CITY OF HELSINKI

ENVIRONMENTAL REPORT 2005 | SUMMARY

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City of Helsinki, Environmental Report 2005

Introduction

The City of Helsinki Environmental Report is a common report for the city's administrative departments. This report contains information from all of the city's 36 departments, and it has been compiled by the Environment Centre. However, the environmental impacts of the city corporation's subsidiaries are not included in this report. The material provided by the departments is presented in its entirety on the Internet (URL on cover).

The environmental reporting of the city is supervised and coordinated by the Environmental Reporting Group set up by the Mayor. All the most important departments in terms of the management of environmental impact are represented on this body.

The City of Helsinki places a significant burden on the environment and is an important actor in environmental protection. For example, the city is responsible for 5% of Finland's carbon dioxide emissions. The Viikinmäki wastewater treatment plant is responsible for the purification of wastewater produced by 750,000 residents.

Deputy Mayor's Overview

PERTTI NISONEN

Energy production and wastewater treatment are the City of Helsinki's largest individual sources for loading the environment. The emission trends for both of these were very positive in 2005.

Helsinki Water's long-term efforts for boosting the efficiency of wastewater treatment have not become a media event, despite the fact that they have resulted in a great decrease in nutrient emissions from the wastewater treatment plant into the Gulf of Finland. As a result of the four-year investment, the start-up of the extension to remove nitrogen decreased nitrogen and phosphorous emissions by almost 30% compared with the previous year. The share of nitrogen removed from the wastewater was 89%, which is a record figure even by international standards. Helsinki Water also participated in the planning of the St Petersburg Southwest Wastewater treatment plant, which was inaugurated in autumn 2005, and this was also important in terms of the state of the Gulf of Finland.

In terms of the management of climate change, the year was also good with regard to the most important greenhouse gas emissions. Helsinki Energy's carbon dioxide emissions fell by 19% over the previous year. Behind this reduction was the favourable hydropower situation for the Nordic countries, thanks to which the separate production of electricity in Helsinki's power generating plants decreased a greatly. Helsinki Energy also continued to improve its eco-efficiency last year through its investment in district heating/cooling production at the Katri Vala heat pump plant.

Despite these achievements Helsinki still has challenges to face both in the state of the local environment as well in global environmental impact. Traffic causes an ever-increasing everyday environmental problem, above all in terms of street dust and noise. Around 100,000 Helsinki residents live in an area where the noise level exceeds 55 dB, which, according to a government decision, is the guideline value for residential areas. In 2005 the limit values set by the EU were exceeded in terms of air particle content and nitrogen dioxide. As a result of exceeding the limits Helsinki had to prepare a report to the EU Commission explaining the city's actions to reduce the contents. Indeed, the Public Works Department has already proposed that not exceeding the limit values for air particle content in 2007 be taken as a binding budget target for next year.

The number of vehicles in Helsinki continued to grow in 2005, this time by 2.4% over the previous year. At the same time the number of people using public transport in the Helsinki area stayed at around the same level as in the previous year. In September the City Council ratified the development lines for public transport, the aim of which is to increase the different means of transport for public transport, and to speed it up. These goals will be achieved if the political will and resources can be found.

Alongside the local environmental problems we should not forget Helsinki's share in global environmental loading. The latest ecological footprint calculations show that the average Helsinki resident consumes more than three times his or her global share of natural resources.

The challenge of sustainable consumption habits concerns everyone, but the city can show a good example. Helsinki has responded to this challenge in the environmental policy ratified by the City Council and in the Helsinki Ecological Sustainability Programme (HEKO) by, for example, increasing eco-efficiency in the city's purchases and construction practices, and environmental education through different means such as the establishment of a network of ecosupport persons and through ecosupport training.

Environmental work has been undertaken in many departments for a long time and with good results. In 2005 the Helsinki Environment Centre received the Helsinki Metropolitan Area Council "Natural Resources Saver" award for, significantly reducing paper consumption, achieving a high degree of recycling, and promoting the prevention of waste generation throughout the city. For its part, the Public Works Department Construction Services received the Best Practices Award during the Energy Savings Week from MOTIVA Oy, for its long-term educational work.

The environmental actions of Helsinki residents also play a key role when a large group of people are working towards the same end. A survey carried out last year into the environmental attitudes of Helsinki residents showed that interest in environmental issues continues to be at a high level – almost 99% of Helsinki residents regard environmental protection as either an important or very important social objective. Moreover, during the years 2000 to 2005 sorting waste has become general for all types of waste.

Pekka Sauri

The City's Environmental Management

Sustainable development is one of the city's values. In 1999 the Helsinki City Council decided that one objective was to include environmental management as an element of the city's administrative management. The city has implemented this objective both at the entire city level as well as in the city's departments. In spring 2005 the City Council ratified the city's new environmental policy, which requires that the departments, agencies, organisations and subsidiaries improve their environmental management.

On 16.5.2005 the City Council approved the objectives and measures of the Helsinki Ecological Sustainability Programme (HEKO) as a directive to be followed. Of the programme's 54 measures, by the end of 2005 three had been completely implemented, 17 partly implemented and 18 had been started.

