



First } years

ECO₂ - ECO-EFFICIENT TAMPERE 2020





Tammerkoski rapids – The heart of the city.



CITY OF TAMPERE

Founded in 1779.

The third largest city in Finland and one of the three most rapidly growing regions in Finland.

Population 2013: 220,000.

Area: City 689.6 km², Land 525.0 km², Water 164.6 km².

First 3 years



© City of Tampere/ECO2-project
© Writers
© Photographers

Editorial staff

Pauli Välimäki
Elli Kotakorpi, Krista Willman, Kirsi Viertola
Mikko Närhi

Graphic design and layout

Nalle Ritvola, Osakeyhtiö Nallellaan, Tampere

Photos

If not stated, the City of Tampere
Mikko Närhi
Nalle Ritvola

Translation

Translatinki Oy

Printing

Hämeen Kirjapaino Oy, 2013

ISBN 978-951-609-710-0



SITRA

Contents

Foreword by the Mayor of Tampere: Towards a Smart Eco-city

9

Introduction. What is the ECO2 project?

10

Eco-efficient city planning and construction

- Energy surveys made part of the planning • Eco-efficient city planning process (Chart)
- Tampere's roadmap for energy-smart construction

15

Examples of eco-efficient construction

- An eco-city in Vuores • Lantti, Finland's first zero-energy house • PuuVuores project progresses • Härmälänranta to become a near-zero energy residential area • The Solar City of Nurmi-Sorila • Increasing the energy efficiency of old buildings • TARMO encourages housing companies to joint renovations • RANE advises constructors and renovators • Tampere Region Construction Heritage Centre • Tampere Real Estate services provide energy-efficient renovations • TAPRE – Energy efficiency throughout the building's life cycle • Peer learning and networking: CASCADE-project

21

Renewable and low emission energy

- From natural gas and peat to renewable energy • Wind and sun: renewable local energy
- RESCA: Renewable energy pilot programmes in Tampere • Tampere Illuminations uses light-emitting diodes

33

Sustainable and smart traffic

- Increasing public transport • A modern city tramline • Tampere is the cycling municipality of the year 2013 • 10 actions to promote cycling in Tampere in 2012
- Towards cleaner motoring

39

Summary: A three-year effort

- Emissions have reduced • Low-carbon urban development • Climate change generated new business • Tampere, a pioneer in climate matters

45

Towards 2020

VISION – Eco-efficient Tampere 2020

53

Appendices

56



Foreword by the Mayor of Tampere: Towards a Smart Eco-city

The ECO2 Eco-efficient Tampere 2020 project was jointly established by the City of Tampere and the Finnish Innovation Fund Sitra in 2010. The goals were ambitious: to reduce greenhouse gas emissions, develop carbon-neutral operations, promote environmental business, and make Tampere one of the world's leading climate-conscious cities.

The progress of ECO2 from 2010 through 2012 is an excellent example of a project with a clear focus and concrete aims. ECO2 has proven that climate change can be turned from a risk into an opportunity.

New, smart, and economic technology has a central role in the search for practical solutions to climate change. Tampere can lead the way in building a smart eco-city. It is a city where everyday life, transport, and work can all be organized sustainably.

This publication describes Tampere's progress towards eco-efficiency. The results can already be

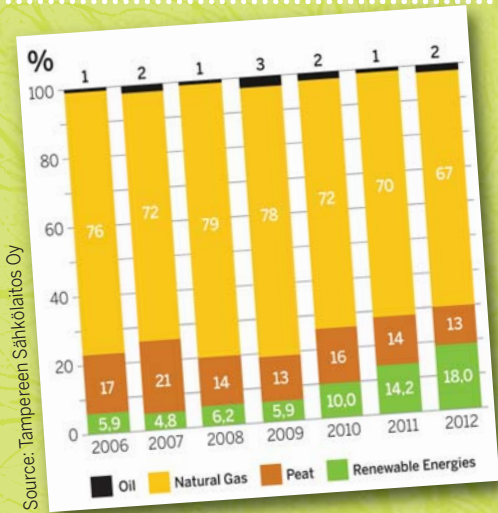
seen: the city's net greenhouse gas emissions have decreased, the proportion of renewable energy is increasing, and the popularity of public transport and cycling has increased. Tampere is growing in an increasingly environmentally conscious way.

The ECO2 project will continue to have an important role in this process. Everyone — the city organisation, the business sector, in fact the whole population of Tampere — can and should contribute to making the change a success. Let's make Tampere a fine European example of a climate-conscious city!

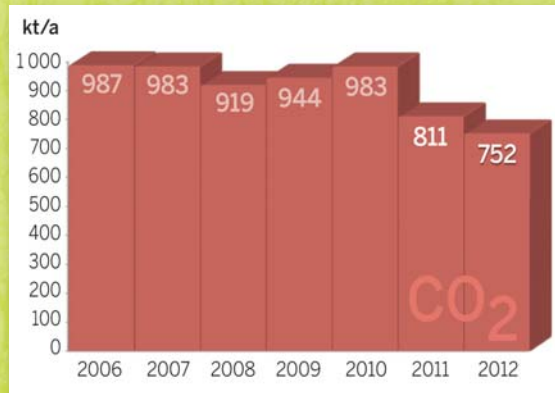


Anna-Kaisa Ikonen
Mayor, City of Tampere 2013 –

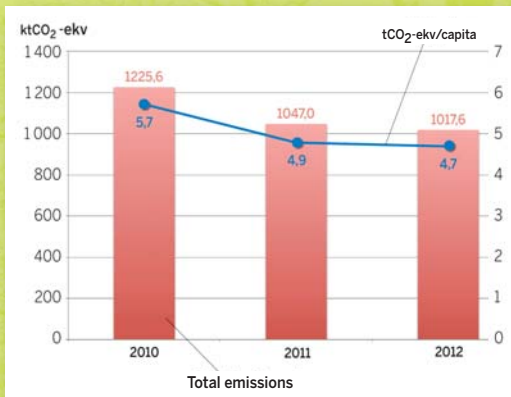
Progress of the City of Tampere towards eco-efficiency



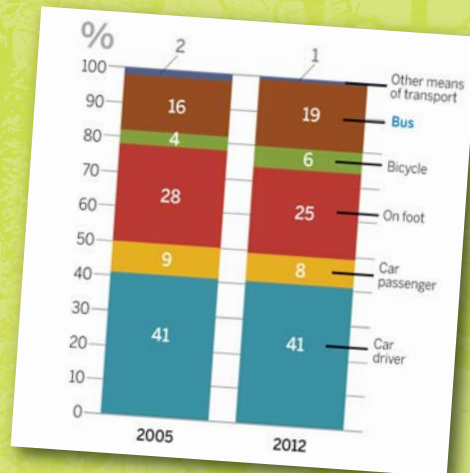
Source: Tampereen Sähkölaitos Oy
 Analysis of local power utility Tampereen Sähkölaitos Oy's own production per energy source, 2006-2012.



