

Environmental Report

2017

Helsinki

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Helsinki

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Deputy Mayor's Review

This is the first environmental report to be handled by the City Council that was formed in the summer of 2017.

Combating climate change and securing biodiversity are huge challenges that require resolute actions on all policy-making levels. Cities have a key role in this. During the new City Council term, consistent and ambitious work will be done for the environment of Helsinki. The condition of the environment is reported systematically and comprehensively in Helsinki. This is important in order to track how we have progressed and achieved our goals.

Helsinki's new city strategy has ambitious environmental objectives. We have significantly raised the bar on our climate objectives: we are targeting carbon-neutrality by 2035 and 60 per cent emissions reductions from the 1990 level by 2030. The carbon-neutrality objective was advanced by 15 years at a stroke.

The diversity of urban nature has a strong role in our strategy. In the coming years, nature's diversity will be increased in forests, parks and all green areas in Helsinki. The forest network will be strengthened, the condition of waters will be improved, the migratory fish stocks will be revived and Helsinki will be given its own marine strategy.

In the autumn, the City Council made a decision on the conservation of the old forest of Kivinokka as a part of the Luontolahjani Suomelle (My gift of nature to Finland) campaign.

The new city plan approved in the autumn of 2016 will begin to be implemented: the city structure will be developed to be more sustainable for the environment and climate, and low-emission modes of transport will be invested in. Raide-Jokeri, Kruunusillat and the tram line of Kalasatama and Pasila are progressing.

The working group's proposal for the City's emissions reduction programme has been completed. It outlines the measures to achieve our climate objectives. For example, the energy efficiency standards of the City of Helsinki are more ambitious than the minimum level.

During this City Council term, Helsinki will work ambitiously to improve the condition of our shared environment. This is best done when detailed information and long-term monitoring data on our successes and areas in need of development is available.

In the report, I was most pleased with how positive attitudes the residents of the Helsinki metropolitan area have on our shared environment. Approximately 80 per cent of the residents of Helsinki and Vantaa would put more emphasis on the environment than economic growth, if these two were contradictory, and almost as many believe that environmental protection and economic growth are possible at the same time. Environmentally friendly attitudes have increased, and they are especially high among the young.

Thank you to everyone that took part in the environmental work and reporting!

Anni Sinnemäki
Deputy Mayor



Environmental Key Figures 2017

more than **60%**

of the residents would be willing to pay higher taxes or fees, if the money was directed to nature protection, water protection, combating climate change or improving air quality

Greenhouse gas emissions have decreased by

24%

8

comprehensive Smart & Clean changes were put in motion

25 300

flower bulbs were given for residents to plant in parks

More than

50

new buses started operating, all of which fall below the strict Euro 6 emission limits

37%

of the residents of Helsinki live in areas where the noise level caused by road traffic exceeds the limit value of 55 dB during the day

1,6 million
The city bikes
were used in
journeys

180 litres
The daily water
consumption of Helsinki
residents was
per resident

21 of the city plans approved
by the City Council during
the year or those that had
already come into effect
The regulations on
green roofs
were made in

A total of
1110 292 tonnes
of excavated earth mass was utilised
in the construction of public areas

20 day care centres implemented
a vegan food experiment
The use of cloth hand-
drying rolls replaced
14–20 million
paper towels

Helsinki in a Nutshell

Helsinki is the centre of a rapidly growing large metropolitan city area. Helsinki, together with the municipalities of the Helsinki Metropolitan Area (Espoo, Vantaa, and Kauniainen) and eight neighbouring municipalities, forms an area with a population of over 1.5 million residents, which is referred to as the Helsinki Region. As of 31 December 2017 Helsinki had a population of 644,700. As of the end of 2017 the population density was 3,016 residents per land area square kilometre. The city of Helsinki's surface area is 715.48 km², of which 213.75 km² (29.9%) is land, 0.86 km² is inland waters, and 500.87 km² sea waters. The majority of the city's green areas are forest (37.2 km²), parks (9.9 km²) and landscape fields or meadows (8.0 km²). There were a total of 426,500 jobs in Helsinki in 2017. Helsinki accounts for 17.2 per cent of Finland's jobs. The business demographics of the city are similar to other

European capitals – strongly service-oriented: the service sector provides 87 per cent of all jobs.

From an environmental perspective the City of Helsinki is amongst the most significant actors. In Helsinki, greenhouse gas emissions resulting from energy consumption and other consumption account for approximately five per cent of Finland's greenhouse gas emissions. The greenhouse gas emissions resulting from energy production and transport in the Helsinki region account for seven per cent of Finland's greenhouse gas emissions. The Viikinmäki wastewater treatment plant cleans the wastewater produced by approximately 800,000 people. Additionally, the City is Finland's largest employer, due to which the City's operations have significant environmental impacts because of the volume of office work, for example.

The Helsinki Group comprises the following communities:

- The City as a parent community (4 divisions, City Executive Office, Audit Department and 5 municipal enterprises)
- subsidiary communities, i.e. organisation which are owned directly by the City (83 subsidiary organisations and 12 foundations)
- associated communities, i.e. companies, foundations and joint municipal authorities in which the City has a 20–50 per cent ownership stake (54 associated companies and 6 joint municipal authorities)

At the end of 2017 the City employed 37,090 people.

Environmental Management and Partnerships

Environmental matters are a part of the city strategy. The environmental policy complements the strategy and its realisation, and in part this realisation will also be monitored with indicators in the environmental report. The information in the environmental report and statistics is open data. The environmental management in the city organisation is described on the next page.

The simplified EcoCompass environmental management system has proven to be a functioning system in the City's operations. The system is currently in use or being implemented in three divisions or parts of them, the City Executive Office, two public enterprises, Helsinki Zoo and 12 subsidiary communities.

The City of Helsinki Service Centre, which transferred to EcoCompass from the ISO 14001 system, was audited in 2017. The EcoCompass certificate covers all services in nearly 600 offices or locations. In addition, the Reaktori event and Stara were re-audited. With the organisational change, the goal is to develop and standardise the EcoCompass operations of different divisions. The aim is to reach a standardised model and develop the EcoCompass systems towards division-specific environmental systems.

Three subsidiary communities, Metropolilab, Helsinki Festival's Huvila Festival Tent and Niemikoti Foundation) were also re-audited. On a follow-up audit, the operations of the Niemikoti Foundation comprising of 20 units was particularly praised for rationalising waste management: by monitoring the filling and the emptying interval of waste containers, the number of containers was reduced and their emptying intervals were made longer. This also reduced costs and the drives of waste trucks. The auditor also

praised them for good internal communications and for taking their customers along in the planning and realisation of the environmental work.

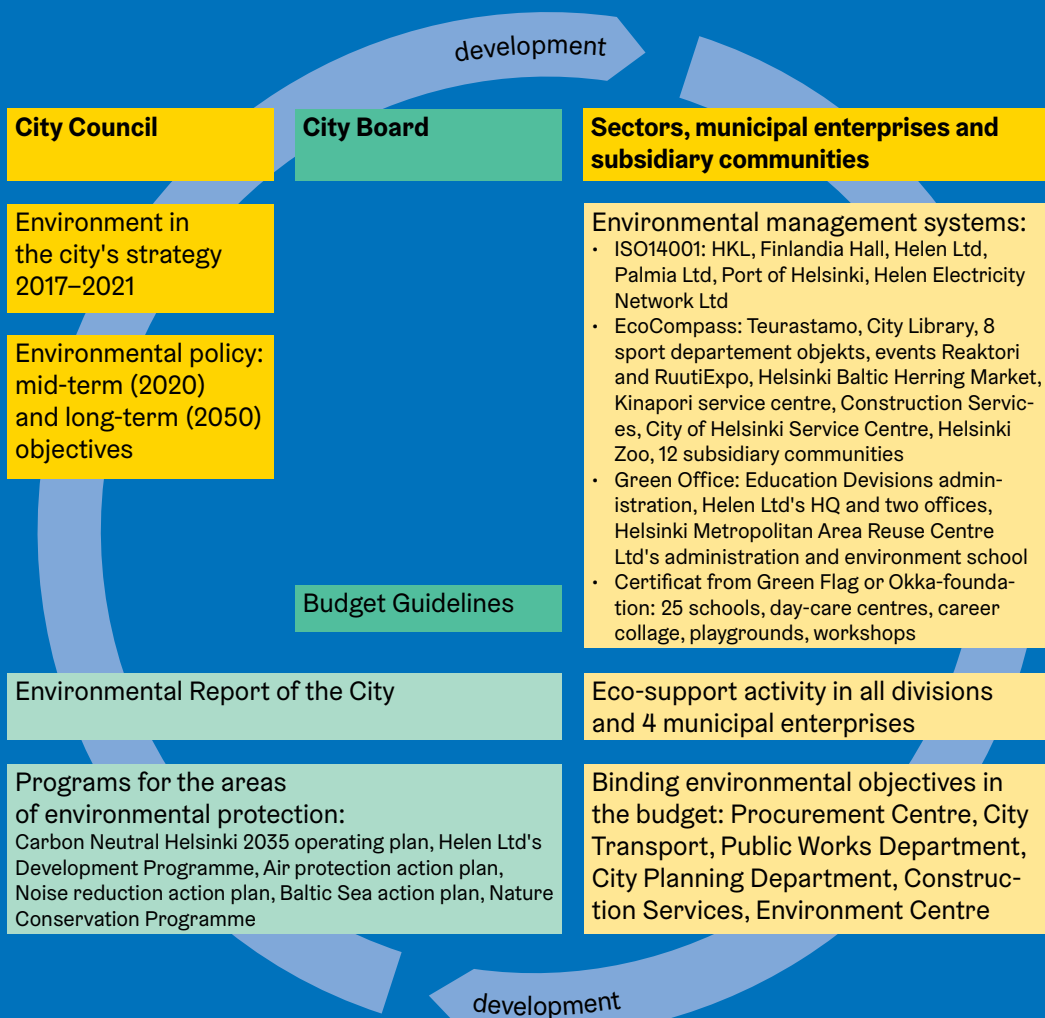
The Climate Partners network already includes 60.

Four events (the World Village Festival, the Helsinki Festival's Huvila Festival Tent, the Great Beers – Small Breweries event, the Delicacies of Finland & Syystober event) were granted a 30 per cent discount on their location rent in return for using the audited EcoCompass Event system.

The sustainable development of sporting events continued with the help of pioneers. SUL's running events were audited in the summer as the first of their kind in the Helsinki Metropolitan Area. The certificate was given to five running events altogether, from the Naisten Kymppi in May to the Helsinki City Marathon. Experiences with using the EcoCompass were good, and the feedback from people taking part in the events was pleasantly surprising. For example, the feedback from the participants of the Helsinki City Run gave top credit for the fact that the event organisers have taken care of their environmental responsibility. The event producer was pleased and said "I'm glad we are at the forefront!"

The Climate Partners network of industries and the City of Helsinki already includes 60 large companies and support members that mitigate climate change in cooperation with the City. In 2017, Mayor Jussi Pajunen signed climate commitments with Fujitsu

Model for City of Helsinki's Environmental Management



The observance of environmental issues in Helsinki is governed by the strategy and the environmental policy approved by the City Council, as well as the budget guidelines approved by the City Board. The city also has several programmes for a number of sectors in the field of environmental protection, all contributing to the environmental management of the city. The environmental programmes of the administrative branches support city-level environmental management.

The City's parent organisation

currently has 731 trained eco-supporters and approximately 230 appointed eco-supporters. Several subsidiary communities also have trained eco-supporters. In addition, the operations have spread to 22 municipalities in Finland, the Uusimaa Centre for Economic Development, Transport and the Environment, the Helsinki Region Environmental Services Authority (HSY) and the Uusimaa Regional Council.

The eco-supporters' responses to the annual survey show that 77 per cent of the eco-supporters that

responded to the survey find that the eco-support activity has an impact on the everyday practices of their workplace. The appreciation of the work community and the support from the immediate supervisor and colleagues contribute to the occupational well-being of the eco-supporters. The main factors in the commitment of the eco-supporters are the conversations on eco-support activity with the immediate supervisor and the feeling that the support from the immediate supervisor is sufficient.

Finland Oy, Ilmarinen, the Finnish Transport Safety Agency Trafi, Nitor, NCC, PwC Finland, Ramboll, Remeo Oy, VTT Technical Research Centre of Finland Ltd, Tieto Oy, Vahanen Group and Varma. In the commitments, each new member defines their own climate objectives, the realisation of which is monitored.

The Urban City Research and Statistics Unit of the City Executive Office examined the environmental attitudes of Helsinki and Vantaa in 2017. A total of 1,560 responses were received. The attitudes were very positive. Approximately 80 per cent would put more emphasis on the environment than economic growth, if these two were contradictory, and almost as many believe that environmental protection and economic growth are possible at the same time. The percentage has grown since the last survey, and especially young people believe in simultaneous environmental protection and economic growth.

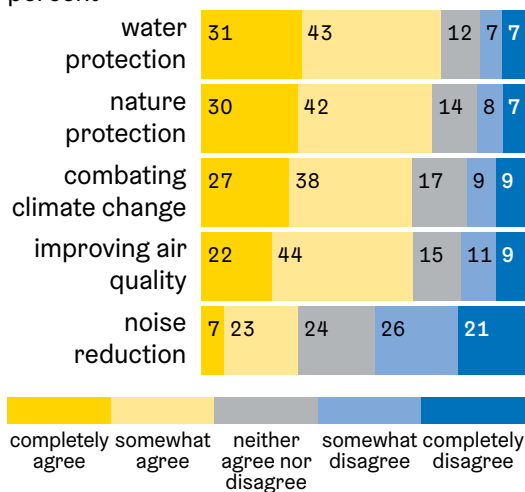
Awareness of the causes and consequences of climate change is reasonably good. The survey included several questions on this, and they form a clear popular opinion: climate change is believed to be the result of human behaviour, its effects are believed to be mainly negative, and one's own actions are believed to have a role in combating it. A majority of the respondents were also willing to make personal financial sacrifices in the form of taxes and fees, if this helped to combat climate change.

In particular, the most aged respondents pay attention to saving energy at home and, for example, monitor and adjust the electricity and heating consumption of their apartments more than others. Young people, on the other hand, favour vegetarian food and different forms of recycling and collaborative consumption; for example car sharing is found interesting.

According to the survey, there are many popular environmentally friendly choices and behaviours: switching off unnecessary lights, using energy saving bulbs, washing full loads of laundry and avoiding food waste. Avoiding plane travel, however, is a relatively rare choice. Environmentally friendly behaviour does not fall on the shoulders of a few people, but the choices are made selectively and also for other reasons than environmen-

I would be willing to pay higher taxes or fees, if they were directed to...

percent



tal protection. For example, saving energy or avoiding food waste saves money, as well.

The survey also addressed the correlation between attitudes and behaviour and views on urban development. The correlation between environmentally positive attitudes and environmentally friendly behaviour was fairly weak. For example, the awareness of climate change only slightly increases the likelihood of active energy saving. The clearest correlation is between awareness of climate change and favouring vegetarian food. In urban development, a clear majority approves of the restrictions on building large supermarkets and supports the promotion of public transport and bicycle and pedestrian traffic. The easier transport of bicycles in public transport and faster public transport could attract more people to choose these options instead of cars.

The survey asked the respondents about their personal willingness to pay for environmental protection. According to the responses, a clear majority would be willing to pay higher taxes or fees, if the money was directed to nature protection, water protection, combating climate change or improving air quality. With noise reduction, the willingness to pay was not as significant.



