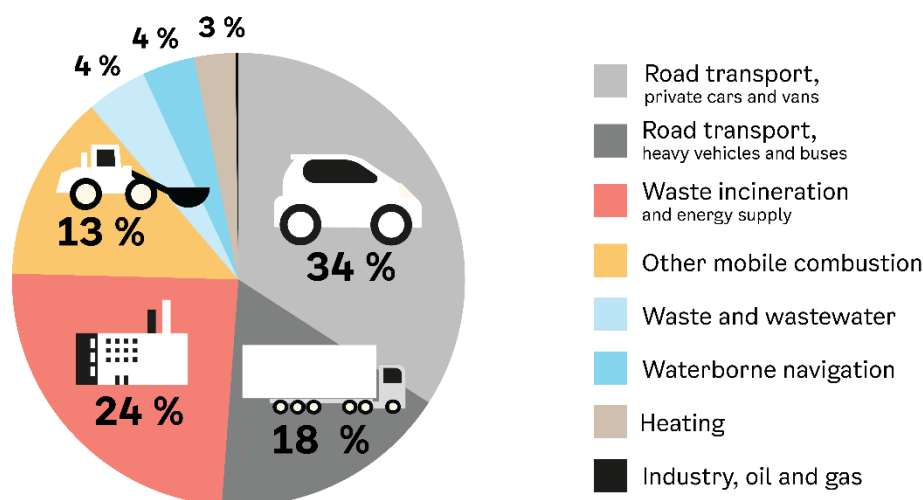


Figure 4: Greenhouse gases in Oslo in 2021, divided by emission source. Source: The Norwegian Environment Agency's municipal greenhouse gas inventory for municipalities.

The municipal greenhouse gas inventory still has significant uncertainties, especially within the category of "Other mobile combustion" (use of diesel in different machines). The effects of Oslo's measures and instruments are not captured, which remains a significant challenge. Oslo has implemented effective measures to reduce emissions from construction sites in particular.

However, the greenhouse gas inventory is continuously being improved, and "Other mobile combustion" is a prioritized area for improvement going forward. Oslo will continue to work with the Norwegian Environment Agency and Statistics Norway to include local data so that the effect of Oslo's measures is made visible.

To supplement the greenhouse gas inventory and indicate the status of emission development in Oslo, the municipality uses the [Climate Barometer](#). The Climate Barometer tracks developments in road traffic and waste incineration in Oslo, as well as the use of diesel at construction sites for the years before 2021.

### Indirect Emissions

Oslo municipality, the business sector, and the population contribute to greenhouse gas emissions outside the municipality's borders. These are called indirect emissions, distinguished from direct emissions occurring within the municipality's borders. Indirect emissions are mainly linked to our consumption of goods and services produced and transported outside Oslo. This involves emissions from the production of food, clothes, building materials, cars, electronics, and their transport to Oslo. Oslo can influence these emissions by setting requirements in procurement and facilitating reduced consumption and a more circular economy in the municipality.

### Indirect Emissions from Oslo Municipality

In recent years, the municipality has gained an increasingly better overview of the indirect emissions from the municipality's operations. The total indirect emissions from the entire municipality's operations are uncertain, but we have figures for certain categories of goods and individual projects

within construction and building. These are published on the Climate Barometer, which now shows emission development for both direct and indirect emissions.

The production and transport of construction and building materials are emission-intensive, and this is assumed to be the largest source of indirect emissions in the municipality's own operations. The exact quantity of this emission is unknown, but emissions from Oslo's building projects completed after 2020 have amounted to about 45,000 tons of CO<sub>2</sub> equivalents (eq.) from building materials. In addition, projects like the New Water Supply and the Fornebu Metro Line will contribute significantly to indirect emissions from material use.

Among selected categories of goods in the municipality's procurement, ICT-equipment accounts for about 20,000 tons of CO<sub>2</sub> eq. annually. Almost 70 % of these emissions are related to computers and accessories. The purchase of food in the municipality's operations amounts to about 10,000 tons of CO<sub>2</sub> eq. annually, of which about 40 % comes from the purchase of beef. The figures are calculated using data from Oslo municipality's procurement.

### Indirect emissions from Oslo municipality's procurements in 2022

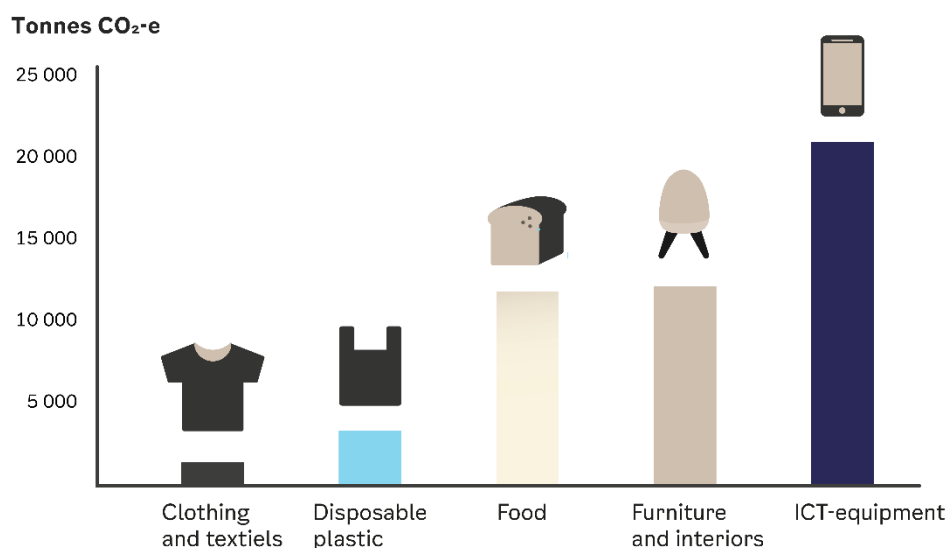


Figure 5: Indirect emissions from chosen categories of goods in Oslo municipality's procurements

### Indirect Emissions from the Population and Business Sector

Good data sources for indirect emissions of the population and the business sector are lacking. The development in household waste can provide an indication of consumption trends among the population. The annual amount of waste per person has significantly decreased since 2004, from 401 kg to 286 kg in 2022. Of this waste, the proportion of household waste going to material recycling increased from 27 % in 2004 to 41 % in 2022.

The production of cars and fuel used by Oslo's inhabitants and business sector is a major source of indirect emissions. The number of cars in Oslo has been stable in recent years at about 360 cars per 1000 inhabitants. The production of an electric vehicle usually results in higher indirect emissions than fossil-fuel cars, while the production of fossil fuel generates higher indirect emissions than electricity. Over the lifecycle (indirect and direct emissions), electric vehicles emit up to 70% less than fossil-fuel cars in Europe ([International Council on Clean Transportation](#)). In Norway, this

difference would be even greater due to a cleaner electricity mix. To reduce Oslo's indirect emissions from the car fleet, the number of both electric and fossil-fuel cars should be reduced.

Norwegians' consumption is among the highest in the world, purchasing more than twice as many shoes and clothes as the European average (Forskning.no 2023). Every year since 2017, the Climate Agency has conducted a survey that maps behavior and attitudes towards climate measures among the population and business sector in Oslo and the population of the Akershus municipalities. The survey has shown that climate-friendly behavior has become more common among Oslo's population (Opinion, 2023). In the last four years, an increasing number of respondents have reported consuming less than before. It is within the categories of clothes and furniture/interior that most respond they buy less new by reusing or repairing what they have. Oslo's inhabitants also respond that they have become better at reducing food waste, while the proportion that reports having reduced their meat consumption has steadily increased in recent years.

Within the business sector in Oslo, more work is being done with business models that include repair, redesign, rental, or second-hand sales, as well as in their own procurement, by requesting used and recycled goods and/or renting/leasing/sharing instead of owning. More than four out of ten businesses also report having implemented measures to reduce consumption of electronics, furniture and interior, food, and air travel.

## Proposed Resolution

To steer towards the goal of a 95 % reduction in emissions within Oslo's borders by 2030 compared to 2009, the city council adopts annual emission limits. The emission limits are ambitious, but contribute to maintaining the prioritized work of reducing emissions. The emission limits up to 2021 have not been met, but there has been an acceleration in emission reductions from 2018, and in 2021, Oslo was 4 percentage points away from reaching the emission limit of -34 %. Emission reductions are expected to continue in the coming years.

With the measures in this climate budget, it is estimated that emissions within Oslo's borders (direct emissions) can be reduced by 39 % in 2024 and 53 % in 2027 compared to the 2009 level. The table below shows the emission limits for reduced emissions within Oslo for the economic plan period 2024 and 2027, and the estimated emission-reducing effect of adopted measures including the baseline trajectory.

### Emission Limits within the Borders of Oslo Municipality 2024-2027

	2024	2025	2026	2027
Adopted measures (incl. baseline) I %	-39 %	-42 %	-45 %	-53 %
Adopted measures (incl. baseline) in tons CO2e	910 300	868 500	829 800	700 900
Emission limit in %	-57 %	-61 %	-66 %	-77 %
Emission limit in tons CO2e	651 300	583 000	514 800	341 800
Gap between adopted measures and emission limit in %	17 %	19 %	21 %	24 %
Gap between adopted measures and emission limit in tons CO2e	259 000	285 500	315 000	359 100

The city council must actively work to ensure the implementation of the measures that have been adopted, develop new and strengthen existing measures if Oslo is to reach the 95 % goal.

Oslo's contribution to greenhouse gas emissions outside the municipality should be significantly lower in 2030 than in 2020. Therefore, the city council will work to reduce indirect emissions (emissions outside Oslo) that occur as a result of the municipality's, business sector's, and inhabitants' consumption. Measures and instruments for reducing indirect emissions have been

proposed, and a set of indicators to track emission development is included in the Climate Barometer. This work will be further developed in the coming climate budget. No emission limits have been set for indirect emissions, as this is challenging to quantify.