The city's organisations that have been certified in accordance with the ISO 14001 environmental management standard are Helsinki City Transport – Bus traffic (1998 – nowadays Helsinki Bus Transport), the Port of Helsinki (2000), and Helsinki Energy's Salmisaari, Vuosaari and Hanasaari power plants. Helsinki City Transport's Trams and Metro, Helsinki Water, the Housing Production Department, the Environment Centre and the Education Department's operating system for its technical and service educational institutions are in accordance with the ISO 14001 standard, but the systems have not started a process for certification.

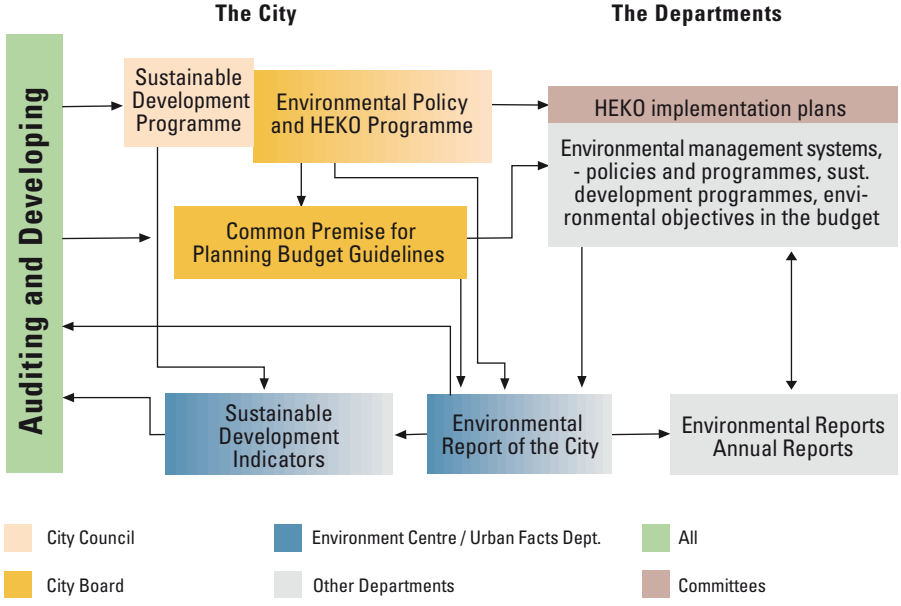
At the end of the year Helsinki Energy with six office buildings and the Helsinki City Transport had the right to use the Green Office environmental management certificate.

Environmental management tools at the whole city level include a sustainability action programme adopted by the City Council, Common premise for planning and budgetary guidelines approved by the City Board, environmental targets set in the budget, and environmental reporting.

An environmental programme coordinated by TKK Dipoli was implemented at the World Championships in Athletics in Helsinki in August 2005. The City of Helsinki was involved in this ECO-mass project, in which for the first time a comprehensive environmental programme was prepared for the World Championships in Athletics. Another outcome of the project was an eco-efficiency handbook for mass events, which was published at a side event for the UN's Commission for Sustainable Development in New York in May 2006.

Part of the environmental programme for the World Athletics Championships included several actions to improve eco-efficiency, in sectors such as energy consumption, waste management, traffic, building and communications. ■

Helsingin kaupungin ympäristöjohtaminen



The City's main environmental actions and impacts

In 2005, the calculation of the indicator that describes the city's overall environmental impact, i.e. the ecological footprint, was done as a joint footprint for the metropolitan area. According to the results, in 2001 the ecological footprint for a resident in the region was 5.8 gha (global hectares), whereas the globe's biologically productive land and water areas is estimated to be 1.8 gha per inhabitant.

The ecological footprint was also calculated separately for Helsinki, Espoo and Vantaa. The ecological footprint for a Helsinki resident, 5.8 gha, was slightly lower than that of an Espoo resident, 6 gha, and that of a Vantaa resident, 5.9 gha. The difference can be explained by the fact that Espoo and Vantaa residents travel more by car, and the slightly higher electricity consumption of people living in Espoo.

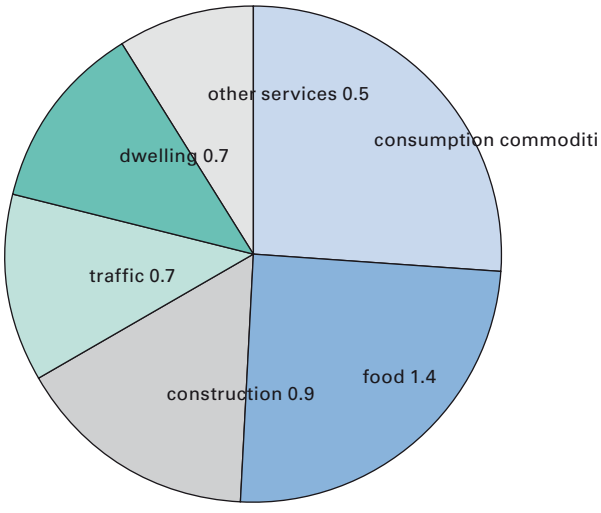
Energy use and greenhouse gases

Of Helsinki's consumption-based greenhouse gas emissions, 74% comes from energy consumption and 16% from traffic. In total, emissions were 5% lower in 2005 than in 1990, but there has been considerable variation from year to year. Factors that affect the amount of emissions include the Nordic electricity market (mainly the hydroelectricity situation) and the coldness of the winter. In 2005, emissions per resident were 28% lower than in 1990. The most significant reason for the decrease in emissions has been the change in Helsinki Energy's production structure, leading towards fewer emissions.

