



City of Helsinki  
Environment Centre

# Helsinki – Basic facts about Environment



# Contents

Helsinki – basic facts .....	3
Land use and urban structure .....	4
Energy .....	6
Air .....	12
Climate .....	16
Traffic .....	20
Noise .....	22
Waters .....	24
Nature .....	26
Soil contamination .....	28
Waste .....	30
Environmental responsibility .....	32

- Helsinki Metropolitan area
- Helsinki Region



# Helsinki – basic facts

**Helsinki**, the capital city of Finland, is located at the Gulf of Finland coast of the Baltic Sea at latitude 60 degrees north. The local climate is influenced by both maritime and continental climatic patterns.

The landscape of this coastal region is a mosaic of mixed coniferous and deciduous forest, steep granite hills, small lakes and farmland developed on former sea-bottom plains. Many landforms in the region are a product of the Ice Age, which ended about 12,000 years ago.

## **Geography and environment Helsinki / Helsinki Region**

Total area (km<sup>2</sup>) 715/5,518

Sea (km<sup>2</sup>) 503/1,678

Land (km<sup>2</sup>) 213/3,840

Shoreline (mainland + bigger islands, km) 220

## **GDP Helsinki region**

48 682 euros/capita (2011)

## **Population Helsinki**

Inhabitants 612 664 (2014)

## **GHG-emissions Helsinki**

4.7 tonnes CO<sub>2</sub>-eq./capita (2013)

## **Nature Helsinki**

Islands 315

Number of vascular plants 1,064

Number of nesting bird species 164

## **Climate Helsinki**

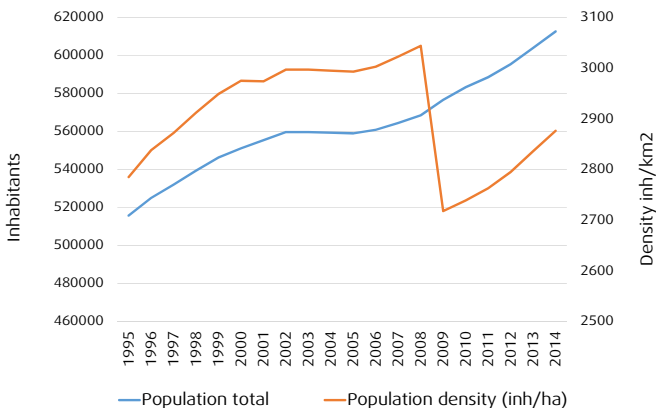
Mean temperature (2000–2009/1900–1999) + 6.5 °C/+ 5.2 °C

Maximum temperature (1844–2009) + 31.6 °C (Jul 1945)

Minimum temperature (1844–2009) - 35.0 °C (Dec 1876)

Average annual precipitation (2000–2009) 655 mm

## Population and density of Helsinki

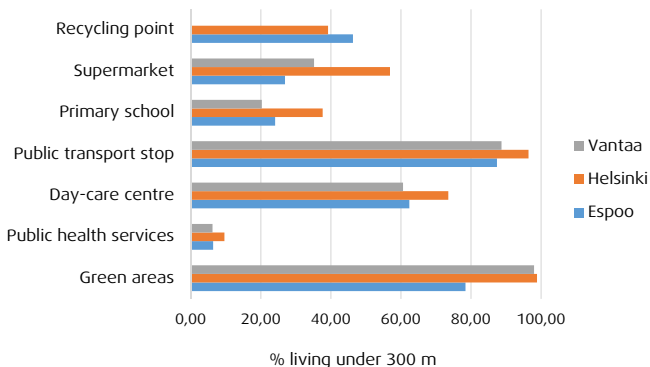


Population density in certain parts of Helsinki's inner city area is very high, reaching 16,494 inhabitants per square kilometer in the district of Kallio, but as a whole Helsinki is quite sparsely populated in comparison to other European capital cities. This is partly due to late urbanization of Finland relative to the rest of Europe.

According to the new proposed masterplan of Helsinki the population density will grow significantly by 2050 with even 250 000 new inhabitants. In 2008 a new section called Östersundom was annexed to Helsinki from Sipoo and Vantaa, and the land area of Helsinki grew by 45 km<sup>2</sup>. This reduced the population density of city temporarily. There is a metro connection planned to new neighbourhood in the future.

More information: [www.yleiskaava.fi/en/](http://www.yleiskaava.fi/en/)

## Availability of services in Helsinki metropolitan area

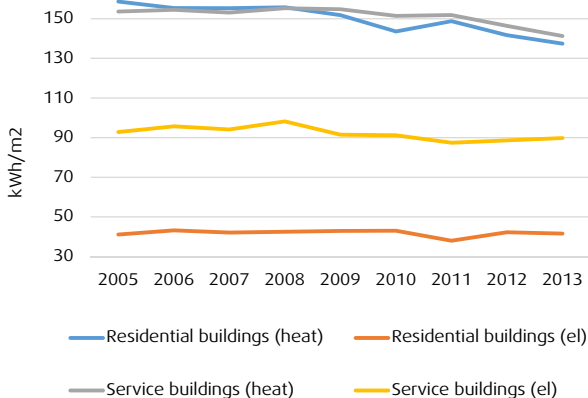


A guiding principle in Helsinki's physical planning has already for many decades been to achieve a compact urban structure in such a way that the network of green areas remains sufficiently large and functional. This principle is also included in Helsinki's current Master Plan 2003.

A major objective of the City strategy is to mitigate climate change with a compact city structure relying on a functional rail transport network. The municipalities of the Helsinki metropolitan region have a target of preventing urban sprawl. The city structure of Helsinki can also be seen in the availability of services, which mainly are very well achievable.