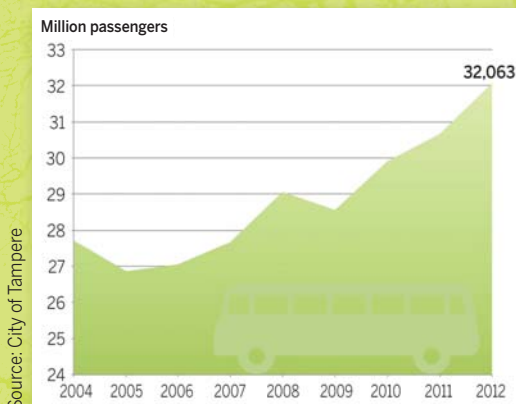
Source: Tampereen Sähkölaitos Oy
 CO₂ emissions of Tampereen Sähkölaitos Oy, 2006-2012.



Source: Benviroc Oy
 Development of greenhouse gas emissions in the City of Tampere, 2010-2012 (excluding industrial operations).



Source: Tampere Regional Travel Survey 2012
 Transportation changes in Tampere, 2005-2012.



Source: City of Tampere
 Tampere public transport passenger volumes, 2004-2012.



Source: City of Tampere
 Number of cyclists in Tampere, 2000 - 2011 (index 100 in 2000).
 Tampere public transport passenger volumes, 2004-2012.



Introduction

What is the ECO2 project?

From its beginnings in 2010, the ECO2 project brought together the city's various operators to create a low-carbon and eco-efficient city.

“The ECO2 project was started to implement the city’s strategic climate objectives. Cities have great opportunities to promote the reduction of emissions through construction regulations and traffic arrangements, which highlights the importance of a responsible approach to these issues. Another reason for establishing the project was that the time was politically favourable: the promotion of climate concerns was broadly considered a common responsibility.”

Kari Kankaala,
Director of Economic and Urban Development

The built environment is the single greatest source of emissions. Reflecting this, ECO2 has participated in various projects focusing on eco-efficient city planning and construction. The energy efficiency requirements of buildings will be tightened

further when the EU directive on near-zero energy buildings takes effect in public construction at the end of 2019, and in all construction at the end of 2020.

The majority of greenhouse gas emissions are generated through energy production and use. Of the heat and power produced in Tampere in 2010, over 90 percent resulted from fossil fuels. Energy efficiency and increased use of renewable energy sources are central to reaching the set emission targets. For this reason, ECO2 also focuses on energy and related projects.

Transportation accounted for around 18% of Tampere’s greenhouse gas emissions in 2010. Projects promoting sustainable transportation and related solutions are the third focus area within the ECO2.

The key features of the ECO2 project include changing the city’s operational methods and implementing pilot programmes. ECO2





has acted as a coordinator, support, and inspiration for the various units of the city organization and for the extensive partner network. One of the main tasks of the ECO2 project has been to distribute information on projects and climate actions within the city organization and further afield.

ECO2 has succeeded in international competitions as a good example of an all-embracing climate project. It won first prize in the Solutions 2011 competition, which was organized by the Nordic Council, and made it to the finals in two other European environmental competitions.

ECO2 is one of the strategic projects of the city of Tampere, the implementation of which is supervised by the City Council. The project operates within the City of Tampere Central Administration, under the

Director of Economic and Urban Development. Departments responsible for city planning, construction, transportation, energy matters, etc., are all represented in the project's steering group, which is key to the success of any climate project of this scale.

The launch phase of the ECO2 project, which is partly funded by the Finnish Innovation Fund Sitra, ended at the end of 2012. The main achievement was the reduction in greenhouse gas emissions. However, working towards a carbon-neutral Tampere has only just begun. ECO2 will continue this work as the city's own climate project.

Pauli Välimäki
Project Director, ECO2



ECO₂

1
ISSUE

Eco-Efficient Tampere 2020 implements the climate and energy objectives of the City of Tampere together with Sitra, the Finnish Innovation Fund. - Towards a carbon neutral city.

Climate actions taken by the City of Tampere in 2011:

- 
- The City requires that all new construction meets the requirements of the energy efficiency class A at the minimum.
 - Several passive and zero energy houses will be constructed in the housing fair area.
 - The planning of the Finland's largest wooden residential block area will start in Vuores.
 - The new suburbs of Nurmi-Sorila and Härmälänranta will be planned to be as carbon-neutral as possible.
 - The city will start an energy-efficient renovation programme in old residential areas.
 - The first BREEAM GOOD rated sports and concert arena in the world will be planned in the centre of Tampere. BREEAM is the world's foremost environmental assessment method and rating system for buildings.
 - A new Sustainable Building Centre that will provide guidance on energy-efficient construction and housing will start operations.
 - Tampereen Sähkölaitos Oy will increase the use of renewable energy sources.
 - The city will acquire the first electric cars.
 - The master plan of tram traffic will be completed.

ECO₂
Eco efficient
Tampere 2020

Tampere is situated between
the lakes Näsijärvi and Pyhäjärvi.





Eco-efficient city planning and construction

Objectives of Tampere

Tampere City Strategy 2025:

A compact, green and low-carbon community structure supports the development of the entire city region.

The growth of the city is focused on the inside the current community structure, in regional centres and around the public transport quality corridors and the southbound railway zone.

Public transport and cycling are smooth transportation alternatives. A city tramline is the leading public transport project.

Tampere is a forerunner in climate policy. The city's carbon dioxide emissions will be reduced by 40% of 1990 levels by 2025.

The ECO2 project has implemented projects relating to city planning and construction in accordance with the objectives of the City of Tampere but also with national and EU objectives. One of the main challenges has been to enhance cooperation between the operators involved in the urban development process (planning, real estate department, construction and constructing, building control and housing department) to establish energy efficiency targets and operating methods.

“ECO2 has increased the consciousness of the central operators in construction and energy production of the strategic importance of eco-efficiency to the city.”

Kari Kankaala,
Director of Economic and Urban Development

City planning can be used to reduce greenhouse gas emissions by creating conditions for an energy- and eco-efficient living environment. Planning must be sufficiently dense to facilitate eco-efficient infrastructure such as district heating and decentralized energy production using renewable energy sources, efficient public transport, walking and cycling, waste management, and local services.

“For us, the timing of the ECO2 project was excellent, as we’d just started to emphasize eco-efficiency in our operations. Cooperation with the city has been smooth in matters relating to eco-efficient construction, because people there are now committed to maintaining this momentum. One major cooperation forum with the city of Tampere and the ECO2 project is KEKO, a tool used for measuring the eco-efficiency of regional development projects.”

Toni Tuomola, Regional Director, Skanska Oy

Energy surveys made part of the planning

Together with the city’s land use planning, ECO2 has participated in the development of two eco-efficiency tools for zoning. Ecocity Evaluator is a calculation

tool designed for city planning. The tool was developed by Eero Paloheimo Ecocity Oy, and can be used to assess the CO₂ footprint and eco-efficiency of alternative solutions. The tool has been used in several projects, including the Solar City project in the Nurmi-Sorila district.

Planning has a fundamental impact on energy density, which is a central consideration in planning an area’s energy system. New tools and operational practices have also been developed within the ECO2 project for calculating solar and wind energy production capacity.

“The role of ECO2 is to find practical methods for discussing and achieving the set emission reduction targets in city planning. Energy and eco-efficiency matters have not been measured in land use planning before. Cooperation with ECO2 has added expertise to planning, which is important considering that the development of solar and wind energy in particular has been rapid.”