Helsinki Energy's carbon dioxide emissions in 2005 were one fifth lower than in 2004. In 2005 it was returned to the low level of emissions that prevailed in 2000, as the Nordic hydroelectric energy situation was once again extremely good following a very dry 2003. Carbon dioxide emissions were, above all, decreased by a reduction in condensate production, i.e. the separate production of electricity – the share of co-production in electricity generation was 97%.

In 2004, 274 new customers were connected to district heating, of which the power for these connections is 43 MW. District heating continued to cover around 93% of Helsinki's heating requirements. Construction work for the Katri Vala heat pump plant continued in 2005. This will be the world's largest heat pump facility, which utilises the heat content of wastewater in its operation. When this heat pump facility is finished in 2006, it will produce 90 MW of district cooling and 60 MW of district cooling.

Pääkaupunkiseudun asukkaan ekologisen jalanjäljen jakautuminen sektoreittain (gha)



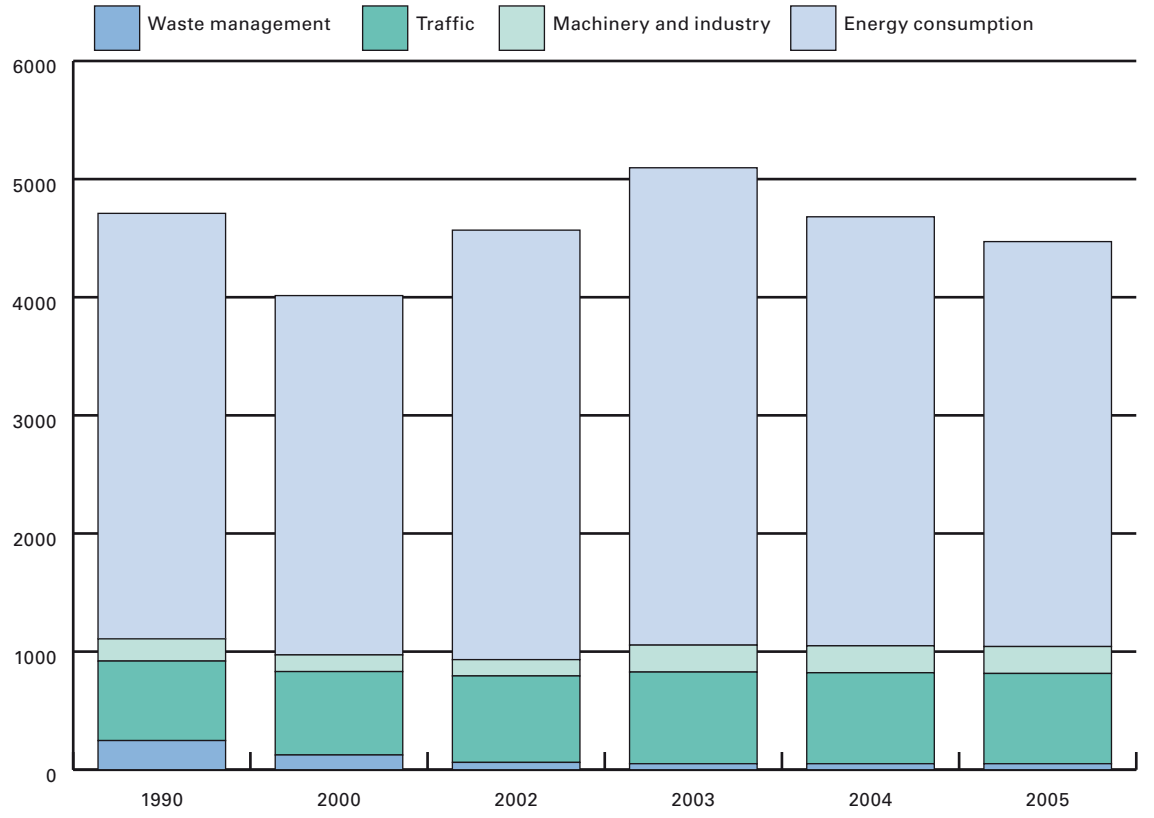
By the end of 2005 energy inspections had been carried out and reports written for 480 city owned buildings. This represents around 80% of the public service buildings, which is in line with the objectives set forth in the Energy and Climate Agreement entered into with the Ministry of Trade and Industry. From the energy inspections a total of 2,586 energy saving measures were suggested, around 50% of which have been implemented.

In 2005 the largest single investment in energy savings was the construction of a heat exchanger for the Töölön Kisahalli Sports Hall A. The aim of the project is to achieve savings of 415 MWh/a in energy consumption for ventilation by adopting a heat exchanger system.

