



LAHTI REGION

Environmental Review

LAHTI

Winner 2021



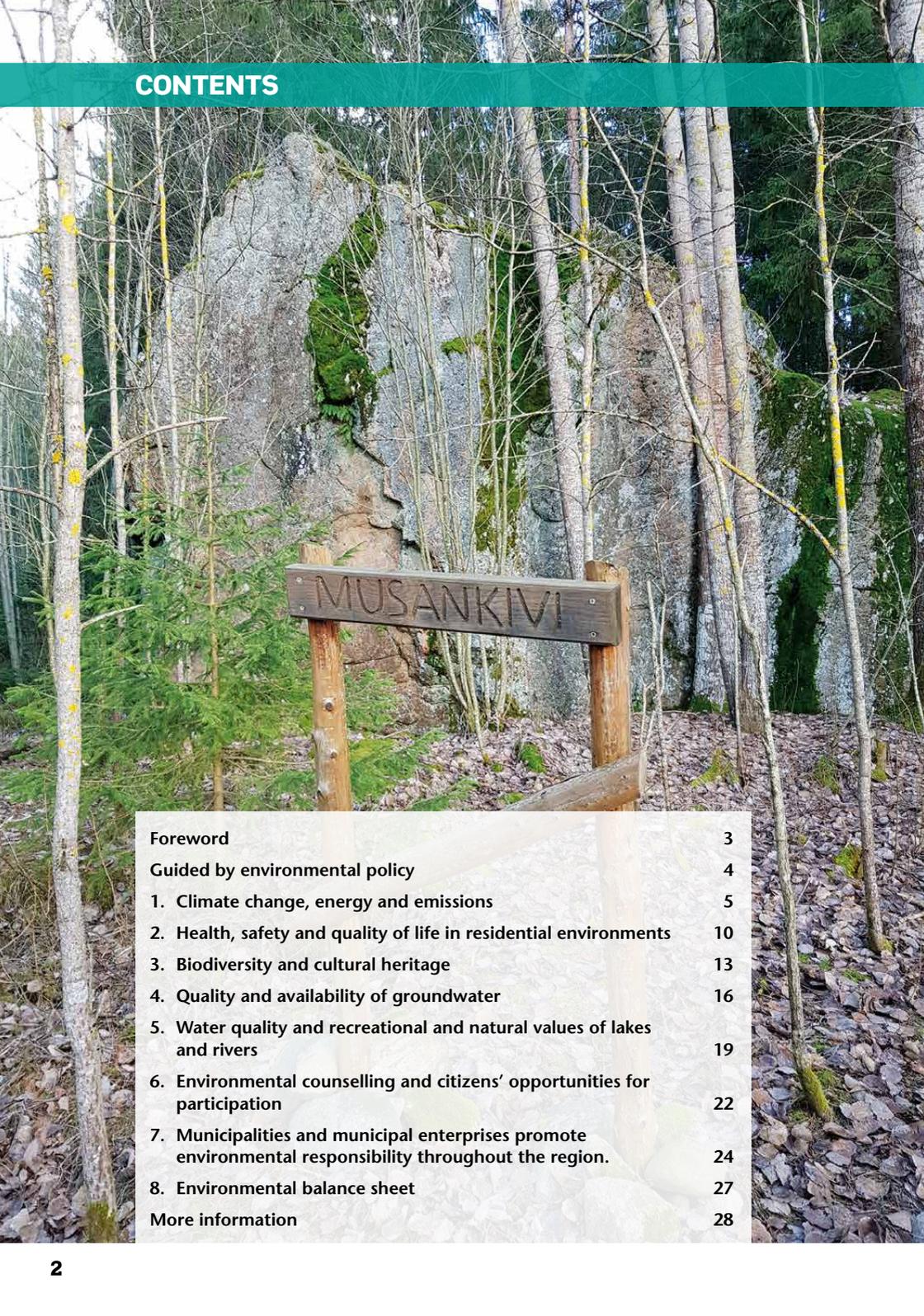
EUROPEAN
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LAHTI
Hollola 2019

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This is a joint environmental review for Lahti and Hollola. The environmental efforts of the region were rewarded in summer 2019, as Lahti was named European Green Capital 2021. Towards the end of 2019, it was decided to establish a foundation to manage the project. The foundation is called Sustainable Lahti, and the participants include a number of municipalities in the region, including Hollola. In 2019, Lahti decided to specify a stricter carbon neutrality target for 2025 and join the Hinku network of municipalities aiming for carbon neutrality. Hollola also decided to join the Hinku network and the KETS energy efficiency agreement of municipalities.

The region continued its negotiations with the government in 2019 to sign the MAL agreement on land use, housing and transport. These areas play a key role in climate change mitigation and adaptation, and the targets were specified further during the negotiations.

This report monitors a number of indicators that depict the condition of the environment and possibilities for sustainable life. It is now important to contemplate how this monitoring and reporting should be revised to match the UN's sustainable development goals and promote their monitoring in the region.

Pekka Timonen
Mayor of Lahti

Päivi Rahkonen
Mayor of Hollola

GUIDED BY ENVIRONMENTAL POLICY



The strategy summarised as '**Lahti – a bold environmental city**' is implemented in practice through key projects. In 2019, the environmental goals included in the strategy were promoted by means such as a key project on sustainable mobility. The targets included in the strategy and the environmental programme to reduce climate emissions into the air and to increase the amount of protected areas were promoted in the continued development of the city master plan in 2019.

In accordance with the key value of **Hollola's municipal strategy**, the municipality joined the nationwide Hinku network of municipalities aiming for carbon neutrality. Hollola also signed the energy efficiency agreement of municipalities, which is a requirement to join the network. This has boosted climate work in Hollola. Hollola aims to reduce emissions by 80 per cent by 2030 from 2007 levels.

In June 2019, Lahti City Board approved the Sustainable Energy and Climate Action Plan (SECAP) of the EU Covenant of Mayors, which includes 97 actions on climate changed mitigation and adaptation. At the same time, the City Board decided a stricter carbon neutrality goal for 2025 and decided on joining Hinku network. 2019 Lahti participated a Motiva peer review project on climate leadership.

The improvement of the recreational value of local nature and waters was one of Hollola's goals for 2019. Hollola prepared a water system vision, and one of its objectives is to contribute to the achievement of this goal. The vision provides guidelines for water protection in Hollola, and it is realised in co-operation with different stakeholders.

1 Climate change, energy and emissions

Lahti and Hollola aim for carbon neutrality

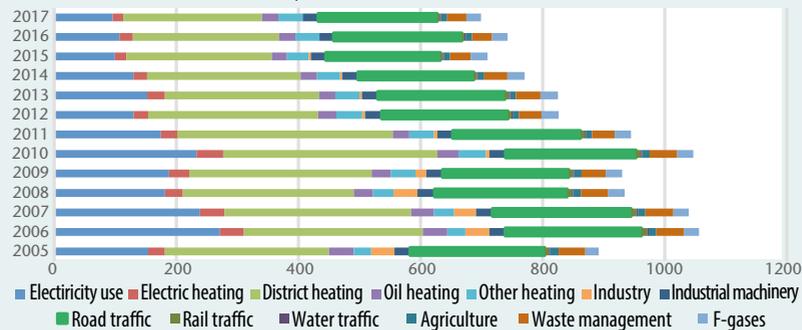
For the first time, the Finnish Environment Institute calculated comparable climate emission figures for all Finnish municipalities. Lahti's greenhouse gas emissions decreased by 33% and those of Hollola by 25% between 2010–2017. The 2010 level is estimated to be close to the 1990 level, which would be the base year for Lahti.

In 2019, Lahti approved the Sustainable Energy and Climate Action Plan (SECAP) and initiated the planning of carbon sinks and compensations on the basis of the carbon sink survey completed in the spring. In addition to the municipal organisations, the participation of residents, companies and associations is necessary in aiming for carbon neutrality. In 2019, Hollola established a climate working group consisting of municipal employees. Food services and the use of chemicals and energy in schools and day care centres were developed in a more eco-friendly direction.



