

City of Helsinki

2015

# Environmental report





# Contents

- 4      Review by the Deputy Mayor**
- 6      Helsinki in a nutshell**
- 7      Environmental Key Figures**
- 8      Environmental management and partnerships**
- 10     Climate protection**
- 14     Air protection**
- 16     Traffic**
- 18     Noise reduction**
- 20     Water protection**
- 24     Conservation of nature and soil**
- 28     Procurement**
- 29     Waste and material efficiency**
- 30     Environmental awareness and responsibility**
- 32     Environmental risks**
- 34     Environmental economy**
- 38     Environmental indicators**
- 40     Contents for diagrams and charts**

# Review by the Deputy Mayor

2015 will go down in the history of humanity: In December a global agreement was reached in Paris on climate change mitigation. Cities have a key role to play in ensuring that the objectives agreed upon in Paris are realised. Before the conference Helsinki published its Climate Roadmap, which outlines the City's route to carbon neutrality. Helen Ltd's decision on the closure of Hanasaari coal power plant was an important leap in the right direction for Helsinki. The rising temperatures also requires ever more adaptation and anticipation work.

The Mayor of Helsinki recently placed the City of Helsinki Climate working group under my leadership, with the majority of the group's members being department directors. Broad networking and effective communications are essential in ensuring that all the key players are involved in climate work.

Helsinki is carrying out a thorough renewal of its management system. The different functions will be assembled into broader entities, which will facilitate the improved integration of environmental matters into all of the City's operations. The city's rapidly growing population must be ensured a comfortable and healthy environment. The council to be elected in spring 2017 will, as its first job, decide on the City's new strategy, in which environmental questions will play a key role.

Over the course of the last few years Helsinki has become a city of an ever broader range of events, and this enriches the lives of citizens in many ways. These new events are also linked to phenomena which are considered to be harmful, such as noise and littering. Helsinki strives to carry out all events in a way that is sustainable for both citizens and the environment.

The majority of environmental work is carried out within everyday routines. The City has over 1,200 trained eco-supporters, who are an important resource in this work. The vegan food which arrived on the menus of Helsinki City Hall's restaurants was one example of the ideas submitted by eco-supporters.

Many residents want to get involved in concrete work to improve the quality of their own local environment, and voluntary activities are popular. The first beach cleaning bee was organised in Vanhankaupunginkoski in cooperation with the Baltic Sea challenge and the Public Works Department's Park Pals scheme, and more are set to follow.

In environmental matters perspectives vary from global climate matters to the immediate circle of each resident. With the flow of information growing faster and faster, the old saying "think globally – act locally" has become more tangible than ever. Helsinki wants to ensure that it is always a forerunner and trend setter when it comes to environmental matters, both in Finland and internationally.

**Pekka Sauri**  
*Deputy Mayor*



# 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 1.4 million residents, which is referred to as the Helsinki Region. As of 31 December 2015 Helsinki had a population of 630,225. As of the end of 2015 the population density was 2,946 residents per land area square kilometre. The city of Helsinki's surface area is 715.48 km<sup>2</sup>, of which 213.75 km<sup>2</sup> (29.9%) is land, 0.86 km<sup>2</sup> is inland waters, and 500.87 km<sup>2</sup> sea waters. The majority of the city's green areas are forest (37.2 km<sup>2</sup>), parks (9.9 km<sup>2</sup>) and landscape fields or meadows (8.0 km<sup>2</sup>). There were a total of 411,347 jobs in Helsinki in 2015. Helsinki accounts for 16.9 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 (27 departments and 4 municipal enterprises)
- subsidiary communities, i.e. organisation which are owned directly by the City (83 subsidiary organisations and 11 foundations)
- associated communities, i.e. companies, foundations and joint municipal authorities in which the City has a 20–50 per cent ownership stake (56 associated companies and 6 joint municipal authorities)

At the end of 2015, the City employed 37,876 people.

**This environmental report sets out the Environmental Policy measures taken in 2015.**

Greenhouse gas emissions have decreased by

**25 %**

The proportion of journeys residents made on foot, bike or public transport was

**76 %**

**59,7 %**

of the surface area of Helsinki is water-permeable

The water consumption of Helsinki residents was

**181 litres**

day/resident

**85 %**

of all centralised procurements include environmental criteria

**In the new policy for the ending times of concerts a maximum number of concerts permitted to finish after 10pm for was defined for each concert venue.**

# Environmental management and partnerships

The observance of environmental issues in Helsinki is governed by the strategy programme 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.

Environmental matters are a part of the City's strategy. The Environmental Policy complements the strategy, and its realisation is to be monitored in the environmental report. Through use of the indicators, the realisation of the strategy can also be monitored.

## Environmental criteria for events were implemented in 2015 in Helsinki, Espoo and Vantaa.

The major international event Gymnaestrada (25,000 performers, 4,000 volunteers and the audience) gave visibility to environmental aspects. Sorting of waste and recycling, use of tap water, vegetarian food and environmentally friendly modes of transport at the event made the values more visible even in the granting of the EcoCompass certification. The Environment Centre's EcoCompass system was audited for its second three-year-period in December 2015 and the Kinapori Service Centre was the first Department of Social Services and Health Care service point to build an EcoCompass environmental management system. Kinapori's staff, and in particular the eco-supporters, play a key role in EcoCompass work. Helsinki Zoo aims to be carbon neutral by 2050. The EcoCompass system, which was audited

in May 2016, is a major support in this work. In total, EcoCompass is in use nationally in 81 companies, events and city departments.

The energy and water consumption of the Finnish National Opera and Ballet have fallen significantly due to EcoCompass, by limiting water flow, adjusting the running times of ventilation, and renewing lighting to introduce LED bulbs. Furthermore, a technical building services renovation project was implemented, whereby the energy efficiency and adjustability of the ventilation equipment were improved. The water cooling machines were replaced with district cooling, which has helped to reduce the amount of electric energy used by the property.

The shopping bag consumption of the member pharmacies of the pharmacy chain YTA Oy – which built an EcoCompass system – have reduced significantly, by up to half in places. Previously customers were asked whether they needed a bag at the counter. Now they are asked "can you take your purchases as they are".

Environmental criteria for events were implemented in 2015 in Helsinki, Espoo and Vantaa. On the basis of a survey carried out on the topic, the majority of event organisers felt that using the criteria was easy. In Helsinki three events were granted a 30 per cent discount on the hire fee charged for area usage, following an EcoCompass event systems audit.

Flow Festival, which has built an EcoCompass event system, calculates the event's carbon footprint each year, and provides compensation for the emissions. All the electricity used comes from renewable sources, and investments are made in sorting waste and preventing its generation in the first place. In 2015 the carbon footprint reduced by 12 per cent, and in proportion to the number of visitors by as much as 30 per cent. During 2015 Flow

also developed the ecology of the event's catering provisions. The Festival guided food sellers to offer ecological portions by piloting the Sustainable Meal instructions. The food sellers received support in the form of instructions on food sales in keeping with sustainable development, and an evaluation form which focused on areas such as the origins of raw ingredients, ethicalness and packaging materials.

The World Village Festival – which has built an EcoCompass event system – transfers to so-called night-rate electricity outside its opening hours. With the need for electricity dropping radically during the times in question, the large generators are turned off and the electricity supply is transferred to grid electricity and smaller generators available in the area. The night-rate electricity operations, which began in 2015, saved a significant amount of fuel – as well as money, naturally – involving relatively little trouble when compared to the benefit.

Eco-support activities continued to increase, and since 2006 1,200 eco-supporters have been trained for 28 of the City's organisational departments and nine subsidiary communities. Eco-support activities are being realised according to Helsinki's model in 24 other municipalities, at the Centre for Economic Development, Transport and the Environment for Uusimaa, and at HSY. The results of the eco-supporters' work can be enjoyed in the restaurants of City Hall, for example. An eco-supporter at the City of Helsinki Executive Office's launched an initiative to get a warm vegan meal on the daily lunch menu at a restaurant in the City Hall. The appeal was well received and the results of a test period carried out in January 2015 were clear. Vegan food has stayed on the restaurants' menus permanently, and broad bean

patties, for example, are one of the most popular foods when available.

Climate Partners – a cooperative network formed between the City of Helsinki and businesses – gained 12 new members (AVAIN Yhtiöt, Bionova Oy, Finnair Oyj, Helen Ltd, Helsingin KTK Oy, HUS, LeaseGreen Group Oy, Naps Solar Systems Oy, Neste Oil Oyj, SRV Yhtiöt Oyj, St1 Oy and Taloakeskus yhtiöt Oy). So far 52 organisations have joined

## **The programme for Smart Kalasatama's Agile Piloting involves the procurement of small pilots that will bring innovative services for residents to use.**

the Climate Partners network. Climate Partners organised workshops throughout the year with the companies. At the annual seminar ambitious climate and cleantech objectives were presented. Additionally, a new kind of cooperation was formed when the Kesko food stores group, Gasum, Myllyn Paras and Wursti began a form of cooperation whereby the shops' biowaste was turned into biogas and used as energy for the production of new Pirkka products.

The programme for Smart Kalasatama's Agile Piloting involves the procurement of small pilots that will bring innovative services for residents to use. The first four pilots began in spring 2016. The pilots are related to smart movement (Tuup Oy), making waste management more efficient (Kalasataman Palvelu Oy and housing companies), reducing food waste (Foller) and joint development of local services (Yhteismaa ry).

## JANUARY 2015

- Information on Helsinki's good climate practices is communicated via the [www.stadinilmasto.fi](http://www.stadinilmasto.fi) website
- Helsinki joined ICLEI's Green Climate Cities campaign to test tools that will help with climate change mitigation and adaptation

## MARCH

- Climate Roadmap 2050 was completed
- Helsinki, Espoo and Vantaa began their broad Smart & Clean collaboration project with Sitra
- Helen Ltd's EIA of its increased use of biofuels in Helsinki saw it being awarded the Good EIA award
- Suvihti solar power plant was completed

## APRIL

- Urbaani selviytyminen (Urban Survival) day taught visitors how to prepare for storms, floods and scorching temperatures

[www.urbaaniselviytyminen.fi](http://www.urbaaniselviytyminen.fi)

## MAY

- Through the Urban LEDS project European cities are helping cities in developing countries to develop their climate change mitigation and adaptation measures <http://urbanleds.iclei.org/>

## JUNE

- Energy Guidance for Consumers in the Helsinki Metropolitan Area rewarded members of the management of housing companies in Kontula for their well-implemented energy efficiency actions
- At the world-wide Climathon 24 hr hackathon event coordinated by Climate-KIC visualisation of the energy consumption of Helsinki's schools was scrutinised

## AUGUST

- The evaluation of the climate impact of investments was tested in connection with the drawing up of a street plan for Iso Roobertinkatu

## SEPTEMBER

- A tool for storm water management was completed in the CityWater project
- Helen Ltd started to sell renewable (pellet) district heating for households

## OCTOBER

- The City's climate network was founded

- Iso Roobertinkatu becomes a climate street

[www.ilmostokatu.fi](http://www.ilmostokatu.fi)

- Diversified energy production report was completed

- The heat loss and solar energy potential of Helsinki's buildings was mapped as part of the Decumanus project <https://kartta.hsy.fi>

## NOVEMBER

- Viikki Environment House received Finland's first energy reserve as part of the property's smart electricity network

## DECEMBER

- Climate Partners seminar's theme was 'Helsinki Metropolitan Area as a Smart & Clean reference area'
- Helen invested in renewable energy and diversified energy production, Hanasaari power plant to be closed by 31 December 2024 at the latest
- Breakthrough at the Paris Climate Change Conference – resulting in a climate agreement binding on all countries
- Helsinki joined the Compact of Mayors commitment, which aims to reduce greenhouse gases, increase renewable energy and adapt to climate change
- Helsinki Environment Centre became Finland's first carbon neutral department

## JANUARY 2016

- FinSolar project that promoted solar energy and created new collaboration, procurement and funding models, concluded
- The 50/50 project, which promotes energy savings in schools, continues in Helsinki – half of the savings to schools

## FEBRUARY

- The Mayor founded a climate group to coordinate the City's climate work
- Smart Construction seminar was organized in collaboration with Climate Partners and Smart Kalasatama

## APRIL

- Kivikko solar power plant was completed

## MAY

- The Association of Finnish Local and Regional Authorities rewarded City of Helsinki's climate work

# Climate protection

Helsinki's climate work is guided by the Strategy Programme approved by the City Council, the City's Environmental Policy and the City's energy policy guidelines. Together with neighbouring municipalities, the Helsinki Metropolitan Area climate and adaptation strategy was drawn up. In March 2015 Helsinki published its Climate Roadmap, which sets out how Helsinki will become a carbon neutral city and adapted to climate change by 2050. The roadmap combines the City's current climate objectives and actions, as well as short-term steps towards carbon neutrality. The main emphasis is on informing residents and companies: what carbon neutrality means and what kind of steps should be taken now to put us on track for carbon neutrality. The aim is to encourage the residents of Helsinki to act to mitigate climate change and adapt to it. Thousands of copies of the Roadmap were distributed and it was presented at numerous events to City workers, residents and other interest groups, at occasions including the Paris Climate Conference.