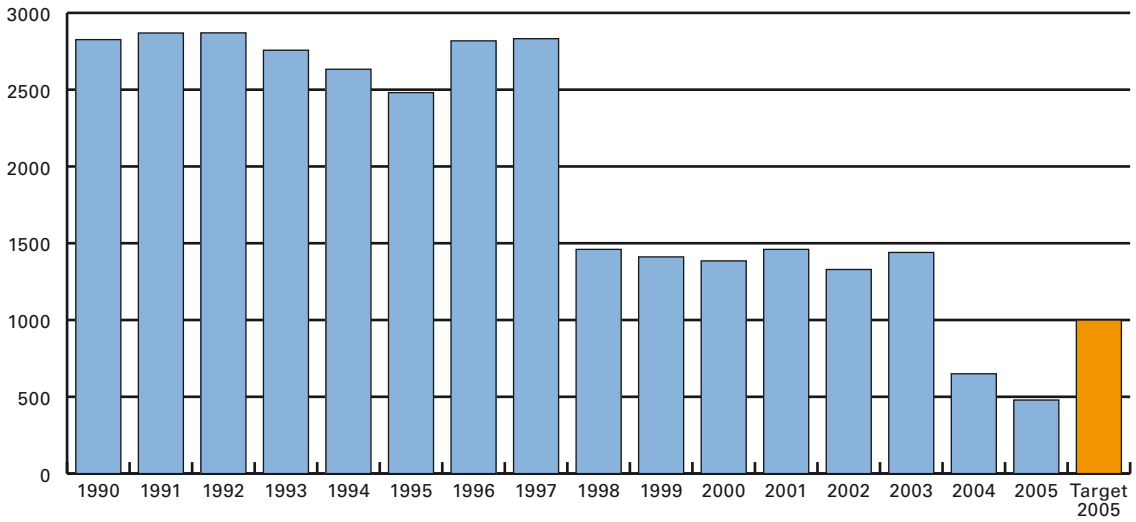
Wastewater and the sea area

The four-year investment in the new purification line and biological filtration at the Viikinmäki wastewater treatment plant were completed in 2004, and the benefits of the expansion have quickly become evident. 2005 was the first full year of operation for the plant following the expansion, and this could immediately be seen in the purification results, which have been better than ever before. The loading of organic substances into the Gulf of Finland decreased by almost 40%, and the nitrogen and phosphorous loadings by almost 30% over the previous year. The improvement in nitrogen and phosphorous removal is extremely important for the state of

Greenhouse gas emission equivalents of Helsinki's consumption (CO_2 equivalent)



Wastewater nitrogen emissions to the sea from Helsinki Water (tons/year)