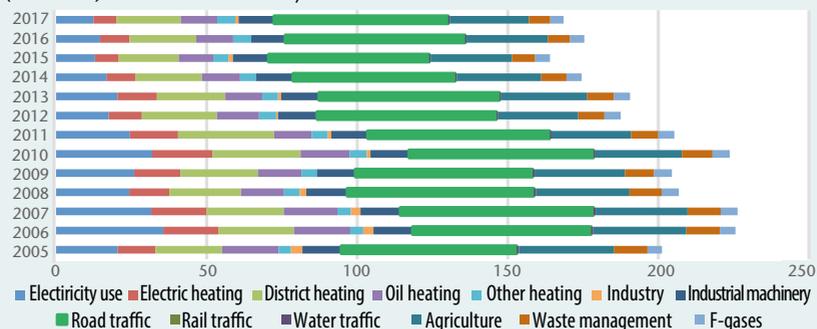
Lahti GHG emissions 1000 t CO₂-e

(use-based) 2005-2017. Source: Syke



Hollola GHG emissions 1000 t CO₂-e

(use-based) 2005-2017. Source: Syke



Average temperature in winter months in Lahti 1961-2019

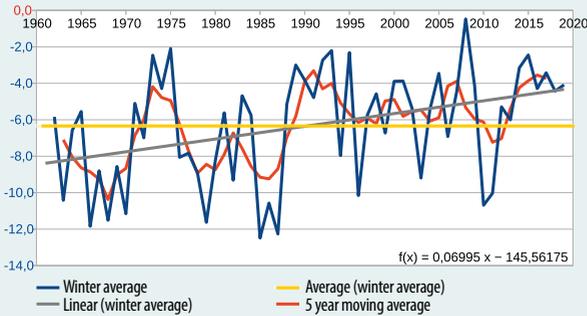


Figure: Average temperature in winter months in Lahti. Source: Finnish Meteorological Institute

Adapting to climate change

The annual average temperature in the Lahti region is already two degrees Celsius higher than it was during the 1960s, and the average temperature in the winter months has risen by four degrees.

It is necessary to take action to adapt to climate change and prepare for extreme weather conditions. The climate change adaptation programme was approved in Lahti in 2019 as part of the Sustainable Energy and Climate Change Action Plan. In the assessment of risks and vulnerabilities, the amount and proportion of surfaced land (figure) and the proportion of green areas (chapter 2) were identified as vulnerability-reducing indicators.

As part of the Lahti Direction city planning work, FCG surveyed the amount of impervious surface area in Lahti. The impervious area covered by buildings and roads totalled 1,724 hectares, or 3.8 per cent of the land area.

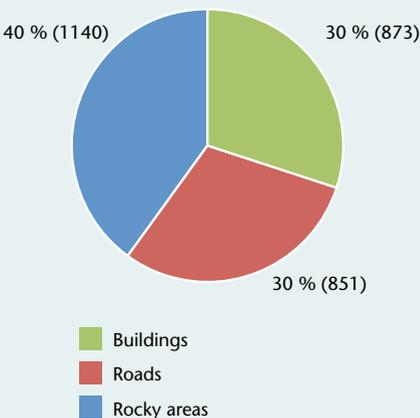
Hollola has prepared for extreme weather conditions and exceptional situations caused by the climate change by equipping public buildings with reserve power.

Lahti Energy's energy turnaround completed

Lahti Energy's most significant environmental and climate action in 2019 was stopping the burning of coal. At the same time, carbon dioxide emissions from Lahti Energy's production dropped by half. At the annual level, the amount of emissions is approximately 600,000 tonnes lower compared with 1990. The start-up of the new Kymijärvi III bio-heating plant progressed according to plan. Biofuel was tested for the first time in August, after which the new plant has significantly contributed to district heat production in the Lahti region.

Lahti Energy considerably increased the proportion of wind power in its acquisition of energy via co-operative energy producers. The amount of wind power electricity increased by 13 per cent from 2018. Lahti Energy continued to invest in profitable production of renewable energy. It committed itself to two non-subsidised wind power plant projects that will be completed within the next two years.

Sealed surface, hectares and % Total 2864 ha



Carbon dioxide emissions decreased significantly

Lahti Energy also reduced carbon dioxide emissions from its own operations by investing in renewable energy. From the beginning of 2019, employees of Lahti Energy were advised to refuel their work vehicles with renewable diesel instead of ordinary diesel whenever possible. At the end of the year, it was very rewarding to see that 92.6 per cent of the diesel used in diesel-operated vehicles was renewable diesel. Compared with ordinary diesel, the use of renewable diesel reduces carbon dioxide emissions by 90 per cent.

In 2019, Lahti Energy's office building was fitted with solar panels. In previous years, solar panels have also been installed on some thermal plants. The solar panels on the office building produce approximately 39,000 kWh of electricity per year. This equals the annual consumption of two or three electrically heated single-family houses or a distance of 200,000 kilometres driven by an electric car.

The utilisation of ash remained similar to previous years. Ash was used as fertiliser and for excavation work. The opportunities to utilise ash from the new Kymijärvi III heating plant and possible uses of the ash are being investigated.

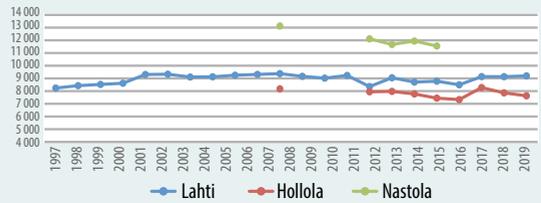
Essential role of customers' environmental choices

In 2019, the customers of Lahti Energy made more eco-friendly choices. A record number of solar power plants were built for customers, their combined power totalling nearly 3 MW. As the district heating energy turnaround was also completed, the carbon footprint of the region's residents decreased remarkably in one go.

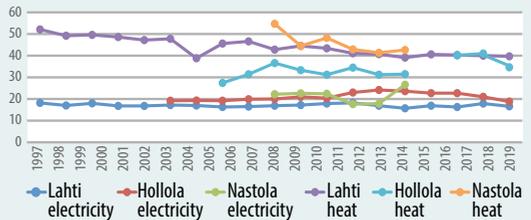
Supply and demand for electric cars increased, which boosted interest in charging solutions. Charging surveys were carried out on companies and housing complexes alike. The implementation of the first major charging solutions was also started. The Kaukolämpö 2.0 district heating service, launched in 2018, is already in use in housing complexes in nearly 1,000 dwellings, in which the ambient conditions are kept at a standard level by the smart heating control of the Reiot service.

Lahti Energy has an ISO 14001-certified environmental management system and an OHSAS 18001 occupational health and safety management system. DNW GL audited the systems in May–June 2019.

Electricity consumption (kWh/resident/year)

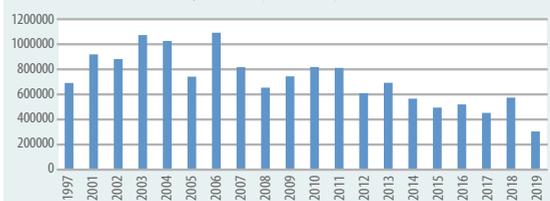


Heat consumption in municipal premises (kWh per cubic meter)

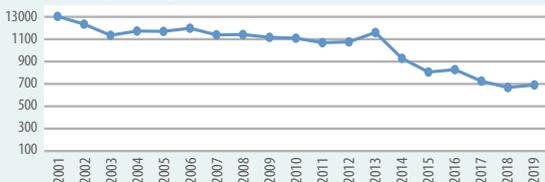


Municipal-level electricity consumption per head decreased in Hollola and increased in Lahti compared with the previous statistical year. Compared with 2007, consumption decreased slightly in both municipalities.