More information: [www.yleiskaava.fi/en/](http://www.yleiskaava.fi/en/)

## Energy consumption in Helsinki

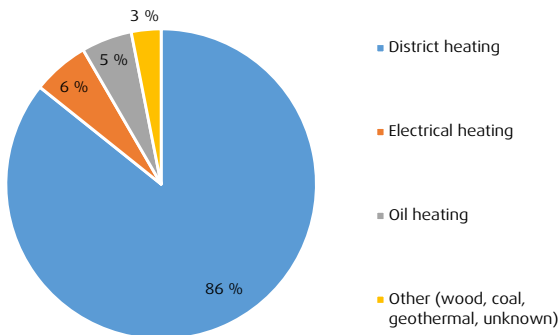


Energy consumption in Helsinki is no longer increasing, and the per capita consumption has begun to decrease. This has been caused by the improved energy-efficiency of buildings, electrical equipment, and traffic.

According to the study, Helsinki has the potential to reduce its energy consumption to some 70 percent of the current consumption by 2030.

More Information: [www.stadinilmasto.fi/en](http://www.stadinilmasto.fi/en)

## Modes of heating in Helsinki 2012

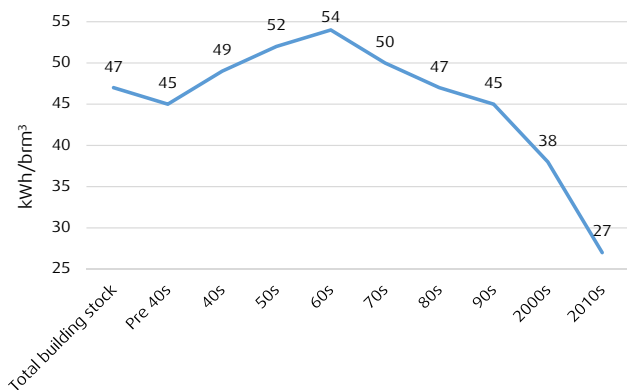


Nearly 90% of the Helsinki building stock is connected to the district heating system. Fuel oil and electrically heated buildings each account for approximately 5% of the building stock. The 90% fuel efficiency for district heating, electricity and cooling production in Helsinki is one of the highest in the world.

The construction of this one of the world's largest district heating network started already in the 1950's and covers nowadays almost all areas of Helsinki. The district cooling network is also widening fast and covers large parts of downtown Helsinki. The market share of oil heating has been reducing as this heating mode is often turned into district heating.

More information: [www.helen.fi/en](http://www.helen.fi/en)

## Heat consumption of district heated apartment building blocks by decade

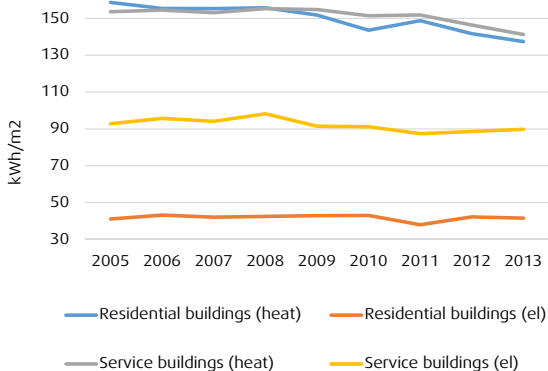


A rapid change in energy efficiency development of building stock has happened especially in the last ten years. The heat demand of new buildings is less than half compared with the buildings built in 1960's, which is the construction time when the energy consumption in apartment building blocks is highest. The positive development is due to the tightening national building code in Finland. Helsinki has also been among the pioneers of energy-efficiency by issuing the requirement for Energy Class A for residential buildings in the plot delivery terms since 2011.

More information: [www.helen.fi/en](http://www.helen.fi/en)



## Energy consumption of city-owned buildings

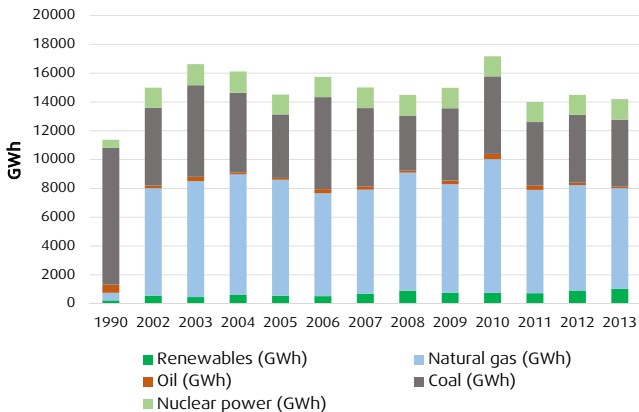


Helsinki has developed the energy efficiency of its own building stock since 1970's. Since the Energy Conservation Agreement of 1993, Helsinki has conducted energy audits on 83% of city-owned public service building stock and implemented energy saving measures recommended in audits. The specific heat consumption of buildings has decreased for a long time. Since 2007 there has been also a decrease in electricity consumption. The city has developed maintenance of buildings and developed energy efficient ways to reduce consumption for example in ventilation and lighting.

According to a recent energy efficiency agreement, Helsinki aims to achieve a 9% saving in energy during the period 2008–2016 through the implementation of, for example, low-energy construction and energy renovations. The city has a low energy building code for new construction and renovation. Almost 0-energy pilot projects have been established to reach EU energy goals.