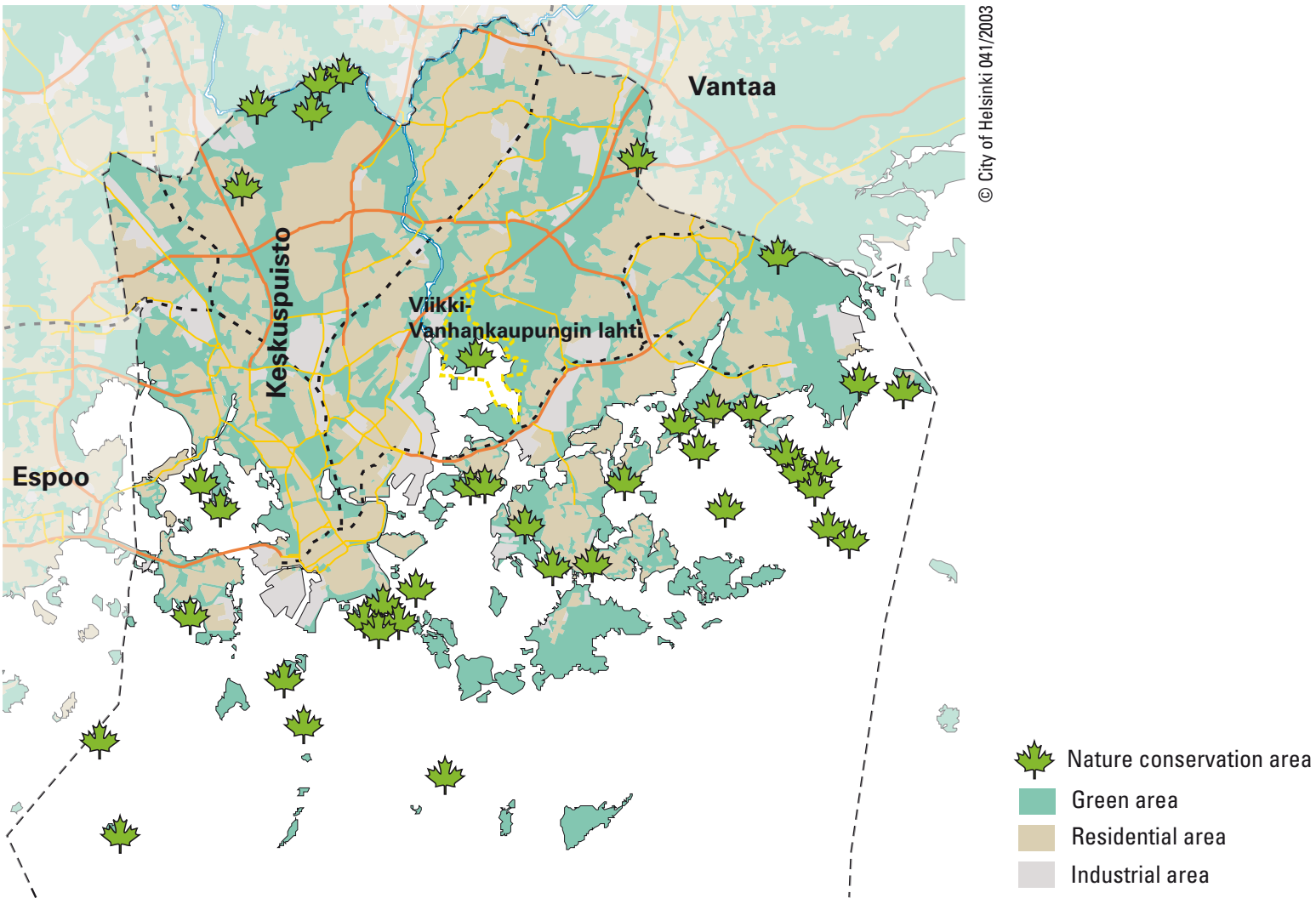


the Gulf of Finland, as both of these have a major impact on the state of the sea area.

In January 2005, as a result of the floods caused by the rise in the sea level, some of the purified wastewater from the Viikinmäki purification plant had to be conducted to the Vanhankaupunkiselkä area. As a result of this the total phosphorous and nitrogen contents, and also the amount of E-coli bacteria rose temporarily in the waters of the Vanhankaupunkiselkä area.

In 2003 high TBT (tributyl tin) content levels were found in the waters off the former dockyard in conjunction with the construction work for the Vuosaari harbour. Around 100 kg of TBT deriving from the dockyard operations were removed by dredging. In the solution adopted, the polluted sediment will be perma-

Nature conservation areas in Helsinki



nently isolated from the sea area and other surroundings. The dredging work was completed in August 2005 and the stabilisation of the sediment mass, which was placed in the Niinilahti area, began immediately following this.

Land use, construction, waste

The objectives for Helsinki's ecological construction were prepared in the Helsinki Ecological Sustainability Programme (HEKO). According to the programme, the city will, among other things, draw up a programme for ecologically sustainable construction, develop life cycle thinking in building planning and construction, and organise training in eco-efficiency in construction for construction professionals.

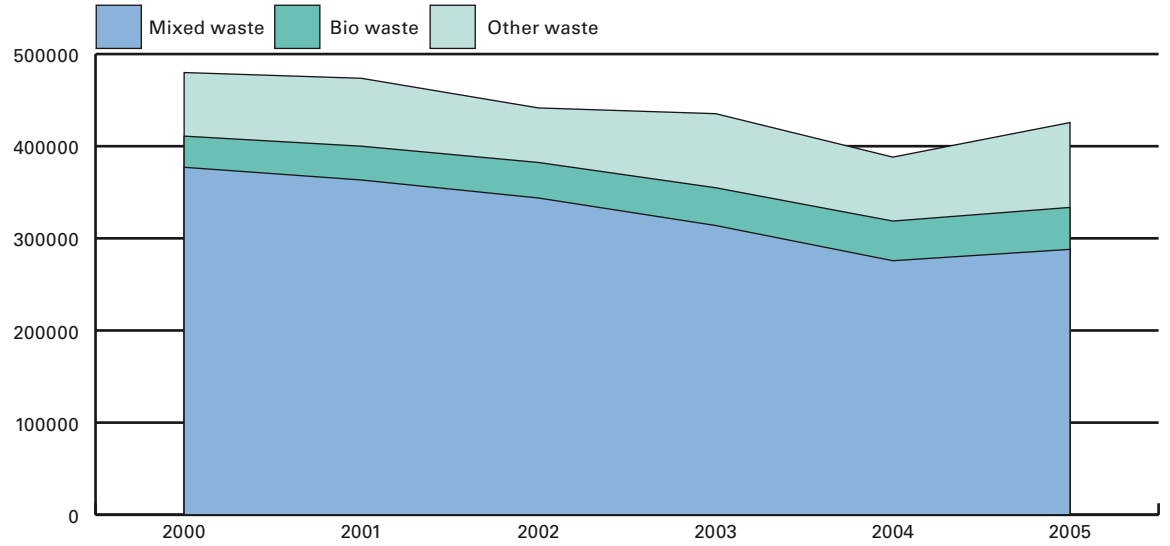
The number of nature conservation areas in the Helsinki area at the end of 2005 remained at 40, but the total area involved grew to 469 hectares when Saunalahti was added to the Vanhankaupunginlahti bird water protection area. In 2005 care and usage plans were drawn up for the Natura area of the Vanhankaupunginlahti bird water area, and for the part of the Ostersundom bird water area in Sipoo owned by the City of Helsinki.

A study on the use of waste for energy in the metropolitan region and the nearby areas has estimated the region's total waste amount for 2005 and the trend for this in the near future. According to the study the region's total amount of waste is around 1.3 million tons per year, of which solid municipal waste accounts for 603,000 tons. Of this amount, an estimated 300,000 tons of combustible waste had its final disposal point at the Ämmässuo waste treatment centre.