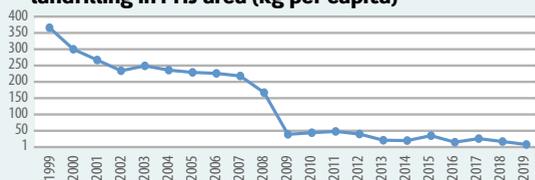
Carbon dioxide emissions from power plants and industries, Lahti (tonnes)



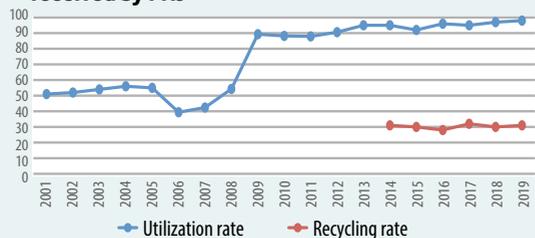
Amount of mixed waste produced by Lahti municipal departments (tonnes)



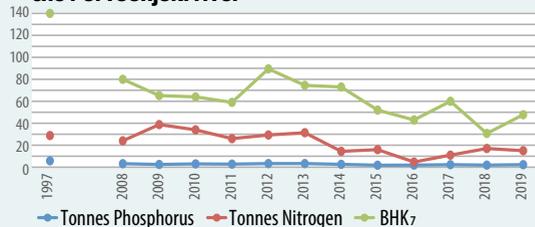
Amount of municipal waste to be disposed by landfilling in PHJ area (kg per capita)



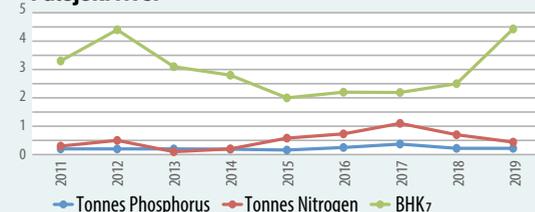
Utilization and recycling rate of municipal waste received by PHJ



Load of wastewater from Lahti and Hollola on the Porvoonjoki river



Load of the Nastola treatment plant on the Palojoki river



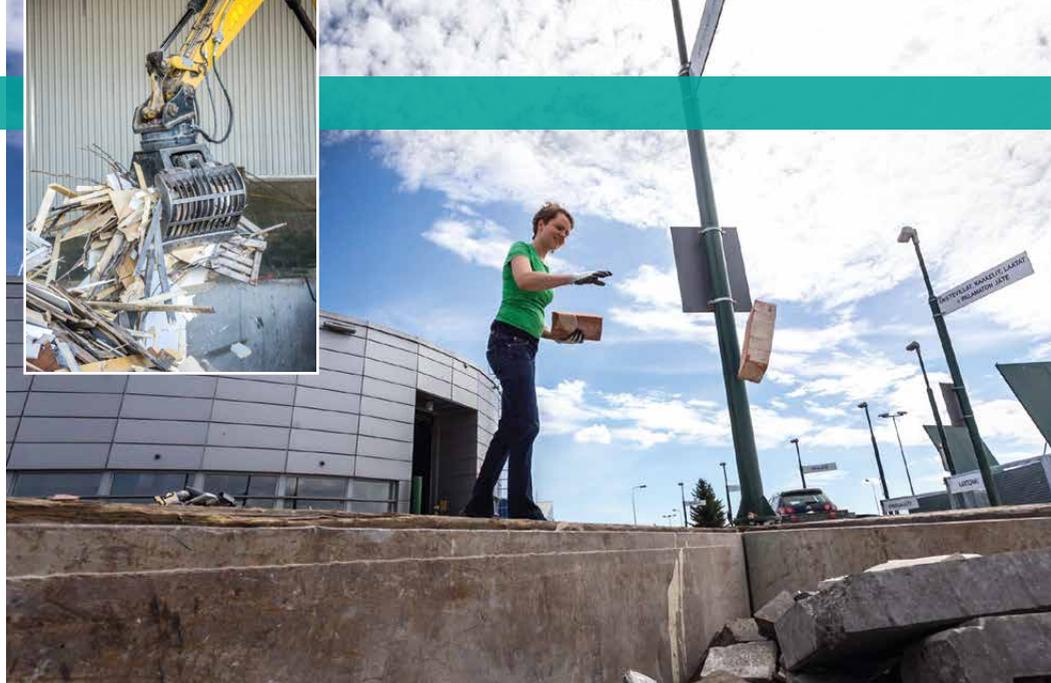
Circular economy

The circular economy in the Päijät-Häme region and the Kujala company ecosystem are excellent examples internationally. In order to promote the future circular economy, and because the Rälssi soil reception site is becoming full, the Päijät-Häme region is looking for a location for a new recycling area. 2019 was the year for the EIA programme phase and the survey phase. The new recycling area will be located in Orimattila or Hollola.

In Lahti, the Technical Services and Environmental Board as well as the Group and Facilities Division discussed the circular economy in 2019. Both organisations decided to promote the circular economy and material efficiency. The main focus is on soil masses, demolition and construction.

Of the waste received by Päijät-Häme Waste Management Ltd (PHJ), 98 per cent was utilised as material or energy. Metals and plastics were recovered from the separately collected energy waste and mixed waste for recycling at the LATE sorting plant, and SRF fuel was manufactured at the MURRE crushing plant. In 2019, the LATE sorting plant separated over 1.2 million kilograms of recyclable plastic from the mixed, construction and energy waste streams. SRF fuel was delivered to Lahti Energy's Kymijärvi II power plant and Stora Enso's co-combustion plant. The mixed waste was sent to waste burning plants to be used for energy production. SRF-, wood- and logging residue-based recycled fuels were sent to be burnt as planned. In particular, demand for wood-based fuels was very high. Biowaste was processed at LABIO Ltd's digestion and composting plant, converting it into biogas and compost.

Early in 2019, Päijät-Häme Waste Management Ltd (PHJ) arranged a tendering process related to the building of a solar power plant on a closed landfill site. However, it was decided to discontinue the project during the development stage: on the basis of the risk analyses and calculations made, it was found that building a solar power plant was currently not profitable. The potential for utilising the closed landfill site for solar power production may increase in the future, as the prices of solar panels have continued to decrease for a long time.



PHJ signed the Society's Commitment to Sustainable Development and committed itself to using 100 per cent renewable energy in all of its facilities and operations. PHJ arranged a tendering process for electricity acquisition in 2019 and will now only buy electricity produced using renewable energy. Through the use of renewable energy, the company wants to promote positive climate effects and reduce its carbon footprint as well as support the development of renewable energy technologies. PHJ aims for 50 per cent energy self-sufficiency by 2030.

PHJ provided waste management counselling in co-operation with City of Lahti. PHJ has a certified operations management system, consisting of a quality management system, an environmental management system and an occupational health and safety system.

Lahti Aqua Oy provides water services for approximately 140,000 people and carries out environmentally important water treatment. The rate of joining the water and sewer system is high, approximately 95 per cent. In Lahti, 100 per cent of raw water is groundwater. Only approximately 25 per cent of the groundwater generated in the Lahti and Hollola area is used by households. The wastewater treatment plants remove 98 per cent of the organic matter and phosphorus and over 70 per cent of the nitrogen contained in water. In 2019, wastewater produced by Lahti, Hollola and Nastola amounted to 12.5 million cubic metres. Sand and solids are removed from wastewater mechanically, organic matter and

nitrogen biologically, and phosphorus chemically. Wastewater is hygienised with UV light before being discharged into the Porvoonjoki river. Hygienisation eliminates nearly 100 per cent of bacteria in the water. Follow-up studies show that bacterial load of faecal origin has decreased considerably in the Porvoonjoki river after the commencement of hygienisation.

Organic matter is decomposed into biogas by the digesters of the Kariniemi and Ali-Juhakkala treatment plants. Some of the biogas is used for heating the treatment plants and the rest goes into the district heating network. After this, the sludge goes into the composting plant of Labio Oy to become soil conditioner.