Smart & Clean

Smart & Clean

During 2017, The Smart & Clean Foundation built Helsinki into the best test bed in the world for smart and clean solutions. During the year, eight comprehensive changes were put in motion. The Smart & Clean changes are to improve the residents' quality of life and to decrease emissions or to promote circular economy. They are carried out in co-operation between the public and the private sectors, across city and sector limits. In addition, the projects will generate new business and scalable home market references.

The tangible change projects produce completely new kinds of solutions for the cities' challenges. The HAQT Helsinki Air Quality Testbed project set up the world's first city-wide air quality sensor network in Helsinki within the year, nearly tripling the measuring points. In turn, the BioSata project switches all buses in the Helsinki Metropolitan Area and Stara machinery to run on waste and residue-based biofuels by 2020.

During the autumn, several other change projects were prepared to target clean and natural methods of storm water quality control, smart and efficient renovation construction and services related to the development of better indoor air.

During the year, within the projects and alongside them, tools have been developed to lead a change. The Smart & Clean test beds in the Helsinki Metropolitan Area and Lahti were reviewed, vision work was done with partners on a smart and clean region and the best solutions from the leading cities in the world were studied. The Hack the City process, in turn, brought together urban developers from different levels to produce innovative ideas for changes, three of which are still being developed. The themes are a personal carbon bonus card, transforming time in transportation into productive time and an anonymous trust service.

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Developing an active cooperation network provides an opportunity to create comprehensive ecosystems, scale solutions and increase effectiveness. The network and the domestic visibility of reference solutions have been increased internationally, for example in the City of Helsinki's Designing Better Life event in Singapore.

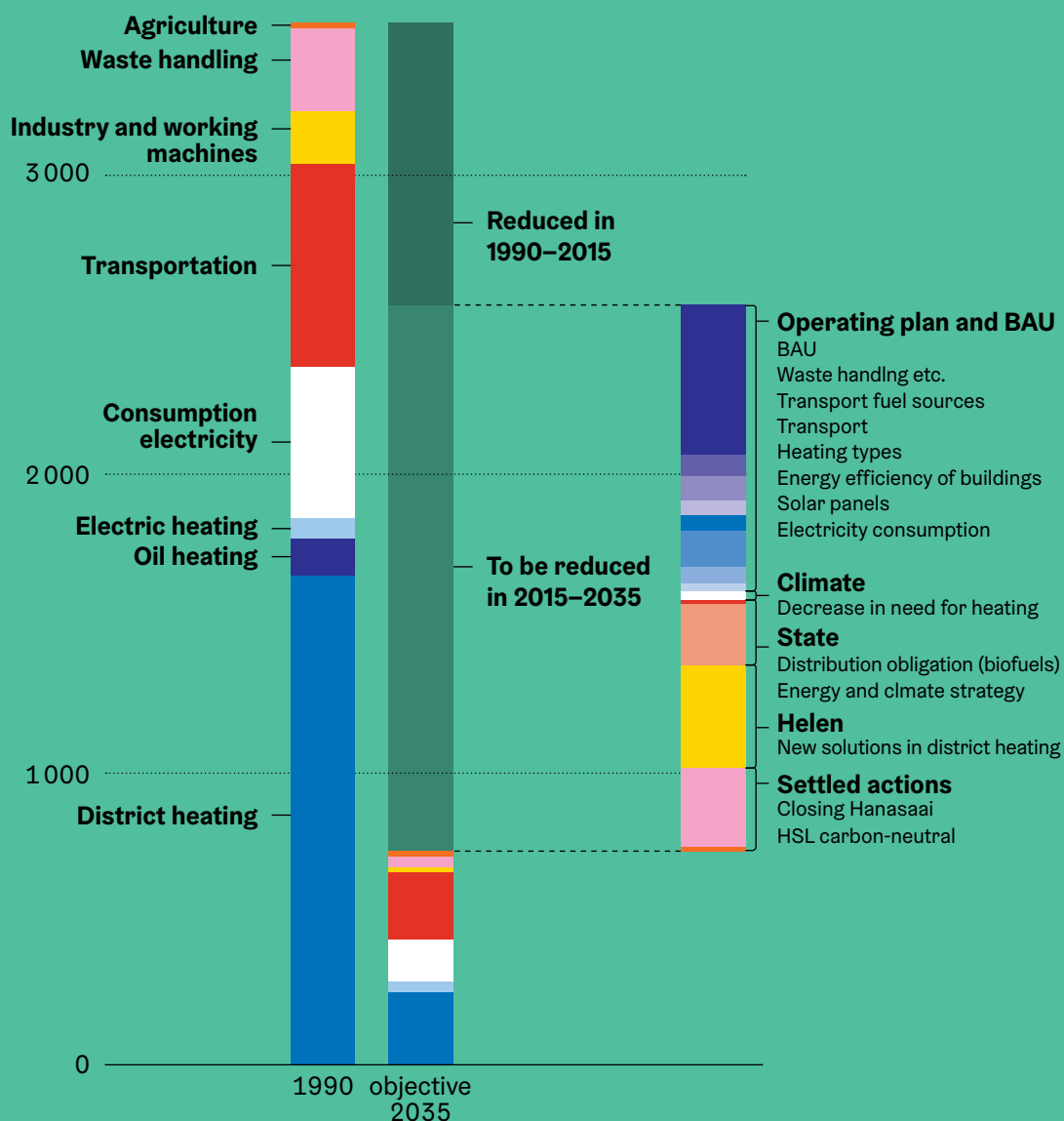
The world's smartest and cleanest city area recognises trends, leads a change and has resilience in a changing world. In 2021, the Smart & Clean changes, agile utilisation of platforms and a committed community will have transformed the Helsinki region and Lahti into the best test bed in the world for smart and clean solutions.

Smart & Clean is a five-year-long (2016–2021) change project. The Smart & Clean partners are the Cities of Espoo, Helsinki, Kauniainen, Lahti and Vantaa and the Uusimaa Regional Council; governmental bodies Business Finland, the Ministry of Transport and Communications (LVM), Sitra, the Ministry of Economic Affairs and Employment (TEM) and the Ministry of the Environment (YM); companies Caverion, Fortum, Gaia, Gasum, Helen Ltd, KONE, Lassila & Tikanoja, Neste, Pöyry, Ramirent, Siemens, St1, Vaisala and YIT; universities and research and educational institutions Aalto University, the University of Helsinki, Lappeenranta University of Technology and VTT Technical Research Centre of Finland.

Climate Protection

Reducing greenhouse gas emissions

1000 CO₂e



In accordance with the city strategy 2017–2021, Helsinki will implement modern climate responsibility. The aim is to reduce emissions by 60 per cent by 2030 and be carbon neutral by 2035. The Carbon Neutral Helsinki 2035 operating plan was started in the Kick-off workshop in October 2017. The event was attended by over 60 representatives from partners and stakeholders, as well as participants from different divisions of the City.

The first smart thermostats were installed in a residential building in Haapaniemenkatu 12 in Merihaka, in order to begin smart heating control.

The preparation of the operating plan was led by a city-level emissions reduction team assembled in the autumn of 2017. By February 2018, eight events were organised, four of which were aimed specially at experts in building and transportation. Company representatives, the city's residents and citizen organisations were also invited to the workshops. In addition, a draft of the plan was freely available and open for comments at www.stadinilmasto.fi/en/. External evaluations were made on the potential for emission reductions in construction and transport. In addition, the economic effects of the most significant measures for buildings were evaluated. The operating plan is estimated to move forward in October.

The climate network was also actively involved in forming the operation plan. In addition, the network organised events to develop the Helsinki smart city project (mySMARTLife), climate friendly meals and the Carbon Neutral Helsinki Zoo project, the aim of which is to reduce Helsinki Zoo's carbon emissions by 2050. In cooperation with Helen Ltd, Helsinki Zoo was equipped with two solar power plants, and a plan to

install a charging point for mobile phones and electric bikes was made for 2018.

The first trials in the MySMARTLife project were started. The first smart thermostats were installed in a residential building in Haapaniemenkatu 12 in Merihaka, in order to begin smart heating control. To advance the energy efficiency of the existing building stock, active cooperation was started with the residents and the Merihaka property management company, as well as in events such as Lähiöfest and the project area in Kalasatama on Helsinki Day. The Viikki Environment House began similar operations and, for example, the optimisation of the smart control of their energy storage.

Reactive power compensation was tested in the solar power plant on the roof of the Kivikko sports hall, and in the Tali area, data was gathered to study the self-sufficiency of individual microgrids. In Suvilahti, Helen Ltd installed the first public two-way charging point for electric cars that receives its power from the nearby solar energy storage. In project cooperation, public charging infrastructure was built in Hakaniemi for electric buses, working machines and transport vehicles. A second generation robot bus arrived in Finland at the end of the year, and the route planning was started for the 2018 trial to make it a part of electric public transport.

Planning information and communication technology solutions and applications was started in order to facilitate the use of the data gathered in the trials and later utilised. An example of this is the gathering of extensive building energy data for the City's 3D energy and climate atlas. The atlas is a visual and informative tool for example for decision-making in housing companies and municipalities, as well as other operators in the property and construction fields. Among other things, the atlas contains information on the energy consumption and conservation potential of buildings, solar electricity and energy, heat leaks and geothermal energy, heating types, finished renovations and energy performance certificates, as well as the consumption of electricity, district heating and water in the rental apartment buildings of the housing company Helsingin kaupungin asunnot Oy.

The mySMARTLife project, funded by the European Commission, is part of the Horizon 2020 programme, which tries out new innovative and smart city energy solutions and promotes their entrance to the market. The operations are aimed at enhancing the energy efficiency and comfort of living in the existing and new building stocks, increasing the percentage of renewable energy production, developing the City energy grid and electricity storage for renewable energy, as well as upgrading electric transport and electric public transport. The cross-sectional theme is the integration of open data and smart information and communication technology in the operations. The goal in the target areas is to reduce energy consumption by 10–20 per cent. The project is carried out by the City of Helsinki (in cooperation with the Helsinki Region Environmental Services Authority HSY), HELEN, Forum Virium Helsinki, Metropolia University of Applied Sciences and the VTT Technical Research Centre of Finland, as well as the SMEs Fourdeg and Salusfin. Our Light-house City partners are Nantes and Hamburg, and the Follower Cities are Bydgoszcz, Palencia, Rijeka and Varna. The operations in Helsinki and the project cooperation were presented in several international events in Finland and elsewhere in Europe.

The City's storm water strategy was updated in cooperation with HSY into the City of Helsinki storm water programme. Storm water is the rain and melted water in constructed areas that is led away from the ground, roofs of buildings or other such surfaces. The storm water programme promotes systematic and sustainable overall storm water management in Helsinki in the long term. The City's goals of densification and adjusting to climate change as well as the renewed legislation and city organisation have all been taken into account in the preparation. The central objectives of the storm water programme are the utilisation of storm water in city planning and construction, ensuring drying with consideration to climate change, control of the storm water flows and the quality of the storm water, reducing the amount of storm water in the combined sewer system, as well as the development of internal coop-

eration and operational models and securing expertise and resources in the city organisation. The storm water programme includes 38 operations, the realisation of which is the responsibility of the Urban Environment Division in cooperation with the required parties and residents, as well as the storm water team appointed to monitor the programme.

The Integrated Storm Water Management (iWater) project produces methods and solutions for controlling storm water to help in city planning. The project updated the Helsinki

The storm water programme promotes systematic and sustainable overall storm water management in Helsinki.

green factor tool used for ensuring that sufficient green surface area is conserved when building new plots and for preventing floods caused by storm water. A storm water filtration container is being piloted by the shore of Taivallahti to filter microplastics and other harmful substances from the storm water.

A biofiltration solution for storm water was built in the Maunulanpuisto park in the EU LIFE+ funded project CITYWATER – Benchmarking water protection in cities. Storm water from the former land traffic centre and the Metsäläntie road are conducted to a stone delaying pool that removes solid material from the water. After this, the water is directed to an area that cleans nutrients and heavy metals from the water, where flood meadows and wetland plants are the filtering materials used, with several layers of sand below them. The goal is to enhance the living conditions of the trout stock in the Haaganpuro brook and pilot the functionality of biofiltration in cleaning storm water. The functionality of the biofiltration area has been monitored for two years. According to preliminary results, the area efficiently cleans the storm water of copper and zinc, in particular. The monitoring will continue in 2018.



The aim of Climate Streets was to create a low-carbon city of the future adapted to cope with the challenges of climate change. New, functional solutions to cut greenhouse gas emissions and energy consumption levels were sought for the built urban environments on Iso Roobertinkatu in Helsinki and Tikkuraitti and Asematie in Vantaa. The solutions were developed and trialled in cooperation with each area's businesses, real estate owners, residents and the city administration. The Climate Street project was implemented by the Cities of Vantaa and Helsinki together with the Green Building Council, HSY's Ilmastoinfo and Aalto University.

In cooperation with companies, new low-carbon services, products and approaches related to the companies' business were developed. Together with the companies, workshops on responsible food and a course on environmentally friendly vegetarian food were organised and the amount of food waste from grocery stores was reduced. Companies received energy consultation and guidance into the realisation of energy-efficient lighting. The project tested the methods of measuring energy consumption and devices to reduce energy consumption, and these were showcased to residents in the Viisaat vempaimet event.

Energy efficiency guidance and solar electricity mappings were offered to housing cooperatives and other pieces of real estate. The chairpersons' club was a successful method of reaching the housing cooperatives. Investing in solar electricity was made as easy as possible for the real estates, and the first housing cooperative solar power plant in the inner city was brought to use on the Iso Roba Climate Street in the summer of 2016. The residents reduced their carbon footprint with personal climate training that implemented new services, devices and approaches to facilitate everyday life. The residents were also offered support for an environmentally friendly life in several different events. The results and observations on the project have been gathered in the Climate Street tools package, which can be found on the Climate Street website at ilmastokatu.fi/en/.

In 2017, the City's Maanalaista energiaa

(Underground energy) report was finished, which studied the possibility of utilising renewable geoenergy in Helsinki. Its benefits include renewability, affordability, not depending on weather conditions and the fact that it is nearly emission-free. The report shows that Helsinki is a potential user of both geoenergy and geothermal energy. For now, the largest user group are detached houses. In the beginning of 2017, 3,310 geothermal wells had been drilled in the Helsinki area. Over 95 per cent of these are the geothermal wells of detached and semi-detached houses. The most significant targets for geoener-

Helsinki is a potential user of both geoenergy and geothermal energy.

gy in Helsinki are Meilahti Hospital (49 wells), Malmi Hospital (30 wells), Viikki Environment House (25 wells) and Sakarimäki School (21 wells). According to the report, geoenergy should be utilised more extensively on an area and block basis, and it would be important to include energy potential statements in new plot conveyance competitions and city planning projects. It would also be wise to make a survey of the whole city's geoenergy potential. In Finland, the most promising method of utilising geothermal energy are power plants using EGS technology, where water is circulated inside the bedrock between at least two deep drill holes.

Helsingin Matkapalvelu, the transport service of the City of Helsinki Service Centre for the elderly and disabled, reduced their mileage by over 430,000 kilometres by combining transports and transporting clients travelling the same way at the same time. The virtual care service utilising video and sound reduced the mileage by over a million kilometres by allowing the nurse to meet the client via a remote connection instead of driving to the client's home. This allows the nurse to meet more clients daily and significantly reduces driving. The mileage was reduced by nearly 200,000 kilometres compared to 2016, which is largely due to an

increase in the number of remote contacts via the virtual care service.

The Ministry of Economic Affairs and Employment, the Energy Authority and Motiva awarded HELEN with a recognition of successful work on energy efficiency during the contract period of 2008–2016. The most significant single project was the Katri Vala heat pump plant, which allows for surplus warmth to be conducted to reuse.