In March 2006 the board of the Helsinki Metropolitan Area Council (YTV) amended its waste treatment strategy in the metropolitan area. According to the decision in principal, the source-separated mixed waste should, in future, be burnt in a waste incineration plant equipped with grate incineration technology.

Contaminated soil in Helsinki was cleaned up on a total of 31 sites in 2005. The areas were usually cleaned by digging out the contaminated soil and taking it elsewhere for appropriate treatment. A total of 607,784 tons of contam-

Waste received at the YTV waste treatment centre (tons/year)



inated soil, of which 83% was from sites being cleaned by the city, was moved for treatment or final placement.

Traffic, air quality and noise

In 2005 the traffic in Helsinki increased greatly at the city border, and there was a slight increase in transverse traffic, but traffic decreased slightly at the downtown and centre border. The combined amounts of traffic using the main road network remained at approximately the same level as the previous year. The number of vehicles in Helsinki continued to grow, with a 2.4% increase over the previous year.

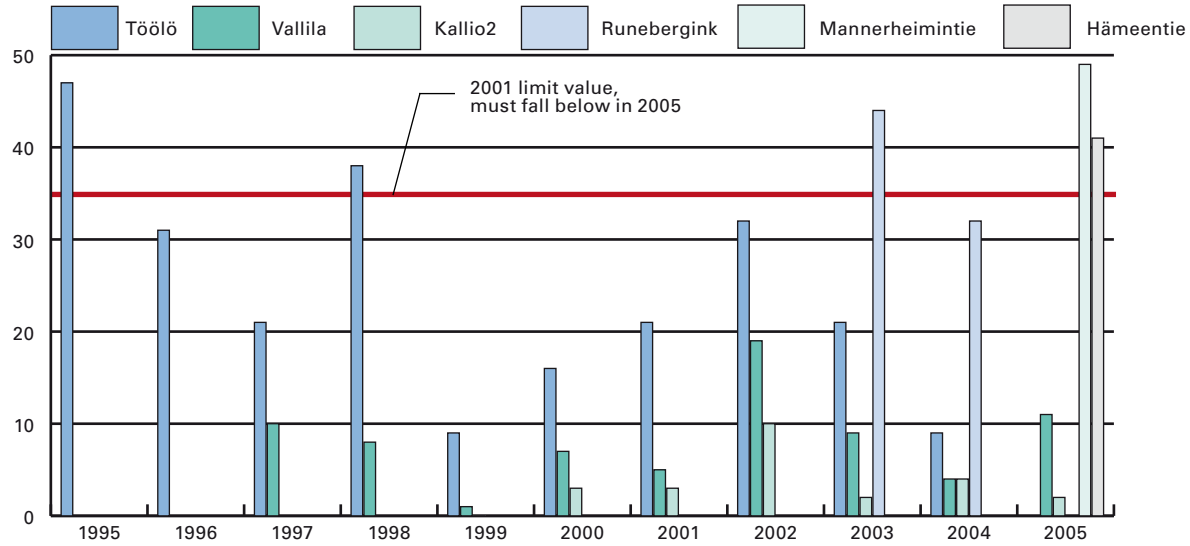
In 2005 the total number of public transport journeys (passengers getting on a means of transport) was 221.1 million, of which regional buses accounted for 8.7 million journeys and VR local trains accounted for 20 million. The number of journeys was approximately the same as in the previous year. The number of passengers on the metro rose by 1.2%, but there were 1.9% fewer tram journeys and 1.5% fewer bus journeys than in the previous year.

The problems in air quality in Helsinki are mainly caused by direct nitrogen dioxide emissions from traffic and by the street dust thrown up by traffic, and by impurities in the area that are carried from afar: microparticles and ozone. The limit values for inhaled particles were exceeded during 2005 at the Mannerheimintie and Hämeentie measuring stations. The limit values are exceeded if during the course of one year there are 35 such days when the average particle content exceeds 50 µg/m³.

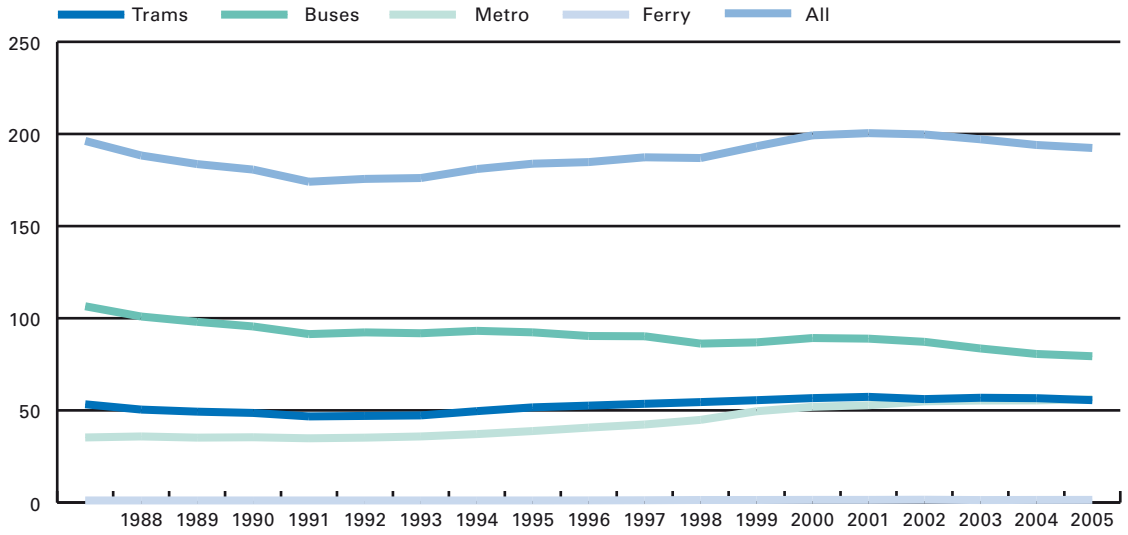
The annual limit value for nitrogen dioxide (40 µg/m³) was exceeded at the YTV Mannerheimintie and Hämeentie measuring stations during 2005. Furthermore, the limit values were found to have been exceeded at three passive diffusion samplers for nitrogen dioxide. As a result of exceeding the limits the City of Helsinki will prepare an air protection programme for reducing contents by the end of June 2007.