One objective of the new City Plan is to support the City's general climate and emissions reductions objectives, and its climate impact was evaluated as a separate part of the evaluation of the plan's impacts. The objective of the City planning is to anticipate changing climate conditions and calculate what will make a well-coping city in the future, through measures such as sustainable planning for storm water, reducing the need for transport in the ever denser urban environment, flood protection means and green roofs. This also creates the preconditions for the realisation of a carbon neutral urban environment, by means such as utilisation of rail-based public transport, wood-construction areas, preservation of carbon sinks, use of solar panels and green roofs, and sheltered microclimate plans.

A Climate Network has been founded for the employees of the City of Helsinki, whereby those involved can learn about climate work from one another, carry out cooperation, disseminate information to others, and develop new climate projects together. The objective is to get those working for the City on climate matters, and those who are interested, involved. The kick-off event for the Network was held in October. Those interested can join the network through the Facebook group "Helsingin ilmastoverkosto". The group already has over one hundred members.

## The Mayor set up a working group to coordinate climate work, carry out monitoring, and promote the realisation of actions.

The Mayor set up a working group to coordinate climate work, carry out monitoring, and promote the realisation of actions. In spring 2016 the working group prepared a report on the impacts of the Paris Climate Convention, and definitions of the forthcoming climate objectives for the 2017–2021 council term's Strategy Programme. Helsinki's Climate Roadmap 2050 will function as a basis for the City's preparation work.

Climate Street is a project being implemented on Helsinki's Iso Roobertinkatu and in Tikkurila, Vantaa, developing a low-carbon city of the future. With a joint effort, residents, companies and property owners are seeking out and trialling solutions to lower the areas' energy consumption and greenhouse gas emissions. The operations began in late autumn 2015 with the energy efficiency mapping of buildings and the production of materials about the implementation of solar energy, costs and suitability for old building stock.

Through the Helsinki Metropolitan Area Energy Guidance for Consumers project, the cities of Helsinki, Espoo and Vantaa offer training – which is free of charge – for housing company management members to support decision making. Members of the housing companies' management can have significant impact on the realisation of the cities' climate objectives. An individual housing company can save a significant amount of energy with its own actions, and at city level the impacts will be substantial. Energy Wise Housing Company

## In 2015, the total greenhouse gas emissions produced by Helsinki's residents, services and industry were 25% lower than in 1990. The emissions calculated per capita were 41% lower than in 1990.

training will tackle methodical building management and improvement of energy efficiency. In the 2014–2015 heating season district heating consumption amongst the housing companies involved in the training in the Kontula area fell by five per cent, without investments. Comparable savings across all of Helsinki's apartment block housing stock could be in the region of nine million euros.

The iWater – Integrated Storm Water Management project began in December 2015. The primary objective is to improve city planning by developing integrated storm water management methods and solutions, which can be used to adapt to climate change and create a high-quality and sustainable urban environment in the cities of the Baltic sea.

At the end of 2015 a report was completed on the promotion opportunities for diversified energy production and improvement opportunities for the energy efficiency of the city's properties and urban environment. The report stated that the theoretical potential of solar energy equates to a quarter of current electricity consumption, and ground heating to a third of the heat consumption of

Helsinki's buildings. In technoeconomic terms too, a large proportion of current demand is already realisable. According to the report the proportion of the heating demand that could be provided for by diversified (solar and ground heating) production methods could reach approximately 18 per cent by 2030. The report also states that Helsinki's overall heating needs will fall from the current level of 7.7 TWh to 7.1 TWh by 2030. This would require the realisation of properties' energy efficiency potential to the tune of approximately 1 TWh, which has taken into account the additional energy consumption new construction will bring about.

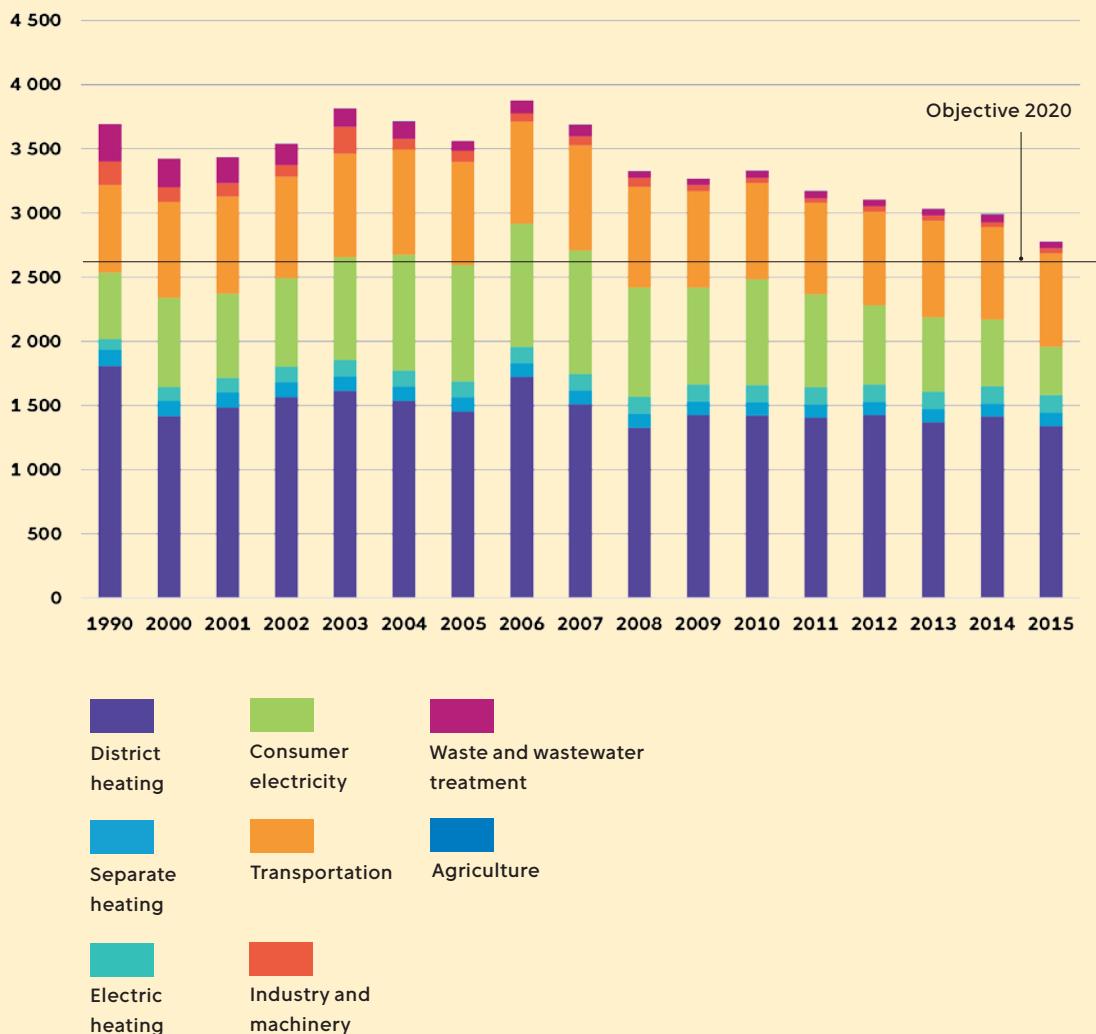
In 2015, the total greenhouse gas emissions produced by Helsinki's residents, services and industry were 2,779 kt CO<sub>2</sub>e, or 25 per cent lower than in 1990. The emissions calculated per capita were 41 per cent lower than in 1990. In recent years emissions have been reduced by the reduction of national emissions, the decrease in specific emissions from Helen Ltd's energy production and the improved energy efficiency of the urban area, which are due to the reduction in industrial electricity use, imported electricity and the good hydropower situation.

The total weather-corrected consumption of energy in the city area increased by 0.4 per cent, but resident-specific consumption decreased by one per cent. The weather-corrected consumption of district heating in Helsinki increased by one percent due to the growing building stock, but electricity consumption continued to decrease.

Global temperatures in 2015 reached unprecedented highs, and the start of 2016 has continued to be record-breakingly warm. The National Oceanic and Atmospheric Administration in the US reported that the average global temperature set a new record in 2015 and was 0.9 degrees warmer than in the 1900s. NOAA began taking measurements in 1880. On a more local scale, a new annual average temperature record was set in Helsinki too in 2015, with the Kaisaniemi measuring station recording an average temperature of 7.8 degrees. Temperature measurements have been taken in Kaisaniemi since 1829.

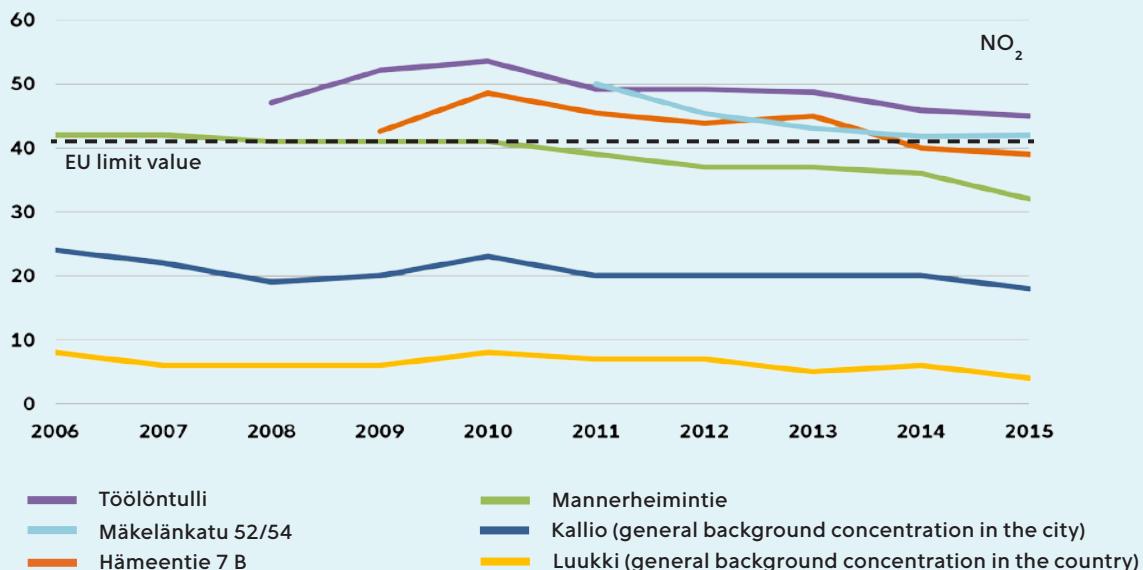
# Greenhouse gas emissions

1 000 t CO<sub>2</sub> e



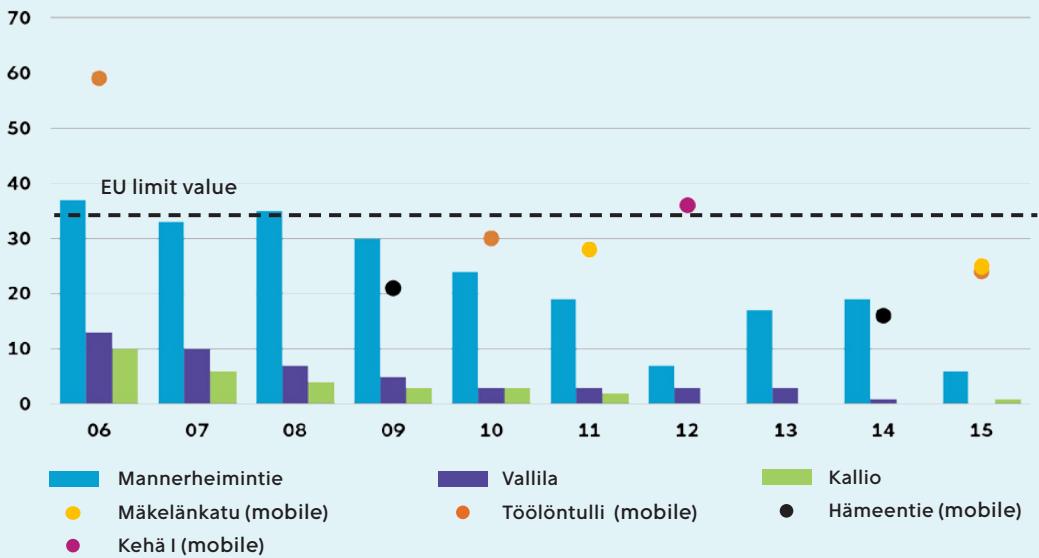
# Nitrogen dioxide ( $\text{NO}_2$ ) concentrations in ambient air

Annual average nitrogen dioxide ( $\text{NO}_2$ ) concentrations measured by HSY's monitoring stations and passive samplers



# Particulate matter ( $\text{PM}_{10}$ ) concentrations in ambient air

The number of days when the limit value level ( $50 \mu\text{g}/\text{m}^3$ ) for particulate matter ( $\text{PM}_{10}$ ) was exceeded in the air quality measurement stations in Helsinki. The limit value is exceeded if the number of days with  $\text{PM}_{10}$  levels above  $50 \mu\text{g}/\text{m}^3$  is more than 35/year.