More information: [www.energiatohokashelsinki.fi/en](http://www.energiatohokashelsinki.fi/en)

## Share of renewable energy in Helen production

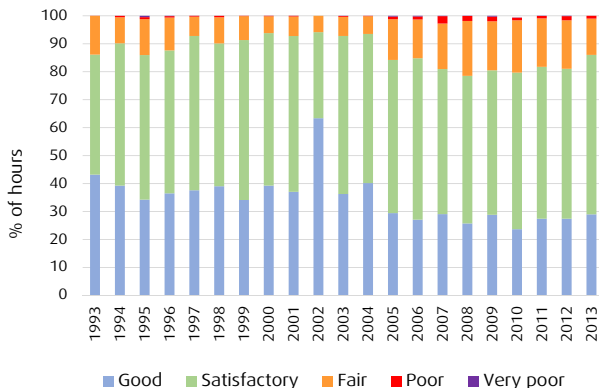


The share of renewable energy, which city-owned energy company Helen produces, was 7% in 2013. The main fuel is natural gas. The company's intermediate target is to increase the use of renewable energy sources to 20% by 2020. This will be achieved by also using biomass to produce energy. In addition, the company aims to supplement the energy palette with offshore wind power.

In the first stage, in 2014–2015, pellets will be introduced among coal to be used at the Salmisaari and Hanasaari CHP-power plants. The share of pellets will amount to 5–7% of fuel. Helsinki City Council will decide on the progress of the second stage in 2015. The alternatives are to build a new multifuel fired power plant (using biomass and coal) in Vuosaari or to use biomass to replace 40% of the coal used in Hanasaari and Salmisaari.



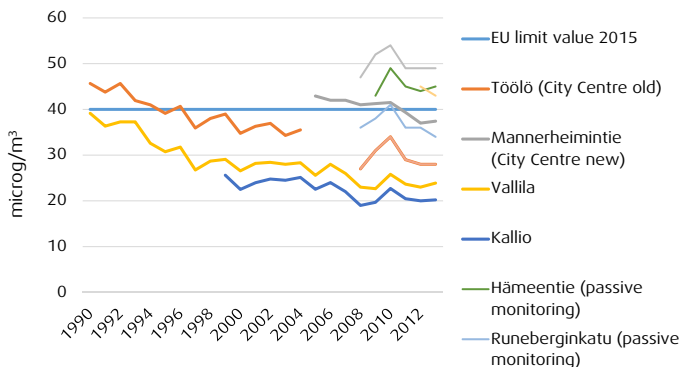
## Air quality in Helsinki city centre



Compared to large European cities, the air quality in Helsinki is rather good. Air quality problems are caused by traffic emissions and street dust from traffic, as well as long-range transported fine particles and ozone. The burning of wood in one-family house areas causes local hazards. Air quality expressed with air quality index, developed by the Helsinki regional environmental authority HSY, is for most of the time good or satisfactory

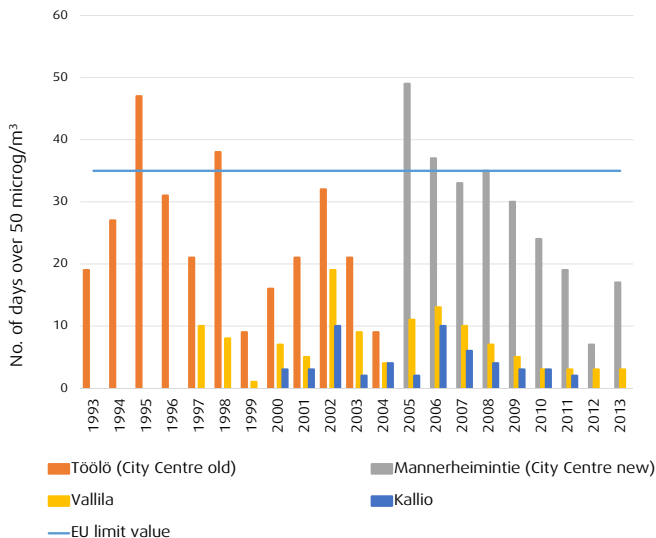
More information: [www.hsy.fi/en](http://www.hsy.fi/en)

## NO<sub>2</sub>-concentration in Helsinki



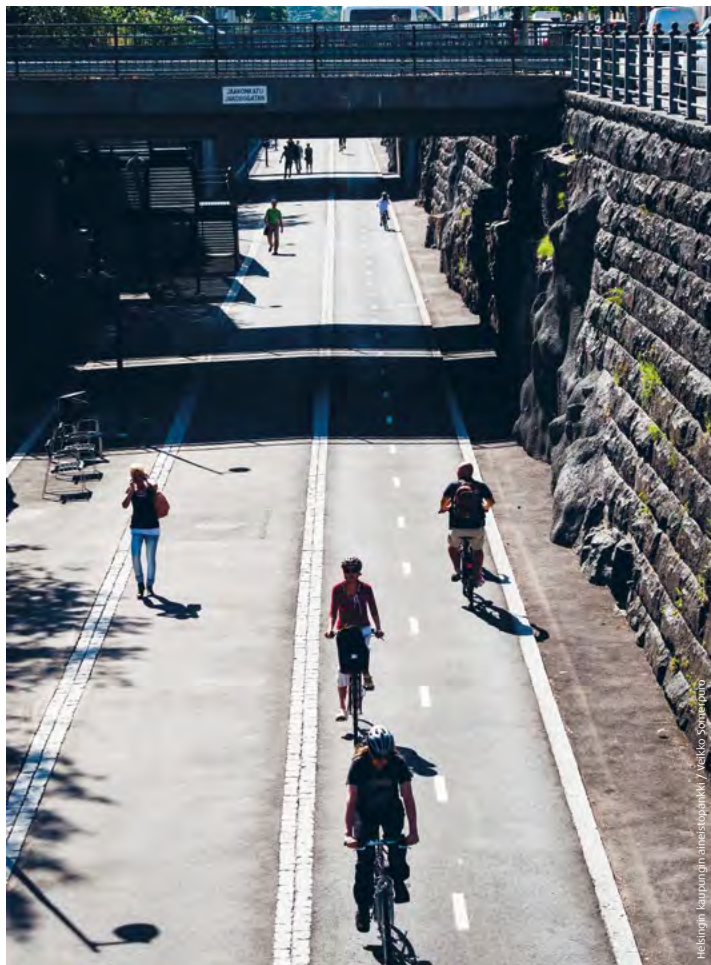
The nitrogen dioxide concentrations in busy street routes within the city continue to exceed the annual limit value, due to emissions from car traffic. The development of vehicle technology is expected to decrease the emissions of nitrogen oxides in the near future, but they are not likely have a sufficient effect by 2015. Therefore, in order to reach the limit values by 2015, the traffic emissions should be reduced by decreasing the amount of traffic within the city. This presents a challenge, as new, extensive residential areas are currently being built within the city.