The City of Helsinki and the Ministry of Economic Affairs and Employment made an energy efficiency agreement (KETS) for the period of 2017–2025 with a target of 7.5 per cent energy saving compared to the 2015 level by 2025.

All city-owned heated buildings are under energy consumption monitoring, and by the end of 2017 approximately 550 city service buildings were reviewed.

In 2017, construction of new buildings and renovation of existing ones was done as low-energy construction. The energy planning instructions for public service buildings, aiming close to zero energy, were finished and have been integrated into the City's general HVAC design instructions for service buildings. The Energy Efficiency Directive requires that, starting in 2018, all public buildings must be constructed as near zero-energy buildings.

The energy studies of the City's new construction and renovation projects evaluate the utilisation of diversified renewable energy. In 2017, solar electricity systems were installed, for example, in Hiidenkivi Comprehensive School (44.5 kW) and Torpparinmäki Comprehensive School (27.5 kW). Solar electricity systems will also be installed in Vesala Comprehensive School and Yliskylä Day Care Centre that are currently under construction, as well as several sites currently under project planning.

The evaluation model for the climate effects of investments underwent piloting in three construction and renovation sites of housing production. In the evaluated plans, environmental matters have been taken into account from many perspectives, but case-specific assessment is done mostly in pilot sites. The pilots have proven to be a

useful tool for versatile testing of different solutions, e.g. energy and material efficiency, calculating the carbon footprint and adjusting to climate change (e.g. green roofs and the green factor), for example. In new construction, a tighter energy efficiency target can well be taken as the starting point for design and construction. The updating of the targets should be a continuous process, as the tightened emission reduction target and on the other hand the ever-evolving technology must actively require more effective measures. In renovation sites, the energy efficiency target is much more modest, and

The Energy Efficiency Directive requires that, starting in 2018, all public buildings must be constructed as near zero-energy buildings.

some compromises have been made on the level of efficiency because of cost pressures. The goals are also more challenging to achieve, so development efforts are needed to find cost-effective solutions. The aim of the evaluation is to increase the attention paid to the climate impact in project planning and the decision-makers' knowledge of the climate impacts of projects. The evaluations were discussed by the management and the board of the housing company Helsingin kaupungin asunnot Oy, as well as the steering group of the housing production service.

The Urban Environment Division is developing an environmental control model for commercial premises from the project stage to the entire life cycle, including use and maintenance. The aim of the model is to assemble the guidelines and objectives of construction. The work was started in 2017 by charting the existing guidelines and models. In connection with the needs assessment of the Laakso Hospital project, Granlund Oy formed a preliminary model based on the

experiences received through the project. Based on this, the model is developed further and piloted for example in the project planning of Laakso Hospital and the Health and Well-being Centre project in the city centre.

The environmental documents for infrastructure and building construction were completed in 2016, and they moved on to the piloting phase. In 2018, the Oulunkylä street design area chosen as a pilot moves on to the contract work phase, the design phase of the replacement of the culverts in Longinoja located in the Tullivuori area will be started, and the Lapinmäki Day Care Centre moves on to contract work. The document will also be used in the Kruunusillat project. The documents include the Planning Officer's instructions, the Environmental Document (a commercial document for tendering the contract) and the base for an environmental plan at the construction site. The implementation of contract-specific reports is being discussed, based on the document. During the piloting, the contents and approach of the documents will be polished, after which a proposal can be made for the principle to become a requirement for third parties as well.

The Building Control Services electronic permit processing service was extended to cover all permit projects and the construction phase in 2017 (www.lupapiste.fi). Customers were encouraged towards energy-efficient construction by offering them a possibility of a 20–30 per cent discount on the building permit fee on the 2017 building control price list, if the building is designed to be low-energy. In 2017, the low-energy discount on the permit fee was given to 54 residential building projects.

In 2017, total emissions of greenhouse gases caused by residents, services and industry, were 2,668,000 tons of CO₂e (–2% compared with 2016). Emissions declined slightly as the emissions of electricity (–5%) and electric heating (–6%) decreased as a result of the purification of Finnish power generation. Emissions in waste management (–24%) decreased due to the natural decomposition of bioreactive waste previously deposited in Ämmässuo, because mixed waste has been exported to Vantaa waste

incineration plant in recent years. On the other hand, increased use of biofuels decreased and decreased emissions (–4%).

As a counterweight to the decline, district heating emissions continued to increase (+1% by 2016 and +12% compared to 2015). The increase in the emissions of Helen Ltd's district heating production over the last few years is explained by the fact that due to the low price of electricity and emission allowances and the price ratio between fuels, coal has been more profitable than combustion of natural gas. The increased use of coal

Greenhouse gas emissions have reduced 24 per cent from the year 1990.

has not been able to compensate for the increased production of wood pellets and heat pumps.

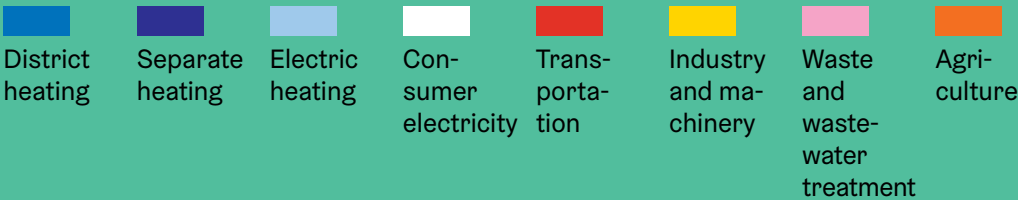
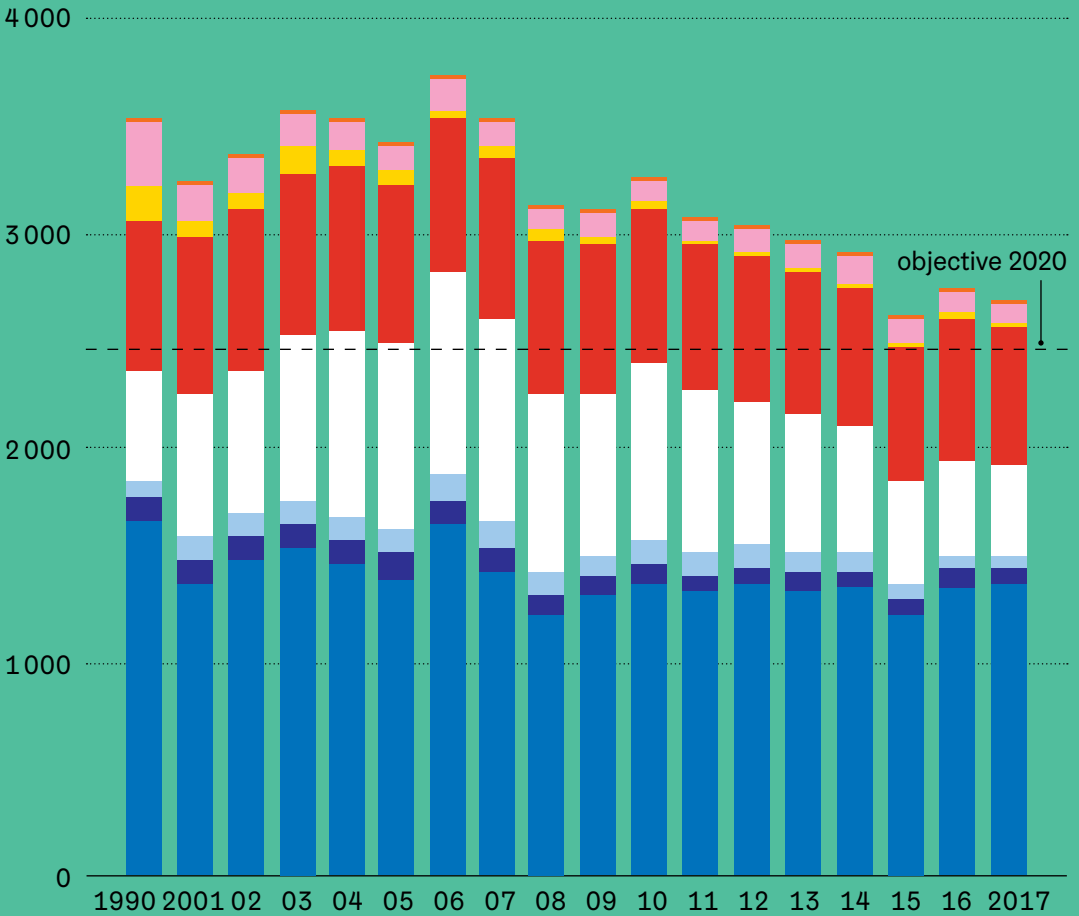
Total greenhouse gas emissions from Helsinki were about 24 per cent lower than in 1990. Per capita emissions were 42 per cent lower than 1990. Helsinki's 2020 overall emissions target (–30%) will be achieved if total emissions drop by 6% of the current, ie. around 208k CO₂e.

Total energy consumption in the urban area remained unchanged despite the increase in population, which is related to improving energy efficiency. Renewable energy accounted for 24% of the production in the city area.

In 2017 the Earth's average temperature was the third highest and 0.84 degrees warmer than the 1900s. The warmer years have been only 2016 and 2015. According to the US Federal Weather and Ocean Research Organization NOAA, record high temperatures were achieved without the climate-warming El Niño phenomenon that existed in the last two years. In Kaisaniemi, Helsinki, the average temperature of the year was 6.6 degrees in the Finnish Meteorological Institute, slightly above the 1971–2000 reference period.

Greenhouse Gas Emissions

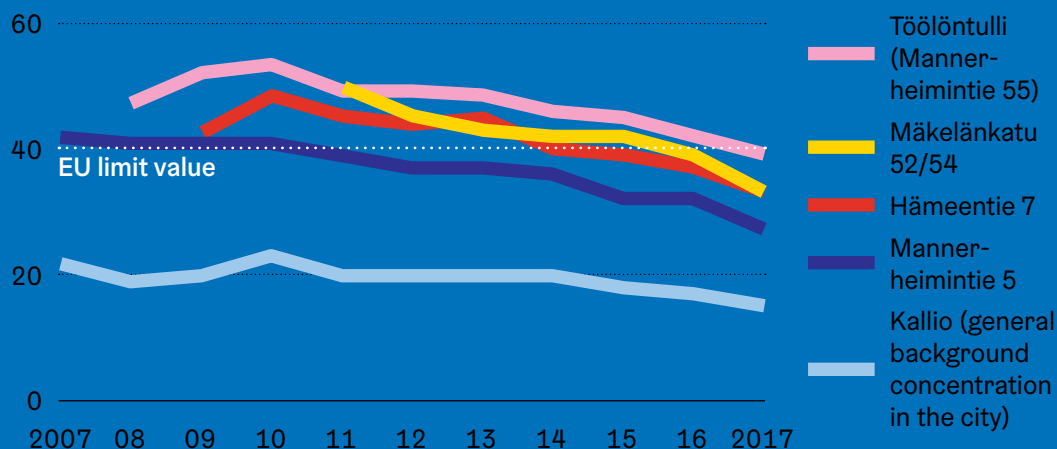
1000 t CO₂e



Air Protection

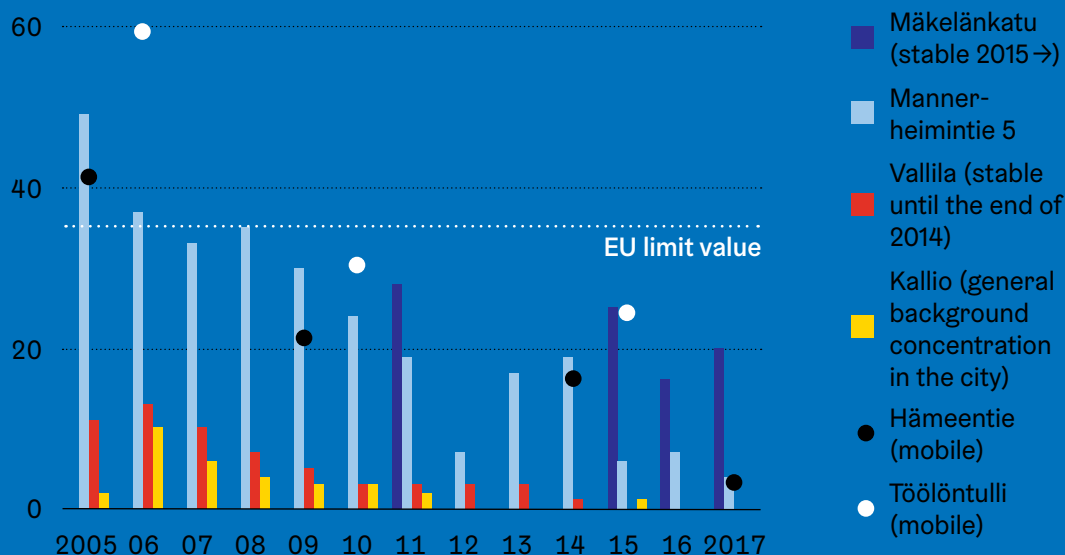
Nitrogen dioxide (NO₂) concentrations in ambient air

Annual average nitrogen dioxide (NO₂) concentrations measured by HSY's monitoring stations and passive samplers, µg/m³



Particulate matter (PM₁₀) concentrations in ambient air

The number of days when the limit value level (50 µg/m³) for particulate matter (PM₁₀) was exceeded in the air quality measurement stations in Helsinki. The limit value is exceeded if the number of days with PM₁₀ levels above 50 µg/m³ is more than 35/year.



In accordance with the city strategy, lowering the emissions of the traffic system is progressing, and emissions harmful to health are reducing significantly. The air quality in Helsinki has improved within the last few decades and years, and it is good on an international level. However, the health-based annual limit of nitrogen dioxide, specified in the EU's Air Quality Directive, is still exceeded in places in the city centre's street canyons. The reason for this are the exhaust emissions from traffic, in particular diesel vehicles. The concentrations of nitrogen dioxide have decreased especially in recent years, and the annual limit's exceedance area is estimated to still have decreased compared to last year. Additionally, the car stock's transformation into a more low emission direction can be seen. For example, more than 50 new buses started operating in the beginning of autumn, all of which fall below the strict Euro 6 emission limits. Through the environmental bonus tender, the use of biodiesel in buses has increased, which reduces nitrogen oxide and fine particle emissions, in addition to carbon dioxide emissions.

At the start of 2017, the City's new Air Quality Plan became effective and its implementation was started. The operations are intended to reduce nitrogen dioxide emissions from traffic so that the emissions will fall below the annual limit as soon as possible. Other themes in addition to exhaust emissions are street dust and small-scale combustion of wood, which also have a significant effect on Helsinki's air quality. The plan contains 48 measures to be implemented in 2017–2024.

In 2017, the concentrations of respirable particles (PM₁₀) were clearly below the limit values. Due to effective dust prevention, the limit values have not been exceeded since 2006. However, street dust continues to weaken the general air quality in spring, and the risk of exceeding the limit exists in particular in street canyons with heavy traffic. Therefore, it is very important to continue investing in the prevention of street dust, and such measures have been included in the Air Quality Plan. In addition, the City is actively

involved in projects studying the sources of street dust and methods of reducing it, such as the effect of studded tyres and tramlines in dust regeneration, for example. There is an ongoing project in cooperation with the City of Vantaa, HSY, Metropolia and Nordic Envicon Oy called Katupölyn lähteet, päästövähennyskeinot ja ilmanlaatuvaikutukset (Sources of street dust, emissions reduction means and air quality impacts).