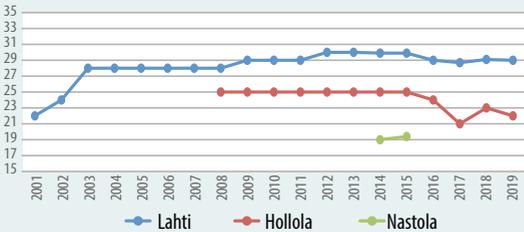
Future plans and challenges

- *Continuing climate change mitigation*
- *Strengthening of carbon sinks*
- *Establishing the post of a circular economy and soil mass co-ordinator*
- *The strategic goal of PHJ is to increase the recycling rate of municipal waste as material in its area to 50 per cent by the end of 2020. This can be achieved through extensive at-source sorting of waste as well as correct processing methods and their efficient use. Increased recycling will reduce the use of waste for energy.*

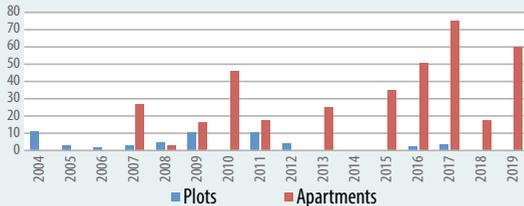
2 Health, safety and quality of life in residential environments



Percentage of parks and green areas within the city planning areas



Percentage of land plots and residences in a noise zone, relative to all planned plots and residences



The living environment provides residents with ecosystem services, such as natural resources, livelihood, recreation, resistance to disease, clean water, nutrient circulation and climate regulation. In Hollola, Lahti and Nastola, densely populated residential areas, roads and the railway are located on the Salpausselkä I end moraine, formed during the last ice age. South of Salpausselkä, land use is causing many changes, including the Southern Ring Road project and the pressure to expand residential areas. The largest farming areas are also located south of the Salpausselkä ridge, and there are also urban streams originating from springs. This means that there is pressure to secure ecosystem services.

The pleasantness and safety of the residential and transport environments were taken into account in the Lahti Direction city planning project in 2019. The Lahti Direction project completed the Master Plan drafting and impact assessment stages. The results of the My Everyday Places and Travel Experience in Lahti survey on positive and negative places were used for the development of a sustainable mobility plan.

According to the results of the noise survey, 10,600 of Lahti's 119,000 residents are exposed to daytime road noise of over 55 dB. A total of 7,100 residents are exposed to nighttime noise of over 50 dB. Of the residents exposed to daytime noise, 63 per cent live in

buildings with a quiet façade. Of the buildings located in a daytime noise zone of over 55 dB, 1,549 were residential buildings and 47 were schools or care units.

The EU's environmental noise directive requires a noise prevention action plan to be prepared on the basis of the noise survey. Lahti has a noise control action plan for 2019–2023. The action plan is updated every five years. It covers 17 sites, and two of the planned noise banks have already been built in Nastola. Noise barriers have been planned for Ahtialantie. In addition, noise barriers have been built in Uudenmaankatu, and 70 per cent of the noise barriers planned for the Ring Road have already been completed. The development of new noise sites is prevented primarily by means of land use planning.

Twelve per cent of the measures in the noise control action plan (2019–23) have been completed.

Year of public transport development

In 2019, approximately 7.5 million trips were made using public transport. The number of trips has not increased as strongly as before; nevertheless, there was a slight increase from the previous year. The Lahti Region Public Transport Committee approved the trunk route plan. The plan will be implemented in phases in 2020–2022. Hollola contributed strongly to the planning of the trunk routes. A new contract transport service was started in 2019 to improve public transport to Hollola.

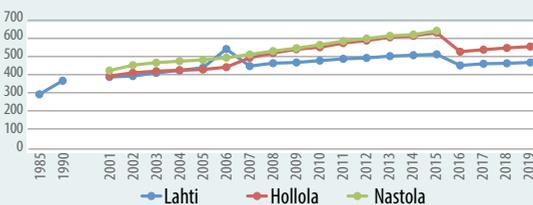
In August, new discount tickets were introduced for children, young people and students. In addition, since August, groups of children in early childhood education and basic education have been able to travel free of charge on Lahti Region Transport's buses. During the first months, over 4,000 children enjoyed this benefit.

In autumn 2019, Lahti established a resident panel for sustainable mobility. The 25 panel members were chosen from among city residents interested in promoting the use of sustainable means of transport, coming from different parts of the city. The resident panel meets a couple of times a year to discuss current themes.

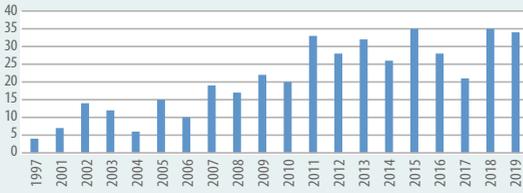
World Car Free Day, 22 September, was celebrated by offering bus rides free of charge throughout the region. The campaign day was



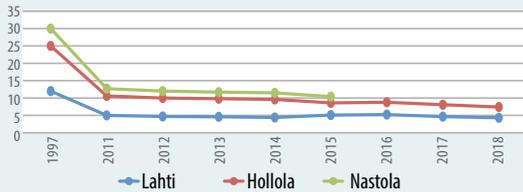
**Car dependency:
Number of passenger cars on the
road / 1,000 residents**



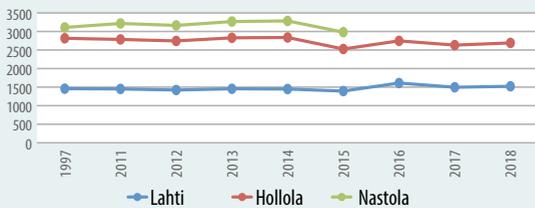
Number of days with poor air quality



NOx emissions from traffic



CO2 emissions from traffic



Future plans and challenges

- *Achieving a change in modes of transport: In 2030, over 50 per cent of journeys will be made sustainably*
- *Increasing the comfort and safety of the urban environment*
- *Ensuring investment funding for main cycle paths/dedicated cycling routes*
- *Completion of the modern cycling route developed by the CitiCAP project and deployment of the emissions trading application*
- *Implementation of the measures included in the noise control plan*

a Sunday, and the number of bus trips nearly tripled compared with an ordinary Sunday.

The relative change index for vehicle traffic was, once again, not obtained for 2019 because of technical problems at the monitoring points. Car dependency continues to increase.

Air quality

According to the results of the outdoor air measurement stations in Lahti in 2019, the air quality was poor or very poor for at least one hour on 34 days. Air quality was classified as poor or very poor on the basis of a high content of inhaled particles (PM10).

In 2019, air quality was monitored by four continuous air quality stations. To enhance air quality monitoring, EUR 32,000 was invested in an analyser of air-borne particles in 2019.

The continuous measuring stations monitored the concentrations of nitrogen oxides, ozone, inhaled particles and fine particles. In addition, two passive tubes, replaced every two weeks, were used for the detection of volatile organic compounds (VOCs).

Promoting cycling

The Sustainable Urban Mobility Plan, which was being prepared for the first time alongside with the Lahti Direction project, progressed to the draft stage in 2019. The draft programme includes 20 measures for the promotion of sustainable mobility. According to one of the goals, in 2030, Lahti should have adequate and safe main cycling routes that are separate from other traffic routes and kept in good condition all year round. In 2019, Lahti had two kilometres of routes reserved exclusively for bicycles.

The CitiCAP app for personal emissions trading was launched for piloting in 2019. The app rewards the use of sustainable transport and can be downloaded from Google Play Store and the Apple App Store.

Instead of only promoting cycling, the emphasis is on smart transport: people in different situations must be allowed to make rational decisions with regard to the duration of the transport, health promotion and need to transport goods. For instance, attention should be paid to the quality and maintenance of cycle paths, as well as the levels of comfort and safety of the walking environment.

3 Biodiversity and cultural heritage



Routes and signs were repaired and improved in the City of Lahti's nature conservation areas. The service roads for the Lapakisto nature trails were improved and more duckboard paths were built. Parking areas were built at each end of the Linnaistensuo nature conservation area. A management and utilisation plan was prepared for the Sammalsillansuo nature conservation area. Prevention of invasive alien species was carried out in all conservation areas. Winter feeding of birds continued in co-operation with the local bird association. In addition, several biota and LUMO area surveys were carried out and preparations for the establishment of three new nature conservation areas began. In connection with the repair of the Kilpiäistenpohja boat landing place, a habitat was created for dragonflies and moor frogs. The initial survey relating to the protection of 37 new natural monuments was started.

