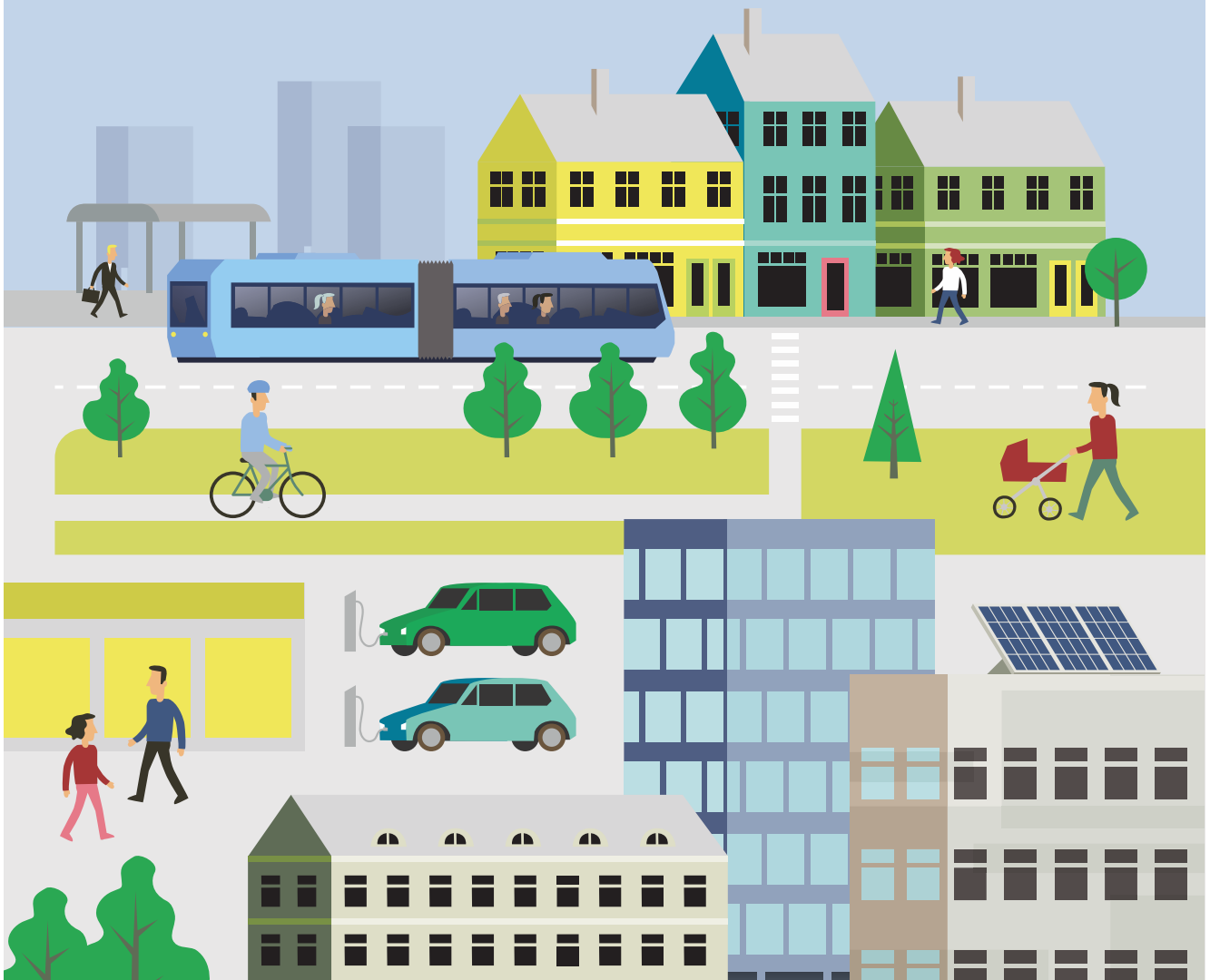




Oslo kommune

# Climate and Energy Strategy for Oslo

Adopted by the City Council in Oslo 22.06.2016 (Proposition 195/16)



## Introduction



Being a city rich in resources, in a country with abundant access to renewable energy, gives Oslo a unique position, with the potential for developing innovative solutions and be a leading city internationally. Our unique position comes with a responsibility – one we should and will embrace.



# Preface

Oslo will cut greenhouse gas emissions in half by 2020. That's good news for the climate and for everyone who lives and works in the city.

The climate target gives us an opportunity to make Oslo an even better and more modern city. It involves more than Oslo taking the lead in climate action.

It's about making the city better – for everyone. That's why we are not talking only about green transformation. We're talking about upgrading the city – the capital becoming a new and better version of itself.

To get where we want to, we need close cooperation between the municipality, residents, the business community, organisations, academia, the state and other public enterprises. The green transformation will not only reduce greenhouse gas emissions. The air will become cleaner, public transport will become even better, it will be easier to ride your bicycle, there will be more green and car-free spaces in the city and street life will become more vibrant. The climate measures will increase quality of life, make for a thriving business community and give us better public health.

In December 2015, a new global climate agreement was adopted at the Climate Change Conference in Paris. The parties agreed to limit global warming to a maximum of two degrees, and an make an effort to keep the temperature increase under 1.5 degrees.

Currently, about half the planet's population lives in cities, and the urbanization trend will continue in the future. Climate and environmentally friendly urban development will therefore determine whether we reach the target or not. Being a city rich in resources, in a country with abundant access to renewable energy, gives Oslo

a unique position, with the potential for developing innovative solutions and be a leading city internationally. Our unique position comes with a responsibility – one we should and will embrace.

