NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Action Plan

Oslo

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1 Introduction

Introduction - textual element

Oslo is the capital of Norway, and the country's largest city with over 700,000 inhabitants. It is a compact city surrounded by the Oslo Fjord on its south side and the national protected forest «Marka» to its east, north and west. Oslo is a city in constant growth and transformation, and is one of Europe's fastest growing cities. A well-developed public transportation system of under- and over-ground trains, buses, trams, and boats gives easy to access to the city and its surrounding region. The city center is easily covered on foot, and city bikes and bikelanes are available throughout Oslo. The city offers great connectivity to nature. This is a central Norwegian value which underlies Oslo's aspiration to be a green capital and its aim to become a fossil free city by 2030.

The City has a parliamentary system of governance. The City Government is responsible to the City Council in the same way that the National Government is responsible to the National Parliament. The City of Oslo holds both municipal and county functions. For information on how the City of Oslo engages citizens see the commitments document, and the section on inclusive practices in the AP.

Oslo has a long history of ambitious climate policies, supported by city governments from different sides of the political spectrum. In 2016 Oslo launched it's first Climate Budget. In 2020 the City's current Climate Strategy was adopted with broad support from parties across the political spectrum. Oslo's CCC builds directly these and other governance processes that have been closely calibrated to fit the City's democratic and political processes.

Note that the bulk of the Commitments document and the Action Plan were drafted in 2023.The Investment plan was drafted in 2024 and uses more recent data, which explains discrepancies between the documents. For updated status including data and numbers, please consult the latest climate budget available here.

In line with NZC guidance Oslo has adapted the CCC guidance and methodology to reflect the City's political realities and existing climate mitigation governance structures. This will ensure that the Climate City Contract adds value to the City of Oslo's climate mitigation work, while avoiding to create parallel processes that distracts from our joint ambition of achieving a Net Zero future. To avoid developing parallell processes, and to not replace something that works well for Oslo, this CCC will not replace Oslo's existing processes, strategies and tools, but will instead summarize and reflect them. Any work to expand on Oslo's current climate ambitions will run through the city's own political processes.

Oslo's Climate Neutrality Action Plan builds directly on the City's Climate Strategy. The Climate Strategy for Oslo sets out the city's climate target towards 2030. Oslo's ambitious climate goals have given the city international recognition Awards/mentions lauding Oslo's climate policies include the 'European Capital Award 2019'and the E-visionary award 2023. Oslo was among the CDP A-list in 2021 and 2022. Nationally, we have won the 'Local climate measure of the year' award in 2021 and 2019 (handed out by the Norwegian foundation 'Zero Emission Resource Organisation'). A recent investigation conducted by 'Sentio1' found Oslo to be the most sustainable municipality in Norway.
The Climate Strategy is a Paris Agreement Compatible (PAC) Climate Action Plan, adopted by the city council in May 2020. The main target is a 95 % reduction of direct GHG emissions, with additional targets including management of natural areas to sequester carbon in vegetation and soil, a 10% reduction in total energy consumption by 2030 compared to 2009, as well as a substantial reduction of indirect emissions. Oslo is not planning to use carbon offsets or carbon sequestration to reach the 95% goal. The Climate Agency has the mandate to coordinate and lead the work on GHG reduction and reduced energy consumption in Oslo.

The GHG inventory shows that emissions in Oslo in 2020 were about 1.08 million tCO2eq. This is a decrease of 5.9% from 2019 and marks the lowest GHG emissions in the period from 2009-2020. Compared to 2009, GHG emissions in 2020 represent a decrease of 26%, while in the same period the population increased by 20%, from 575,475 to 693,494. This greenhouse gas inventory includes

only direct emissions (scope 1) from Oslo's geographic area. The inventory includes all emissions from district heating which lies entirely within Oslos geographic borders but does not include scope 2 emissions from electricity production.

Oslo's 95% goal includes only scope 1 emissions. If this target is reached, Oslo will have approximately 72 000 tonnes CO2eq residual emissions from scope 1 in 2030. However, the NetZero Cities goal includes both scope 2 emissions from electricity and scope 3 emissions from waste. The Climate Agency has quantified these emissions, which amounted to approximately 75 000 tonnes CO2eq in 2020.

In the spring of 2022, an agreement was signed between the central government, the City of Oslo and the new owners of the waste-to-energy facility at Klemetsrud (Hafslund Oslo Celsio), which secured the full financing of carbon capture at the waste facility. Construction is currently on hold due to cost increases related to higher energy and material costs, inflation, and changes in exchange rates etc. A decision on how to finance the increased costs between the owners, the municipality, and the state is expected in the summer of 2024. The earliest start of the facility is thus expected to be summer 2027.Carbon capture will not only reduce fossil emissions by just under 165,000 tonnes but will also capture 170 000 tonnes of biogenic CO_2, i.e., carbon from organic matter (such as wood, cardboard/paper and food waste). The carbon capture of biogenic CO_2 at the waste facility at Klemetsrud can enable Oslo to become "carbon negative" by 2030, as stated in the vision established in the Climate Strategy.

As part of the overall Climate Strategy, Oslo aims for a significant reduction in indirect emissions (emissions from outside the city geographic boundaries) by 2030. Consumption-based emissions (scope 3) are targeted at different levels through policies and measures. A priority mission is to reduce embodied carbon from construction materials. Through targeted use of sustainable procurement the city also develops its efforts and requirements for circular, low carbon products on key consumption categories such as transport, construction, furniture, food, textile and ICT equipment. A strategy for reduced and sustainable consumption in Oslo was adopted in 2019 and is followed by efforts to develop performance indicators. A new initiative to develop a more comprehensive management framework to reduce consumption based, indirect emissions was launched in 2023.

Climate Budget Oslo's overall Climate Strategy is closely linked to the city's budgeting processes. The process for achieving Oslo's climate targets is anchored in the City's annual Climate Budget-process, with funding integrated into the city's 4-year budget-cycles. This means that tagging or attempting to isolate allocations for climate work in the city budget would give an inaccurate understanding of the resources allocated to climate measures. The climate budget provides a concrete timeline, monitorable targets, regular reporting, and an updated plan for stakeholder engagement, and is revised annually. The budget identifies and calculates the effect of concrete climate measures and assigns responsibility for cutting emissions across the city Government. Measures are proposed, adopted, implemented, monitored, and reported on in line with the budget cycle- ensuring a coordinated effort. The budget is managed by the city's finance department. A scientific knowledge base prepared before each budget cycle helps the city identify where to concentrate its efforts. Gaps are continously identified, and new measures and solutions proposed annually. The Climate Budget as such has monitoring, evaluation and learning already built into its process. Therefore, while the NZC Climate Contract and Action Plan will be updated as necessary, it is this locally adapted and fine-tuned Climate Budget which in practice will serve as an annually updated Climate Action Plan for the city.

Emissions statistics
The City of Oslo reports its GHG emissions through C40 to CDP, is a signatory to the Covenant of Mayors, and is among the CDP A List cities. These processes are all linked to Oslo's existing Climate Strategy and Climate Budget, as our international ambition are governed by our local policy.

The largest source of emissions in Oslo is 'Road transport' (52%), followed by 'Waste incineration' (25%) and 'Other mobile combustion' (12%) (including constriction machinery). These emission sectors are the key priorities of Oslo's climate action. Oslo has already adopted policies and measures

which is estimated to bring the City to a 62% emission cut by 2030. Additionally, the City has identified municipal and national policies and measures which willl lead to a 79% emission cut (if implemented at full strength). For the final 21% of emission cuts, the City has developed detailed roadmaps (more details in chapter 5 of the addendum to the Climate Budget).

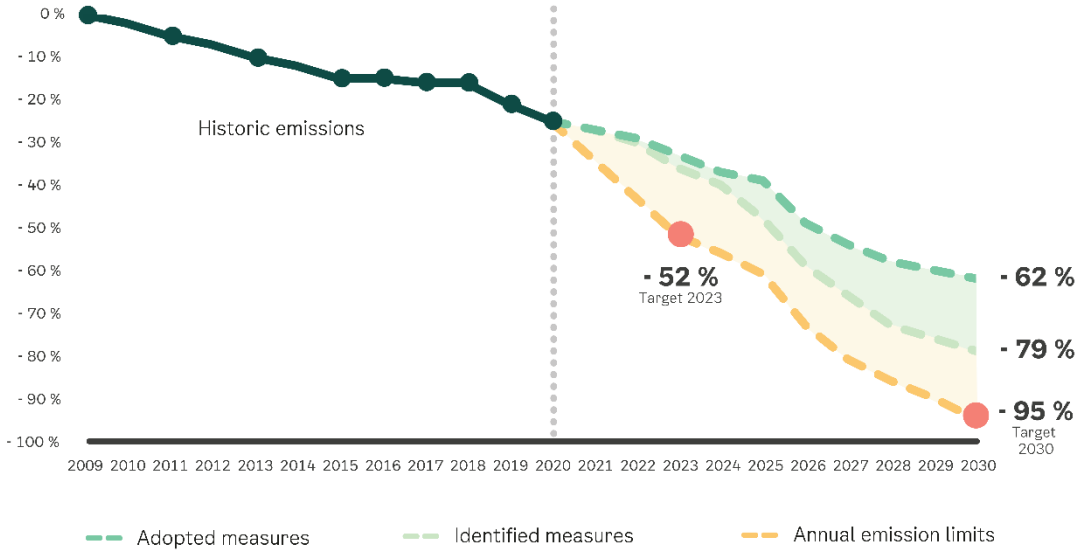

Figure 1 : Projected development in emissions towards 2030 with adopted measures and the potential for emission cuts from identified measures

Since 2009 emissions from fossil-fuelled heating have been almost eliminated in Oslo, and have been replaced with electricity. Electricity production in Norway is predominantly hydropower-based and the Norwegian grid thus has very low scope 2 emissions, averaging 11 grams (g) CO2eq per kilowatt-hour (kWh) in 2020. As a result, energy efficiency is less relevant for carbon reductions in Oslo than for some other European cities. Nevertheless, Oslo has committed to reduce total energy consumption in the city by 10%. The City works to promote renewable energy solutions and facilitates pilot to develop flexible and innovative energy solutions, such as energy storage and smart energy consumption systems.

Oslo acknowledges the need to reduce energy consumption, increase energy efficiency and promote local energy production. The City Council has therefore launched a reinforced energy savings program as part of the 2023 Climate Budget. Increased subsidies for energy saving measures, as well as increased funding for local solar production, are part of the incentives-package in this energy programme.

Climate Strategy- engagement
Oslo has a long history of ambitious climate policies, driven by various city governments from different sides of the political spectrum. The current Climate Strategy began with a consultative process, involving citizens, private sector, and NGOs through workshops and a public hearing. The Climate Strategy was adopted in 2020 by a broad majority of parties in the city coouncil (8 of 10 political parties).

The Climate Strategy also makes climate leadership as a priority. This includes strengthened citizen engagement, especially when it comes to the involvement of children, youth and the private sector. For example, the Climate Agency runs the 'Business for Climate' coalition of appx 150 private businesses in the city (established 2010). This network has been key in identifying, refining and implementing activities climate actions. Some of the work the City has done on electrifying construction, for example, stems from partnerships forged between the City and the business community, originating in the Business for Climate network. All members of this coalition have signed

a Climate Contract that supports Oslo's Climate Strategy and climate target. 19 of the members are also 'Climate Partners', committing to more binding collaboration with the city to reduce emissions. The City of Oslo is also partial or sole owner of several limited liability companies, among them energy and grid companies, transportation companies, the Port of Oslo, as well as major construction companies. Governance structures of these companies emphasize social and environmental responsibility.

Oslo's Climate Agency also supports targeted communication and involvement processes about climate change towards schools, youth, specific neighbourhoods and the wider public. The agency conducts yearly climate polls, mapping behaviour and attitudes towards climate action and climate measures the city is introducing. The polls indicate that 68% of citizens support the ambitious climate goals set by the city.

The City also engages on issues related to national climate policies, and has long standing collaboration with other Norwegan cities such as Bergen, Stavanger and Trondheim through the 'Network for large cities on climate change' (Storbynettverket for Klima).

Finally, Oslo has a strong international engagement on climate policies, through support of C40, CNCA, and the Covenant of Mayors.

2 Part A – Current State of Climate Action

2.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

The Norwegian Environment Agency (NEA) prepares an emissions inventory for all municipalities in Norway (including Oslo). This inventory is done with methodology that is consistent with the national greenhouse gas inventory which is submitted to the UNFCCC and follows the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. However, there are a few exceptions. The inventory does not include F-gases and includes through-traffic from ships. The latter is not included in the national inventory. Oslo's greenhouse gas inventory shows the direct physical emissions occurring within the geographical boundary of a city. Indirect emissions that can be linked to the local authorities or the city's inhabitants through their consumption are not included. The emissions are limited geographically and placed in the city where the physical emissions take place.

Although the GHG inventory uses consistent methodology with the national inventory submitted to the UNFCCC, the city level emission inventory is divided into fewer categories. Specifically, the *greenhouse gas inventory* is distributed amongst nine emission sectors and 45 sources of emissions, and shows emissions for the years 2009, 2011, 2013 and 2015 to 2020 (shown in annex 2). Emissions prior to 2009 have not been calculated because it is not possible to find good data sources that would give a reliable time series further back in time than this.

Emissions have been calculated for the greenhouse gases carbon dioxide (CO2), nitrous oxide (N2O) and methane (CH4). The greenhouse gases have been converted into CO2eq using GWP values in accordance with the fourth main report from the IPCC (Intergovernmental Panel on Climate Change). The GWP values for CO2, N2O and CH4 are respectively 1, 298 and 25. The emission inventory does not include F-gases, hydrofluorocarbons (HFKs) and perfluorocarbons (PFKs), or Sulphur hexafluoride (SF6) or Nitrogen trifluoride (NF3). Currently we only have data for HFKs and PFKs and SF6 at the national level, and Norway does not have NF3 emissions. The Norwegian Environment Agency is working to include these gases to the municipality level inventory in the future.

The Climate Agency does all analysis based on the sector categorization in the municipality level GHG inventory from the Norwegian Environment agency. Our 95% goal is a scope 1 goal, and our Climate Budget and gap analysis only quantifies scope 1 emissions. Total scope 1 emissions in Oslo amounted to 1.08 million tonnes CO2eq in 2020.

2.1.1 AFOLU and IPPU emissions

The Norwegian environment agency produces a GHG inventory for agriculture, forestry and other land use (AFOLU) emissions based on IPCC guidelines. This inventory is updated every five years. Currently we only have data from 2015, but should receive data for 2020 sometime in 2023. Emissions from the AFOLU sector in 2015 amounted to around 17000 tonnes CO2eq, while sequestration amounted to around 113000 tonnes CO2eq. Oslo does not have a quantified goal for carbon sinks, and instead has a general goal to manage the natural environment to enhance carbon storage in vegetation and soil (see more info on target 2 on page 30 and onwards). This is because the inventory for AFOLU has too many uncertainties and among other things does not include carbon sinks in forest soil, which is an important aspect of Oslo's mitigation measures.

With regards to emissions from Industrial Processes and Product Use (IPPU), the Norwegian Environment Agency's inventory does not use this categorization and the GHG inventory does not include F-gases and SF6 (see explanation above). However, Oslo does not have emissions from industrial processes. Emissions in Oslo that stem from the emission sector *industry, oil and gas* in the NEA GHG inventory is solely from combustion of fossil-fuels (see explanation under industry in A-1.6). Furthermore, emissions from the use of paraffin wax are included in the heating sector (see explanation under heating in A-1.6).

2.1.2 Norwegian Environment Agency GHG inventory compared to Global Protocol for Community-Scale GHG Inventory (GPC)

Although the City of Oslo uses the Norwegian environment agency's greenhouse gas inventory, we also submit a greenhouse gas inventory to the Carbon Disclosure Project (CDP) and C40 in GPC format. For comparison to other cities we have also included our emission inventory for 2020 in both the GPC format and our own format in annex 2 and 3. We have also included emission factors and underlying activity data see annex 4 and 5. The biggest differences between the NEA inventory and the inventory in GPC format is a different categorization of sectors and that scope 2 and certain scope 3 emissions are included in the GPC format. Although the NEA inventory only includes scope 1 emissions, this does cover all district heating (mostly waste incineration) which is both produced and consumed within Oslo's geographical boundaries.

2.1.3 Scope 2 and 3 emissions

Oslo is working to reduce scope 2 and 3 emissions, but our 95% reduction goal covers scope 1 emissions and only these emissions are quantified in our Climate Budget and gap analysis as described in module B-1 and B-2. Emissions from district heating are included in Scope 1 in Oslo since the facilities are within the city's geographic boundaries. Scope 2 emissions from electricity use and scope 3 emissions are covered by target 3 and 4 respectively, but these goals do not have quantified CO2 emission targets (see chap xx for more information on these goals).

Scope 2 emissions from electricity are generally quite low in Norway since most energy generation stems from hydropower. The emission factor for energy in 2021 provided by the Norwegian Water Resources and Energy Directorate (NVE) was 11 grams CO2eq/kWh (Location based method). With this emissions factor scope 2 emissions from energy use in Oslo amounted to approximately 50 000 tonnes CO2eq in 2020. However, this estimate of total emissions can have large fluctuations from year to year due to changes in the emission factor. The emission factor has ranged from 8-18 grams CO2eq/kWh over the past few years.

Scope 3 emissions are quite challenging to estimate, and it can be difficult to establish consistent time series. The Climate Agency has not reported many estimates of scope 3 emissions with the exception

of emissions from waste, which are included in our CDP reporting. These emissions amount to approximately 25000 tonnes CO2eq and stem from incineration of sorted plastic that doesn't get recycled, and biogenic emissions from a biogas facility that treats Oslo's food waste and a facility that treats some of Oslo's wastewater. However, the Climate Agency is also developing a set of indicators to track additional scope 3 emissions from consumption (see page 38), and in 2022 set a goal to reduce GHG emissions from materials in new and refurbished buildings by 30%.

A-1.5: Graphics and charts

The following graphs, charts and baseline trajectory are divided in the emission inventory format from the Norwegian Environment Agency. The emission inventory shows that total GHG emissions in Oslo amounted to around 1.08 million tonnes CO2eq in 2020. From 2019 to 2020, emissions fell by 5.2%, primarily as a result of an increase in the proportion of electric cars and a reduction in vehicle-kilometres. The reduction in vehicle-kilometres is the result of restrictions in connection with the COVID-19 pandemic. The rise in emissions in 2017-18 was caused by an increase in emissions from diesel-powered motorised equipment and a reduction in the use of biofuels in road transport. In 2020, GHG emissions from the waste and wastewater, industry, oil and gas, aviation, heating and road transport sectors were at their lowest level since 2009. Compared with 2009 levels, emissions in Oslo have fallen by 25% (Figure 1).

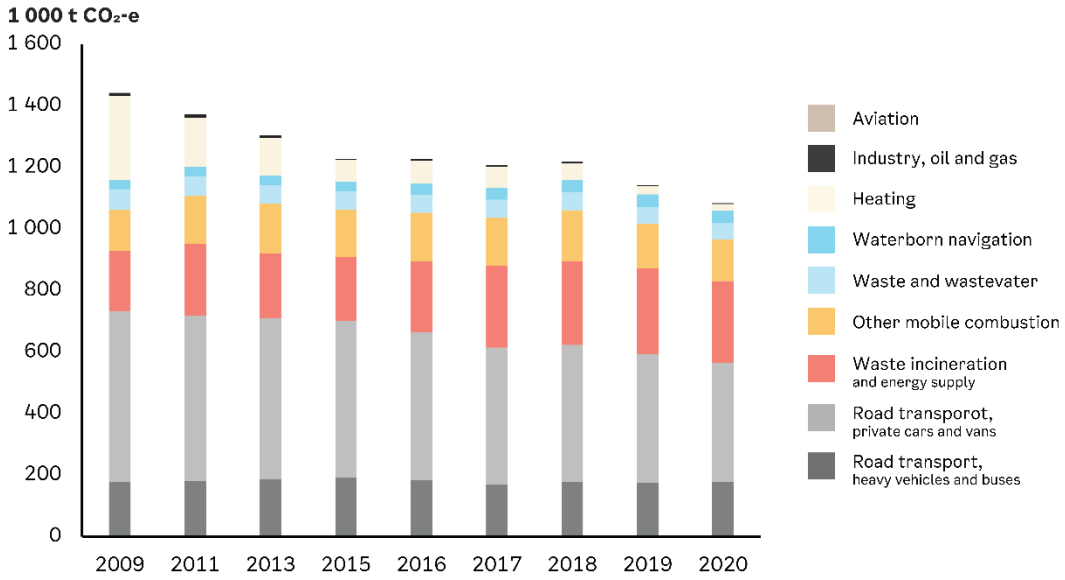

Figure 2: Historic emissions 2009-2020

As Figure 2 shows, the largest emission sources in 2020 were road transport (52%), waste incineration and energy supply (25%, primarily the incineration of fossil waste), and other mobile combustion (12%).

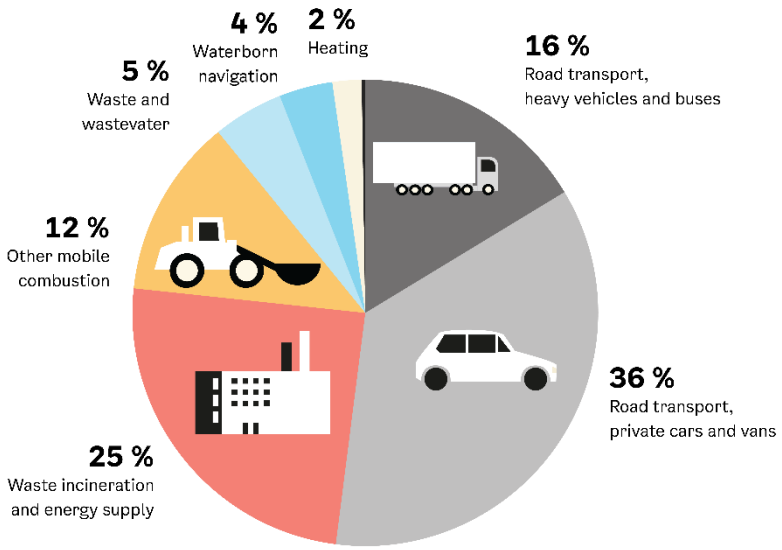

Figure 3: GHG emissions in Oslo by emission sector, 2009-2020

The baseline trajectory shows an estimated reduction in GHG emissions of 39% in 2030 from 2009. Figure 3 shows historical emissions and projections of emissions towards 2030.

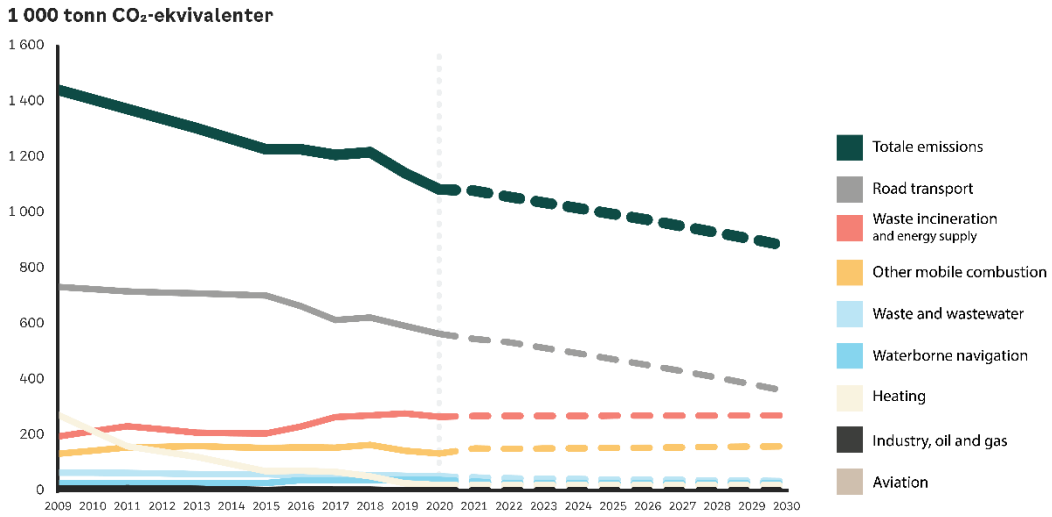

Figure 4: Development in historical emissions during the period 2009-2020 and emission projections for the period 2021-2030, assuming no additional measures

A-1.6: Description and assessment of GHG baseline inventory

Emission inventory for Oslo broken down by emission sector

Road transport

Emissions from road transport originate from cars, vans, heavy vehicles and buses, and amounted to just under 564,600 tonnes CO_2eq in 2020. This represents a decrease of 4.9% from 2019, equivalent to just under 30,000 tonnes CO_2eq. The decrease is primarily due to an increase in the proportion of electric cars and a reduction in vehicle-kilometres. A reduction in the in the use of biofuels made a

contribution in the opposite direction. GHG emissions from road transport are the largest emission source in the city and accounted for 52% of total emissions in Oslo in 2020.

In 2020, cars and vans accounted for 48% and 20% of emissions from road transport in Oslo respectively, while heavy vehicles and buses accounted for 25% and 6% respectively. Emissions from cars fell by 9% from 2019 to 2020, while vans decreased by 4.5%. Emissions from heavy vehicles rose slightly by an amount corresponding to 2% from 2019 due to a reduction in biofuel blending, while buses saw a small reduction corresponding to 1%.

Emissions from road transport have fallen every year since 2009, with the exception of a 1.5% increase from 2017 to 2018. This increase was primarily the result of a decrease in the use of biofuels in Norway. In both 2019 and in 2020, emissions from road transport fell by just under 5% compared with the previous year.

Waste incineration and energy supply

The emissions sector waste incineration and energy supply include emissions from waste incineration, other district heating, and electricity production and other energy supply. Oslo only has emissions from waste incineration and other district heating. Emissions from the sector amounted to around 266,600 tonnes CO_2eq in 2020. Almost all emissions originate from waste incineration, with the energy generated being used in district heating production. Emissions fell by 4.4% from 2019 to 2020, corresponding to approximately 12,000 tonnes CO_2eq. This reduction was primarily due to the fact that almost no fossil energy sources (peak load) were used in district heating production in 2020. At the same time, the use of peak loads varies from year to year, depending on electricity prices and temperature.

Other mobile combustion

Emissions from other mobile combustion originate from the use of duty-free diesel for non-road motorised equipment used in the construction, agriculture, forestry, transport and waste treatment sectors. Duty-free diesel used in snowmobiles is also included.

In 2020, emissions from the sector amounted to around 135,000 tonnes CO_2eq. Machinery linked to construction generated the largest emissions, accounting for almost 70,000 tonnes CO_2eq. 'Other industries' and 'Services related to transport' are the next two largest emission sources, both resulting in emissions of almost 30,000 tonnes CO_2eq in 2020.

Emissions from the sector fell by 6.8%, corresponding to just under 10,000 tonnes CO_2eq from 2019 to 2020. However, the calculation method used by the Norwegian Environment Agency to estimate emissions from other mobile combustion is subject to some uncertainty, which makes it challenging to explain both emission levels and trends in the sector. Emissions from other mobile combustion vary from year to year depending on the level of construction activity.

Heating

This emission sector includes emissions from the heating of commercial buildings and households, broken down between the emission sources 'fossil fuel heating' and 'wood-firing'. In 2020, emissions from the sector amounted to around 22,000 tonnes CO_2eq, a decrease of 21.1% from 2019. The reduction is linked to a sharp decline in the use of fossil fuel heating sources, a result of the ban on oil heating ban which entered into force on 1 January 2020.

The largest emission source in the sector is the use of LPG, which resulted in emissions of just over 12,300 tonnes CO_2eq in 2020. Emissions from the combustion of paraffin wax and wood-firing both accounted for just under 5,000 tonnes CO_2eq.

Waterborne navigation

This emissions sector includes waterborne commercial and passenger traffic within the city's borders. In 2020, emissions from the sector amounted to around 40,300 tonnes CO_2eq, a decrease of less than 1% from 2019. The effect of shore power will be taken into account, but only in 2020. The statistics prior to this will therefore be slightly too high.

In 2020, emissions from cruise traffic fell by over 80% compared with 2019, due to the COVID-19 pandemic. In addition, emissions from chemical tankers and general cargo ships have fallen somewhat. This may partly be due to the fact that there were fewer deliveries of aviation fuel to the Port of Oslo, due to a decrease in the number of flights as a result of the COVID-19 pandemic. Emissions from the passenger segment rose by 20% from 2019 to 2020 as a result of international ferries operating on the Oslo-Kiel route spending much more time within the city boundary than they did before the pandemic.

Industry, oil and gas

The emission sector 'industry, oil and gas' includes emissions from both industrial processes and combustion. Oslo only has emissions from combustion. In 2020, emissions in Oslo from industrial combustion amounted to just under 2,700 tonnes CO_2eq, a decrease of 12% from 2019. The facilities that have submitted reports to the Norwegian Environment Agency are FATLAND OSLO AS, GE Healthcare, Nordox and Tine Meieriet Oslo (Kalbakken facility). According to Norske utslipp, Nordox reduced its emissions from 2019 to 2020.

Statistics Norway estimates emissions from incineration plants that do not submit reports to the Norwegian Environment Agency. These emissions are excluded from the emission inventory, but are shown as additional information to the emission inventory as supplementary emissions estimated by Statistics Norway. These emissions have been omitted because of uncertainty linked to annual developments in these emissions, as Statistics Norway's estimates are based on a sample survey where not all enterprises are asked about energy consumption every year. In 2020, these emissions amounted to approximately 25,700 tonnes CO_2eq.

Waste and wastewater

The Waste and wastewater sector includes the emission sources waste landfill gas, biological treatment of waste and wastewater. In 2020, emissions from the sector amounted to around 53,200 tonnes CO_2eq, a decrease of 3% from 2019.
Around 82% of emissions from the sector originate from landfill gas produced at closed landfill sites in Oslo. These landfills are the largest source of methane gas emissions in Oslo.