Based on the above, the city council proposes the following resolutions for the climate budget in Case 1:

*The City Council requests the City Government to work towards a reduction in greenhouse gas emissions within Oslo's borders according to the emission limit towards a 95 % reduction by 2030. This involves an emission limit of -57 % in 2024 and -77 % in 2027, compared to the emission level in 2009.*

*Furthermore, the City Council asks the City Government to work towards a reduction in emissions occurring outside Oslo's borders due to activities from the municipality, the business sector, and residents of Oslo Municipality (indirect emissions). The City Council notes that it is challenging to quantify the effect of measures and instruments that reduce indirect emissions.*

*The City Council endorses the measures and instruments for reducing direct and indirect emissions in the Climate Budget 2024, Case 1. The City Government is to report, as part of the regular reporting to the City Council, on the status in the implementation of the instruments. For direct emissions, the report will cover the achievement of the emission limit in 2024 and 2027. The reporting is based on the status of the implementation of adopted measures, as well as the indicators in the "Climate Barometer."*

## Measures and Instruments for Reducing Direct Emissions

The table "Measures and Instruments for Reducing Direct Emissions" below shows adopted measures and instruments in the Climate Budget and the estimated emission-reducing effect of these within the economic plan period. The table also indicates which entity is responsible for the implementation of the instrument and who has reporting responsibility.

The shown effect is emission reductions occurring within the municipality's geographical boundary. The climate effect of the instruments is measured against a baseline trajectory, with an estimated emission development in Oslo towards 2030 without new instruments. Thus, only the additional effect beyond what is already estimated development in the baseline is included.

Some instruments are overlapping, meaning they affect the same source of emissions, such as instruments reducing emissions from passenger cars. In such cases, the effect reported in the table is adjusted to avoid double counting.

For some of the instruments, no emission-reducing effect is provided. This is either because the data basis for estimating the effect is too weak or because the instruments facilitate emission reductions and therefore cannot be quantified. For example, establishing chargers for electric vehicles does not provide a direct climate effect but facilitates the use and purchase of an electric vehicle.

Calculations of the effect of instruments in the climate budget and development in the baseline have significant uncertainty. Detailed information about the baseline and the method for calculating the effect of the instruments in the table below is further described in Chapter 5 in the Annex to the Climate Budget 2024.

## Measures and Instruments for Reducing Direct Emissions

Emission sector	No.	Measures/instruments	Responsible entity	Effect 2024 (tons CO2eq.)	Effect 2027 (tons CO2eq.)
<b>Waste Incineration and Energy Supply</b>					
Waste Incineration with Carbon Capture	1	Carbon Capture at Klemetsrud	NOE*	-	98 000
<b>Waste and Wastewater management</b>					
Landfill Gas Extraction	2	Maintenance of landfill gas facilities at Rommen and Grønmo	EBY*, REG	Not estimated	Not estimated
<b>Road traffic</b>					
Overarching Measures	3	Procurement of zero-emission and fossil-free vehicles in the municipality	All*, UKE*	4 200	6 000
	4	Zero-emission (incl. biogas) and transport-efficient delivery of goods and services on behalf of the municipality	All*, UKE*, KLI	5 200	5 000
Reduced Traffic	5	Incentives for increased cycling and walking (grants for climate-friendly work travels, infrastructure for bicycles, better accommodation for pedestrians, etc.)	BYM*, KLI*	Not estimated	Not estimated
	6	Improve public transportation (increased accessibility, reduced prices, new trams, improvements for the subway, etc.)	Ruter*, BYM*		
	7	Facilitate the use of sharing solutions (car sharing, electric bike sharing, etc.)	Ruter*, BYM*		
	8	Parking measures (increasing rates, residential parking, removing parking spaces, parking norms)	BYM*, PBE		
	9	Reduced transport of masses and waste	KLI*, FOB, UKE, Oslobygg, Oslo havn, PBE, EBY, BYM, VAV		
Zero-emission personal vehicles	10	Establish charging infrastructure for personal vehicles	BYM*	Not estimated	Not estimated
	11	Incentives for zero-emission taxis from November 2024 (requirements, grants, charging infrastructure, etc.)	BYM*, KLI*	8 700	11 900
Zero-emission vans	12	Incentives for zero-emission vans (establishing/grants for charging infrastructure, consolidation centers, loading bays parking, etc.)	KLI*, BYM*	4 200	11 100
Zero-emission/biogas busses	13	Incentives for zero-emission tour and express buses (establishing/grants for charging infrastructure)	KLI*, BYM*, UDE, UKE	Not estimated	Not estimated
Zero-emission/biogas trucks	14	Requirement for the use of zero-emission trucks for the transport of masses and waste on behalf of the municipality	All*, UKE*	4 200	11 100
	15	Incentives for zero-emission heavy transport in Oslo (exemption in the toll ring, establishing/grants for charging infrastructure, procuring areas for energy stations, etc.)	KLI*, EBY, BYM*		
<b>Other mobile combustion</b>					

Zero-emission construction and building activity	16	Requirement for zero-emission construction and building activity on behalf of Oslo	All*, UKE*	18 600	19 200
	17	Requirement for fossil-free construction and building activity in zoning plans	PBE*, KLI*	15 900	31 900
Zero-emission machines and motor tools	18	Acquisition of zero-emission machines in Oslo Municipality's machinery fleet	Oslo Port Auth.	900	2 200
	19	Zero-emission handling of goods and cargo at Oslo port	All*, UKE*	4 900	5 200
	20	Incentives for zero-emission motor tools and events	KLI*, BYM*	3 900	10 200
<b>Maritime transport</b>					
Zero-emission port stays	21	Establish shore power for container and cruise ships and optimize the use of the shore power facility for cement ships	Oslo Port Auth.*, NOE	3 100	6 000
<b>Total effect</b>				<b>73 800</b>	<b>217 800</b>

*\*reporting responsibility*

Below, a brief description of the measures in the table above is provided. Initially, a description is given of what causes the emissions in the sector, and what is required to further reduce these beyond the existing, adopted measures.

#### Waste Incineration and Energy Supply

Emissions from waste incineration and energy supply in Oslo mainly arise from the combustion of waste for district heating production. However, some fossil energy is also used for peak load in district heating production. The use of fossil energy for district heating significantly decreased from 2009 to 2013, but it has varied in scale since 2015. There is still potential for further phasing out of fossil gas.

With carbon capture at Oslo's largest waste-to-energy plant at Klemetsrud, emissions from this sector could be reduced by just over 50 % by 2030 compared to the 2009 level. The city council has also initiated work to assess measures to reduce emissions from the municipality's own waste-to-energy plant at Haraldrud. The city council proposes to allocate 11 million NOK for decision-making basis and studies related to a 65 % recycling rate and Zero-emission waste management in 2024.

#### Waste Incineration with Carbon Capture

##### 1. Carbon Capture at Klemetsrud

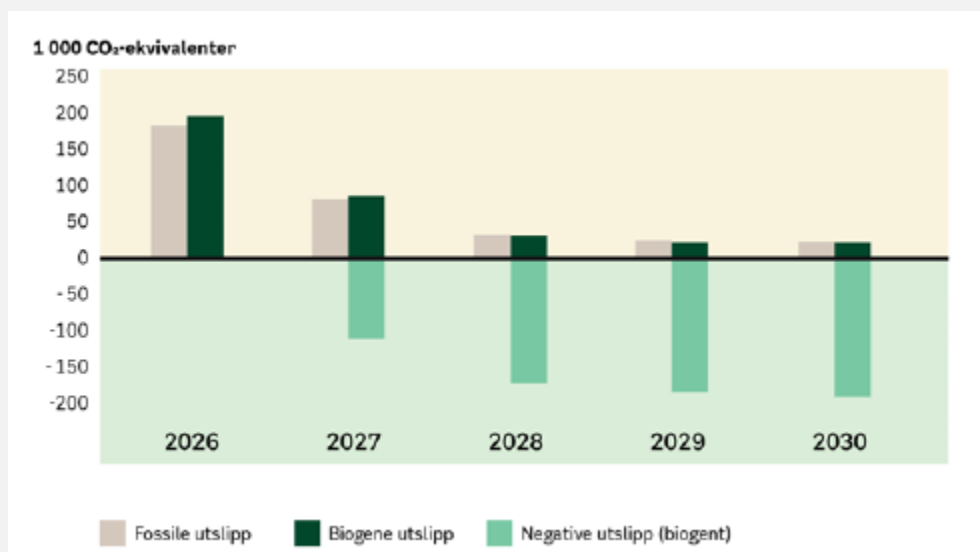
The measure involves capturing CO<sub>2</sub> emissions from the waste-to-energy plant at Klemetsrud and storing them permanently under the North Sea. The carbon capture plant could reduce emissions by up to 95 % when fully operational. The plant has been delayed by at least one year due to increased costs. The company has announced that it is working to present a new project plan with updated and quality-assured cost estimates by May 2024.

### Carbon Capture and Storage from Waste Incineration

A waste-to-energy plant emits CO<sub>2</sub>, methane, and nitrous oxide arising from the combustion of both fossil materials (plastic, etc.) and biogenic materials (wood, cardboard, etc.). Emissions of CO<sub>2</sub> from the combustion of biogenic material are not included in the greenhouse gas inventory because emissions from combustion are reabsorbed by plants and trees in the short carbon cycle, provided the areas are managed sustainably.

At the same time, if biogenic CO<sub>2</sub> is captured and stored, it is referred to as negative emissions. Such negative emissions are currently neither reflected in the national nor municipal greenhouse gas inventory but are just as valuable for the atmosphere as fossil emission reductions. Carbon capture at Klemetsrud can capture up to 95 % of both biogenic and fossil CO<sub>2</sub>. This is illustrated in the figure below. The gray and dark green columns in the figure below show emissions at the Klemetsrud facility before carbon capture (2026) and estimated remaining emissions towards 2030 with carbon capture. The light green columns represent the expected negative emissions as a result of the carbon capture facility.

#### **Estimated emissions from the Klemetsrud incineration plant and effect of CCS**



### Waste and Wastewater management

Methane warms the atmosphere about 28 times more than CO<sub>2</sub>. Methane gas that seeps out from the decomposition of biological material from closed landfill sites is the main source of methane emissions in Oslo. The facilities at Grønmo and Rommen both have systems for capturing methane. There is a need to increase the capture of methane gas towards 2030. The captured methane gas is combusted and converted to CO<sub>2</sub>, thereby reducing the overall greenhouse gas emissions.



## *Landfill Gas Extraction*

### *2. Maintenance of landfill gas facilities at Rommen and Grønmo*

The Agency for Real Estate and Urban Renewal has methane gas collection facilities at the waste landfills at Rommen and Grønmo. To ensure high methane extraction from the facility, continuous maintenance and upgrading are needed.

The Agency for Real Estate and Urban Renewal has received 0.4 million NOK from Klimasats to establish a new drainage solution and improve gas extraction at parts of Grønmo waste landfill, and 0.3 million NOK to quantify diffuse gas emissions at Rommen waste landfill.