Since 2011, the City has granted cars that fulfil low emissions criteria a 50 per cent discount on parking charges. Because the

At the start of 2017, the City's new Air Quality Plan became effective.

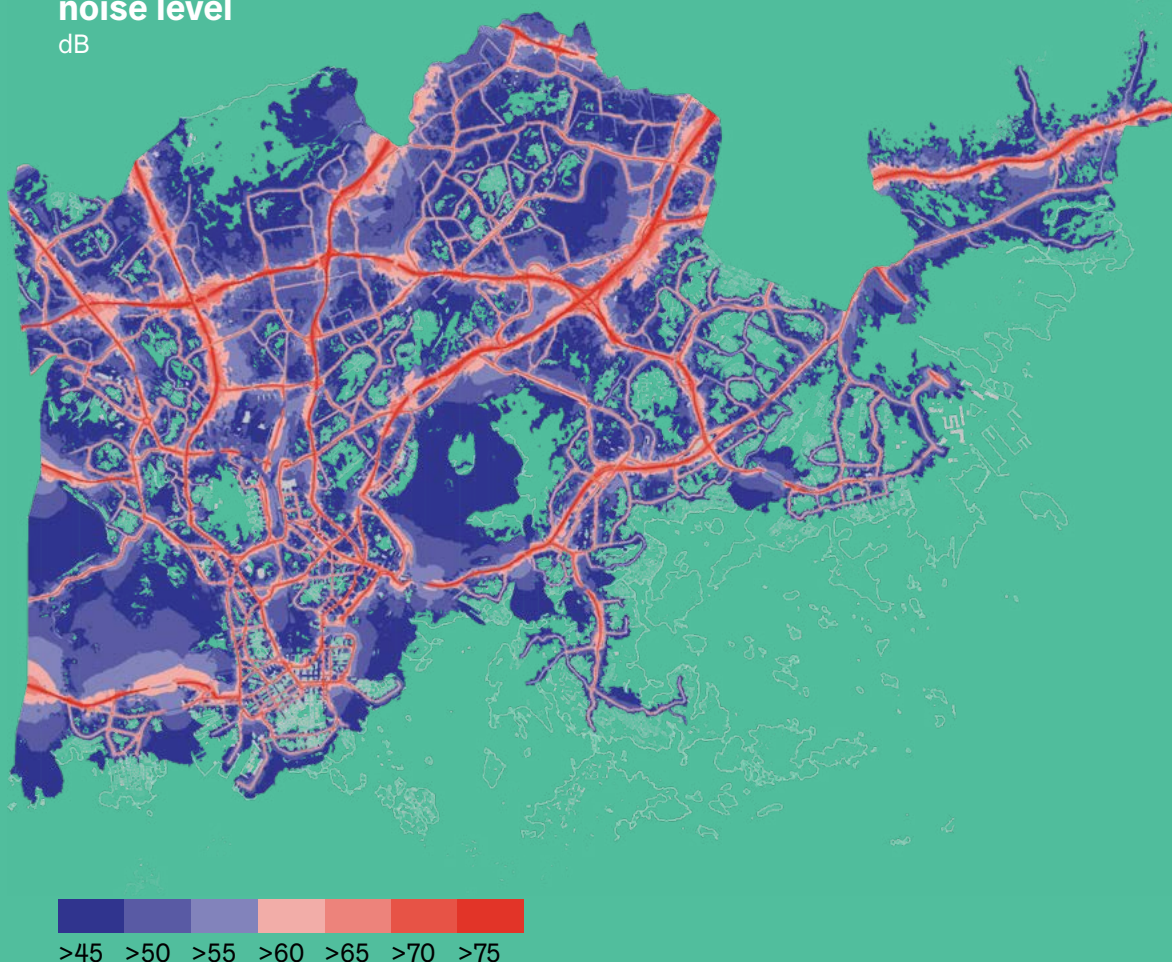
nitrogen oxide and nitrogen dioxide emissions from diesel cars have been shown to be considerably higher than what the manufacturers have stated, and because they have a considerable effect on air quality, the criteria for diesel cars were made stricter at the start of 2017. The carbon dioxide emissions from a diesel car may not exceed 50 g/km to make the car eligible for the discount. In the City's procurements, the criteria became effective at the beginning of 2018. The criteria on low emissions will be regularly reviewed as a part of the realisation of the Air Quality Plan.

The effect of diesel vehicles on air quality requires research. Together with HSL, Trafi and HSY, the City is taking part in a three-year research project coordinated by VTT, the purpose of which is to study the actual emissions of the new EuroVI buses in Finnish conditions. A joint project to study the Euro 6 diesel cars' emissions is also being launched, which is funded in addition to the City by VVT, Neste Oyj, Trafi and HSY.

Helsinki is taking part in the EU's Urban Agenda air quality project together with HSY. The goal of the project is to increase the significance of urban air quality and look for ways to enhance air quality in cities, as well as on a local, regional, national and European level. The project continues until the end of 2018.

Noise Reduction

Day-time average
noise level
dB



Environmental noise significantly affects the quality of the living environment and general comfort levels. Continuous loud noise also causes health hazards. Road traffic is the most significant cause of disturbing noise in Helsinki. According to the noise mapping project finished in 2017, 37 per cent of the residents of Helsinki live in areas where the noise level caused by road traffic exceeds the limit value of 55 dB during the day. Noise is locally caused also for example by construction and repair works, public events and restaurants.

In accordance with the city strategy, traffic investments and land use are always planned together in Helsinki. It makes it possible to pay attention to noise abatement, which was guided by the noise abatement operating plan of 2013–2017. Paying attention to noise in zoning and traffic planning is one of the most important measures. New residential areas or other noise-sensitive functions will not be placed in areas exposed to noise without sufficient noise abatement. Noise reviews have been carried out in connection to zoning, and the noise abatement needs have been taken into account in zoning markings and regulations. Efforts have been made to decrease the need for transport by making the urban structure denser. By improving the prerequisites of public transport, pedestrian traffic and cycling, the aim has been to steer traffic towards more sustainable forms of transport.

In 2017, five noise barrier projects were ongoing. The Porvoonväylä surplus earth noise barrier and wall were finished in Jakomäki, and the construction of the Itäväylä noise barrier in Herttoniemi was begun. The realisation of the Kulosaari Bridge noise barrier was in the planning phase. The construction of the Ring I surplus earth noise barrier was continued in Sepänmäki. During the renovations to Ring I, the noise barriers in Konala and Pitäjänmäki were raised. The Ring I projects were realised in cooperation with the Finnish Transport Agency.

The new noise abatement operating plan of 2018–2022 was finished in 2017. Noise disturbance prevention done in land use and traffic planning is essential. Noise levels, in turn, are reduced with the use of anti-noise coatings, reductions in speed limits and reducing the use of studded tyres. Building-specific solutions, such as improving the soundproofing of windows, are important especially by busy streets.

Out of all construction projects causing noise, most feedback from residents was caused by night work. There has been cooperation in post control of construction sites with the land use and monitoring unit that grants digging permits. Notifying the neighbourhood of future night work would be an effective method of reducing the disturbance, but this

was still not adequately handled in several construction sites. Doing community infrastructure construction and renovation work in more shifts is likely to increase, so efforts to reduce the damage will have to be made.

Large neighbourhood construction sites did a lot of pile driving, excavation and crushing in 2017, of which noise disturbance notifications were made. To prevent the construction site noise that will last for years from being unreasonable to the first residents settling in these areas, conducting the noisiest work at evenings or weekends

The new noise abatement operating plan of 2018–2022 was finished.

without a legitimate reason was not allowed. Advance notice to the area's residents was also required for work causing noise.

The project to monitor the environmental hazards in the City's construction projects was started in five neighbourhood construction sites: Central Pasila, Kalasatama, Jätkäsaari, Kruunuvuorenranta and Kuninkaantammi. Noise, dust, storage of chemicals and waste management on the sites were under enhanced monitoring.

Ending time policies for preparing the decisions on the noise notification by large outdoor concerts were implemented in 2016. These will help keep the disturbance level caused by large music events to the nearby residents reasonable. The policy applied to the Kaivopuisto, Hietaniemi, Wholesale Food Market, Suvilahti, Kyläsaari and Kaisaniemi event locations, and in 2017 the Töölönlahti park, Kansalaistori square, Mäntymäki field, Ice Hall parking lot and Malmi airport were added to the list. The Urban Environment Division provided information on concerts on its website and in social media. Additionally, a general bulletin was made on the events of Helsinki Day, which included information on the disturbances in traffic caused by the event. Good prior provision of information has been shown to reduce the noise disturbance experienced by residents.

Traffic



In accordance with the city strategy, the percentage of sustainable modes of transport is increased and Helsinki is a pioneer in comprehensive smart transport systems. The emission reductions of traffic are realised by increasing the popularity of cycling and walking and by increasing the percentage of electric cars, electric buses and rail-based public transport. Helsinki promotes transferring to a call-based transport system and works as a test bed to commercialise new smart transport services made possible by the Transport Code (e.g. Mobility as a Service) and to promote future technology.

The HSL area was ranked second in 2017's international BEST public transport study, after Geneva, third time in a row. Of the residents of the HSL area, 78 per cent were satisfied with the public transport.

Some revisions were made in the City of Helsinki's public transport. The history of metro traffic in the Helsinki Metropolitan Area received a new chapter, as the West Metro started its operations between Ruoholahti and Matinkylä in Espoo on 18 November 2017.

Raide-Jokeri was decided to be realised with the alliance model, and the parties signed an alliance agreement. A development phase lasting for approximately a year was started, with the objective of forming an implementation plan of the project, including the schedule and cost plans of the construction project. The Kruunusillat (Crown Bridges) project was also decided to be realised with the alliance model, where one work contract will be the Kruunuvuori Bridge, Finke Bridge and preconstruction of the Korkeasaari area. A design competition for the Laajasalo tram depot was also launched in the project.

22 new Artic trams started operating, and altogether 40 were operating at the end of the year. Old articulated tramcars were removed from use. Out of the 20 new M300 trains, the Metro got 18 into operation, as two trains were being repaired after crash damage. A project plan was made for the renovation of older metro trains and articulated tramcars. The Variotram tramcars are removed from operation in Helsinki at the end of 2018.

The route reform for tram transport was designed to respond to transportation needs that have changed with the developed city structure and to improve the clarity, dependability and operating frequency of the route network. Changes in the route network can be expected in the coming years, as well, when new track sections are finished.

In the spring of 2017, HKL tendered the cooperation arrangement for the design, realisation, maintenance and advertising use of stop shelters. The stop shelters will

The first fully electric buses in Helsinki started operations at the start of the year.

be renovated, and the lighting will be gradually changed to environmentally friendly LED lighting. The D model shelters will be installed with a solar electricity system, five stops will be given green roofs and efforts will be made to place more city bike stations close to the stops.

The first fully electric buses in Helsinki started operations at the start of the year. HSL has leased 12 Finnish fast-charging Linkker buses that operators can try without own investments or financial risks. The electric buses support the HSL strategic objective of making public transport nearly emissions-free by 2025. Charging points for electric buses were built in the Central Railway Station and Hakaniemi. Through the environmental bonus tender, HSL was able to reduce the carbon dioxide emissions of public transport by 13,568 tonnes in 2017 due to the biofuels used by the operators. Nitrogen dioxide emissions that decrease air quality were reduced by 6.7 tonnes and fine particle emissions by 270 kg.

The City of Helsinki's electric traffic working group published a report based on their operating term of 2015–2016 with objectives and measures to develop electric traffic until 2020. The aim is that in 2020 at least 20 per

cent of new cars registered in Helsinki are electric cars, chargeable hybrids or other low-emission cars and that the number of public charging points is at least 250 points, 20 of which are fast-charging points.

Helen Ltd opened Finland's first two-way charging point for electric cars in Suvilahti. The charging point does not only allow the charging of electric cars but also lets cars function as electricity storages and participate in regulating the electricity system.

The city bike service expanded three-fold compared to the previous year and established its place as a part of city transport. City bikes are very popular in Helsinki on an international level: as much as 1.6 million individual bike rides were made in 2017. Using the bikes has been especially frequent close to metro stations and in the peak hours of commuter traffic. Winter-time cycling conditions were improved on three main cycling routes by the use of the sweeping and salting method. In the coming years, efforts will be made to expand the prioritised route network.

In the summer, HSL and VR started a year-long experiment where bicycles can be taken into local trains free of charge whenever there is room in the carriage. Previously, bicycles have been allowed in local trains only outside of rush hours.

HSL opened a Company services website, which is a marketplace for smart transportation intended for employers. Opening the marketplace was part of the smart commuting project that received funding from the national funding application system for commuting control. The funders were Sitra and Trafi. The website offers comprehensive smart commuting guidance and the option to offer employees electric and folding bicycle trials, for example, to increase everyday exercise. The site also offers car sharing services, company bicycles, parking planning and bicycle parking solutions.

The Työpaikka, joka liikuttaa (Workplace that moves) certificate was given to five new workplaces. In addition, one of the certified workplaces got the national Työmatkaliikkumisen edelläkulkija (Forerunner in commuting) acknowledgement, awarded regionally.

The number of users of the commute counter increased by 11 users.

In the preparation of the joint Helsinki region MAL 2019 plan for land use, housing and traffic, several statements were made in 2017 on the central themes in the planning. In addition, the MAL 2019 objectives and their indicators were prepared, assessment of impacts was programmed and the methods were described in the evaluation programme outline. The outline of the plan is expected to be completed at the end of 2018.

The amount of motor vehicle traffic decreased in 2017 by 7 per cent at the border

The city bike service expanded three-fold.

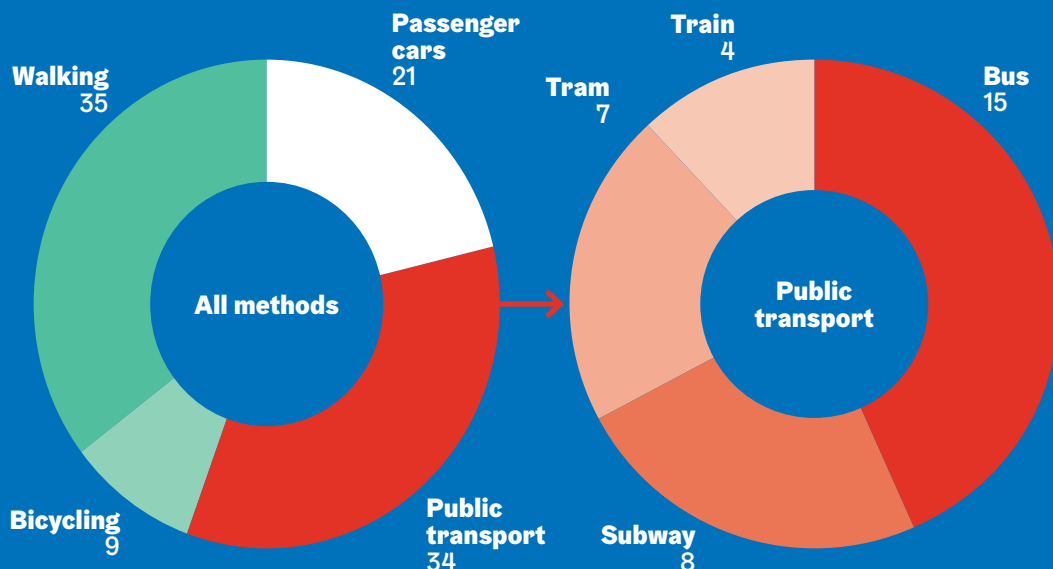
of the Helsinki peninsula and by 4 per cent at the border of the inner city compared to the previous year. The amount of motor vehicle traffic increased during the year by 6 per cent at the city border and by 6 per cent in crosstown traffic. The increase in the city border and crosstown traffic is largely due to the completion of the Ring I improvement project between the border of Espoo and Hämeenlinnanväylä.