Aviation

Emissions from this sector originate from emissions from aircraft and helicopters during landing or take-off. In 2019, Oslo was attributed emissions of 0.2 tonnes CO_2eq as a result of the take-off and landing of helicopters at Rikshospitalet and Ullevål Hospital in Oslo. These emissions are not included in the inventory for 2020, so the time series in the Norwegian Environment Agency's emission inventory is not consistent for this emission source.

2.2 Module A-2 Current Policies and Strategies Assessment

A-2.1: List of relevant policies, strategies & regulations					
Type	Level	Name & Title	Description	Relevance	Need for action
(regulation/ policy/ strategy/ action plan	(local, regional, national, EU)	(Name of policy/ strategy/ plans)	(Description of policy/ strategy/ plans)	(Describe relevance/ impact on climate neutrality ambition)	(list any suggested action in relation – to be further picked in Module C-1)
Climate Strategy	Local	Oslo Climate Strategy	A holistic strategy for all climate work in Oslo	Highly relevant	Actions and measures to follow up Oslo's Climate Strategy is described in Oslo Climate Budget
Action Plan/ Policy/ Investment plan	Local	Oslo Climate Budget	A holistic action plan for climate policy on all levels of City government in Oslo	Highly relevant	Table below (Mitigation measures and measures in the Climate Budget) describes all major City actions to reduce City climate gas emissions.
Mapping of relevant national policies	National	'Statlige rammebetingelser og behov for klimavirkemidler' (attached)	Description of national laws, regulations, policies and conditions which impacts local climate policy in Oslo, and where Oslo has a need for national policy change in order to tackle ghg emissions. 28 pages (in Norwegian)	Highly relevant	List of action needs, from overall national governance tools (changes in national law on planning and construction, changes in CO2 tax, changes needed related to climate leadership, mobility, energy, waste and climate adaptation)

Mapping of relevant EU Policies.	European	'Oversikt over EUs ramme-betingelser på mobilitets området av betydning for gjennomføringen av Oslo Kommunes Klimastrategi for 2030'	Mapping of existing and upcoming EU policies on mobility and how they will affect Oslo.	Highly Relevant	Consider if we should work more closely on related EU Policies on Waste and CCS- which is our second largest source of emissions. Consider if we should work more closely on 'other mobile combustion' (potentially covered through NZC Pilot application). Consider if we should work more closely on EU taxonomy and how it will affect city government.
The City of Oslo's bicycle strategy	Local	The City of Oslo's bicycle strategy 2015-2025	Details how Oslo will work to promote cycling. And contains a plan for the cycle network	Highly relevant	Under implementation
Oslo ports zero emission action plan	Local	Zero-emission port action plan	Describes concrete measures to reduce emissions from shipping and on land at ports.	Highly relevant	Currently under revision
Oslo procurement strategy	Local	Procurement strategy 2017	Describes how Oslo will use procurement also to combat climate change	Highly relevant	Under implementation

A-2.2: Description & assessment of policies

Oslo has been working systematically on mainstreaming local climate policies through our Climate Budget for over seven years now. The Climate Strategy is the overarching guiding document, while the yearly Climate Budget is our tool to operationalize our climate targets. The Climate Budget compiles all the City's work on climate and can be found at our website. We do yearly translations to English.

Below we describe Oslo's goals and the City's adopted climate policies and measures from the Climate Budget.

Oslo's climate targets

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

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

For information on how Oslo is working on all our goals see Oslo's climate budget .

Aggregated effect of the Climate Budget 2023

With the measures that have been adopted in this Climate Budget, it is estimated that GHG emissions in Oslo will be reduced by 33% in 2023 by 49% in 2026 compared with 2009 levels and by 62% by 2030. The effect on the climate of the adopted measures is measured against a baseline trajectory prepared by CICERO, which estimates Oslo's emissions towards 2030, assuming that no further measures will be introduced after 2021. Since the Climate Budget is a part of the ordinary budgeting cycle, we estimate emission reductions in accordance with the financial budget for 2023 (the coming year) and for 2026 which is the end of the economic plan period. However, for this specific Net Zero Cities Action Plan we have only included estimates for 2023 and 2030 our two climate target years.

The Climate Budget is a continual process. When it is decided in the city council and published, the Climate Agency and other underlying entities are already working on formulating climate measures for the next year's budget. Adopted measures in the Climate Budget are measures that are decided upon by the city council. However, once implemented, the effect of the measures will disappear from the table in the Climate Budget and instead be included in the baseline trajectory. Implemented measures are those for which legislation is in force, or financial resources have been allocated. This means that every year some climate measures that have been «completed » disappear from the Climate Budget while other, new or strengthened measures are adopted. However, some measures which require continuous follow-up or continuous funding (for example installing charging stations), will remain in the Climate Budget every year and be reported on three times per year (see 4-2 monitoring and reporting).

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

GHG emissions in the City of Oslo 2020, 2023 and 2030

	2009 (baseline year)	2020 (inventory)	2023	2030
Historical emission cuts and baseline trajectory	0%	-25%	-28%	-39%
Adopted measures (incl. the baseline trajectory)	-	-	-33%	-62%
Emission level (tonnes CO_2eq)*	1,442,878	1,084,233	962,000	548,300
Targets			-52%	-95%
Difference between adopted measures and targets			19 pp.	33 pp.

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

Mitigation measures in the Climate Budget 2023

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

The table below shows adopted mitigation measures and measures in the Climate Budget, as well as estimated emission reductions in 2023 and 2030 the climate target years.

The effect of the measures includes emission reductions which occur within the geographical boundary of the city (scope 1). Indirect emissions (scope 2 and 3) caused by the city or its inhabitants and businesses through their consumption are not included (see chap 3.3 for more information on work concerning scope 2 and 3).

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

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

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

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

Mitigation measures in the Climate Budget

Emission sector/mitigation measure	No.	Measures	Responsible	Effect 2023 (tonnes CO_2 eq.)	Effect 2030 (tonnes CO_2 eq.)
Waste incineration and energy supply					
Zero-emission production of district heating	1	Establishment of gas boiler for the production of district heating from landfill gas	REG*, EBY	200	250
Waste incineration with carbon capture	2	Carbon capture at the Klemetsrud facility	Hafslund Oslo Celsio/KON	0	164,500
Waste and waste water					
Extraction of landfill gas	3	Maintenance of landfill gas facilities at Rommen and Grønmo	EBY*, REG	Not calculated	
Road transport					
Overarching measures	4	New tariffs in the road toll ring		17,200	17,200
	5	Procurement of zero-emission and fossil-free vehicles in the city	All*, UKE*	1,100	900
	6	Establishment of zero-emission zone in the Car-free city living area	BYM*, KLI	0	4,800
Reduced traffic	7	Incentives to promote cycling and walking (subsidies, climate-friendly commuting programme, infrastructure for cycling)	BYM*, KLI*	Facilitating mitigation measures	
	8	Improve public transport (improve accessibility, new trams, improvements to the Oslo Metro, etc.)	Ruter*, BYM*		
	9	Facilitate the use of sharing solutions (car sharing, e-bike sharing, etc.)	BYM*, Ruter*		
	10	Parking measures (increase tariffs, remove parking spaces, new parking regulations, etc.)	BYM*, PBE*	Not calculated	
	11	Reduce the transport of bulk materials and waste	KLI*, FOB*, UKE, Oslobygg, Port of Oslo, PBE, EBY, BYM, VAV		
Zero-emission cars	12	Establish charging infrastructure for cars	BYM*	Facilitating mitigation measures	
	13	Incentives for zero-emission taxis from 2025 (requirements, subsidies, charging infrastructure, etc.)	BYM*, KLI*	5,800	8000
Zero-emission vans	14	Zero-emission requirement for goods deliveries on behalf of the City	All*, UKE*, KLI	900	10,000
	15	Incentives for zero-emission vans (establish/subsidies for charging infrastructure, freight consolidation centres, loading facilities, parking, etc.)	KLI*, BYM*		
Zero-emission-free/biogas buses	16	Procurement of zero-emission buses for public transport	Ruter*, MOS	14,000	20,700
	17	Procurement of zero-emission transport for persons with disabilities		800	800
	18	Incentives for zero-emission tour and express buses (establish/subsidies for charging infrastructure)	KLI*, BYM*, UDE, UKE	Not calculated	

Zero-emission/biogas trucks	19	Zero-emission requirement for trucks on assignments carried out on behalf of the City	All*, UKE*	2,400	31,000
	20	Incentives for zero-emission heavy transport in Oslo (exemptions inside the road toll ring, establish/subsidies for charging infrastructure, provision of land for energy stations, etc.)	KLI*, EBY, BYM*		
Other mobile combustion					
Zero-emission building and construction projects	21	Zero-emission requirement for City construction sites	All*, UKE*	11,900	15,200
	22	Fossil-free construction site regulation in zoning plans	PBE*, KLI*	17,900	49,000
Zero-emission machinery and motorised equipment	23	Facilitate zero-emission handling of goods and cargo at the Port of Oslo	Port of Oslo*	300	2,800
	24	Procurement of zero-emission machinery for the City of Oslo's machinery fleet	All*, UKE*	1,300	3,300
	25	Incentives for zero-emission motorised equipment and events (subsidies, electricity for events)	KLI*, BYM*	500	800
Waterborne navigation					
Zero-emission ferries on public transport services	26	Procurement of zero-emission high-speed ferries	Ruter*, MOS	0	1,400
Zero-emission berths	27	Establish shore power for container, tanker and cruise ships	HAV*, NOE	1000	5,700
Aggregated effect of measures in the Climate Budget				**74,300**	**336,350**

** Indicates reporting responsibility*

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

Waste incineration and energy supply

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

Zero-emission production of district heating

1. Establishment of gas boiler for landfill gas

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

Waste incineration with carbon capture

2. Carbon capture at Klemetsrud

From the summer of 2026, carbon will be captured from waste incineration at Klemetsrud under the auspices of Hafslund Oslo Celsio. The facility burns in excess of 380,000 tonnes of waste annually. The facility is expected to achieve the full treatment effect from 2028, equivalent to a reduction of just under 165,000 tonnes of fossil CO_2eq.

Waste and wastewater

Methane gas emissions from closed landfills is the principal source of methane emissions in Oslo. The facilities at Grønmo and Rommen both have systems for methane extraction (methane "capture"). The formation of methane in the ground diminishes over time as the waste gradually decomposes and no new waste is added to the landfills. Nevertheless, efforts must be made to increase the rate of methane gas extraction towards 2030. The captured methane gas is combusted to form CO_2, which has a significantly lower climate impact (see the discussion of how the landfill gas is used for district heating production under measure 1 above).

Extraction of landfill gas

3. Maintenance of landfill gas facilities at Rommen and Grønmo

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

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

Road transport

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

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

Overarching measures

4. New tariffs in the road toll ring

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

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

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

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

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

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

Reduced traffic

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The City Council has put forward proposals for new parking regulations which will be considered by the City Government in 2022. These regulations will provide guidance on the amount of parking that should be designated for cars and bicycles in new zoning plans. In the new parking regulations, the minimum limit for the number of parking spaces has been replaced with a maximum limit. In addition, a requirement has been introduced which will require at least 50% of parking spaces to have electric vehicle charging, along with requirements regarding the number and quality of bicycle parking places. Consideration should be given to allocating up to 10% of the parking spaces in larger parking facilities for car sharing, and zoning plans should consider the possibility of shared use.
In 2022, the City's enterprises were asked to consider whether parking spaces at City service centres could be removed and/or whether the installation of electric vehicle charging would be appropriate.

11. Reduction in the transport of bulk materials and waste

The City is actively working to reduce the transport of bulk materials and waste from construction sites in Oslo by increasing the reuse of materials produced either in City projects or internally within the city. The Agency for Improvement and Development is working to raise the level of awareness amongst the City of Oslo's buyers of bulk material transport services concerning how such materials can be reused.
The interagency City working group, which consists of the Agency for Planning and Building Services, the Climate Agency, Oslobygg Oslo KF, the Oslo Port Authority, the Department of Urban Environment,

Oslo City Water and Sewage Administration and the Fornebu metro line, and the Pådriv project in Hovinbyen, is exploring new solutions and logistics for the handling of bulk materials. The Agency for Real Estate and Urban Renewal procures land for bulk material handling at the request of relevant City entities.

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

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

Zero-emission cars

12. Establish charging infrastructure for cars

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

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

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

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

Zero-emission vans

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

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

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

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

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

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

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

Zero-emission-free/biogas buses

16. Use of zero-emission buses in public transport

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

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

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

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

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

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

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

Zero-emission/biogas trucks

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

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

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

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

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

The Climate Agency and the Agency for Real Estate and Urban Renewal are working to facilitate energy stations which offer recharging and refuelling with renewable fuels, such as biogas, hydrogen and fast charging. Through the Climate and Energy Fund, grant schemes have been established for fast-charging stations for heavy vehicles and biogas filling stations. The purpose of the schemes is to ensure the adequate provision of charging and refuelling facilities in the city. The schemes are in addition to the existing grant scheme for establishing charging facilities in a dedicated area for companies. In 2022, it was decided that biogas trucks should be exempt from charges inside the road toll ring, and a predictability resolution was passed guaranteeing this exemption from charges through until at least 2027. Together with the Norwegian Public Roads Administration, Oslo is reviewing how public transport lanes can be used to promote reduce traffic and GHG emissions, including whether electric trucks or trucks powered by biogas should be permitted to use public transport lanes.

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

Other mobile combustion

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

Zero-emission building and construction projects

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

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

22. Fossil-free construction site regulation in zoning plans

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

Through the Climate and Energy Fund, the grant scheme entitled *Mobile charging stations for construction sites* was launched in the spring of 2022. The scheme enables clients and contractors to receive grants for purchasing, hiring or leasing mobile charging stations for use on construction sites.

The charging stations must have provision for energy storage and can be moved both internally within construction sites and between construction sites.

Zero-emission machinery and motorised equipment

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

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

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

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

25. Incentives for zero-emission motorised equipment and events

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

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

Waterborne navigation

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

Zero-emission ferries on public transport services

26. Procurement of zero-emission high-speed ferries

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

Zero-emission berths

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

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

The City of Oslo's follow-up of the Climate Strategy

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

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

Land use section of the municipal master plan

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

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

Climate management

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

Against this background, the City Council has decided that climate impacts must be examined, where relevant, in matters that are to be decided by the City Council or the City Government. The City Council and City Government must be aware of the consequences of their decisions. The City has a good overview of sources of GHG emissions and mitigation measures and measures for reducing emissions, including in the Climate Budget. At the same time, there is a need for a system which also indicates whether decisions will lead to an increase in emissions or greater vulnerability to climate change.

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

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

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

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

Safeguarding of carbon sinks and increasing uptake of GHG in forests and vegetation apply to both the construction zone and Marka. According to the Norwegian Environment Agency's emission inventory for forestry and other land use, sequestration in forests increased from 106,000 tonnes CO_2eq in 2010 to 113,000 tonnes CO_2eq in 2015, equivalent to an increase of 6.5% (7,000 tonnes CO_2eq). At the same time, emissions of around 20,000 tonnes of CO_2eq were caused by land degradation. Thus, the statistics show that CO_2 emissions associated with land degradation exceed the CO_2 sequestration of forests. Although these statistics are subject to considerable uncertainty, it is anticipated that the next publication, which will be available during 2022, will be improved in a number of respects.

Oslo will manage forested land in a way which has a positive effect on the climate, biodiversity and outdoor recreation. In this context, 'climate' means that forests are less vulnerable to climate change, that carbon sinks are protected, that the uptake of CO_2 is increased and that efforts will be made to use timber for durable, high-quality products. The City Council for Environment and Transport has approved 13 mitigation measures concerning the management of the City of Oslo's forests which take these considerations into account. The most comprehensive and important principle is that the City Council will continue its efforts to convert the forest to multi-aged and mixed forests with a higher proportion of pine and deciduous trees. This is a method of forest management which simulates the natural development of the forest through, among other things, selective harvesting and natural rejuvenation. In 2023, further work will be carried out to operationalise the mitigation measures in cooperation with the Climate Agency and the Department of Urban Environment. Examples of mitigation measures include increasing the cycle period prior to logging, determining the overall logging level and thinning intensity based on climate considerations, assessing more climate-optimal utilisation of timber from thinning, and continuing and further developing the work relating to wetland restoration.

It is furthermore assumed that the destruction of wetlands should not take place, and that deforestation should only take place when compelling reasons indicate that it is appropriate. Wetland contributes many benefits, such as carbon sequestration, flood mitigation, biodiversity and important landscape elements for outdoor recreation. Since 2007, the City of Oslo has restored over 400 acres of marshland and gained considerable experience and knowledge in the discipline which will be developed further. Furthermore, an assessment will be made as to how, through the stipulation of requirements in procurements, the City can grow demand for slow-growing and sustainable timber of larger dimensions, which in turn can contribute to durable, high-quality timber products, and with an increase in the proportion of timber which is utilised.

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

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

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

Due to the high price of electricity and the challenging energy situation in Europe, the City Council wants the City to further step up its efforts to increase energy efficiency and production. RePower EU, if adopted, will see massive investment in solar energy across Europe and Norway, such as solar panels on all new public buildings by 2026, and on existing buildings by 2027. The Commission is also proposing to raise its target for reducing energy consumption from 9% to 13%, excluding biofuels. Oslo City Council is proposing to set aside an additional NOK 132 million in 2023 for energy efficiency measures and the installation of solar panels on its own buildings. Including VAT reimbursement, this will enable mitigation measures costing NOK 165 million to be funded. In addition, NOK 9 million has been incorporated into the adopted financial plan in 2023, meaning that a total of NOK 174 million has been allocated for this purpose in 2023. By ensuring that the City's enterprises, inhabitants and businesses both adopt more energy-efficient solutions and produce more local energy, energy will be freed up for the massive electrification process that will be needed in the transport and construction sectors in order to achieve the goal of a 95% reduction in emissions by 2030.

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

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

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

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

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

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

Oslo City Water and Sewage Administration is continuing its important work relating to stream openings. Hovinbekken will be opened as part of the upgrade of Klosterenga park, with completion scheduled for 2023. Oslo City Water and Sewage Administration is carrying out a preliminary project in partnership with the Department of Urban Environment concerning opening-up of the Bakåsbekken stream in Furuset. The Climate Agency coordinates pilot projects aimed at delaying stormwater (forested land retains rainwater) by safeguarding bottom vegetation in Marka.

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

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

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

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

The City Council's new and strengthened initiatives for reducing GHG emissions outside the city

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

The City Council is now taking an important step forward in its efforts to reduce indirect emissions and has set a target of reducing GHG emissions from materials used in the city's new and refurbished buildings by 30%, compared with the emission levels for materials in FutureBuilt ZERO's baseline trajectory. Find out more about this under "new/strengthened" initiatives in the introduction to the Climate Budget.

Climate requirements in procurements

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

Sustainable food, reduced meat consumption and reduced food waste

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

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

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

Reduced traffic with fewer cars and less road building

The City Government has adopted a goal of reducing traffic by one third compared with 2015. Reduced traffic results in reduced direct and indirect emissions. Making it less attractive to own your own car can take cars off the road, and thus reduce emissions from their manufacture. The City Council will not build major new roads/motorways, and it will work to scale down existing roads and reallocate land from road transport to green purposes. This will also help to reduce indirect emissions, including those from the manufacture of asphalt, etc. For more information about traffic reduction measures, see the discussion of the adopted policy measures in the Climate Budget (above). The City Council is proposing to set aside NOK 1 million in 2023 and NOK 1 million in 2024 for a pilot scheme where two districts use car-sharing services on the market, rather than their own vehicles. By requesting car-sharing services, the City is helping to build up the market for the car-sharing vehicles. An increase in the number of car-sharing vehicles could help to reduce indirect emissions. In addition, the City Council is proposing to set aside a total of NOK 4.5 million during the period 2023-2025 to establish a fleet management tool for vehicles and machinery in the City of Oslo's enterprises. Furthermore, NOK 0.5 million will be set

aside annually from 2024 for operation of the tool. A fleet management tool which provides an overview of the vehicles and machines that are in use and their location, booking status, etc. will make it easier to share the City's 1,500 vehicles and 2,000 machines.

Indicators for consumption based GHG emissions

The City of Oslo is working to develop a set of indicators for consumption and indirect emissions from the City's enterprises, the city's population and the business sector. Transport, construction materials, meat consumption, food waste, electronics, furniture and fixtures and fittings have all been identified as important categories that the City will focus on in order to reduce indirect emissions. The purpose of the indicators is to obtain a better basis for measuring developments in indirect emissions and consumption with respect to the targets in the Climate Strategy and the Strategy for Sustainable and Reduced Consumption. The indicators will also contribute to the development of targeted policy measures. However, the indicators will not necessarily provide any information on trends in total consumption and overall indirect emissions in Oslo.
In a study, NORSUS et al. calculated indirect emissions from purchases of goods and services in the City's enterprises, as well as indirect emissions from mobility from the City's enterprises, residents and business sector. Partly on the basis of data from the study, the Climate Agency has developed a preliminary set of indicators for indirect emissions (see Table 2.4, which provides a general overview):

Transport – population and business

According to NORSUS et al., indirect emissions from cars and commercial vehicles in Oslo amounted to almost 870,000 tonnes CO_2eq in 2019. This figure includes emissions from the production of fuel and the manufacture and maintenance of vehicles and infrastructure (e.g., materials for road building). According to the Norwegian Environment Agency's emission inventory, direct emissions from cars and commercial vehicles in Oslo amounted to around 530,000 tonnes CO_2eq in the same year. These calculations were performed using different methodologies and delimitations and are therefore not comparable. The figures for indirect emissions are subject to considerably greater uncertainty than those for direct emissions in the Norwegian Environment Agency's emission inventory. Nevertheless, the figures confirm that emissions from the manufacture of cars and road building result in substantial GHG gas emissions, and the key mitigation measures for reducing indirect emissions from transport are to cut the number of cars on the roads of Oslo and reduce road building.

- Indicators for the number of cars in use by the general population and the business sector are included in the preliminary set of indicators. No figures to enable the development of an indicator for reduced road building are currently available
- NORSUS et al. calculated the emissions from air travel by Oslo's inhabitants and businesses as being 140,000 and 15,000 tonnes CO_2eq respectively in 2019. This figure includes production emissions and fuel combustion, in addition to emissions relating to the manufacture and maintenance of aircraft and infrastructure. The underlying data for aircraft emissions is significantly weaker than that for car emissions, and intercontinental travel is not included in the calculations. Irrespective of the uncertainties, these figures show that emissions from air travel are substantial, and that it would help to reduce indirect GHG emissions if people in Oslo and businesses were to fly less frequently.
- An indicator based on questionnaire surveys will be used to measure developments in air travel amongst the business sector and the general population, even though this indicator is considered to be subject to some uncertainty. No more robust underlying data is currently available, but the Climate Agency is working on this.

Transport/vehicles – the City's enterprises

- Indirect emissions from the City's own vehicles and machinery were estimated to amount to around 3,500 tonnes CO_2eq in 2019. Reduced numbers of vehicles and machines and reduced road building will to help reduce indirect emissions. The City's enterprises already submit reports on the number of vehicles and machines.

- Indicators for the numbers of vehicles and machines in the City and an indicator for the proportion of City roads constructed using climate-friendly asphalt are included in the preliminary set of indicators. Underlying data and a definition of what constitutes climate-friendly asphalt must be developed. This may change over time as the manufacturing process and use of materials evolves.
- The report from NORSUS et al. showed that city air travel emitted 140 tonnes CO_2eq in 2019. These figures are very uncertain and are based on bookings through the travel agency Berg-Hansen. However, not all City employees book flights through this framework agreement.
- An indicator for City air travel will be included in the final set of indicators, but the data must be developed further to make it meaningful to follow developments.

Construction materials

- GHG emissions from materials for buildings and infrastructure are estimated to account for up to 50% of the indirect emissions generated by City projects. The new target of reducing GHG emissions from materials in new and refurbished buildings by 30% will therefore be very important for reducing indirect emissions from City project.
- The percentage GHG reduction from construction materials in the City's new and refurbished buildings will be included as an indicator in the preliminary set of indicators.

Meat consumption and food waste

- It is estimated that the production of food purchased by the City's enterprises generated around 12,000 tonnes CO_2eq in 2019, with the highest proportion of emissions originating from purchases of meat, which generates more than 3,000 tonnes of CO_2eq per year. For the inhabitants of Oslo, there are no good sources of data which provide any information on trends in meat consumption, although data can be obtained through the annual Climate Survey. Food waste also results in substantial greenhouse gas emissions and is not very resource-efficient, and it is therefore relevant to monitor developments in food waste. Food waste is challenging to measure, but for residents, the quantity of discarded food waste and the proportion of food waste which is sorted are indicators which will supplement each other and provide a picture of developments over time. It is also challenging to measure reductions in food waste from the City's enterprises. It is very resource-intensive to systematically weigh food waste for all the City's enterprises throughout the year.
- Indicators for kg of purchased meat per year and kg of food waste per user in City enterprises are included in the preliminary set of indicators. For inhabitants, indicators for kg of food waste discarded, proportion of sorted food waste, and reduction in meat consumption are included in the preliminary set of indicators.

Electronics

- Purchases of electronics in the City resulted in emissions of around 7,400 tonnes of CO_2eq in 2019. Laptops accounted for the largest share of emissions.
- Indicators for the reuse of PCs and mobile phones respectively are included in the indicator set. In the further development of the indicators, consideration will be given to whether it would be appropriate to include indicators for this for the general population and the business sector.

Furniture and interior fittings/fixtures

- Emissions from the City's purchases of furniture and interior fixtures and fittings amounted to around 1,800 tonnes CO_2eq in 2019. Institutional furniture accounted for the largest contribution to GHG emissions during the period. In the further development of the indicators, consideration will be given to whether it would be appropriate to include indicators for furniture and interior fixtures and fittings, for both the City's operations and the general population.

General consumption

- Quantifying indirect emissions from consumption by Oslo's inhabitants is challenging due to the lack of reliable data sources. Statistics Norway (SSB) now conducts a survey to determine what households in Norway spend their money on. SBB's consumer survey was last conducted in 2012. The new survey is expected to provide information on consumption by Oslo's inhabitants.
- 'Kilograms of waste per inhabitant' provides a certain amount of information on consumption by inhabitants, and indicators for total household waste, textile waste and plastic waste are included in the preliminary set of indicators. The proportion of reuse and material recycling of household waste, including sorted glass/metal, is also included in the indicator set.

Preliminary indicator set

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

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

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

Preliminary set of indicators for indirect emissions

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

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

Other effects of measures in the Climate Budget

Other cost-benefit effects

Many of the measures in the Climate Budget have other beneficial or cost-related effects besides reductions in GHG emissions. One example is improved air quality and lower noise levels as a result of measures which reduce vehicle use or increase the use of zero-emission technologies in road transport and construction projects. Measures that promote cycling and walking also offer health benefits, while measures which reduce discharges from wastewater contribute to better water quality in the Oslo Fjord.

The measures in the Climate Budget may have economic consequences beyond what is covered by the city treasury, e.g., where the business sector is required to use zero-emission solutions that are more expensive than fossil-fuel based solutions. Some measures will lead to an increase in sales of biofuels, which could potentially have negative effects for GHG emissions or biodiversity elsewhere in the world. The City of Oslo is therefore imposing requirements regarding sustainable biofuels in its procurements to avoid this.

Distributional effects

The City Council wishes to ensure that climate measures do not lead to greater social inequality. It is assumed that climate measures relating to construction projects and transport in the Climate Budget are the sectors within which the measures will have the greatest impact on the population and the business sector. At a general level, the Climate Agency has assessed the distributional effects of climate measures within transport. This is discussed in more detail below. Requirements for zero-emission construction sites are discussed at the end of the chapter.

Anticipated distributional effects of transport projects

A third of Oslo's population lives in a household which does not have access to a personal vehicle, and two in every three journeys are made on foot, by bicycle or on public transport. Investment in public transport, road toll payments and the use of space for walking and cycling instead of car parking all contribute to the redistribution of resources from those who have access to a car to those who do not. Women and low-income groups walk and travel by public transport more often. Overall, these population groups will benefit from the redistribution.

Mitigation measures aimed at the business sector, such as environmental requirements for taxi permits and measures relating to goods and service transport vehicles, will have different consequences for different stakeholders. The requirements may entail an economic risk during the transitional phase to zero-emission solutions, and could have different consequences for large and small enterprises. In order to avoid inequal consequences of the measures, the City is working to establish charging infrastructure and offering grant schemes to both reduce the costs associated with transition and boost innovation capacity.

The road toll ring

On 1 June 2019, new road toll stations and a new road toll system were introduced, with more road toll sections in Oslo and the former Akershus. As a result, residents across the whole of Oslo now pay more to travel by car than they did previously. Urbanet analyse (2017) has looked at the distributional effects of the new road toll sections. The analyses show that men tend to pay road tolls more often than women, because they tend to travel by car more. Households with multiple members are affected more than single persons, and those with medium or high incomes are affected to a greater extent than those with low incomes. This is because those with higher incomes tend to travel by car more to get to and from work. Travel to and from work is also affected more than other types of travel.
Revenues generated via the road toll ring are used to improve accessibility for all road user groups and fund road and public transport improvements. No studies are available which have analysed the overall effects of this for Oslo. The road toll payment system also reduces car use and GHG emissions and improves the urban environment (Norwegian Public Roads Administration, 2019).

Improved public transport

Good public transport services bring people from different parts of a region together and reduce inequality by giving everyone the practical and financial opportunity to participate in working life and lead an active life outside work (Ruter, 2020a). In Oslo, 34% of the population live in a household which has no access to a car. In the inner-city area, this applies to more than half of the population. Attractive public transport services help to make this possible. More than half of the city's population live less than 500 metres from a public transport stop which is convenient for them. Approximately 80% of the population live in an area with public transport services with at least four departures per hour (Urbanet Analyse, 2021). However, a study from the Oslo region shows that less affluent residential areas on the periphery of the region have poorer access to competitive public transport. The study also shows that

areas of Oslo with a high proportion of non-Western immigrants tend to have better access to public transport. These differences are also linked to different housing preferences (Lunke, 2022).