The Kintterö health forest project planning continued in 2019. The health forest is located next to Päijät-Häme Central Hospital, around the Likolampi lake and in the Kintterö nature conservation area. The health forest is particularly intended to serve hospital users and staff as well as local residents. According to the plans, an accessible environment will be developed at Likolampi for easy outings





from the hospital. The routes in the Kintterö nature conservation area will be connected to the accessible route at Likolampi.

The stocking of eels in Vesijärvi continued in order to protect the extremely endangered species, and Lahti also participated in the maintenance of the eel chest of the Salpaus-selkä fishing area. The Natural Resources Institute (Luke) collects the migrant eels caught in the chest and releases them downstream from the Kymijoki power plants, so that they can continue their migration towards the Sargasso Sea.

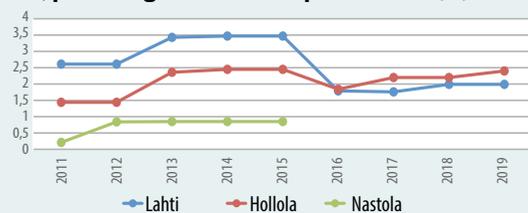
A meadow network survey was carried out and open-area management cards were prepared for lands owned by the City of Lahti.

Hollola established new nature conservation areas in 2019, and now their total area is 1,720 hectares. The figure does not include Esker Conservation Programme areas and Natura areas, as these partially overlap with other nature conservation areas. The new hiking trail, Round the Lakes, was one of the most concrete nature-related achievements in Hollola in 2019. The Tiirismaa relic site was included in the Round the Lakes route.

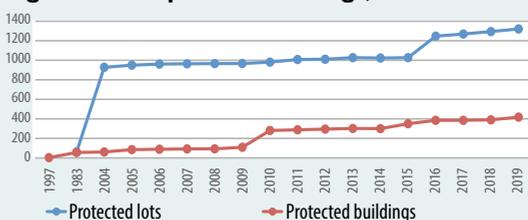
In addition to conservation areas, municipalities have independently established LUMO biodiversity sites. The total area covered by LUMO sites in Lahti increased as a result of the municipal merger to approximately 1,500 hectares. The LUMO biodiversity sites partially overlap with the other nature conservation areas.

The prevention of invasive alien species has an important role in the protection of biodiversity and forest and park management as well as resident activities. Climate change will make the prevention and its resourcing even more important. In 2019, the Forestry Services used EUR 56,000 for the prevention of invasive alien species.

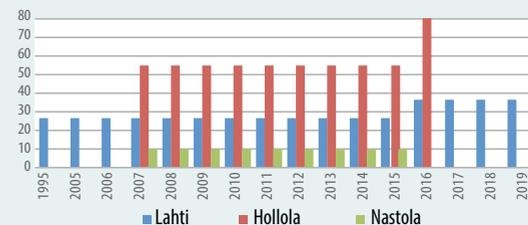
Areas protected under the Nature Conservation Act, percentage of the municipal land area (%)



Valuable lots protected by city planning regulations and protected buildings, Lahti



Traditional landscapes (hectares)



Future plans and challenges

- Survey and protection of natural monuments
- The health forest project; connecting and marking the routes
- Preventing invasive alien species and ensuring adequate resources for it
- Implementing the actions of the meadow network survey and ensuring adequate resources for it
- Updating the flying squirrel survey
- Carrying out nature conservation discussions with private landowners
- Ecological compensation together with climate emission compensation

4 Quality and availability of groundwater



3 GOOD HEALTH AND WELL-BEING



6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



Lahti and Hollola are located above the significant I Salpausselkä groundwater reserves. Groundwater protection is essentially incorporated as part of environmental protection, land use planning, building supervision, planning of municipal engineering and water supply.

Joint groundwater monitoring commenced in the Lahti and Renkomäki groundwater areas in 2019. The joint monitoring area also covers the Salpakangas industrial area. In the joint monitoring, groundwater monitoring is carried out collectively: the consultant and the analysis laboratory selected through a tendering process are responsible for the samples of all participants and for the reporting of results. The joint monitoring is managed by the City of Lahti. In 2019, a total of 16 operators at 28 locations participated in the joint monitoring, and 81 samples were collected. For the operators, participation in joint monitoring means relief from having to ensure that the monitoring is carried out, and possibly also cost savings. From the authorities' perspective, the main advantage of joint monitoring is receiving the monitoring results jointly from all the operators, and the consistent sample collection makes the results comparable with each other.

In January 2019, Geological Survey of Finland (GTK) launched the RAINMAN project to survey the need and means for preparing for climate change from the perspective of groundwater and stormwater. In addition to GTK and the City of Lahti, the participants include the Helsinki Region Environmental Services Authority HSY, the City of Mikkeli and parties focusing on environmental monitoring in St Petersburg. In Lahti, the project focuses on surveying the effects of climate change on groundwater. The project will update a groundwater flow model that is used to identify the areas in which an increase in the highest groundwater level may cause problems for land use in the area. Changes in the chloride concentration of groundwater are monitored in areas in which the use of chloride for road de-icing has been replaced with potassium formate since 2017 or 2018. Lahti's groundwater protection plan is updated as part of the project. The project will run for three years, and it is funded by the South-East Finland – Russia CBC 2014–2020 programme.

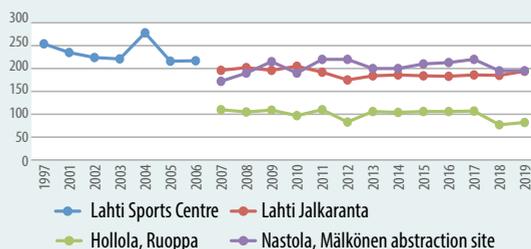
A structural survey of the Salpakangas groundwater area started in 2019. The project surveys flow conditions in the Salpakangas area in Hollola and in the watershed area of the Riihelä water extraction plant in Lahti. The work is carried out by GTK.

Water acquisition by Lahti and Hollola is solely based on groundwater reserves. The volume of water pumped for consumption in Lahti and Hollola totalled 25,000 m³ per day in 2019. All water samples taken met the quality requirements and recommendations set for household water. In some groundwater areas the chloride content of some samples was above the quality recommendation level. Approximately 100,000 m³ of groundwater is formed in the Lahti groundwater reserves every day, which is around four times the daily consumption. Altogether, 23 per cent of the groundwater areas are classified as being in a poor state.

There have been no major changes in water consumption over the last few years. The specific consumption figure includes water consumed by residents and industry as well as loss caused by leakage. The figures for Lahti include Nastola and the figures for Hollola include Hämeenkoski.

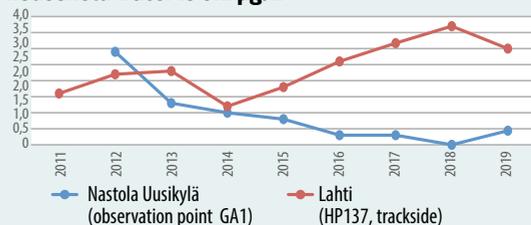
Groundwater conductivity ($\mu\text{S}/\text{cm}$)

Groundwater conductivity indicates the total amount of salts dissolved in the water. The limit value is 2,500 $\mu\text{S}/\text{cm}$.