The average bicycle traffic at the border of the peninsula on a weekday in June increased by 7 per cent compared to the previous year. In other passenger traffic, the numbers of travellers crossing the peninsular border on a weekday in autumn by public transport grew (+3.6%) whilst the numbers travelling by car fell (-6.2%) compared to the previous year. In morning traffic, the numbers of travellers crossing the peninsular border towards the city centre by public transport grew (+4%) whilst the numbers travelling by car fell (-9.8%). In crosstown traffic, the numbers of travellers using public transport fell (-5.2%) whilst the numbers travelling by car grew (+6.1%) compared to 2016.

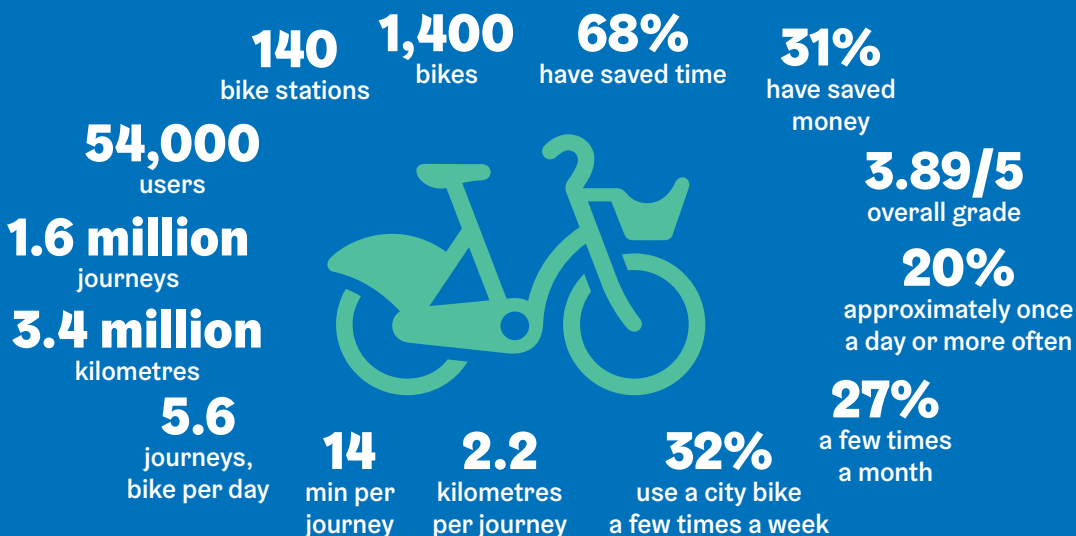
The number of Helsinki residents owning a car went up by 0.3 per cent (411 cars / 1,000 inhabitants). The number of cars in traffic use fell by 0.4 per cent (329 cars / 1,000 inhabitants).

Distribution Transport Methods

The main transport method of trips inside the City of Helsinki, % of all trips



City Bikes



City bikes have replaced especially walking, tram and bus trips, but also car trips with as much as **14% of residents**.

The most popular stations: **the Kamppi metro station, Töölönlahdenkatu, Itämerentori, the Railway station/west, the Sörnäinen metro station**

In October 2017, the city bikes were awarded the **Helsinki Travel Award 2017** honorary mention and the Helsinki Neighbourhoods Association Helka awarded the team of the city bike project with the **Vuoden teko 2017** (Deed of the year 2017) honorary mention.

Water Protection

In accordance with the city strategy, the state of the small water bodies and coastal waters of Helsinki will be improved and the revival of the migratory fish stock will be paid attention to. The significance of the sea will be strengthened and opening the nearby archipelago to public use will be continued.

The water areas in Helsinki include extensive marine areas as well as the freshwater areas of the river Vantaanjoki, various streams, ditches, ponds and springs. The water quality of the city is affected by the impurities in storm water, nutrients brought by scattered loading, cleaned wastewater led to the outer archipelago, human activities, the muddy waters flowing from the river Vantaanjoki, and the state of the Gulf of Finland. In addition to the environmental policy, water protection in Helsinki is regulated by the small water bodies programme, the storm water strategy, the flooding instructions and the action plan for the Baltic Sea Challenge.

Over a million people live in the impact area of the river Vantaanjoki, and the river winds over 100 km from Riihimäki to the bay in Vanhakaupunki. The river with its rapids is a valuable and attractive fishing location where Atlantic salmon and Brown trout travel up to spawn. In accordance with the ecological classification, the condition of Vantaanjoki is satisfactory, but the Kytäjoki area and the upper reaches of the river Keravanjoki are in good condition. Good condition would be achievable in the lower reaches as well if the annual median of the overall phosphorus concentration were to reach a level of 60 µg/l. Phosphorus and nitrogen come from wastewater and agriculture. The Jokitalkkari (river caretaker) project of the Water Protection Association of the river Vantaanjoki and Helsinki Region realised several operations in 2017, for example fish-themed signs on nature trails, upkeep of kayaking trails, cleaning river banks, angling events for children, restoration of salmon breeding grounds, electrofishing and fishing control.

In 2017, some significant anomalies were observed in the water quality of marine areas. The impact of pulses of more saline sea water pushing into the Baltic Sea in recent years was seen as an exceptionally high salinity in the Helsinki region's marine areas all the way up to September. Water salinity was elevated in both coastal areas and middle and outer archipelagos. With more saline water, phosphate levels were also elevated, which

The impact of pulses of more saline sea water pushing into the Baltic Sea in recent years was seen as an exceptionally high salinity in the Helsinki region's marine areas all the way up to September.

favours the development of cyanobacteria.

However, no significant, extensive presence of cyanobacteria was formed within Helsinki's marine area. At the end of the summer, approximately a month-long, local cyanobacteria bloom was present in the Laajalahti and Seurasaarenselkä areas. The bloom was caused by a species of the *Dolichospermum* genus, found sometimes toxic in the Baltic Sea.

During 2017, a survey of harmful substances in the sea floor was also carried out. The sea floor in the Helsinki area is in places polluted by heavy metals (especially cadmium and lead), oils and organotins. Concentrations of the PAH compound anthracene exceeding environmental quality standards were also found in places. Hardly any PCB



compounds were any longer found in the surface sediment of surveyed areas.

The Urban Environment Division monitored the water quality of 35 streams and 21 ponds. The two-year intensive monitoring of the river Mätäjoki was continued in cooperation with the City of Vantaa. Samples were also collected from Mätäjoki's tributaries and storm water sewers. The river's aquatic vegetation and the channel's transformation were surveyed with a thesis worker from the University of Helsinki.

A report was finished on the ecological condition of Östersundom's ponds, Storträsk and Hältingträsk. According to the zoning proposal, as much as 63 per cent of the catchment area of Hältingträsk would be constructed. This may endanger the substantial nature values of the pond and will require efficiency in handling storm waters.

The Urban Environment Division is renovating and monitoring the Saunapellonpuisto pond in Viikki, which suffers from eutrophication caused by a very dense fish stock. To lower the number of fish in the pond, fishing was organised and the pond's vegetation cut back.

The inner city snow survey by the working group considering options in snow reception was finished. The work on the principles concerning the handling of snow was also continued, and policies were made on the permit requirements concerning snow dumping. The number of snow reception sites has decreased in recent decades due to more compact land use. It is essential to find new handling locations. Work related to litter accumulating on beaches was continued in cooperation with the Finnish Environment Institute and the Keep the Archipelago Tidy Association. Site formation, dredging and shoreline construction increase litter. The amount of litter decreased in 2017, because no large fill work sites were in operation. Development work will continue in 2018, and a report will be finished on the shock tubes among blasted rock.

The Urban Environment Division's geoenery working group is studying if it is possible to allow the construction of geothermal wells in groundwater areas as well.

A total of 91,7 million m³ of water was pumped into the water system within the HSY water treatment area in 2017. The water consumption per capita in Helsinki was 180 litres per day, which was one litre less than in 2016. A total of 106 million m³ of waste water was delivered to the Viikinmäki sewage treatment plant for treatment, of which 76 million m³ came from Helsinki. The amount of waste water was at same level as the previous year. The Viikinmäki wastewater treatment plant met all the environmental permit regulations. Combined sewer network overflows amounted to 0.1 per cent of the overall amount of waste water.

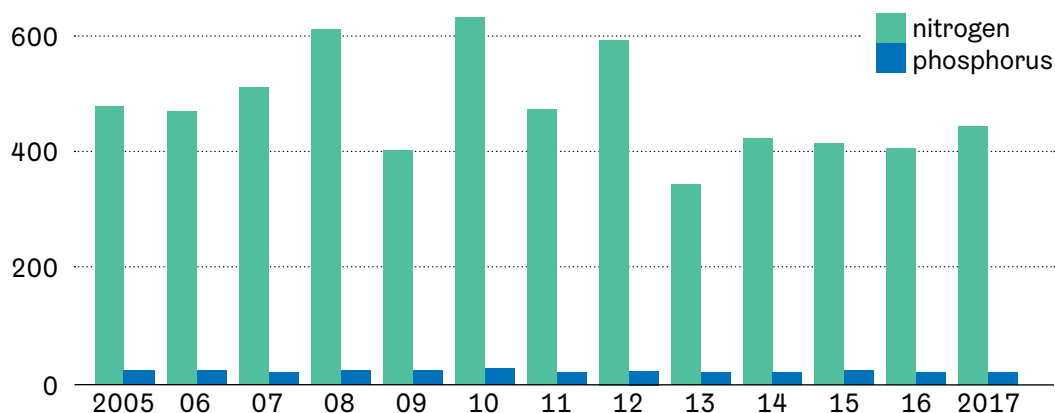
Kaupunkivesistöt kuntoon project pilots biochar and rootstock- based handling in storm water purification.

The 2017 treatment efficiency for phosphorus in Viikinmäki was 97 per cent. For biological oxygen demand, the removal efficiency was 98 per cent, and for nitrogen, 91 per cent. The wastewaters treated at the Viikinmäki wastewater plant are conducted through rock tunnels to the open sea, about eight kilometres away from the shore. The phosphorus load from the Viikinmäki wastewater treatment plant on the sea areas in front of Helsinki was 20 tonnes (–5% from the 2016 level), and the nitrogen load was 443 tonnes (+8% from the 2016 level). For eutrophication, the nitrogen load is more significant, because nitrogen is a minimum nutrient in the waterways in the Helsinki region.

The vision in Helsinki and Turku's other joint programme of measures for the Baltic Sea in 2014–2018 is a clean, productive and shared Baltic Sea. Over 40 of the programme's 75 measures were in use at the end of the year, and five were completed. Especially the measures concerning littering, storm waters and underwater noise have been sped up. The third Itämeren ihmetellen day was arranged for

Load to the Sea

Nitrogen and phosphorus load channeled to the sea from the Viikinmäki treatment plant, tons per year



school groups in Suomenlinna. Together with the Keep the Archipelago Tidy Association's Siisti Biitsi campaign, a beach clean-up week was arranged as a part of the Finland 100 programme. There has been extensive research and project cooperation with other operators.

With the Ministry of the Environment's funding for leading projects, a joint two-year Kaupunkivesistöt kuntoon project with the City of Espoo was started, with the objective of reducing the nutrient and harmful substance load of the Baltic Sea by improving the quality of storm waters. The project pilots biochar and rootstock-based handling in storm water purification. This method can also be used to reduce load, control flooding peaks and, in the event of an accident, control the spreading of emissions. The pilot sites are Maunulanpuisto in Helsinki and Otsonlahti in Espoo.

In October, the three-year BEST (Better Efficiency for Industrial Sewage Treatment) project, funded in part by the EU's Interreg Baltic Sea Region Programme and coordinated by the City, started. The project includes 15 partners from five countries by the Baltic Sea: cities, water treatment plants, universities and specialist organisations. The project improves the management of industrial wastewaters in municipal wastewater treatment plants in the Baltic Sea region by promoting cooperation between municipalities, industrial companies and water treatment plants and good management in the handling of industrial wastewaters,

and by executing pilot investments to improve process management and control load peaks in municipal treatment plants. In addition, a background survey of the current condition of the handling of industrial wastewaters in the Baltic Sea region will be conducted, as well as recommendations on better handling, when industrial wastewaters are conducted to community wastewater treatment plants. The project has been named one of the flagship projects in the EU's Baltic Sea strategy.

The Baltic Sea challenge has a partner network of 260 organisations, and tools, events and forums are being created to support their own Baltic Sea and water conservation efforts. The partner network's annual seminar was held at Musiikkitalo. The themes were the global aspects in the work on the Baltic Sea from climate change to the UN's objectives on sustainable development and from circular economy to the recent evaluation on the condition of the Baltic Sea. The Mayors of Helsinki and Turku called together a two-year local-level Baltic Sea panel for ten operators chosen from among the network partners of the Baltic Sea challenge. The panel had two meetings during the year. In addition, during the year Helsinki's Baltic Sea work and the Baltic Sea challenge received visibility in international events, such as Baltic Sea Future in Stockholm and Baltic Sea Day in St. Petersburg in the spring, as well as several EU project events.

Securing Biodiversity

In accordance with the city strategy, Helsinki treasures its valuable nature and works to increase the diversity of urban nature. The ecological quality, accessibility and health effects of green areas will be secured, the nature conservation programme will be carried out and the forest network will be strengthened. Systematic increase of diversity in forests and forested areas is the central objective of the treatment. Green surface area will be increased in the city structure to promote cost-effective management of storm waters, and the diversity of the City's parks will be increased.

The nature management policies approved by the City Board and the objectives of the LUMO programme will be adhered to in nature management. Land use planning strengthens the recreation and urban nature network and plans green infrastructure as an entity, by increasing green surfaces, providing compensation, supporting the green network and measuring green efficiency, amongst other methods.

The new city plan programme has set the goals of securing the sufficiency of recreational and green areas, development of seaside areas and development of urban nature networks as part of the recreational network. The development needs of the recreational, green and ecological networks have been identified in the programme, from the development of the green fingers, differential recreational connections and shore route to the green network's improvement projects related to construction projects.