Public transport is funded through ticket revenues, road tolls and public appropriations. Funding through the road toll payment system results in a transfer from those travelling by car to those travelling by public transport. At the same time, both public transport and road tolls help to reduce traffic levels and thus improve accessibility on the roads for commercial traffic and those who have no option but to travel by car.

Incentives to promote cycling

The bicycle is a readily accessible and affordable means of transport. Improvements to cycling infrastructure create more opportunities for residents who either cannot afford or are unable to use a car or who live in an area with poor public transport services.

A cohesive and safe cycle path network makes the bicycle a more attractive means of transport for many groups in the population (children, women, the elderly, etc.), as road safety is improved, and it feels safer to cycle on cycle paths rather than public roads. Safe cycling infrastructure offers particular benefits in areas with low public transport provision and areas with a heavily loaded public transport system and/or road network. Increasing the number of cyclists on the streets can also help to improve safety in vulnerable areas, as there are more people moving around in the cityscape (Spacescape, Markör, 2016).

There are major health benefits associated with switching from passive to active forms of travel like cycling (Journal of the Norwegian Medical Association, 2020). Where an increase in cycling results in less car use, this will also reduce air and noise pollution, which will be especially beneficial for those living in areas with heavy traffic.

The reduction in the number of on-street parking spaces in favour of cycling infrastructure could disadvantage some groups, such as people with disabilities and businesses that depend on goods and service transport. In connection with the planning of new cycle paths, consideration is given to whether mitigation measures are appropriate in order to maintain accessibility for these groups as far as possible. Mitigation measures could for example include reserved parking for disabled persons and goods deliveries at suitable locations in areas close to where parking spaces have been removed.

Changes to parking provision

In recent years, the City of Oslo has redeployed many parking spaces in favour of cyclists, public transport and urban life. Emphasis has been placed on ensuring access to parking for disabled permit holders, and provision for goods deliveries.

In 2015, the Institute of Transport Economics studied the distributional effects of parking facilities with regard to housing and employment (Institute of Transport Economics, 2015). The study showed that, although single people and those on low incomes do not tend to have their own parking space, they do tend to have good public transport services close to their home. There are minor differences in access to parking at workplaces depending on income and household structure.

The resident parking scheme (City of Oslo, City Council, 2012) is a scheme where residents are given better access to and discounted prices for parking in their area, while visitors have to pay a higher fee. The evaluation scheme was evaluated in 2009 (Urbanet Analyse, 2009) and consisted of a pre- and post-trial survey which involved the registration of cars and questionnaire surveys. The evaluation showed that the scheme has given residents easier access to parking where they live and led to a significant reduction in the proportion of parked cars from non-residents, especially in the case of Frogner and St. Hanshaugen. Nine out of every ten residents found it easier to find a parking space. More than half agreed with the statement “the resident parking scheme makes it easier for me to live in central Oslo”. However, the business sector gave more mixed feedback, which led to changes being made to the scheme. For example, the rule concerning maximum parking time was abolished.

Measures for zero-emission taxis

Oslo has introduced environmental requirements for taxis. Taxi vehicles tend to be replaced at a faster rate than private cars, and a range of zero-emission cars is now available on the market with comparable costs to those of ICE vehicles. It is assumed that the environmental requirement will not adversely affect the incomes of taxi drivers if the necessary charging and refuelling infrastructure is in place before the environmental requirement enters into force (City of Oslo, Department of Urban Environment, 2017). Changes in travel patterns as a result of the COVID-19 pandemic and the new national permit regulations are probably of greater importance to the industry, and future developments in profitability and industry structure are uncertain. This is discussed in a report from the Institute of Transport Economics and the Fafo Research Foundation on taxis in Norway through to 2020 (Institute of Transport Economics, 2020).

Measures to promote zero-emission vans and heavy transport

Climate requirements will affect the transport sector, but it is uncertain how they will affect the industry and what they will mean for different businesses. In 2020, a questionnaire survey was conducted in industry, which was followed up by a number of in-depth interviews (Hafslund, 2021; Zero, 2021) concerning barriers to the transition to zero-emission heavy transport. The most important barrier highlighted by the industry is financial risk. This applies to both small and large players. It can be assumed that businesses which operate with low margins will be worst-placed to adapt and make substantial investments in new zero-emission vehicles. Predictability concerning measures is important for businesses if they are to plan purchases and see the overall cost of their investments.

Facilitating the more efficient transport of goods and services will result in a reduction in the number of vehicle-kilometres per product. Both a reduction in traffic levels and electrification will make a general contribution to lower NOx emissions, lower noise levels, and a better urban environment for those living or staying in the area in which the transport takes place.

Fossil-free construction site regulation in zoning plans

In autumn 2020, the City Council for Urban Development pursued a dialogue with the major industry players regarding requirements for fossil-free construction sites. During these meetings, it was stated that the industry can meet the requirement, but at an additional cost. Requirements regarding fossil-free construction sites mean that biofuel must be used, which is more expensive than fossil fuels. Biofuels cost around 50 to 100% more than traditional fuels. In addition, there are administrative costs associated with obtaining biofuels. These costs impact equally on all actors, but they can be more challenging to meet for smaller businesses. The City may therefore grant dispensations in individual cases in order to avoid imposing requirements that are either impossible or disproportionately demanding to meet, provided that the applicant can implement other mitigation measures to compensate for the lack of emission reductions.

2.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

A-3.2: Description of systemic barriers – textual elements

Note that while this section does not undertake a full mapping of stakeholders per emissions domain such mapping is an integrated part of how the Climate Agency works, including in the work going into the Climate Budget and road maps, and sectoral work. Some key examples summarized below

Systemic Barriers - Local solutions:

In 2018, the Climate Agency developed a white paper containing a broad analysis of the local conditions in Oslo, as well as the gaps, barriers and opportunities. The White Paper was based on several scientific reports made for the City of Oslo on topics such as low-carbon transition for the city, technology trends in the transport sector, and climate friendly spacial planning policy (by leading research institutes such

as Cicero, Sintef, NIBIO, Asplan Viak). You will find the short and long version of the White Paper and scientific reports here (Norwegian).

The White Paper analysed systematic barriers and challenges for the 2030 climate target, as well as sector-specific gaps and assistance needs. On Page 61-63 in this paper there is a description of risks and costs, identification of the need for deepened competence and administrative resources in the Climate Agency. Measures that can potentially be seen as Low Hanging Fruit with great benefits such as improved public procurement guidelines, waste incineration with carbon capture, and improved societal benefits of public transports vs. car traffic are specifically mentioned.

The world is rapidly changing, as is climate policies and technological development. Several of the measures identified in the White Paper are already implemented, and several of the barriers are overcome already. An example of a barrier that has been broken is that Oslo succeeded in finding a finance model for waste incineration with carbon capture at 'Klementsrud'. Similarly, a combination of restricted parking, nudging through economic incentives, facilitation of charging stations and technologic development have resulted in a fast-tracked electrification of Oslo's carpool.

At the same time new barriers have emerged. Currently, as Oslo is deep in the process of implementation of our Climate Strategy, we face new barriers connected to specific sectors. Oslo is continuously deepening our understanding of these barriers and identifying ways to overcome them through targeted research, applied science, and innovative projects.

Examples of recent reports and projects that are targeting these new barriers are:

Barrier 1: Accelerated electrification put stressors on grid electric system.
Oslo aims to be the first zero emission capital by 2030. Construction activities, machinery, and associated HDVs represent roughly 10% of direct greenhouse gas (GHG) emissions in Oslo. By 2025, all construction activities commissioned by the City, including transport connected to procurement of goods and services, shall be zero emission or use biogas. By 2030, the goal is citywide zero emission construction (ZEMCON). Oslo has taken a leading role in clean construction globally through the C40 Cities network. The transition to ZEMCON in Oslo is well underway. Through targeted use of public procurement, construction works commissioned by the City became 99% fossil-free in 2021. Through electrification of construction machinery, almost half of all energy use at these construction sites was zero emission in 2021.

A recent report on accelerated electrification of Oslo's construction sites shows that a future scenario where the city has achieved ZEMCON in 2030 will put drastic stressors on the grid, due to increased electricity demand and grid load. Handling an emission-free future will put new demands on optimisation and timing of charging and storage of electricity. Moreover, one of the main pre-conditions for large-scale electric charging of HDV and construction will be the establishment of sound and elastic routines and processes for mapping of grid-capacity and electric transmission. Efficient organisation of energy systems will be crucial to avoid large-scale construction of renewable energy and grid systems (which will imply larger GHG emissions). To address these issues, the city, together with a selected energy service company, DSO, contractors, and companies working on charging stations, will look at how new, alternative means for grid-rental and demand tariffs can be organised in an efficient manner.

Oslo aims to be a zero-emission city in 2030. This transition is depending on sufficient supply of energy and power. Currently, Oslo's generates more energy than we import (due to Hydropower). However, continuous electrification of the city could also mean more fossil electricity import (and hence increased scope 2 emissions).

Therefore, the City of Oslo promotes cooperation with the energy sector to develop an energy system customized for the zero-emission future. Through the Climate Strategy, the City has stated that a larger share of Oslo's energy will be produced locally, and that a variety of energy solutions will complement and supplement each other. Oslo's buildings will use electricity and heat efficiently and reduce their energy consumption. District heating from Oslo's waste incineration plants produces renewable energy

for large parts of the city. The goal is that Oslo will use less energy, produce more energy locally, for instance install more solar panels on roofs, and use energy more flexibly. Oslo will facilitate more pilot areas with flexible and innovative energy solutions such as energy storage and smart management of energy consumption.

Barrier 2: Achieving transition to zero emission heavy vehicles
Heavy vehicles count for a fourth of GHG emission from road transport and 13% of total city GHG emissions. In 2020 only 5 % of new trucks purchased in the city were electric or biogas. Because of this, city council decided that Oslo should become a pioneer city for zero emission heavy transport. Since then, Oslo has worked doggedly to overcome this barrier. We have implemented tools, incentives and measures to nudge the transition towards a world leading revolution in this sector towards vehicles run on electricity, biogas or hydrogen.

The City of Oslo has used public procurement as a strategic tool to drive climate solutions forward. Since 2019, Oslo has required fossil free heavy-duty freight and construction machinery in the city's procurements. Oslo has also stated that from 2025, electric, hydrogen or biogas will be a standard requirement, and already today this is required if there are three or more that are able to deliver electric, hydrogen or biogas. Further, Oslo has established and financed electric charging stations and biogas and hydrogen filling stations, specifically targeted towards heavy vehicles. Finally, electric or bio heavy vehicles will get tax exemption in the city traffic toll ring.

Currently, the sale of electric or biogas heavy vehicles has risen from 5% in 2020 to 25 % in 2022. After the last new measures was implemented in early September 2022 the share of sales of electric and biogas trucks have been almost 40 % of the market. This makes Oslo a world leader in zero emission heavy transport, and on track to overcoming this barrier in the future.

Barrier 3: Municipal Zoning Plans
Municipal zoning plans will play an important role in reaching all of Oslo's five climate targets. The zoning plans are adopted by the City Council and are legally binding. The zoning plans work as a climate measure both with regard to how the City choose to manage land use through detailed maps, and through legally binding climate provisions on how building projects must be carried out. Requirements in zoning plans on preserving and strengthening green structure, green mobility, energy use, and use of climate friendly and climate robust construction materials will be particularly important, as well as provisions on climate adaptation. The building sector accounts for around one third of Oslo's direct emissions and is one of the main sources to Oslo's indirect consumption-based emissions. The majority of the building projects are private and will not be covered by green public procurement measures. Legally binding climate requirements in zoning plans will apply to all building projects, including the private projects.

The overall municipal master plan will be fundamental as it guides zoning plans on a lower level through both legally binding maps and provisions. The Climate Agency has cooperated with the Planning and Building Agency to explore the legal room of manoeuvre regarding climate requirements in the municipal zoning plans. In 2020, Oslo included a requirement for fossil free construction sites in all new zoning plans. The requirement has been debated, and the national authorities have stated that legally this is a complex issue, and that the requirement lacks sufficient legal basis. Thus, the effect of zoning plans as a climate measure might depend on a strengthening of the Planning and Building Act, in a way that leaves little or no doubt that the municipalities may set a broad range of climate requirements in the zoning plans. The majority of the building sector is welcoming ambitious climate requirements, as it gives long term predictability with regard to how the transition towards a zero-emission city will be carried out. The municipal master plan of Oslo is under revision and will be subject to public consultation during spring 2023, with a view to final adoption in 2024/2025.

You will find more thinking about how Oslo will organise the systemic change needed in the 2023 Climate Budget chapter on 'Climate Transformation'. In this section we have described more detailed analysis on how Oslo works strategically at several levels to ensure that emissions are reduced, and new opportunities presented by the green transition are utilised. We go into detail on the role of the

population, the role of business and industry, the role of central government and international work to facilitate the climate transformation (page 22-27).

Finally, for the remaining emission gap in Oslo, we have started work on roadmaps to net zero in the addendum to the Climate Budget 2023 (Link to English translation). In Part 5 '*Potential for further emission-cut and opportunities for goal-achievement*' you will see sectoral analysis for transport, waste, other mobile transport etc. We are considering measures for some of these emissions, but for some of them such as through-traffic or methane leaking out of old dumpsites, the possible policy measures are not yet identified.

Systemic Barriers: The role of central government

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

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

More legal room for manoeuvre:

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

Tax policy:

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

Financing/investment:

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

Other measures:

- Make the climate targets a guiding principle for assignments for the transport agencies that will form the basis for the new National Transport Plan

- Central government should establish a common standard for corporate emission inventories
- To achieve the other main goals of the Climate Strategy, there is a need for:
    - A better framework which will make it easier and more profitable to exchange locally produced energy in neighbouring areas
    - A clearer national framework for stormwater management, for example by clarifying responsibilities
    - Better framework conditions for a circular economy, for example in order to increase sorting and material recycling, especially plastic waste from the private sector

In the document ''*Statlige rammebetingelser og behov for klimavirkemidler* (2022)' Oslo has mapped national barriers which hinders Oslo in implementing large emission reductions. We are in dialogue with government on removing/easing these barriers through various means. There is a network for Norwegian cities, where we work jointly to address these barriers, both using open debate and targeted lobbying through different channels as a tool.

The largest cities in Norway (Oslo, Bergen, Trondheim, Stavanger) have established the 'Network for large cities on climate' (Storbynettverket for Klima). We have regular meetings about four times a year, where we discuss collaboration and ways of engaging with national government on CC policy. We write common positions for national white papers on CC policy, and have frequent Op-Eds in the largest newspapers on the topic of climate change (such as this). Every year the largest cities in Norway meet at 'Arendalsuka', the largest political gathering in Norway, and organise a common event where we challenge the national government on select topics related to climate change.

The NZC cities in Norway have also established a forum where we touch base with national authorities on specific questions related to the NZC initiative. It is our hope that the EU Mission can facilitate a national platform to address the barriers the NZC cities face.

Work on EU/ International barriers

Norway's participation in the EU climate cooperation (as of 2021) implies legally binding yearly emission budgets, with possibilities for sanctions if we cannot reach them. This gives our climate policy larger predictability than before. The EU goals is also followed up by systems and regulations to secure implementation and goal achievement. The rules demand European emission-cuts, which puts pressure on Norway to achieve national emission reductions.

The City of Oslo works actively towards national authorities to ensure that relevant EU climate regulations will be implemented quickly, and that it will achieve effect on a national and local level. We also work through networks such as Eurocities, and through national consultations, to advocate for ambitious EU regulations. We are working towards creating a forum for dialogue between national authorities and large cities on European demands and expectations.

The Climate Agency has mapped the EU framework on mobility, and EU rules and regulations which will affect implementation of Oslo's Climate Strategy. We will consider if we should also work more closely on related EU Policies on waste and CCS- which is our second largest source of emissions. We will also consider if we should work more closely on EU policies linked to 'Other mobile combustion' (potentially covered through NZC Pilot application Repower Construction). Finally, we will consider if we should work more closely on the EU taxonomy and how it will affect city government.

5. A-3.3: Description or visualisation of participatory model for the city climate neutrality – textual and visual elements

Existing inclusive processes related to climate policies in the City of Oslo.

Municipal masterplan- societal element
All Norwegian municipalities should have a holistic municipal plan that includes a societal element and a land-use element. The societal element should encompass a holistic view of long-term challenges, goals and strategies for Oslo. The City of Oslo adopted a new societal part for strategic city development in 2019. The plan was adopted after a broad process for citizen involvement, where a text message was sent to all citizens. More than 1000 responses were recorded, and the input was collected and replied to in a document. The plan contains four target areas. The first target area, "a greener city", encompasses the climate crisis and environmental challenges such as biodiversity loss and air pollution. Through the societal element of the municipal plan, the city has developed specific targets related to climate and the environment. One of these targets is that Oslo should be a zero-emission city, with reduced noise pollution, capable of adapting to climate change.

Climate Strategy
The Climate Strategy was developed as a consultative process. The strategy was made in the following manner; The Climate Agency made a professional basis for a white paper for a new Climate Strategy. The white paper contained suggested target areas. The suggestions were based on the city's direct emissions, and a series of professional suggestions about what was needed. The target areas were decided upon in a participative process, where organisations and the public could contribute. We organised breakfast meetings, meetings with the private sector, and general feedback meetings. The white paper was sent for a public hearing, and we received 75 different written responses from the public, the private sector and the non-governmental organisations (NGOs), in addition to other inputs. These consultations contributed to an even better foundation for the new Climate Strategy. The strategy was approved by a broad majority in the City Council (8 out of 10 parties).

The Climate Agency is responsible for implementing the Climate Strategy, and for driving collaboration and coordination across silos in order to achieve net zero emissions by 2030.

Climate Budget
The Climate Budget has goals and tangible measures which are implemented to cut emissions within the borders of the city and describes important commitments and investments contributing to reaching the overall goal of the Climate Strategy. The responsibility for implementing measures lies within the City entities and contains climate reporting requirements in line with the economic reporting requirements.

All measures proposed for the City Council should assess distribution impacts if relevant. The City has also produced a guidebook for this assessment. If Oslo implements measures which affects targeted groups, it should also consider mitigating the effect (for example, people with disabilities could be negatively affected by the removal of parking in the city centre).

Climate leadership and citizen engagement.
Through Oslo's Climate Strategy towards 2030, the City Council has pointed towards climate leadership as a priority. As a part of the work on climate leadership, the City Council also want to strengthen citizen engagement, especially when it comes to the involvement of children, youth and the private sector. As part of this category, we are working on the following:

Business for Climate
The Business for Climate network was established in 2010. The purpose of the network is to create an arena for dialogue and collaboration between the City of Oslo and the private sector in order to exchange experiences and align policy. We also want to mobilise the private sector and other businesses in order to actively contribute towards achieving Oslo's climate goals. Members and partners of the network will commit to reducing greenhouse gas emissions from their own company,

and by promoting climate-friendly solutions through innovation and purchase of services beyond their own operation.

Business for Climate consists of close to 150 businesses that work towards reducing Oslo's climate emissions. The members are small, medium and large companies from a diversity of sectors, as well as several organisations. The companies become members through signing a contract with the Vice Mayor for environment and transportation, pledging support for Oslo's climate targets. The 93 companies for which data is available have more than 44 000 employees in the Oslo area and a revenue of about 230 billion NOK.

Through signing the climate contract, the members commit to working actively for the city's emissions to decrease, and to achieve 95% reduction by 2030. The climate contract is a contract of intention, but is supported by a set of membership criteria that the members commit to through signature. In 2022, the network introduced partnership as a next step for the network, inviting members to commit more strongly to be climate leaders, collaborating more closely and reporting on their emissions and progress to the city on a yearly basis. Partner reporting will enable measurement and monitoring of the partners' progress towards climate neutrality individually and for the network overall. As of 2023 there are now 19 partner members in the network.

Cooperation with the business sector through the Business for Climate network is key to succeed in adopting the right measures within each sector. Through network meetings, the members are invited to take part in shaping future policies. The network was consulted and involved in the process of developing the city's Climate Strategy, and has played a vital part in identifying measures and barriers.

Communication
Climate leadership is all about how the City of Oslo can govern its own business in the transition towards an adapted zero-emission city. Furthermore, it is about how the City should interact with citizens, the private sector, organisations, other cities and municipalities, in order to promote this transition. Climate communication which is well-thought-out and to the point is a premise of good climate leadership. The City Government wants to strengthen consultative processes towards the population, especially children, youth and the private sector in the zero-emission city transition. The Climate Agency will also strengthen deliberative participation in its work on climate.

In search of new action points linked to its climate work, the Climate Agency has invited Oslo's citizens to contribute with ideas and to join the climate mission. The purpose of a participatory process around climate action is threefold:

- Create common ownership of the climate targets, and a common responsibility for goal achievement.
- Use participation as a tool for creating new ideas for climate action
- Get feedback on the work related to climate in the City, and on how measures can be targeted in order to get the largest possible acceptance from the public.

The point of departure for climate communication is to mobilise for action which contributes to Oslo achieving the targets of the Climate Strategy. This is why climate-friendly behavioural change is more important than a change of attitude. Communication should contribute towards direct or indirect behavioural change among the population and the business community, on both an individual level, on group level and on a systemic level.

Raising awareness on climate change within the Oslo school
The City of Oslo has a specific goal on climate communication towards children and youth. The Climate Agency and the Education Agency collaborate through the project 'Lifting climate within the Oslo school' to create the web portal 'Climate School' and to offer visits of young 'Climate Pilots' (young speakers) to schools in the city. The goal is to provide knowledge that makes the pupils

understand the main challenges related to the environment and climate, while seeing the possibilities of the green transition.

The Climate Pilots gave presentations for around 5500 pupils at about 40 different schools in 2021. The Climate Pilots also engage in dialogue with the young people at schools and get insight into how committed they are to climate change, their knowledge needs, and their perspectives. This information is useful for the Climate Agency when it comes to youth involvement.

The web portal Climate School (Klimaskolen.no) has collected a selection of quality-controlled education material about climate and the environment for teachers. The portal is frequently updated and had 54.000 displays in 2021.

Climate House
The Climate House is a part of the Natural History Museum in Oslo but has received city support. The Climate House provides interactive education for Oslo schools, and has exhibitions about the climate, targeting children and youth. The background is that the City of Oslo wants to give children and youth access to an exhibition which gives insight into the science of climate change, climate adaptation and solutions for reducing emissions. The Climate House has frequent visits by school classes that wants to learn more about climate. The Climate Agency has placed a letterbox at the Climate House, where they ask citizens to give their input on different thematic priorities. The purpose is to involve citizens and youth, and to let them come up with ideas for the climate mission.

Climate Polls
The City of Oslo has been conducting yearly Climate Polls since 2017. The polls map behaviour and attitudes towards climate actions and measures, by the public and the private sector, within the whole surrounding region (Akershus). The polls indicate that a majority of Oslo's citizens support the ambitious climate goals set by the City of Oslo. 68% of the citizens indicate that it is 'very important' or 'pretty important' to reduce climate gas emissions by 95% by 2030.

The webpage ClimateOslo
The website ClimateOslo was launched in 2017. It is a hub and a one-stop-shop for all climate-communication in Oslo, and as the main channel for mobilising behavioural change. The web portal contains interviews with people who make climate-friendly choices. They also have articles featuring practical advice for reducing emissions in everyday life, and stories that should motivate behavioural change. It also contains basic facts on Oslo's climate work, news about the Climate Agency, sites for the climate polls, a collection of reports, strategies, and the climate budget. The webpage also links to the website "Climate grants", which has collected an overview of different of support schemes Oslo's citizens can apply for (more about schemes for financial support below). Furthermore, ClimateOslo has an English section, targeted towards the media, NGOs, government representatives and other non-Norwegian collaborators. During the first four years, the magazine achieved 1,911,000 site views and had 1,037,300 unique users.

The Beehive, the Oslo Centre for city ecology
The Beehive serves as an open meeting place for work on climate friendly city development and sustainable urban life, and as a centre for urban knowledge and innovation. The centre coordinates a wide portfolio of inclusive projects, like the Oslo Tree project, where citizens are invited to plant and take care of trees, urban farming, and projects to reduce food waste.

Re-use week
The City of Oslo collaborates with citizens and local actors to host a week filled with activities that support reuse and promote more sustainable consumption.

Climate grants
The City of Oslo provides grants for both citizens and businesses which implements climate activities/measures through a diverse set of climate grants. Businesses can, amongst other things, get support for establishing safe and dry bicycle parking at the workplace, while housing associations, co-

ownerships or citizens can get support to establish electric charging stations, or to install renewable energy sources and energy-saving equipment or insulation in buildings.

Green support for city district administrations
10 out of 15 District Administrations provide green support for local citizen initiatives that promote suburban green development. These projects have a strong focus on diversity and inclusion and contribute to local activity and change. The work has also been followed by a group of researchers who look at citizen engagement and local societal transformation. District administrations is an important link between City Agencies and citizens, and The Climate Agency is working to strengthen this collaboration.

Collaboration with utilities on net-zero construction and transportation
A consortium consisting of the Climate Agency, Hafslund (electricity company), Elvia (electric grid company) and SINTEF (Norway's largest independent research institute) has been established to jointly develop suggestions for tools, activities and measures to achieve net-zero construction in Oslo. These organisations have conducted several pilot projects and research studies in this field which have given Oslo insights and knowledge as well as network and accessibility. Through this cooperation the Climate Agency has done a preliminary mapping of necessary grid capacity for zero-emission heavy transport and zero emission construction sites towards 2030. Together the consortium has also asked for funding through the NZC pilot. The core of this project is continuous knowledge development and learning to deliver systemic energy optimization for a net zero future, to facilitate net zero construction and heavy-duty transportation as well as improving grid-capacity.

Since Oslo first initiated its ZEMCON programme in 2017, a key part of the effort has been directed towards involving stakeholders in the construction ecosystem, locally, in Norway, the Nordic countries, Europe and globally. All important policy measures, lessons learned reports, impact assessments and analyses have been translated into English and communicated actively through networks and the Climate Agency main communication platforms. To illustrate the broad scope of our work to involve and communicate, most recently the Director of the Climate Agency performed on TEDtalk.

Oslo leads the EU BBI group on ZEMCONs and the global C40 cities clean construction programme. We work on the institutional space at a multi-scalar governance level (city, national and European) and what possible risks, barriers, opportunities, and incentives currently exist to support optimal development of energy supply for ZEMCON and heavy- duty transport. This includes ongoing policy development and ‘regulatory issues’, that could facilitate infrastructure development and increased flexibility of energy supply system at the local level in Oslo and in Europe.

Collaboration with academia- Oslo as an international test centre for climate innovation.
The City of Oslo aims for Oslo to be an international "living laboratory” for climate innovation. We have developed a collaboration with academia, and we have adopted a ‘Campus Oslo’ strategy. Campus Oslo will establish innovation hubs on several topics to facilitate idea development and commercial collaboration with the city’s businesses. The innovation hubs are based on collaboration between research centres/academia, private and public sector, and they involve civil society and citizens in the process. All innovation hubs have demonstration sites and should incentivise start-ups and scalable solutions. The tree hubs focus on (1) sustainability, health, digitalisation, democracy and inclusiveness, (2) new science, solutions and jobs linked to circular economy, and (3) renewable city development, technology and urban ocean solutions. This form of cross-sectoral collaboration between the City and the private sector should facilitate new science and solutions to reach the zero-emission target by 2030.

Oslo is also participating in a number of innovation and research projects on climate transition. Examples of these are MOVE 21, Include, and Ntrans.

Collaboration with labour unions
The City Government and the largest labour union in Norway committed to establish ‘the Oslo model for just transition’ during the Global Climate Action Summit in San Francisco. This model will be based on social dialogue, participation and inclusion of workers and their labour unions in planning,

executing and implementing measures to reduce Oslo's climate gas emissions. One element of this work will be to establish a council for just transition.

The City and the city's largest labour unions have signed a common declaration on environmental work travels and have also developed a work package for this (with a strong focus on motivating and facilitating biking to work).

Collaboration with 'User Councils' representing marginalised groups.
Oslo has established User Councils on the topic of Cultural and Ethnic Diversity, Sexual and Gender Diversity, Elderly, Youth, and Disability. The Climate Agency has reached out to the User Councils to see how we can improve collaboration with them on issues related to the climate agenda. The User Councils expressed different needs for collaboration, and the Climate Agency will explore different ways of including and gathering inputs from the different User Counsils in our work going forward.

All Users councils have given feedback on how to improve mobility in the city for marginalised groups. The Climate Agency will look closer on how concrete inputs, such as for instance how universal design needs to be a part in solutions for a climate neutral city, will be implemented to a stronger degree in the future. We will also explore different possibilities for improved public transport or other kinds of mobility in parts of the city which has a larger low-income population.

Additionally, The Youth Council will have a youth hearing this spring, on the topic of climate change, which will form an important background for our climate work targeting youth.

Citizen involvement as part and parcel of City daily work.
Citizen engagement is already part and parcel of the daily work of the City of Oslo. Municipalities are often bound by law to let users have their say on matters that concern them. On a systematic level, it is often required by law to involve users when developing services. Through involvement during design or improvement of an area or service, it is likely that the development will be targeted and better than it would have been without such involvement. Therefore, The City of Oslo has well developed methods that are used in cases and services related to climate work. Some examples below:

The city is testing out new forms of citizen and private sector involvement. For instance, when developing storm water management in one neighbourhood, the City of Oslo held public meetings to develop and anchor decisions regarding blue-green solutions locally. The Agency for Urban Environment is studying how to establish a pilot project for a zero-emission zone in Oslo and has met with several actors in the service, retail, and transport sectors to get input on how to facilitate a well-functioning business and retail environment within the zone.