More information: [www.hsy.fi/en](http://www.hsy.fi/en)

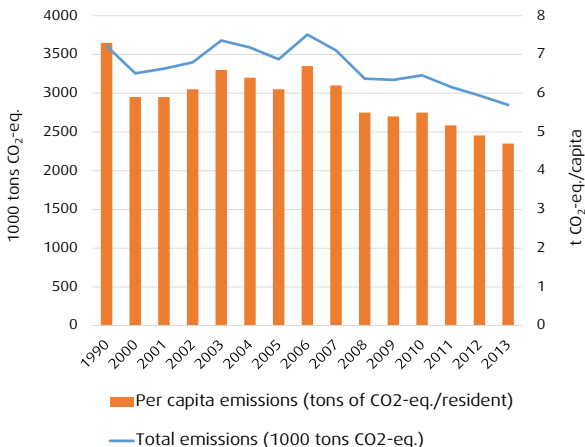
No of days exceeding 50 microg/m<sup>3</sup> of PM<sub>10</sub>

The street dust contents in Helsinki have decreased, which proves that the investments in controlling street dust over the past years have been successful. The daily limit value for particulate matter, introduced in 2005, was last exceeded in the centre of Helsinki in 2006. Street dust is a problem mainly in springtime, when the roads have just dried but the street sand has not yet been cleaned.

More information: [www.hsy.fi/en](http://www.hsy.fi/en)



## GHG emissions of Helsinki



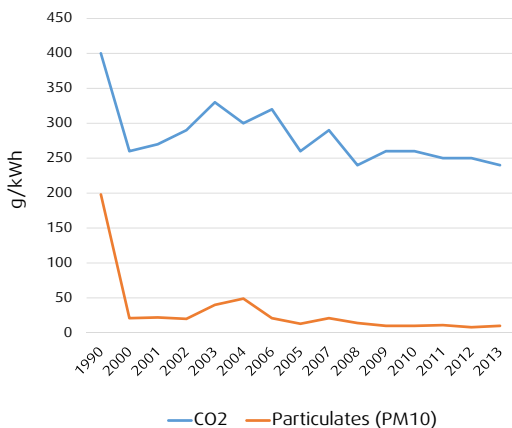
The total greenhouse gas emissions in the city of Helsinki have decreased by 21% since 1990. The most significant factor in this was the replacement of coal with natural gas in energy production. The collection and utilisation of landfill gas has also had an impact on the overall emissions, as have the decreased emissions from road traffic, as well as the structural changes and the introduction of district heating instead of oil heating in industry.

The emissions from electricity consumption have been increasing for a long time, but the development seems to have finally turned downwards. Helsinki is aiming for carbon neutrality by 2050, and aiming to decrease amount of greenhouse gases by 30% by 2020. According to recent study Helsinki could reduce its emissions by 44% by 2020.

More information: [www.stadinilmasto.fi/en](http://www.stadinilmasto.fi/en)



## Specific emissions in Helen production

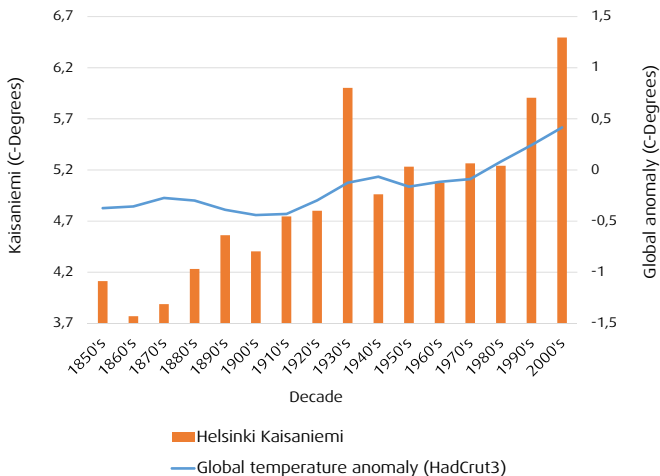


The city-owned energy company Helsingin Energia has reduced its emission significantly from 1990. The reduction has been achieved partly with improved smart and energy efficient solutions in production and distribution of heat, electricity and district cooling, but mainly due to fuel switch from coal to natural gas and efficient flue gas cleaning methods.

The specific emissions of energy production (heat, power and cooling) of Helsingin Energia were 260 g CO<sub>2</sub>/kWh in 2013 compared with the European average of electricity production 476 g CO<sub>2</sub>-ekv/kWh.