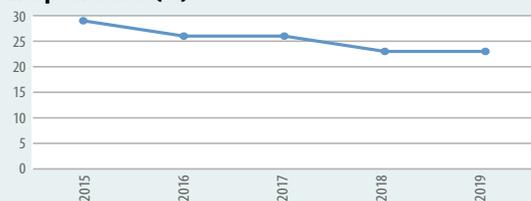


Atrazine levels in groundwater ($\mu\text{g}/\text{L}$)

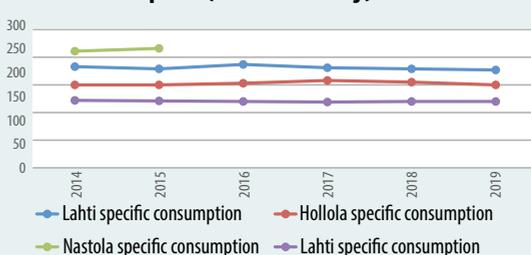
The limit value for any particular pesticide in household water is 0.1 $\mu\text{g}/\text{L}$

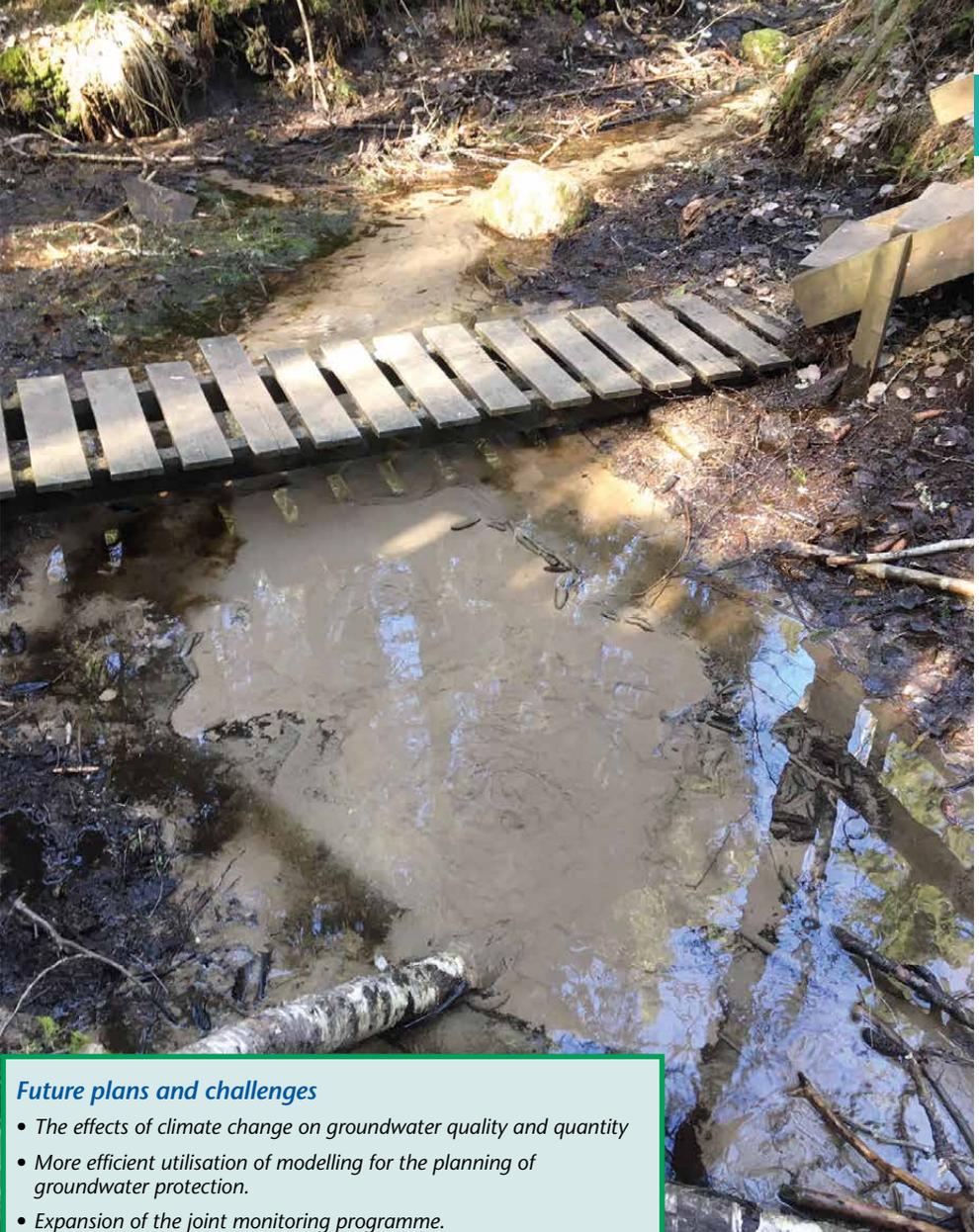


Groundwater areas classified as being in a poor state (%)



Water consumption (L/resident/day)

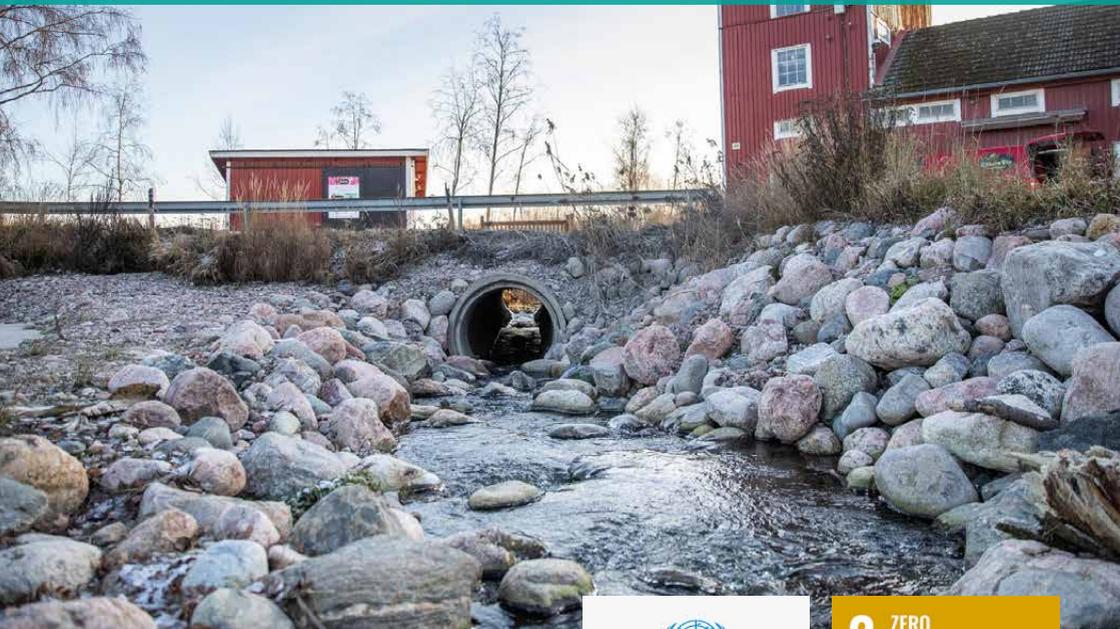




Future plans and challenges

- *The effects of climate change on groundwater quality and quantity*
- *More efficient utilisation of modelling for the planning of groundwater protection.*
- *Expansion of the joint monitoring programme.*
- *Construction of the ring road below the groundwater surface level in Laune.*
- *Monitoring the impact of the new de-icing method on chloride levels in groundwater.*
- *Cleaning the groundwater areas that are in a poor chemical state*
- *The need for water supply network renovations will increase as the pipelines built during Lahti's years of rapid growth in the 1960s and 1970s will reach the end of their life cycle.*

5 Water quality and recreational and natural values of lakes and rivers



Lahti Environmental Services continued the maintenance of Lake Vesijärvi in Lahti, Hollola and Asikkala areas. Maintenance continued also on smaller lakes as part of the Vesijärvi programme prepared together with the Vesijärvi Foundation. Lahti Environmental Services were responsible, among other things, for the management of fish stocks in Vesijärvi and Kymijärvi, winter oxygenation of Vesijärvi, water sampling in lakes and ditches, and the maintenance of ten automatic water quality monitoring stations.

Hollola improves the recreational value of local nature and waters in co-operation with various parties. The vision is communicated to the local community, so that fishery associations, residents, etc. can actively promote the protection of waters in their immediate surroundings. Anyone interested is welcome to participate in the work. An idea bank is used as background material for the implementation of the vision. It contains a collection of possible measures external to the vision that could possibly be implemented during the next programme period.