## *Road Traffic*

Emissions from road traffic have steadily decreased since 2009, mainly due to an increased proportion of electric passenger cars and increased use of biofuels. At the same time, road traffic still accounts for over half of the emissions in Oslo.

The Oslo toll ring has long contributed to limiting the amount of traffic in the city, in addition to incentivizing the choice of zero-emission cars through discount schemes/exemptions for such vehicles. Measures such as requirements in procurement and parking tariffs have also been important for reducing emissions from road traffic.

If Oslo is to reach its climate goal by 2030, it will be particularly important to reduce emissions from vans and heavy vehicles. Therefore, it was important for Oslo to reach an agreement in the Oslo Package 3 negotiations in 2022 about exemptions for heavy vehicles on biogas in the toll ring, in addition to electric and hydrogen vehicles. There is predictability in that the exemption applies until at least 2027. Oslo Municipality also has several projects that emphasize these emissions, including contributing to the project "Goods Delivery in the E18 West Corridor" a collaborative project between the municipalities of Bærum, Asker, Oslo, and Drammen, and Viken County Municipality, which has received 8 million NOK in support from Klimasats to continue and develop the work with testing measures to reduce transport and emissions from goods delivery. The Planning and Building Agency (together with Asker, Bærum, Lørenskog, Lillestrøm, Ullensaker, Nordre Follo, and Ås municipalities and Viken County Municipality) has also received 1 million NOK from Klimasats to strengthen the coordination and planning of climate-friendly urban logistics with the goal of Zero-emission heavy transport, reduced car traffic, and better land use and utilization.

## *Overarching Measures*

### *3. 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. The high percentage is a result of Oslo Municipality's ambitious goal for a zero-emission vehicle fleet by 2025. The City Council case "Oslo Municipality's action plan for a zero-emission and sharing-based machinery and vehicle fleet by 2025" (1078/23) shows how the municipality's enterprises should adjust their practices for procurement and management of their own vehicles, machinery, and equipment.

For some enterprises, it may be challenging to convert parts of the vehicle fleet to zero-emission by 2025, particularly because it may compromise public safety where there are no emergency vehicles or other special vehicle models available in the market. In such cases, an exemption from the requirement will be granted. The City Council proposes to allocate 65 million NOK in 2025, in addition to previously granted funds, to replace refuse collection vehicles.

The Agency for Improvement and Development has received 0.3 million NOK from Klimasats to map opportunities and barriers for the use of Zero-emission emergency vehicles. Currently, the market for zero-emission emergency vehicles is not well enough developed to operate continuously for a long time under demanding working conditions.

#### *4. Zero-emission (incl. biogas) and transport-efficient delivery of goods and services on behalf of the municipality*

All agencies are responsible for using the municipality's standard climate and environmental requirements for transport in the procurement of goods and services. This means that since 2019, there have been requirements for zero emission transport in most new contracts, where there are more than three suppliers who can offer. Climate and environmental requirements are also set for transport in the municipality's construction and building contracts. This implies, at a minimum, the use of fossil-free fuel, while zero-emission or biogas technology is rewarded. There is predictability in that Oslo for several years has communicated that from 01.01.2025 only electricity, hydrogen, and biogas transport will be procured. The requirements are directed at the "last-mile" of delivery of goods or services to the municipality's locations and apply to procurements from 500,000 NOK excluding VAT. Energy-efficient driving, sensible planning, and route optimization of transport, in addition to shifting more goods and services onto electric bicycles are also to be included in relevant procurements. Requirements and guidance have been published in the municipality's electronic procurement guide.

#### Oslo's traffic reduction goal

Walking, cycling, and public transport should be the first choices for travel in Oslo. There is a goal to reduce car traffic by one-third by 2030 compared to 2015. This can be achieved either by reducing the population's need to travel, for example, through the use of home offices, digital meetings, and trade and service offerings closer to where people live, or by more people using public transport, cycling, or walking when they travel. For commercial transport, there is potential for efficiency by ensuring as full a load as possible in vehicles and better planning of routes. Reduced traffic leads to less congestion, improved air quality, and better health for the city's residents. Land use planning that reduces the need for transport can also free up areas for other purposes such as green spaces, residential areas, and business.

Since 2016, the city council has worked purposefully to reduce traffic, including through good land use planning, public transport initiatives, the development of cycling infrastructure, road user charging, and reduced transport of masses in municipal projects. This has resulted in Oslo having stable car traffic, even with a population increase of over 8% since 2015.

Emissions from traffic in Oslo are being reduced by phasing out fossil-fuel vehicles. At the same time, it is more likely to reduce emissions if traffic is also reduced. If Oslo achieves the goal of reducing traffic by one-third by 2030, compared with 2015, this could contribute to reducing annual emissions by approximately 50,000 tons of CO<sub>2</sub>-equivalents in 2030, beyond the measures already decided in this climate budget. The calculation has high uncertainty and is based on a professional assessment of the potential for traffic reduction for heavy and light vehicles and the electrification of the vehicle fleet by 2030.

## *Reduced Traffic*

### *5. Incentives for increased cycling and walking (grants for climate-friendly work travels, infrastructure for bicycles, better accommodation for pedestrians, etc.)*

The Agency for Urban Environment facilitates for pedestrians by upgrading and constructing new shortcuts that make it easier and faster to move on foot. Furthermore, the Agency for Urban Environment works on adapting the road network better for those who walk and cycle, including through the reconstruction of intersections, speed-reducing measures for cars, establishing smaller sidewalks, relocating pedestrian crossings and signage.

The Agency for Urban Environment also works to create a cohesive cycling network, maintain and upgrade existing cycling infrastructure (such as bike parking) and uses communication and campaigns to influence the population's travel habits.

The Climate Agency has several grant schemes aimed at private companies with the aim of facilitating employees' choices to walk, run, or cycle to work: Safe bike parking at work, Active to work, and Scrap bonus for parking spaces. Support includes, among other things, upgrading of changing rooms, charging stations for electric bicycle batteries, and bike wash.

### *6. Improve public transportation (increased accessibility, reduced prices, new trams, improvements for the subway, etc.)*

Through many years of long-term and targeted efforts, the public transport offer in Oslo has become a competitive alternative to private cars.

The development of the Fornebu Line, new signal and security systems, and the upgrading of Majorstuen station to increase its capacity are important, prioritized infrastructure projects in the coming years. By the end of 2024, all the new trams will be in operation. The new trams have increased capacity and improved accessibility features, providing Oslo with an enhanced and robust tram service with room for more passengers onboard.

Improving the accessibility for city buses is important to strengthen the public transport offer. The Agency for Urban Environment is responsible for establishing bus lanes, reallocating street space, improving signage, and enhancing accessibility through the "Powerful Accessibility Measures" (Kraftfulle fremkommelighetstiltak - KFT) project, which will continue in 2024.

In addition, the city council is systematically working to reduce public transport prices and has achieved several discounts in recent years.

### *7. Facilitate the use of sharing solutions (car sharing, electric bike sharing, etc.)*

The Agency for Urban Environment facilitates the increased use of sharing solutions by reserving areas for shared cars, racks for city bike schemes, and for renting electric scooters and bicycles. The agency has conducted a pilot where 600 public parking spaces were reserved for car sharing and is working to reserve an additional 400 parking spaces for car sharing. The city council is also considering solutions to increase the share of electric cars among shared cars, such as requiring that shared car spaces are reserved for electric cars.

Ruter has integrated city bikes and electric scooters into the Ruter app and is considering how other forms of shared mobility can be integrated to enable seamless travel with various modes of transportation. Ruter has also launched a pilot with shared autonomous vehicles, as well as carpooling of passengers and goods.

### *8. Parking measures (increasing rates, residential parking, removing parking spaces, parking norms)*

The municipality actively uses parking rates, the removal of parking spaces, and residential parking to reduce traffic in the city. Residential parking offers those living in the area reduced annual rates for parking, while visitors must pay a fee per hour. Residential parking was initially introduced in the inner city, but several districts in the outer city are adopting the introduction of residential parking throughout the district or in certain streets. Since 2015, the Agency for Urban Environment has also removed over 6000 parking spaces for other purposes.

In 2022, a new parking norm for new zoning plans was adopted. This is central to developing Oslo into a less car-based city and promoting zero-emission vehicles. A maximum limit for the number of parking spaces instead of a minimum limit has been set, there are requirements for charging facilities on at least half of the parking spaces, and there are requirements for the number and quality of bicycle parking spaces. The parking norm also confirms that it should be considered whether up to 10 % of the parking spaces in larger parking facilities should be set aside for car sharing and that opportunities for shared use should be considered in zoning plans.

### *9. Reduced transport of masses and waste*

The municipality is actively working to reduce the transport of masses and waste from construction and building sites in Oslo by increasing the reuse of masses in municipal projects or internally within the city. Suppliers capable of transporting masses and waste over short distances are rewarded in tender competitions. The Agency for Improvement and Development is working to increase the knowledge among the municipality's purchasers on how masses can be reused.

A cross-departmental municipal working group, consisting of the Planning and Building Agency, Climate Agency, Property and Urban Renewal Agency, Municipal Undertaking for buildings (Oslobygg KF), Oslo Port Authority (Oslo Havn KF), Agency for Urban Environment, Agency for Water and Wastewater Services, and the Fornebu Line, is considering new solutions and logistics for more local and environmentally friendly mass management. The Planning and Building Agency has received 0.2 million NOK from the Climate Initiatives Fund (Klimasats) to create a guide for mass management plans, as well as to conduct a needs assessment of mass types.

### *Zero-emission personal vehicles*

#### *10. Establish charging infrastructure for personal vehicles*

Oslo Municipality facilitates the use of electric vehicles by having the Agency for Urban Environment establish both regular charging points and fast and ultra-fast chargers in the city. A good offer of charging infrastructure is crucial for the successful introduction of climate requirements for the taxi industry and in a future zero-emission zone. Particularly important is normal charging in areas where many residents do not have their own parking space. The Agency for Urban Environment has acquired a new system for municipal chargers that will make the app solution more intuitive and user-friendly.

Through the Climate and Energy Fund, the municipality provides grants for electric vehicle charging stations in housing cooperatives and condominiums. The scheme is important to enable the transition to electric vehicles for everyone who needs access to a car. Since the start of the grant scheme in 2017, the grants have enabled over 60,000 charging points.