More information: [www.helen.fi/en](http://www.helen.fi/en)

## Annual temperature in Helsinki and Globe

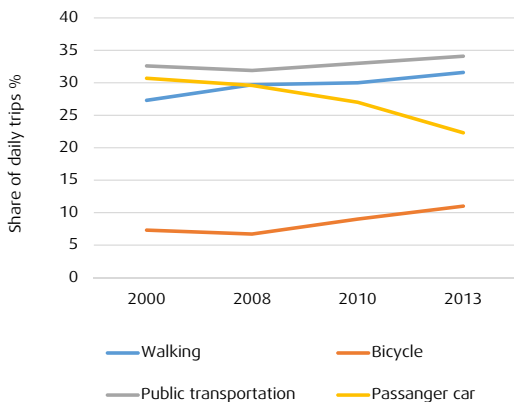


In Finland, the temperature has increased by over one degree, more than global average of 0.8 Degrees. Helsinki has seen its warmest year, winter, and summer of all time over the past few years. The highest level of sea water occurred in January 2005 when the sea water almost reached the city hall at +151 cm above

Temperature will still rise between 3–6 degrees during the 21st century depending on the global mitigation progress of GHG's. The average rainfall will increase by 10–20 % and there will be more extreme events of heavy rain and heatwaves. This causes that adaptation must be included in all of the existing, essential planning processes and construction.

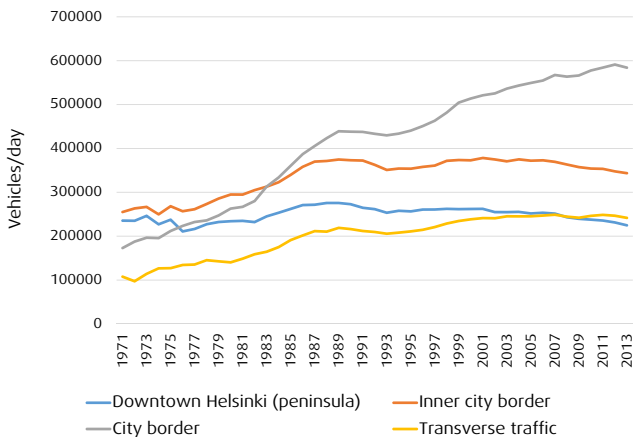


## Share of daily trips in Helsinki by modes of transport



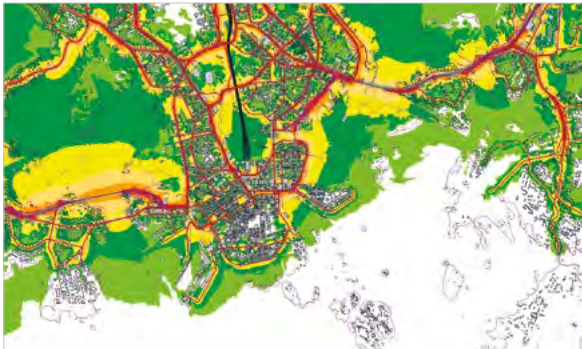
The share of transport modes in Helsinki is such that about 30% of all trips are made by car, 32% by public transportation, 29% on foot and 7% by bicycle. In the centre of Helsinki, only 20% of all trips are made by car. The city aims to double cycling by 2020 with major investments in cycling network. The share of bicycles has increased from 7% in 2000 to 11% in 2013.

## The amount of motor traffic in Helsinki



Helsinki has had the advantage of having pursued a policy of favouring public transport – especially rail-borne traffic – since the 1970s. This has resulted in the region's transport system working quite well. Since the year 2000 the traffic in the city centre has decreased, whereas the traffic at the city borders and transverse routes has been increasing by 1-2% per year until recent years, when the lower economic activity has slowed down the growth of traffic.