The Car Free Liveability Programme works to reduce car use in the city. Here, dialogue with users is key. Examples of this include the removal of cars from a certain street, where it has been designed in accordance with input from local stakeholders both on the street and in the surrounding area. The input was collected through ideation workshops and several dialogue meetings early in the process
.
The collaboration the Programme has had with the elderly citizens of Oslo is another example of citizen involvement. Several elderly citizens have recorded their journeys as they move around in the city centre. Through this, we have learned much about improving accessibility in the city. As a direct result, the City of Oslo has installed numerous comfortable benches, better lighting, more public toilets and drinking fountains, and we have removed tripping hazards from streets.
At the level of District Administrations, the City of Oslo works with exploratory workshops in order to find out how citizen initiatives and social entrepreneurs can contribute to sustainable development. These kinds of workshops involve both grassroots representatives and employees of the local districts, to stimulate wider engagement around green projects.

What can Oslo do to strengthen its work related to citizen involvement on climate?
Due to the existing strong collaborative processes mentioned above, Oslo will focus on deepening citizen engagement on climate rather than creating new, broad-based collaborative structures. Below you will find initial thinking on how Oslo can deepen its existing participatory processes:

- Organise a 'Business for Climate' meeting on the topic of the EU Mission
- Meet with the National Business for Climate fora called 'Shift' and propose to organise a joint workshop on the topic of the EU mission together with the other Norwegian Mission Cities.
- Organise meetings with the Climate Pilots on including something on the EU mission during school presentations and updating the Climate Oslo Website and the Climate School website to include information on the EU mission.
- Consider creating a Citizen Assembly on the topic of Climate
- Consider strengthening the collaboration with the largest labour unions in the City, and how climate can be part of the official tripartite networks in Oslo.

Part B – Pathways towards Climate Neutrality by 2030

2.4 Module B-1 and B2- Climate Neutrality Scenarios, Impact Pathways and Climate Neutrality Portfolio Design

Potential for further emission cuts and target attainment

The figure below shows the expected development in emissions towards 2030 based on the current situation, potential emission reductions using new, identified measures, and the politically established emission limits. The emission limits in the figure below represents an optimal pathway towards the climate targets that that the city council is working towards and functions as a benchmark for the yearly emission reductions that are necessary to reach the targets.

The estimated development in GHG emissions based on the current situation, which includes newly adopted measures in the Climate Budget is expected to result in a reduction of 62% in 2030 compared with 2009 levels (dark green line). This line includes both emission reductions in the baseline trajectory and emission reductions from measures in the 2023 Climate Budget. As the figure shows, the effects of the measures in the 2023 Climate Budget will not be sufficient to achieve the climate targets for 2023 or 2030 (see chap below).

The City Council will continue its efforts to strengthen climate measures and adopt completely new measures over the coming years. The Climate Budget is an annual process and every year the Climate Agency prepares a white paper for the strategy conference held in March. This white paper details new policy initiatives to reach Oslo's ambitious climate goals and lays the groundwork for new climate measures that can be adopted in the Climate Budget in the final budget conference. Thus, the Climate Budget process functions as an arena for a yearly ratcheting up of efforts. See further explanation of the climate budget module C-1.

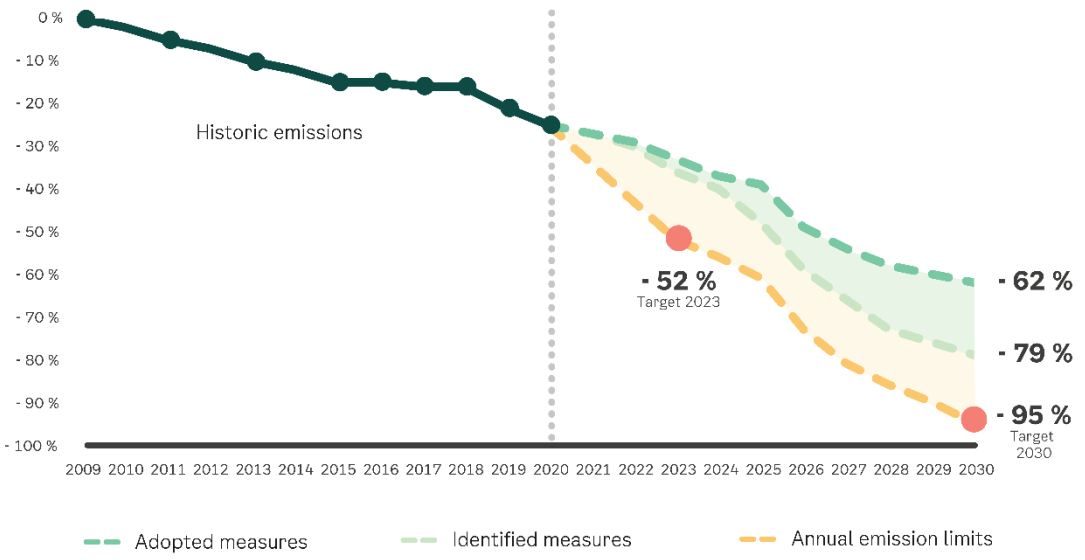

Figure 5: ***Projected development in emissions towards 2030 with adopted measures and the potential for emission cuts from identified measures***

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

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

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

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

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

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

Table 5: Identified measures and estimated isolated effect

Sector	Measures	Estimated isolated effect [tonnes CO2eq]
Road transport	Higher charges inside the road toll ring (difference of up to NOK 100 between fossil fuel and electric vehicles)	45,000
	Zero-emission zone within Ring 2	20,000
	CO_2 tax for road transport of NOK 2,000/tonne in 2030 without compensatory measures	45,000
	Increase in the biofuel quota obligation to 40% in road transport in 2030	20,000
	Access to public transport lanes for zero-emission/biogas-powered heavy vehicles	
	Areas for charging and refuelling infrastructure	
Waste incineration and energy supply	Household waste from the City of Oslo is treated in a waste incineration facility with carbon capture and storage	45,000
	Sorting facility for household waste from the City of Oslo	20,000 - 30,000
	Reduce emissions from incineration of industrial waste at Hafslund Oslo Celsio's plant at Haraldrud	20,000 - 30,000
	Increased textile recycling	3,000 - 4,000
	Improved sorting of plastic waste in other countries and municipalities (the EU's revised Waste Framework Directive) *	7,000 - 16,000
	District heating without the use of fossil fuels	1,000 - 11,000
Other mobile combustion	Requirement for all construction sites to be zero-emission by 2030	10,000 - 15,000
	CO_2 tax of NOK 2,000/tonne in 2030 for construction projects	1,000
Waterborne navigation	Zero-emission requirement for international ferries	10,000 - 12,000
	Environmental differentiation of port charges at piers	1,000
	Requirement for zero-emission solutions at piers	5,000 - 7000
	Cooperation with other cruise ports concerning common requirements regarding shore power	1,000 - 3,000
	Replace the use of heating oil on ships in port with renewable alternatives	4,000 - 5,000
Heating	National ban on the use of gas for heating purposes	14,000

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

If all identified measures are implemented, emissions in 2030 can be reduced by 79% compared with 2009, while adopted measures can reduce emissions by 62%. This results in an emissions gap of 16 and 33 percentage points respectively. In other words, it will be necessary to both strengthen existing measures and identify new measures.

In some sectors, it will not be possible to cut all emissions by 2030, for example because of residual emissions of methane and nitrous oxide from biogenic emission sources or because there is unlikely to be sufficient technological advances for the implementation of measures by 2030. As regards sectors and emission sources where zero-emission technologies are already available, this means that such technologies must become widely used to reduce emissions in line with Oslo's emission reduction target for 2030, although there are currently many barriers to achieving this. Against this background, roadmaps have been drawn up for each emission sector showing the possible trend in emissions for each sector that will be necessary to achieve the overall emission reduction target for 2030. In these roadmaps, the road transport, waste and wastewater sectors, waste incineration and energy supply sectors will each have residual emissions of between 10,000 and 40,000 tonnes CO_2eq in 2030. The remaining sectors will each have residual emissions of less than 5,000 tonnes CO_2eq.

A description is given below of the identified measures and how the effect has been calculated, as well as the reductions that will be required for Oslo to achieve its emission reduction target in 2030.

Assessments have been made of how the measures as a whole will affect the level of activity, the choice of technology and the choice of fuel for the various emission sectors. Nevertheless, there is considerable uncertainty associated with possible overlaps between measures, and the uncertainty associated with the overlap between the identified measures in this analysis and the measures actually adopted in the Climate Budget.

Aviation and industry have marginal emissions in Oslo, and Oslo has few measures which can be used to cut emissions in these sectors. The sectors are therefore not discussed further below. In order to reduce emissions from industry, the Climate Agency has concluded that an increase in carbon tax could play a key role.

Assessment of whether Oslo will achieve the 2023 and 2030 emission reduction targets

The Norwegian Environment Agency's latest update concerning the emission inventory for municipalities covers the period from 2009 to 2020. We therefore do not yet know whether the emission limits for 2021 have been achieved. In order to achieve the emission limits set for 2021 and 2022, as well as the 2023 emission reduction target, the annual reductions must be approximately 130,000 tonnes CO2eq from 2020 to 2023. This under the assumption that the emission limits are achieved every year. Between 2018-2019 and 2019-2020, emissions were cut by 60,000 - 75,000 tonnes CO2eq per year. The annual emission reductions before 2018 vary greatly from year to year and are considered to be less relevant for comparative purposes, even though 2020 was an abnormal year as a result of the COVID-19 pandemic.

An almost doubling of emission reductions during the period towards 2023 compared with 2018-2019 and 2019-2020 is considered to be both very challenging and unlikely. In light of both the above and the potential for emission reductions from the calculations of measures, the Climate Agency considers it unlikely that the emission reduction target of a 52% reduction will be achieved in 2023. This will also apply even though there are several measures for which the effect cannot be calculated, and despite the fact that several of the measures in the Climate Budget are not reflected in the City emission inventory.

During the period from 2023 to 2030, emissions must be cut by almost 65,000 tonnes CO_2eq, in addition to the emission reductions from carbon capture at Klemetsrud, if the emission limits are to be achieved. This annual reduction in emissions is considered to be achievable in light of the emission reductions during the periods from 2018 to 2019 and 2019 to 2020.

There are several measures which we expect to have a greater effect going forward than they have had to date, such as the initiative relating to zero-emission heavy transport. Both the market and the business sector also have a completely different focus on zero-emission solutions now than they did a few years ago, and an exponential growth is anticipated in several zero-emission technologies. This indicates that the emission limits from 2023 to 2030 could be more than achieved. However, there is reason to believe that there will be a "backlog" of unachieved emission reductions from the period from 2020 to 2023, which could increase the distance to the emission limits after 2023.

Given the 2020 emission inventory from the Norwegian Environment Agency, total emissions must amount to around 72,000 tonnes CO_2eq in 2030 if Oslo is to achieve its emission reduction target of a 95% reduction in emissions compared with the 2009 level. It may be challenging to eliminate the final emissions towards 2030 relating to minor emission sources, emissions of methane and nitrous oxide from biogenic sources and, for example, from products that have few applications, meaning few incentives for zero-emission technology. As the largest emission sources have been eliminated, the annual reduction in emissions may therefore level off. As developments in markets, technology, political decisions and other national and international events will also affect emission levels in Oslo, it is challenging to assess whether the annual emission limits are attainable both in the longer term and as regards the target for 2030.

Roadmaps

If all identified measures are implemented, emissions in 2030 can be reduced by 79% compared with 2009, while adopted measures will reduce emissions by 62%. This will result in emissions gaps of 16 and 33 percentage points respectively. In other words, it will be necessary to both strengthen existing measures and identify new measures to reach the target.

In some sectors, it will not be possible to cut all emissions by 2030, for example because of residual emissions of methane and nitrous oxide from biogenic emission sources or because there is unlikely to be sufficient technological advances or profitability in the implementation of measures by 2030. As regards sectors and emission sources where zero-emission technologies are already available, this means that such technologies must be fully implemented in order to reduce emissions in line with Oslo's emission reduction target for 2030, although there are currently many barriers to achieving this. Against this background, roadmaps have been drawn up for each emission sector showing the possible trend in emissions for each sector that will be necessary to achieve the overall emission reduction target for 2030. In these roadmaps, the road transport, waste and wastewater sectors, waste incineration and energy supply sectors will each have residual emissions of between 10,000 and 40,000 tonnes CO_2eq in 2030. The remaining sectors will each have residual emissions of less than 5,000 tonnes CO_2eq.

A description is given below of the identified measures and how the effect has been calculated, as well as the reductions that will be required in order for Oslo to achieve its emission reduction target in 2030.

Assessments have been made of how the measures as a whole will affect the level of activity, the choice of technology and the choice of fuel for the various emission sectors. Nevertheless, there is considerable uncertainty associated with possible overlaps between measures, and the uncertainty associated with the overlap between the identified measures in this analysis and the measures actually adopted in the Climate Budget.

Aviation and industry have marginal emissions in Oslo, and Oslo has few measures which can be used to cut emissions in these sectors. The sectors are therefore not discussed further below. To reduce emissions from industry, the Climate Agency has concluded that an increase in carbon tax could play a key role.

Road transport

In 2020, emissions from light and heavy vehicles accounted for 36% and 16% of total emissions respectively. This corresponds to 564,600 tonnes CO_2eq. Figure shows that road transport is expected to generate emissions of around 510,000 tonnes CO_2eq in 2022. If all adopted measures are

implemented with the anticipated phasing-in, emissions could be cut to 266,000 tonnes CO_2eq in 2030. If the identified measures are also implemented, emissions could be reduced to around 155,000 tonnes CO_2eq in 2030. This corresponds to a 79% reduction in emissions in the transport sector in 2030 compared with 2009 levels.

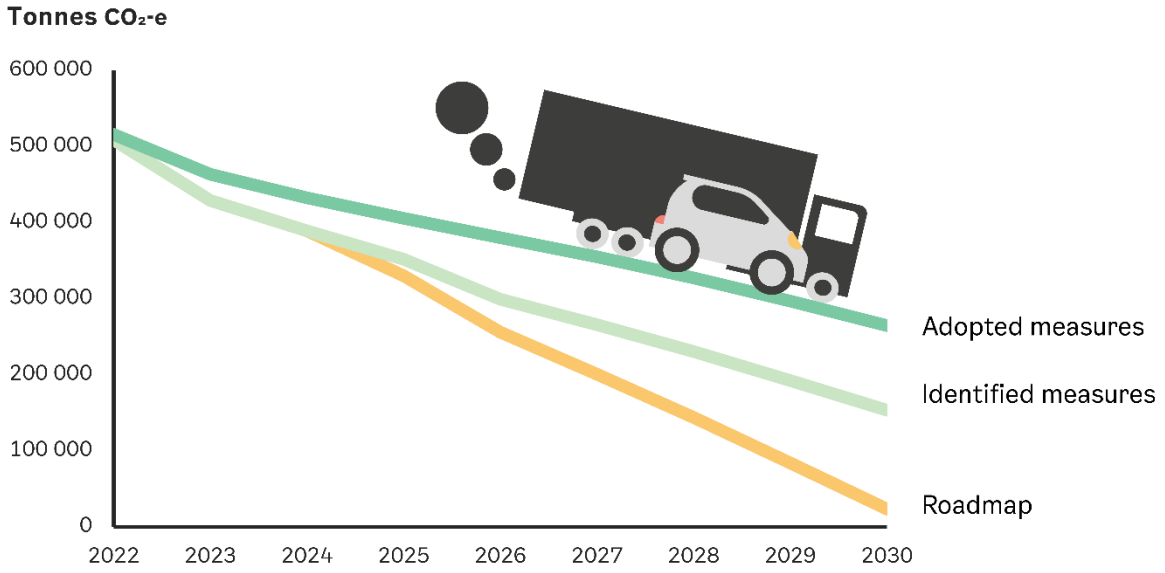

Figure 6: Roadmap for Road transport, 2022-2030

Although there are many barriers to eliminating emissions from across the entire transport sector, this is a sector where technology is available which can bring about such a transition. In order to achieve the required reduction, it will be necessary to use electricity, biogas and hydrogen across all vehicle categories. No assessment has been made of the measures that could contribute to triggering this. The residual emissions originate from through traffic, where becoming zero-emission by 2030 is expected to be challenging.

The identified measures included in the figure are as follows:

Higher tariffs in the road toll ring (+NOK 100)

A further increase in tariffs in the road toll ring could result in emission reductions over and above the effects of the recently negotiated tariffs in Oslo Package 3. Renegotiation of Oslo Package 3 is planned for 2024.

The calculation is based on a study by Norconsult (2020) concerning how escalation of the road toll payment system, with a gradual price rise towards +NOK 100 per passage for fossil fuel cars in 2030, would affect the phasing in of electric vehicles and the number of vehicle-kilometres travelled by cars and vans. It was only possible to obtain figures for cars and vans. This means that no effect has been assumed for zero-emission heavy vehicles and buses for this measure. The climate effect is therefore underestimated. To include the impact relating to heavy vehicles and buses, a more thorough study will be necessary.

Norconsult (2020) shows that the measure could increase the proportion of electric vehicles in 2030 amongst cars from 63% to 85%. In the case of electric vans, it is assumed that the measure will result in an increase from 40% to 58% by 2030. In isolation, it is estimated that this measure could contribute to a reduction in emissions from road transport of just under 45,000 tonnes CO_2eq by 2030.

In the Climate Strategy the city council adopted a resolution that Oslo will further develop the road toll payment system so that it contributes to reducing traffic and promotes the adoption of zero-emission vehicles in all vehicle categories. The next negotiations between Oslo City, Viken county council and national authorities to establish new rates in the toll ring will take place in 2024.

Zero-emission zone within Ring 2 from 2026

If the City Council adopts a larger zero-emission zone than a zone within the Car-free city living area, it could result in further reductions in emissions. The status of the work on a zero-emission zone is that the City Council is now open to the possibility of a payment zone, rather than just a prohibition zone. The Norwegian Public Roads Administration submitted its recommendation for further work on a zero-emission zone in September (Norwegian Public Roads Administration, 2022). The report is currently being reviewed by the Ministry of Transport. In the meantime, Oslo Climate Agency and the Department of Urban Environment are responsible to follow-up work with a zero-emission zone and have recently completed an analysis with recommendations of how a zero-emission zone should be designed.

The calculations were taken from a report by Norconsult (2021) on the emission effects of zero-emission zones in Oslo. The calculations show that a zero-emission zone within Ring 2 from 2026 could have an emission-reducing impact within the City of Oslo's boundaries of 31,000 tonnes CO_2eq. Such a zone would also have an impact outside the boundaries of the City of Oslo, as the vehicles which are converted will also be used outside the City's boundaries. Norconsult has calculated the overall effect of a zero-emission zone within Ring 2 from 2026 to be a reduction in emissions of up to 73,000 tonnes CO_2eq. The figures refer to the isolated impact of a zero-emission zone, and have not been assessed with regard to other measures such as the road toll ring, etc.

In the analysis, the Climate Agency has deducted the effect of establishing a zero-emission zone within the Car-free city living area from 2024, which is an adopted measure in the Climate Budget.

Carbon tax for road transport equivalent to NOK 2,000 in 2030 without compensatory measures

The Government has announced that it wishes to increase carbon tax to NOK 2,000 in 2030. This tax is intended to stimulate a reduction in car use and accelerate the transition to zero-emission solutions. Until now, the road use tax has been reduced slightly in order to compensate for the increase in carbon tax. Reducing road use tax results in lower prices at the pumps and reduces the effect of the increase in carbon tax. The Government has not announced whether it will compensate for the increase in carbon tax by reducing road use tax in future budgets. The City of Oslo has argued that deductions from the road use tax or other compensatory measures should be avoided in order to maintain an adequate climate effect. The City of Oslo is working with central government to ensure an adequate level of ambition at national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party with regard to new policy developments, and establishing clear expectations for national authorities.

The calculation is based on the assumption that higher fuel prices as a result of the tax will reduce the use of fossil fuel-powered cars, vans, heavy vehicles and buses. It is estimated that a higher carbon tax will reduce the use of fossil fuel cars by 2.6%, result in the transfer of freight to sea and rail of 2.5%, and reduce heavy transport by 20% as a result of logistics optimisation by 2030. In total, this is estimated to amount to an isolated reduction of around 45,000 tonnes CO_2eq by 2030, with the largest reduction coming from heavy vehicles.

However, these estimates are based on the Institute of Transport Economics' model runs for Climate Cure 2030 and electricity and fuel prices dating from 2019 (TØI, 2020). An increase in carbon tax of NOK 2,000 per tonne corresponds to around NOK 4 per litre (incl. a deduction from biofuel blending). Petrol prices have recently increased well beyond this figure. There is therefore reason to assume that much of the effect that has been estimated as a result of a higher carbon tax will occur in any case, even with higher electricity prices. On the other hand, the general population and the business sector may react differently to the announcement of an increase in the tax over time versus petrol and diesel prices

which will not necessarily remain stable and high towards 2030. Deliveries of new zero-emission vehicles are currently subject to delays, which may slow down the replacement of the vehicle fleet. We do not have any analyses available which take into account recent changes in petrol and diesel prices. However, we will be able to see the effect of this over time in the emission inventory prepared by the Norwegian Environment Agency and will consider the effect in more detail if new transport model runs are performed in connection with updates to the baseline trajectory.

Increase in the biofuel quota obligation to 40% in road transport in 2030

An increase in the biofuel quota obligation to 40% in road transport in 2030 was studied as part of Climate Cure 2030, and the Norwegian Environment Agency has distributed a proposal to increase the biofuel quota obligation for consultation in the spring of 2022 (Norwegian Environment Agency, 2022d). The City of Oslo has been working with other stakeholders to obtain approval in the revised national budget for 2022 for the establishment of a national register for the use of biofuels over and above the quota obligation in order to secure a climate effect for those purchasing 100% sustainable biofuels.

The calculation shows the emission-reducing effect in Oslo of increasing the biofuel quota obligation to 40% within road transport in 2030. Advanced biofuels are counted twice, which means that only half of the volume is needed in order to fulfil the requirement if advanced biofuel is chosen over other biofuels. The calculation assumes an increase in the quota obligation to 40% towards 2030 as studied in Climate Cure 2030, with the assumption that only advanced biofuels will be sold from 2025 onwards. The climate effect has been calculated based on the difference between the quota obligation and the biofuel share in the baseline trajectory. In the baseline trajectory for Oslo, the share of biofuels in road transport has been set to 12.25% for the period from 2022 to 2030. A quota obligation of 40% in 2030 would result in a 20% real volume after the double-counting of advanced biofuels. A further effect from the use of 7.75% additional biofuel in 2030 has therefore been calculated, which corresponds to around 20,000 tonnes CO2eq in 2030.The national government appears to be following their plan of increasing the biofuel quota obligation towards 2030.

Areas for charging and refuelling infrastructure

The lack of charging infrastructure is one of the biggest barriers to the transition to electric commercial transport, while the non-availability of land is the biggest barrier to the establishment of charging facilities. It is therefore crucial that sufficient land is secured for publicly available fast charging. In addition, land is also required for the storage of bulk materials, refuelling stations for hydrogen and biogas, and freight consolidation centres, in order to cut emissions from heavy vehicles. The measure is a facilitating measure, and no climate effect has therefore been calculated. The Climate Agency and the Agency for Real Estate and Urban Renewal are working to facilitate areas for energy stations which offer recharging and refuelling with renewable fuels, such as biogas, hydrogen and fast charging.

Access to public transport lanes for zero-emission/biogas-powered heavy vehicles

Access to public transport lanes for zero-emission and biogas trucks could give companies an additional incentive to invest in such vehicles. A study will be carried out by the Norwegian Public Roads Administration to assess such a scheme. The study will be completed in 2023 and is being carried out in cooperation with the Department of Urban Environment, Ruter and the Climate Agency. The climate effect of the measure has not been calculated.

Waste incineration and energy supply

Waste incineration and energy supply accounted for 25% of emissions in Oslo in 2020. This corresponds to 266,600 tonnes CO2eq. Emissions from the sector in Oslo primarily originate from waste incineration (both commercial and household waste), with some residual emissions from the use of fossil fuels for the production of district heating. Around 80% of the emissions originate from Hafslund Celsio's waste-to-energy facilities at Klemetsrud and Haraldrud, while the remainder originates from the Agency for Waste Management’s energy recovery facility at Haraldrud. These emissions stem from the incineration

of fossil fractions in the waste, such as plastic and synthetic textiles. Emissions can be reduced either by using carbon capture or by reducing the fossil material that is incinerated through, for example, greater sorting of plastic and textiles.

Figure shows that a relatively flat development in emissions is projected towards 2025 inclusive. From 2026 onwards, it is assumed that emissions will be reduced significantly as a result of carbon capture at Klemetsrud. With the implementation of the identified measures (see the discussion below), emissions in the sector could be reduced by 90% by 2030, and the necessary reduction in emissions in the sector achieved. The residual emissions in 2030 originate from emissions from waste incineration. Carbon capture is expected to remove around 94% of fossil CO2. Greater sorting of plastics and textiles could result in further reductions, but some emissions of CO2 will still remain. In addition, there will be some emissions of methane and nitrous oxide, which will be difficult to reduce. This means that there will be around 20,000 tonnes of CO2eq residual emissions in the sector in 2030. This analysis only includes fossil emissions. A carbon capture plant at Klemetsrud will also capture approximately the same amount of CO2 from biomass. Carbon capture of biogenic emissions (bio-CCS) can contribute to negative emissions from waste incineration in the City.

A description of the identified measures is presented after the figure.

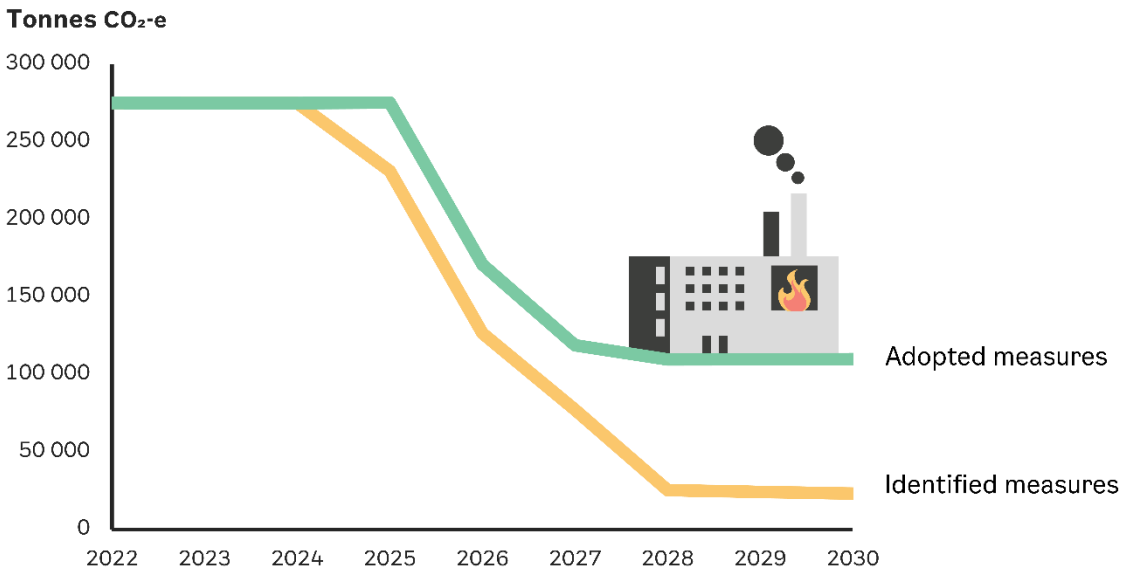

Figure 7: Roadmap for Waste incineration and energy supply, 2022-2030

The identified measures included in the figure are as follows:

Carbon capture from all household waste from the City of Oslo

For Oslo to achieve its emission reduction target, emissions from incineration of Oslo's household waste at Haraldrud must also be reduced. Current emissions amount to around 50,000 tonnes CO2eq. The City Government's Department for Environment and Transport commissioned the Agency for Waste Management to assess the options open to the City of Oslo as regards the incineration of household waste with carbon capture. This study was completed in late 2022 and is currently under consideration. In the roadmap the Climate Agency has assumed treatment with carbon capture from 2028 with a 90% efficiency rate. This would reduce emissions by around 45,000 tonnes CO_2eq.

Sorting facility for household waste from the City of Oslo

Greater sorting of plastic in household waste prior to incineration will reduce emissions. The national waste regulations have recently been updated. The regulation tightens the requirements for waste management by the municipalities. The regulation includes a gradual phasing-in of percentage targets for the sorting of plastics of 50, 60 and 70% in 2028, 2030 and 2035 respectively (Norwegian Environment Agency, 2022c). Sorting household waste in an advanced single-stream sorting facility is the only identified measure which can ensure that Oslo will meet the stricter requirements. The Agency for Waste Management has assumed that a new single-stream sorting facility would be capable of removing at least 80% of the plastic from household waste. Accordingly, a sorting plant could, in isolation, cut direct emissions by around 20,000-30,000 tonnes CO2eq. (Agency for Waste Management, 2022). The Agency for Waste Management is preparing a detailed concept study on how Oslo can ensure that household waste is sorted in an advanced sorting facility. The roadmap assumes an effect of this magnitude from 2025 onwards. If the waste is treated using carbon capture from 2028 onwards (see above), the effect of a single-steam sorting facility would be reduced to around 2,500 tonnes CO2eq during the period 2028-2030. This double counting is taken into account in the figure. It should be noted that an increase in plastic recycling will also reduce indirect emissions by replacing virgin plastics, an effect that is not reflected in Oslo's emission inventory.