#### *11. Incentives for zero-emission taxis from November 2024 (requirements, grants, charging infrastructure, etc.)*

The municipality has decreed that taxis operating within the borders of Oslo Municipality must be zero-emission by November 2024, according to the regulation on environmental requirements for taxi transport in Oslo. The Agency for Urban Environment is responsible for contributing to new standard charging points reserved for taxis either by municipal management or through collaboration with other actors. The agency is also responsible for working towards prioritizing zero-emission taxis at taxi stands. This will require new state regulations and is currently not allowed. Through the Climate and Energy Fund, grants are provided for home charging for taxi drivers.

#### *Zero-emission vans*

*12. Incentives for zero-emission vans (establishing/grants for charging infrastructure, consolidation centers, loading bays parking, etc.)*

Oslo Municipality facilitates the use of zero-emission vans by having the Agency for Urban Environment contribute to establishing publicly available charging points through municipal involvement and dedicating commercial parking spaces and loading and unloading bays for electric goods and utility transport. Electric vans pass for free in the toll ring and park for free at municipal parking spaces (not at charging stations).

Through the Climate and Energy Fund, the municipality provides support for charging at businesses and fast chargers for electric vans, as well as support to business actors wishing to establish urban logistics terminals. The Property and Urban Renewal Agency procures areas for charging stations and consolidation centers for commercial transport, on request from relevant municipal measures.

#### *Zero-emission/biogas busses*

*13. Incentives for zero-emission tour and express buses (establishing/grants for charging infrastructure)*

In procurements, Oslo requires that buses operating on behalf of the municipality must be zero-emission. Electric tour buses are already being used for school transport, and several companies have acquired electric buses to be able to operate on behalf of the municipality.

The municipality also facilitates zero-emission bus operation by the Climate Agency providing grants for chargers for trucks and buses through the Climate and Energy Fund and the Agency for Urban Environment establishing publicly available fast chargers adapted for heavy vehicles. A decision under the Oslo Package 3, which provides predictability that heavy vehicles on zero emissions and biogas have toll exemption in the toll ring until the end of 2027, reduces the risk for companies investing in zero-emission buses that operate extensively in Oslo.

#### *Zero-emission/biogas trucks*

*14. Requirement for the use of zero-emission trucks for the transport of masses and waste on behalf of the municipality*

Since 2020, Oslo Municipality has required fossil-free transport of masses and waste to and from construction sites in its own projects. In addition, award criteria are used to promote the use of electricity, hydrogen, and biogas. All relevant entities impose requirements in new contracts where applicable.

*15. Incentives for zero-emission heavy transport in Oslo (exemption in the toll ring, establishing/grants for charging infrastructure, procuring areas for energy stations, etc.)*

Oslo Municipality has several measures to shift heavy transport from the use of fossil fuels to electricity, hydrogen, or biogas.

The Agency for Urban Environment contributes to establishing charging points for heavy transport through municipal involvement and works on reallocating attractive areas for goods delivery to be reserved for zero-emission and biogas vehicles. The Climate Agency and the Property and Urban Renewal Agency work to facilitate energy stations offering fast charging and filling of biogas and hydrogen.

The Climate and Energy Fund has committed to establishing a total of 55 charging points. If all these projects are realized, there will be a significantly better public charging offer for heavy transport in Oslo by 2024 compared to today. Additionally, the Climate and Energy Fund provides grants for filling stations for biogas and establishing normal charging for heavy transport on company premises.

In 2022, with the supplementary agreement to the Oslo Package 3, it was decided that zero-emission and biogas trucks will not have to pay fees in the toll ring until the end of 2027. This means that both electric and biogas trucks will have lower operating costs in Oslo. In 2022, the Climate Agency received funds from the national Climate Initiatives Fund (Klimasats) to continue working towards making Oslo a pioneering city for zero-emission heavy transport until 2025. An important part of this work is to have a good dialogue with the business sector, as well as targeted communication to relevant actors.

#### Other mobile combustion

Emissions from machinery using diesel (non-road machinery) decreased from 2020 to 2021 and were then at the lowest level since 2011. Through Oslo's targeted efforts to reduce emissions from construction and building sites, emissions are expected to decrease further in the coming years. Oslo also has data from its own projects showing that the consumption of diesel has decreased more in recent years than what is shown in the greenhouse gas inventory from the Norwegian Environment Agency.

At the same time, about half of the emissions from other mobile combustion come from machinery used elsewhere than on construction and building sites. In Oslo, there are over 2000 businesses in various industries included in this statistic. General economic measures, such as a high CO<sub>2</sub> tax and the reintroduction of the base tax for mineral oil, will be the most effective measures to reduce emissions going forward. Oslo Municipality is working for the state to strengthen the use of taxes as a climate measure.

#### Zero-emission construction and building activity

##### *16. Requirement for zero-emission construction and building activity on behalf of Oslo Municipality*

Oslo Municipality requires that all machinery used on municipal construction and building sites use fossil-free fuel and rewards zero-emission solutions (including biogas) through award criteria. From 2025, the requirement will be strengthened to zero-emission machinery. The Agency for Improvement and Development (UKE) is responsible for monitoring these requirements.

UKE leads an internal municipal working group for all entities issuing construction and building contracts, to exchange experiences and ensure a unanimous practice regarding tender competitions and contract monitoring.

##### *17. Requirement for fossil-free construction and building activity in zoning plans*

Since 2020, Oslo has required fossil-free construction and building sites from private and state actors through new zoning plans. It is assumed that about 40 % of the construction activity will be covered

by the requirement in 2024. The Planning and Building Agency is responsible for monitoring the requirement.

The legal basis for the requirement is under debate. Oslo Municipality will work for the government to quickly send a new legal basis for zero-emission construction and building sites out for consultation.

The Climate and Energy Fund provides grants for mobile charging stations at construction sites. Through the scheme, builders and contractors can receive grants to purchase, rent, or lease mobile charging stations for use at construction and building sites. The charging stations must have energy storage and can be moved internally on the construction site and between construction sites.

#### *Zero-emission machines and motor tools*

##### *18. Acquisition of zero-emission machines in Oslo Municipality's machinery fleet*

Oslo Municipality is working to replace all its own machines and vehicles with zero-emission alternatives by 2025, and funds for this replacement have been allocated in previous budgets. The entities themselves must report needs as part of the ordinary budget processes but can also apply through national subsidy schemes like Climate Initiatives Fund (Klimasats) and Enova. The Agency for Improvement and Development assists the entities with advisory services.

##### *19. Zero-emission handling of goods and cargo at Oslo port*

Oslo Port Authority is working to facilitate that all activity and transport related to cargo handling in the port area become zero-emission. This handling includes loading and unloading with cranes and machinery at the port, but not cranes and equipment that are part of the ships.

##### *20. Incentives for zero-emission motor tools and events*

The Agency for Urban Environment is working to replace diesel generators on municipal areas leased for outdoor events, such as concerts and festivals. The City Hall Square, Vaterland, and Kontraskjæret, among others, already have electricity available. For example, the facility at Vaterland can supply power to amusement parks, ice rinks, tour buses, and other events. The Culture Agency and the Agency for Urban Environment have received 1.5 million NOK from the Climate Initiatives Fund to establish power for events at Voldsløkka.

Through the Climate and Energy Fund, businesses can apply for support to purchase electric motor tools, such as tractor mowers, leaf blowers, steam rollers, or tractors. It is required that the motor tool purchased must have a power of at least 5 kWh. Oslo's subsidy scheme complements Enova's subsidy scheme for Zero-emission construction machines, and no subsidy is provided for machines that Enova has announced support for.

#### *Maritime transport*

Emissions from maritime transport accounted for about 4 % of greenhouse gas emissions in Oslo in 2021. The emissions include commercial and passenger traffic by sea within the municipality's borders. Several measures have been implemented in recent years to reduce emissions: The Nesodden boats and the boats to the islands in the Oslo fjord became electric in 2020 and 2022. The international ferries started using shore power from 2019 (Vippetangen). Cement ships were equipped with shore power facilities in 2021. In addition to efforts to establish shore power for container and cruise ships as described below in measure 19, Oslo Port has also recently been granted respectively 20 and 10 million NOK to establish shore power for cruise ships at Filipstad Quay, and on the tanker pier. The Port Authority has not made a final investment decision.

## Zero-emission port stays

### 21. Establish shore power for container and cruise ships and optimize the use of the shore power facility for cement ships

Oslo Port is in the process of establishing shore power facilities at Sydhavna for container ships and at Vippetangen for cruise ships. The facilities are scheduled to be completed in 2024. There have been challenges in achieving full effect from the shore power facility for cement ships that was built in 2021, and efforts are being made to optimize the use of the facility. Shore power replaces the use of fossil fuels when ships are in port. However, ships still use some diesel for heating, among other things, even when connected to shore power. In addition to reducing greenhouse gas emissions, shore power contributes to less air pollution and noise.

## New appropriations for climate measures to reduce direct emissions 2024–2027

New appropriations for climate measures, figures in thousands NOK.

Entity	Measure	2024	2025	2026	2027
Agency for Waste Management (self-financed)	Study funds - 65% material recovery and waste incineration with carbon capture	11 000			
Agency for Urban Environment	Increased costs due to the transition to zero emissions and other requirements	21 200	21 200	21 200	21 200
Purchase of transport services (Ruter)	Cost growth	129 000	129 000	129 000	129 000
Purchase of transport services (Ruter)	Operation of public transport services	147 500	112 800	112 800	112 800
SUM		308 700	263 000	263 000	263 000

The city council proposes to allocate 65 million NOK in the investment budget for the Waste Management and Recycling Agency in 2025, in addition to previously granted funds for replacing garbage trucks. The city council also proposes to strengthen the development of fast charging for electric heavy transport and taxis. It is proposed to allocate 10 million NOK in 2024 and 10 million NOK in 2025 to the Agency for Urban Environment - parking investment budget.

## Possibilities of achieving the 95 %-goal by 2030

The climate budget shows that with adopted measures and instruments, it is possible to achieve up to a 63 % reduction in direct emissions by 2030. For Oslo to reach the climate goal of a 95 % emissions reduction by 2030, there is a need to both reinforce existing instruments and to identify and implement new instruments. The Climate Agency has identified possible instruments that can help bridge the gap between the 63 % emissions reduction and the goal of 95 %, based on, among other things, the basis of the new National Transport Plan, the Norwegian Environment Agency's report on Climate Measures in Norway towards 2030, the government's climate status and plan (green book), Oslo's climate strategy, etc. These instruments are listed in the table below. If all the identified instruments are implemented with full strength, this could lead to an emissions reduction of up to 79 % by 2030.