# Noise

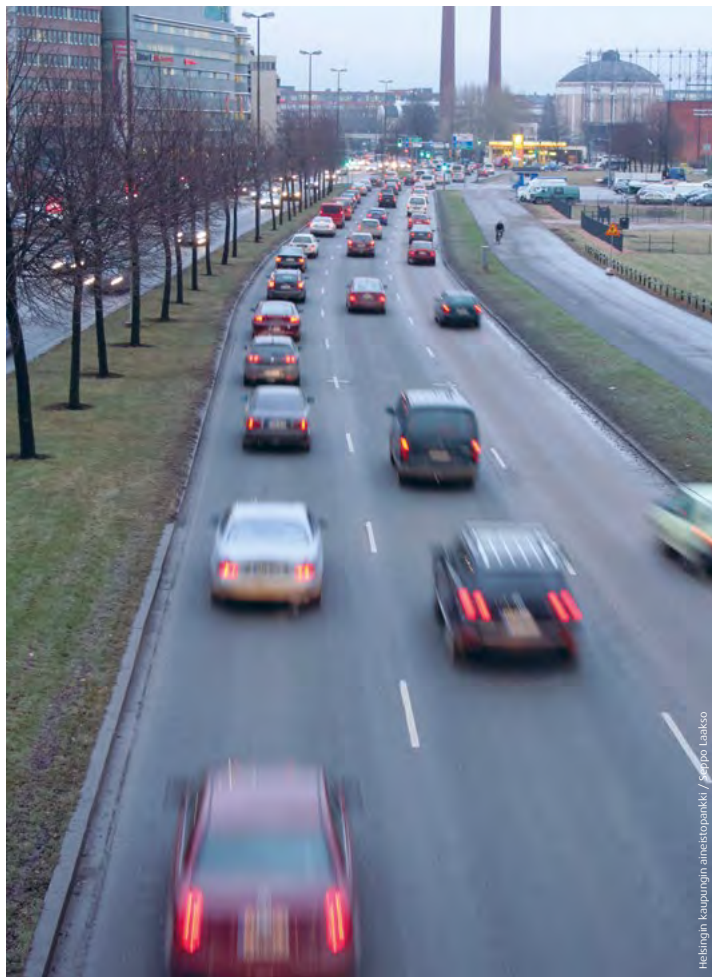


Helsinki noise map

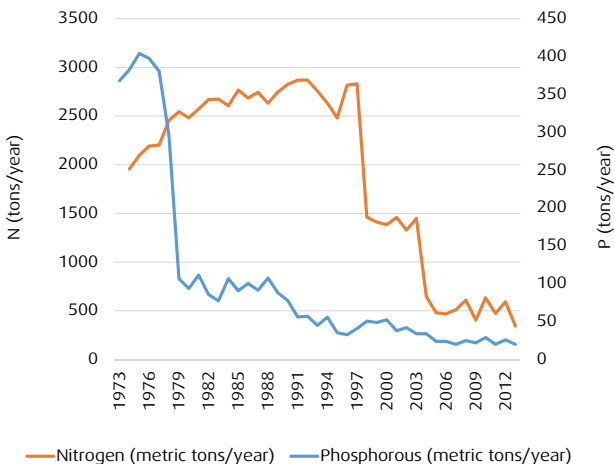
The greatest noise problems in Helsinki are caused by road traffic. Efforts are made to prevent noise problems by reducing noise emission, preventing the spread of noise, and by protecting noise-sensitive areas. It is estimated that by 2020, the number of residents exposed to road traffic noise will increase by around 27% unless new noise barriers or other noise prevention projects are implemented. The main reasons for this growth are the increasing amount of traffic, the expansion of noise areas, and construction within noise areas.

The revised noise control action plan presents 26 measures for carrying out noise control and reducing the noise levels caused by traffic. These concern land use planning and traffic planning, antinoise coatings for roads, the promotion of quieter modes of transport, the construction of noise barriers, improving the sound insulation of buildings and the development of quiet areas.

More information: [www.hel.fi](http://www.hel.fi) » **English** » **Housing and environment** » **Environmental protection and oversight** » **Environmental protection programmes** » **Noise prevention**



## Waste water discharges of Viikinmäki wastewater treatment plant

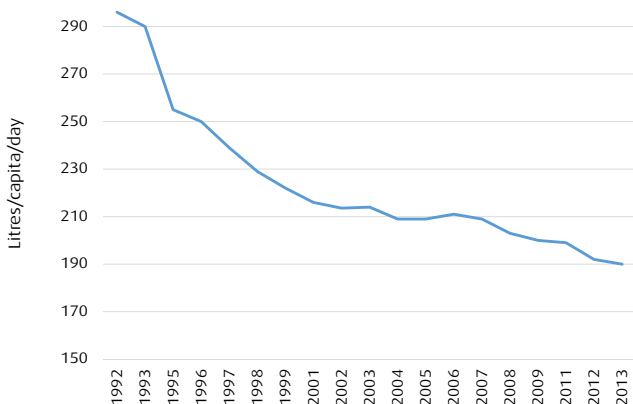


Nutrient loading of the sea in Helsinki has decreased significantly since the 1970s due to improved wastewater treatment. The Vantaanjoki River currently brings around 60% of the nutrient loading to the waters in Helsinki. However, the phosphorous loading during winter in the waters in Helsinki has risen since the beginning of the 1990s due to general increase in phosphorous concentrations and the internal loading from the seabed. The total amounts of blue-green algae and phytoplankton in the summer have increased due to the rise in phosphorous concentrations and the warming of the surface waters.

The state of the Helsinki bay areas has improved significantly from the 1970s and 1980s, when wastewater was discharged into the bay areas. However, there is still over-eutrophication. The quality of the water at the swimming beaches has been mainly good.



## Total water consumption (households, services, industry)

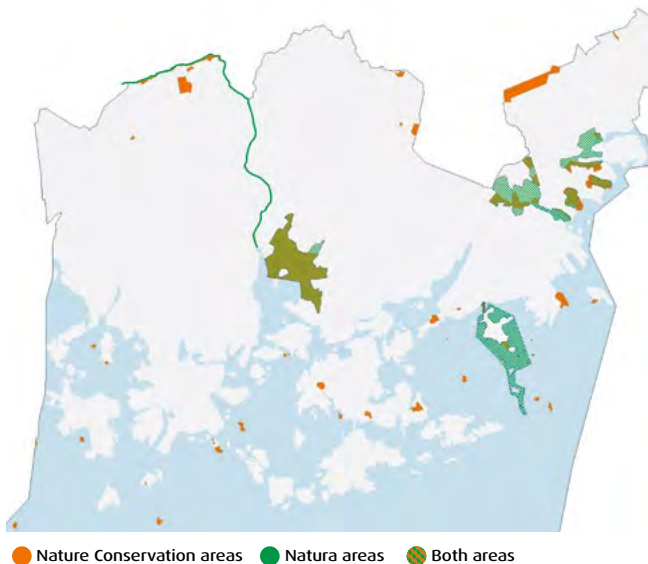


Water consumption in Helsinki has decreased significantly over the past decade. The consumption per capita was 190 liters in 2013. The main influences behind the drop were the introduction of the wastewater charge in the 1970s, the increased price of energy, technological advances in appliances and water fixtures enabling lower water consumption, and increased general awareness of environmental matters. The rise in the price of energy also increases the price of domestic hot water as 40 to 45 percent of all domestic water used is heated water.

Water consumption varies between building types, but there can also be significant variation between individual customers living in the same building. Water consumption in blocks of flats is, on average, higher than in terraced houses or detached houses.