The City has developed and adopted the Oslo Climate and Energy Strategy, which is in accordance with the Paris Agreement. The target is to reduce the city's CO2 emissions by 50 per cent by 2020 and by 95 per cent by 2030, compared to the 1990 level.

The Strategy shows how we will implement the green transformation. Many of the measures are pioneering work, and Oslo's progress is closely followed by many other cities. We are developing new forms of interaction and governance, and we are initiating the development of new technology. We will contribute to green growth in the business sector in Oslo.

The investments we are currently making in infrastructure, smart energy systems, transport solutions and buildings will be with us for many decades. It is therefore essential that we make the right, zero-emissions choices. Many people want to contribute and many are already doing so through measures in the public sector and initiatives in the business community and at home. The City will provide strong incentives for increasing commitment in all sectors of the city.

This strategy involves developing a climate-friendly city, a city that is liveable. The changes we must undergo to avoid dramatic climate change give us a golden opportunity to create the liveable city.

**Let's upgrade Oslo together!**



*Lan Marie Nguyen Berg*

Lan Marie Nguyen Berg,  
Vice Mayor for Environment  
and Transport

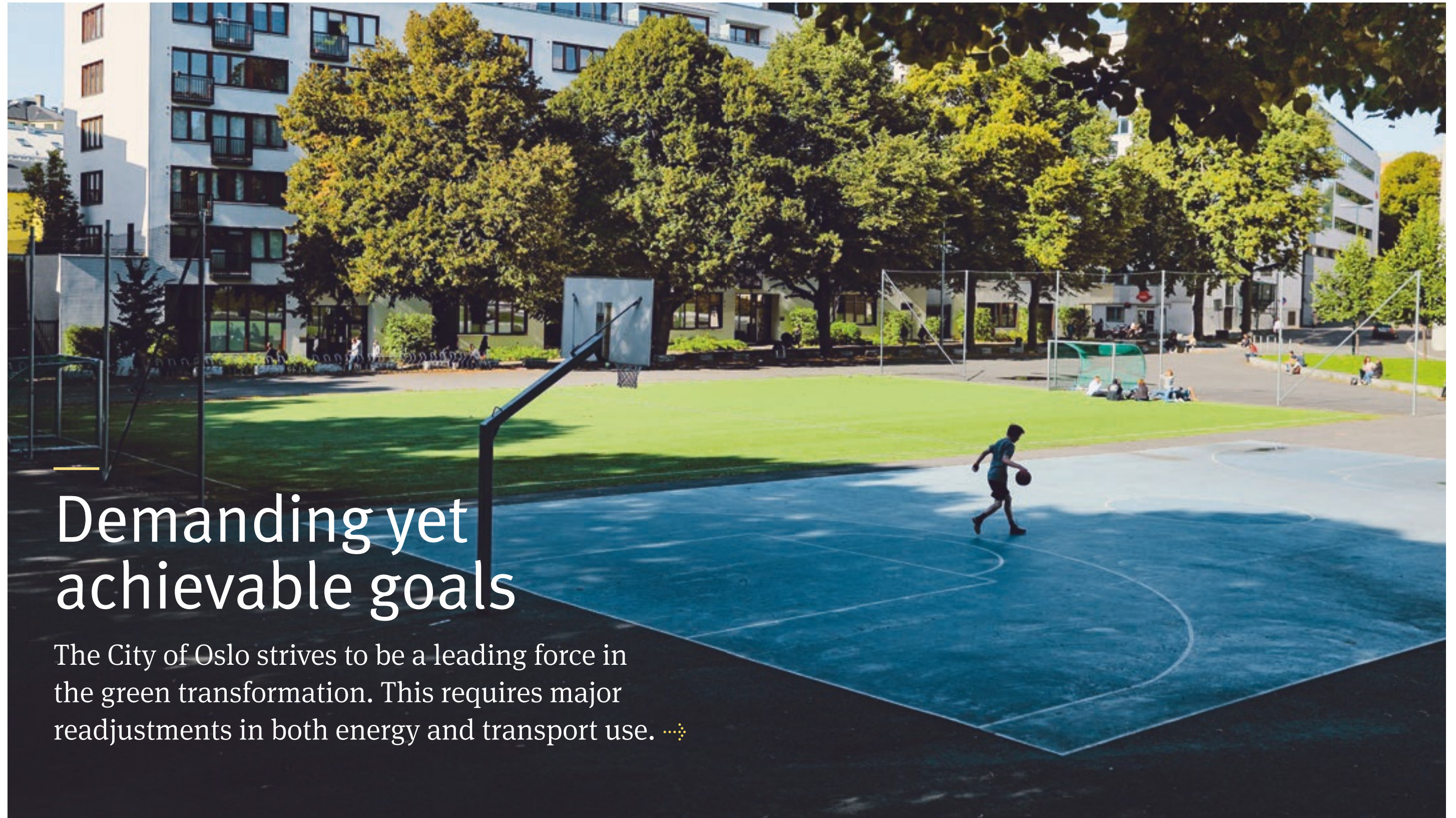


*Raymond Johansen*

Raymond Johansen,  
Governing Mayor

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# Demanding yet achievable goals

The City of Oslo strives to be a leading force in the green transformation. This requires major readjustments in both energy and transport use. ❖❖

Status and strategy

To create a society without greenhouse gas emissions, we must convert from using fossil energy to using renewable energy. Greenhouse gas emissions in Oslo have increased by 25 per cent since 1990. Reversing this trend and starting to cut emissions will be challenging. However, the analysis upon which this strategy was built indicate that the targets are achievable, provided that we implement strong measures now.