The identified instruments have not been decided for implementation either nationally or locally, and the final design and any distributional consequences have not been clarified. There is significant uncertainty in the estimates of the climate effect for the identified instruments, and because they are not adopted and finally designed, the estimated climate effect is shown in a range. At the same



time, the effect that is stated is an isolated effect, to allow for prioritization among the identified instruments. See the Annex to the Climate Budget 2024 for a comprehensive description of the identified instruments.

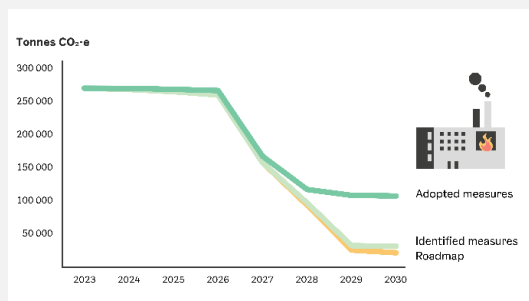
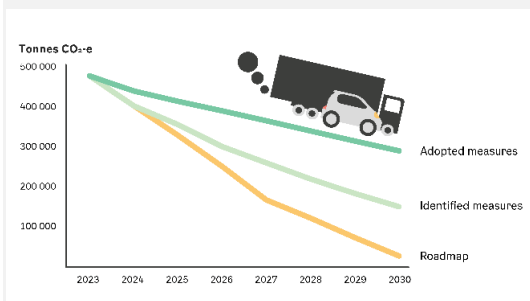
### Identified Measures and Instruments for Reducing Direct Emissions

Emission sector	Measures/instruments	Estimated Isolated Effect
<b>Cross-sectoral instruments</b>	CO2-fee equivalent to 2,000 NOK in 2030 without compensating measures	20,000-25,000
<b>Road Traffic</b>	Increased toll rates (up to 100 NOK difference between fossil and electric vehicles)	40,000-50,000
	Increased national biofuel quota to 36.5% in road traffic by 2030	15,000-25,000
	Heavy vehicle tolls for new fossil passenger and light commercial vehicles after 2025	10,000-20,000
	Remove discounts for fossil vehicles in the toll ring	Not calculated
	Zero-emission zone for vans and heavy vehicles within Ring 2 (along the inner toll ring) from January 1, 2026	12,000-18,000
	Zero-emission zone for passenger cars within Ring 2 (along the inner toll ring) from January 1, 2028	1,000-5,000
	Parking measures for municipal workplaces (gradually increased parking fees with phase-out of parking for fossil cars by 2030 and repurposing of parking spaces)	1,500-2,500
	Requirements for private actors to charge for parking at workplaces, shopping centers, etc. (possibly excluding home parking)	Not calculated
	Facilitate the transition from passenger cars to electric motorcycles (reduced parking spaces, communication)	Not calculated
	Enhanced incentives for zero-emission vans (measures in parking, communication, conditional financial support, pilot projects for charging, etc.)	Not calculated
	Access for emission-free commercial transport (heavy and light vehicles) in public transport lanes	Not calculated
	Areas for charging and fueling infrastructure	Facilitative measures
	License requirements for buses operating in Oslo (excluding Ruter)	2,000-3,000
<b>Waste Incineration and Energy Supply</b>	Carbon capture on all household waste incineration in Oslo municipality	40,000-50,000
	Reduce emissions from incineration of commercial waste at Hafslund Oslo Celsio at Haraldrud	21,000-27,000
	Post-treatment facilities for household waste from Oslo municipality	15,000-22,000
	Increased collection of textiles	2,000-4,000
	100% fossil-free district heating	1,000-9,000
<b>Other Mobile Combustion</b>	Requirement for all construction sites to be emission-free by 2030	8,000-12,000

	Increased national biofuel quota to 35% for non-road machinery	15,000-21,000
<b>Maritime transport</b>	Incentives for zero-emission inland and coastal ferries	8,000-12,000
	Onshore power for tankers and bulk carriers	4,000-6,000
	Onshore power for other vessels	1,000-1,500
	Environmental differentiation of port fees for using onshore power	Effect included in onshore power measures above
	Incentives for zero-emission inland and coastal ferries	Not calculated

### Sector-specific roadmaps

To identify what is required for Oslo to meet its climate goal by 2030, the Climate Agency has created roadmaps for each emissions sector. These roadmaps show the estimated emissions reductions within the sector with the adopted measures and the emissions reductions that can be achieved with the identified measures. Based on which sectors currently have Zero-emission, available technology, the degree of barriers to transformation, etc., the roadmaps also include an emissions development that is necessary to reach the overall climate goal by 2030. If Oslo is to meet the goal by 2030, only some methane gas emissions from landfills, small amounts of residual emissions from waste incineration, some fossil emissions from through traffic (primarily heavy transport), and emissions of methane and nitrous oxide from wood burning can be released. Below are roadmaps for road traffic, and for waste incineration and energy supply. For a more detailed description of the roadmaps, see Appendix to the Climate Budget 2024.



## Measures and instruments to reduce indirect emissions

The main guidelines for reducing indirect emissions are outlined in the Oslo Climate Strategy towards 2030, The Future of Consumption - strategy for sustainable and reduced consumption 2019-2030, the Oslo Municipality's procurement strategy, and the Thematic Plan for a Circular Economy towards 2030.

Increased circularity and a reduction in indirect emissions depends on changing the national and international policy framework. The City Council will work towards national authorities to address the need for instruments that promote repair, reuse, material recycling, reduced food waste, and that prevent products with a short lifespan that cannot be repaired or recycled.

The City Council have proposed several requirements for developers in the proposal for the municipal plan's part on land-use (KPA), which will contribute to less demolition, more rehabilitation, reuse, and use of climate-friendly materials. The City Council proposes to quantify a requirement for emissions reductions from material use: 20 % reduction in greenhouse gas emissions from materials by 2025, 30 % by 2027, and 50 % by 2030. With this, the City Council aims to send a clear and predictable signal that greenhouse gas emissions from materials must decrease. This can lead to significant reductions in indirect greenhouse gas emissions. The KPA is under external consultation in the fall of 2023.

The table "Measures and instruments to reduce indirect emissions" below shows adopted measures and instruments in the Climate Budget. The table also shows which entity is responsible for implementing the measure, as well as who has reporting responsibility.

The table does not include effects of reduced emissions as a result of the instruments. This is because the data basis is uncertain in many cases, for example, because there is little information about the production method or the means of transport of the goods purchased. We do not have access to sales figures in Oslo, and today there is no greenhouse gas account for consumption-based emissions. The instruments with the assumed greatest potential for emissions reduction are instruments 33 and 34, which are about reducing emissions from materials in the municipality's construction and civil engineering projects, see also description under emissions development.

### Measures and Instruments to Reduce Indirect Emissions

Emission Sector	No.	Measures/instruments	Responsible entity
<b>Cross-sectoral processes and overarching instruments</b>			
	22	Develop tools to display the municipality's emissions from procurement	UKE*, KLI
	23	Communication work and campaigns promoting reduced and more sustainable consumption	KLI*, BYM, UKE*
	24	Environmental management and certification of municipal enterprises	BYM*
	25	District network for climate and environmental work	KLI*, BYM, Bykuben
<b>Consumption</b>			
	26	Joint procurement agreements with a climate-friendly menu planning tools	UKE*

Sustainable food and reduced food waste	27	Instruments to reduce meat consumption in municipal enterprises (vegetarian food as standard at meetings and events, meat-free school meals)	UKE*, HEL, UDE, All
	28	Instruments to reduce food waste (guidance materials, food waste measurement)	UKE*
Reduced consumption of textiles, IT, disposable plastics, recreational equipment, tools, and furniture	29	Reuse-platform for Oslo municipality	UKE*
	30	Joint procurement agreements demanding goods and services with low ghg-emissions	UKE*
	31	Instruments to reduce consumption of textiles, disposable plastics, IT, recreational equipment, tools, and furniture	BYM*, UKE, KLI, REG, Deichman, Bykuben, FutureBuilt, PBE, Oslobygg, districts, UDE, All
<b>Mobility and Traffic</b>			
Reduced emissions from the production of fuels		<i>See measures for road traffic in the chapter on direct emissions</i>	
Reduced emissions from the production of vehicles and machinery	32	Fleet management tools for vehicles and machinery	UKE*
<b>Buildings and Construction</b>			
Reduced emissions from materials	33	Climate requirements in construction projects	Oslobygg*, PBE, EBY
	34	Climate requirements in procurement of construction materials and in contracts	BYM*, VAV*, FOB*

\*reporting responsibility

## Cross-cutting processes and overarching measures

### *22. Develop tools to display the municipality's emissions from procurements*

The Agency for Improvement and Development participates in the innovation project "CO2-calculator for procurement" under the auspices of an KMD procurement analysis. The project aims to develop a tool that can estimate emissions from energy use, procurement, and disposal from the municipality's purchases.

### *23. Communication work and campaigns promoting reduced and more sustainable consumption*

Through the websites Klimaoslo.no, Klimatilskudd.no, Klimamyter.no, and social media, the Climate Agency disseminates information about climate solutions and content related to reuse, recycling, repair, food waste, and climate-friendly diets. The Climate Initiative in Oslo's schools is a dedicated effort aimed at children and young people. The project includes Klimaskolen.no, a competence portal with resources for climate and environmental education, as well as the Climate Pilots. The Climate Pilots give presentations to about 5,500 students in middle and high schools annually.

Oslo municipality has a dedicated website on sustainable and reduced consumption. The website showcases solutions that Oslo's residents can implement, what the municipality is doing, what support schemes are available for sustainable and reduced consumption, etc. The Agency for Urban Environment is primarily responsible for further developing the page with support from the Waste Management and Recycling Agency, Bykuben, the Climate Agency, and the Agency for Improvement and Development.

The Agency for Urban Environment also has the main responsibility for organizing the Reuse Week, in collaboration with the Waste Management and Recycling Agency, Bykuben, Deichman, and the Climate Agency. The Reuse Week is a week dedicated to sustainable consumption and increased reuse across Oslo with various events and activities.

The Agency for Urban Environment, together with the Education Agency, provides training, informational materials, and activities about sustainable and reduced consumption to schools, kindergartens, and youth clubs.

### *24. Environmental management and certification of municipal enterprises*

The municipality's operations are to be environmentally certified through the Eco-Lighthouse standard or ISO certification. Through the systems for environmental management and certification, there is a focus on sustainable and reduced material consumption in the municipality's operations. The Agency for Urban Environment is responsible for coordinating the municipality's network for environmental management and for advocating for the environmental certification of municipal operations. The network's work focuses on exchange of experiences, joint competence development, and collaboration between municipal services and sites.