Increased textile recycling

The Agency for Waste Management is working to assess how the sorting of textiles can be optimised. The Norwegian Environment Agency has announced that it is considering introducing a requirement for textiles to be collected separately from 2025 (Norwegian Environment Agency, 2022). It is assumed that the sorting of textiles could increase from around 56% at present to around 85% (Agency for Waste Management, 2022). This will result in an emission reduction of 2,000-3,000 tonnes CO2eq in 2025. In the roadmap, the effect is corrected for overlap and is thus reduced to around 300 tonnes CO2eq. from 2028 if the household waste is also treated using carbon capture. It should be noted that an increase in reuse and recycling of textiles will reduce indirect emissions by replacing virgin materials, an effect that is not reflected in Oslo's emission inventory.

Reduce emissions from incineration of industrial waste at Hafslund Oslo Celsio's plant at Haraldrud

In 2020, just over 50,000 tonnes of industrial waste was incinerated at Hafslund Oslo Celsio's facility at Haraldrud. This resulted in emissions of almost 30,000 tonnes of fossil CO2. There are currently no plans for reducing emissions from the facility. The alternatives for reducing these emissions are to ensure that the waste is treated using carbon capture, to reduce the fossil content of the waste, or to use renewable fuels only. In the roadmap, we estimate a reduction in emissions of around 27,000 tonnes CO_2eq in 2028, equivalent to treatment with carbon capture.

Through the Climate Strategy 2030 Oslo has decided to use an active ownership to integrate climate consideration in businesses that are partially or entirely owned by the City. The City owns a majority share in Hafslund Oslo Celsio and is working to ensure a reduction in emissions from their activities. The Department for Culture and Business Development is responsible for managing Oslo's ownership in private companies.

Improvements in the sorting of fossil waste in other countries and municipalities (the EU's revised Waste Framework Directive)

The market for waste is regional and crosses national borders. Both household and commercial waste from other municipalities and countries are incinerated at Hafslund Oslo Celsio's facilities. The type of waste incinerated at the facilities in the future will depend on the competitive situation in the market. As a result of the new waste regulations (see the description of the sorting facility above), Norwegian municipalities and companies will also be required to improve the sorting of plastics, as well most international actors due to the sorting requirements in the EU's revised Waste Framework Directive. As a result, the volumes of plastic incinerated at the facilities in Oslo will decline over time, almost regardless of whether the waste originates from a neighbouring municipality or one of our neighbouring countries. The Climate Agency has estimated that these regulations could reduce

emissions in Oslo by between 7,000 and 16,000 tonnes CO2eq in 2030. In the roadmap, the effect is corrected for overlap and is thus reduced to around 2,000-6,000 tonnes CO2eq from 2030 if the household waste is also treated using carbon capture. An increase in recycling will also reduce indirect emissions by replacing virgin materials, an effect that is not reflected in Oslo's emission inventory. Since this regulation is now implemented this measure will be included in the updated baseline for Climate Budget 2024.

District heating without the use of fossil fuels

District heating production in Oslo primarily uses energy from renewable sources and waste incineration. Natural gas is still used during periods with high electricity prices or low temperatures. The quantity used varies from year to year and from season to season, depending on temperature and electricity prices. The measure aims to replace the use of natural gas with renewable sources such as biogas. The roadmap includes an effect of district heating production becoming completely fossil-free in 2025, which corresponds to an emission reduction of around 5,000 tonnes CO_2eq.

Through the Climate Strategy 2030 Oslo has decided to use an active ownership to integrate climate consideration in businesses that are partially or entirely owned by the City. The City owns a majority share in Hafslund Oslo Celsio and is working to ensure a reduction in emissions from their activities. The Department for Culture and Business Development is responsible for managing Oslo's ownership in private companies.

Other mobile combustion

In 2020, the sector 'Other mobile combustion' accounted for 12% of total emissions in Oslo. This corresponds to 135,000 tonnes CO2eq. Half of these emissions originated from construction, while the remainder originated from non-road machinery and vehicles used in industry, freight terminals, ports, waste treatment, etc.

Figure 6 shows that the estimated emissions from the sector amount to just under 140,000 tonnes CO2eq in 2022. If all adopted measures are implemented with the anticipated phasing-in, emissions could be cut to around 90,000 tonnes CO2eq by 2030. If the identified measures are also implemented, emissions could be reduced to around 80,000 tonnes CO2eq. This is a 60% reduction in 2030 compared with 2009 in the sector.

The emission gap includes emissions from various types of machinery used at waste facilities and freight terminals, as well as in industry and other sectors. This is machinery which likely could switch to electrical operation. However, this category covers a wide array of types of machinery. These will probably be specialised machines for which few zero-emission solutions are currently available. The roadmap can therefore be read as optimistic, but still necessary if Oslo is to achieve its emission reduction target for 2030.

A description of the identified measures is presented after the figure.

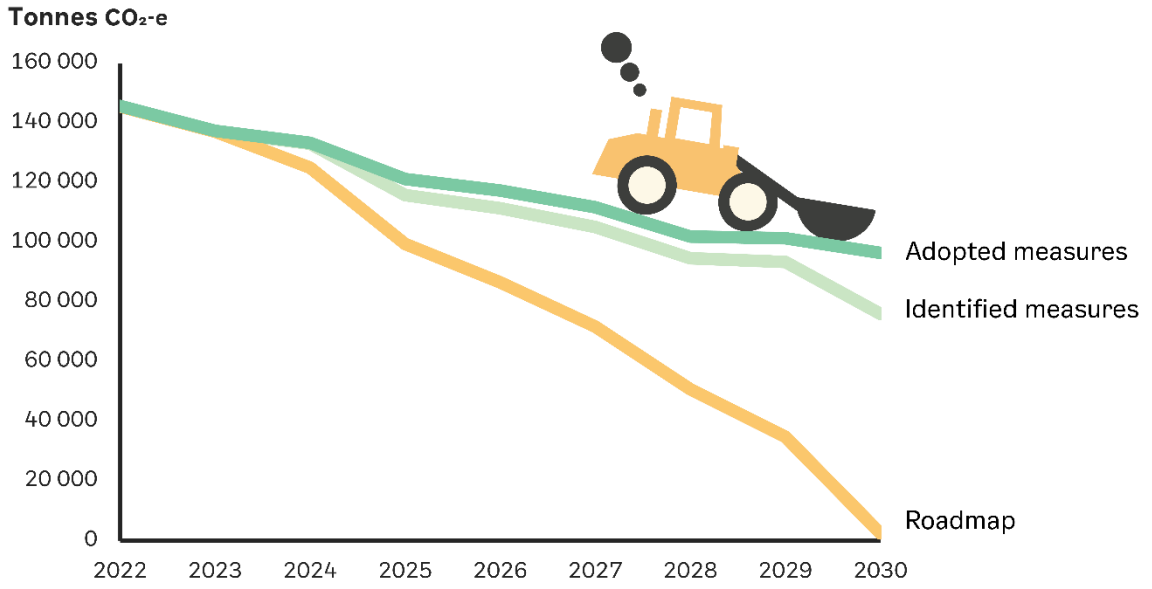

Figure 8: Roadmap for Other mobile combustion, 2022-2030

The identified measures included in the figure are as follows:

Requirement for all construction sites to be zero-emission by 2030

The requirement for all construction sites to be zero-emission by 2030 comes in addition to the effect of the adopted measure which is a requirement for construction sites to be fossil-free imposed via new zoning plans (around 50,000 tonnes CO2eq.). This can be done through the further tightening of requirements in land-use plans covering all future developments, regardless of when the zoning plan was adopted.

At the same time, this means that, as the number of zoning plans that will be covered by the current requirements is expected to increase, the effect of requirements in land-use plans will diminish towards 2030 (from 20,000 tonnes CO2eq in 2026 to 12,000 tonnes CO2eq in 2030). A phased introduction of 50% in 2025, 70% in 2027 and 100% in 2030 has been assumed for this measure. The Climate Agency is working together with the Planning and Building Agency to see how we can include such requirements in the city plan.

Carbon tax of NOK 2,000/tonne in 2030 for construction projects

As a basis for Report to the Storting (Parliament) No. 13 (2020-2021) Climate Plan for 2021 – 2030, the Norwegian Environment Agency (Norwegian Environment Agency, 2020b) submitted calculations of the impact of a carbon tax of NOK 2,000/tonne in 2030 on emissions from construction projects. The Norwegian Environment Agency estimates that emissions can be reduced by 10,000 tonnes CO2eq in 2021 and up to 70,000 tonnes CO2eq in 2030 nationally, as a result of the tax increase. The national calculation has been scaled down to the local level based on population. The effect is estimated at around 1,000 tonnes CO_2eq in 2030.

The City of Oslo is working with central government to ensure an adequate level of ambition at national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party regarding new policy developments, and establishing clear expectations for national authorities.

Waste and wastewater

In 2020, emissions from landfill sites and wastewater facilities accounted for 5% of total emissions in Oslo, equivalent to around 53,200 tonnes CO2eq. With the adopted measures, emissions from the sector could be reduced by 45% in 2030 compared with 2009. This corresponds to residual emissions of 36,300 tonnes CO2eq in 2030. The reduction stems from a natural reduction in methane gas emissions from closed landfill sites.

No measures have been identified that could bring about further cuts in emissions in the sector. Emissions from landfill gas must be significantly reduced for Oslo to achieve its emission reduction target. These emissions will be challenging to reduce, but the Climate Agency is working together with the Agency for Real Estate and Urban Renewal to identify new measures to reduce emissions from the sector.

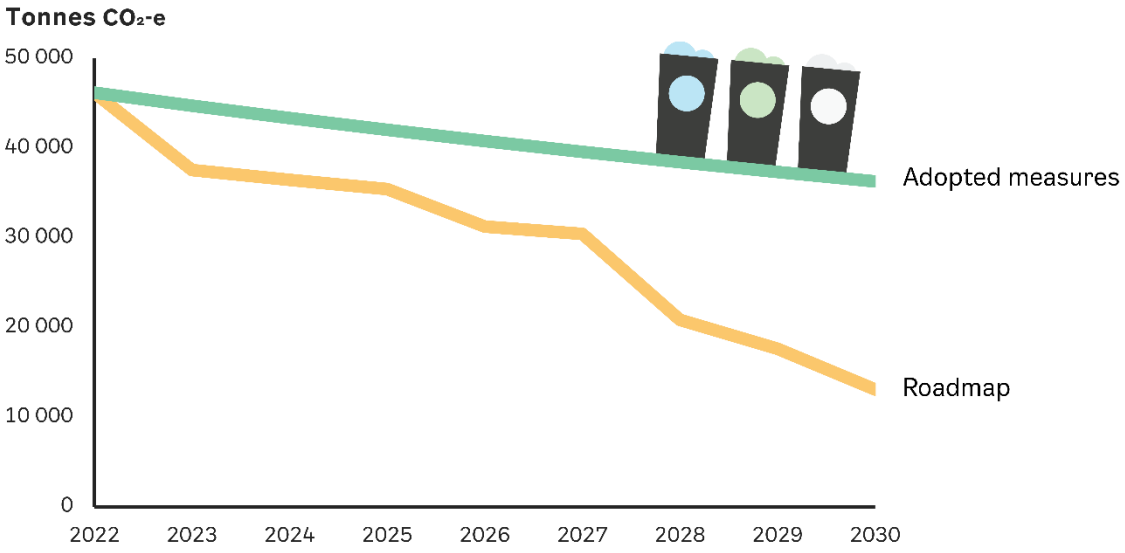

Figure 9: Roadmap for Waste and wastewater, 2022-2030

Waterborne navigation

In 2020, waterborne navigation accounted for around 4% of total emissions in Oslo. This corresponds to 40,300 tonnes CO2eq. About a third of these emissions originate from arriving and departing ships, while the rest comes from heating, etc. for ships in port. Oslo City Council has adopted the Action Plan for the Port of Oslo as a zero-emission port, which estimates that the measures in the plan could reduce emissions from waterborne navigation within the City boundary by around 90% in 2030 compared with 2009 levels. The action plan is currently being revised and is due to be considered by the City Council in spring 2023.

Figure shows that the estimated emission level in 2022 is around 27,800 tonnes CO2eq. With the implementation of the identified measures, emissions in the sector could be reduced to below 3,000 CO2eq by 2030, and the necessary reduction in emissions in the sector achieved. This corresponds to a 90% reduction in emissions in the sector from 2009. The residual emissions in 2030 primarily originate from inbound and outbound ships other than the international ferries.

A description of the identified measures is presented after the figure. Several of the measures overlap, as some measures will contribute to an increase in the use of shore power (reduced emissions at piers).

The isolated effect indicates that there is potential for reductions in emission levels if the measures are implemented in isolation, but it will probably be necessary to implement many of the measures in order to reduce emissions from inbound and outbound sailings and moored ships. During the revision of the action plan, a more thorough assessment will be made of the phasing-in of measures and the projected climate effect. The action plan for the port of Oslo is the responsibility of the Department for Culture and Business Development and is being revised in 2023 together with the Climate Agency and the Port of Oslo.

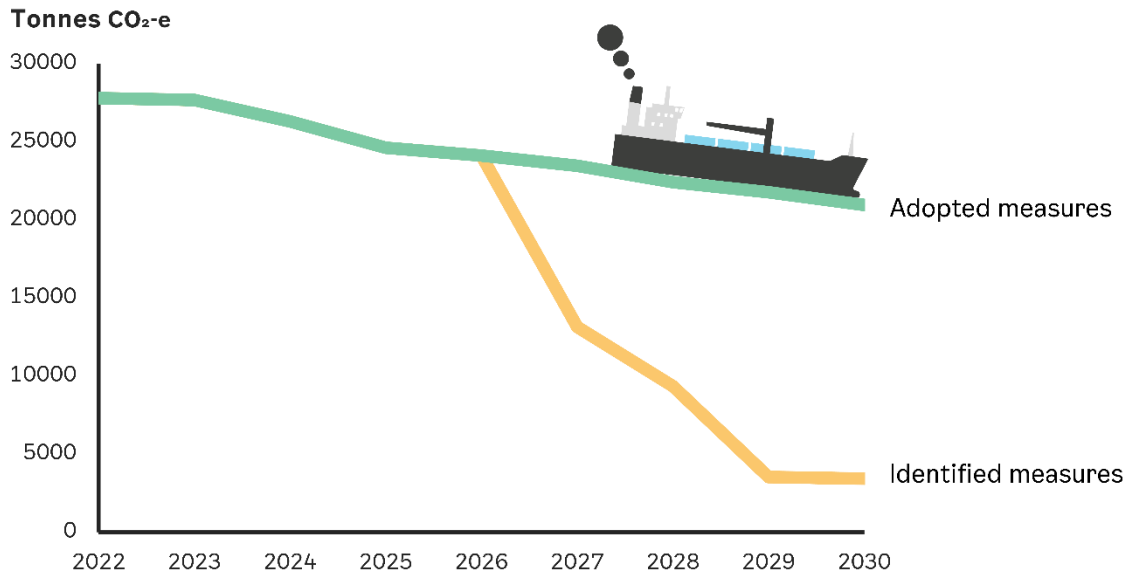

Figure 10: Roadmap for Waterborne navigation, 2022-2030

Requirement for zero-emission solutions for international ferries (inbound and outbound sailings)

This measure entails the introduction of a requirement for international ferries to use zero-emission solutions during inbound and outbound sailings. The Action Plan for the Port of Oslo states that this must be done if new routes are established, if existing routes are exposed to competition, in connection with contract renewals, or if the situation permits. However, it is rare for new routes to be opened, and the contracts signed with international ferry companies are long-term in nature. When the effect of such a requirement can be achieved is uncertain and the requirement has therefore been viewed as an identified measure, rather than an adopted measure, in the Climate Budget.

If the requirement were to cover all inbound and outbound international ferry sailings, the isolated effect would be around 10,000 tonnes CO2eq. The requirement will also cut emissions in port, as the ships will be zero-emission while in port. This effect is included in the roadmap from 2027 onwards, but with a correction with regard to double counting for the other measures that will reduce emissions in port. This is a very uncertain estimate, as it is, for example, likely that the effect will take effect more gradually because contracts are replaced at different times.

Differentiated port fees

Cruise ships arriving at the Port of Oslo are currently charged lower port fees if they cut emissions of CO2, NOX and SOX while they are moored. The identified measure is based on further developing this environmental differentiation and extending it to cover other segments. The climate effect in the

roadmap is taken directly from the Action Plan for the Port of Oslo and is stated as amounting to 900 tonnes CO_2eq.

Requirement for zero-emission solutions at port

The measure entails using the Ports and Fairways Act to require all ships to use shore power while moored at a pier. As it is not possible to require all consumption of heating and electricity to come from shore power, the effect that has been included is set to 65% of emissions while in port, corrected for the other adopted measures relating to shore power. This is considered an optimistic estimate. If all ships were to be required to use shore power for 65% of their consumption, this would correspond to an effect of around 7,000 tonnes CO_2eq.

Cooperation with other cruise ports on common requirements regarding shore power

Upgrading cruise ships to allow for shore power is expensive. To get more ships to switch to shore power, more ports than just Oslo need to offer shore power. Oslo is in the process of establishing shore power for cruise ships (measure 27 in the Climate Budget). However, in order to bring about reductions in emissions, the facilities will actually have to be used. Cooperation with other ports on common requirements regarding shore power will therefore be conducive to the realisation of measure 27. In the baseline trajectory, emissions from cruise ships in port are estimated to amount to almost 3,000 tonnes CO_2eq. If these emissions are to be eliminated, cruise ships must use shore power for all their needs while in port, including heating (see measure below).

Replace the use of heating oil on ships in port with renewable alternatives

Even if ships use shore power, this will only replace around half of the emissions that are generated in port. This is because the ships need power for heating and other purposes on the ship, for which fossil fuel-fired boilers are used. This measure involves replacing these boilers with renewable alternatives. The emission-reducing effect of the measure is calculated by assuming that emissions from ships at port in the baseline trajectory are eliminated but is corrected for overlap with the existing transition to shore power. The roadmap also includes a correction for overlap with shore power for cruise ships (see above). The isolated effect of the mitigation measure is estimated to be up to 4,000 tonnes CO_2eq if all ships were to use zero-emission solutions while in port instead of heating with fossil fuels. This has been estimated by assuming that 45% of emissions from ships in port originate from heating. However, this is an uncertain estimate, as the actual figure will vary between ships. If a requirement for zero-emission solutions is introduced for inbound and outbound international ferry sailings, much of the effect will already be achieved as the ships will then be zero-emission in any case.

Heating

In 2020, heating accounted for just 2% of total emissions in Oslo. Emissions from this sector have been cut by 92% since 2009, primarily due to a ban on the use of mineral oil (oil-fired boilers). In order for the emission reduction target to be achieved, all fossil emissions from the sector should be cut by 2030.

This year's Climate Budget contains no adopted measures in the heating sector. The adopted measures in Figure therefore show developments in the baseline trajectory. Implementing the identified measure which reduces the use of gas for heating purposes could result in an overall reduction in emissions in the sector of 98% in 2030, compared with the 2009 level.

The gap between identified measures and the required reductions stems from emissions from the combustion of paraffin wax. Although these emissions should be reduced, no measures have so far been identified in this area.

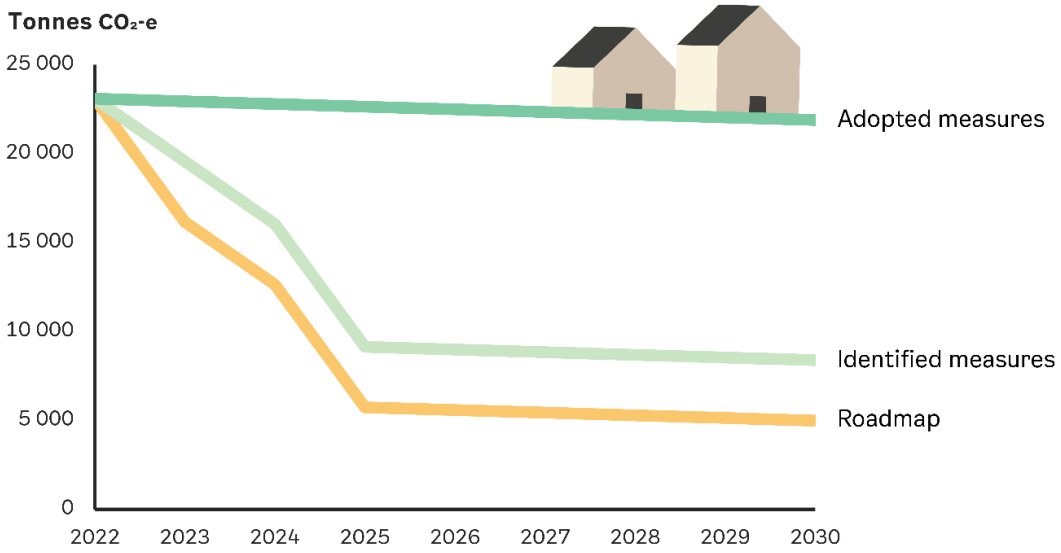

Figure 11: Roadmap for Heating, 2022-2030

The identified measure included in the figure is as follows:

National ban on the use of gas for heating purposes from 1 January 2025

The Climate Agency has assessed measures that could reduce emissions from the use of gas for heating buildings and believes that a national ban would be the best approach. A ban would eliminate emissions from this source, equivalent to 13,500 tonnes CO2eq. The estimated climate effect is only the effect that will be reflected in the emission inventory. The actual effect of the measure may be greater, as the emission figures in the emission inventory do not include tanks with a storage volume of less than 0.4m3 or tanks used for temporary storage.

Oslo is working with central government to ensure an adequate level of ambition at national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party regarding new policy developments, and establishing clear expectations for national authorities.

B-2.3: Summary strategy for residual emissions
In principle, Oslo does not intend to offset emissions, but aims at directly reducing our emissions. Nevertheless, in some sectors, it will not be possible to cut all emissions by 2030, for example because of residual emissions of methane and nitrous oxide from biogenic emission sources or because there is unlikely to be sufficient technological advances or profitability in the implementation of measures by 2030. In the spring of 2022, an agreement was signed between the central government, the City of Oslo and the new owners of the waste-to-energy facility at Klemetsrud (Hafslund Oslo Celsio), which secured the full financing of carbon capture at the waste facility. Originally the facility was planned on opening in 2026, but due to an investment pause, the facility will not open until 2029. Carbon capture will not only reduce fossil emissions by just under 165,000 tonnes but will also capture 170 000 tonnes of biogenic CO2, i.e., carbon from organic matter (such as wood, cardboard/paper and food waste). If Oslo reaches its goal of reducing direct emissions by 95% residual emissions will be around 70 000 tonnes

CO2eq. The carbon capture of biogenic CO2 at the waste facility at Klemetsrud can enable the City of Oslo to become "carbon negative" by 2030, as stated in the vision established in the Climate Strategy.

2.5 Module B-3 Indicators for Monitoring, Evaluation and Learning

The climate change challenge requires cross-sector cooperation – both within and outside the city's own organisation – as well as deploying resources in new areas. In addition, the timeframe for climate measures is short, which makes it difficult to achieve the necessary impact using a traditional action plan.

Oslo uses a Climate Budget in an attempt to solve these challenges by linking targets and measures more closely together in the City's most important steering document: the financial budget. There are several similarities between a Climate Budget and the action part of a Climate Action Plan. The Climate Budget's strength is that it is directly integrated into the city budget and is therefore followed up in the same way as other budget chapters in the City. The Climate Budget can be seen as a process tool in the City's work on climate and energy planning. The Climate Budget provides the City with a tool to steer towards the emissions targets. The Climate Budget ensures that the City initiates and funds measures to reduce the emissions. Responsibility for following up the measures is clearly defined. Since the Climate Budget is embedded in the regular financial budget process, this also entails that responsible entities must report on their mitigation measures in a similar manner to how they report on their finances.

The Climate Budget is updated annually. This is our most important form of monitoring. Updating the Climate Budget annually provides an opportunity to evaluate our latest GHG inventory, adjust course and identify whether measures are being implemented according to plan and are having the desired climate effect. The climate effect of new and existing measures is evaluated each year in this process. Furthermore, since the Climate Budget is embedded in the financial budgeting process City entities are asked to propose new climate measures in their budget instructions. See more about the Climate Budget process in module 5.1 on governance.

In addition to the annual Climate Budget process, existing measures in the Climate Budget (see table in Module A-2) are reported on three times throughout the year. Each entity that is responsible for reporting (denoted by a star in the table) must report on how they are following up on their measure based on a series of measure specific output indicators. This can for example be a target for how many public charging stations should be installed, or km of new bike lanes constructed by the end of the first quarter. These indicators are established in each entity's activity plan.

Moreover, Oslo's Climate Agency has a set of outcome indicators in our Climate Barometer which we use to monitor the outcomes of the different measures across the most important sectors. These outcome indicators are a more *real-time* supplement to our GHG emission inventory, since the GHG inventory is published once per year and has a lag time of over one year. For example, the GHG inventory for 2021 will be published in late January 2023. These indicators are exemplified below in a table divided by sector. These indicators are evaluated three times per year to ascertain that measures in the Climate Budget are on track. They are also used once per year as a supplement to NEAs GHG inventory to update estimates of the climate effect of different measures in the Climate budget. See visualizations of some of these indicators by accessing the Climate Barometer at klimaoslo.no. We are continually improving this indicator set.

Table 6: Outcome indicators in Climate Barometer

Sector	Outcome indicators
Road transport	-Vehicle traffic in the toll ring divided by fuel type -EV proportion cars in Oslo -EV proportion of vans in Oslo -EV and biogas proportion of busses in Oslo -EV and biogas proportion of trucks in Oslo
Waste	-Quantity waste incinerated at Oslo's three waste incineration sites -Quantity plastic sent to recycling
Other mobile combustion	-Duty free diesel sold in Oslo (discontinued dataset) -City entities use of duty-free diesel -Subcontractors use of duty-free diesel

3 Part C – Enabling Climate Neutrality by 2030

3.1 Module C-1 Organisational and Governance Innovation Interventions

C.1.1: Enabling organisational and governance interventions					
Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Climate Budget	Main- streaming climate action in city planning, and tying it to finance	Climate Agency Finance	Whole City Administration, businesses that are wholly or partially owned by Oslo.	Main- streams climate action, makes departments responsible for action, makes finance dept. responsible for monitoring	Facilitates all co-benefits generated by all activities listed below.
Incentivise emission-free heavy transport	Ensured exemption for zero-emission and biogas in road tollring until 2027, demanded zero-emission transport in city procurement, and support for charging infrastructure	Climate Agency	Business, Business NGOs, Toll-Ring, UKE, National authorities	In October 2022 sale of new electric trucks was 60% (from 5% in 2020). ¼ of trucks in Oslo are now electric and biogas	Noise reduction Less localised pollution in city centre (better for asthmatics)
Klemetsrud carbon capture project	Capture CO2 from Oslo's residual waste	City of Oslo	National Government Private companies (Hafslund Oslo Celsio, Hafslund AS, Infranode and HitecVision)	17 percent of Oslo's greenhouse gas emissions come from the Waste-to-Energy plant, where the waste incineration accounts for the largest single discharge in the city. The plant will be able to capture 400 000 tons of CO2 annually.	Improved local pollution Improved biodiversity (less need for landfills) District heating generated by burning waste generates heating and hot water for neighbours Possible pilot case for 450 incineration plants in Europe with comparable emissions

The road toll payment system and charges	Oslo's road toll payment system aims to reduce car traffic, while the income generated supports public transport	Fjellinjen (Private Company) City of Oslo Viken Regional Government	Public, Toll-Ring, Public transport companies (Ruter)	In 2022 income from the road toll ring supported generation and upgrade of metro and tram infrastructure in the city.	Improved public transport. Less road traffic in city centre, and increased safety for pedestrians and bikers. Less localised pollution in city centre (better for asthmatics)
Zero emission construction sites, facilitated by NZC pilot on construction	By 2025, all construction activities commissioned by the City, including transport connected to procurement of goods and services, shall be zero emission or use biogas. By 2030, the goal is citywide zero emission construction (ZEMCON). Oslo has taken a leading role in clean construction globally through the C40 Cities network.	Climate Agency	Power company Grid Company Research inst. Contractors Property owners Infrastructure developers	Construction activities, machinery, and associated HDVs represent roughly 10% of direct greenhouse gas (GHG) emissions in Oslo.	Noise reduction Less localised pollution in city centre (better for asthmatics) Nudging commercial development of zero-emission machinery
Oslo's natural environment shall be managed in such a way that natural carbon storage in vegetation and soil is protected	Safeguarding of carbon sinks and increasing uptake of GHG in forests and vegetation apply to both the construction zone and city forests	City Council for Environment and Transport	13 mitigation measures adopted concerning the management of the City of Oslo's forests, in cooperation with forest managers and Climate Agency and the Department of Urban Environment	Forests are less vulnerable to climate change, carbon sinks are protected, uptake of CO2 is increased, and efforts will be made to use timber for durable, high-quality products. Since 2007, the City of Oslo has restored over 400 acres of marshland	Positive effect on climate, biodiversity and outdoor recreation
Reduce GHG emissions from building materials	Reduce GHG emissions from materials in the City's new and refurbished buildings by 30%	Agency for Improvement and Development	The City Council will reduce indirect emissions and has set a target of reducing GHG emissions from materials used in the City's new and	Reduces Oslo's Scope 3 emissions	Creates a larger market for climate-friendly products, and nudges companies towards coming up with better business solutions if they

			refurbished buildings by 30%		want to compete for market access in Oslo. Less generated waste from Building sites
Climate requirements in procurements	The City of Oslo will continue to work on implementing environmental declaration requirements in procurements.	Agency for Improvement and Development	The City of Oslo is a major buyer and makes purchases worth just under NOK 30 billion annually. The City Council is working to ensure that the City facilitates redesign, repair, refurbishment upgrading and second-hand purchases in joint purchase agreements concerning furniture, textiles and ICT	Reduces Oslo's Scope 3 emissions	Creates a larger market for climate-friendly products, and nudges companies towards coming up with better business solutions if they want to compete for market access in Oslo.
Sustainable food, reduced meat consumption and reduced food waste	The City Council is working to halve food waste in its own enterprises and per inhabitant by 2030	Agency for Improvement and Development, Climate Agency	All city agencies, citizens	Reduces Oslo's Scope 3 emissions. Meat consumption by the City's own enterprises will be halved by the end of 2023, and the proportion of fruit, vegetables, legumes and seasonal goods will be increased amongst City enterprises. The City Council will continue to work to establish new joint purchase agreements concerning food which will underpin the goals	Creates a larger market for climate-friendly products, and nudges companies towards coming up with better business solutions if they want to compete for market access in Oslo.