# Air protection

The limit value set for nitrogen dioxide in the EU's Air Quality Directive is being exceeded due to exhaust gas emissions on busy street traffic routes in the centre of Helsinki. Helsinki was granted time extension to get the levels below the annual limit value by January 1st 2015, but the nitrogen dioxide levels are still above the limit value. For this reason, the City is to draw up a new Air Protection Plan by the end of 2016. Residents were also given the opportunity to comment on the preliminary proposals, during autumn 2015, and on a draft of the plan in its entirety in March–April 2016. The Air Protection Plan will be completed in late 2016.

City planning develops innovative solutions to safeguard the environmental health of this growing city, through means such as carpooling trials, smart transport solutions, real-time traffic information and the placing of different functions.

In February 2016 HSY's new permanent air quality monitoring super-site was installed on Mäkelänkatu, which will allow for a more in-depth analysis of the impact of traffic emissions on the composition of city air. Mäkelänkatu was selected as the location as particularly high air pollution concentrations have been measured there. In addition to HSY's own measurements, special monitoring will also be carried out at Mäkelänkatu in cooperation with research organisations.

The limit value for particulate matter ( $PM_{10}$ ) was not exceeded in 2015. However, the risk of exceedence still exists in heavily trafficked areas. The problems become particularly visible during spring's heavy street dust period. In 2015 the period was exceptionally severe due to the weather conditions, and particulate matter concentrations rose to momentary highs. However, the efficiency of street dust prevention took the spotlight again as the highest concentrations measured in the centre of Helsinki were still significantly lower than those of a number of other municipalities. Dust suppression and fast street cleaning have reduced street dust concentrations. Research into the topic was also continued through the KALPA project, which incorporates an examination of the emissions of new studded tyres, the dust effect of tramlines, and a closer examination of the sources of street dust.

Since 2011 the City has granted cars that fulfil low emissions criteria a 50 per cent discount on parking charges. As the nitrogen oxide emissions of diesel cars have been demonstrated to be significantly above the official emissions levels, the Air Protection Working Group proposes in its amendments to the criteria that diesel cars be removed from the parking benefits list. The proposal is set to go to the City Board in spring 2016.

## In February 2016 HSY's new permanent air quality monitoring super-site was installed on Mäkelänkatu.

The Helsinki region is growing fast, which also puts pressure on the transport system. In 2015–2016 HSL established the preconditions required to implement pricing for vehicle traffic, and how it could impact upon the everyday life of residents of the region, as well as on the transport system, environment, growth and competitiveness. According to the report, pricing would reduce travel times by a tenth, travel times could be predicted more accurately, transport chains would become smoother, and moving around the city would become safer. At the same time, the competitiveness of public transport, walking and cycling would improve.

HSL and the Environment Centre were involved in the Joukkovoimalla harrastuksiin (Teaming up for Transport) project, which developed sustainable transportation opportunities for the everyday lives of families with children. The project was implemented in Pakila and Viikki. The family oriented car-based mode of transport was the best known and most common method of transporting children to their activities. The best known and most-used method of shared transportation was car-pooling. Methods of transportation based on sustainable modes of transport were known, but such shared transportation methods were foreign to many. However, they did awaken interest. Accompanying children by bike or public transport was seen as an intermediate step, during which the parent taught the child the route and ensured that the child knew how to travel to their activity independently.

# Traffic

Transport, and the emissions of car traffic in particular, have the largest impact on air quality in Helsinki, as they are released close to air that is breathed in. The main road network had roughly the same amount of passenger car traffic as in the previous year (+0.2%). Car ownership amongst residents of Helsinki grew 0.5 per cent to 404 cars per 1,000 residents, but the number of cars in traffic use fell 0.3 per cent to 328 cars per 1,000 residents.

## Cycling grew in popularity based on mechanized calculation in 2015 during June-August by 5-10 per cent.

The numbers of travellers crossing the peninsular border on a weekday in autumn by public transport grew (+2.9%) whilst the numbers travelling by car fell (-3%). Additionally, numbers of travellers crossing the peninsular border into the city by public transport in the morning grew (+4.3%) and numbers in cars fell (-1%).

Cycling grew in popularity based on mechanized calculation in 2015 during June-August by 5-10 per cent, The change ranged between -1 per cent and +22 per cent depending on the counting point. The largest instances of annual growth were recorded at the Munkkiniemi bridge and Hesperian park counting points.

The HSL area was ranked second in 2015's international BEST public transport study, after Geneva. Of the residents of the HSL area, 81 per cent were satisfied with the public transport.

The objective of the Strategy Programme is to increase sustainable modes of transport by four per cent. Favouring sustainable means of transport is a key principle in the preparation of the City Plan. In January 2015 the City Board approved Helsinki's Urban Mobility Policy (Helsingin liikkumisen kehittämishjelma), which officially gave walking and cycling greater importance than driving. The City Board approved also the City Logistics Action Plan (Citylogistiikan toimenpideohjelma), which includes, among other measures, the development of a parking ID for delivery traffic and a development project for waste transpor-

tation. Furthermore, the Baana cycling network was expanded and in December the City Planning Board approved the traffic plan for Hämeentie and it was approved by the City Council in April 2016. In the plan thoroughfare by car will be prohibited between Kurvi and Hakaniemi, the functionality of public transport will be improved, and modern cycle paths will be added along the entire length of the road.

The Transportation System Plan of the Helsinki region (HLJ2015) was approved in March 2015. The key point in the plan is increasing the efficiency and competitiveness of the region by investing in the public transport trunk network and its service level, as well as enhancing the role of walking and cycling in the transport system.

The Paloheinä tunnel and Kuusmiekentie public transport street were completed in August, when HSL began running trunk route 560. The route has become very popular amongst passengers.

The tram project set up by the City Council continued in 2015, when the definition of the role of tram transport as a form of transportation was started, in association with the preparations for the City Plan. The Raide-Jokeri project plan was drawn up in collaboration between Helsinki, Espoo and HSL. The City Council decided to approve a zoning plan for a bridge between Sompasaari and Kruunuvuorenranta. In the Kruunusillat (Crown Bridges) project the general plan for the bridges section was prepared.

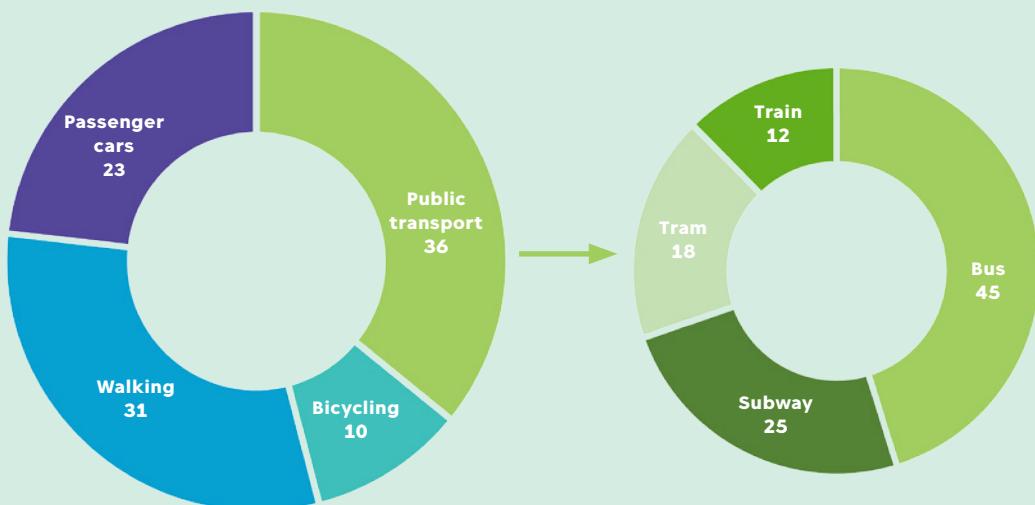
The first two new Arctic trams were introduced into passenger traffic, and the feedback received from passengers has been very positive. The mass-produced tram, which has been developed further on the basis of user experiences, arrived in Helsinki in January 2016. The first M300-series metro train was delivered from Spain in March 2015.

A tender for the realisation of the Helsinki city bike system was held, and a contract signed with a consortium made up of Smoove and Moventia. The system was introduced in May 2016.

Construction of the West Metro (Ruoholahti-Matinkylä) progressed according to schedule, and the West Metro will open to passenger traffic in August 2016.

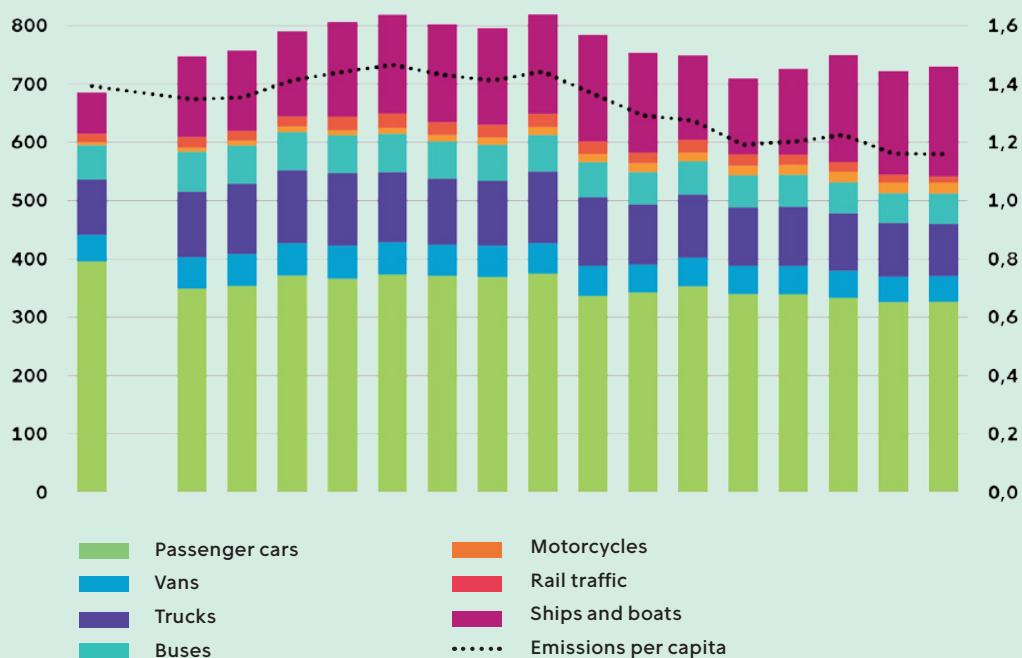
# Distribution of various transport methods in Helsinki in 2015