### *25. District network for climate and environmental work*

Several districts have various projects that contribute to reducing indirect emissions from residents' consumption, especially within reuse, lending schemes, repair, etc. The Climate Agency, the Agency for Urban Environment, and Bykuben are exploring opportunities to further develop, strengthen, or supplement existing networks for environmental and climate work in the districts to support more such projects.

## Consumption – Sustainable food and reduced food waste

The City Council is working to halve food waste in its own operations and per capita by 2030. At the same time, meat consumption in municipal operations is to be halved by the end of 2023, and the share of fruits, vegetables, legumes, and seasonal products increased.

### *26. Joint procurement agreements with a climate-friendly menu planning tool*

The Agency for Improvement and Development (UKE) will strengthen knowledge about healthy and plant-based food in the municipality and works strategically with procurements and supplier chains. UKE has entered into a joint procurement agreement for food and beverages (retail) with Oda Norway AS, which also provides a menu planning tool. The content is developed in collaboration with UKE and kindergartens. A pilot project was conducted in nine kindergartens, and on September 1, 2023, the menu planning tool was launched for all kindergartens. In the online store of Oda, all municipal kindergartens now receive suggestions for weekly/seasonal menus with recipes and shopping lists with a lot of plant-based food, a clearly visible price calculator, and user-friendly ordering. Other information and materials about sustainable food are gathered on the same site. This is to help the municipality's kindergartens create sustainable, healthy, and more plant-based food, with seasonal raw materials – and within the budget.

### *27. Instruments to reduce meat consumption in municipal enterprises*

The effort to halve the municipality's meat consumption is well underway. Vegetarian food is the standard option at all the municipality's meetings and events, which all agencies are responsible for implementing. In secondary and high schools, a free meat-free meal is served once a day. This is carried out by the Health Agency, in collaboration with the Agency for Improvement and Development and the Education Agency.

### *28. Instruments to reduce food waste*

The Agency for Improvement and Development has hired a coordinator for the effort to halve food waste in municipal operations. In collaboration with a municipal interdisciplinary working group for sustainable food, the Agency for Improvement and Development is responsible for developing guidance materials for measures that reduce food waste. The agency will also develop new indicators for food waste and test out measurement tools for collecting food waste data.

## Consumption – Reduced consumption of textiles, IT, disposable plastics, recreational equipment, tools, and furniture

Oslo Municipality purchases various goods such as furniture, fixtures, PCs, mobile phones, workwear, and healthcare textiles for over half a billion kroner annually. The municipality uses procurement as a tool to promote the transition to a circular economy and achieve more sustainable and reduced material consumption. For the population, the municipality supports local schemes for lending, leasing, repair, and second-hand sales, as well as communication work.

### *29. Reuse-platform for Oslo Municipality*

The Agency for Improvement and Development is to procure a digital reuse platform so that the municipality's operations can more easily reuse each other's products, equipment, and materials, thus extending the life of products and reducing unnecessary new purchases.

### *30. Joint procurement agreements demanding goods and services with low ghg-emissions*

The Agency for Improvement and Development (UKE) facilitates the reduction of emissions from the procurement of goods in the municipality through requirements in joint procurement agreements. Requirements are set for long product life and for suppliers to assist and guide the operations in choosing sustainable products with environmental labels and declarations. UKE has entered agreements for the repair of e-bike batteries, work shoes, protective gear, and furniture to ensure the long life of its products, as well as to help develop a market for circular services. UKE will also review the municipality's existing agreements to explore the possibility of imposing requirements for reduced consumption. For instance, in the procurement of mobile phones and accessories, 50 % of the award criteria were used to reward circular measures and services: 15 % for repair, 20 % for reuse, and 15 % for the supplier's organization for cooperation on sustainability and future solutions. Additionally, in 2022, a repair-friendly and more fairly produced mobile phone was included in the agreement for the purchase of mobile phones and accessories. This phone has been user-tested and chosen as the service phone for the entire Payroll Services department in the Agency for Improvement and Development.

### *31. Instruments to reduce the consumption of textiles, disposable plastics, electronics, recreational equipment, tools, and furniture*

Textiles, furniture, and IT-equipment are major consumption categories in the municipality with significant climate and environmental impacts. Through the Future of Consumption – Strategy for sustainable and reduced consumption 2019-2030, and the associated Action Lists against plastic and marine pollution and for sustainable and reduced consumption, the Agency for Urban Environment follows up on cross-municipal efforts to reduce the consumption of textiles, disposable plastics, electronics, recreational equipment, tools, and furniture. The municipality's libraries are actively used as a reuse and sharing venue for books, other media, tools, and machines. Through joint procurement agreements and acquisitions, the Agency for Improvement and Development imposes requirements for alternatives to virgin plastic and promotes reduced use of disposable plastics. The Agency for Urban Environment guides employees at service locations (e.g., kindergartens and nursing homes), as well as actors operating canteens or holding events on municipal grounds. The Agency for Urban Environment also conducts information work about plastic use directed at Oslo's residents and school students (through the Climate School and the school meal project). To further systematize this work, the City Council will initiate efforts to establish goals, requirements, and criteria or other strategic measures that can contribute to reduced greenhouse gas emissions associated with the municipality's procurement of furniture, textiles, and IT-equipment.

### **Mobility and Traffic – Reduced emissions from the production of fuel, vehicles, and machinery**

Measures contributing to the transition to electric vehicles and reduced driving (see the table "Measures and instruments to reduce direct emissions"), also help to reduce indirect emissions. This is because the indirect emissions from the production of both cars and fossil fuels are significant. The City Council's budget proposal - Case 1 - Budget 2024 and economic plan 2024-2027 highlights that the production of all vehicles and machinery generates significant indirect emissions. Therefore, the municipality is working to optimize the use of its own machinery and vehicle fleet and to improve the knowledge base around emissions in the production of electric machinery and vehicles, so that low-emission alternatives can be chosen.

### *32. Fleet management tool for vehicles and machinery*

The Agency for Improvement and Development has previously been allocated funds to establish a fleet management tool for the municipality to provide an overview of vehicles and machinery

available for sharing between operations. This will make it easier to share the municipality's 1,500 vehicles and 2,000 machines.

### Construction and Civil Engineering – Reduced emissions from materials

In 2022, the City Council set a goal to reduce greenhouse gas emissions from materials used in the municipality's new and rehabilitated buildings by 30% compared to the emission levels in FutureBuilt ZERO's baseline trajectory. To achieve this goal, Oslo Municipality must demolish less and, to a greater extent, rehabilitate instead of building anew. Additionally, the way buildings are designed, and the choices of plots and materials are decisive. Before new construction projects are decided, the City Council will therefore have a thorough assessment of whether needs can be met through rehabilitation instead of demolition and new construction, where it is practically possible and climatically beneficial. The assessment should be documented in connection with the preparation of concept choice studies or equivalent early-phase studies.

#### *33. Climate requirements in construction projects*

Oslo's portfolio of construction projects shall have 30 % lower emissions from materials compared to FutureBuilt's baseline trajectory. Oslo requires material choices and the reuse of materials in their construction and civil engineering contracts.

#### *34. Climate requirements in procurement of construction materials and in contracts*

The Water and Sewerage Agency imposes climate requirements on concrete, asphalt, and crushed stone fractions in some projects. This includes incentives, awards, or requirements for the reuse of stone, as well as reduced transport and materials with low emissions from production. In some cases, requirements are set for lifespan and environmental product declarations as documentation for both new and reused products. In Oslo's New Water Supply project, emissions from specific construction materials were used as award criteria in some construction and civil engineering contracts. Minimum requirements for low-carbon concrete and a share of recycled steel were also included in some of the contracts.

The Fornebu Line imposes climate requirements on concrete, cement, and steel in procurements. Additionally, they require the shortest possible transport of masses, environmental management (ISO), climate reporting, and sustainability certification (Breeam infrastructure).

The Agency for Urban Environment continues to work on reusing materials and imposing climate requirements when purchasing emission-intensive materials like stone, concrete, steel, and asphalt. Climate gas budgets and climate inventory for materials will be prepared, initially in two pilot projects.

## Reporting

Entities responsible for measures in the climate budget must report three times a year to the city council through regular budget reporting. Performance indicators for each enterprise are described in the sector chapters in the City Council Budget Proposition (Sak 1) or in the enterprises' allocation letters. Performance indicators for instruments that apply to most enterprises are shown in the table below.

Measure/instrument	Result indicator	Target
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<i>3. Procurement of zero-emission and fossil-free vehicles in the municipality</i>	Share of zero-emission vehicles of the total vehicle fleet under 3.5 tons	100 %
	Share of vehicles running on sustainable biofuel of the total vehicle fleet under 3.5 tons	
	Share of zero-emission vehicles/biogas of the total vehicle fleet over 3.5 tons	100 %
	Share of vehicles on sustainable biodiesel/fuel of the total vehicle fleet over 3.5 tons	
<i>4. Zero-emission (incl. biogas) and transport-efficient delivery of goods and services on behalf of the municipality</i>	Share of new contracts that involve transport where standard environmental requirements for transport are set	100 %
<i>14. Requirement for the use of zero-emission trucks for the transport of masses and waste on behalf of the municipality</i>	Share of zero-emission, including biogas-based, transport of materials and waste (measured as a percentage of total kilometers driven)	100 %
	Share of transport of materials and waste on sustainable biodiesel (measured as a percentage of total kilometers driven)	
<i>16. Requirement for zero-emission construction and building activity on behalf of Oslo Municipality</i>	Share of zero-emission, including biogas-based, execution of construction work (measured as a percentage of total energy use)	100 %
	Share of construction work carried out on sustainable biodiesel (measured as a percentage of total energy use)	
<i>19. Acquisition of zero-emission machines in Oslo Municipality's machinery fleet</i>	Share of zero-emission machines of the total machinery park 100%	100 %
	Share of machines running on sustainable biodiesel/fuel of the total machinery park	

All contracts with suppliers for the use of zero-emission or sustainable biofuel in vehicles and construction machinery shall include requirements for reporting on the consumption of fossil and biofuels (in liters) and other energy sources (e.g., electricity in kWh (instruments 14, 19, and 21)). The figures should be collected in connection with the annual environmental and climate reporting and used to estimate the climate effect resulting from climate requirements for suppliers.