C-1.2: Description of organisation and governance interventions – textual and visual elements

Climate budget as a governance tool

In this section we will describe in more detail how the climate budget process functions as a governance tool to ensure the implementation of the climate strategy.

The Climate Budget is our local climate action plan and presents reduction targets and mitigation measures which are being implemented in Oslo to reduce emissions within the city and describes important initiatives in order to achieve the climate targets established in the Climate Strategy. The climate budget analysis, a yearly gap analysis, is based on the Norwegian Environment Agency's municipality level greenhouse gas inventory and estimates the impact of all types of mitigation measures (regulations, taxes, subsidies etc.) at the local, regional and national level that can help Oslo achieve our climate targets(see module a-2 and b-1 and b-2 for this analysis) or our published Climate budget, and Appendix

However, the climate budget is much more than an action plan, it is also an annual process. Since the Climate Budget is an integrated part of the ordinary budget it also means that climate consideration and the Climate Agency has a prominent role in the entire budget process. The figure below is a depiction of the budget process in Oslo.

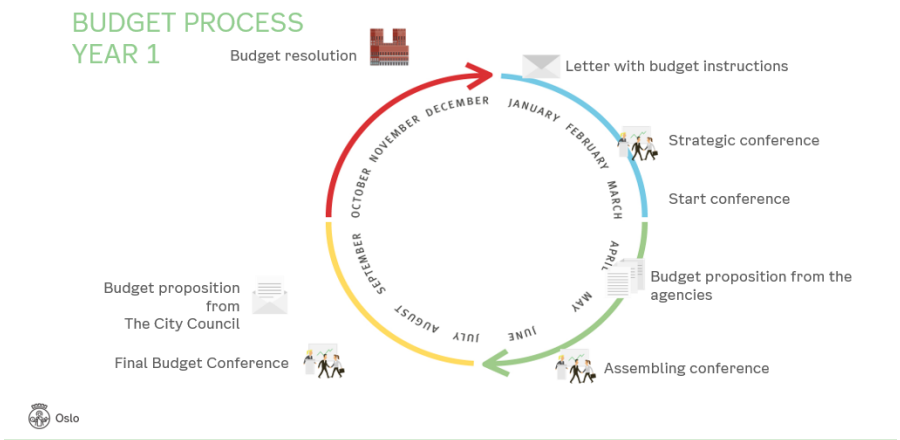

Figure 12: Climate budget process year 1

The Climate Agency writes strategic recommendations that are discussed at the political level in all the yearly budgeting conferences, and the climate budget analysis with adopted measures is politically decided by the city council yearly in the final budget conference and the budget resolution.

Furthermore, the Climate Agency also has an official role to give feedback on budgeting instructions to other entities, has the mandate to comment on the activity plan of other agencies, and gives feedback on and evaluates the impact of other agencies' budget propositions. Through the budgeting process climate is mainstreamed through all government levels.

The figure below depicts year 2 of the Climate Budget process. After a new Climate Budget takes effect this (just like in the regular budget) entails that government entities (and businesses that are owned or partially owned by the municipality) must report on their climate measures in a similar manner to how they report on their finances three times per year in this case to the Climate Agency. The Climate Agency consolidates this information and gives feedback to the city government on where climate action is lagging or if climate impacts deviate from earlier estimates.

The Climate Budget 2023 is the seventh in the series of climate budgets. Although we have made progress there is still a long way to go with streamlining the decision-making processes and improving

methods. The Climate Agency is therefore continually developing methods to improve the Climate Budget process and is evaluating whether more of the city's environmental goals can be managed using a similar governance system.

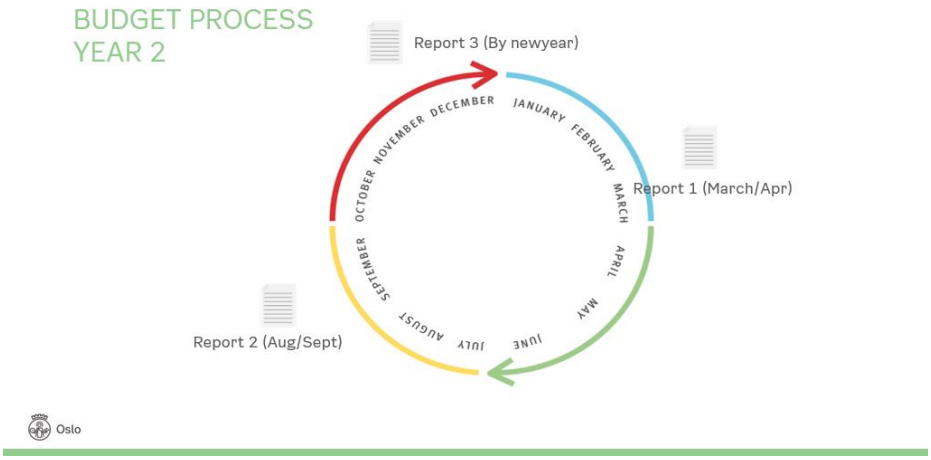

Figure 13: Climate budget process year 2

Oslo's Climate Budget (our local Action Plan) is prepared annually, decided upon by the City Council. In this way the annual budget shows how the City Council is following up the Climate Strategy. In addition to a brief description of the Climate Budget we have also included in the table C-1-1 a brief description of key initiatives decided in the 2023 Climate Budget under the main targets. When the budget is first published, the Climate Agency and other underlying entities are already working on formulating climate measures for the next years' budget. As such, the Climate Budget is an innovative governance tool that is constantly revised, tweaked and improved and is a yearly arena for ratcheting up efforts. As the Climate Budget develops, the level of ambition and complexity of the activities will continually increase. Most of the low-hanging fruit has already been captured.

Oslo's Climate Agency

Establishing a Climate Agency has been key for following up Oslo's climate goals. The Climate Agency was established 2016 as an Agency responsible for following up implementation of the Climate Strategy. It is a professional resource and an instigator for achieving the climate goals. In 2018 the Climate Agency was subject to a City Audit. The audit was investigating whether the work of the agency and the interaction with other City agencies was of sufficient quality to achieve the goals in the Climate Budget. The revision found that the work and the collaboration was well underway, but identified some areas of improvement. For example, the Climate Agency could improve overall risk assessments. The audit was followed up in 2021, and the Climate Agency was found to have improved its performance overall.

The findings of the City Audit demonstrate that overall, mainstreaming climate action through the Climate Budget works well, and that the Climate Agency demonstrates constructive interaction with other City agencies.

Oslo's Climate Strategy

Oslo has a developed Climate Strategy with an ambitious target. We are currently considering if parts of this Climate Strategy need revision. If revised, there will be a new plan for citizen engagement around the core elements of the strategy accordingly. When adopting the previous strategy, Oslo held broad consultation meetings for the public, the private sector, NGOs, and marginalised groups. The document will also be on a 'public hearing' with opportunity to comment, and all documents sent for approval in City Council are public. A revision of the existing Climate Strategy will be equally, if not more, consultative as the former.

A revision of the NZC CCC will follow established procedures, on a bi-annual basis, as required by the EU Commission. With the CCC version 2 we will aim to integrate the existing local workstream on the Climate Budget stronger into required EU work-process of the CCC.

3.2 Module C-2 Social and Other Innovation Interventions

C.2.1: Enabling social innovation interventions					
Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Climate Strategy	The Climate Strategy has adopted a vision of Oslo carbon emissions shall be *reduced with 95% (direct emissions) compared to 2009, and of Oslo* being a *carbon-negative* city as of 2030	Climate Agency	The Climate Strategy was developed as a consultative process; Climate Agency made a white paper for the Strategy, with suggested target areas. Suggestions were based on the city's direct emissions, and professional suggestions. The target areas were decided upon in a participative process, organisations and public could contribute. We organised breakfast meetings, meetings with private sector, and general feedback meetings. The white paper was sent for a public hearing, receiving 75 inputs from the public, the private	Enables broad commitment and support by citizens, private sector, NGOs	Mainstreams climate action for all levels of city government

			sector and NGOs. The strategy was approved by wide majority in City Government		
Business for Climate network	The purpose of the network is to create an arena for dialogue and collaboration between the City of Oslo and the private sector in order to exchange experiences and align policy.	Climate Agency	Business for Climate consists of 130 businesses that work towards reducing Oslo's climate emissions. The members are small, medium and large companies from a diversity of sectors, as well as several organisations. The companies become members through signing a contract with the Vice Mayor for environment and transportation.	The network will mobilise the private sector and other businesses in order to actively contribute towards achieving Oslo's climate goals. Members and partners of the network will commit to reducing greenhouse gas emissions from their own company, and by promoting climate-friendly solutions through innovation and purchase of services beyond their own operation.	
Strategic climate communication	How the City should interact with citizens, the private sector, organisations, other cities and municipalities, in order to promote this transition.	Climate Agency	The City Government wants to strengthen consultative processes towards the population, especially children, youth and the private sector in the zero-emission city transition	Climate communication mobilises for action which contributes to Oslo achieving climate targets. Climate-friendly behavioural change is more important than a change of attitude. Communication should contribute towards behavioural change among the population and the business community, on an individual level, on group level and on a systemic level.	
Climate School	The Agency for Climate and the Education Agency collaborate through the project 'Lifting climate within the Oslo	Climate Agency	Schools Teachers Students Youth	Provide knowledge that makes the pupils understand the main challenges related to the environment and climate, while seeing	

	school' to create the web portal 'Climate School' and to offer visits of young 'climate pilots' (young speakers) to schools in the city.			the possibilities of the green transition.	
Climate grants	The City of Oslo provides grants for both citizens and businesses which implements climate activities/measures through a diverse set of climate grants.	Climate Agency	Business Citizens Housing associations/Co ownerships	'Nudge' citizens and business towards systemic transformation. Businesses can get support for safe and dry bicycle parking at the workplace, while housing associations, co-ownerships or citizens can get support to establish electric charging stations, or install renewable energy sources and energy-saving equipment/insulation in buildings.	
Collaboration with academia- Oslo as an international test centre for climate innovation.	Oslo aims to be an international "living laboratory" for climate innovation. We have developed a collaboration with academia, and we have adopted a 'Campus Oslo' strategy, establishing innovation hubs on several topics to facilitate idea development and commercial collaboration with the city's businesses.	Dept. for Business Development and Public Ownership	The innovation hubs are based on collaboration between research centres/academia, private and public sector, and they involve civil society and citizens in the process.	All innovation hubs have demonstration sites and incentivise start-ups and scalable solutions. The tree hubs focus on (1) sustainability, health, digitalisation, democracy and inclusiveness, (2) new science, solutions and jobs linked to circular economy, and (3) renewable city development, technology and urban ocean solutions. This form of cross-sectoral collaboration between the City and the private sector should facilitate new	

				climate science and solutions	
Include - Research centre for socially inclusive energy transition and Just transition of Urban Mobility	Include is a centre focusing on socially inclusive energy transitions, and how to realize a socially just low carbon society. The PhD project on just transition of urban mobility is a Public Sector PhD focusing on how to achive Oslos climate goals within urban mobility in a socially just way	Agency for urban environment (user partner in Include)/ Climate agency (PhD)	Academia and public sector, private sector and voluntary sector Include has seven research partners and about 20 user partners in the public, private and voluntary sectors in Norway and the UK. •	Include is set up to develop knowledge and solution on about how to realise a socially just low-carbon society. The PhD projects is directly targeted on develop knowledge on how cities can meet the urgent need for climate action without socially unjust consequence within urban mobility.	The research at the centre will have significant benefits also when it comes to health, air-quality and liveability in the city. In particularly addressing the just city it will also co-benefit the citizens when it comes to different aspects of justice such as equity, democracy and recognition of a diversity of groups
Move 21 – Mobility Hub Network	Move 21 is an innovation project funded by the European Commision. The project aims at transforming European cities and their surroundings into smart zero emissions nodes for mobility and logistics. In Oslo the project is organised within a living lab. One concept in the Oslo Living Lab, called Mobility Hub Network, is seeking to build a network of mobility hubs. The goal is for the network to expand	Agency for urban environment / Climate Agency	Businesses Citizens City government Alna District Public transport provider	A mobility hub network will provide a more complete, and seamless mobility service, thereby reducing the need for private car ownership. It will also seek to establish sustainable business models for mobility providers,	Groruddalen area and Alna district is pointed out as a pilot area for the mobility hub network concept. The district is a multicultural hub with over 65% of its inhabitants with origins outside Norway. It is an area with highway and rail infrastructure that acts as a barrier for cycling and walking, and

	throughout the city but piloting start in area Groruddalen.				many inhabitants are reliant on the public transportation system. The project will focus on inhabitants needs for transportation but also the barriers preventing different types of mobility today.
NTRANS – Norwegian Centre for Energy Transition Strategies	NTRANS is a research centre that focuses on the role of the energy system in the decarbonization of sectors such as energy, transport, industry, and buildings, as well as our everyday lives.	Climate Agency represents the City of Oslo as a user partner in NTRANS. The Centre is led by NTNU.	More than 30 research partners and other stakeholders from government, academia and business collaborate to increase the knowledge base on how to progress towards the low emission future	New practices, increased citizen engagement, and changes in behaviour are vital in order to stimulate demand for low-carbon solutions, to create political legitimacy, and to mobilize the resources needed for the transition.	
Research projects	Climate action is a priority research topic in Norway and the EU, and many individual projects seek to expand the knowledge base	The Climate Agency and other municipal agencies take part in relevant research projects	Research institutions together with government, NGOs and business partners. CAPSLOCK, TRIPOP and others		

3.3 Module C-3 Financing of Action Portfolio

Module C-3 “Financing of Action Portfolio” should contain the list of action portfolios and interventions outlined in Modules B-2, and those from C-1 and C-2 with cost implication to provide a summary list of interventions that need to be unpacked in the Investment Plan.

Existing Climate Action Funding and Financing in Oslo
How Oslo funds its climate work cannot be seen through direct allocations to specific measures. Our goal is to have the climate work integrated in the agencies’ already adopted 4-year budgets. This means that, in general, we cannot isolate allocations for the climate work in the budget.
However, when we see that, for example, the City can lead by example, we have had specific pots of funding to motivate a shift in the market. For example, we have had funding for climate measures at City owned buildings and for electrifying the city fleet. This way the city can accelerate a shift in the market and thus make the transition easier for the private sector.
Because city budgets will differ a lot from one city to the next in terms of which level of government provides which types for services, we are questioning whether it makes sense to try and a identify a share of the entire budget.
Furthermore, as long as Oslo is moving towards integrating the climate work into the regular operations, trying to isolate budget allocations to specific fields of action targeting, will not be presenting a full picture of finances towards the climate work. A number in the table below will not reflect the full amount, and thus we will not try to fill it out.
In the end, city operations only account for four-five percent of the city-wide direct emissions. Of course, the city will make investments to facilitate a shift to climate friendly technology. EV charging infrastructure is an obvious example where the city invests in charging infrastructure and provide financial incentives to install chargers at home, but the investments made by vehicle owners will be much larger in total.

Existing collaboration with private sector in Oslo
Oslo has an established approach to working with the private sector.
The City of Oslo is partial or sole owner of several limited liability companies, among them the energy company Hafslund and the grid company Elvia. Hafslund is Norway’s second largest producer of renewable energy and Elvia is the electricity grid-company responsible for distribution of electricity in the wider Oslo region. The City also owns the public transportation companies Ruter (50 %) and Sporveien, as well as the Toll-ring company Fjellinjen. The City of Oslo also owns the Port of Oslo, a municipal enterprise and Norway's largest public cargo and passenger port. Other municipal enterprises owned by the City are Oslobygg and Boligbygg with a significant market share in Oslo’s construction market.
These companies are all active in major emission sectors in Oslo (traffic, waste, construction, harbour, heating) as well as the energy and grid company. Thus, the city owns major companies affecting scope 1ghg emissions. Governance of companies where the City is an owner, follows established principles for good corporate governance, and discussions on corporate strategies and work takes place on a board level. Oslo is cognizant of not establishing parallel governance structures of these companies and sowing confusion on City corporate governance through detailed Climate-City contracts with these companies. This said, we do have an established way of collaboration with private sector companies through the Business for Climate network.

Business for Climate
The Business for Climate network was established in 2010. The purpose of the network is to create an arena for dialogue and collaboration between the City of Oslo and the private sector in order to exchange experiences and align policy. We also want to mobilise the private sector and other businesses in order to actively contribute towards achieving Oslo’s climate goals. Members and partners of the network will commit to reducing greenhouse gas emissions from their own company, and by promoting climate-friendly solutions through innovation and purchase of services beyond their own operation.

Business for Climate consists of close to 150 businesses that work towards reducing Oslo's climate emissions. The members are small, medium and large companies from a diversity of sectors, as well as several organisations. The companies become members through signing a contract with the Vice Mayor for environment and transportation, pledging support for Oslo's climate targets. The 93 companies for which data is available have more than 44 000 employees in the Oslo area and a revenue of about 230 billion NOK.

Through signing the climate contract, the members commit to working actively for the city's emissions to decrease, and to achieve 95% reduction by 2030. The climate contract is a contract of intention, but is supported by a set of membership criteria that the members commit to through signature. In 2022, the network introduced partnership as a next step for the network, inviting members to commit more strongly to be climate leaders, collaborating more closely and reporting on their emissions and progress to the city on a yearly basis. Partner reporting will enable measurement and monitoring of the partners' progress towards climate neutrality individually and for the network overall. As of 2023, 19 businesses have signed a partner agreement.

Cooperation with the business sector through the Business for Climate network is key to succeed in adopting the right measures within each sector. Through network meetings, the members are invited to take part in shaping future policies. The network was consulted and involved in the process of developing the city's Climate Strategy, and has played a vital part in identifying measures and barriers

NON-FINANCIAL BARRIERS TO CLIMATE INVESTMENT
National level regulation
Planning and building act: Oslo is working towards mandating fossil free and eventually zero emission construction city wide. If all privately owned projects were to move in this direction, it would generate large investments in climate friendly technology in the construction sector. It requires a change in the national governments' interpretation of the Planning and Building Act for the city to be able to mandate this. Oslo is working towards the national level to clarify the legal basis for fossil free zoning permits, but thus far we have been unsuccessful.
Transport: Oslo's largest emission source is transport. While we have come far in electrifying the private car fleet, we still have some way to go. There are several policy levers the national level can pull to support Oslo and other Norwegian municipalities in the work to electrify all transportation. They need to:

- Increase the registration fee for fossil cars and ensure that leasing fossil cars become less attractive
- Give municipalities the authority to mandate zero-emission zones
- Give the regional level the authority to require zero-emission buses when giving out permits to private bus operators
- Give electric and biogas trucks access to the bus lane
- Give temporary free passage through toll rings for electric vans
- Ensure that electric and biogas trucks have free passage through toll rings for at least five years and after that pay maximum 50% of the fossil truck rate
- Give municipalities the authority to mandate parking fees on private parking grounds
- Provide financial schemes for charging infrastructure and biogas filling stations

Circular economy: An integral part of reaching the 1.5 degree target is to dramatically reduce the use of virgin materials. While cities handle most of the waste, house most retail and restaurants and have most of the construction, they are limited when it comes to transforming the linear economy to a more circular one where capital flows to more circular solutions. For Oslo it is thus important that the national level:

- Implement EU regulations on circular economy as they are key to stimulate circular business models
- Adjusts VAT and taxes to make it more profitable to repair/donate/reuse than to throw out and replace with something new
- Adjust regulation for reuse of materials to allow for more reuse in construction
- Expand and strengthen producer responsibility especially when it comes to use of plastics
- Assess how to regulate commercial waste with an aim to reduce plastics

Climate Policies for Capital Formation and Deployment
So far, Oslo has identified measures that can result in a 79 percent reduction in emissions by 2030. The city has already adopted and implemented measures that can lead to a 62 percent reduction. Measures that have been identified to close the gap between 62 and 79 percent are:

- Increase fees at the toll ring and make the difference between diesel cars and EVs more than €10
- Zero emission zones in the city center
- CO2 taxes for road transport without compensating measures
- Require 40% biofuels for road transport
- Give zero-emission and biogas trucks access to the bus lane
- Secure lots for charging and fuelling infrastructure
- CCS for all household waste in Oslo
- Sorting plant for household waste in Oslo
- Reduced emissions from commercial waste incineration
- Increased textile recovery
- Improved sorting of fossil waste
- District heating without fossil oil and gas
- Mandate emission free construction sites city wide
- Carbon taxes for construction
- Zero emission ferry terminals
- Harbor fees based on fuel
- Fully electrify the harbor
- Collaborate with other ports on standard for electrification for cruise traffic
- Replace oil heating with renewable heating sources in vessels
- National ban on use of gas for heating

Risks to Sufficient Investment:
The main risk to sufficient investment is that the EU, the national level and the city fails to develop, adopt and implement the necessary policies. In this mix, failing to implement is probably the largest risk because it requires institutional capacity to implement.

C-3.1: Summary of the major climate interventions with cost implication					
Action/ intervention name	Responsible entity and person	Start/end date	Field of action	Impact	Total cost estimated
(list action portfolios and interventions from Modules B-2, C-1 and C-2, which have a cost implication)	(indicate responsible entity and person)	(indicate start and end date of the activity)	(indicate the field of action the interventions belongs to)	(indicate impact - i.e. the GHG reduction/ co-benefit)	(indicate the total costs in €, estimated for the intervention)
Carbon Capture Plant at Klemetsrud (more info here)	Department for Culture and Business Development owns Hafslund (private company 100% owned by the City of Oslo), which has a 60% share in the subsidiary Hafslund Celsio responsible for the CCS project. The City has supported the project financially through provision of loan.	Work on project starts in 2022, carbon capture will be initiated 2029. Due to rising costs in the project, a new agreement between Hafslund, the City and the national government must be reached. Thus the initiation date is 2029.	Carbon Capture (CCS) from waste-to-energy incineration plant facility 'Klementsrud'	400.000-ton CO2 will be captured yearly. When calculating emissions, we say that 165.000 ton CO2 will be captured (17% of Oslo's total CO2 emissions). Possible co-benefit: technological solution can be exported to 450 European waste incineration plants.	City of Oslo and private companies commit 6 billion NOK 3 billion NOK has been committed in national support
New tariffs in road toll ring			In 2022, new tariffs were negotiated and adopted for the road toll ring (the road user payment system).	Reducing traffic providing incentives for zero-emission vehicles,	Generates income of NOK 5 billion for period 2023-2026

				the road toll ring provides revenue that goes to the funding of infrastructure specifically for public transport, cycling and walking.	
Procurement ensuring Zero emission services for the city (More here)	UKE	The City of Oslo is one of Norway's largest public purchasers and is purchasing goods and services for 30 billion NOK every year. We will use our purchasing power strategically to nudge the market towards a zero-emission path, through demands such as the following: From 2025 all transport services shall be zero emission From 2025 all City construction sites shall be zero emission	Strategic zero-emission public procurement	The city will minimize its own GHG emissions. The city will minimize scope 3 emissions. The city will nudge the market towards a zero-emission path.	In 2022 the City purchased goods and services for 30 billion NOK.

		By 2030 50% of food purchased by the City shall be vegetarian, sustainably produced, and ecological By 2030 there will be a 30% reduction in GHG emissions from materials used in new and refurbished buildings			

4 Outlook and next steps

Plans for next CCC and Action Plan iteration – textual elements
The Climate Budget is Oslo's existing governance tool for implementing the Climate Strategy (our Climate Action Plan). The Climate Budget is presented to the City Council at yearly budget conferences, for the whole planning period of 2022-2025. The current Climate Budget is our 8th version, and our methodology for implementation, monitoring and execution has been constantly refined. When new barriers are identified, we are continuously working to overcome these, through research and collaborative partnerships with academia, private companies and citizens. Oslo's Climate Strategy was adopted in 2020 by a wide majority of representatives and political parties in City Council (8 out of 10 parties). We are considering the need for updating parts of our Climate Strategy. If so, we will base the update on scientific research and development of new analysis for achievement of the 2030 climate target. An update will also be based on appropriate consultative and deliberative processes with both citizens and business community.

5 Annexes

1: List of links/ Reports referred to in the Climate Action Plan

1. Analysis of barriers to transition away from ICE vehicles among Oslo's vehicle owners https://www.klimaoslo.no/rapport/de-siste-fossilbilistene/#:~:text=Andelen%20elbiler%20i%20personbilparken%20vil,ha%20fossildrevet%20bil%20i%202030
2. Business for Climate- climate contract-template https://www.oslo.kommune.no/getfile.php/1314910-1632745047/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Milj%C3%B8%20og%20klima/N%C3%A6ring%20for%20klima/N%C3%A6ring%20for%20klima%2C%20klimakontrakt%20-%202017.pdf
3. City of Oslo Climate Barometer https://www.klimaoslo.no/klimabarometeret/ https://www.klimaoslo.no/klimabarometeret/veitrafikk/
4. City of Oslo Energy Barometer https://www.klimaoslo.no/energibarometeret/
5. Climate and environmental requirements in procurement https://www.oslo.kommune.no/for-vare-leverandorer/krav-til-leverandorer/klima-og-miljokrav/#gref
6. Climate Budget 2023 https://www.klimaoslo.no/rapport/oslos-climate-budget-2023/, with appendix https://www.klimaoslo.no/rapport/appendix-to-oslos-climate-budget-2023/
7. Climate Budget 2024 https://www.klimaoslo.no/rapport/oslo-climate-budget-2024/
8. Diversity and inclusion in Oslo https://www.oslo.kommune.no/english/welcome-to-oslo/life-in-oslo/an-open-and-inclusive-city/#gref
9. Mapping of EU policies: Oversikt Over EUs Rammebetingelser på mobilitetsområdet av betydning for gjennomføringen av Oslo Kommunes klimastrategi for 2030 https://www.klimaoslo.no/wp-content/uploads/sites/2/2024/01/OVERSIKT-OVER-EUS-RAMMEBETINGELSER-PA-MOBILITET.pdf
10. Members of Business for Climate Oslo https://www.oslo.kommune.no/miljo-og-klima/naring-for-klima/medlemmer-i-naring-for-klima/medlemmer-i-naring-for-klima
11. Newspaper article: The City Council secured a majority for the climate strategy. Oslo is to become a zero-emission city by 2030" «Byrådet fikk flertall for klimastrategien. Oslo skal bli en utslippsfri by innen 2030». https://www.vartoslo.no/arild-hermstad-bjorn-revil-camilla-wilhelmsen/byradet-fikk-flertall-for-klimastrategien-oslo-skal-bli-en-utslippsfri-by-innen-2030/236811
12. Norwegian Agency for Environment, Climate measures in Norway "Klimatiltak I Norge: kunnskapsgrunnlag" https://www.miljodirektoratet.no/publikasjoner/2024/april-2024/klimatiltak-i-norge-kunnskapsgrunnlag-2024/
13. Norwegian Agency for Environment, Methodology for impact assessments «Metodikk for tiltaksanalyse» for https://www.miljodirektoratet.no/publikasjoner/2018/juni-2018/metodikk-for-tiltaksanalyser/
14. Norwegian PRTR/Norske utslipp https://www.norskeutslipp.no/en/Frontpage/

15. Organizational chart City of Oslo https://www.oslo.kommune.no/getfile.php/13503654-1707728231/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Politikk/Slik%20styres%20Oslo/Organisasjonskart-eng-2024%20feb.pdf
16. Oslo Climate Agency website www.klimaoslo.no
17. Oslo Climate Strategy https://www.klimaoslo.no/oslos-new-climate-strategy/
18. Oslo Port's Zero Emission Action Plan https://www.oslohavn.no/globalassets/oslo-havn/dokumenter/sentrale-planer/2018-oslo-havn-som-nullutslippshavn.pdf
19. Oslo's "Climate pilots" https://www.klimaoslo.no/oslos-nye-klimapiloter-om-lukten-av-elbuss-fremtidshap-og-klimakunnskap/
20. Oslo's climate strategy: Key reports and white papers feeding into Oslo's Climate Strategy https://www.oslo.kommune.no/miljo-og-klima/slik-jobber-vi-med-miljo-og-klima/miljo-og-klimapolitikk/klimastrategi/#gref
21. Oslo's Governance System https://www.oslo.kommune.no/politics-and-administration/politics/city-governance/#gref
22. Oslo's Procurement Strategy https://www.oslo.kommune.no/getfile.php/13254871-1510047808/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Anskaffelser/Anskaffelsesstrategi%202017%20-.pdf
23. Plan for Oslos bicycle network. "Plan for sykkelveinettet i Oslo» https://www.oslo.kommune.no/getfile.php/13137178-1538031274/Tjenester%20og%20tilbud/Gate%2C%20transport%20og%20parkering/Sykkel/Sykkelstrategier%20og%20dokumenter/Plan%20for%20sykkelveinettet%20i%20Oslo.pdf
24. Policy instrument analysis for energy in Oslo, "Virkemiddelanalyse for energi i Oslo»https://www.klimaoslo.no/rapport/virkemiddelanalyse-for-energi-i-oslo-full-rapport/
25. Policy Instrument Analysis for Zero-Emission and Biogas Heavy Transport in Oslo by 2030 «Virkemiddelanalyse for utslippsfri og biogass tungtransport i Oslo innen 2030» https://zero.no/wp-content/uploads/2021/02/VIRKEM_1.pdf
26. Regulations on environmental requirements for taxi transport in Oslo «Forskrift om miljøkrav til kjøretøy i løyvepliktig drosjetransport innenfor Oslo kommunes grenser (forskrift om miljøkrav for drosjetransport i Oslo)» https://lovdata.no/dokument/LF/forskrift/2020-09-23-1969
27. Report on accellerated electrification on construction sites: «Forsert elektrifisering av tungtransport og bygg- og anleggsektoren i Oslo mot 2030» https://www.klimaoslo.no/rapport/elektrifisering-av-tungtransport-og-bygg-og-anleggsektoren-i-oslo/sammendrag-elektrifisering-tungtransport-bygg-og-anlegg/
28. The City of Oslo's Bicycle Strategy https://www.oslo.kommune.no/getfile.php/13415683-1630567227/Tjenester%20og%20tilbud/Gate%2C%20transport%20og%20parkering/Sykkel/Sykkelstrategier%20og%20dokumenter/The%20City%20of%20Oslo%E2%80%99s%20Bicycle%20Strategy%202015-2025.pdf