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



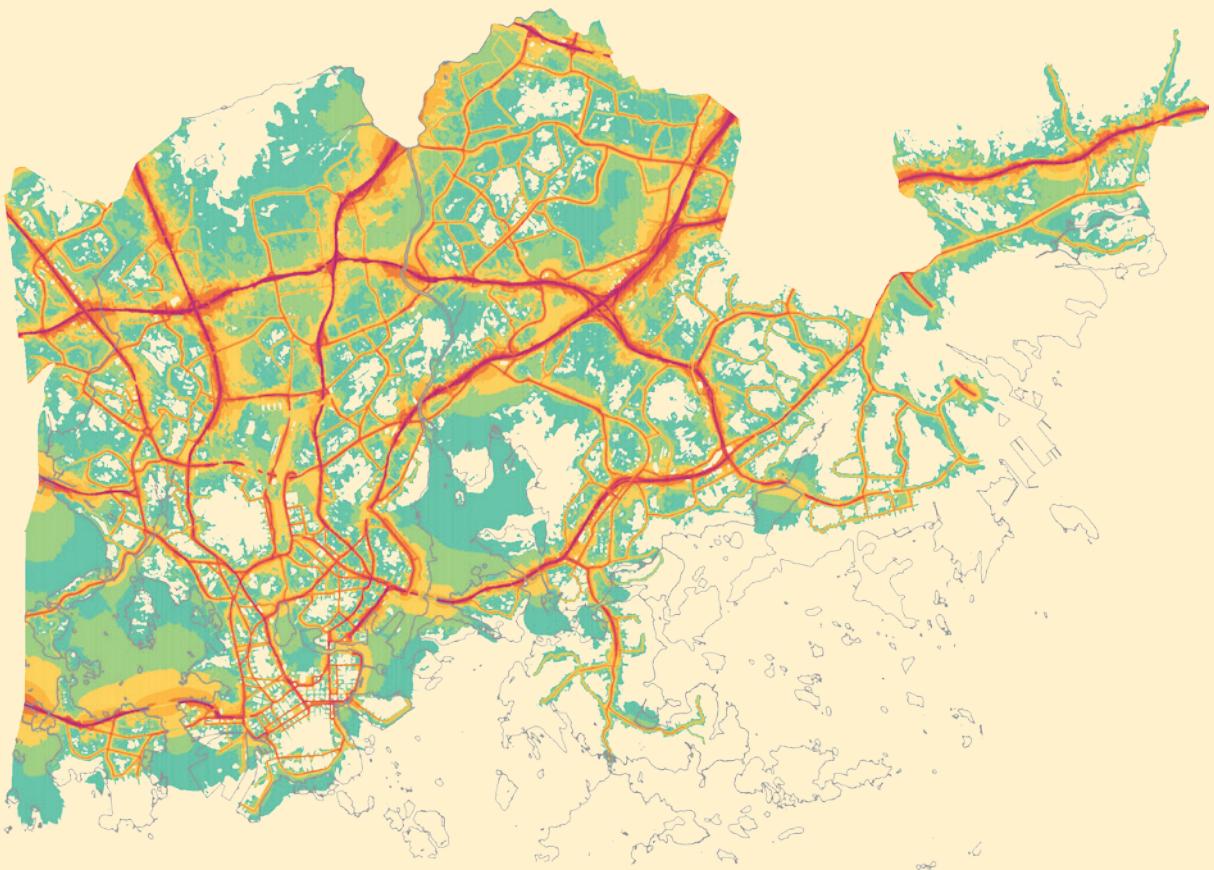
## Emissions from transport

CO<sub>2</sub> emissions of different modes of transportation (left scale) and emissions per capita (right scale) in Helsinki



# Residents exposed to road traffic noise

Day-time average noise level 2012, dB



Street and road traffic is the most significant cause of noise pollution in Helsinki. The noise levels of different areas can be checked with the help of noise zone maps. The maps will be drawn up every five years in connection with the traffic noise reports to be realised.

# Noise reduction

Environmental noise weakens the healthiness and quality of living environments in large European cities, including Helsinki. The biggest cause of noise pollution is road traffic, and almost 40% 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. Locally, construction and repair works and public events, restaurants and deliveries may also cause noise pollution.

Traffic noise prevention is guided by the 2013 revision of the City of Helsinki's Noise Control Action Plan, which presents 26 measures. The objectives set for noise prevention are challenging, however, and they cannot be achieved without increasing the effectiveness of noise prevention significantly.

Measures to obtain a new noise report for the Helsinki Metropolitan Area, in accordance with the Environmental Noise Directive, were started in 2015. The noise report is to be realised in collaboration with Espoo, Kauniainen, Vantaa and the Finnish Transport Agency. The noise report, produced once every five years, will be completed in summer 2017.

The largest worksite supervision sites were Kruunuvuorenranta in Laajasalo, Jätkäsaari, Kala-satama, and the Tripla district in Pasila, where pile driving, quarrying and demolition were carried out. The most challenging of the construction sites, from a supervision perspective, were sites where work causing particularly disruptive noise had to be carried out at night in the vicinity of residential buildings. For example, on the Tripla worksites in Pasila, for safety reasons due to the proximity to train tracks, pile driving also had to be carried out at night.

In collaboration between Helsinki, Espoo, Kauniainen and Vantaa, a guide was drawn up giving advice on property specific traffic noise prevention. The purpose of the guide is to give residents of the municipality basic information on measures which could improve the noise situation where they live, and which they can implement themselves.

Noise from outdoor concerts was prevented in many different ways. In noise notification decisions regulations are set out on end times,

permitted noise levels and noise measuring, amongst other things. In particular, the distribution area for resident notices for the largest outdoor concerts remained wide, as in the previous year, and information about the concerts was also provided online and on social media. Good prior provision of information has been shown to reduce the noise disturbance experienced by residents. The late-finishing Flow and Weekend Festivals, which were held on successive weekends, caused a great deal of conversation. The densification of Kalasatama's new residential area around Suviлаhti Cultural Centre posed additional challenges for holding concerts.

**In the guidelines for the ending times of concerts sets out the maximum number of concerts that can finish after 10pm for each event site.**

In autumn 2015 the attitudes of those living close to the event areas were assessed regarding the outdoor concerts and end times. In 2015 the survey focused on the following concert areas: The Olympic Stadium, Kaisaniemi, Suviлаhti, Tukkutori Wholesale Market – Teurastamo, and Kyläsаari. The results of the survey were utilised in the guidelines for the ending times of concerts, which was completed in January 2016, which sets out the maximum number of concerts that can finish after 10pm for each event site. The policy gives residents, tenants in the area, and event organisers prior information of how many late-finishing concerts can be held at each event site.

The finalisation work on the noise barriers at Tapanilankaari was completed in 2015. The plan for the noise barriers on Kirkonkyläntie was completed in 2015 and the site will be finished in 2016. The plan for the Porvoonväylä noise wall and fence at Jakomäki and the plan for the noise wall on Kehä 1 ring road at Sepänmäki were started in 2015. Construction at the sites started in 2016. In the noise walls at both sites surplus earth and recycled materials are to be used, including stabilised clay and crushed concrete.

# Water protection

The water areas in Helsinki include extensive sea areas, as well as the freshwater areas of the Vantaanjoki river, 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 Vantaanjoki, and the state of the Gulf of Finland. In addition to the Environmental Policy, water protection in Helsinki is regulated by the City of Helsinki's Small Water Bodies Programme (2007), the Storm Water Strategy (2008), the Flooding Instructions (2013) and Helsinki's action plan for the Baltic Sea Challenge (2014–2018).

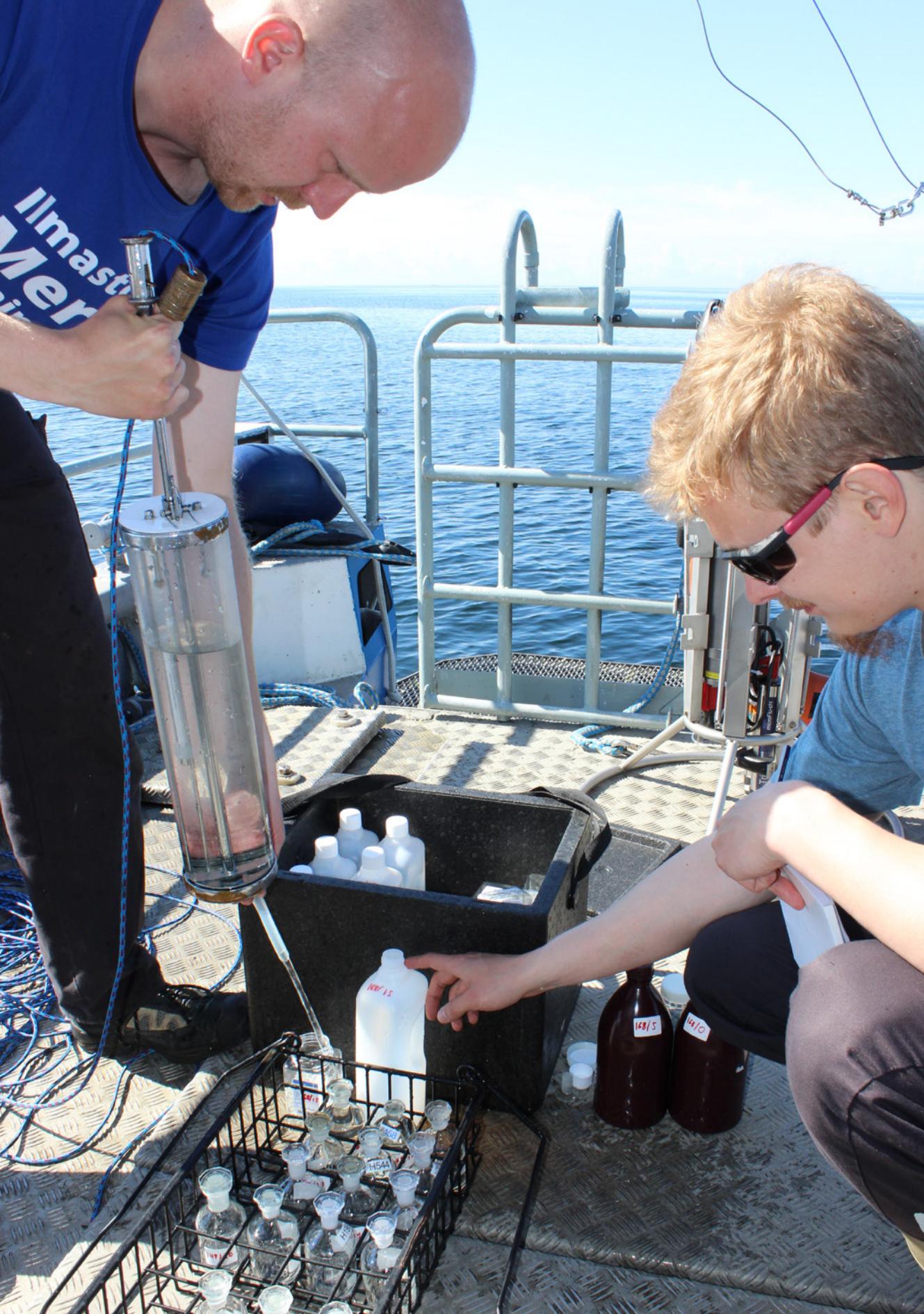
Over a million people live in the impact area of the Vantaajoki, and the river winds over 100 km from Riihimäki to the bay in Vanhankaupunki. The river facilitates many different activities, and is a fantastic site for fishing, attracting both Atlantic salmon and sea trout. In accordance with ecological classification, the condition of the river Vantaa is satisfactory, but the Kytäjoki area and the upper reaches of the river Keravanjoki are in good ecological condition. The EU's objective was to reach good ecological condition of water areas in 2015. According to the analysis, good ecological condition would be achievable in the lower reaches if the annual median of the overall phosphorus concentration were to reach a level of 60 µg/l. Phosphorus and nitrogen come from waste water and agriculture. Untreated waste water should no longer be able to enter the river at Riihimäki wastewater treatment plant following the completion of an expansion.

A total of 90 million m<sup>3</sup> of water was pumped into the water system within the HSY water treatment area in 2015. The water consumption per capita in Helsinki was 181 litres per day, which was eight litres less than in 2014. A total of 101.5 million m<sup>3</sup> of waste water was delivered to the Viikinmäki sewage treatment plant for treatment, of which 74.6 million m<sup>3</sup> came from Helsinki. The amount of waste water was at same level as the previous year. The Viikinmäki wastewater treatment plant met all the permit criteria. Combined sewer network overflows amounted to 0.15 per cent of the overall amount of waste water.

The 2015 treatment efficiency for phosphorus in Viikinmäki was 96 per cent. For biological oxygen demand, the treatment efficiency was 98 per cent, and for nitrogen, 91 per cent. The wastewater treated at the Viikinmäki wastewater plant are conducted through rock tunnels to the edge of the open sea, about seven kilometres away from the shore. The phosphorus load from the Viikinmäki wastewater treatment plant on the sea areas in front of Helsinki was 23 tonnes (+10% from the 2014 level), and the nitrogen load was 414 tonnes (-2% from the 2014 level). For eutrophication, the nitrogen load is more significant, because it is a minimum nutrient in the waterways in the Helsinki region.

The Environment Centre monitors sea areas in accordance with the Helsinki Metropolitan Area's Common Monitoring Programme for Marine Areas (Pääkaupunkiseudun merialueen yhteistarkkailuohjelma). In the new monitoring programme the aim is to provide a clearer picture of the overall condition of marine areas. No significant changes have been observed in marine areas in 2015. The temperature of water near the bottom was at times higher than average, and the water near the bottom was at times muddier. An investigation of the impact of power plants' marine condensation water and the phytoplankton population's nutrient limitations, as well as an investigation into the quality of the Port of Helsinki's water were carried out as separate investigations within the common monitoring. The impacts of power plants' marine condensation waters are local, in the vicinity of condensation water discharge areas. The growth of phytoplankton in Helsinki's marine areas is primarily limited by nitrogen nutrients, which prefer the presence of blue-green algae.

Blue-green algae was not abundant in front of Helsinki in summer 2015, due to the cool and windy summer. The abundant blue-green algae blooms in the late summer in the outer sea areas did not reach the area in front of Helsinki. A significant planctonic algae bloom appeared in Vanhan kaupunginlahti in September. At this point the chlorophyll a level, which is indicative of the algae level, was approximately three times the long-term average.