More details about the specifics of instruments 3 and 4 can be found in the "Action Plan for a Zero-emission and Sharing-Based Vehicle Fleet (city council case 1078/23). For reporting on instruments intended to reduce indirect emissions, result indicators will be developed for the 2024 allocation letter. For some instruments, reporting will be considered through other processes or strategies, such as reporting on the action list for reduced and sustainable consumption.

## Oslo's efforts to follow up on the climate strategy

The implementation of the Climate Strategy for Oslo towards 2030 is a prerequisite for achieving Oslo's ambitious climate goals. The City Government shall in the annual budgets demonstrate how the climate strategy is followed up. The chapters below provide a brief description of the key initiatives in 2024 and the work that will be done in the economic plan period within goals 2, 3, and 4. Goals 1 and 5 concerning direct and indirect emissions are discussed in the preceding chapters.

## Oslo's total energy consumption in 2030 shall be reduced by 10 % compared to 2009

Oslo's energy consumption includes electricity, district heating, wood burning, heating oil/paraffin, petroleum products, and biofuels. Today, there is no national municipality-distributed energy inventory, as for GHG-emissions. The municipality has therefore compiled an inventory for energy consumption based on statistics from Statistics Norway (SSB), the Norwegian Environment Agency's municipality-distributed greenhouse gas inventories, and Norwegian District Heating. This is shown in the figure below. Along with Stavanger, Bergen, and Trondheim, Oslo has requested national authorities to re-establish a national energy account for Norwegian municipalities.

### Energy use in Oslo from 2009-2021

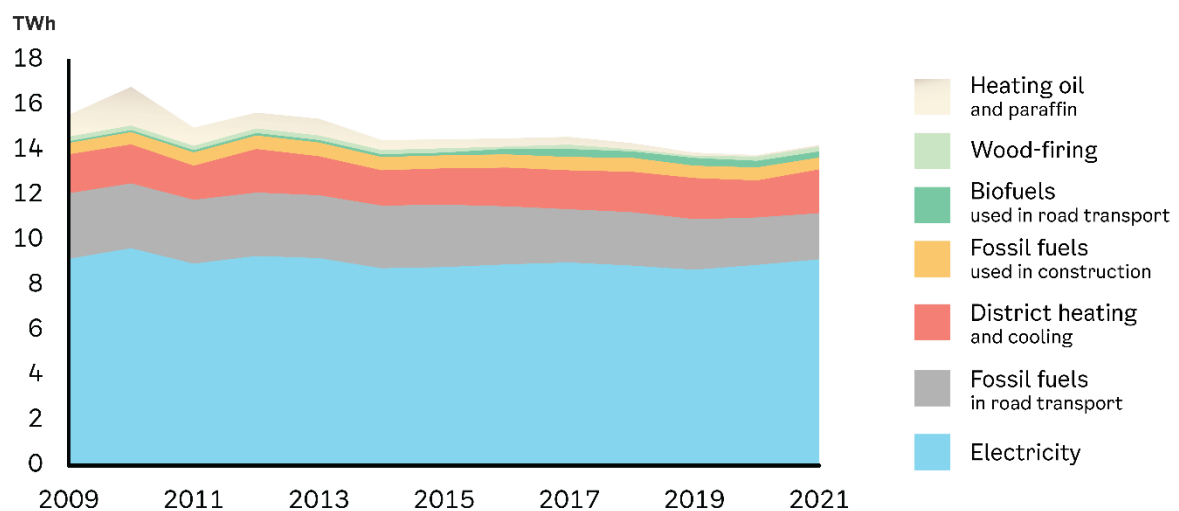


Figure 6: Energy use in Oslo from 2009-2021

The total energy consumption in Oslo has decreased by over 8 % from 2009 to 2021. The decrease is primarily a result of the electrification of the transportation sector and the ban on the use of heating oil in buildings from 2020. The consumption of other energy commodities has remained relatively stable since 2009, despite a population increase of 21 % in the same period.

From 2020 to 2021, energy consumption increased by 3 % due to higher consumption of electricity and district heating because of a cold winter in 2021. It is estimated that electricity consumption will continue to increase in the coming years as a result of increased use of electric vehicles and electric machinery in the construction and building sector.

There are no specific statistics for biofuel consumption in individual municipalities. It is assumed that the use of biofuels for construction and civil engineering projects has increased in the period from 2009 to 2021 as a result of Oslo Municipality's requirements for the use of fossil-free fuel in such procurements. Therefore, the total energy consumption is assumed to be somewhat greater than what the figure shows.

Oslo Municipality facilitates increased energy production and energy-efficient and smart energy solutions through its role as a planning authority, property owner, developer, and electricity and biogas producer. The municipality produces biogas from sewage sludge at the Bekkelaget treatment

plant and Vestfjorden's sewage company (Veas AS), and biogas is produced from the household food waste of Oslo at the Romerike biogas plant.

Since June 2020, the municipality has approved a total of 127 solar panel installations in housing cooperatives and condominiums with a combined annual energy production of about 19,800 MWh, equivalent to the electricity consumption of about 1,170 households. Furthermore, Oslo Municipality has approved a total of 1,536 energy efficiency measures since October 2020.

In the adopted budget for 2023, funds have been allocated in the economic plan to the Municipal Undertaking for buildings to install solar panels and reduce energy consumption in buildings and facilities operated by the municipality. As of June 2023, the Municipal Undertaking for buildings's solar panel installations had a combined annual energy production of about 3,900 MWh, equivalent to the electricity consumption of about 280 households. Additionally, there are facilities at the City Hall, the energy central at Ryen, and more. The Climate and Energy Fund's support rates for energy efficiency measures and the establishment of solar panels in housing cooperatives and condominiums were also increased in the autumn of 2022, until the end of 2023 as part of an energy campaign.

#### Measures and instruments within energy

Oslo's climate goals require a transition from fossil to renewable energy and an energy supply adapted to the zero-emission city. Because of high power prices and the challenging energy situation in Europe, the municipality has stepped up its efforts in energy efficiency and production. The following chapter systematizes the municipality's work in the energy field, providing an overview of existing measures and instruments.

In the Climate Strategy, it has been decided that a larger share of the energy in Oslo shall be produced locally and that various energy solutions should complement and relieve each other. Buildings in Oslo are to use electricity and heat efficiently and reduce energy use. Based on these goals, Oslo is working with three focus areas: increased local energy production, increased energy flexibility, and energy efficiency.

Measure	No.	Instruments	Responsible entity
<b>Cross-cutting instruments</b>			
	1	Projects within the FutureBuilt innovation program	PBE*
<b>Increased local energy production</b>			
	2	Increased energy production in municipal operations	Municipal Undertaking for buildings (Oslobygg)*
	3	Subsidies for the establishment of solar panels	Climate Agency*
<b>Increased energy flexibility</b>			

	4	Pilots for flexibility to the power system and microgrids in Hovinbyen	Oslobygg*, PBE*
	5	Comprehensive energy planning in Oslo towards 2030	Climate Agency*, PBE, Elvia, Celsio
<b>Energy efficiency</b>			
	6	Subsidies for energy efficiency	Climate Agency*
	7	Energy efficiency campaigns	Climate Agency*
	8	Reducing energy use in municipal buildings	Oslobygg*
	9	Increasing energy efficiency and reducing energy use in water and sewage facilities	Agency for Water and Wastewater Services *
	10	Reducing energy use for lighting in streets, parks, and public spaces	Agency for Urban Environment*
	11	Guidance for energy efficiency of older and heritage buildings	BYA*, PBE, KLI
	12	"Catch the Energy Thief" in buildings operated by Oslo Municipality	Oslobygg*

### Cross-cutting instruments

#### *Projects within the FutureBuilt innovation program*

The municipality has several projects in FutureBuilt's innovation program for energy-smart and climate-friendly buildings and urban areas. These are innovative projects that contribute to energy efficiency, local energy production, and energy flexibility, in addition to lower greenhouse gas emissions (for example, the use of low-carbon concrete).

#### Increased local energy production

Hafslund Consulting, on behalf of the Climate Agency, has assessed the electricity needs for the construction and civil engineering sector and heavy transport with a gradual transition to zero-emission technology. The report concludes that the transition to a zero-emission city will increase the city's energy and power needs and will require a large-scale expansion of capacity in the distribution network and the central network. The development of local renewable energy such as solar energy facilities (solar panels and solar collectors) and the use of the fjord as an energy source for heating and cooling will be an important part of the solution.

Energy production in Oslo Municipality has increased in recent years, but there is a need to strengthen efforts. There is a significant potential for local solar energy production on roofs in Oslo, up to 1.5 TWh for solar panels.

#### *Increased energy production in municipal operations*

Oslo's entities owning buildings and facilities, such as the Municipal Undertaking for buildings (Oslobygg), Boligbygg, the Agency for Urban Environment, and the Agency for Water and Wastewater Services, are considering solar power systems for energy production.

From 2022, the specification requirements (SKOK) for the municipality's purpose-built buildings state that all new buildings and major rehabilitations should, as a general rule, have a plus-house standard. Solar panels on roofs and facades should be installed where possible. The Municipal Undertaking for buildings is also working to retrofit solar panels when rehabilitating existing roofs. There will be 32 new solar power systems established by 2026. The Municipal Undertaking for buildings's annual energy production from solar panels will then be 6,050 MWh, equivalent to the electricity consumption of about 430 households.

The Agency for Water and Wastewater Services is constructing a water turbine at the St.Hanshaugen reservoir, which will produce an annual energy output of 700,000 kWh.

#### *Subsidies for the establishment of solar panels*

Through the Climate and Energy Fund, housing cooperatives, condominiums, and companies can receive support for consulting, purchasing, and installing solar panels.

#### *Increased energy flexibility*

The electrification of construction sites, port operations, and heavy transport will require increased access to electric power. This necessitates comprehensive energy planning in urban development and new solutions such as markets for buying and selling flexibility (see below) and batteries to always ensure sufficient energy and power in the network.

#### *Pilots for flexibility to the power system and microgrids in Hovinbyen*

In collaboration with the municipality's electricity supplier, Energi Salg Norge AS, the Municipal Undertaking for buildings (Oslobygg) has a pilot project to offer flexibility to the power system during periods of power shortage. Among other things, the Municipal Undertaking for buildings will offer to disconnect electric boilers to free up power in the network.

The Planning and Building Agency has received 0.3 million from the national Climate Initiatives Fund (Klimasats) to initiate a collaboration between property developers, housing cooperatives, energy suppliers, etc., to find solutions for establishing microgrids for energy in Hovinbyen. The purpose is to gain experience with how microgrids, a locally delimited transmission network that can be disconnected from the overarching power grid, can produce, store, and distribute energy while relieving the power grid in Oslo.