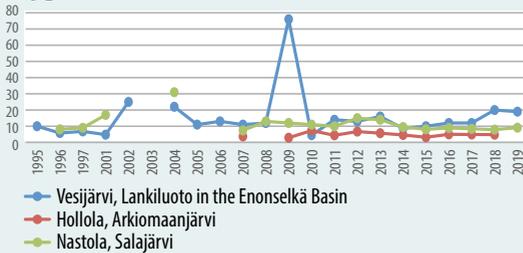
Dialogue on the content has been carried out with the Lake Vesijärvi Foundation in Päijät-Häme, the vitality services and the employment services. In order to be able to implement projects, it is necessary to receive external funding and/or employ a trainee or thesis student. The time span of the vision is five years. With respect to the protection



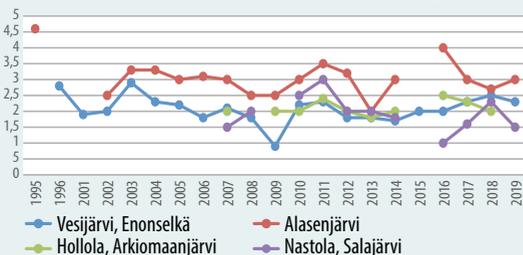


Photo by Pekka Tuuri

Lake water chlorophyll a, measured in August (µg/L)



Lake water transparency measured in August (m)



of waters, this time span enables carrying out concrete projects from beginning to end and developing ideas for the future.

In 2019, Lahti installed an automatic water quality measuring station in the Porvoonjoki river. The management fishing catch from Vesijärvi and Kymijärvi totalled 116 tonnes, of which approximately 30 tonnes could be utilised. Bream was particularly used as raw material for fish steaks and roaches for the production of canned food.

In 2019, a project was launched to stop the regulation of Lake Iso-Kukkanen and restore the Kumiankoski rapids. The water level project in Lake Salajärvi and Lake Ruuhijärvi continued its co-operation with the local residents and the Lake Vesijärvi Foundation. The restoration of the Seestaanjoki river continued upriver in co-operation with Salpaus Further Education. The Porvoonjoki river caretaker project contributed to the restoration, stocking young fish in the Seestaanjoki river.

The Myllylampi pond at Erviänoja stream in Okeroinen, Lahti, was restored, and the wooden Myllylampi dam was made into a natural submerged dam enabling the passing of fish. Over 2,600 tonnes of solid matter, brought into the pond by the stream, was removed. The project partners included, among

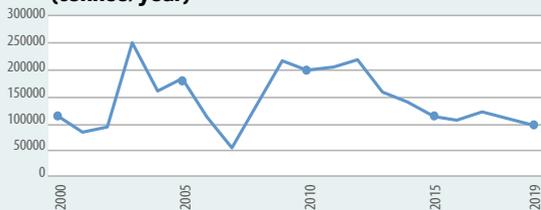


others, Lahti Municipal Engineering, WWF and the Häme Centre for Economic Development, Transport and the Environment (ELY Centre). In August, an event was organised to stock young trout in the restored rapids area.

A key project led by the University of Helsinki and funded by the Ministry of the Environment continued to test a novel application of hypolimnetic withdrawal in Lake Kymijärvi. Various reports were prepared in 2019 relating to the condition and loading of water bodies as well as their bottom feeder and fish populations. Lahti participated actively in the work and funding of the Vesijärvi Predatory Fish Fund. Vesijärvi was stocked with a considerable quantity of eel, trout and pike-perch.

Storm water management is guided by Lahti's stormwater programme, the application of which is co-ordinated by the city's stormwater working group. The AIKO-funded Hule Smart&Clean project, co-ordinated by the City of Lahti, continued to develop new methods for stormwater quality management in co-operation with cities, companies and universities. Lahti's pilot site in the programme was the Länsi-Hennala stormwater management system. Its deployment was prepared together with the initiation of continuous stormwater monitoring.

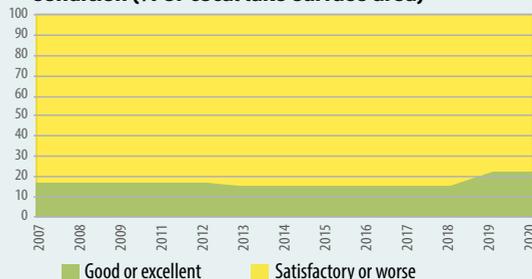
Vesijärvi management fishing catch (tonnes/year)



Kymijärvi power plant's heating load into Vesijärvi (TJ)



Percentage of lakes in good or excellent condition (% of total lake surface area)



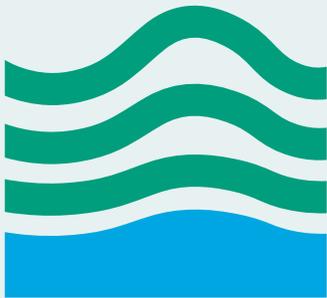
Future plans and challenges

- Reducing the external and internal load on Lake Vesijärvi.
- Achieving the target levels (good or excellent) outlined in the Water Framework Directive for all lakes.
- Decreasing the stormwater load of Lahti city centre.
- Reducing the adverse effects caused by the excessive fluctuation of the water level of lakes in the Nastola area.
- Increasing the appreciation of the streams originating from springs in the head section of the Porvoonjoki river and protecting the biodiversity of their watershed areas.

6 Environmental counselling and citizens' opportunities for participation



'I love plastic' campaign and contest organised by the Finnish Broadcasting Company (Yle)



**Salpausselkä
Geopark**
FINLAND

Lahti and Hollola belong to Salpausselkä Geopark area which unique landscapes were formed by the latest Ice Age.

Environmental education was continued in schools and day care centres, and environmental work by volunteers continued in day care centres. The person providing environmental counselling for adult residents retired early in the year. As a result, participation in events for residents decreased. The Ympäristökasvatus- ja Geoparkissa ('Environmental Education at Geopark') project developed geoeducational programmes suitable for early childhood education. The environmental development service unit co-ordinated the School Tour, which covered three schools. Children and young people participated in city planning workshops using a range of methods. In lessons, the theme was sustainable transportation: the pupils learned to use buses in different roles, for instance. Tour events were organised and implemented by approximately ten representatives from city planning, environmental development and higher education. The positive feedback inspired the decision to repeat the tour each year for three schools.

In spring 2019, Lahti participated in the 'I love muovi' ('I love plastic') campaign and contest organised by the Finnish Broadcasting Company (Yle), the Finnish Plastics Industries Federation and the Rinki eco points. In Lahti, the campaign participants included 10 day care centres, one school, the Pajulahti Sports Centre, PHJ, Remeo, L&T, Muovipoli and the local Yle. Lahti did not win the



contest, but recycling and plastic received a lot of attention on Yle channels. In spring 2019, PHJ arranged compost courses in collaboration with Lahti's 4H youth organisation.

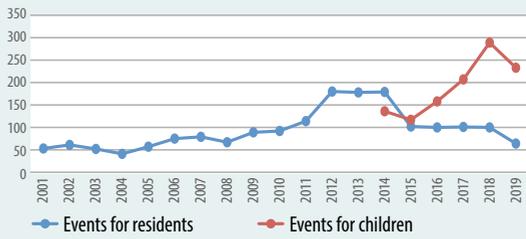
In October 2019, a sustainable development seminar was arranged for 2nd year high school students. In addition to lectures, the students could choose from over 30 different workshops. A 1.5 degree lifestyle experiment was launched in co-operation with the Regional Council of Päijät-Häme. Nearly 70 households in Lahti participated in the three-month experiment. The experiment continued into 2020.

Altogether, in 2019, environmental counselling physically reached about 11,550 people through various events. This included 77 outings and 12 different Tutustu luontoon ('Discover Nature') lectures. All this became possible thanks to the collaboration between the municipalities, residents and associations.