Pia Hastio,
Head of Master Planning, Land use planning

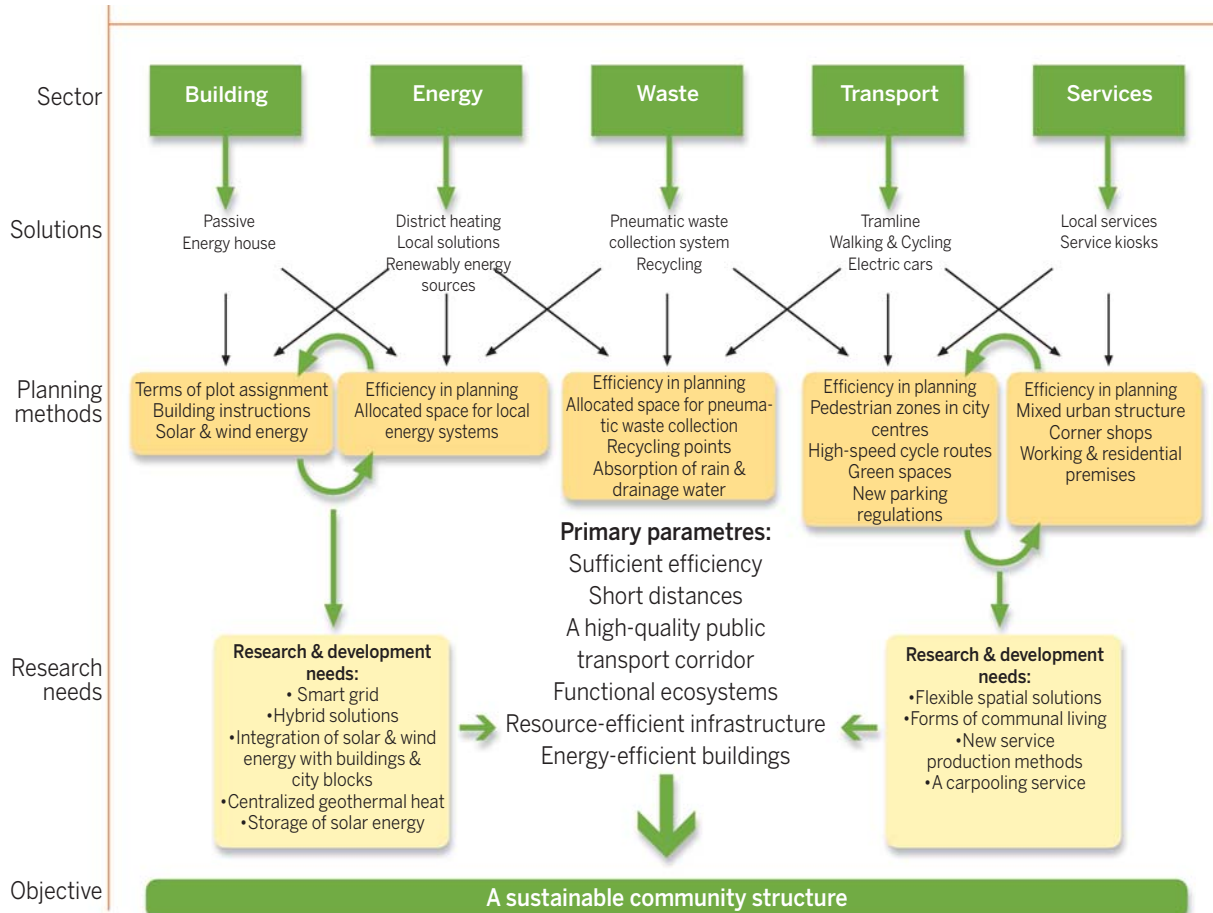
Eco-efficient city planning process

Energy efficiency has in Tampere been elevated to one of the most important objectives of local master and local detailed plans. This requires common operating practices to define energy efficiency, set targets, and find alternatives. For this reason, ECO2 works in close cooperation with land use and planning to establish common practices.

“Thanks to ECO2, understanding and awareness of eco-efficiency have increased in city planning, and hopefully eco-surveys will in future become a natural part of city planning.”

Antonia Sucksdorff,
Environmental Expert, Land use planning

Eco-efficient planning processes



© ECO₂



Tampere is planning a city tram.



Each sector involved in urban development has a role and specific tasks in implementing eco-efficiency:

- The City Planning affects the efficiency of community structure, which in turn affects energy density and the profitability of energy systems, waste management organization, frequency of public transport, and local service provision. The plan influences the conditions for and usage ratio of public transport, walking, and cycling as well as energy and waste solutions.
- The Real Estate Department of the City of Tampere is responsible for land policy. It influences the terms of plot assignment, planning contracts and compensations that can be used to promote energy-efficient construction and complementary construction by setting energy-efficient and CO₂ footprint criteria for construction competitions.
- Housing Department affects the location and forms of housing and the condition of properties. It distributes state subsidies for energy repairs and administers the housing fund of the city of Tampere, which grants subsidies for projects such as elevator construction and energy efficiency subsidies to var-

ious city communities. The Housing Department supervises the operation of the city's housing production communities and can promote their energy efficiency-related activities.

- The Building Control Department oversees and regulates the quality and energy efficiency of construction, application of energy regulations, and advising and training of constructors. In Tampere, the building control maintains the Energy Consultancy Centre for Construction and Housing (RANE), which for example organizes constructor training. The Department also grants construction and action permits for e.g. geothermal heat projects, and supervises the quality of the final result.
- The constructor is responsible for the practical planning and implementation of energy and eco-efficient construction. In the public-private partnership model applied in Tampere, the constructor participates in the planning already at the preparation phase, which enables interactive consideration of energy and eco-efficiency requirements. The constructor can utilize energy and carbon calculation tools as well as environmental certificates granted to planned buildings.