#### *Comprehensive energy planning in Oslo towards 2030*

Oslo Municipality, through the Climate Agency, has initiated the project "Energy Supply in the Zero-emission City," a collaboration project between the municipality and relevant stakeholders such as Elvia, Hafslund Oslo Celsio, landowners, developers, innovative energy companies, and national actors. The project aims to develop tools for comprehensive energy planning in Oslo, where the interplay between electricity and district heating is central to meeting the increasing power needs of the city.

## Energy efficiency

Oslo Municipality facilitates that buildings in Oslo should use electricity and heat efficiently and reduce energy use. The municipality is systematically working to reduce energy use in its own buildings.

In the planning and development of its building stock, Oslo Municipality uses the standard requirement specifications for Oslo Municipality (SKOK). SKOK contains stricter requirements for energy use in new buildings than the minimum requirements in the Building Technical Regulation (TEK17).

Battery electric motors are about three times more energy-efficient than combustion engines, and the transition from fossil to electric vehicles therefore contributes to reduced energy use. Measures for the electrification of transport are covered under direct emissions in the climate budget.

### *Subsidies for energy efficiency*

Through the Climate and Energy Fund, the municipality provides support for energy consultancy and energy efficiency measures such as insulation and the replacement of windows and doors in households.

### *Energy efficiency campaigns*

The Climate Agency organizes campaigns aimed at the population and businesses to increase knowledge about the benefits of energy efficiency measures, especially in the rehabilitation of buildings and homes.

### *Reducing energy use in municipal buildings*

The Municipal Undertaking for buildings has set a goal to reduce energy consumption in its building stock by 15 percent by 2026 compared to 2021 (adjusted for annual temperature differences). From 2021 to 2022, energy consumption was reduced by 2.9 percent. The Municipal Undertaking for buildings analyzes data for energy use per hour from all electricity and district heating meters in its buildings and implements measures where large energy and power drains are discovered.

### *Increasing energy efficiency and reducing energy use in water and sewage facilities*

Large amounts of energy are required to operate the city's water and sewage facilities. The Agency for Water and Wastewater Services has established an energy management group that works systematically to identify and implement energy-saving measures in water and sewage facilities. Measures include reducing water pressure in the network at night, optimizing temperatures in all facilities, and raising the level of sewage water to reduce the need for pumping power.

### *Reducing energy use for lighting in streets, parks, and public spaces*

The Agency for Urban Environment works systematically to reduce energy consumption related to lighting in streets, parks, and public spaces. The Agency for Urban Environment has established a control system for road- and streetlights and other municipal lighting facilities and continuously works to replace older lighting fixtures with more energy-efficient lighting systems.

### *Guidance for energy efficiency of older and heritage buildings*

The City Antiquarian, the Planning and Building Agency, and the Climate Agency will develop a guide for energy efficiency of older and heritage buildings. The guide will be easily accessible for Oslo's

residents and make it simple to get an overview of good energy efficiency measures for various types of buildings.

### *"Catch the Energy Thief" in buildings operated by Oslo Municipality*

The Municipal Undertaking for buildings organizes "Catch the Energy Thief" annually, where energy advisors go through all energy systems in selected buildings and identify operational faults and energy leaks. In 2022, "Catch the Energy Thief" was organized in four schools and four kindergartens, and "energy thieves" were uncovered totaling 860,000 kWh annually. In 2024, the Municipal Undertaking for buildings will conduct "Catch the Energy Thief" in a minimum of 10 buildings.

### [Oslo's capacity to withstand climate changes is strengthened towards 2030, and the city is being developed to be prepared for the changes expected up to 2100](#)

With climate changes, Oslo experiences more torrential rain, posing challenges with stormwater and urban flooding. Therefore, the municipality has adopted an action plan for stormwater management (proposition 291/19). The work on stormwater management is coordinated by the Planning and Building Department. Thematic maps for stormwater and urban flooding will be a central professional basis for the safe handling of stormwater in Oslo. The work to develop such a thematic map is ongoing. Guidelines and guidance for stormwater management have been prepared. This is intended to be an important tool in dialogue with developers and individuals to ensure good stormwater management.

The Planning and Building Department is revising the norm for blue-green factor. This is a tool used to maintain blue-green infrastructure (waterways and green areas) in city construction projects. The City Council took the strategy for green roofs and facades to orientation in proposition 160/22. More green roofs and facades will contribute to more nature in the building zone and the city being better equipped to meet more torrential rain, stormwater, heat, and drought.

The Agency for Water and Wastewater Services continues its work with opening streams. As part of the upgrade of Klosterenga Park, Hovinbekken stream was reopened in 2023. The Climate Agency coordinates pilot projects to facilitate the delay of stormwater in Marka (the forested areas around Oslo).

Proper land management is important in Oslo's work to become a climate-resilient city. Therefore, new provisions to the municipality plan's land use part have been proposed, laying the foundation for Oslo to be developed to handle climate changes. Central to this are proposed plan provisions related to risk and vulnerability analyses and efforts to maintain waterways and green areas in the building zone. Preserving the city's natural waterways and green areas is important for natural stormwater management, temperature regulation, and well-being. Bykubens project "Oslo Trees", aiming to plant 100,000 more trees in the city, is an important contribution to this work, and in 2022 nearly 2,300 trees were planted. In previous budgets, 9.5 million annually has been allocated for the years 2023-2026 to this project.

The City Government is committed to preserving biological diversity and ecosystems that give nature the ability to adapt to climate changes. The City Government recently adopted an action plan for biological diversity in Oslo. The purpose of the plan is to strengthen efforts to restore and increase the amount and quality of nature in the building zone, in the fjord, and in Marka. For climate adaptation and carbon sequestration, the restoration of nature is of particular importance. The Climate Agency and the Agency for Urban Environment have initiated a pilot project for the reintroduction of seagrass in the Oslo fjord. Seagrass provides habitats, improves water quality, and prevents erosion. A successful reintroduction of seagrass will have positive effects on biological

diversity and carbon absorption and storage. The Agency for Urban Environment is also doing extensive work to prevent and combat invasive species that more easily gain a foothold in a changed climate.

Oslo's nature will be managed so that natural carbon stores in vegetation and soil are preserved and the uptake of greenhouse gases in forests and other vegetation is increased towards 2030

Over 60 % of Oslo municipality consists of forest. This results in significant carbon uptake. According to the Norwegian Environment Agency's municipality-distributed emission inventory for forests, land use, and land-use changes, the uptake in forests in Oslo increased by about 7,000 tonnes of CO<sub>2</sub> eq. from 2010 to 2015. In 2015, the uptake in forests was about 114,000 tonnes of CO<sub>2</sub> eq. At the same time, there was an emission of around 20,000 tonnes of CO<sub>2</sub> eq. from 2010 to 2015 due to land-use changes in Oslo. The emission inventory has significant uncertainties. A new publication is expected in 2023, which will include several methodological improvements.

An analysis by the Planning and Building Department, based on NIBIO's land resource map AR5, shows that between 2016-2022, construction activities in Oslo primarily occurred on already developed areas. The areas that have been developed were largely those with small carbon stocks. The proposal for a new land use part of the municipal plan increases the area to be kept undeveloped by almost 2000 decares. This is estimated to save emissions equivalent to nearly 8,000 tons of CO<sub>2</sub> equivalents from avoided land-use change.

In collaboration with Trondheim, Stavanger, and Bergen, Oslo Municipality (through the Climate Agency) got the Norwegian Institute for Nature Research in 2023 to summarize existing knowledge and give recommendations on how municipalities can gain more knowledge about carbon in soil. The main conclusion is that there is very little data and knowledge about carbon stored in soil in various Norwegian natural types and that the maps of Norwegian nature are not accurate enough to use them to know how much carbon will be released by different land interventions. This is something Oslo will work towards national authorities to improve.

In the management of Oslo Municipality's own forests, measures that have a positive effect on climate, biodiversity, and outdoor life will be prioritized. The Department of Environment and Transport has commissioned the Agency for Urban Environment and the Climate Agency with several measures to strengthen climate considerations in the management of Oslo Municipality's forests. In addition, the Climate Agency is asked to consider possible measures and instruments to ensure that climate considerations are taken into account on forest lands not owned by the municipality. For the municipality's forests, the Agency for Urban Environment is, among other things, asked to continue to practice a forestry that simulates natural processes, aiming to achieve a varied forest with continuous plant cover and rich biodiversity. Such gentle forestry practice preserves the carbon stocks in the forest soil and ground vegetation and allows for the building up of carbon stocks over time, while avoiding emissions and soil degradation as a result of clear-cutting. As a general rule, closed logging forms should be practiced, and the Agency for Urban Environment should strive to avoid any form of logging or other interventions in old-growth natural forests. The Agency for Urban Environment has already converted several spruce-dominated forest areas to pine or mixed forests. There have also been attempts to convert from spruce forest to deciduous forest by sowing oak acorns. Both conversion forms will be tried out more in the years to come. The Agency for Urban Environment will further ensure reduced deforestation. Actions involving deforestation should only be carried out when there are compelling reasons for this and should be



carried out in a way that limits the extent of the deforestation. In areas with old-growth natural forest, deforestation should not be carried out.

The agencies are also asked to provide an overview of areas that are protected or subject to other restrictions and to consider which areas of old-growth forest, natural forest, and bog and swamp forest land might be suitable for protection to ensure robust ecosystems with a wider biodiversity. Over 30 % of the municipal forest is already protected, and the proportion will increase to over 50 % if a national park in Østmarka is established. The City Government simultaneously wishes for forestry to continue in the municipal forest and that Oslo Municipality's alternative management practices can inspire other forest owners to convert their operations in a more environmentally and climate-friendly direction. This will be considered in the assessment of possible expansion of protected forest.

The Agency for Urban Environment is working on restoring peatlands and will further develop and increase the extent of peatland restoration in a way that ensures the best possible effect for climate gas mitigations and biodiversity. Vegetation analyses have been conducted, which will be repeated a few years after restoration, to provide a basis for assessing the effect of the measures more closely. In collaboration with the Norwegian Nature Inspectorate, the Agency for Urban Environment has restored 435 decares of peatland from 2017 through 2023. Peatland restoration also contributes to Marka's ability to retain larger amounts of precipitation, improves the forest's drought resilience, and reduces the risk of forest fires.