During 2005 the noise barrier programme for the main thoroughfares in the metropolitan area was updated. Fifty-seven of the most urgent points for noise barriers were include in

Cases of exceeding the daily limit value (50 µg/m³) for inhalable particles (PM_{10}). (Source:YTV)



Number of passengers on public transport in Helsinki (excluding regional buses and local trains)



the programme. The costs for implementing all the points in the programme will be MEUR 59 million. Helsinki's share of the costs is around MEUR 26.

Other environmental activities

Clear environmental criteria were set for six competitions for tender organised by the Supplies Department. These concerned bus transport, cleaning equipment, disposable plates, home appliances (fridges, washing machines and dishwashers), and equipment for destroying confidential materials. The total value of these procurements was MEUR 85.2, which represented 37% of the value of all the Supplies Department's procurements by competitive tender. In total around 150 items from the City's Logistics Centre's product range are contract products with environmental labels (Nordic ecolabel, Bra Miljöval label).

One aim of the city's ecological sustainability programme is to reduce the 2002 level of paper consumption by 10% by the end of 2008. However, following a slight reduction annually in the paper consumption per person, there was a clear increase in 2005. In 2005 the average paper consumption was 3,560 sheets per employee.

The Environment Centre and Gardenia arranged 38 guided excursions to nearby Helsinki nature areas, and over 2,000 people took part in these, an average of 54 people per excursion. Three more excursions than last year were organised, and the number of participants increased by 500 over the previous year. A total of 22,350 Helsinki residents, around 4% of the Helsinki population, took part in various environmental education events organised by the City of Helsinki. This number includes those who participated in the Nature School Days at Harakka, Gardenia and the Young People's Nature House, as well as those who participated in other environmental education events and courses.

In January 2005 the City Board approved an oil accident prevention plan for the Helsinki rescue operations area. The plan includes instructions, training, and procurement of rescue equipment such as boat and boom equipment. The effect of this was a threefold increase in oil accident prevention readiness. For its part, the working group set up by the Mayor drew up a flood prevention plan. The working group's report deals with flood prevention from the operative side, but it also puts forward the procedures for preparing in advance to prevent flood damage..

Environmental economy indicators	Environmental income	Environmental costs	Environmental investments
Air pollution prevention and climate protection	54	7,424	1,291
Water conservation and wastewater treatment	50,507	26,760	19,932
Waste management	3,241	6,019	1,137
Soil and groundwater conservation	220	2,002	10,416
Noise prevention	0	338	3,442
Nature and landscape conservation	0	1,798	0
Other environmental protection measures			
Environmental administration	266	3,956	0
Environmental training and education	1,345	1,195	0
Activity to improve eco-efficiency	143	1,693	3,995
Environmental management	0	2,822	0
Cleaning of public areas	176	6,511	0
Environmental taxes and charges	0	28151	0
total	**55,952**	**88,669**	**40,213**
in relation to the city's operational income, costs and capital investments	4.3%	2.5%	9.5%
total / resident	**100**	**158**	**72**