Tampere's roadmap for energy-smart construction

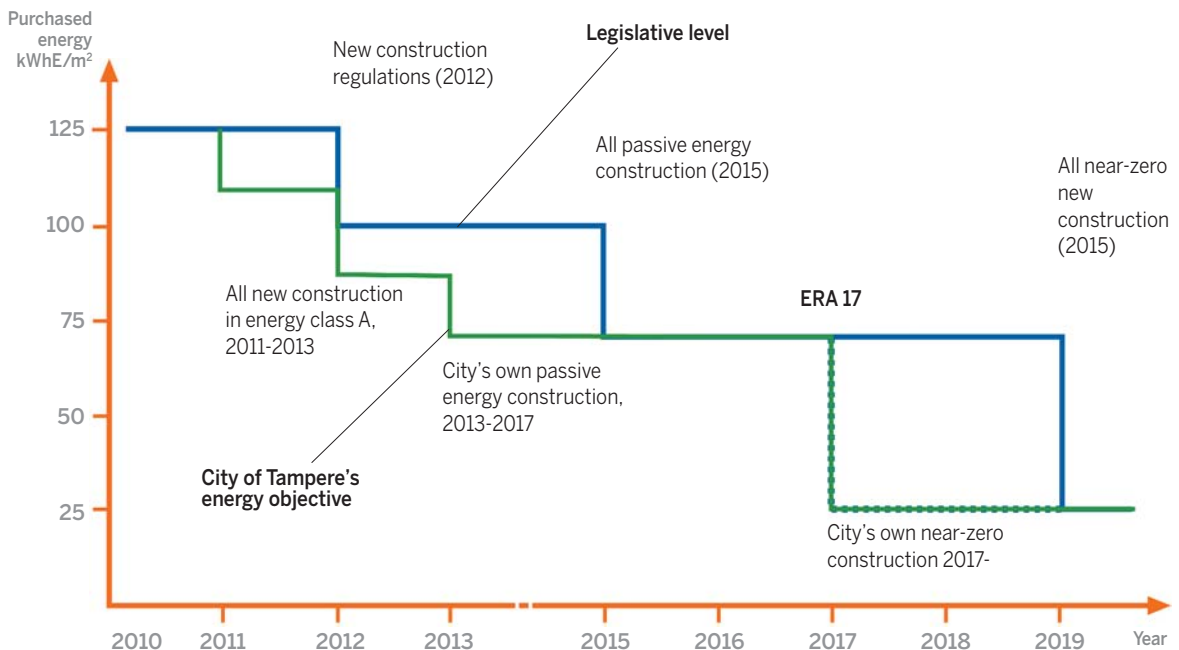
The ERA17 roadmap for energy-smart construction is a vision and programme of the Ministry of the Environment, the Finnish Funding Agency for Technology and Innovation (TEKES), the Finnish Innovation Fund Sitra, and operators in the construction sector on the means that facilitate Finland to reach the EU's near-zero energy objective already in 2017.

The ERA17 programme includes 31 concrete objectives on improving the energy efficiency of construction, creating an energy-efficient built-up environment, enhancing the use of renewable energy, and increasing training and research in the sector.

The municipalities will prepare a local ERA17 roadmap. In Tampere, the ECO2 project has prepared a survey on and proposal for an ERA17 roadmap in cooperation with VTT, the Technical Research Centre of Finland.



Pispala is an old-fashioned wooden town house area in Tampere – very natural, but also quite dense.

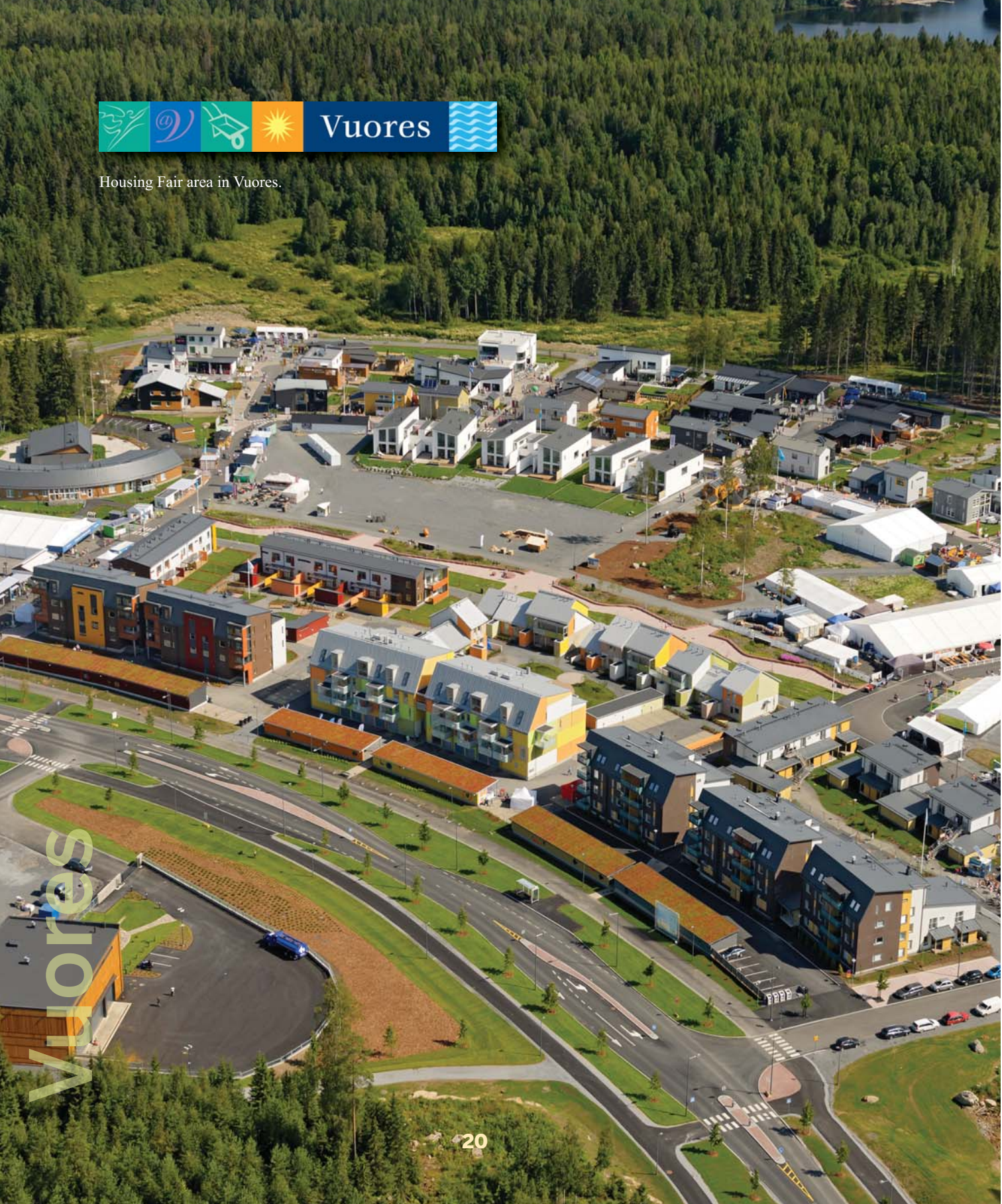


© ECO₂

Energy objectives of construction in the 2010s, and the ECO2 proposal for Tampere's ERA17 roadmap.



Housing Fair area in Vuores.



Vuores



Examples of eco-efficient construction

An eco-city in Vuores

Vuores is among the largest area construction projects in Finland. The planning of the area began in the late 1990s, with the aim of creating a residential and working area for 13 000 people. From the outset, the aim was to integrate the natural world with the construction. The plan was based on thorough Environmental Impact Assessments, and the most valuable areas were earmarked for recreational areas rather than construction sites.

In addition to natural heritage conservation, diverse green areas, and energy-efficient construction, the eco-efficient and ecological aspects of In Vuores there are pneumatically pipe collection system for waste and natural stormwater management system. Excellent pedestrian and cycling routes and public transport connections facilitate car-free housing.

Vuores became of the main partners of the ECO2 project and a demonstration platform for eco-efficient construction projects. The Housing Fair 2012 at Vuores was the most visible result of this cooperation: Finland's currently most energy-efficient residential area was constructed in the area.



Vuores has an automated pipe collection system for waste management, which has been supplied by MariMatic Oy. Instead of house-specific waste collection bins, waste is taken to joint collection points from where it is pneumatically conveyed to a waste collection centre for collection by truck.