2: Detailed sectors and emission sources in the greenhouse gas inventory from Norwegian environment agency

Emission sector / emission source	2009	2011	2013	2015	2016	2017	2018	2019	2020
Other mobile combustion	**133696.5**	**156534.7**	**161872.2**	**154755.7**	**156984.6**	**155998.2**	**165923.8**	**144808.6**	**134984.7**
Other industries	22308.1	39242.8	37148.8	30260.8	46820.8	36878.6	24074	30166.3	29296.7
Waste treatment	2538.3	4457.3	5977.8	6750.6	6122.8	5846.8	5770.4	4820.2	5298.2
Building and construction	76656.1	66131.9	83096.4	69109.9	59903.2	80265.2	97841.9	73318.7	69618.5
Agriculture	254	266	254.8	230	237.3	236.1	243	246.7	250.4
Forestry	181.7	190	264.2	148.1	164.4	76.4	202.4	101.8	358
Transport-related services	31182.5	45687.1	34618.1	47748.9	43233.6	32190.8	37325	35694.5	29238.9
Snowmobiles	575.8	559.6	512.1	507.4	502.5	504.3	467.1	460.4	924
Waste and wastewater	**66485.1**	**65091.4**	**60990.6**	**59905.8**	**57513.7**	**58974.9**	**58409.6**	**54864.4**	**53154.9**
Landfill gas	61944.9	57985.4	54729.7	52391.3	48922.3	50659.1	50233.6	47683.2	43481.4
Wastewater	2491.6	5029.6	3950.4	5557.6	4002.1	4336.1	4375.7	4621	5288.1
Biological waste treatment	2048.6	2076.4	2310.5	1956.9	4589.3	3979.7	3800.3	2560.2	4385.4
Waste incineration and energy supply	**195816.8**	**233437.3**	**209643.9**	**206657.2**	**231635.1**	**266139.2**	**271885.4**	**278790.4**	**266614.4**
Waste incineration	147067.1	173434.2	196157.7	201398.4	226063.5	261355.9	265086.2	268222.8	265442.7
Distance heating, not waste incineration	48749.7	60003.1	17471.1	8282.0	9288.2	4783.2	6799.2	10567.7	1171.7

Industry, oil, and gas	**9980.2**	**11000.2**	**8458.3**	**4179.1**	**6271.4**	**4916.3**	**5304.7**	**3039.9**	**2685.8**
Industry, oil, and gas	9980.2	11000.2	8458.3	4179.1	6271.4	4916.3	5304.7	3039.9	2685.8
Aviation	**0.2**	**0.9**	**0.8**	**0.7**	**0.5**	**0.4**	**0.2**	**0.2**	**0**
Domestic aviation	0.2	0.9	0.8	0.5	0.4	0.4	0.2	0.1	0
Aviation abroad	0	0	0	0.2	0.1	0	0	0.1	0
Heating	**273710**	**160533.1**	**123108.3**	**70945.9**	**72886.9**	**69356.8**	**53016.1**	**27812.3**	**21955.4**
Miscellaneous	5512.2	6365.9	6334.8	6054	5811.9	5048.6	5069.8	4727.8	4859.8
Bioenergy	124	152.7	131.9	133.4	128.1	150.8	144.8	143.4	136
Fossil oil	237308.1	117003.6	85447.3	40946.7	40253.3	40131.9	26575.6	8939.4	55.4
Heating paraffin	16787.3	14261.4	9421.3	5879.1	4281.9	4342.7	2692.4	112.1	0
LPG	7195.4	12557	15657.1	12013.5	18733.4	14631.4	13232.7	10095	12326.2
Natural gas	0	0	0	0	0	0	0	0	0
Wood burning	6783	10192.5	6115.9	5919.2	3678.3	5051.4	5300.8	3794.6	4578
Shipping	**29486.5**	**29486.5**	**29486.5**	**29486.3**	**38807.3**	**38715.3**	**40027.5**	**40510.6**	**40267.4**
*Estimate shipping	29486.5	29486.5	29486.5	0	0	0	0	0	0
Other activities shipping	0	0	0	606.1	655.1	507.1	525.9	990.6	577.2
Other offshore service ships	0	0	0	0	0	1.9	0	0	0
Bulk carriers	0	0	0	1090.7	706.5	1288.5	929.2	428.7	743.6
Cruise ships	0	0	0	2173.4	3157	4098.7	3473.6	4349.1	727.5

Fishing vessels	0	0	0	1.9	14.9	0.2	0	0	26.2
Tankers carrying chemicals	0	0	0	0	0	0	0	0	0
Refrigerator/freezer ships	0	0	0	3059.9	4408.6	3844.1	4348.4	4547.4	3453.5
Container skips	0	0	0	2739.6	5223.4	4129.9	4926.7	5269	5717.8
Offshore supply ships	0	0	0	39.8	0	1.9	2.7	0	56.7
Oil product tankers	0	0	0	215.5	219.7	251.1	390.5	800.5	800.5
Passenger ships	0	0	0	17423.6	22060.4	22455.5	23139	21011.6	25195.2
Ro-Ro cargo	0	0	0	404.2	466.1	499	504.5	1839.3	2035.9
Crude oil tankers	0	0	0	0	0	0	0	0	0
Regular cargo ships	0	0	0	1730.1	1895.6	1637.4	1786.3	1273.5	932
Road traffic	**733702.3**	**717688.1**	**711044.8**	**702604.1**	**664739.4**	**614621.6**	**623767.9**	**593713.5**	**564570.8**
Buses	41126.2	40494.4	41273.4	41269.3	39320.9	36014.7	36464.3	35450.2	35136
Passenger cars	416810.8	391295.4	382538.1	374714.6	353600.1	329160.4	324365.3	299104	272476.9
Heavy vehicles	137103.5	139819.6	145300.5	151551.3	144741.5	133418.1	142147.2	138934.7	142116.6
Delivery vans	138661.8	146078.7	141932.8	135068.9	127076.9	116028.4	120791.1	120224.6	114841.3
Total	1442877.6	1373772.3	1304605.4	1228534.8	1228838.9	1208722.7	1218335.2	1143539.9	1084233.4

Note that although the inventory from NEA includes only scope 1 emissions, this includes emissions from district heating (mostly waste incineration) which is both produced and consumed within Oslo's geographical boundaries. These emissions from district heating are also included as scope 2 in the GPC format under the category *Energy generation supplied to the grid*. This means that district heating is both included in the scope 1 and 2 emissions in the GPC table. The value that is also included in scope 2 is denoted in purple under scope 1 in the table below.

3: Detailed sectors and emission sources in GPC format as reported to CDP and C40 (adapted from Ciris tool)

GPC ref No.	GHG Emissions Source (By Sector and Sub-sector)	Total GHGs (metric tonnes CO_2e)			
		Scope 1	Scope 2	Scope 3	Total
I	**STATIONARY ENERGY**				
I.1	**Residential buildings**	16 953	147 812	10 065	174 830
I.2	**Commercial and institutional buildings and facilities**	4 898	160 089	11 385	176 372
I.3	**Manufacturing industries and construction**	136 138	9 072	NE	145 210
I.4.1/2/3	**Energy industries**	NO	NO	NE	
I.4.4	**Energy generation supplied to the grid**	267 610			
I.5	**Agriculture, forestry and fishing activities**	714	16	NE	730
I.6	**Non-specified sources**	NO		NE	
I.7	**Fugitive emissions from mining, processing, storage, and transportation of coal**	NO			
I.8	**Fugitive emissions from oil and natural gas systems**	NO			
SUB-TOTAL	(city induced framework only)	**158 703**	**316 989**	**21 450**	**497 142**
II	**TRANSPORTATION**				
II.1	**On-road transportation**	564 571	IE	NE	564 571
II.2	**Railways**	NO		NE	
II.3	**Waterborne navigation**	40 267	NO	NE	40 267
II.4	**Aviation**	0	NO	NE	0

II.5	**Off-road transportation**	924	NO	NE	924
SUB-TOTAL	(city induced framework only)	**605 762**			**605 762**
III	**WASTE**				
III.1.1/2	**Solid waste generated in the city**	43 481		NO	43 481
III.2.1/2	**Biological waste generated in the city**	4 385		1 447	5 832
III.3.1/2	**Incinerated and burned waste generated in the city**	IE		NO	
III.4.1/2	**Wastewater generated in the city**	5 288		3 556	8 844
III.1.3	**Solid waste generated outside the city**	NO			
III.2.3	**Biological waste generated outside the city**	NO			
III.3.3	**Incinerated and burned waste generated outside city**	IE			
III.4.3	**Wastewater generated outside the city**	NO			
SUB-TOTAL	(city induced framework only)	**53 154**		**5 003**	**58 157**
IV	**INDUSTRIAL PROCESSES and PRODUCT USES**				
IV.1	**Emissions from industrial processes occurring in the city boundary**	NE			
IV.2	**Emissions from product use occurring within the city boundary**	NE			
SUB-TOTAL	(city induced framework only)				
V	**AGRICULTURE, FORESTRY and OTHER LAND USE**				
V.1	**Emissions from livestock**	NE			
V.2	**Emissions from land**	NE			

V.3	**Emissions from aggregate sources and non-CO2 emission sources on land**	NE			
SUB-TOTAL	(city induced framework only)				
VI	**OTHER SCOPE 3**				
VI.1	**Other Scope 3**			NE	
TOTAL	(city induced framework only)	**817 619**	**316 989**	**26 453**	**1 161 061**

4: Emission factors in GPC format from CDP reporting

GPC Classification	Sector	Fuel	Component	Value	Unit
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 2-stroke	Gasoline	CO2	2,35	kg CO2/liter
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 4-stroke	Gasoline	CO2	2,32	kg CO2/liter
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 2-stroke	Gasoline	CH4	0,019	kg CH4/liter
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 4-stroke	Gasoline	CH4	0,005	kg CH4/liter
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 2-stroke	Gasoline	N2O	3,92E-05	kg N2O/liter
II.5 Off-road transportation	Off-road vehicles and other machinery, Snow mobile 4-stroke	Gasoline	N2O	8,78E-05	kg N2O/liter

I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other mashinery with diesel engine	Diesel	CO2	3,17	tonne CO2/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other mashinery with diesel engine	Diesel	CH4	0,17	kg CH4/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other mashinery with diesel engine	Diesel	N2O	0,14	kg N2O/tonne
I.1 Residential buildings	Stationary combustion	Heating, fuel oil	CO2	3,17	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, fuel oil	CH4	0,431	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, fuel oil	N2O	0,0259	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, liquefied petroleum gas	CO2	3	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, liquefied petroleum gas	CH4	0,2305	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, liquefied petroleum gas	N2O	0,0046	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, natural gas	CO2	1,99	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, natural gas	CH4	0,1775	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, natural gas	N2O	0,0036	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, kerosene	CO2	3,15	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, kerosene	CH4	0,431	kg/tonne

I.1 Residential buildings	Stationary combustion	Heating, kerosene	N2O	0,02586	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, pellets	CO2	-	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, pellets	CH4	0,1901	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, pellets	N2O	0,0691	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood waste	CO2	-	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood waste	CH4	0,1788	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood waste	N2O	0,065	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, black liquor	CO2	-	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, black liquor	CH4	0,0216	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, black liquor	N2O	0,0144	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood briquettes	CO2	-	tonne/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood briquettes	CH4	0,1703	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood briquettes	N2O	0,0619	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, charcoal	CO2	-	tonne/tonne

I.1 Residential buildings	Stationary combustion	Heating, charcoal	CH4	5,9	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, charcoal	N2O	0,12	kg/tonne
I.1 Residential buildings	Stationary combustion	Heating, wood	CO2	1608 (not included)	g/kg
I.1 Residential buildings	Stationary combustion	Heating, wood	CH4	8,2	g/kg
I.1 Residential buildings	Stationary combustion	Heating, wood	N2O	0,032	g/kg
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Biodiesel	CO2	-	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Biodiesel	CH4	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Biodiesel	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Light fuel oils	CO2	3,17	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Light fuel oils	CH4	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Light fuel oils	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		LPG	CO2	3,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		LPG	CH4	0,00	Tonn/ tonn

I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		LPG	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Municipal waste	CO2	0,55	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Municipal waste	CH4	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Municipal waste	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Natural gas (dry gas)	CO2	2,69	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Natural gas (dry gas)	CH4	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Natural gas (dry gas)	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Pellets	CO2	-	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Pellets	CH4	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		Pellets	N2O	0,00	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		wood waste	CO2	-	Tonn/ tonn
I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		wood waste	CH4	0,00	Tonn/ tonn

I.4 Energy industries (excluding Emissions from energy generation supplied to the grid)		wood waste	N2O	0,00	Tonn/ tonn
I.3 Manufacturing industries and construction		Light fuel oils	CO2	3,17	Tonn/ tonn
I.3 Manufacturing industries and construction		Light fuel oils	CH4	0,00	Tonn/ tonn
I.3 Manufacturing industries and construction		Light fuel oils	N2O	0,00	Tonn/ tonn
I.3 Manufacturing industries and construction		LPG	CO2	3,00	Tonn/ tonn
I.3 Manufacturing industries and construction		LPG	CH4	0,00	Tonn/ tonn
I.3 Manufacturing industries and construction		LPG	N2O	0,00	Tonn/ tonn
III.2 Biological treatment of waste	Biogas production	NA	CH4	5 %	tonn CH4/ tonn methan produced
III.2 Biological treatment of waste	Compost	NA	CH4	4,00	kg/ tonn waste
III.2 Biological treatment of waste	Compost	NA	N2O	0,24	kg/ tonn waste
II.1 On-road transportation	Road Transport-Passenger Cars	Distance driven	CH4	0,00078168	g/km
II.1 On-road transportation	Road Transport-Passenger Cars	Distance driven	CO2	122,534158	g/km
II.1 On-road transportation	Road Transport-Passenger Cars	Distance driven	N2O	0,0025662	g/km
II.1 On-road transportation	Road Transport-Light duty vehicles	Distance driven	CH4	0,00012923	g/km
II.1 On-road transportation	Road Transport-Light duty vehicles	Distance driven	CO2	179,878229	g/km
II.1 On-road transportation	Road Transport-Light duty vehicles	Distance driven	N2O	0,00532329	g/km

II.1 On-road transportation	Road Transport-Buses	Distance driven	CH4	0,03445814	g/km
II.1 On-road transportation	Road Transport-Buses	Distance driven	CO2	875,461656	g/km
II.1 On-road transportation	Road Transport-Buses	Distance driven	N2O	0,04231997	g/km
II.1 On-road transportation	Road Transport-Heavy duty vehicles	Distance driven	CH4	0,00144254	g/km
II.1 On-road transportation	Road Transport-Heavy duty vehicles	Distance driven	CO2	824,907	g/km
II.1 On-road transportation	Road Transport-Heavy duty vehicles	Distance driven	N2O	0,0343833	g/km
II.3 Water transport		Fuel consumption	CH4	0,0002958	tonne/tonne
II.3 Water transport		Fuel consumption	CO2	3,17722597	tonne/tonne
II.3 Water transport		Fuel consumption	N2O	1,59E-04	tonne/tonne
II.4 Aviation		Fuel consumption	CH4	NE	tonne/tonne
II.4 Aviation		Fuel consumption	CO2	NE	tonne/tonne
II.4 Aviation		Fuel consumption	N2O	NE	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, fuel oil	CO2	3,17	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, fuel oil	CH4	0,431	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, fuel oil	N2O	0,0259	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, liquefied petroleum gas	CO2	3	tonne/tonne

I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, liquefied petroleum gas	CH4	0,2305	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, liquefied petroleum gas	N2O	0,0046	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, natural gas	CO2	1,99	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, natural gas	CH4	0,1775	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, natural gas	N2O	0,0036	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, kerosene	CO2	3,15	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, kerosene	CH4	0,431	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, kerosene	N2O	0,02586	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, pellets	CO2	-	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, pellets	CH4	0,1901	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, pellets	N2O	0,0691	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood waste	CO2	-	tonne/tonne

I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood waste	CH4	0,1788	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood waste	N2O	0,065	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, black liquor	CO2	-	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, black liquor	CH4	0,0216	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, black liquor	N2O	0,0144	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood briquettes	CO2	-	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood briquettes	CH4	0,1703	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood briquettes	N2O	0,0619	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, charcoal	CO2	-	tonne/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, charcoal	CH4	5,9	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, charcoal	N2O	0,12	kg/tonne
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood	CO2	1608 (not included)	g/kg

I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood	CH4	8,2	g/kg
I.2 Commercial and institutional buildings/facilities	Stationary combustion	Heating, wood	N2O	0,032	g/kg
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, fuel oil	CO2	3,17	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, fuel oil	CH4	0,431	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, fuel oil	N2O	0,0259	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, liquefied petroleum gas	CO2	3	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, liquefied petroleum gas	CH4	0,2305	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, liquefied petroleum gas	N2O	0,0046	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, natural gas	CO2	1,99	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, natural gas	CH4	0,1775	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, natural gas	N2O	0,0036	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, kerosene	CO2	3,15	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, kerosene	CH4	0,431	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, kerosene	N2O	0,02586	kg/tonne

I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, pellets	CO2	-	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, pellets	CH4	0,1901	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, pellets	N2O	0,0691	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood waste	CO2	-	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood waste	CH4	0,1788	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood waste	N2O	0,065	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, black liquor	CO2	-	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, black liquor	CH4	0,0216	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, black liquor	N2O	0,0144	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood briquettes	CO2	-	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood briquettes	CH4	0,1703	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood briquettes	N2O	0,0619	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, charcoal	CO2	-	tonne/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, charcoal	CH4	5,9	kg/tonne

I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, charcoal	N2O	0,12	kg/tonne
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood	CO2	1608 (not included)	g/kg
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood	CH4	8,2	g/kg
I.5 Agriculture, forestry, and fishing activities	Stationary combustion	Heating, wood	N2O	0,032	g/kg
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Gasoline	CO2	3,13	tonne CO2/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Gasoline	CH4	5,5	kg CH4/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Gasoline	N2O	0,07	kg N2O/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Bioethanol	CO2	0	tonne CO2/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Bioethanol	CH4	5,5	kg CH4/tonne
I.3 Manufacturing industries and construction	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Bioethanol	N2O	0,07	kg N2O/tonne
I.3 Manufacturing industries and construction		Biodiesel	CO2	0	tonne CO2/tonne
I.3 Manufacturing industries and construction		Biodiesel	CH4	0,17	kg CH4/tonne
I.3 Manufacturing industries and construction		Biodiesel	N2O	0,14	kg N2O/tonne

I.5 Agriculture, forestry, and fishing activities	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Light fuel oils	CO2	3,17	tonne CO2/tonne
I.5 Agriculture, forestry, and fishing activities	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Light fuel oils	CH4	0,17	kg CH4/tonne
I.5 Agriculture, forestry, and fishing activities	Off-road vehicles and other machinery, All off road vehicles and other machinery with diesel engine	Light fuel oils	N2O	0,13	kg N2O/tonne

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Oslo

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Table of contents

1 Introduction

Your text

Oslo's CCC builds directly on Oslo's existing processes of climate action, participation and multilevel governance that have been established over years, and that have been closely calibrated to fit the City's democratic and political processes. Note that the bulk of the Commitments document and the Action Plan were drafted in 2023. For updated numbers, please consult the latest climate budget available here.

The city has a long history of ambitious climate policies, supported by city governments from different sides of the political spectrum. In 2016 this ambition increased with the launch of the City's first Climate Budget. In 2020 the City's strong Climate Strategy was adopted with broad support from parties across the political spectrum.

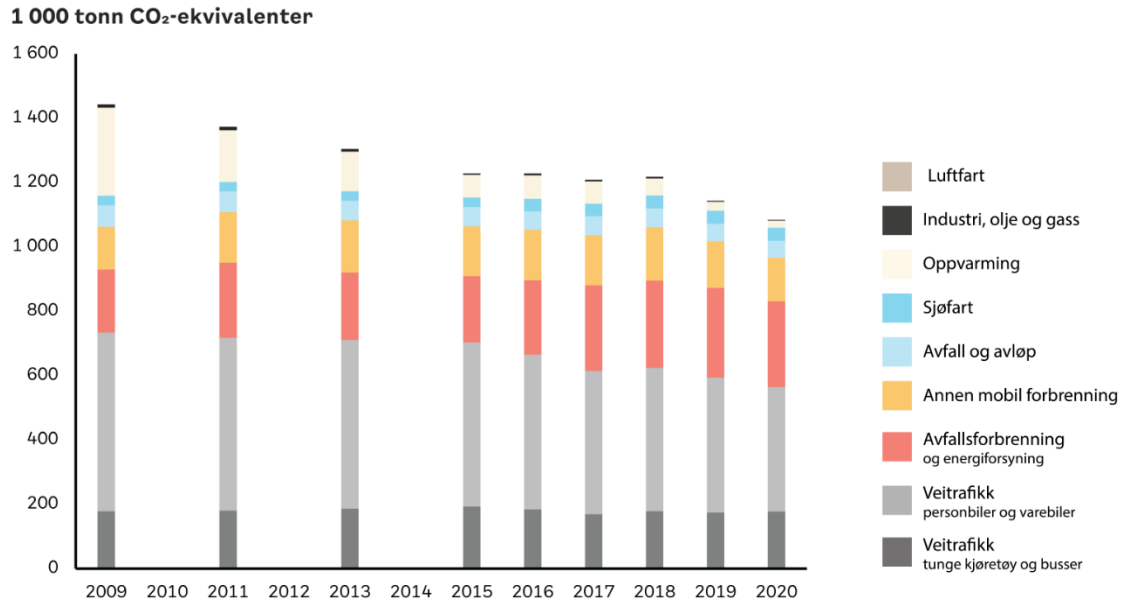
Oslo joined the EU Mission to deepen its collaboration with other European cities in the area of climate mitigation and adaptation, to gain knowledge of new climate solutions, and to share its own experience and locally defined solutions to emissions reductions. Oslo sees great value in international collaboration at the city level, and how such collaboration can disseminate solutions across borders. The city is eager to work through Net Zero Cities to escalate common City challenges to the EU policy level, and to collectively define new policy solutions. Oslo is dependent on regional and national government instruments to achieve its climate targets and also sees the EU Mission as an additional and important channel to strengthen these.

Oslo is deeply committed to a Net Zero future and aims to become a city virtually free from GHG emissions that is equipped to cope with the consequences of climate change. In the Climate Strategy for Oslo towards 2030, Oslo's City Government adopted five main targets- which form the foundation for Oslo's CCC commitments.

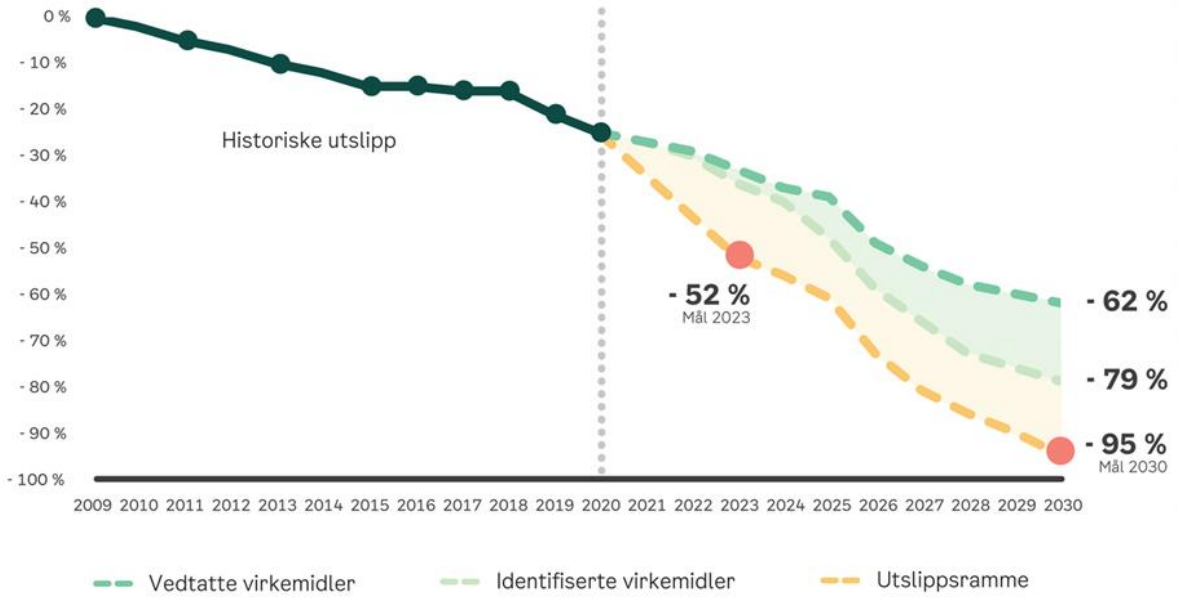
These five targets are:

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

Oslo's Climate Strategy forms the framework for its Climate City Contract. Additionally, Oslo has a well-established governance system for climate action, with the City's Climate Budget process at its core. The City's Climate Budget has proven to be highly effective in reducing emissions and advancing Oslo towards its carbon neutrality commitments. The strength and appeal of the Climate Budget as a governance tool is demonstrated by how the approach has been replicated and adapted by cities as diverse as London, New York City and Tshwane, with Mumbai recently announcing it will develop its own Climate Budget.



Through these locally developed governance tools, systematic participatory processes grounded in the City's democratic system, and with sustained political commitment over years, Oslo has achieved large emission cuts to date. The figure above shows how the city has substantially cut emissions related to heating and road traffic since 2009. As of 2023 Oslo was on track to reduce emissions by 62% by 2030 with regulations and measures that are already under implementation, and had identified regulation and measures that could take the city to a 79% emission cut, if approved by local and national authorities.



Oslo has mobilized a broad range of actors including citizens, the public and the private sector to support the City's climate transition and has developed its strategies and initiatives through inclusive processes across a wide range of actors and sectors. Additionally, the City invests strongly in global collaboration through global and EU initiatives such as CNCA, C40, The Covenant of Mayors, ICLEI, EU Big Buyers Initiative and others.