In the river Mätäjoki a two-year close inspection was started, investigating water quality and taking samples from lateral channels and storm water drainage systems. With the help of benthic fauna samples the ecological condition of the stream will be investigated, and in the future its condition will also be studied by looking at fish and diatoms. Additionally, the land cover of the whole stream's catchment area will be investigated. Thanks to the monitoring and control inspections, two waste water discharges were stopped.

## **The first shore-cleaning bee was held in April 2015 in Vanhankaupunginkoski in collaboration with the Public Works Department's Park Pal operations.**

The concentrations of harmful substances in brook waters around Tattarisuo were investigated and found to be low. Longinoja's lateral drain, the Lentokentäoja ditch, however, showed high metal concentrations. The metal load in the Lentokentäoja ditch established by the investigation appears to come from elsewhere, possibly from airport operations.

The Public Works Department continued the restoration of Saunapellonpuisto pond in Viikki, in collaboration with the University of Helsinki and the Finnish Environment Institute. The pond was suffering from over eutrophication caused by very dense fish stocks. Several angling events were organised for school children in order to reduce the fish stocks. The Environment Centre monitored the pond's water quality.

The action plan connected to the Baltic Sea Challenge is being implemented by 13 organisational departments. The Public Works Department's and Stara's agriculture water pollution control in agriculture actions, which started with the City's own measures in previous years, and the Port of Helsinki's maritime transport actions are examples of active ongoing actions. New meas-

ures include the projects started with the University of Helsinki and the Water Protection Association of the River Vantaa and Helsinki Region on snow as a transporter of small pieces of plastic debris and paddocks as a source of nutrient loads. The first shore-cleaning bee was held in April 2015 in Vanhankaupunginkoski in collaboration with the Public Works Department's Park Pal operations, and the City was also involved in the organisation of an international teachers' science camp on the islands of Aegna, Harakka and Korkeasaari, and a conference for school children from schools involved in the Baltic Sea challenge. The Baltic Sea challenge has a partner network of over 220 organisations. In 2015 the international activities were active and cooperation with Sweden intensified significantly.

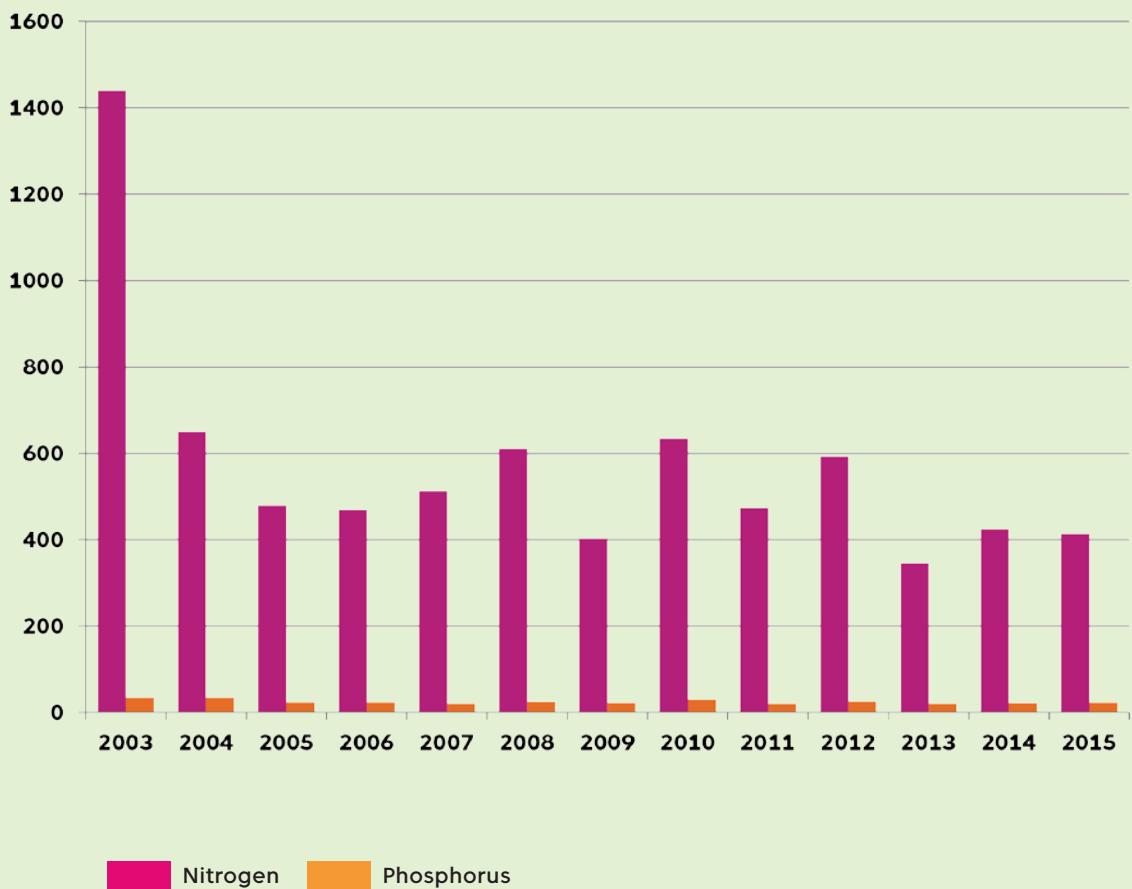
The Citywater project, which finished in December 2015, promoted and implemented measures to protect waters in municipalities, and spread the Baltic Sea Challenge internationally. In 2015 the project organised two international networking events in Tallinn. In 2015 a natural storm water management system based on bio-filtering was completed in Maunulanpuisto. The results of the project, along with recommendations to support water protection work have been gathered in the tools package available at [www.waterprotectiontools.net](http://www.waterprotectiontools.net).

Under the leadership of Helsinki-Uusimaa Regional Council and the Centre for Economic Development, Transport and the Environment for Uusimaa a flood risk management plan for 2016–2021 for the coastal area of Helsinki and Espoo (Helsinki-Espoo-rannikkoalueen tulvariskien hallintasuunnitelma vuosille 2016-2021) was completed.

The Environment Centre partook in the preparation of a joint ground water monitoring programme between the municipalities of the Helsinki Metropolitan Area, along with HSY and the Water Protection Association of the River Vantaa and Helsinki Region. The joint monitoring programme began at the start of 2016.

# Load to the sea

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



# Securing biodiversity

On the basis of the new international City Bio-diversity Index (CBI) there is still a great deal of original nature left in Helsinki, along with plenty of recreational areas, relative to the population. However, only a small number of Helsinki's natural areas are protected, and the city's network of natural areas is disconnected. Furthermore, there is relatively little monitoring data available for the indicators on native species. The city also has a moderate amount of permeable surfaces and the number of ecologically damaging invasive alien species is low. The state of biodiversity-related management is good in Helsinki, but even though Helsinki has plenty of natural and recreational areas and the national core curriculum emphasises biodiversity, comprehensive school pupils make surprisingly few field trips to these areas. Based on the index, the proportion of the overall budget dedicated to ensuring and managing biodiversity in Helsinki is small, which can be explained by social and healthcare services being City services, unlike in some other large cities.

## In April 2015 the Environment Committee approved the City's guidelines on alien species.

2.1 per cent of all land area is nature reserves, as compared to 0.5 per cent of water areas. There are currently 52 nature reserves. 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 3.5 per cent of Helsinki's land area and 1.0 per cent of water areas.

The Nature Information System's valuable plant sites material was supplemented with 33 sites, primarily in old manor and villa environments, where there are concentrations of old, rare culture plants.

Land use planning strengthens the recreation and urban nature network and plans green infrastructure as an entity, by increasing green surfaces, providing compensation, supporting

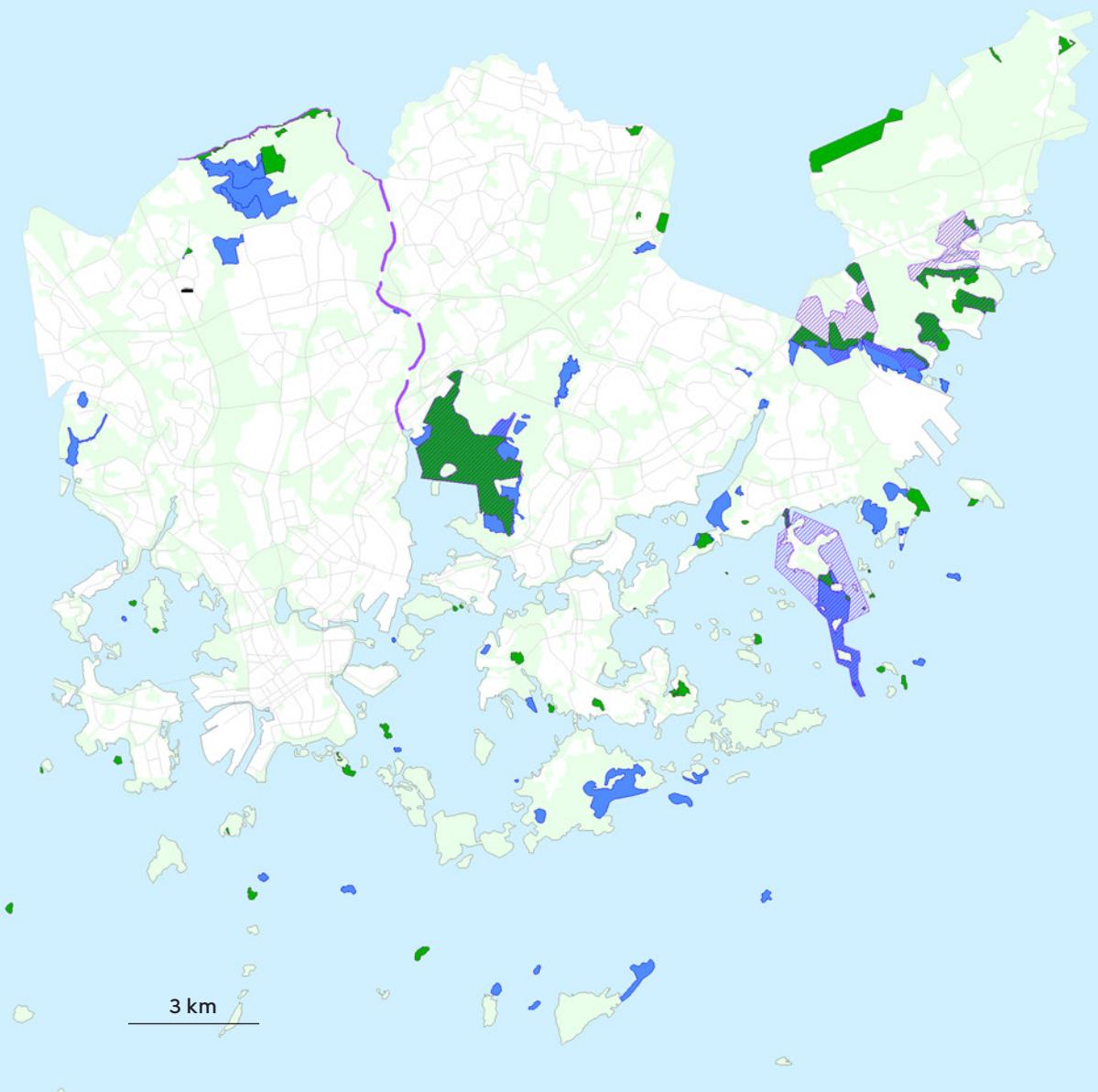
the green network and measuring green efficiency, amongst other methods. Helsinki's nature management complies with the Programme to Secure Biodiversity in Helsinki 2008–2017 and nature management guidelines, the objective of which is to preserve and manage biodiversity.

In April 2015 the Environment Committee approved the City's guidelines on alien species (2015–2019). In accordance with it, an inter-departmental alien species working group was set up, training organised, and the City's location information based alien species register set up for workers carrying out measures and planning preventive means to use. The most harmful alien plants are Persian hogweed, rugosa rose and Himalayan balsam, and the most harmful alien animal species are mink, European rabbit, and Spanish slug. According to alien species mapping of valuable plant sites, alien species are even present in wooded plant sites.

Harmful alien species are prevented through the City's own work, with voluntary work and by Park Pals operations. Prevention of Persian hogweed, rugosa rose, large-leaved lupin, Himalayan balsam, Japanese knotweed and giant knotweed, along with mink, raccoon dogs, rabbits and rats has continued. Senecio cannabifolius has been prevented at Viikki arboretum and cornus sericea on Vartiosaari. Pilot trials for the prevention of the Spanish slug have been carried out in Lauttasaari and Puistola. Fishing for the Prussian carp was organised, as in previous years, at Saunapellonlampi pond.