Pekka Heikkinen



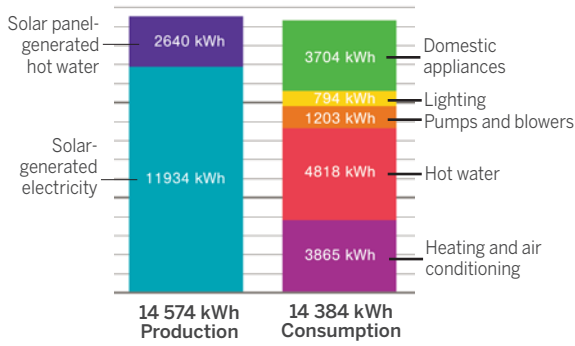
Lantti, the first zero-energy single family house in Finland. *Design: Aalto University. Implementation: Täyhtymä Oy.*

Lantti, Finland's first zero-energy house

The Lantti single-family house, designed and constructed for the Housing Fair in Tampere, is an excellent example of zero-energy construction. Aalto University, The Housing Finance and Development Centre of Finland (ARA) and the Finnish Innovation Fund Sitra, TA-Yhtymä Oy, and the city of Tampere participated in its planning and construction.

Energy conservation, autonomous energy production, and use of renewable energy sources were the starting points for the project. The aim was to implement a normal-sized residential small house for the Housing Fair in Vuores, Tampere, the E-rating of which would be zero, based on the total energy use in accordance with the construction regulations that took effect in July 2012.

In the architectural planning of the Lantti building, the starting point was the optimization of natural



Energy production and consumption of Lantti House.

light and positioning of the building within the limits set by the local detailed plan. A large part of Lantti's energy efficiency is based on own electricity production. Lantti is a demo version of the house, which will be put into wider production and can be adapted into a zero-energy house thanks to its structure and room modules.

Energy efficiency does not significantly increase construction costs, which was a significant finding from the constructor's perspective. When the construction costs were calculated, it was noticed that the additional costs relating to energy efficiency were absorbed by other construction costs. Building an energy-efficient house is not a matter of finances, but of good planning and implementation.

→ Read more about the Lantti House at <http://www.lanttitalo.fi/> (in Finnish).

Planning a Class A zero-energy house:

- An effective heating system, most commonly implemented with water circulation (thermal energy, wood burning, or district heating)
- Low-energy AC equipment with an effective heat recovery system.
- A passive level outer shell with best windows available.
- Avoiding corners that have no purpose the form of the building considered as well as bay and over-sized windows.
- Installation of protection against sunshine outside the windows to prevent overheating.
- Installation of solar thermal collectors to heat water and provide floor heating in wet premises in summer.
- Solar panels to produce energy

→ Source: Jarek Kurnitski: The energy efficiency of the Housing Fair houses. TM Rakennusmaailma Magazine, issue 6/2012.



Uusipuu was praised by the jury for its unique village-like atmosphere, which merges well with the other of blocks in the Isokuusi area. Wooden structures and surfaces of the houses have been left visible, and the aim is for the residential block to be amenable to alterations. Roof-mounted solar panels provide additional heat, and conservatories can be built in the lofts. Treatment of rain and drainage water is based on absorption and retention. Assembly, sauna, and washing facilities are located in an outdoor building. *Implementation: Peab Oy, Etera, Arkkitehtitoimisto Eero Lahti Oy, Metsä Group, Metsä Wood.*

PuuVuores project progresses

The ECO2 project is also involved in the PuuVuores project in the Isokuusi area. It is a development project for an eco-efficient wooden city, where the public-private partnership model will be applied. Various business teams selected by the city of Tampere based on a planning competition participate in the implementation of the project. Each business team includes a constructor, architectural office, and operator in the wood product sector.

The aim is to make Isokuusi a CO₂-neutral, mainly wooden residential area for around 1500 residents. Energy efficiency, energy systems, material efficiency, life cycle thinking, and ecological lifestyle are considered in all planning.



Vuores



The wooden residential block “**Kaarna**” (bark) that was awarded a prize in the PuuVuores architectural competition is based on the use of wood element structures.

The buildings are energy-efficient, with a very small carbon dioxide footprint. The consumption of heating energy is around 80 kWh/ gross m². The block has green roofs, which cool and clean the air and absorb noise. Plants bind atmospheric CO₂, thus reducing its concentration. Green roofs also help with rain and drainage water management, and contribute to energy saving by providing added insulation.





In **Urbica**, eco-friendliness is based not only on wooden construction but also on the modular structure, which provides increased versatility and thereby lengthens the building's life cycle. Patios, roof terraces, conservatories, rain and drainage water management, a communal sauna, and excellent activity and bicycle storage facilities facilitate ecological living. Solar panels and roof-mounted vertical axle wind generators will account for a significant share of the Urbica block's annual electricity usage. Solar panels also serve as adjustable elements to protect indoor premises and balconies against sunlight. *Implementation: Studio Suunto Oy, Arkkitehdit Sarlin+Sopanen Oy, Rasto Oy.*

“The objectives and climate work within the ECO2 project include developing community structure in a meaningful manner, providing energy solutions, and promoting public as well as pedestrian and cycling traffic. The same themes have been part of the Vuores project from the very beginning. Together we have been able to implement many great things that the Vuores project could not have managed with its own resources alone. ECO2 has been a great help in preparing the environmental impact assessment of our project plan.”

Pertti Tamminen, Project Director, Vuores project



“**Kuistilla**” (on the patio) block is based on CLT technology. Ecology and energy-efficiency are the starting point for the construction of the entire block. Combined with the wooden structure, the shape of the buildings, shading elements, green roofs, and solar panels make the block significantly more eco-efficient than traditionally-constructed buildings. *Implementation: Peab Oy, Sato-Rakennuttajat Oyj, BST-Arkkitehdit Oy, Stora Enso Oy.*

Vuores



Härmälänranta to become a near-zero energy residential area

The Härmälänranta area is being developed based on eco-efficiency together with the city of Tampere and Skanska Oy that owns the land. The aim is to implement an energy system based on near-zero energy construction for around 3000 residents in a new housing block area. Constructing Near-Zero Energy District (CoZED) funded by Tekes, the Finnish Funding Agency for Technology and Innovation, has been started for the purpose. Other participants to the project include Skanska, VTT Technical Research Centre of Finland, Tampereen Kaukolämpö Oy (Tampere District Heat) and ECO2.



A conceptual drawing of Härmälänranta.
Tengboms arkitekter.

The near-zero energy status of Härmälänranta is based on the construction solutions used and the utilization of renewable energy sources, but also on the reduction of energy consumption peak loads by means of a local smart electricity network and user motivation. The best combination of energy sources will be selected based on primary energy consumption, CO₂ emissions, and cost efficiency.



The Solar City of Nurmi-Sorila

The main aim of the Solar City of Nurmi-Sorila project was to identify the conditions for implementing a CO₂-neutral residential area. Nurmi-Sorila is a rural greenfield area about 15 kilometres from the centre of Tampere. A residential area of around 12,000 residents will be built in the area in the 2020s.

It was demonstrated in the implementation plan that the Nurmi-Sorila area can be implemented so as to meet the set emissions reduction target. Calculations suggest that by 2030, an 83% reduction on 1990 emissions levels will be reached in the area.