Inspections of the green network will be added to zoning projects, so that the recreational services and ecological networks can be realised and the necessary investments can be prepared for. By implementing the green factor method, goals can be set for the green construction of blocks in the city structure. In 2017, regulations on green roofs were made in 21 of the city plans approved by the City Council during the year or those that had

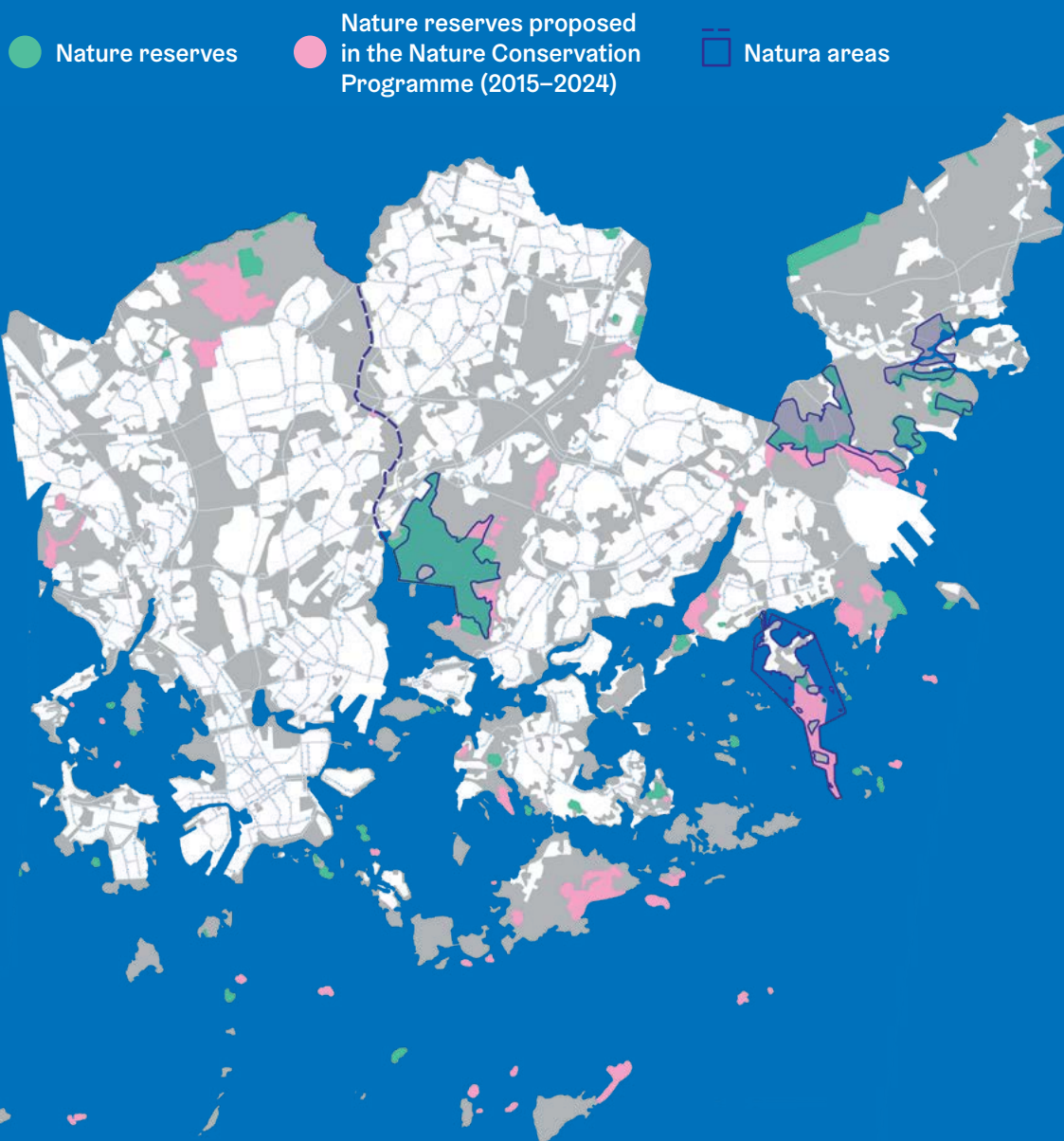
already come into effect. Green roofs were assigned to be constructed especially on one-storey building parts, outbuildings and car and bike sheds, but also on residential buildings. In three cases, the regulations on green roofs gave choices of constructing, for example, a green roof or a terrace. The surface area or number of green roofs required in the plans has not been settled. The use of the green factor method, in turn, was required in seven plans. The regulations mainly required that applying the green factor method will be reviewed in further planning of the area, so that the green efficiency of the area is in accordance with the target level of the Helsinki green factor. All plans that included regulations on the green factor method also required the construction of green roofs.

The forest, meadow and blue networks will be developed. The objectives regarding urban nature and the forest network are presented in attachment 1 of the city plan programme in accordance with the city strategy, the nature preservation programme 2015–2024 and the Urban nature map in the city plan.

In the preliminary study regarding a national city park, existing knowledge of nature has been utilised. In a work-related map survey, characteristics of Helsinki's nature and natural pearls were investigated.

The development plan for the green and recreational network of Helsinki (VISTRA II) will be applied to city planning and public area planning as source data, for example via the Paikkatietovipunen geographic data service. VISTRA II stated that the compacting city's green areas, other public outdoor areas, beaches and the archipelago will be developed as a network-like entity that provides diverse ways of relaxing in all the city's neighbourhoods. The mutual connections within and attractiveness of the network will be further improved as the city's identity-defining factors, with the areas' characteristics and diverse cultural and natural values,

Nature Reserves in Helsinki



The map indicates the 55 currently existing nature reserves in Helsinki, the new nature reserves proposed in the Nature Conservation Programme (2015–2024) and the Natura areas. Currently, 2.2 per cent of all land area is nature reserves, as compared to 0.5 per cent of water areas. When including protected nature types, species protection areas, and Natura 2000 areas not protected by the Nature Conservation Act, the total protected area amounts to 3.7 per cent of Helsinki's land area and 1.0 per cent of water areas. The new proposed nature reserves would nearly double the area.

such as the cultural environments that are located within the green areas and the forest network that maintains natural diversity, used as the starting point.

The good results received from the ecosystem service review that was piloted in Vanhakaupunki's area plan, and the methods and models for improving the ecosystem service that were developed during that work, were compiled into a set of instructions. These instructions together with their method descriptions are mainly intended for regional planners and planning consultants. The instructions are supplemented by the background material report on the attention paid to ecosystem services in regional planning. In addition, water catchment area reviews have been piloted into the area plans. The pilot will factor in a more extensive water catchment area than the area plan when planning the area.

The Kruunuvuorenranta bat survey was completed for city planning and area implementation planning. The survey gathered data on bat occurrences, breeding and resting areas, hunting grounds and flight routes in the area. In addition, experiences on the experiment to switch off street lighting in the area during the summer and its effect on the bats was gathered in the report.

The Public Works Department started a project in December 2016, the purpose of which was to compile instructions for paying attention to strictly protected animal species occurring in Helsinki in zoning, planning and construction. As a result of the work, the instructions "Luontodirektiivin liitteen IV(a) eläinlajien huomioon ottaminen Helsingin kaupungin hankkeissa" (Taking animal species of the Habitats Directive Annex IV(a) into account in the projects of the City of Helsinki) were completed in 2017.

The realisation of the City of Helsinki's nature conservation programme for 2015–2024 was continued. A protection proposal and a management and utilisation plan were formed for the nature reserves in the old forest of Korkeasaarenluoto and Kivinokka. The old forest of Kivinokka was given to Finland as a birthday present as a part of the "Luontolahjani 100-vuotiaalle" (My gift of

nature to a centenarian) campaign. A draft of a management and utilisation plan was prepared for the coming nature reserve of Haltialanmetsä. A protection proposal was formed for the Veräjämäki grove, which is outside the nature conservation programme.

Sediment studies were conducted in the Vanhankaupunginlahti Natura area, and their results will show whether dredging according to the management and utilisation plan can be done. The occurrence of dragonfly species mentioned in the EU Habitats Directive in the

A protection proposal and a management and utilisation plan were formed for the nature reserves in the old forest of Korkeasaarenluoto and Kivinokka.

area was also investigated for the realisation of possible dredging.

The occurrence of habitats in accordance with Section 29 of the Nature Conservation Act was surveyed in Meri-Rastila and Juorumäki in Puotila.

Surveys of endangered habitats were made in Östersundom, Laajasalo, Uutela, Vartiosaari, Ramsinniemi, on the shores of the river Vantaanjoki and on seashores. The survey defined 470 sites, 120 of which had excellent or good diversity.

The green shield-moss survey found 20 new occurrences of the species. Green shield-moss is a bryophyte species that has been classified as critically endangered (CR) in Finland. It is also a protected species according to Annex II of the EU Habitats Directive, and a species under strict protection according to the Nature Conservation Decree. The woodland areas of Helsinki play a fairly major role as regards the species' overall distribution in Finland.

The 136 most significant bird areas in Helsinki were defined based on the bird surveys conducted in Helsinki in recent years.

In accordance with the prioritisation plan for controlling invasive species by the invasive species working group, the focus in 2017 was on controlling the 25 most harmful plant species and five animal species. In the regional prioritising, the priority fell on nature reserves, endangered habitat types and locations with endangered plant species. The control resources were targeted based on the prioritisations. Only the Persian hogweed will be completely eradicated from Helsinki, if possible, while efforts are made to keep the other species away from agreed areas. The control was done primarily by the City's own workers, but also by volunteering residents and park pals.

The control of alien plant species in Helsinki has been instructed by compiling a training package on the most harmful alien plant species for the city's green professionals. The package includes instructions in identifying and controlling plant species, as well as information on the plants' characteristics and distribution.

Regarding the "Show on a map" resident survey on the Spanish slug, a report has been written that, in addition to stating data on the slugs' distribution, presents ways of managing the environment to control the slugs' population and distribution.

The summer of 2017 was cool, and no masses of the Spanish slug were encountered. Removal of the Prussian carp by fishing was started in Vanhankaupunginlahti, and fishing for the Prussian carp was organised, as in previous years, at the Saunapellonlampi pond as well. With the help of fishing, monitoring data is received as the number of fish is reduced.

The EU-funded NATTOURS – Sustainable urban nature routes using new IT solutions project, in operation in 2016–2018, was continued in cooperation with the City of Tallinn. During the project, the cities' valuable nature locations will be restored in order for the residents and tourists to be better able to enjoy urban nature. In 2017, a new accessible duckboard path, approximately

one kilometre in length, was constructed from Pornaistenniemi to Lammassaari. In addition, the construction of an accessible bird watching platform in Lammassaari and the replacement of information boards were started. The work will be completed in the spring of 2018. During the project, ten urban nature sites were compiled into a mobile website and mobile nature trails that are suitable for schoolchildren as well. The website was published in the spring of 2018.

Helsinki Zoo houses approximately 170 species, of which over one third are endangered. New additions to the Zoo include the Azara's agouti, greater guinea pig, Eurasian harvest mouse, golden mantella, a small spur-thighed tortoise found in the forest in Siuntio and leeches confiscated by Finnish Customs. The Zoo has successfully bred endangered or rare species such as the markhor, Przewalski's wild horse, Père David's deer, vicuña and two Finnish forest reindeer calves to be reintroduced into nature in the WildForestReindeerLIFE project. Animals born in the Helsinki Zoo (e.g. Pallas' cats, an Amur leopard and owls) were taken to other zoos, and Finnish forest reindeer to the Ähtäri Zoo to wait for reintroduction into nature.

Helsinki Zoo is a member of the European Association of Zoos and Aquaria (EAZA) and works in close cooperation with zoo experts and various conservation organisations around the world. In 2017, the Helsinki Zoo was visited by a French reproductive biologist, and the objective of the started cooperation is to increase the genetic diversity of markhors in captivity by artificially inseminating goats with cryopreserved semen. Over 400 gene samples of the animals in the Helsinki Zoo have been collected into the Zoo's low-temperature freezer, and these form a part of the EAZA Biobank hub.

The Helsinki Zoo Wildlife Hospital treats injured and orphaned wild animals, as well as informs and educates on current topics concerning wild animals. In 2017, the work of the Wildlife Hospital was awarded with the "Vuoden eläinsuojeluteko" (Animal protection deed of the year) award of the Finnish Federation for Animal Welfare Associations.

Restoration of Contaminated Soil and Landfill Sites

The most significant contaminated soil restoration locations managed by the City were the project areas of Kalasatama and Jätkäsaari that were to be transformed into residential use. In addition, there were large restoration projects in the area of the old wastewater treatment plant in Vuosaari and in Herttoniemi on Kirvesmiehenkatu. In addition to the large projects, several individual small sites were inspected and restored in 2017. Soil was decontaminated at approximately 40 different restoration locations. The soil restoration was usually done during the other construction work in the areas. The soil condition database created by the Ministry of the Environment features the details of 863 areas in Helsinki where research has shown the soil to be contaminated, where the soil has been assessed as being potentially contaminated or where the soil has been restored.

The soil was cleaned in the same way as in previous years, primarily by excavating the soil containing harmful substances and transporting it elsewhere for appropriate processing. Soil was also restored by isolating the contaminated soil matter on site. Below is an overview of how the contaminated soil matter was transported for treatment or final disposal in Helsinki in 2014–2017. Some of the excavated, contaminated soil matter was utilised in landfilling at construction sites, mainly for the base structures of parks, and in landfill sites.

The costs generated by the restoration of contaminated areas and landfill sites decreased from the last few years. Below are details of the costs for the City of Helsinki caused by the restoration of contaminated

In 2017, a total of 1,110,292 tonnes of excavated non-contaminated earth mass was used in the construction of public areas. 107,821 tonnes of non-contaminated earth mass was sent to external recipients.

soil and landfill sites in 2014–2017.

A total of 70,135 tonnes of contaminated soil was transferred to be processed or disposed of, which is significantly less than last year.

In 2017, a total of 1,110,292 tonnes of excavated non-contaminated earth mass was used in the construction of public areas. 107,821 tonnes of non-contaminated earth mass was sent to external recipients.

Contaminated Soil Matter Transported for Treatment or Final Disposal in Helsinki 2014–2017

	2014	2015	2016	2017
Soil, ton	96,642	180,000	300,000	70,135

The Costs for the City of Helsinki Caused by the Restoration of Contaminated Soil and Landfill Sites 2014–2017

	2014	2015	2016	2017
Costs, euro	7,310,000	10,370,000	23,480,000	19,671,000



Procurement

In accordance with the city strategy, Helsinki will assess how it can direct its procurements to better promote innovative entrepreneurship. The City's environmental policy sets ambitious objectives in terms of making procurements more sustainable.

Helsinki is a Fairtrade city.

The environmental network of the procurements aims to increase the internal cooperation in the City and exchanging information between the parties responsible for the City's procurements. The environmental services and the procurement and tendering unit of the City Executive Office have also published the The City of Helsinki instructions on sustainable procurements and make joint sustainable procurement consultation visits to the City's divisions.

To take one example, in 2017 the City's food procurements were developed regarding dairy products and fruit and vegetables. Criteria were defined regarding, for example, animal welfare, soy use, energy consumption and employment. In addition, environmental and low-emissions criteria for the procurement of heavy vehicles and working machines were developed in cooperation between the municipalities in the Helsinki Metropolitan Area, and an extensive market survey was conducted on operators in the field.

A meeting of the national sustainable procurement network was arranged in Helsinki in October 2017. Regarding procurements, the City was still actively involved in international cooperation on sustainable procurements and the Procura+ network.

The biggest environmental impacts in the food services were the result of the ingredients used. In the Service Centre, environmen-

tal impacts are reduced primarily through means of product development and menu planning (e.g. by developing recipes that take climate impacts into account and serving vegetarian food).

The use of organic ingredients has been increased in day care centres since 2012, and day care centres are on level three in the six-level Steps to organic food programme. For the third year in a row, the Service Centre won the Finnish organic food championship in the category of large public food service providers. The share of organic food calculated from ready portions is approximately 15 per cent. In addition to organic products, especially vegetarian food is currently invested in. A selection of new vegetarian foods was added to schools' menus in the autumn, developed and chosen together with the students. All day care centres and schools in Helsinki hold a local and organic food week.

During 2017, 20 day care centres implemented a vegan food experiment. Based on the results of the experiment, from the start of 2018 all day care centres in Helsinki have offered vegan food for children who are on a vegan diet at home. There are just under 50 of these children in day care centres in Helsinki. The physiological need for energy, protein and several other nutrients per kilograms of bodyweight is larger with children than with adults. For this reason, the implementation of a vegan diet for small children is particularly challenging. Researchers at the University of Helsinki started the MIRA Helsinki study in cooperation with the City with the topic of Micronutrients in the nutrition of the children of Helsinki.

Helsinki is a Fairtrade city. In 2017, the City of Helsinki Service Centre used 2,698 kg and Palmia Oy 22,859 kg of Fairtrade products. The largest product groups were coffee, tofu and sugar.