More information: [www.hsy.fi](http://www.hsy.fi)

# Nature



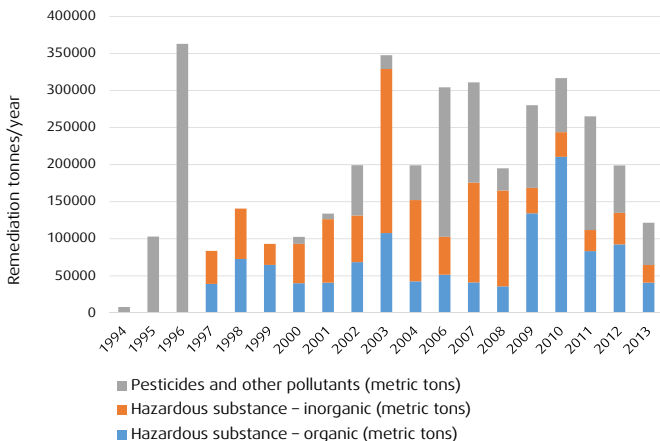
The land surface area of Helsinki includes a total of 36% of various types of green area, 22% of which is forest. The forests are maintained as recreational areas. The flora of Helsinki includes over 1,100 species, of which 40% are native. Their proportion is highest in the archipelago. Plant species have disappeared as a result of construction, forestation of meadows and fields, and change of use of forests. 3.2% of the city's land area and 1.2% of the water areas are protected under the Nature Conservation Act or designated as Natura areas. There are a total of 52 nature conservation areas in Helsinki.

More information: [www.hel.fi](http://www.hel.fi) » English » Housing and environment » Environmental protection and oversight » Environmental protection programmes » Nature conservation and soil protection



# Soil contamination

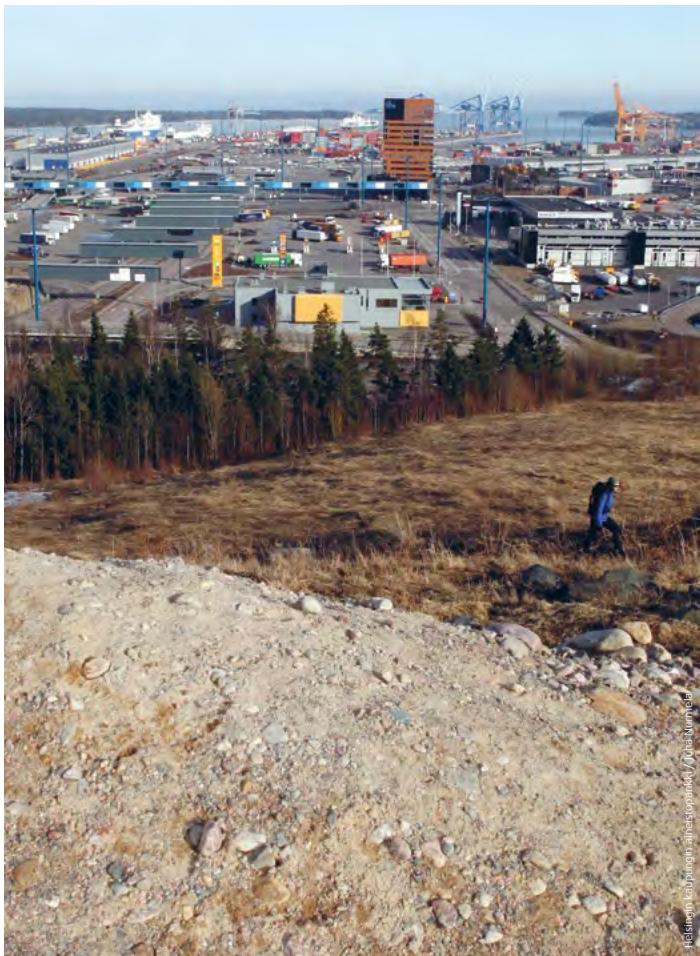
## Remediation of sites in Helsinki



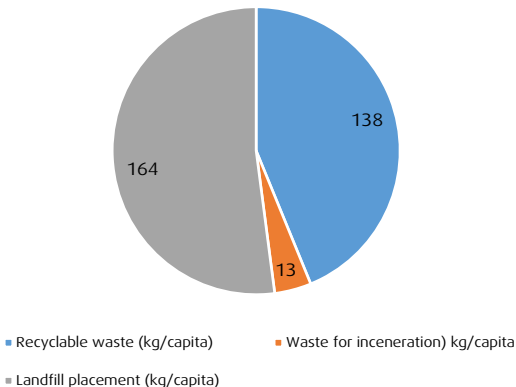
Harmful substances have accumulated in the soil as a result of many kinds of industrial and other activities. The land is often cleaned in when new dwellings are built on former industrial, storage and harbour areas. The state of the soil is constantly improving with remediation of soil.

The significance of the land mass economy in the operations of the city has been emphasised in recent years with the launch of large area building projects. Several projects that aim to utilise surplus landmasses were initiated in 2013 with landfill shaping and noise barriers. The mass saving resulting from more efficient utilization of surplus landmasses have totalled approximately 7 million euro in 2012-2013.

More information: [www.hel.fi](http://www.hel.fi) » [English](#) » [Housing and environment](#) » [Environmental protection and oversight](#) » [Environmental protection programmes](#) » [Nature conservation and soil protection](#)



## Household waste collection 2012

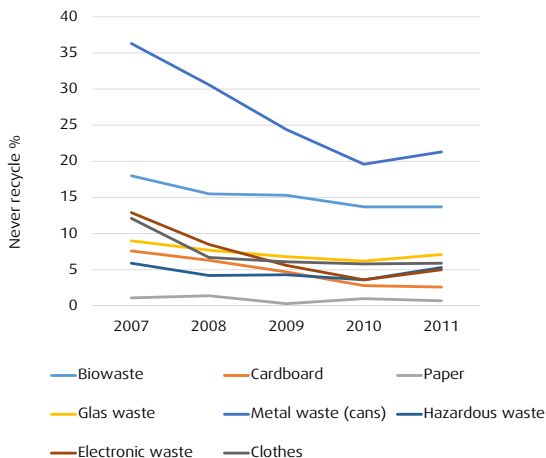


Waste management in the metropolitan region has been based on source separation of waste, and on landfilling the non-recyclable waste. From year 2014, mixed waste that cannot be recycled is used for energy production. This will result in a significant improvement in the degree of waste utilization in the metropolitan area. As the number of residents in the metropolitan area increases, the overall amount of waste will also probably continue to increase.