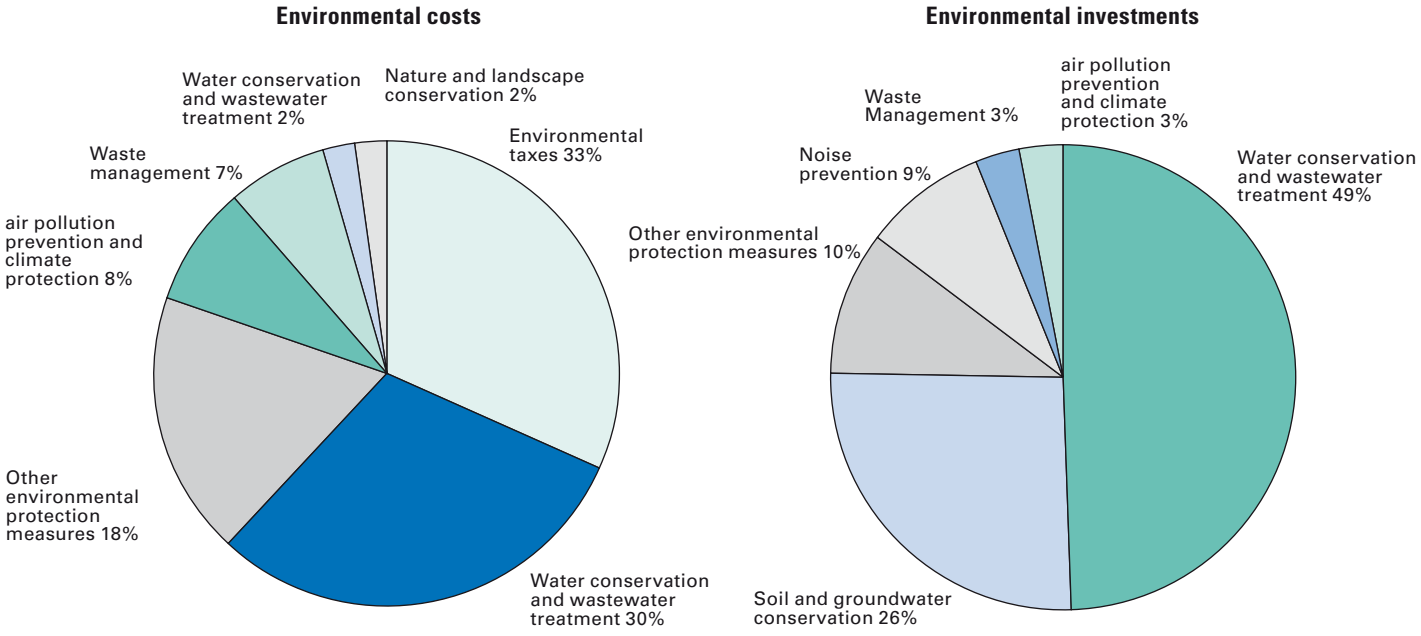
The economic significance of environmental matters

The aggregate environmental income reported by the city's departments in 2005 was MEUR 56, representing 4.3% of the city's overall operational income. The biggest source of income was the wastewater charges, which was 88% of all external environmental income.

The City of Helsinki's aggregate environmental costs for 2005, according to figures provided by the departments, were MEUR 88.7, which is 2.5% of the city's entire operational costs. The largest sectors of costs were environmental based fuel taxes and electricity taxes, and wastewater treatment costs. The reported environmental costs were reduced compared with the previous year as a result of the decreased production by Helsinki Energy, and the reduction in environmental taxes for the city resulting from the incorporation of HKL Bus Transport

The environmental investments of the City of Helsinki in 2005, according to the figures provided by the city's departments, amounted to MEUR 40.2, which was 9.5% of all the city's capital investments. The largest investments in 2004 were connected with water protection (wastewater purification, sewerage, and oil damage prevention, in total 49%), and the remediation of contaminated soil (27%). ■

Breakdown of environmental operating costs and investments, 2005.



ENVIRONMENTAL REPORT 2005
Publications of the Administration Centre of the City of Helsinki
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Keywords: environmental reporting, environmental management, environmental economy

Layout: Tommi Luhtanen, Vihreä Peto Oy
Images: City of Helsinki, Future Image Bank and Pekka Helos

Publication year: 2006
Print run: 300
Printers: Frenckellin kirjapaino Oy
ISSN 1976-475X
ISBN 952-473-708-6

The Helsinki sustainable development indicators (joint indicators for the six towns)

Indicator	2005	2004
Ecological footprint	5,8 gha (2001 data)	-
Greenhouse gas emissions, tons/resident/year	8.1	9.3
Share of buildings and dwellings built in the city plan area	100%	100%
Proportion of nature protection areas and reserves of the land area	3.7%	3.7%
Proportion of nature protection areas and reserves of the total surface area	0.9%	0.9%
Community electricity consumption, kWh/resident/year	7,919	7,794
Community water consumption, l/resident/year	209	209
Heating needs covered by district heating	93%	93%
Specific consumption of heat in city-owned buildings kWh/m^3	44.0	44.8
Specific consumption of electricity in city-owned buildings kWh/m^3	17.8	17.6
Community air quality, PM_{10} exceeding the daily limit values (35 allowed)	49 – Mannerheimintie	32 – Runeberginkatu
Community air quality, bad and very bad days according to the index, % of hours	1.2 Mannerheimintie	0.1 Runeberginkatu
Community wastewater load, phosphorous, g/resident/day	0.1	0.1
Community wastewater load, nitrogen, g/resident/day	1.7	2.4
Community wastewater load, BOD_7, g/resident/day	2.2	3.6
Amount of community waste for final placement (Ämmässuo), kg/resident/year	372	340
Amount of waste utilized, biowaste, kg/resident/year	44.6	42.4
Number of cars/1,000 residents	365	356
Number of public transport journeys/resident/day	1.08	1.08
Cycle path network, m/resident	2.0	1.8
Copy paper consumption in City departments, A4 sheets/employee/year	3,560	3,270
Share of environmental criteria in centralised purchasing (invitations to tender, Supplies Department)	37%	no value
Green flag schools and kindergartens	16	21
Participation in environmental education arranged by the city, proportion of Helsinki residents	4.0%	4.3%