Waste and Circular Economy

In accordance with the city strategy, circular economy projects will be implemented in Helsinki in cooperation with the corporate world and residents. Helsinki wants to function more and more actively as a platform for interesting and profitable innovations.

Due to the use of excavated earth mass, 6,8 million euros were saved.

In 2017, the city organisation produced 5,254 tonnes of mixed waste, 3,685 tonnes of bio waste, 551 tonnes of recovered and office paper, 711 tonnes of cardboard and cartons, 168 tonnes of energy waste, 70 tonnes of plastic, 78 tonnes of metal and 58 tonnes of glass. The amount of hazardous and oily waste was 3.1 tonnes, construction, concrete and wood waste 271 tonnes, grease separation well slurry 15 tonnes, and electrical and electronic waste 5 tonnes.

Pipe-line collection systems for waste have been constructed in Jätkäsaari, Kalasatama and Kruunuvuorenranta, the benefit of which is the collection of waste from a single point. This reduces the waste truck traffic in the area, improves the cleanliness and safety of the environment and encourages people to reduce waste and increase recycling.

The use of cloth hand-drying rolls in the organisational departments promotes material and ecological efficiency. In 2017, a total of 129,023 rolls were used, which replaced 14–20 million paper towels.

Avoiding food waste is both economical and beneficial for the environment. In the Service Centre, efforts are made to reduce the generation of food waste, e.g. by monitoring demand

and developing the food preparation process, as well as encouraging customers to reduce food waste, for example with the help of campaigns. Efforts are also made to develop solutions for utilising the generated food waste, and a pilot project is being developed to sell surplus food via a food ordering application.

Coordinated management and utilisation of excavated earth reduced transportation and the resulting emissions. In 2017, a total of 1,110,292 tonnes of excavated earth mass was used in the construction of public areas. The amount increased by 46 per cent from the year 2016. Due to this use, 6,8 million euros and 360,000 litres of fuel were saved and the emissions were reduced by 900,000 CO₂e. Masses were utilised the most at the West Harbour project area.

In the autumn, a questionnaire on circular economics was conducted for divisions and municipal enterprises, whose results will be analyzed and refined during 2018.

In 2017, principles for handling excavated earth, rock material and demolition material were prepared, and they were completed in 2018. This improves the preconditions for circular economy in the processes of the urban environment.

A condition of circular economy is that the area has sufficient locations where masses can be stored and processed. The City has six sites, where materials such as blasted rock, surplus soil, ash from power plants and contaminated soil are stored and processed in accordance with the sites' environmental permits. Additionally, asphalt, concrete and brick waste are crushed and dredged sediment dried at the sites. At the end of 2017, mass stored at the sites totalled 1.5 million m³.

In 2017, the Public Works Department used 101,000 tonnes of hot mixed asphalt. Recycled asphalt was used in 44 per cent, out of which 50 or 70 per cent was crushed asphalt.

Environmental Awareness and Responsibility

The official Finland 100 project of the Urban Environment Division was the website www.suomenpresidentit.fi. The project includes a short film and a teaching package on presidents. Seventeen guided tours were made to the presidents' statues during the year. Summer flower plantings were done with blue and white flowers. Other events that were arranged included spruce planting events, receiving Japanese cherry trees from the Sakura Foundation in Japan, guided park walks, the 50-year anniversary of the Meilahti arboretum, the 10-year anniversary of the arboretum's rose garden, the Finnish Nature Day and the opening ceremonies of the Alakivenpuisto and Kalasatamanpuisto parks. In the autumn of 2017, 25,300 flower bulbs were also given for residents to plant in parks.

The most popular nature excursions were the Marine biology for the whole family on Harakka island, Migratory birds in Lauttasaari and The ruffs of Viikki excursions. Over 22,000 residents took part in the spring cleaning bee.

The activities of the Nature School Arkki of Helsinki Zoo included, in addition to nature school days, for example the Koululaiskonferenssi conference for schoolchildren and the Helsinki Zoo Day for schools. "The wildest club in the country" intended for 2–5-year-old children in home care continued its operations, and the "wolverine weeks" event was arranged for the preschool groups in Helsinki. The Zooklubi activity was developed together with Youth Department workers and young people. Helsinki Zoo celebrated Finland's centennial by taking part in the celebration of the Finnish Nature Day. The events held by the Helsinki Zoo were Pääsiäissaari (Easter Island), Kissojen yö (Night of the Cats), Viettelysten Ilta (Night of Temptations), Korkeasaaripäivä (Helsinki Zoo Day) and Halloween.

The Environmental Youth Work Unit conducted an environmental survey to find out

young people's values, opinions and suggestions on environmental matters. The survey was answered by over 600 young people. Based on the survey, young people consider environmental matters important and are interested in ecological cooking, event organising, nature camps and photography and helping animals and people. The survey will be done annually, and operations will be developed together with young people based on its results.

Transport plans were made at HSL's friendship schools. Each school chose a hit squad comprised of pupils and a teacher in charge, who executed projects designed by themselves to develop commuting trips in their schools. HSL awarded the Hyvä koulutie vie pitkälle badge to nine schools that finished their commuting plans.

Helen Ltd encouraged citizens to save energy. During the year, Helen Ltd talked about energy, its smart use and the energy industry at Energiatori, power plants and schools to 3,800 people.

Ilmastoinfo organised resident evenings on efficient property maintenance during the year. In the Solar power to homes campaign resident evenings and case presentations on realised solar power projects were organised, and the turnkey deliveries of solar power packages were compared. The Exercise to exercise campaign encouraged to leave your car at home when going to exercise, and it involved the sports facilities of the City of Helsinki and Urheiluhallit Oy, among others. A presentation on the environmental impacts of food was held at the What's cooking Helsinki food blogger event. Food waste, vegetarian food and sorting matters were highlighted at the Food Waste Festival in Teurastamo. The Climate match test was taken by hundreds of visitors at the Tikkurila festivaali and Flow festivals.



Environmental Risks

Due to climate change, extreme weather conditions will increase and forecasting will become more difficult. Invasive species also cause harm, and the risk of an oil incident at the Baltic Sea is great. From the City's perspective, the most significant environmental risks are fires, oil and chemical spills, soil and water contamination, deterioration of air quality, diminishing biodiversity, disruptions in the railway network, and the challenges posed by extreme weather phenomena to healthcare, in particular. Preparing for these risks is done through organised actions.

According to the city strategy, Helsinki is a functioning, safe and comfortable city. Part of the safety is preparedness for the effects of climate change. In March 2018, a climate risk evaluation report was completed in cooperation with the Finnish Meteorological Institute, based on which the largest risks are storm water floods caused by heavy rain, inland floods, slipperiness, extreme and abnormal winter conditions, symptoms caused by prolonged darkness, heat waves, drought and the eutrophication of the Baltic Sea. The evaluation also responds to the requirement of the Compact of Mayors climate initiative.

In 2017, the policies on adjusting to climate change were completed, and they will be used to prepare for the already ongoing climate change. The aim of controlling climate change is to limit the rise in the average global temperature to 1.5–2 degrees. However, the current emissions development seems to be leading closer towards a four-degree rise by the end of the century. In Helsinki, this means a rise of over six degrees. Adjusting to climate change refers

A climate risk evaluation report was completed, based on which the largest risks are storm water floods caused by heavy rain, inland floods, slipperiness, extreme and abnormal winter conditions, symptoms caused by prolonged darkness, heat waves, drought and the eutrophication of the Baltic Sea.

to the means of reducing the detrimental effects of climate change and utilising the benefits. The policies are a plan to help Helsinki adjust to climate change. The plan is in effect for two City Council terms, 2017–2025.

The adjustment vision presents what a climate-proof Helsinki will look like in 2050. To make the adjustment vision possible to achieve, actions are needed now. These actions are addressed with four themes. These themes are preparedness, integration, development, and overall economy and business opportunities. Every theme in-

Oil Spill Damages in Helsinki

	2014	2015	2016	2017
Drainage system	24	39	31	75
Important ground water areas	1	2	10	11
Other areas	294	317	303	278
Total	319	358	344	364

cludes central operations or priorities to be focused on during the next two City Council terms. The adjustment policies have been formed for the needs of the City's planning. The proposed measures are included in the City's planning and guidance, for example in city planning, adjustment and preparedness planning, the storm water control programme, the flood strategy and the programmes for green area development and nature preservation and management. Helsinki is a part of several city networks, some of which require the cities to form an adjustment programme.

In 2017, 37 horse-chestnut trees had to be removed from Tokoinranta because of a bacterial infection (*Pseudomonas syringae pv aesculi*). It is possible that the infection came years ago with planted supplementary saplings and gradually started to spread. No occurrences of the Asian long-horned beetle (*Anolophora glabripennis*) were found with visual inspections in the Helsinki area in 2017.

Helsinki's oil spill response preparedness was improved with trainings and equipment upkeep and maintenance. Oil spill response training is an integral part of preparing for oil spill response: they help to ensure sufficient human resources in oil disasters on land and in water areas. The preparedness of the oil spill response fleet was improved by procuring three class D oil spill response vessels, which will be able to both collect oil spilled in the water and provide help in booming and produce logistics when fully equipped. In Helsinki, the maritime oil spill preparedness is maintained in cooperation between divisions

providing maritime services. This method ensures that the oil spill preparedness in Helsinki is remarkably good. The Uusimaa rescue departments work on coordination to develop the overall oil spill response

37 horse-chestnut trees had to be removed from Tokoinranta because of a bacterial infection.

preparedness in the HIKLU group (Helsinki, Eastern Uusimaa, Central Uusimaa, Western Uusimaa), which started operations at the start of 2017. The work is led by the Helsinki City Rescue Department.

Helsinki Zoo's responsibility to act in the event of an oil spill was defined in connection with the international BALEX oil spill exercise in 2012. Since 2014 the Zoo's vet has acted as the WWF's Chief Veterinarian in regard to oil spills. The actions of this responsibility, such as trainings and exercises, are related to preparing for oil spills and take place in cooperation with the Finnish Environment Institute and the Helsinki City Rescue Department. The Chief Veterinarian organised training in cooperation with the Rescue Department regarding the care and handling of injured wild animals and took part in the Sea Alarm oil spill response course in Belgium. In 2017, two oil spill response exercises were organised either partially or fully in Helsinki Zoo in cooperation with WWF, the Helsinki City Rescue Department, SYKE and Metsähallitus.

Environmental Economy

Environmental economy includes the income, costs and investments made primarily for environmental reasons. The information is presented for the parent organisation: the City's divisions, public enterprises and departments.

The environmental costs of the City of Helsinki, including amortisations, added up to a total of 89 million euros (+2 from 2016). The environmental costs of the City of Helsinki made up 2.1 per cent of the City's total operating costs, equalling 139 euros per capita. The City's largest expense items were the costs of sanitation and waste management of the areas (24%), climate protection (20%) and promoting climate and environmentally friendly transport (17%). The City's environmental costs were on the same level as the previous year.

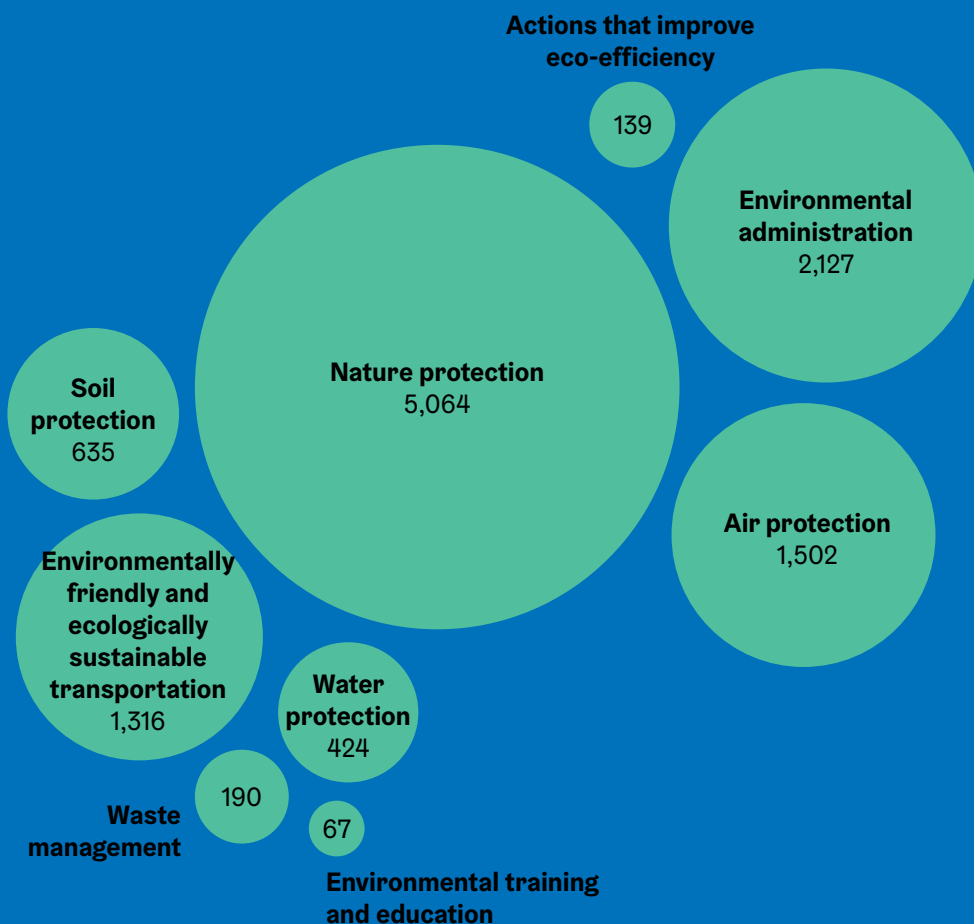
The environmental investments made by the City of Helsinki added up to 145 million euros, which was 23.5 per cent of the total capital expenditure of the City and 226 euros per capita. The City's environmental investments remained at the same level as the previous year, and the largest investments were targeted at promoting climate and environmentally friendly transport (HKL's fleet acquisitions) and soil decontamination.

The environmental income for the City of Helsinki added up to 11.5 million euros, making up 1.0 per cent of the total operating income of the City and 18 euros per capita. The greatest sources of environmental income for the City were the proceeds from the ticket sales of the Helsinki Zoo.

The City's largest expense items were the costs of sanitation and waste management of the areas (24%), climate protection (20%) and promoting climate and environmentally friendly transport (17%).