In November 2015 the Public Works committee approved the green roof guidelines, according to which Helsinki's aim is to assert itself as a trail-blazer for green roof construction in Finland. The guidelines that have been revised according to the statements will be dealt with by the City Board in autumn 2016. The main aims of the strategy are better management of storm water during downpours, mitigation of the urban heat island phenomena, protection of urban biodiversity, and active utilisation of the roofs as a functional, financial and aesthetic resource.

# Protected nature areas in Helsinki



In the map is presented the current 52 nature reserves, the new nature reserves proposed to be founded in the City of Helsinki Nature Conservation Programme 2015–2024 and Natura 2000 areas. The total area of the new proposed nature reserves would almost double Helsinki's nature reserve area.

- █ Nature reserves
- █ Nature reserves in the Nature Conservation Programme 2015-2024
- Natura 2000 areas

The City of Helsinki Nature Conservation Programme 2015–2024 and a forestry network study proposed 47 new nature reserves be founded over the 10-year-period 2015–2024. Their total area would come to approximately 650 hectares, which would almost double Helsinki's nature reserve area.

## **The City of Helsinki Nature Conservation Programme 2015–2024 and a forestry network study proposed 47 new nature reserves.**

A maintenance and usage plan for 2015–2024 was completed for the Natura 2000 area of Vanhankaupunginlahti bird wetlands and in connection with the area two new nature reserves were founded: Pornaistenniemi common alder grove and Möylä forest. Two new nesting species were encountered in the area: the greylag goose and the common crane. A maintenance and usage plan was also completed for Kivinokka old forest area. The aim of the plan is to preserve the atmosphere of the old forest and the almost 200 species living there, primarily polypores and corticioid fungi living on the spruce trees.

In the Vartiosaari nature reserve Finland's only area of Petasites spurius was cared for by providing nutrients and removing alien plants. In the

Roosinmäki nature reserve monitoring and care of areas of field gentian and fragrant orchid continued. Maununneva nature reserve was expanded by adding a section of a neighbouring plot where peatland vegetation grows. According to an investigation carried out in the Kallahti shallows, the most important Natura nature type in the shallows is underwater sandbanks, and of the underwater nature types in the Baltic the most common is beds rich in underwater plants.

The new Haltiala nature reserve presented in the new Nature Conservation Programme is, according to an investigation, in terms of its polypore value at least equal to earlier protected forest areas. In addition to a large number of species, the proposed new nature reserves also feature a number of species indicative of endangered and valuable woodland environments. A vegetation investigation was carried out at Patterinmäki in Pajamäki, which is one of the Nature Conservation Programme sites. On the hill's fortress ramparts there is a diverse range of traditional biotope species, such as the endangered galium verum.

Helsinki Zoo continued its conservation work with the Amur leopard, snow leopard, red panda and Pallas's cat in their habitats. The Zoo has successfully bred endangered or rare species such as the Amur leopard, markhor, Finnish forest reindeer and Père David's deer.

### **Contaminated soil matter transported for treatment or final disposal in Helsinki 2012–2015**

Chart 1.

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Soil, ton	186 000	121 665	96 642	180 000

### **The costs for the City of Helsinki caused by the restoration of contaminated soil and landfill sites 2012–2015**

Chart 2.

	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Costs, euro	13 703 705	9 095 605	7 312 393	10 367 188

# Restoration of contaminated soil and landfill sites

The most significant contaminated soil restoration sites were the former Pasila engineering works shop area and the former port areas Kalasatama and Jätkäsaari, which were transformed for residential use. Additionally, construction of a central district was started in central Pasila. 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. The opposite page gives an overview of how the contaminated soil matter was transported for treatment or final disposal in Helsinki in 2012–2015. The excavated, contaminated soil matter was utilised in landfilling at construction sites, mainly for the base structures of parks, and in landfill sites. The soil condition database created by the Ministry of the Environment features the details of 842 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 costs generated by the restoration of contaminated areas and landfill sites grew from the last few years. The amount of soil matter excavated almost doubled from 2014 levels, which is clearly due to increased construction. The opposite page details the costs for the City of Helsinki caused by the restoration of contaminated soil and landfill sites in 2012–2015.

A total of 70,800 tonnes of contaminated soil matter and sediment containing harmful substances was restored in 2015, of which contaminated soil accounted for approximately 36,800 tonnes. The largest construction sites were in Jätkäsaari, Kalasatama, Kruunuvuoren ranta, Sompasaari, Töölölahti, Alppikylä, Hermanninpuisto and

**In 2015 no cleaned surplus soil was sent to external recipients.**

Sörnäistenniemi's Kalasatama park. The restoration projects were linked to changes to land use.

The second area of the Hyvänköönpuisto utilisation site located in Jätkäsaari came into use in 2015. In the area approximately 43,200 m<sup>3</sup> of contaminated soil was encapsulated, with the majority coming from construction sites in the West Harbour area. Contaminated soil from elsewhere in the city was transported outside the city to various different recipients.

The restoration of Vuosaari's old dump continued in 2015. Restoration of the site facilitated the use of 100,000 m<sup>3</sup> of excavated earth in the shaping and surface structures of the area. An environmental permit was received for the restoration of Iso-Huopalahti dump in 2015, and inspection measurements are underway at the site.

In 2015 no cleaned surplus soil was sent to external recipients. All soil was utilised in the City's own sites or transported to an intermediate storage area to wait for later utilisation.

# Procurement

The City's Environmental Policy sets ambitious objectives for the organisational departments in terms of making procurements more sustainable. Challenges include monitoring procurements and the large number of them taking place.

## **The Sustainable Procurements Guide (Kestävien hankintojen opas) was published in autumn 2015.**

The City's environmental network for procurements has reinforced the cooperation between departments and information exchange between the parties in charge of the City's procurements. The group has worked on, among other matters, the definitions for environmental criteria use in Helsinki's public procurements and the monitoring of procurements. The Sustainable Procurements Guide (Kestävien hankintojen opas) was published in autumn 2015. Its purpose is to help the organisational departments to carry out more sustainable procurements and provide examples of product- and service-group-specific environmental criteria in procurements. 2015 also saw the continuation of the commissioning of sector reports regarding the environmental criteria of procurements, and in autumn the environmental criteria reports for procurements relating to building renovations and park construction were completed. The network also features in the PKS CleanTech network comprising procurement units in the Helsinki Metropolitan Area.

Helsinki partook in the Hankintamalli project

managed by the Finnish Environment Institute, which involved creating a database for public procurement cleantech procurements. Two of Helen Ltd's investments were added to the database: The Sakarinmäki school centre's renewable energy pilot and smart street lighting control solution. The intention is to continually update the database in the future, and for it to also contain a communication channel for those involved in cleantech procurements. Additionally, the project involved calculation of the carbon footprint for the paving stones for the renovation of Iso-Roobertinkatu for different procurement options.

Tendering processes are seen to consider environmental aspects if they are included in the mandatory requirements or in the comparison criteria for the tenders. The environmental criteria used in procurement processes include an environmental management system or equivalent, eco-label requirements, material efficiency, recyclability, sorting and reduction of waste, organic products, chemical safety, genetically unmodified raw ingredients/materials, life cycle costs, versatility, service life, energy efficiency, fuel consumption and emissions class, and noise level.

The Procurement Centre remained actively involved in international cooperation on sustainable procurements. The City of Helsinki is a member of ICLEI's sustainable procurements Procura+ campaign, and a founding member of the Global Lead Cities on Sustainable Procurement working group, founded in April 2015. The City is also involved in the EU funded INNOCAT project, the aim of which is to develop methods and activities to promote sustainable and innovative food service procurements.

## **Environmental criteria proportion in centralised acquisitions, i.e. in procurements which are put up for tender for the use of all organisational departments**

Chart 3.

Joint procurement unit	Proportion in euros	Proportion in numbers
Procurement Centre	68,1 %	51,3 %
Stara	100 %	100 %

# Waste and material efficiency

The City's internal waste network aims to develop the City's waste reporting. Challenges are posed by the number of agreements, the amount and format of the information, and the fact that despite the Premises Centre managing the majority of the City's waste management agreements, the organisational departments also have their own agreements. The work is carried out in collaboration with waste management companies, and things have started moving forward with HSY, for example, with good cooperation, and water consumption information reporting is also being investigated at the same time. The aim is to facilitate the distribution of information to the organisational departments through the Pakki system, for example.

As part of the City's City Logistics Programme (Citylogistiikkaohjelma) at the beginning of the year HSY began a trial investigating the possibilities for advancing waste loading taking place in properties. The trial started in the Ruoholahti and Punavuori areas, and in the autumn expanded to several other waste transportation contract areas.

Improving material- and eco-efficiency is an Environmental Policy objective. A good example is the use of cloth hand-drying rolls in the City's organisational departments. In 2015 a total of 90,706 rolls were used, and as one roll can be used approximately 110 times, the rolls replaced 10–15 million paper towels.

Approximately 5–6 million tonnes of waste is generated every year in the Helsinki Metropolitan Area. Of this, approximately 350,000 tonnes comes from private households. In 2014, the region's residents generated an average of 310 kilos of household waste per capita.

Coordinated management and utilisation of excavated soil reduced transportation and the resulting emissions. In January 2015 the City Board implemented an excavated earth utilisation development programme to be followed in the operations of the organisational departments. The

working group for the coordination of soil matter, founded by the Mayor of Helsinki, is responsible for coordination of the City's soil mass economy and improving materials efficiency in accordance with the City's Strategy Programme and the Excavated Soil Utilisation Development Programme (kaivumaiden hyödyntämisen kehittämishjelma).

In 2015 a total of 460,720 tonnes of excavated earth mass was used in the construction of public areas. The amount has quadrupled since 2012. In 2015, by utilising excavated earth mass, i.e. reducing transportation, 2.1 million litres of fuel was saved, which is equivalent to 5,175 CO<sub>2</sub> tonnes. The financial savings were in the region of 10 million euros. The most significant recycling site was Vuosaari dump.

A condition of circular economy is that the area has sufficient recycling areas where masses can be stored and processed. A report on associated technical maintenance support areas (recycling areas, snow storage areas, depots) was completed in 2015. The City operates five intermediate storage and preprocessing sites. The sites are located in Jätkäsaari, Kalasatama, Kivistö, Vuosaari and Laajasalo. At the sites materials such as blasted rock, surplus soil, ash from power plants, contaminated soil and potentially other materials too are stored and processed in accordance with the sites' environmental permits. Additionally, recycling materials (asphalt, concrete and brick waste) are crushed and dredged sediment dried at the sites. The sites facilitate utilisation of recycling materials and controlled construction in large area building projects. At the end of 2015 mass stored at the sites totalled 1.3 million m<sup>3</sup>. The maximum capacity of the intermediate storage sites is 2.9 million m<sup>3</sup>.

In 2015 the Public Works Department used approximately 52,000 tonnes of recycled asphalt, made up of 50 or 70 per cent recycled crushed asphalt. The overall utilisation rate of recycled asphalt was 51 per cent.

Chart 4.

## **City of Helsinki environmental education and guidance (organisers and numbers of participants)**

	<b>2015</b>
The Harakka Island Nature Centre (EC)	5 042
Gardenia-Helsinki Oy	6 398
Spring cleaning bee and other similar events (PWD)	22 664
Park walks and Park Pals (PWD)	2 102
Youth Department, Meriharju Nature House and Fallkulla Domestic Animal Farm	6 422
Helsinki Zoo	19 100
Helsinki Metropolitan Area Reuse Centre, guidance	14 278
Matkakummi (Public Transportation Educator) (HSL)	2 300
Energy for 2nd graders material for pupils (PWD)	902
Environment Centre (Helsinki Metropolitan Area Energy Guidance for Consumers, Environment House presentations, Climate Roadmap, Climate Street)	3 589
Helen Ltd, energy guidance	145 593
Ilmastointo (HSY), event participants	2 800
<b>TOTAL</b>	<b>231 190</b>

The figures contained in the table should not be compared to one another as the functions are very different. For example, the Harakka Island Nature Centre's nature school sessions are several hours long, whereas the Environment Centre's climate and energy guidance figures include the Climate Roadmaps, which have been distributed to residents. Helen Ltd's energy guidance figures also include telephone and email guidance, which is of a different nature to environmental education carried out face-to-face, or the open bees organised by the Public Works Department in the City's parks, for example.

# Environmental awareness and responsibility

In 2015 almost 78,000 residents partook in environmental education events, i.e. nature schools, nature trips, island adventures, themed weeks, environmental courses, a conference for school children, public events related to the environment, spring cleaning events and park walks. Climate and energy guidance services reached over 150,000 residents.

The guided nature walks in Helsinki's local nature were very popular and over 22,000 residents took part in the spring cleaning bee.