→ Source: Oy Eero Paloheimo Ecocity Ltd:

The Solar City of Nurmi-Sorila: Implementation plan for a CO₂-neutral and eco-efficient city district. Final report 2012.

Increasing the energy efficiency of old buildings

In addition to new construction, it is vital to increase the energy efficiency of old buildings. Most buildings constructed between the 1960s and the 1980s can be renovated so as to significantly reduce their energy consumption and CO₂ footprint. They also create opportunities for cost savings in the private and public sectors.

ECO2 ordered an assessment of the energy repairs of the existing building stock in Tampere from the Department of Civil Engineering of the Tampere University of Technology. With the current rate of repairs, only 6 % energy savings will be achieved by 2020 compared to the 20% objective established by the EU. To reach the 20% objective, normal repairs must be supplemented with energy-efficient repair measures.



Tammela.

Tammela renovation plan

Tammela was originally a densely-planned wood-built suburb near the centre of Tampere. The current building stock of the area mostly dates back to the 1970s and is due for renovation. The aim of the Tammela project is to renovate the old buildings in the area in an energy-efficient manner, to add new construction, and develop the urban milieu.

To promote energy-efficient repair construction in Tammela, the city participates in the EU-GUGLE projects starting in 2013 together with many other EU cities. During the project, energy repairs will be made in cooperation with housing companies with the aim to reduce energy consumption by the minimum of 50%. The housing companies will receive funding from the EU-GUGLE, which is up to €50/m² and 50% of the total energy repair budget.



TARMO encourages housing companies to joint renovations

TARMO is an ERDF project administered by ECO2. Within the project, housing companies will cooperate to improve the energy efficiency of various suburbs. The aim is to train volunteer “energy experts” within the housing companies and to encourage the housing companies to cooperate in monitoring energy consumption and in energy repairs.



An easy-to-use energy consumption calculation tool will be developed as part of the TARMO project for housing companies. With the tool, the housing companies will be able to compare their own energy consumption with that of the other buildings within the project and assess the impact of different energy saving measures on energy consumption and carbon emissions. The project also encourages housing companies to jointly plan energy repairs.



One aim of the project TARMO is to train volunteer “energy experts” within the housing companies.



Rane consultants took part in Housing Fair in Vuores.

RANE advises constructors and renovators

The City of Tampere established the Energy Consultancy Centre for Construction and Housing (RANE) for the municipality's residents in 2011. Although targeted at constructors and renovators, the Centre provides energy consumption consultancy services to households. RANE began as a joint project between the Building Control Department and Housing Department of the city of Tampere, Sustainable Community unit, and ECO2.

RANE provides consultancy services online and by phone and email. In addition, information events have been organized within the projects on topical themes.

→ Further information: www.neuvoo.fi.



Tampere Real Estate Services provide energy-efficient renovations

Tampere Real Estate Services, which maintains City-owned real estate, has made energy-efficient construction and renovation operations one of its central aims. In 2010 the unit decided that all its new buildings must be in the energy class A or higher. In repair construction, the goal of greater energy efficiency has been incorporated into various projects, including the renovation of the Koukkuniemi Home for the Elderly.

“Energy efficiency generates energy and environmental benefits, and also significantly reduces expenses. I’ve been involved in energy-saving and energy-efficiency work since the 1990s, and feel that the efforts of ECO2 in these areas are an excellent development. We can truly say that ECO2 is a very important cooperation partner for us.”

Pertti Koivisto,

Director, Tampere Real Estate Services



Renovations of the Jukola House in Koukkuniemi were aimed at finding energy-efficient solutions that would preserve the original 1950s look of the senior home. *Architectural design: BST-arkkitehdit Oy. Implementation: Tampere Real Estate Services.*



Minna Paavola

The solar panels of the Luhtaa daycare centre integrate nicely with the surrounding buildings.

TAPRE – Energy efficiency throughout the building's life cycle

The aim of the TAPRE project for improving the energy efficiency of service buildings in the Tampere region was to create joint energy-efficient contract and operating principles in the region, to be applied throughout the building's life cycle from planning to utilization of the completed building. Jointly agreed principles and rules make the work of the owners of the buildings as well as the contractors, equipment suppliers, and service providers easier and more efficient. This results in improved energy efficiency, but also in improved quality of construction in general.

The TAPRE project has involved public and private property owners and companies that provide services for them. The project is administered by the Tampere Real Estate Services. TAPRE is a tool for achieving the set energy efficiency objectives.



Built in 1879, Finlayson Church has already had a long lifespan. Parishes of the Tampere region participate in the TAPRE project, which aims to enhance the energy-efficiency of service buildings.

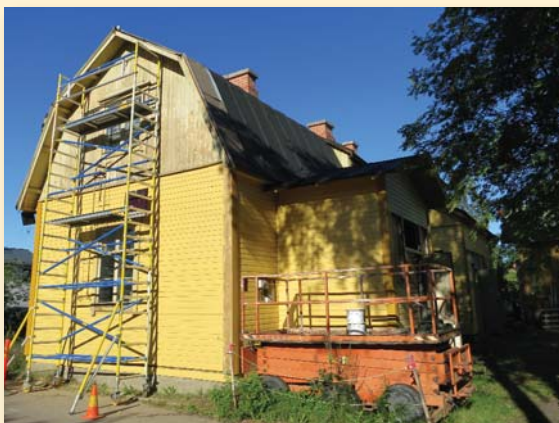
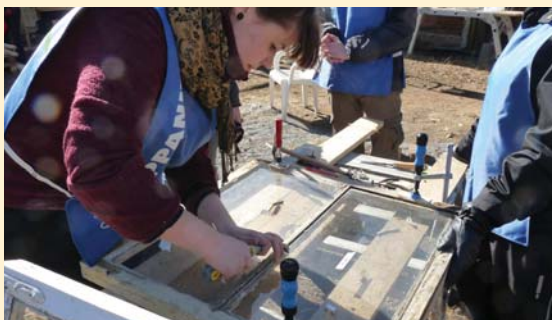
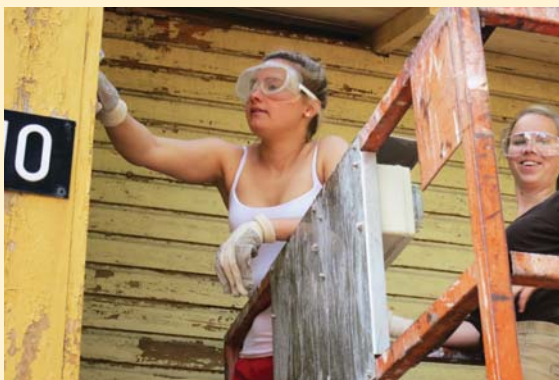
Built Heritage Centre in Tampere Region

The Built Heritage Centre in Tampere Region offers advice on restoration of old buildings.

A project to establish the Built Heritage Centre in Tampere Region and Association was started with partial funding from ECO2. The aim of the project is to promote the renovation of old building stock and the use of traditional construction methods. Many detached residential areas in Tampere were constructed before the Second World War and should be renovated in a way that upholds the original construction tradition while also improving energy efficiency.

As its first project, the association will renovate the building known as the Uittoyhdistyksen talo (the House of the Log Floating Association) in Pispala as its operating premises.