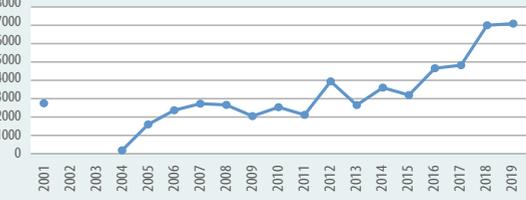
Future plans and challenges

- Increasing the environmental know-how and responsibility of residents and the city personnel: 'How does being the Environmental Capital show at your workplace?'
- Supporting residents' activity.
- Informing people of good examples.
- Applying for UNESCO Geopark status.

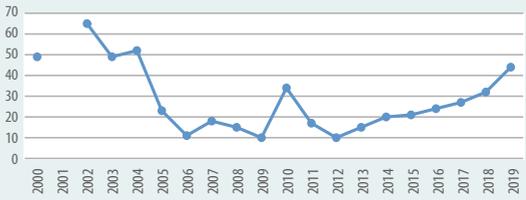
Number of environmental counselling events for residents and children



Number of children reached by environmental counselling



Events for residents related to land use



7 Municipalities and municipal enterprises promote environmental responsibility throughout the region.

Lahti Procurement Services can no longer monitor how environmental aspects are taken into account in procurement. However, in accordance with the Procurement Programme 2018, environmental aspects and the circular economy are taken into account in procurement in the different city units.

Environmental matters constitute an essential everyday part of the work of *Päijät-Hämeen Ateriapalvelut (Päijät-Häme Catering Services)*. In 2019, vegetarian meals were available at schools and day care centres every day, and one day of the week was an all-vegetarian day. The selection of vegetarian recipes was improved; use of red meat was decreased and it was replaced with Finnish chicken; use of soya in vegetarian dishes was decreased and replaced with Finnish vegetable protein in the form of broad beans. Finnish vegetable protein was established on the menu. Nearly 30,000 kilogrammes of organic products were purchased. This amount was divided between schools, day-care centres, the hospital, care services and staff restaurants. Scales were purchased for all kitchens in 2019 for the measurement of food waste, and we participated in the national Food Waste Week. During Food Waste Week, the schools were invited to reduce food waste from meals, and food waste-related messages were displayed in school cafeterias. As many as 67 per cent of the schools reduced their food waste from meals compared with the previous year. The price of a lunch was EUR 3.96.

Lahden talot is engaged in a major Life-CANEMURE project focusing on energy renovations and retrofits. The ten houses included in the project were chosen in 2019. The effects of the measures on carbon dioxide emissions and energy consumption of the houses are monitored. For years now,

Lahden Talot has been taking considerable measures to improve energy efficiency and reduce water consumption and waste.

Environmental education and research in the region

In 2019, *LUT University* further strengthened its presence in Lahti. In August 2019, LUT started operations on the new, energy efficient Lahti campus in Mukkula. Nearly 1,200 applications were received for an intake of 170 in the master's programmes starting in autumn 2019.

In 2019, LUT announced the establishment of three new professorships in bioeconomy, and LUT School of Business and Management filled three new professor vacancies in Lahti. Businesses in the area provided funding of nearly EUR 1 million for these. Companies have also utilised LUT's expertise in areas such as chemical process technology and in various projects. In addition, LUT's expertise in the minimisation of the environmental impact of cultural and sports events was used by means such as life cycle modelling in the Finnish Ice Hockey League (Lahti Pelicans) and golf course climate campaign (Messilä Golf).

The University of Helsinki's multidisciplinary and international researcher community and partner network constitute a diverse research and teaching unit at the NiemiCampus in Lahti. It focuses on sustainable and diverse urban environment, other applied natural science-oriented environmental research, scientific education and long-term university activities. The Ecosystems and the Environment research programme carries out internationally high-standard environmental research, focusing on subjects such as ecosystem services





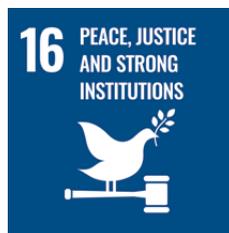
produced by green areas; the effects of land use in watershed areas on waters; research into environments contaminated by chemicals and development of various restoration methods by means of ecotoxicology, environmental chemistry and environmental biotechnology; and the use of algae in circular economy applications. The latest key projects include a project studying the effects of the recreational use of nature on health and well-being, and a project focusing on the development of nature-based solutions for urbanisation-related problems.



Education in Lahti is provided through two multidisciplinary degree programmes (a bachelor's degree programme in environmental science and an ECGS master's programme). The programmes offer a diverse range of digitally-supported environmental studies. Some of the studies are arranged in cooperation with the Open University, providing residents of Lahti with direct access to higher environmental education. Lahti is also active in providing further education. Each year, the University of Helsinki provides a project course on environmental aesthetics in Lahti, promoting an understanding of the significance of aesthetic values in urban environments.

The Päijät-Häme Lumo Centre has promoted interest in natural sciences, mathematics and technology among pupils at Lahti schools, with the purpose of inspiring them to start studying these subjects in the future.

Salpaus Further Education provides environmental maintenance training in Asikkala. The training focuses on the maintenance, repair and condition assessment of various types of urban and natural environments. Students can choose to specialise in repair and maintenance operations, waste management, water maintenance operations or environmental communication and counselling. As part of their studies, the students have restored structures and waters at nature sites of City of Lahti and Hollola.



Environmental maintenance students have been active on the Salpausselkä Geopark project, participating in workshops and the activities of the company network and by arranging excursions.

Future plans and challenges

- It is difficult to monitor the sustainability of consumption in the City organisation, as there is no information available on the environmental impact of the purchases made by the City.
- Promoting corporate environmental awareness and working for the climate through means such as the development of climate partnership activities.
- Utilisation of the international visibility resulting from being named Environmental Capital of Europe.
- Environmental goals were developed for Päijät-Häme Catering Services for 2020–2023. According to the goals, the objectives include taking environmental impacts into account in service production, reducing the amount of waste and energy consumption, improving the efficiency of transport, reducing the use of detergents and communicating about environmental measures.

8 Environmental balance sheet



The financial statements of the City of Lahti for 2019 include a compilation of environmental indicators of the city and the City Corporate Group's area. Data for this environmental balance sheet has been collected from all the city's service sectors and functional balance sheet units. City of Lahti's Environmental Programme 2030 also includes indicators in euro that are monitored using the environmental balance sheet. The City Corporate Group calculation includes, among others, Lahti Aqua Ltd, Lahti Energy Group, Päijät-Häme Waste Management Ltd, Lahden Talot Ltd and Päijät-Häme Catering Services. Environmental expenses for the entire City Group amounted to EUR 44.7 million and environmental income to EUR 35.3 million. Environmental investments amounted to approximately EUR 19.6 million.

ENVIRONMENTAL BALANCE SHEET 2019 SUMMARY, 1000 EUR	The City of Lahti and balance sheet units			Lahti Group as a whole		
	Income	Expenses	Investments	Income	Expenses	Investments
1. Air and climate protection	472.4	303.2	267.7	472.4	3,978.8	5,010.7
2. Water protection and wastewater treatment	214.2	503.9	18.0	14,787.2	10,105.7	12,440.0
3. Waste management and litter prevention		1,568.9		19,556.6	24,433.7	698.0
4. Soil and groundwater protection	40.2	129.9		40.2	195.9	136.0
5. Noise and vibration abatement			56.0		3.3	56.0
6. Nature and landscape conservation	4.1	82.1		4.1	82.1	
7. Administrative functions related to environmental protection	376.6	1,367.0		376.6	1,367.0	
8. Promotion of environmental protection	50.8	731.5		50.8	1,116.8	1,247.0
9. Environmental taxes and levies		1,065.0			3,406.7	
TOTAL	1,158.2	5,751.6	341.7	35,287.8	44,690.0	19,587.7
Interest paid					168.0	
Environmental provisions		1,131.0			-1,597.0	
Change in environmental provisions (increase -, decrease +):					-1,597.0	
Contingent environmental debt (estimated cost):						

Please note: the classification does not match the sections in this review.



More information

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