The City's Environmental Income

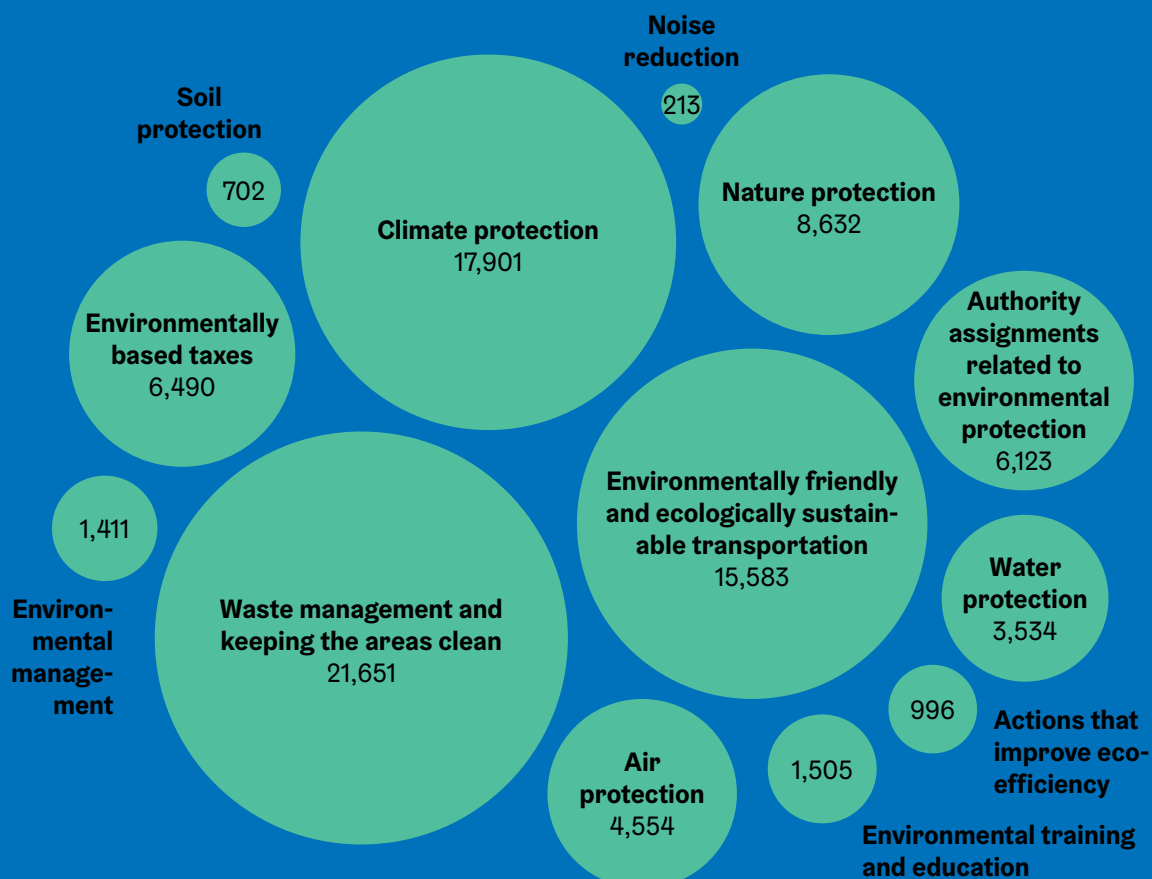
City organisation in 2017, thousand euros



	2016	2017
Nature protection	4,796	5,064
Environmental administration	722	2,127
Air protection	1,034	1,502
Environmentally friendly and ecologically sustainable transportation	382	1,316
Soil protection	149	635
Water protection	99	424
Waste management	207	190
Actions that improve eco-efficiency	134	139
Environmental training and education	67	67
Environmental income	7,590	11,485

The City's Environmental Costs

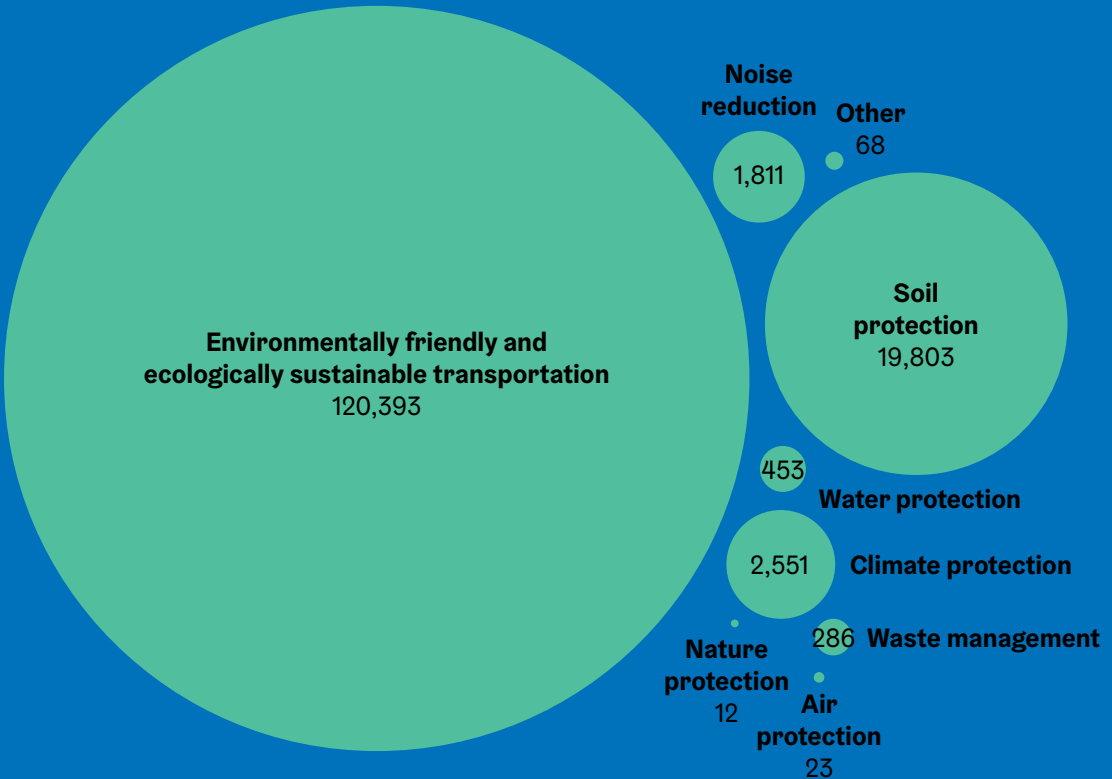
City organisation in 2017, thousand euros



	2016	2017
Waste management and keeping the areas clean	21,729	21,651
Climate protection	15,474	17,901
Environmentally friendly and ecologically sustainable transportation	15,130	15,583
Nature protection	9,278	8,632
Environmentally based taxes	6,196	6,490
Authority assignments related to environmental protection	6,187	6,123
Air protection	4,852	4,554
Water protection	3,535	3,534
Environmental training and education	1,663	1,505
Environmental management	1,440	1,411
Actions that improve eco-efficiency	340	996
Soil protection	1,252	702
Noise reduction	213	213
Environmental costs	87,292	89,926

The City's Environmental Investments

City organisation in 2017, thousand euros



	2016	2017
Environmentally friendly and ecologically sustainable transportation	118,026	120,393
Soil protection	23,046	19,803
Climate protection	1,645	2,551
Noise reduction	1,768	1,811
Water protection	1,139	453
Waste management	1,778	286
Air protection	18	23
Nature protection	25	12
Other	2,334	68
Environmental investments	149,778	145,402

Indicators

- The objective is reached or is about to be reached
- The realisation of the objective is proceeding
- It is challenging to reach the objective

Indicators for environmental management and partnerships

Objective

The share of administrative branches (out of all administrative branches) that carry out environmental management at least in accordance with the criteria for streamlined environmental systems will be 100% by 2020 (environmental policy)	66%	●
Number of administrative branches (of administrative branches that use bonus schemes) where environmental management is part of the bonus scheme will be 100% by 2020 (environmental policy)	25%	●
The combined number of audited EcoCompass companies, Climate Partners companies and organisations that have accepted the Baltic Sea Challenge will increase (environmental policy)	342 pcs	●

Indicators for climate change mitigation

Objective

Greenhouse gas emissions in the Helsinki region to fall by 30% from the 1990 level by 2020 (Strategy Programme 2013–2016)	–24%	●
Per capita greenhouse gas emissions in the Helsinki region to fall by 39% from the 1990 level by 2030 (Helsinki Metropolitan Area Climate Strategy)	–42%	●
Greenhouse gas emissions from energy production to fall by 20% from the 1990 level by 2020 (Strategy Programme 2013–2016)	–4%	●
Energy consumption per capita in the Helsinki area to fall by 20% from the 2005 level by 2020 (Environmental Policy)	–15%	●
Renewable energy to account for at least 20% of total energy production by 2020 (Environmental Policy, Strategy Programme 2013–2016)	15%, Helen Ltd 24%, The City	● ●

Indicators for air protection

Objective

Annual average nitrogen dioxide concentration on the Mannerheimintie monitoring station will not exceed 40 µg/m ³ in 2015 (EU directive)	27 µg/m ³	●
Annual average nitrogen dioxide concentration on the Mäkeläkatu monitoring station will not exceed 40 µg/m ³ in 2015 (EU directive)	33 µg/m ³	●
Number of days when the limit value level of particulate matter exceeds on the Mannerheimintie monitoring station will be max 35 days per year in 2010 (EU directive)	4 pcs/a	●
Number of days when the limit value level of particulate matter exceeds on the Mäkeläkatu monitoring station will be max 35 days per year in 2010 (EU directive)	20 pcs/a	●

Indicators for noise reduction

Objective

Noise barriers to protect current land use will be constructed as presented in the operating plan	3,950 m	●
Anti-noise coating will be used as presented in the noise operating plan	2,450 m ²	●

Indicators for traffic

Objective

The share of walking, cycling and public transport will be increased by % point per year from the starting point of 75% (strategy programme 2013–2016)	78%	●
The number of public transportation trips will increase (strategy programme 2013–2016)	375 trips/resident/a	●
Carbon dioxide emissions of road traffic in Helsinki will reduce 20% by 2030 (the climate strategy of the metropolitan area)	–10%	●
Carbon dioxide emissions of passenger cars registered for the first time in Helsinki will reach the objective for average emissions 130 g CO ₂ /km by 2015 (EU regulation)	115.9 g CO ₂ /km	●
Share of cycling as a transport mode will be 15% by 2020 (the Brussels Convention 2009)	9%	●

Indicators for water protection

Objective

Nitrogen emissions to the sea from the Viikinmäki waste water treatment plan will reduce (t/a) (environmental policy)	443 t/a	●
Phosphorous emissions to the sea from the Viikinmäki waste water treatment plant will be reduced (t/a) (environmental policy)	20 t/a	●
Number of combined sewer network overflows will reduce 20% from the current level by 2020 (environmental policy)	–27%	●
Number of trained oil spill response personnel will reach a level, where the city will have a sufficient number of trained people for beach clean-up operations	840 persons*	●

* The city's focus point in oil prevention is at the sea and most of the oil prevention patrols trained thus far were trained for marine operations. The objective is to train 340 officers and petty officers for cleaning the shores, who will lead the companies of coastal cleaning organisation. The cleaning staff will be trained by the officers and petty officers of each company after an oil spill has occurred, immediately after the companies have been established. All in all, the objective is to train 1,000 persons for oil prevention at sea and on the coast. The training has already started for 840 people.

Indicators for nature protection

Objective

Share of nature reserves of total area (City of Helsinki Nature Conservation Programme 2008–2017)	2,2%	●
The surface area of water-permeable areas in Helsinki (the urban run-off water strategy for the City of Helsinki 2008)	60% (2015)	●

Indicators for procurements and waste

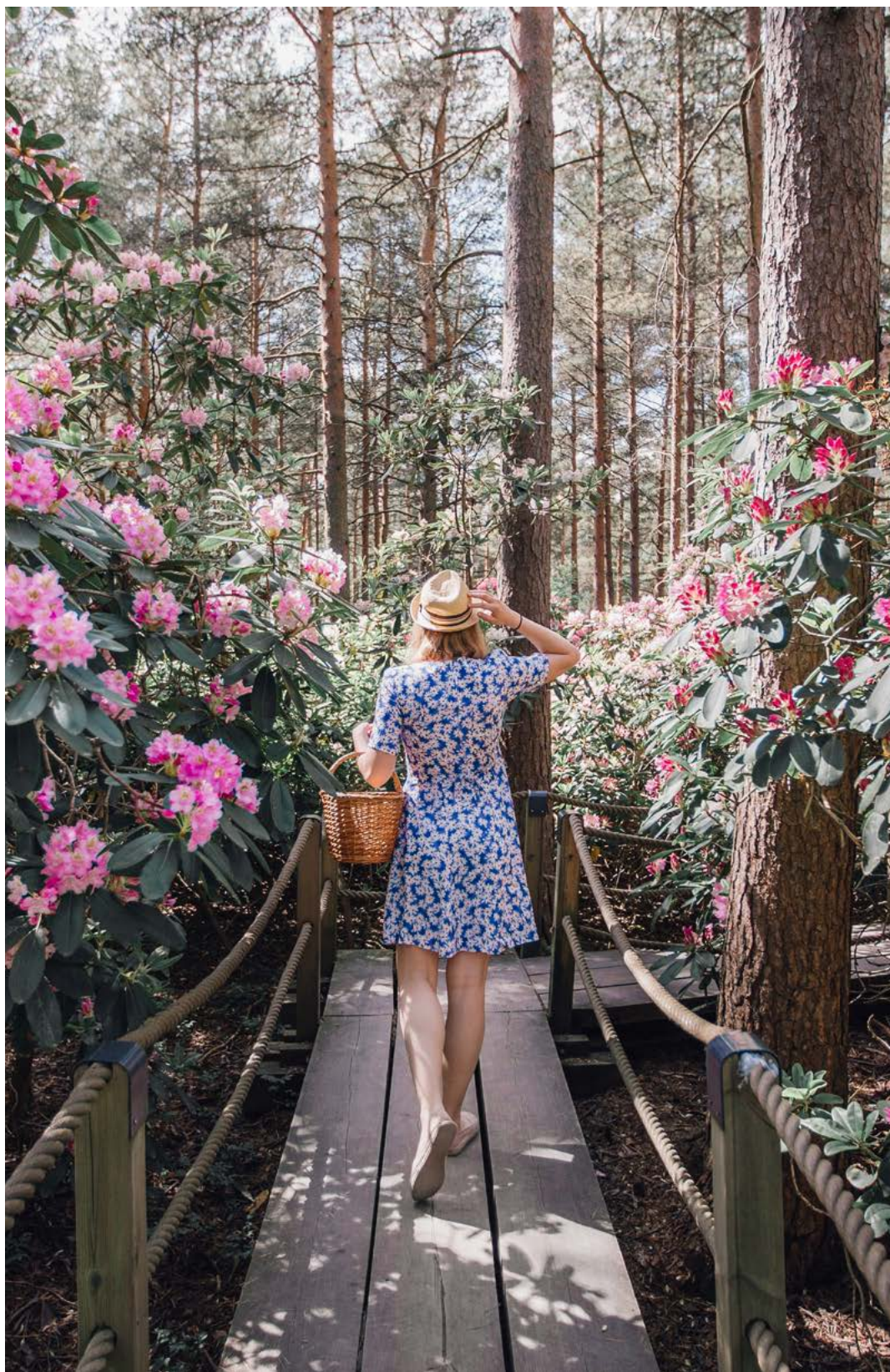
Objective

Share of environmental criteria in the centralized acquisitions of the City of Helsinki will be 50% by 2015 and 100% by 2020 (environmental policy)	56%	●
Amount of communal waste produced in the Helsinki metropolitan area per capita will reduce 10% by 2020 (environmental policy)	313 kg/resident/a (2016)	●

Indicators for environmental awareness

Objective

The number of eco-supporters in the city organisation will increase, so that every work community will have a dedicated eco-supporter (environmental policy)	1,293 eco-supporters	●
The share of citizens who have taken part in the environmental education events and climate and energy guidance provided by the city will increase, so that the environmental awareness of city personnel and citizens will be improved (environmental policy)	38%	●



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All of the 4 divisions, 5 municipal enterprises, City Executive Office and Audit Department have produced information for the report compiled and edited by the Urban Environment Division. The City of Helsinki Group also includes 12 foundations and 83 subsidiary organisations, 50 of which submitted information for the Environmental Report.

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The logo consists of the word "Helsinki" in a white, sans-serif font, centered within a white-outlined speech bubble shape. The background of the entire page is a solid blue color, with a large, irregular yellow shape on the right side that resembles a stylized map of Finland.

Helsinki

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