→ Further information: www.trkk.fi





Peer learning in practice: Energy experts from Eurocities network visited Tampere to assess its sustainable development policy.



Peer learning and networking: CASCADE project

The energy-efficient practices and methods of city planning and construction in Tampere have been introduced to the representatives of European cities within the CASCADE project (Cities Exchanging on Local Energy Leadership). The joint project of nineteen cities of the Eurocities network develops peer learning and distributes information on the sustainable energy solutions of the cities.

Energy experts of several cities within the Eurocities network visited Tampere to assess its sustainable development policy in general and the practical implementation models in Vuores and the Tammela

project in particular. The comprehensive approach, in which individual projects are all part of a wider strategic programme, was considered to be the strength of the city. The division of responsibility between several operators within the organization was the main challenge.

The three-year project support cities in reaching the EU's climate and energy objectives by 2020. It is funded by the Intelligent Energy Europe programme. In Finland, ECO2 is the contact organization of the project.

→ Further information: www.eurocities.eu/eurocities/activities/projects/CASCADE-Cities-exchanging-on-local-energy-leadership





Renewable and low emission energy

City of Tampere objectives:

The City of Tampere Environmental policy of 2020:

- Greenhouse gas emissions have been reduced by the minimum of 20% by 2020 through improved energy efficiency and shift to renewable fuels and energy production with low life-cycle emissions.
 - Tampere will be a carbon-dioxide neutral city by 2050.
- The city will adapt to climate change and prepare for the accompanying risks.

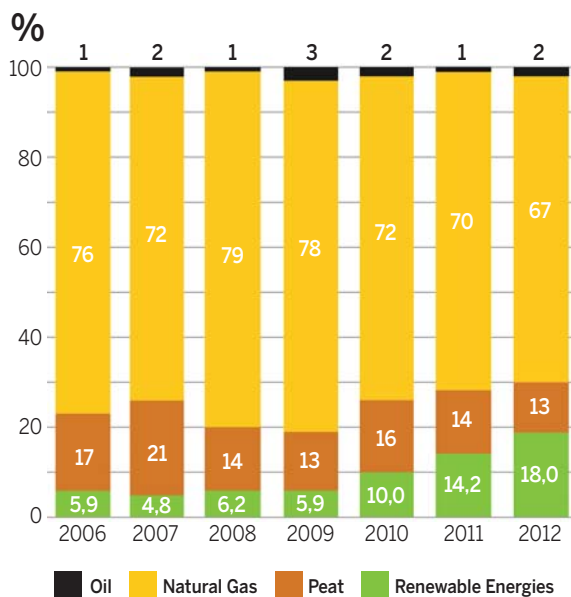
Tampereen Sähkölaitos Oy's (Tampere Power Utility Ltd) strategy:

- Renewable energy will account for 30% of the total by 2020.
 - Carbon dioxide emissions will be reduced by over 20% from 2005 levels by 2020 (nearly 300 000 tons), and by over 50% by 2030.
- Building the Tammervoima waste-to-energy (WTE) power plant.

From natural gas and peat to renewable energy

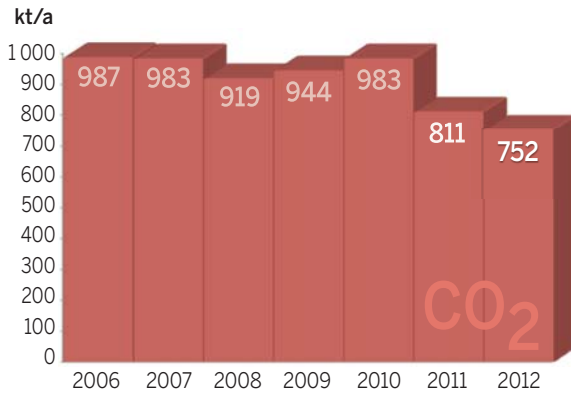
Tampereen Sähkölaitos Oy is the city of Tampere's own power utility, providing district heat and electricity for the Tampere region. The power utility has two combined heat and power plants (CHP), which main fuels are natural gas and peat.

However, a shift towards renewable fuels has already started. While the proportion of renewable energy was only 6% in 2009, the proportion had increased to 18% of the total energy procurement by 2012. Woodchips are the most important renewable energy source. The proportion of renewable energy has significantly exceeded that of peat, which has reduced to 13%.



Analysis of Tampereen Sähkölaitos Oy's energy production per energy source, 2006–2012. Source: Tampereen Sähkölaitos Oy.

Tampereen Sähkölaitos Oy aims to shift to almost exclusive use of renewable energy sources by 2040. In this vision, 80% of the total energy is produced using emission-free energy sources while peat is used as a support and backup fuel only. The use of natural gas would be reduced by around 70% of the current level.



CO₂ emissions (kilotons) generated by Tampereen Sähkölaitos Oy, 2006–2011. Source: Tampereen Sähkölaitos Oy.

The most important projects to increase the production of renewable energy in near future are the construction of the Tammervoima waste-to-energy power plant (2015) and the replacement of one of Naistenlahti power plant's boilers to use biofuels (2019).

To reach the long-term objective, the energy efficiency of the building stock must be improved significantly also. The strategy of the power utility is based on the assumption that the energy efficiency of the building stock will be improved by 20-30% by 2030, thus reducing the demand for district heat.

"We expected a lot from the ECO2 project since the very start. The painless and easy launch of the project shows that there really was a demand for it. And it is easy to see why. The content of the Mayor's Covenant and other objectives will never be reached without a project like this, which is needed to inspire the necessary efforts."

Jussi Laitinen,
Managing Director, Tampereen Sähkölaitos Oy



Wind and sun: renewable local energy

ECO2 has participated in the development of decentralized renewable energy production models with the Tampere Sähkölaitos Oy (Tampere Power Utility Ltd) and others in the field. Surveys have been conducted on the potential of solar and wind power with the aim to lower the threshold for undertaking small-scale renewable local energy production.

Testing a small wind power plant and solar panels in Nekala.



Solar energy systems and small wind power plants connected to the electricity network in Tampere, early 2013.

RESCA: Renewable energy pilot programmes in Tampere

One of the main ECO2 projects promoting the use of renewable energy is RESCA (Renewable Energy Solutions in City Areas), which was begun in 2011 as a joint project between Finland's largest cities.

Various renewable energy pilot programmes are being implemented during the project, which was initiated by Tampere and also includes Oulu, Turku, and the Helsinki Region Environmental Services Authority (HSY). Hermia Ltd. is the joint coordinator of the project. The aim is to establish permanent cooperation and exchange information between the participating cities.

In Tampere, the implemented pilot programmes include the introduction of solar energy. Thanks to the project, the first solar power systems has been connected to the electricity network in the region. The project partners include the Vuores school centre, Tampereen Sähkölaitos Oy's (Tampere Power Utility's) Nekala unit, Technopolis Ltd., and Särkänniemi Ltd.