The future state of Oslo is a climate-friendly city. The Climate and Energy Strategy describes how we can achieve our climate targets, while developing and upgrading an urban community in which people and commerce thrive.

**Strategic roadmap**

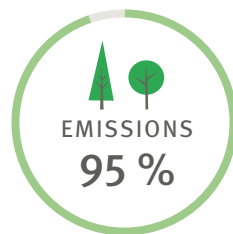
The Climate and Energy Strategy aligns with the City of Oslo's Municipal Master Plan "Oslo towards 2030: Smart, safe and green". This master plan is the municipal government's overarching strategy for future development in the city. The Climate and Energy Strategy is a roadmap outlining how the green shift should be implemented in order to achieve Oslo's climate targets for 2020 and 2030. It was adopted by the City Council on 22 June 2016.

The strategy shows how we will take a clear stand in the transport sector, wherein pedestrians, cyclists and public transport users will be prioritised and where we aim to reduce car traffic by 20 per cent by 2020 and by 33 per cent by 2030. The Climate effort will be organized more clearly, and will be a cross-sectoral task for the City of Oslo.

**The targets of the Climate and Energy Strategy for Oslo:**



To reduce greenhouse gas emissions by 50 per cent by 2020



and by 95 per cent by 2030.

**A thorough strategic process**

In formulating the Climate and Energy Strategy for Oslo, it was important to develop a multidisciplinary and cross-sectoral picture of potential ways to implement the green shift.

The Climate and Energy Strategy has been developed in dialogue with and involvement of 40 organisations from the City of Oslo, the business community and state-owned enterprises. This involvement process has mainly been undertaken in five sector groups: Transport, Energy, Buildings, Resource Utilisation and Cross-Sectoral Energy Issues.

The Norwegian Institute for Energy Technology and Oslo Renewable Energy and Environment Cluster have contributed with technical advice and modelling tools (TIMES NORWAY) for the strategy development. An important element of the work involved identifying expected changes in technology and framework conditions.

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Status and strategy

# Greenhouse gas emissions in Oslo

**Oslo has made significant progress in a number of areas.** Greenhouse gas emissions per capita are falling, and the number of people travelling by public transport, cycle and on foot is rising – at the expense of car traffic. Oslo has the world's highest proportion of electric cars and is a city defined by its proximity to green spaces, open areas and the Oslo fjord. We have a cycle-based waste management system where waste is converted to useful products and we have an expanding green commercial sector. While we have much to be proud of, there lies significant challenges ahead to achieve our zero-emissions vision.

In 2013, CO<sub>2</sub> emissions were approximately 1,400,000 tonnes. To achieve the target of a 50 per cent reduction by 2020 from 1990 levels, we will have to cut CO<sub>2</sub> emissions with about 800,000 tonnes.

19%




A total of **19 per cent** of the city's emissions derive from the treatment of sewage and waste. Carbon capture and storage of emissions from Oslo's largest waste-to-energy plant at Klemetsrud could make a substantial difference in this context.

17%



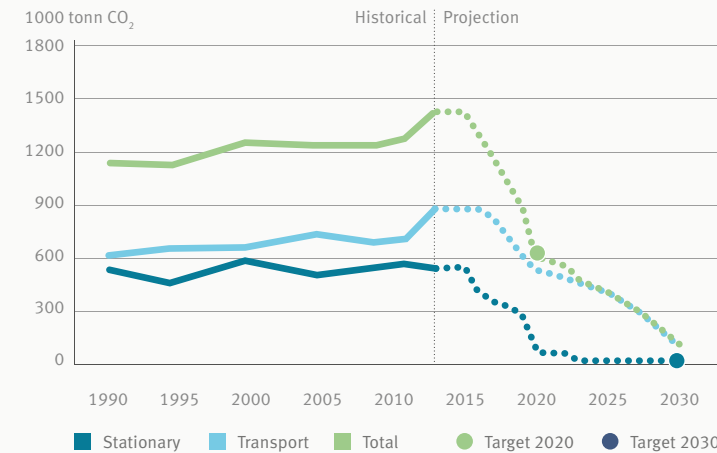
The use of fossil heating oil in buildings accounts for **17 per cent** of the emissions. The goal is to fully phase out these emissions by 2020.

61%



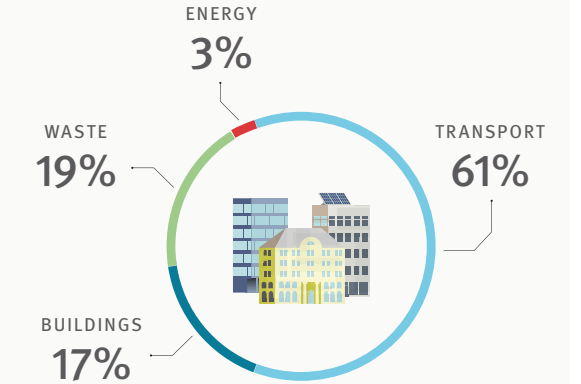
**61 per cent** of the emissions in Oslo derive from transport, of which around half are attributable to the transport of people, and half to goods transport and construction activities. The transport sectors will require the most determined efforts moving forward.

Historical and projected emissions curve 1990–2030



Source: Statistics Norway, 2013.