Over six million tons of waste is created every year within the Helsinki metropolitan region. Of this, some 350,000 tons come from private households. The amount of municipal solid waste from private households in the region has been increasing since 2004. A slight decrease was visible in 2010, but it cannot yet be said to indicate a trend.

More information: [www.hsy.fi](http://www.hsy.fi)

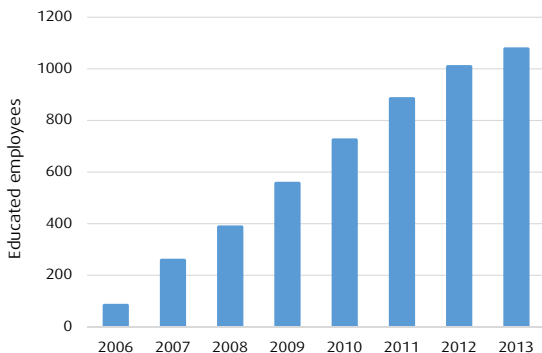
## Recycling of waste by type (% never recycles)



Between 2004 and 2008, the waste recycling rate has increased from 45 to 50 percent, meaning that resource-efficiency has improved somewhat. The waste legislation which took effect in May 2012 aims to affect the solutions to waste problems at a comprehensive level. The new act defines the responsibilities of the various operators and sets an order of priority for waste management, aiming to reduce the amount and hazards of waste. Site-specific separate collection requirements are being introduced for glass and metal, and the property-specific collection of cardboard will be expanded at the beginning of 2014.

More information: [www.hsy.fi](http://www.hsy.fi)

## Educated Eco-support persons in city organisation

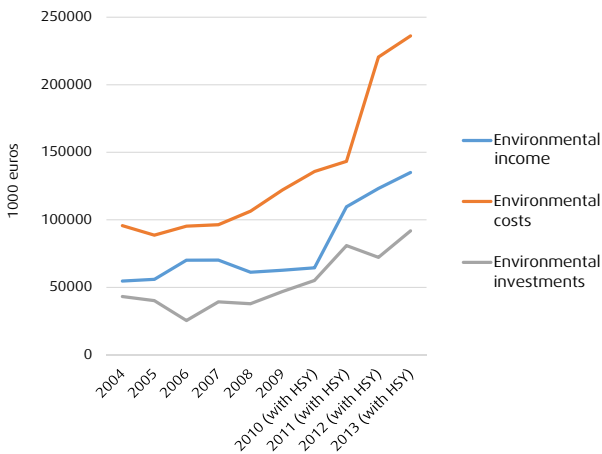


Environmentally responsible behavior calls for environmental awareness. Helsinki has started an eco-support activity in 2006. Eco-support is an operating model developed for promoting environmental awareness in the workplace. Eco-supporters are appointed and trained for working communities to promote work for a better environment. The new ecological practices in everyday operations conserve the environment and save money.

More information: [www.ekotuki.fi](http://www.ekotuki.fi)



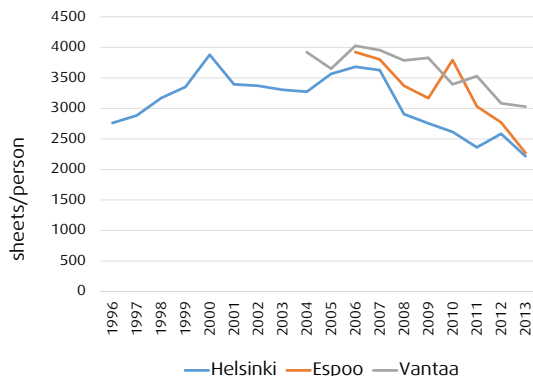
## City of Helsinki environmental economy figures



The environmental costs of Helsinki have been increasing over the years. The city's largest expense items have been environmentally-based taxes on electricity and fuel, sanitation and waste management, and during the past recent years also climate protection. The environmental investments vary between the years. The biggest investments are made in soil protection, sanitation and waste management. The greatest sources of environmental income for the city have been the income from sanitation, waste management and the ticket sales of the Helsinki Zoo.

More information: [www.hel.fi](http://www.hel.fi) » **English** » **Housing and environment** » **Environmental protection and oversight** » **Environmental policy and reporting** » **Environmental reporting**

## Paper consumption per city employee



The Procurement Centre of Helsinki is responsible for the joint tendering process of paper products. During the tendering, the Centre will ensure that the copying paper used is as environmentally friendly as possible, among other things. However, the procurement decision and paper consumption take place at the department level.

Paper consumption has been reduced in recent years. In 2013, paper consumption per employee in city organisation was 2,217 sheets, which is 40 percent higher lower than in 2006. The consumption is also lower than in neighbouring cities. This reduction has been achieved with eco-support activity in city organization, electronic decision-making system where all politicians have laptops and secure printing, where printing must be verified with ID.

More information: [www.hel.fi](http://www.hel.fi) » English » Housing and environment » Environmental protection and oversight » Environmental policy and reporting » Environmental reporting





## Viikki Environment House

the office building with the lowest energy consumption in Finland

- Solar energy plant with a capacity of 60 kW
- Optimally oriented in relation to dominant winds and the sun
- 25 drilled wells produce cooling energy
- Urban wind turbines
- Roof gardening

## Contact details

Environment Centre, Helsinki  
Viikinkaari 2a  
00790 Helsinki  
P.O. Box 500, 00099 CITY OF HELSINKI  
[www.hel.fi/ymk](http://www.hel.fi/ymk)