In terms of ecosystem services, the downloadable Suuri Mysteri (Big Mystery) educational material was completed and brochures on Viikki, Kallahdenniemi, Mustavuori, Vantaajokivarsi and Lauttasaari were completed as part of the Helsingin luontoon! (To the Nature of Helsinki) brochure series.

An Environmental Awareness Cooperation plan was drawn up for Helsinki, in collaboration between City departments, HSY and the Helsinki Metropolitan Area Reuse Centre. The objective of the plan is to create environmental awareness work that meets residents' expectations and needs, is wise from an overall economic perspective, uses shared resources more efficiently and is more effective in Helsinki.

Helsinki Zoo's annual theme was climate change, which formed a part of the European Association of Zoos and Aquaria's (EAZA) Pole to Pole campaign. The year's biggest public events were the Easter Island events in March–April, the Art Meets Sand sand sculpting event in June, and the Night of the Cats in September. On Helsinki Zoo Day on 4 October the Zoo saw a record number of visitors: 17,050.

The Youth Department organised a diverse range of environmental education activities for young people: urban agriculture, agriculture camps, nature day trips, adventures, environmental art, animal care and environmental training.

The transport plans aimed at developing journeys to school which were made at HSL's ten twin schools in transport and mobility themed lessons reached 2,300 children and young people. Additionally, Matkakummi provided information for the elderly and immigrants.

## In terms of ecosystem services, the downloadable Suuri Mysteri (Big Mystery) educational material was completed.

Helen Ltd used many different communications channels to encourage residents to save energy, focusing on young people in particular by means such as developing lecture packages for those at upper secondary schools and vocational colleges. Energy Gallery and power plants drew almost 6,000 visitors during the year. Furthermore, Helen published its Uutta voimaa blog, which provides information on the progress of Helen's development projects. The Hanasaari power plant grow pallets were once again reserved right away, even though the number available had been doubled to 100. Helen also supported ten Finnish events creating good urban energy in summer 2015.

The Public Works Department's Energy for 2nd graders campaign's wide-ranging information and material package was received by over 900 pupils and teachers.

Ilmastointi's biggest event of the year was the Uurbaani selviytyminen (Urban Survival) day organised with its partners and held in April, where visitors could experience the power of storms and raging winds in a storm container, see what it's like to work in scorching heat in a hot weather office and find out more about crisis and rescue operations.



# Environmental risks

Due to climate change, extreme weather conditions will increase and forecasting will become more difficult. Storms and floods, for example, have occurred more often than normally in Finland too in recent years. The risk of oil damage is high in the Baltic Sea, which is one of the most vulnerable, yet highly trafficked sea areas in the world.

The operations for adapting to climate change have been distributed amongst several organisational departments, and adaptation is a part of many different operating plans. The Storm Water and Flood Strategies of the City of Helsinki, as well as the LUMO programme and the nature management guidelines also include actions for adapting to climate change. Adaptation is also promoted as part of everyday work, for example, through maintaining the vitality and good condition of recreational areas.

In January 2016 the research of safe buildin-gheights in the shores of Helsinki for the years 2020, 2050 and 2100 was completed. Waves, wind and waterheights were measured in the research and the information was used to evaluate how high the unified green water can rise. There are and will be a lot of extensive building projects in the shoreareas of Helsinki where the information will be used.

Oil prevention training in Helsinki was developed and made more efficient in 2015 by the implementation of oil prevention work at the premises of Isosaari fortress island. In autumn, led by the Finnish Environment Institute, a large-scale oil prevention exercise was carried out to test the use of the Isosaari oil prevention base in terms of coping with long booms and using different kinds

of seining techniques. Isosaari proved to be a particularly good base for oil prevention.

The preparedness of the fleet located at the Santahamina oil prevention depot was improved during the year by, for example, improving the anchoring equipment of the oil booms and the storing systems. Oil prevention training continued through the whole open water season and training and an oil prevention exercise were organised with the Finnish Navy for Stara's staff in front of Helsinki.

The Rescue Department participated actively in the development of oil prevention preparedness both nationally and internationally through various cooperation projects with the Finnish Environment Institute, the Ministry of the Environment and the Finnish Border Guard. A prevention plan for vessels spillages of chemicals or oil into the Gulf of Finland was one of a number of plans completed during the year. The Rescue Department participates in projects as a specialist in oil prevention work in the coastal areas and archipelago and in matters relating to the consequences of oil spills.

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 associated with this responsibility, which are related to preparing for oil spills, take place in cooperation with the Finnish Environment Institute and the Rescue Department.

## Oil spill damages in Helsinki

Chart 5.

	2012	2013	2014	2015
Drainage system	38	51	24	39
Important ground water areas	8	11	1	2
Other areas	311	303	294	317
TOTAL	357	365	319	358

# Environmental economy

As a result of the incorporation of Helen Ltd, its environmental accounting figures have, along with HSY's municipal allocations from Helsinki, been removed from the parent organisation's figures. For the sake of comparability, the figures for 2014 have been classified in the same way as those of 2015, i.e. Helen Ltd's (then Helsingin Energia) figures are, in the figures for 2014, on the same side as HSY's figures.

**The City's largest expense items were sanitation and waste management of the areas (29%) and the costs of promoting climate and environmentally friendly transport (20%).**

Helsinki's environmental costs, including amortisations, Helen Ltd's environmental costs and HSY's costs, added up to a total of 146 million euros in 2014 (-5% from 2014). Helen Ltd's share was 16.6 million euros, HSY Water Management's 15 million euros, HSY's Waste Management's 43 million euros, and HSY regional and environmental information's 0.8 million euros. The environmental costs based on the City of Helsinki's own operations were 71 million euros (-9% since 2014). The environmental costs resulting from the operations of the City made up 1.7 per cent of the City's total operating costs, equalling 113 euros per capita. The City's largest expense items were sanitation and waste management of the areas (29%) and the costs of promoting climate and environmentally friendly transport (20%). The decrease in costs can be explained by factors such as the legislation for service buildings' energy efficiency having become more stringent and reaching the level of the City's instructions, thus the Public Works Department and the Real Estate Department no longer report the distinction between new construction's and renovation's low energy costs. Instead, as

residential construction legislation is not yet at the level of the City's instructions, the Helsinki Housing Production Department has reported the price difference compared to the level required by legislation.

Helsinki's environmental investments, including Helen Ltd's environmental investments and the costs of HSY, added up to a total of 125 million euros (+29% from 2014). Helen Ltd's share was 24 million euros, HSY Water Management's investments relating to cleaning of waste water accounted for 30 million, and HSY Waste Management's investments nine million euros. The environmental investments made by the City of Helsinki added up to 62 million euros, which is 10.9 per cent of the total capital expenditure of the City. The City's environmental investments grew by 16 per cent from the previous year, which can be explained by the investments in the promotion of climate and environmentally friendly transport, which were greater than during the previous year, and the restoration of contaminated soil.

Helsinki's environmental income, including Helen Ltd's environmental income and HSY's shares, added up to a total of 111 million euros (+0.9% from 2014). Helen Ltd's share was 0.8 million euros, HSY's wastewater treatment income 56 million euros, and the transportation and processing fees for waste collected by HSY 47 million euros. The internal environmental income for the City of Helsinki added up to approximately 7 million euros, making up 0.7 per cent of the total operating income of the city. The greatest sources of environmental income for the City were the proceeds from the ticket sales of the Helsinki Zoo.

The value of mandatory provisions and environmental responsibilities in the financial statements on 31st December 2015 was 26.6 million euros. These responsibilities were related to the preparation for the processing of contaminated soil and the after-treatment of landfill sites.

# The city's environmental income

City organisation in 2015, thousand euros



Chart 6.

	City organisation		Helen's environmental accounting and computational share of HSY's figures included	
	2 014	2 015	2 014	2 015
Air protection	784	955	784	955
Climate protection	0	0	358	525
Water protection	90	99	54 765	56 153
Waste management	848	290	49 625	47 788
Soil protection	134	149	134	149
Nature protection	4 287	4 406	4 287	4 406
Environmental administration	1 036	957	1 036	957
Environmental management	23	64	119	125
Environmental training and education	42	65	42	113
Actions that improve eco-efficiency	170	171	170	171
<b>Environmental income</b>	<b>7 413</b>	<b>7 157</b>	<b>110 315</b>	<b>111 342</b>

# The city's environmental costs

City organisation in 2015, thousand euros

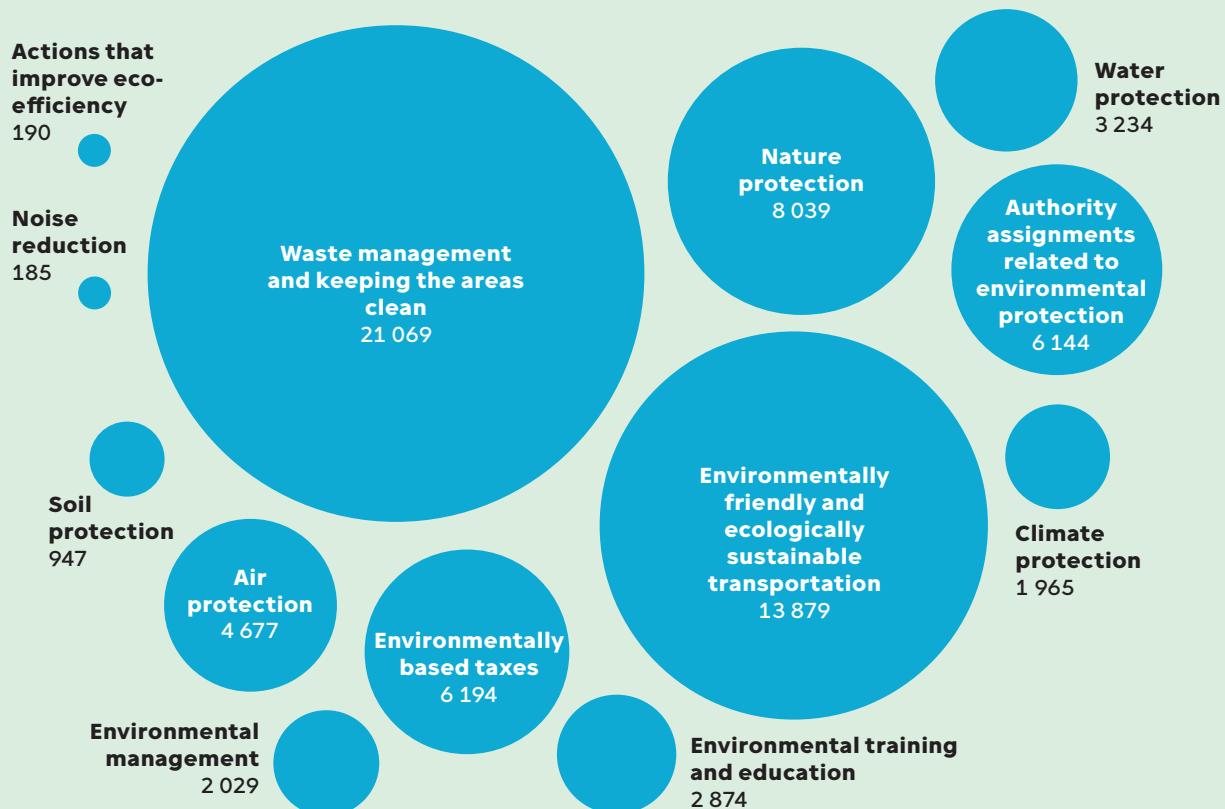


Chart 7.