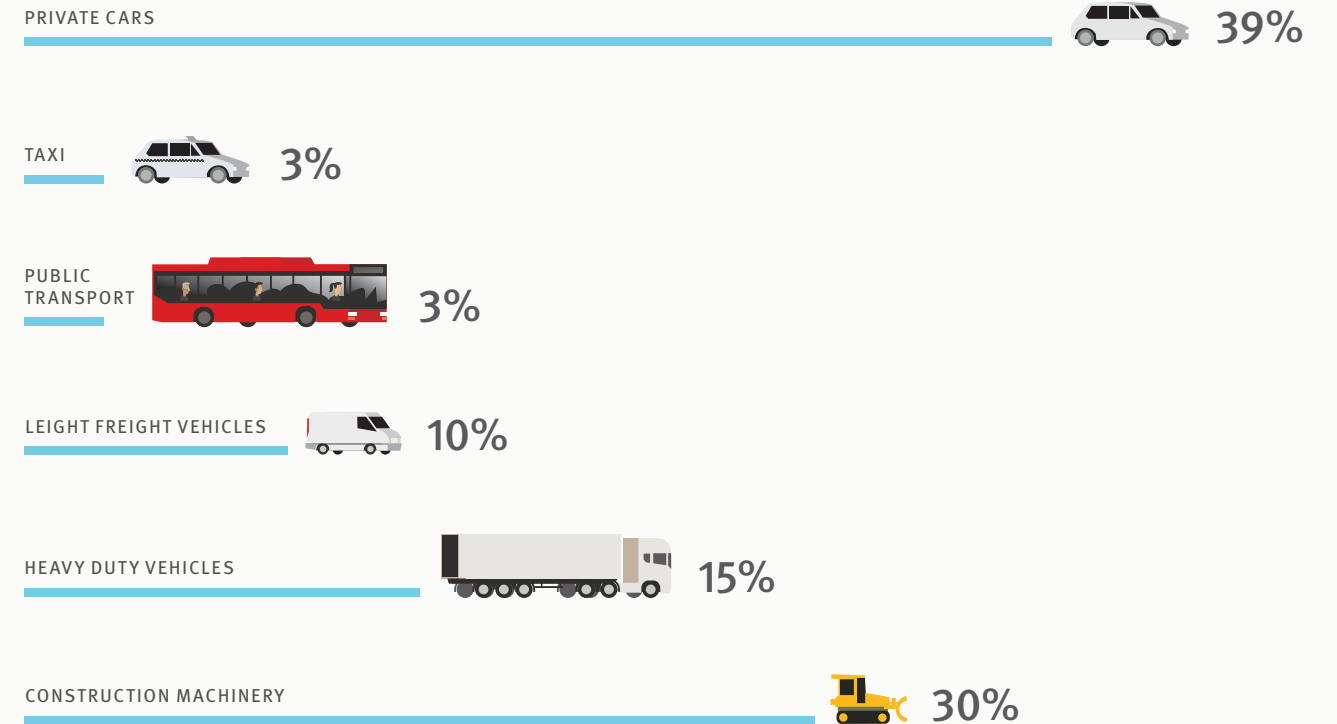
Main sources of greenhouse gas emissions in Oslo



Source: Statistics Norway combined with The City of Oslo's own numbers, 2013.

## Distribution of emissions from transport

Source: Statistics Norway combined with The City of Oslo's own numbers, 2013.



## The 16 initiatives in the Climate and Energy Strategy

**1** To reach the goal of reducing all car traffic by 20 % during the council period, and one-third by 2030, the proportion of passenger transport covered by public transport, cycling and walking must be increased considerably while demand for transport must be reduced. These considerations shall be cornerstones for land use planning, transport planning and infrastructure investments.

**2** Densification and development of the city shall occur along the railway, tram and metro networks as well as public transport nodes to ensure sustainable modes of transport.

**3** Public transport shall only use renewable fuels by 2020.

**4** The percentage of daily travels by bike shall be increased to 16 % by 2020 and 25 % by 2025.

**5** The City of Oslo shall facilitate a city logistics system where traffic demand is reduced, and where all new cars and light freight vehicles in Oslo shall use renewable fuels or be plug-in hybrids from 2020.

**6** The City of Oslo shall facilitate required changes so that at least 20 % of heavy duty vehicles in Oslo shall use renewable fuels by 2020. Furthermore, all heavy duty vehicles and construction machinery shall be able to use renewable fuels by 2030.

**7** The City of Oslo will work with national authorities and transport industry to transfer as much as possible of the freight by heavy duty vehicles over to rail and sea.

**8** Shore power and other environmental measures shall reduce emissions from port activities in Oslo with at least 50 % by 2030.

**9** The use of fossil fuels for heating shall be phased out in Oslo in 2020 and replaced by renewable sources of energy for heating.

**10** The city of Oslo shall work to reduce energy consumption in buildings by 1.5 TWh by 2020. This reduction will be achieved through national and local measures.

**11** An overall plan for using water as an energy carrier, comprising both heating and cooling, shall be established for Oslo within 2020

**12** The City of Oslo shall have a regional perspective in its long-term plans for treatment of waste and wastewater and strive to achieve zero discharge from energy recovery from residual waste by increasing recycling. Efforts to reduce consumption is important in this area.

**13** The City of Oslo will strengthen the strategic climate work by integrating climate budgets in the municipal budget process.

**14** The City of Oslo will undertake eco-efficient procurement and set specific climate requirements for businesses owned by the City of Oslo.