2 Goal: Climate neutrality by 2030

Your text
Oslo Cities Mission Expression of Interest (EoI) stated: '*The Climate Strategy for Oslo towards 2030 is a Paris Agreement-compatible climate action plan adopted City Council in May 2020. [The] Main target is a 95 % emissions reduction of direct emissions, additional targets include management of natural areas to sequester carbon in vegetation and soil, a 10% reduction in total energy consumption by 2030 compared with 2009, as well as a target of substantially lower indirect emissions. Indirect GHG emissions (scope 2) and out-of-boundary GHG emissions (scope 3) are not included all the while Oslo doesn't have an inventory of these emissions. The target to reduce emissions by 95 percent by 2030 thus covers only scope 1 emissions. Oslo does however have targets to reduce emissions from scope 2 and scope 3. Oslo considers the energy-mix as fossil-free.* ' See also the targets in Oslo's climate strategy referenced in section one above, and section three below. **Co-benefits** of Oslo's climate efforts are expected to be plentiful. Emissions reduction and climate change adaptation measures have already made the city more liveable and people friendly, in line with the City's vision of a greener, warmer, and more creative city- for everyone. Investments in bike-lanes, electrified and accessible public transport, nature-based solutions and charging infrastructure make people's lives better, while also having impact on emissions reduction and adaptation. Co- benefits of the climate transition, such as more green public spaces, cleaner air and waters, improved public health benefits, and better public transportation are already noticeable in the city, and are expected to continue to unfold. **The following text explains how Oslo is operationalising its climate commitments to meet the NZC ambition:** Oslo's GHG inventory shows that emissions in Oslo in 2020 were about 1.08 million tCO2eq. This is a decrease of 5.9% from 2019 and marks the lowest GHG emissions in the period from 2009-2020. Compared to 2009, GHG emissions in 2020 represent a decrease of 26%, while in the same period the population increased by 20%, from 575,475 to 693,494. This greenhouse gas inventory includes only direct emissions (scope 1) from Oslo's geographic area. The inventory includes all emissions from district heating which lies entirely within Oslo's geographic borders but does not include scope 2 emissions from electricity production. Oslo's 95% goal includes only scope 1 emissions. If this target is reached, then Oslo will have approximately 72 000 tonnes CO2eq residual emissions from scope 1 in 2030. However, the NetZero Cities goal includes both scope 2 emissions from electricity and scope 3 emissions from waste. The Climate Agency has quantified these emissions, which amounted to approximately 75 000 tonnes CO2eq in 2020. Construction of the carbon capture facility at Klemetsrud began in the summer of 2022 but has been put on hold due to cost increases in the project. The cost increases are largely related to higher energy and material costs, inflation, and changes in exchange rates. A decision on how to finance the increased costs between the owners, the municipality, and the state is expected to be presented in the summer of 2024. The earliest start of the facility is expected to be in the summer of 2027.Carbon capture will not only reduce fossil emissions by just under 165,000 tonnes but will also capture 170 000 tonnes of biogenic CO2, i.e., carbon from organic matter (such as wood, cardboard/paper and food waste). The carbon capture of biogenic CO2 at the waste facility at Klemetsrud can enable Oslo to become "carbon negative" by 2030, as stated in the vision established in the Climate Strategy. Oslo is not planning to use carbon offsets or carbon sequestration to reach the 95% goal. As part of the overall Climate Strategy, Oslo aims for a significant reduction in indirect emissions (emissions from outside the city geographic boundaries) by 2030. Consumption-based emissions (scope 3) are targeted at different levels through policies and measures. Oslo is developing an indicator set to better follow these emissions and is conducting a pilot on how to better embed these

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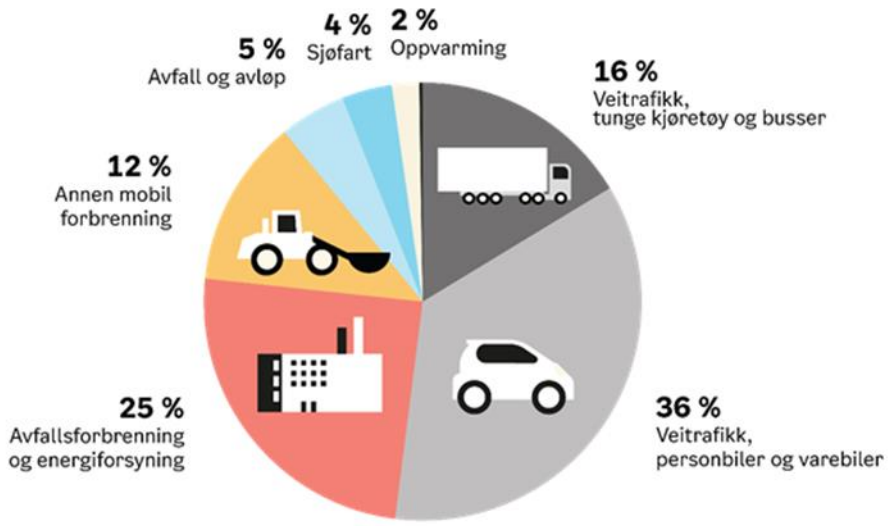
3 Strategic priorities

Your text

The Climate Strategy towards 2030 sets out the strategic priorities for the City's climate transition:

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

The Strategy is guided by data on the city's biggest emissions sources (2020), shown in the image below:



To tackle these emissions sources, the Climate Strategy features 16 target areas to cut GHG emissions, quoted from the strategy here:

1. Oslo shall ensure proper management of Marka recreational area [the forested areas surrounding Oslo] so that the carbon storage in the forest is protected, allowing nature to adapt to climate change and maintaining the important role played by Marka in preventing the consequences of climate change
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3. Walking, cycling and public transport shall be the primary choices for transport in Oslo. Car traffic shall be reduced by one third by 2030, compared with the level in 2015.
4. All private vehicles on Oslo's roads shall have zero emissions by 2030. Public transport shall have zero emissions by 2028.
5. All vans shall have zero emissions. All heavy-duty transport in Oslo shall have zero emissions or make use of sustainable, renewable fuel by 2030.
6. Port operations and transport on the fjord shall have close to zero emissions.
7. Building and construction work in Oslo shall be fossil-free, then zero emissions by 2030.
8. Oslo shall have a circular waste and sewage management system based on reuse, material recovery and energy recovery, which does not produce greenhouse gas emissions.
9. A larger share of energy production in Oslo shall be local, and various energy systems shall supplement and support each other.
10. Buildings in Oslo shall utilise electricity and heat efficiently and reduce energy consumption.
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12. The City of Oslo shall promote climate-friendly conduct among its citizens and businesses through communication, dialogue, training and collaboration.
13. The City of Oslo shall facilitate climate-friendly innovation and change via close collaboration between the City and its businesses, researchers, organisations and citizens.
14. The City of Oslo's climate governance system shall be further developed. Climate targets shall govern the City of Oslo's budgets, and the Climate Budget shall be incorporated into the City's annual budgets. All relevant decisions shall take into account emission reductions and climate change.
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4 Process and principles

The systematic process for achieving Oslo's climate targets is anchored in the City's annual Climate Budget-process. The Climate Budget provides a concrete timeline, monitorable targets, regular reporting, and an updated plan for stakeholder engagement, and is revised annually. The budget identifies and calculates the effect of concrete climate measures and assigns responsibility for cutting emissions across the city Government. Measures are proposed, adopted, implemented, monitored, and reported on in line with the budget cycle- ensuring a coordinated effort. The budget is managed by the city's finance department. A scientific knowledge base prepared before each budget cycle helps the city identify where to concentrate its efforts. The Climate Budget as such has monitoring, evaluation and learning already built into its process.

Therefore, while the NZC Climate Contract and Action Plan may be updated as necessary, it is this locally adapted and fine-tuned Climate Budget which in practice will serve as the Climate Action Plan

for the city. Examples of initiatives in support of the city's climate targets include how the city employs strategic green procurement to drive down emissions, is investing in innovation- including on emissions free construction sites and carbon capture and storage, is integrating climate requirements into the City's municipal Master Plan and has made climate assessments a requirement for all (relevant) cases that go in front of the City Council and City Government.

The principles of **multilevel governance, stakeholder engagement, and a fair transition** are integrated into Oslo's climate mitigation efforts. Some examples below (non-exhaustive)

Governance: Cross sectoral collaboration within Oslo is a critical part of how the city works to address emissions across City departments and entities, including through the Climate Budget. The City of Oslo is also working with other Municipalities and with central government to create more room for implementation of local climate mitigation measures, and to lobby for a strong level of ambition at the national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party with regard to new policy developments, and establishing clear expectations of national authorities. International cooperation also plays an important role in the City of Oslo's climate work. Such cooperation presents the municipality with an opportunity to bring about greater diversity in the solutions that are used to reach its climate goals. International cooperation is also important for developing global markets for emission-free technology. And, international cooperation is an opportunity for Oslo to contribute with solutions where Oslo is leading.

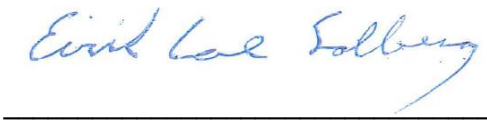
Stakeholder engagement: Oslo recognizes that in order to achieve the emission reduction targets set out in the Climate Strategy, the city's business community, researchers, non-governmental organisations and citizens must all take part in the transition. Openness and participation of citizens is integrated into Oslo's democratic system, including in the decision-making process for strategy development, and urban planning etc (i.e. through public hearings, public meetings etc). The climate strategy for instance, was developed through a consultative process, involving citizens, private sector, and NGOs, through workshops and a public hearing. The city has citizen councils as part of its formal City structure, and the Climate Agency is working with these to ensure a broad range of perspectives are heard in the City's climate work. The City's "Business for Climate" initiative is another example of stakeholder engagement where businesses and the municipality meet to discuss and define climate measures and solutions. Also, Oslo's team of young professionals known as "Climate Pilots" work with middle and high schools to engage with students on issues related to climate change and climate solutions.

Just transition: In addition to solid and comprehensive policies and initiatives that address issues of equality and workers rights (e.g. the Oslo model) the City is addressing just climate transition issues. For example the City works to ensure that grant schemes are available to the entire population, including low-income groups and both large and small businesses. The city has processes in place to ensure that distributional effects are assessed and that climate mitigation measures are formulated in support of a socially sustainable city which offers equal opportunities to all. The climate agency has also established a just climate transition team working on scaling up participatory approaches, and the City is engaged in a C40 project on just transition of the construction sector.

5 Contract with signatures

We, the undersigned, hereby commit to help make the City of Oslo climate neutral by 2030. We agree on the joint ambition and commitments, as formulated in the City of Oslo's Climate City Contract.

11 October, 2024



Eirik Lae Solberg
Governing Mayor
City of Oslo

Appendix I: Individual Signatory Commitments from the 'Business for Climate' initiative

All members of the 'Business for Climate' initiative have signed a climate contract (see link) stating active support of The City's climate goals.

The following businesses are members of the coalition (The list of members is continuously updated online):

1. 6CST
2. Accenture
3. Advokatfirmaet Wenger
4. AF Eiendom
5. Anemo
6. Architectopia
7. Asko Norge
8. AspelinRamm
9. AsplanViak
10. Atea
11. Atkins Norge AS
12. Bama
13. Bane Nor Eiendom
14. Bergans
15. Bergfald Miljørådgivere
16. BI Handelshøyskolen
17. Bike-Fixx
18. Braathen Landskapsentreprenør
19. Bolt
20. Bravida
21. ByBi
22. Bytjenester
23. Capra Consulting
24. Cargotron
25. Cityhubs
26. Civitas
27. Codex Advokat
28. Color Line
29. Dachser Norway
30. DB Schenker AS
31. Diakonhjemmet
32. DNB Næringseiendom
33. DNV GL
34. Døgnvill Burger
35. Ecocube
36. ECOHZ
37. Elektroforeningen (EFO)
38. Endrava
39. Energi Salg Norge AS
40. Enerhaugen Arkitektkontor
41. Entra ASA
42. Evo El-Sykler AS
43. Factlines
44. Fremtind
45. Finans Norge
46. Flytoget
47. Frævleik
48. Futurebuilt
49. Grape Arkitekter
50. Green Energy
51. Greener Events
52. Grundfos
53. Gruten
54. Hafslund E-CO
55. Hertz
56. IF
57. IKT Norge
58. IKEA
59. Isokalk
60. ISS
61. It's Tomorrow
62. Kinver
63. Kiwa
64. KLP
65. Knowit
66. Kompa
67. KS Agenda
68. Lala Tøyen
69. Link Arkitektur
70. MAN
71. Medarbeiderne
72. Merida Norge
73. Mixmove
74. Nydalen Fabrikker (Modul AS)

75. Multiconsult
76. Mustad Eiendom
77. NCC
78. Nelfo
79. NHO Logistikk og Transport
80. NHO Viken Oslo
81. NHO Transport
82. Nokas verdihåndtering
83. Norbetong
84. Nordea
85. Nordr Eienom
86. Norges bilbransjeforbund
87. Norges Taxi
88. Norsk Gjenvinning
89. Norsk Hydrogenforum
90. Norsk sertifisering
91. NRC Group Norge
92. NSW
93. Oda
94. Olav Thon Gruppen
95. Oslobuss
96. Oslobygg KF
97. OsloMet
98. Oslo Elektriske
99. Oslo Handelsstands Forening
100. Oslo Havn
101. Posten
102. Postnord
103. Pure Consulting
104. R. Bergersen Sikkerhet og Design
105. Ragn-Sells
106. Rejlers
107. Rodeo Arkitekter
108. Ruter
109. Ryde
110. Schibsted
111. Schneider-Electric
112. Selvaag Bolig
113. Selvaag Eiendom
114. Siemens
115. SINTEF
116. Skanska
117. Sopra Steria
118. Sporveien
119. STACK EMEA
120. Stiftelsen Miljøfyrtårn
121. Storebrand
122. Storespeed
123. Studentsamskipnaden i Oslo SiO
124. Svanemerket
125. Sweco
126. Telenor
127. Tellmann Executive Advisors
128. Toyota
129. Transport-Formidlingen
130. UIP Drift
131. Unibuss
132. Unicon
133. Universitetet i Oslo
134. Virke
135. Voi
136. Vollebekk fabrikker
137. Vy
138. WSP Norge
139. Øyafestivalen

Appendix II: National support letter

Please find attached a letter from the Norwegian Ministry of Local Government and Regional Development in support of Oslo, Stavanger and Trondheim's climate neutrality ambitions.

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Oslo

NetZeroCities has received funding from the H2020 Research and Innovation Programme under the grant agreement n°101036519.

Disclaimer

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

Table of contents

1 Introduction

Your text

Oslo's CCC builds directly on Oslo's existing processes of climate action, participation and multilevel governance that have been established over years, and that have been closely calibrated to fit the City's democratic and political processes. Note that the bulk of the Commitments document and the Action Plan were drafted in 2023. For updated numbers, please consult the latest climate budget available here.

The city has a long history of ambitious climate policies, supported by city governments from different sides of the political spectrum. In 2016 this ambition increased with the launch of the City's first Climate Budget. In 2020 the City's strong Climate Strategy was adopted with broad support from parties across the political spectrum.

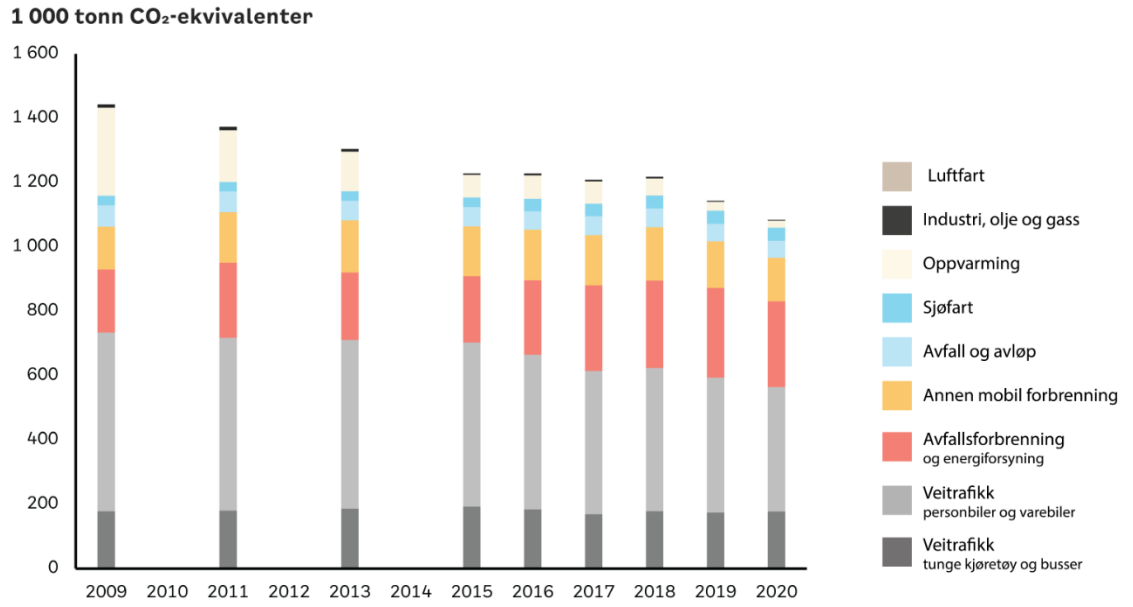
Oslo joined the EU Mission to deepen its collaboration with other European cities in the area of climate mitigation and adaptation, to gain knowledge of new climate solutions, and to share its own experience and locally defined solutions to emissions reductions. Oslo sees great value in international collaboration at the city level, and how such collaboration can disseminate solutions across borders. The city is eager to work through Net Zero Cities to escalate common City challenges to the EU policy level, and to collectively define new policy solutions. Oslo is dependent on regional and national government instruments to achieve its climate targets and also sees the EU Mission as an additional and important channel to strengthen these.

Oslo is deeply committed to a Net Zero future and aims to become a city virtually free from GHG emissions that is equipped to cope with the consequences of climate change. In the Climate Strategy for Oslo towards 2030, Oslo's City Government adopted five main targets- which form the foundation for Oslo's CCC commitments.

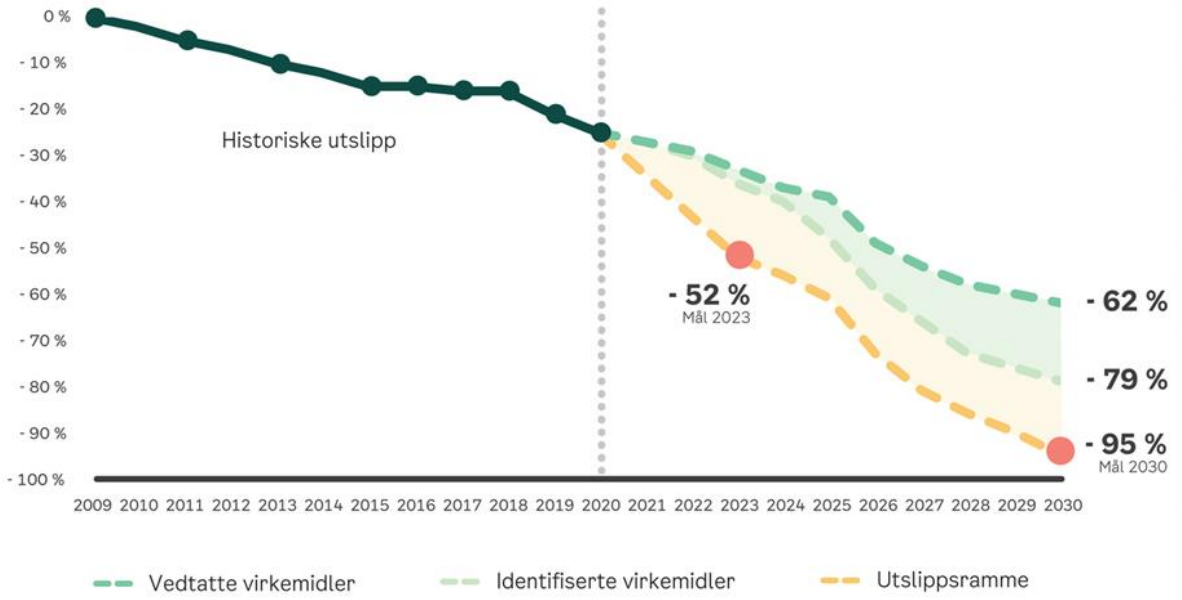
These five targets are:

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

Oslo's Climate Strategy forms the framework for its Climate City Contract. Additionally, Oslo has a well-established governance system for climate action, with the City's Climate Budget process at its core. The City's Climate Budget has proven to be highly effective in reducing emissions and advancing Oslo towards its carbon neutrality commitments. The strength and appeal of the Climate Budget as a governance tool is demonstrated by how the approach has been replicated and adapted by cities as diverse as London, New York City and Tshwane, with Mumbai recently announcing it will develop its own Climate Budget.



Through these locally developed governance tools, systematic participatory processes grounded in the City's democratic system, and with sustained political commitment over years, Oslo has achieved large emission cuts to date. The figure above shows how the city has substantially cut emissions related to heating and road traffic since 2009. As of 2023 Oslo was on track to reduce emissions by 62% by 2030 with regulations and measures that are already under implementation, and had identified regulation and measures that could take the city to a 79% emission cut, if approved by local and national authorities.



Oslo has mobilized a broad range of actors including citizens, the public and the private sector to support the City's climate transition and has developed its strategies and initiatives through inclusive processes across a wide range of actors and sectors. Additionally, the City invests strongly in global collaboration through global and EU initiatives such as CNCA, C40, The Covenant of Mayors, ICLEI, EU Big Buyers Initiative and others.

2 Goal: Climate neutrality by 2030

Your text
Oslo Cities Mission Expression of Interest (EoI) stated: '*The Climate Strategy for Oslo towards 2030 is a Paris Agreement-compatible climate action plan adopted City Council in May 2020. [The] Main target is a 95 % emissions reduction of direct emissions, additional targets include management of natural areas to sequester carbon in vegetation and soil, a 10% reduction in total energy consumption by 2030 compared with 2009, as well as a target of substantially lower indirect emissions. Indirect GHG emissions (scope 2) and out-of-boundary GHG emissions (scope 3) are not included all the while Oslo doesn't have an inventory of these emissions. The target to reduce emissions by 95 percent by 2030 thus covers only scope 1 emissions. Oslo does however have targets to reduce emissions from scope 2 and scope 3. Oslo considers the energy-mix as fossil-free.* ' See also the targets in Oslo's climate strategy referenced in section one above, and section three below. **Co-benefits** of Oslo's climate efforts are expected to be plentiful. Emissions reduction and climate change adaptation measures have already made the city more liveable and people friendly, in line with the City's vision of a greener, warmer, and more creative city- for everyone. Investments in bike-lanes, electrified and accessible public transport, nature-based solutions and charging infrastructure make people's lives better, while also having impact on emissions reduction and adaptation. Co- benefits of the climate transition, such as more green public spaces, cleaner air and waters, improved public health benefits, and better public transportation are already noticeable in the city, and are expected to continue to unfold. **The following text explains how Oslo is operationalising its climate commitments to meet the NZC ambition:** Oslo's GHG inventory shows that emissions in Oslo in 2020 were about 1.08 million tCO2eq. This is a decrease of 5.9% from 2019 and marks the lowest GHG emissions in the period from 2009-2020. Compared to 2009, GHG emissions in 2020 represent a decrease of 26%, while in the same period the population increased by 20%, from 575,475 to 693,494. This greenhouse gas inventory includes only direct emissions (scope 1) from Oslo's geographic area. The inventory includes all emissions from district heating which lies entirely within Oslo's geographic borders but does not include scope 2 emissions from electricity production. Oslo's 95% goal includes only scope 1 emissions. If this target is reached, then Oslo will have approximately 72 000 tonnes CO2eq residual emissions from scope 1 in 2030. However, the NetZero Cities goal includes both scope 2 emissions from electricity and scope 3 emissions from waste. The Climate Agency has quantified these emissions, which amounted to approximately 75 000 tonnes CO2eq in 2020. Construction of the carbon capture facility at Klemetsrud began in the summer of 2022 but has been put on hold due to cost increases in the project. The cost increases are largely related to higher energy and material costs, inflation, and changes in exchange rates. A decision on how to finance the increased costs between the owners, the municipality, and the state is expected to be presented in the summer of 2024. The earliest start of the facility is expected to be in the summer of 2027.Carbon capture will not only reduce fossil emissions by just under 165,000 tonnes but will also capture 170 000 tonnes of biogenic CO2, i.e., carbon from organic matter (such as wood, cardboard/paper and food waste). The carbon capture of biogenic CO2 at the waste facility at Klemetsrud can enable Oslo to become "carbon negative" by 2030, as stated in the vision established in the Climate Strategy. Oslo is not planning to use carbon offsets or carbon sequestration to reach the 95% goal. As part of the overall Climate Strategy, Oslo aims for a significant reduction in indirect emissions (emissions from outside the city geographic boundaries) by 2030. Consumption-based emissions (scope 3) are targeted at different levels through policies and measures. Oslo is developing an indicator set to better follow these emissions and is conducting a pilot on how to better embed these

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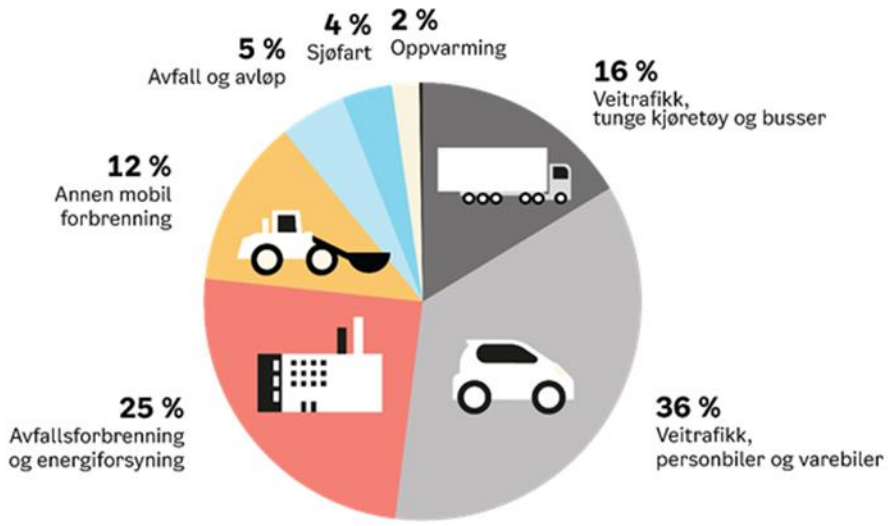

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Governance: Cross sectoral collaboration within Oslo is a critical part of how the city works to address emissions across City departments and entities, including through the Climate Budget. The City of Oslo is also working with other Municipalities and with central government to create more room for implementation of local climate mitigation measures, and to lobby for a strong level of ambition at the national level. In this context, Oslo is participating in collaborative projects with central government, acting as a consultative party with regard to new policy developments, and establishing clear expectations of national authorities. International cooperation also plays an important role in the City of Oslo's climate work. Such cooperation presents the municipality with an opportunity to bring about greater diversity in the solutions that are used to reach its climate goals. International cooperation is also important for developing global markets for emission-free technology. And, international cooperation is an opportunity for Oslo to contribute with solutions where Oslo is leading.

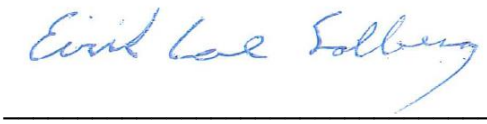
Stakeholder engagement: Oslo recognizes that in order to achieve the emission reduction targets set out in the Climate Strategy, the city's business community, researchers, non-governmental organisations and citizens must all take part in the transition. Openness and participation of citizens is integrated into Oslo's democratic system, including in the decision-making process for strategy development, and urban planning etc (i.e. through public hearings, public meetings etc). The climate strategy for instance, was developed through a consultative process, involving citizens, private sector, and NGOs, through workshops and a public hearing. The city has citizen councils as part of its formal City structure, and the Climate Agency is working with these to ensure a broad range of perspectives are heard in the City's climate work. The City's "Business for Climate" initiative is another example of stakeholder engagement where businesses and the municipality meet to discuss and define climate measures and solutions. Also, Oslo's team of young professionals known as "Climate Pilots" work with middle and high schools to engage with students on issues related to climate change and climate solutions.

Just transition: In addition to solid and comprehensive policies and initiatives that address issues of equality and workers rights (e.g. the Oslo model) the City is addressing just climate transition issues. For example the City works to ensure that grant schemes are available to the entire population, including low-income groups and both large and small businesses. The city has processes in place to ensure that distributional effects are assessed and that climate mitigation measures are formulated in support of a socially sustainable city which offers equal opportunities to all. The climate agency has also established a just climate transition team working on scaling up participatory approaches, and the City is engaged in a C40 project on just transition of the construction sector.

5 Contract with signatures

We, the undersigned, hereby commit to help make the City of Oslo climate neutral by 2030. We agree on the joint ambition and commitments, as formulated in the City of Oslo's Climate City Contract.

11 October, 2024



Eirik Lae Solberg
Governing Mayor
City of Oslo

Appendix I: Individual Signatory Commitments from the 'Business for Climate' initiative

All members of the 'Business for Climate' initiative have signed a climate contract (see link) stating active support of The City's climate goals.

The following businesses are members of the coalition (The list of members is continuously updated online):

1. 6CST
2. Accenture
3. Advokatfirmaet Wenger
4. AF Eiendom
5. Anemo
6. Architectopia
7. Asko Norge
8. AspelinRamm
9. AsplanViak
10. Atea
11. Atkins Norge AS
12. Bama
13. Bane Nor Eiendom
14. Bergans
15. Bergfald Miljørådgivere
16. BI Handelshøyskolen
17. Bike-Fixx
18. Braathen Landskapsentreprenør
19. Bolt
20. Bravida
21. ByBi
22. Bytjenester
23. Capra Consulting
24. Cargotron
25. Cityhubs
26. Civitas
27. Codex Advokat
28. Color Line
29. Dachser Norway
30. DB Schenker AS
31. Diakonhjemmet
32. DNB Næringseiendom
33. DNV GL
34. Døgnvill Burger
35. Ecocube
36. ECOHZ
37. Elektroforeningen (EFO)
38. Endrava
39. Energi Salg Norge AS
40. Enerhaugen Arkitektkontor
41. Entra ASA
42. Evo El-Sykler AS
43. Factlines
44. Fremtind
45. Finans Norge
46. Flytoget
47. Frævleik
48. Futurebuilt
49. Grape Arkitekter
50. Green Energy
51. Greener Events
52. Grundfos
53. Gruten
54. Hafslund E-CO
55. Hertz
56. IF
57. IKT Norge
58. IKEA
59. Isokalk
60. ISS
61. It's Tomorrow
62. Kinver
63. Kiwa
64. KLP
65. Knowit
66. Kompa
67. KS Agenda
68. Lala Tøyen
69. Link Arkitektur
70. MAN
71. Medarbeiderne
72. Merida Norge
73. Mixmove
74. Nydalen Fabrikker (Modul AS)

75. Multiconsult
76. Mustad Eiendom
77. NCC
78. Nelfo
79. NHO Logistikk og Transport
80. NHO Viken Oslo
81. NHO Transport
82. Nokas verdihåndtering
83. Norbetong
84. Nordea
85. Nordr Eienom
86. Norges bilbransjeforbund
87. Norges Taxi
88. Norsk Gjenvinning
89. Norsk Hydrogenforum
90. Norsk sertifisering
91. NRC Group Norge
92. NSW
93. Oda
94. Olav Thon Gruppen
95. Oslobuss
96. Oslobygg KF
97. OsloMet
98. Oslo Elektriske
99. Oslo Handelsstands Forening
100. Oslo Havn
101. Posten
102. Postnord
103. Pure Consulting
104. R. Bergersen Sikkerhet og Design
105. Ragn-Sells
106. Rejlers
107. Rodeo Arkitekter
108. Ruter
109. Ryde
110. Schibsted
111. Schneider-Electric
112. Selvaag Bolig
113. Selvaag Eiendom
114. Siemens
115. SINTEF
116. Skanska
117. Sopra Steria
118. Sporveien
119. STACK EMEA
120. Stiftelsen Miljøfyrtårn
121. Storebrand
122. Storespeed
123. Studentsamskipnaden i Oslo SiO
124. Svanemerket
125. Sweco
126. Telenor
127. Tellmann Executive Advisors
128. Toyota
129. Transport-Formidlingen
130. UIP Drift
131. Unibuss
132. Unicon
133. Universitetet i Oslo
134. Virke
135. Voi
136. Vollebekk fabrikker
137. Vy
138. WSP Norge
139. Øyafestivalen