	City organisation		Helen's environmental accounting and computational share of HSY's figures included	
	2 014	2 015	2 014	2 015
Air protection	5 030	4 677	10 751	12 481
Climate protection	3 813	1 965	6 966	4 464
Water protection	3 425	3 234	18 370	18 558
Waste management and keeping the areas clean	24 544	21 069	70 669	66 800
Soil protection	1 065	947	1 169	1 133
Noise reduction	298	185	332	185
Nature protection	6 914	8 039	6 914	8 039
Environmentally based taxes	5 810	6 194	5 810	6 194
Authority assignments related to environmental protection	6 616	6 144	6 616	6 144
Environmental management	2 316	2 029	3 603	3 266
Environmental training and education	3 005	2 874	5 188	4 754
Environmentally friendly and ecologically sustainable transportation	15 087	13 879	15 087	13 879
Actions that improve eco-efficiency	176	190	2 303	867
<b>Environmental costs</b>	<b>78 099</b>	<b>71 425</b>	<b>153 777</b>	<b>146 764</b>

# The city's environmental investments

City organisation in 2015, thousand euros

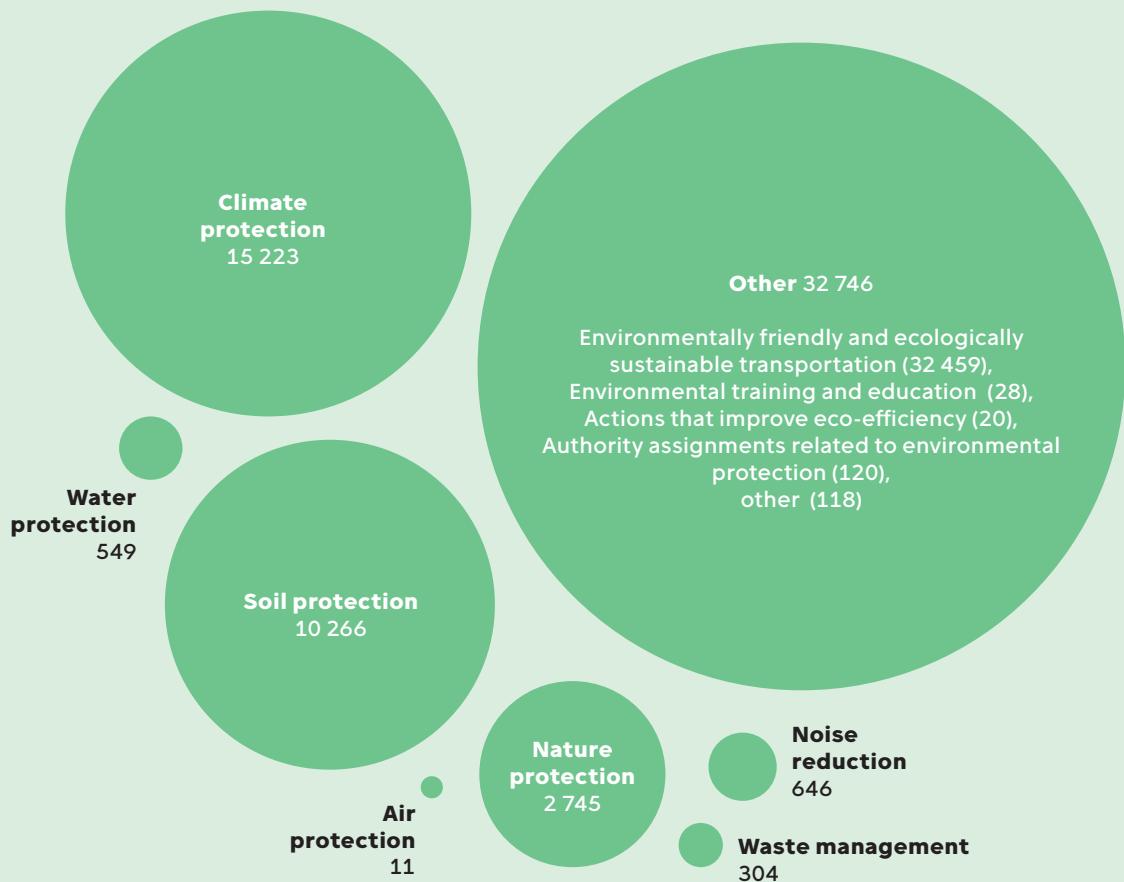


Chart 8.

	City organisation		Helen's environmental accounting and computational share of HSY's figures included	
	2 014	2 015	2 014	2 015
Air protection	27	11	3 745	11 880
Climate protection	19 987	15 223	26 425	15 241
Water protection	1 028	549	16 943	23 400
Waste management	411	304	11 700	9 153
Soil protection	7 145	10 266	7 145	11 857
Noise reduction	894	646	894	646
Nature protection	3 558	2 745	3 558	2 745
Other	20 857	32 746	26 958	50 585
<b>Environmental investments</b>	<b>53 906</b>	<b>62 489</b>	<b>97 367</b>	<b>125 507</b>

# Environmental indicators 2012 and 2015

Chart 9.

Indicators for environmental management and partnerships	2012	2015
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)	14 %	35 % ●
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)	44 % (2013)	41 % ●
The combined number of audited EcoCompass companies, Climate Partners companies and organisations that have accepted the Baltic Sea Challenge will increase (environmental policy)	257 pieces	331 pieces ●
Indicators for climate change mitigation	2012	2015
Greenhouse gas emissions in the Helsinki region to fall by 30% from the 1990 level by 2020 (Strategy Programme 2013–2016)	-16 %	-25 % ●
Per capita greenhouse gas emissions in the Helsinki region to fall by 39% from the 1990 level by 2030 (Helsinki Metropolitan Area Climate Strategy)	-32 %	-41 % ●
Greenhouse gas emissions from energy production to fall by 20% from the 1990 level by 2020 (Strategy Programme 2013–2016)	0 %	-15 % ●
Energy consumption per capita in the Helsinki area to fall by 20% from the 2005 level by 2020 (Environmental Policy)	-7 %	-11 % ●
Renewable energy to account for at least 20% of total energy production by 2020 (Environmental Policy, Strategy Programme 2013–2016)	8 % (Helen Ltd) 14 % (The City)	12 % (Helen Ltd) ● 17 % (The City) ●
Energy savings in the City's own operations (public buildings, vehicles, street lights) of 129 GWh (9%) (KETS 2005–2016)	70,2 GWh (54 %) <i>With the early actions 125 GWh (97 %)</i>	117 GWh (90 % of the goal) <i>With the early actions (before 2008): 180 GWh (140 % of the goal)</i> ●
Energy savings of City-owned residential buildings: 49.9 GWh (7%) (VAETS 2010–2016)	22,1 GWh (44 %)	28,9 GWh (58 % of the goal) ●
Indicators for air protection	2012	2015
Annual average nitrogen dioxide concentration on the Mannerheimintie monitoring station will not exceed 40 mikrog/m <sup>3</sup> in 2015 (EU directive)	49 µg/m <sup>3</sup>	32 µg/m <sup>3</sup> ●
Annual average nitrogen dioxide concentration on the Mäkelänkatu monitoring station will not exceed 40 mikrog/m <sup>3</sup> in 2015 (EU directive)	50 µg/m <sup>3</sup>	43 µg/m <sup>3</sup> ●
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)	7 pieces/a	6 pieces/a ●

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

<b>Indicators for traffic</b>	<b>2012</b>	<b>2015</b>
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)	75 %	76 % ●
Motorization will reduce as a part of promoting sustainable mobility (strategy programme 2013-2016)	342 passenger cars in traffic use /1000 residents	328 passenger cars in traffic use /1000 residents ●
The number of public transportation trips will increase (strategy programme 2013-2016)	405 trips/resident/a	380 trips/resident/a ●
Carbon dioxide emissions of road traffic in Helsinki will reduce 20 % by 2030 (the climate strategy of the metropolitan area)	-8 %	-9 % ●
Carbon dioxide emissions of passenger cars registered for the first time in Helsinki will reach the objective for average emissions 130 gCO <sub>2</sub> /km by 2015 (EU regulation)	140 g/CO <sub>2</sub> /km	122,3 g CO <sub>2</sub> /km ●
Share of cycling as a transport mode will be 15 % by 2020 (the Brussels Convention 2009)	11 %	10 % ●
<b>Indicators for noise reduction</b>	<b>2012</b>	<b>2015</b>
Noise barriers to protect current land use will be constructed as presented in the operating plan	0 m	0 m ●
Anti-noise coating will be used as presented in the noise operating plan	21 900 m <sup>2</sup>	11 725 m <sup>2</sup> ●
<b>Indicators for water protection</b>	<b>2012</b>	<b>2015</b>
Nitrogen emissions to the sea from the Viikinmäki waste water treatment plant will reduce (t/a) (environmental policy)	593 t/a	414 t/a ●
Phosphorous emissions to the sea from the Viikinmäki waste water treatment plant will be reduced (t/a) (environmental policy)	26 t/a	23 t/a ●
Number of combined sewer network overflows will reduce 20 % from the current level by 2020 (environmental policy)	The comparison year	-18 % ●
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	750 persons* (2014)	780 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 780 people.		
<b>Indicators for nature protection</b>	<b>2012</b>	<b>2015</b>
Share of nature reserves of total area (City of Helsinki Nature Conservation Programme 2008-2017)	2,2 %	2,2 % ●
The surface area of water-permeable areas in Helsinki (the urban run-off water strategy for the City of Helsinki 2008)	60 %	60 % (2013) ●
<b>Indicators for procurements and waste</b>	<b>2012</b>	<b>2015</b>
Share of environmental criteria in the centralized acquisitions of the City of Helsinki will be 50 % by 2015 and 100 % by 2020 (environmental policy)	37 %	85 % ●
Amount of communal waste produced in the Helsinki metropolitan area per capita will reduce 10% by 2020 (environmental policy)	319 kg/resident/a	310 kg/resident/a (2014) ●
<b>Indicators for environmental awareness</b>	<b>2012</b>	<b>2015</b>
The number of eco-supporters in the city organisation will increase, so that every work community will have a dedicated eco-supporter (environmental policy)	1 139 eco-supporters	1 200 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)	12 %	37 % ●

# Contents for diagrams and charts

13	DIAGRAM 1 Sectoral CO <sub>2</sub> emissions in Helsinki 1990 and 2000–2015	18	DIAGRAM 6 The map of exposed residents to road traffic in 2012
14	DIAGRAM 2 Annual average nitrogen dioxide (NO <sub>2</sub> ) concentrations measured by HSY's monitoring stations and passive samplers in 2006–2015	23	DIAGRAM 7 Nitrogen and phosphorus load channeled to the sea from the Viikinmäki treatment plant in 2003–2015
14	DIAGRAM 3 The number of days when the limit value (50 µg/m <sup>3</sup> ) for particulate matter (PM <sub>10</sub> ) was exceeded in the air quality measurement stations in Helsinki in 2005–2015	25	DIAGRAM 8 Map of Helsinki's current nature reserve and Natura areas and new Nature Conservation Programme sites
17	DIAGRAM 4 Distribution of various transport methods in the public transport of Helsinki in 2015	35	DIAGRAM 9 The city's environmental income in 2015
17	DIAGRAM 5 CO <sub>2</sub> emissions of different modes of transportation in Helsinki in 1990 and 2000–2015	36	DIAGRAM 10 The city's environmental costs in 2015
		37	DIAGRAM 11 The city's environmental investments in 2015

All the materials for the Environmental Report can be found (in Finnish) at [www.hel.fi/ymparistoraportti](http://www.hel.fi/ymparistoraportti).

26	CHART 1 Contaminated soil matter transported for treatment or final disposal in Helsinki 2012–2015	35	CHART 6 The city's environmental income in 2014 and 2015
26	CHART 2 The costs for the City of Helsinki caused by the restoration of contaminated soil and landfill sites 2012–2015	36	CHART 7 The city's environmental costs in 2015 and 2015
28	CHART 3 Environmental criteria proportion in centralised acquisitions, i.e. in procurements which are put up for tender for the use of all organisational departments in 2015	37	CHART 8 The city's environmental investments in 2014 and 2015
30	CHART 4 City of Helsinki environmental education and guidance in 2015	38-39	CHART 9 Environmental indicators 2012 and 2015
33	CHART 5 Oil spill damages in Helsinki 2012–2015		

The city's environmental policy and strategy programme set goals for the various sectors of environmental protection. The environmental policy can be found in its entirety at [www.hel.fi/ymparistopolitiikka](http://www.hel.fi/ymparistopolitiikka), but the central objectives are also presented in this report.

All of the 27 city departments and four public utility companies have produced information for the report compiled and edited by the Environment Centre. The City of Helsinki Group also includes 11 foundations and 83 subsidiary organisations, 54 of which submitted information for the Environmental Report.

Environmental reporting is steered by a working group set up by the Mayor with the members including Päivi Kippo-Edlund as chairperson, Katarina Kurenlahti as vice-chairperson, Johanna af Hällström as secretary and Marianne Annanolli, Eeva Heckwolf, Päivi Holopainen, Annukka Eriksson, Maria Kuula, Seppo Manner, Sirpa Hinzell, Perttu Pohjonen, Aino Rantanen, Susanna Saloranta, Maija Sarpo, Anna Ruskovaara, Rauno Tolonen and Toni Åkerfelt as members.

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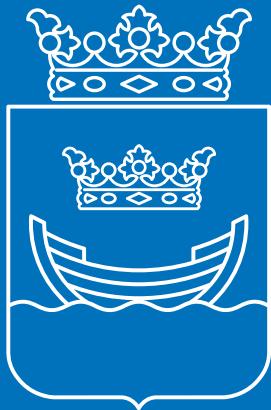
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**City of Helsinki  
Environment Centre**

Street address  
Viikinkaari 2 A  
00790 Helsinki  
Postal address  
P.O. Box 500  
FIN-00099 City of Helsinki  
Exchange +358(0)9 310 1635  
[ymparistoraportti@hel.fi](mailto:ymparistoraportti@hel.fi)  
[www.hel.fi/ymparistoraportti](http://www.hel.fi/ymparistoraportti)