**15** Oslo shall work closely with citizens, businesses, knowledge institutions, organizations and other public authorities to develop and implement good climate solutions.

**16** The City of Oslo will take the lead and execute flagship projects that may trigger significant emission reductions in the future.

# Reducing emissions and improving quality of life

**The transport sector** accounts for 61 per cent of Oslo's greenhouse gas emissions. The large proportion and complex emission profile makes it imperative to implement measures to reduce greenhouse gas emissions without delay. ❖





## Urban development and mobility



The City of Oslo aims to gradually phase out fossil fuel-based vehicles by 2030 and replace these with zero-emissions vehicles.

**T**hese measures will increase availability and capacity for cyclists and public transport users, and thus actively facilitate more environmentally friendly transport. These measures also play an important role in improving air quality, building more green, car-free urban spaces and invigorating street life.

#### Urban development through public transport hubs

Land use and transport planning must enable reduced transport needs for people and goods. Strong population growth makes it important to develop the city around its public transport hubs, along metro and train lines. This is in accordance with the provisions of the Municipal Master Plan, to develop a city in which residents become less dependent on their cars.

To strengthen this effort, the City of Oslo will prioritise major public transport projects. These include a new central tunnel, a tram line along Ring 2 (second ring road) and significant expansion of the network of bicycle paths. Close collaboration with the Akershus County and the state to secure financing for these projects will be a critical success factor.

#### Cycling in the city

The City of Oslo will considerably increase its efforts to make cycling attractive. By 2025, the city aims to have 25 per cent of daily journeys by bike. Construction of dedicated cycle paths in the inner city will be prioritised, and the rate of construction will be accelerated.

Operation and maintenance of the cycle network has already been markedly stepped up in order to make it safe and attractive to cycle all year round. In accordance with the National Transport Plan, the City of Oslo will also facilitate pedestrian growth by making it more attractive to walk.

#### Cutting emissions from transport

Reducing car traffic will be essential to make room for cycle paths and to alleviate congestion that prevents the flow of public transport. The target is to reduce car transport in Oslo by 20 per cent by 2020 and 33 per cent by 2030 compared to 2015 levels.

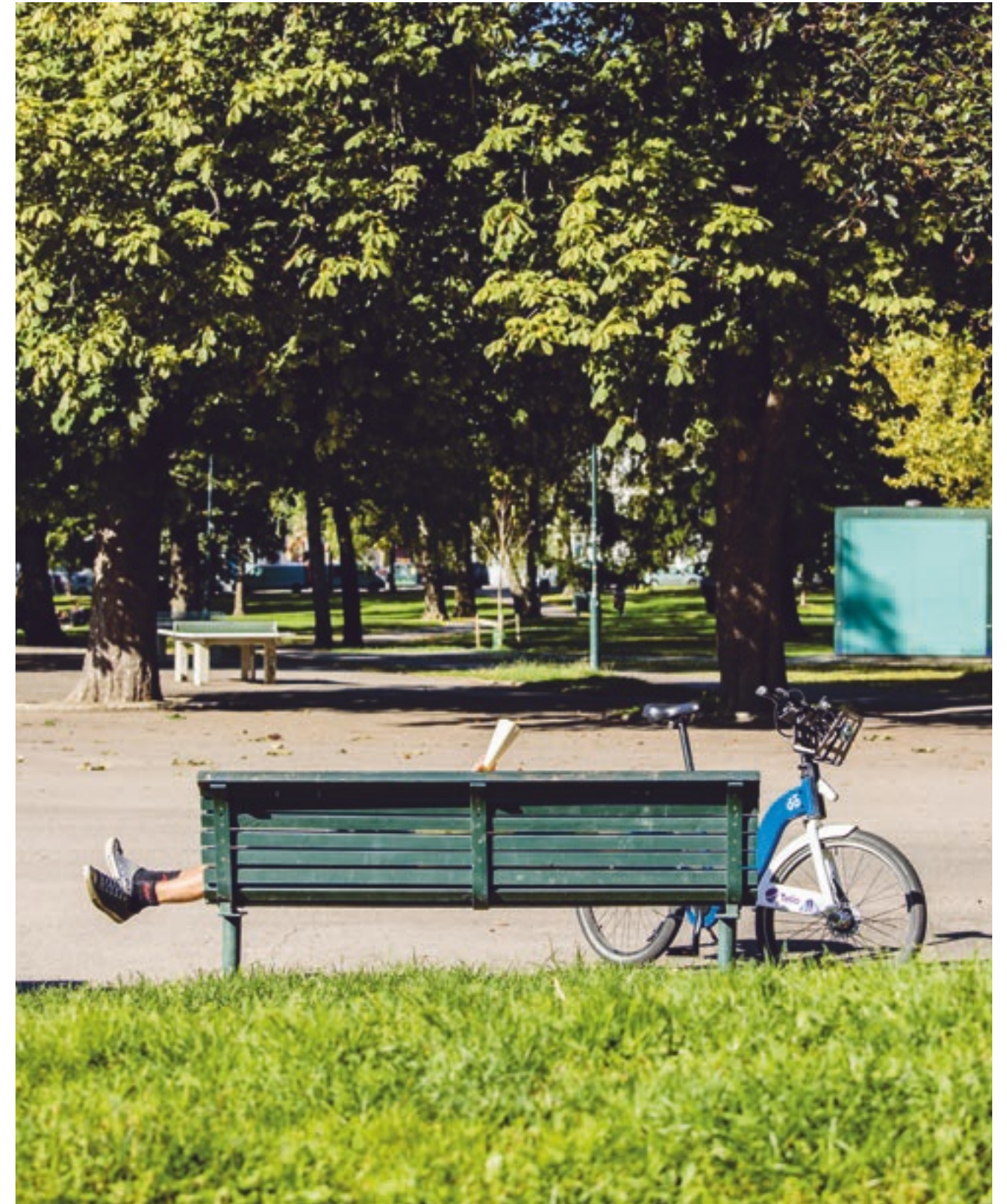
The City will introduce measures such as removing parking places, making parking more expensive and introducing a car-free city-centre and a tightly integrated network of car-free streets. Environmentally and time-differentiated toll fees will be used as means to reduce traffic. At the same time, the efforts to improve public transport, cycling infrastructure and walking conditions will be significantly reinforced.

#### Phasing out fossil fuels in transport

The City of Oslo aims to gradually phase out fossil fuel-based vehicles by 2030 and replace these with zero-emissions vehicles. This sends an important signal to the market.

The most important measures for fossil-free transport include introducing low/zero-emissions zones, environmentally differentiated tolls and lanes reserved for public and environmentally friendly transport. Furthermore, upholding and reinforcing state policy instruments and using intelligent transport systems (ITS). It will also be necessary to consider the connection between energy for buildings and energy for transport to ensure that the energy is used in an efficient and environmentally friendly way.

A mobility plan will clarify the basis for reducing car transport, reducing transport needs and increasing public transport use. There is also a need to focus more intensely on sustainable distribution of goods in cooperation with the retail industry, and to specify



Urban development and mobility



Procurement strategies that require zero-emission transport solutions, based on electricity or hydrogen will push technology development.

→ renewable construction operations in municipal construction projects.

**Establishing energy stations**

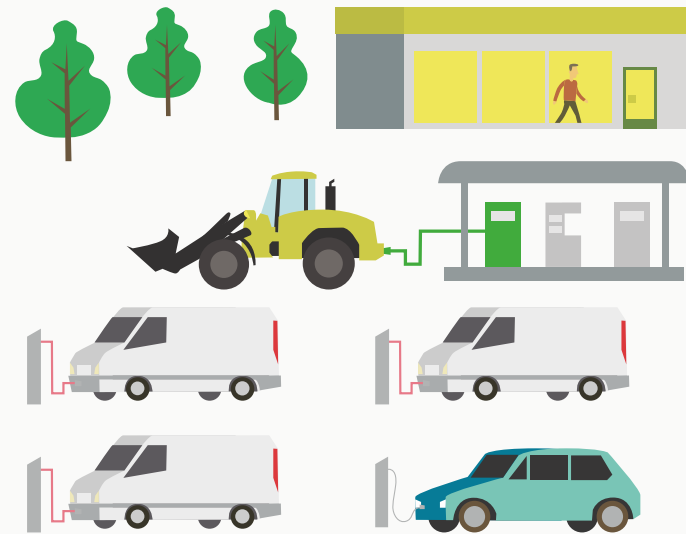
The target of reducing emissions from cars, light freight vehicles, heavy duty vehicles, taxis and construction works requires the development of infrastructure for zero-emission and renewable fuels. This includes, hydrogen, electricity and biogas via “energy stations”. Facilitating the establishment of this type of station is one of the City of Oslo’s Lighthouse projects.

Procurement strategies that require zero-emission transport solutions, based on electricity or hydrogen will push technology development. Where zero-emission solutions are not feasible, we will demand renewable solutions based on biogas or biodiesel. Oslo must also actively encourage state and private enterprises to demand these solutions.

**Electric ferries**

The City of Oslo will facilitate the electrification of local ferries and enable larger ships to use onshore power supply while in port. Oslo will also strive to transfer the movement of goods from roads to rail and sea, which will significantly reduce emissions from road transport.

Effective cooperation with the state is critical if Oslo is to successfully reduce emissions from transport. This includes regulations, tools and support schemes to develop infrastructure for distribution of renewable fuels. It will also be necessary to implement measures in the transport sector in close collaboration with commercial and public enterprises.



**Petrol stations of the future**

The transport sector currently accounts for 61 per cent of Oslo’s greenhouse gas emissions. Facilitating the establishment of energy stations with zero-emission fuels such as electricity and hydrogen, along with renewable fuels such as biogas and biodiesel, will be an important prerequisite in reducing emissions from the transport sector.

For this reason, the City of Oslo is now working on the Lighthouse pilot project Alnabru Energy Station. This station will deploy zero-emission and renewable fuels. The project is in par-

ticular aimed at heavy duty vehicles, which is currently responsible for 9 per cent of total CO2 emissions in Oslo, and light freight vehicles, which is responsible for 6 per cent. Alnabru is Norway’s largest freight terminal.

The Alnabru Energy Station pilot project will represent an important measure for phasing in zero emission and renewable fuels for transport purposes. In the long term, this type of energy station will replace the ordinary petrol stations as we know them today.



# New, renewable and more robust energy systems

**The use of fossil heating oil** in buildings and the waste-to-energy plant at Klemetsrud are major greenhouse gas emission sources in Oslo. The plan is to completely phase out these emissions by 2020. At the same time, the conversion of Oslo's energy system will help to increase security of supply and reinforce efficient and smart use of available energy.



## Buildings and resource utilisation

**End of the road for fossil heating oil**

Energy consumption in buildings contributes to 17 per cent of total greenhouse gas emissions in Oslo. While the City of Oslo is about to phase out all fossil heating oil in its own buildings, there are still many oil heaters in commercial buildings, housing associations/cooperatives and private homes. The Oil-Free 2020 project, which aims to phase out fossil energy for heating, has been launched and is set to continue. A nationwide ban on fossil heating oil will be in effect from 2020, and Enova and Oslo's Climate and Energy Fund support the transition to fossil-free heating.

**Smart pilot**

Plans to establish a microenergy system at Furuset are being accelerated. The project is a pilot for smart and environmentally friendly energy solutions and solutions for green mobility in connection with the local subway station. The project will develop an energy system that utilises energy locally and exchanges renewable energy with the central energy grid.

The aim of the microenergy system at Furuset is to establish a localized network for district cooling and heating, alongside new solar-based electricity production. This energy will be used

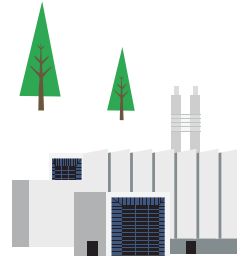
locally and surpluses will be transferred to the central grid.

**International potential**

With 12 per cent of total emissions in 2013, the largest individual point source of CO<sub>2</sub> emissions in the City of Oslo are generated by the incineration of waste at the Klemetsrud waste-to-energy plant. The City of Oslo is working to make CO<sub>2</sub> capture and storage at Klemetsrud a national industry pilot. In collaboration with Gassnova, the City has carried out a study demonstrating technical feasibility of the CO<sub>2</sub> capture process.

Achieving the City of Oslo's climate targets requires that the carbon capture and storage plant at Klemetsrud is in place by 2020. Carbon capture and storage applied to waste-to-energy plants also holds national and international promise, opening up for knowledge and technology transfer.

The City of Oslo will facilitate increased recycling, reuse and sharing to reduce consumption and the ecological footprint. The use of climate-friendly materials in buildings and recycling of building waste materials will be important additional measures to reduce greenhouse gas emissions. In order to achieve the targets of less consumption and more material recycling the city of Oslo has its own waste strategy.

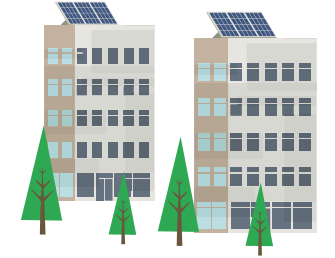
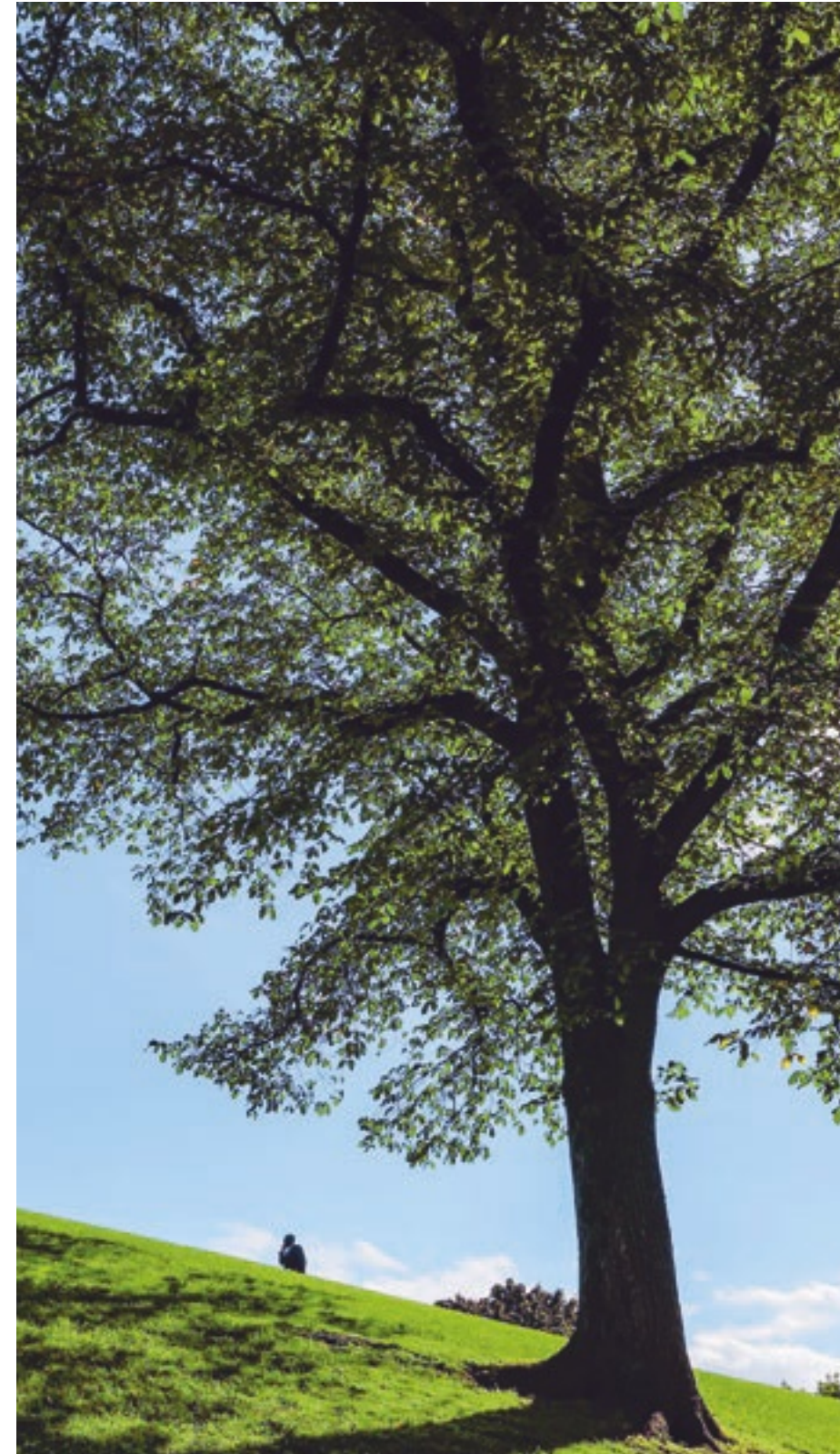


### Zero emissions at Klemetsrud through carbon capture and storage

If Oslo is to become a zero-emissions society, the city will have to introduce carbon capture and storage at its waste-to-energy plant at Klemetsrud.

The Klemetsrud plant is Norway's largest waste-to-energy plant and emits more than 300,000 tonnes of CO<sub>2</sub> each year.

Carbon capture and storage from this waste-to-energy plant is one of the Lighthouse projects in Oslo's Climate and Energy Strategy. The test facility that was opened in 2016 has demonstrated that 90 per cent of CO<sub>2</sub> emissions can be captured. Construction of a full-scale plant would require state support and could be completed by 2020.



### Climate-friendly urban development at Furuset

Furuset is an important part of both the Groruddalen Action Plan and the model area in the City of Oslo's FutureBuilt project. FutureBuilt is a ten-year programme currently underway in Oslo, Bærum, Asker and Drammen, with a vision of demonstrating the feasibility of developing green mobility solutions, climate-neutral buildings and high-quality urban spaces.

The development of the centre of Furuset represents an important focus area for climate-friendly urban development. The target is to halve current greenhouse gas emissions while implementing innovative urban development. The planned measures include up to 2,000 new homes featuring environmental solutions and exciting architecture, a new town square with improved commercial facilities, new green urban spaces and meeting places for residents – alongside a reinforced public transport service.

To stimulate climate initiatives in Oslo, it will be important to focus on innovative solutions to secure local access to renewable energy. It is planned to develop a microenergy system at Furuset focusing on low energy consumption and use of local energy sources such as waste heat from the local ice rink, electricity from solar cells and other solutions. This type of micro energy system can also offer solutions for energy storage and cooling.

Green mobility solutions will be built at Furuset, prioritising cyclists, pedestrians and public transport users.

# A collective effort

**Several different municipal agencies** are responsible for achieving the targets of reduced greenhouse gas emissions. Close collaboration with the academia, businesses and other public authorities is essential for Oslo to achieve its climate targets. ❖

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## It may lead to development of environmental technology and solutions of interest to international markets.

On 1 July 2016, the City Council established the Agency for Climate to act as a driving force and specialist agency for the City of Oslo's climate initiatives towards 2020, both internally and in collaboration with external stakeholders. The Agency for Climate will promote cross-sectoral initiatives and help to achieve the targets of a 50 per cent reduction in greenhouse gas emissions by 2020, and a 95 per cent reduction by 2030.

The introduction of climate budgets will be a key instrument in ensuring that all the City of Oslo's agencies assume responsibility for climate initiatives. Starting with the 2017 budget, preparing climate budgets with sector-specific emission ceilings will be an integral part of the standard budget process. This will be tracked through normal business management and in quarterly and annual reporting on results and the status of climate efforts.

### Encouraging commitment

Making Oslo a zero-emissions city is a major undertaking that will only succeed through close interaction between residents, businesses, organisations, the state and the municipality.

Management and involvement will be central in achieving the climate targets. Oslo's residents and business community will be engaged through information campaigns and the planning and implementation of climate and environmental measures. The Climate Policy will not just reduce greenhouse gas emissions, it will also invigorate the city, improve air quality and public transport, and create more bicycle paths and car-free streets. Involvement and engagement are therefore essential to bring about necessary changes in attitudes and behaviour in the local community.

Transparent and inclusive processes and collaboration between the City of Oslo's va-

rious agencies and with other Norwegian and international cities will play an important role in achieving the desired emission cuts.

### Business community at the forefront

The City of Oslo will actively encourage Oslo's business community to spearhead the green shift. The City of Oslo will use public procurement as a strategic tool.

A clearer procurement policy will challenge the principle of technology-neutrality and entails that the City of Oslo will make technological choices in selected procurement areas.

Increased interaction with the business community could stimulate green economic growth and employment. It may also lead to development of environmental technology and solutions of interest to international markets.

### Close public collaboration

Several of the measures in the Climate and Energy Strategy require rules and regulations which are not controlled by the City of Oslo. Consequently, Oslo needs to work closely with the state and other public actors on climate initiatives. These partnerships will in particular focus on changes in, or development of, regulations that authorise the municipality to implement measures and engage in joint financing of public transport projects.

### Green pensions

In its official declaration, the City Council states that climate consequences shall be assessed in all relevant cases presented to the City Parliament. The City of Oslo has initiated work with the Pension fund of Oslo to divest in fossil energy, sending an important signal to the financial markets.

## The 16 initiatives in the Climate and Energy Strategy

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### Climate Governance in the City of Oslo

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**City of Oslo**

**Agency for Climate**

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