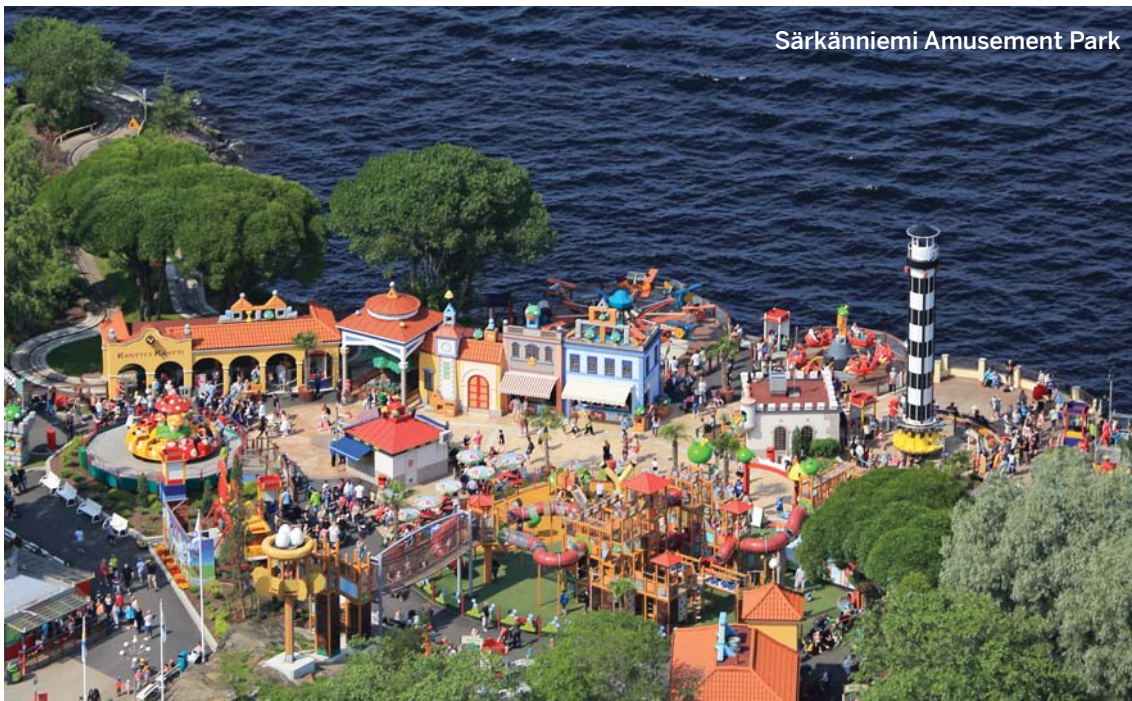
A Master's thesis on the potential use of solar energy in Tampere is also part of the RESCA.

The second pilot programme concerns the Kämenniemi district heating network, where renewable energy will provide an alternative to oil-fuelled heating of buildings. Sarankulma pellet-fired heating plant is the third pilot programme.

The fourth pilot programme is to make Särkänniemi Amusement Park and Tampere Hall Carbon-neutral. Implementing environmentally aware operational concepts and concrete actions in these popular destinations will significantly contribute to establishing a positive atmosphere for climate-conscious work in Tampere.

“RESCA is our main cooperation project with ECO2, and in it we've calculated the CO₂ balance of Tampere Hall and Särkänniemi Amusement Park and identified means to reduce emissions. In this, ECO2 has acted as a coordinator and provided crucial know-how.”

Laila Wallden, Project Manager, Tampere Hall





Tampere Hall.

Tampere Illuminations uses light-emitting diodes

A concrete example of successful energy efficiency solutions in Tampere is the use of light-emitting diode (LED) lights at the annual Tampere Illuminations event, and in outdoor lighting in general. Tampere Illuminations searched for a more energy-efficient and ecological solution and in autumn 2012 the event transferred to led lighting. Outdoor lighting is also being renovated: around 2000–3000 lights are being replaced annually with new and more energy-efficient lights. The reduction of energy consumption of outdoor lighting and streetlights since 2007 has markedly exceeded the set targets.







Sustainable and smart traffic

Objectives of the City of Tampere

Tampere City Strategy 2025:

- The use of public transport has been increased (from 19% in 2012) to account for 22% of all modes of transport by 2016.
- Walking and cycling have become more popular accounting for 34% of all means of transport in 2016 (walking 25% and cycling 6% in 2012).

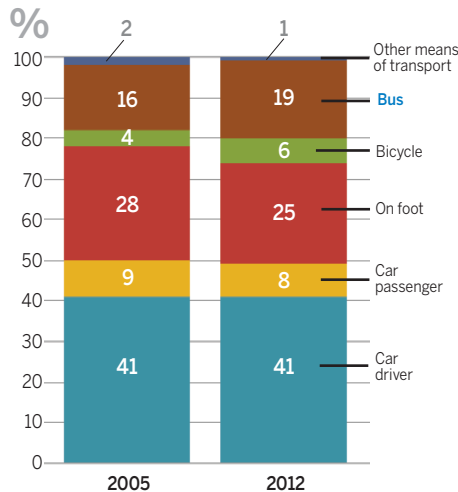
The structure plan of the Tampere Region 2030:

- Stopping the increase in motor traffic and increasing the proportion of public transport by developing a public transport system based on quality corridors, local trains, and a modern tramline.
 - Directing population growth to the vicinity of public transport corridors and pedestrian zones.

The components of a sustainable transportation system include the reduced need to move, well-designed traffic control, walking and cycling, public transports, and smart motoring, of which car pooling is a good example.

ue of buildings near the stops, and facilitates ecological transportation and sustainable growth of the city. The aim is to use the tramline development project as the innovation platform of the smart transport system.

Increasing public transport



Tampere public transport passenger volumes, 2004-2012.
 → Source: City of Tampere Department of Economic and Urban Development.

User volumes of public transport in Tampere have increased visibly since 2006, when the city implemented measures to encourage increased public transport provision and use, e.g. by expanding bus services. Lanes, traffic light priorities, and other traffic control methods have also been used to promote public transport.

A modern city tramline

Tampere City Council has accepted a decision on a new regional public transport system based on buses, a modern tramline, and local trains.

Modern rail traffic increases the density and cohesiveness of the city, attracts residents and companies, creates new event venues, increases the val-

A preliminary general plan on four route alternatives ordered by the City of Tampere was completed in autumn 2011. The plan included a comparison between the tramline and the development of bus traffic, a cost assessment, and a feasibility assessment of the tramline. The City Council accepted the preliminary general plan as a basis for further development.

The preparation of a general plan started at the end of 2012. The plan will be partially prepared in cooperation with the tramline project of the City of Turku. Tampere City Council will decide in spring 2014 on the implementation and schedule on the tramline based on the general plan. The City aims to commence the first tramline before 2020.

An illustration of the first tramline in Tampere.





The new look of Ratina Bay: Laukonsilta pedestrian and cycling bridge connects the new Ratinanranta residential area with the city centre. Photograph: Timo Seimelä.

Tampere is the cycling municipality of the year 2013

In summer 2010, Tampere launched a city bike system. ECO2 participated in the funding and planning of the project.

The popularity of cycling increased in 2012, due to improved conditions for cycling through investments such as new cycling routes. In the city centre, the improvements included a tunnel under the railway and a bridge over the Tammerkoski rapids for pedestrian and cycling traffic. This increased the smoothness of the cycling routes in the city centre.

ECO2 participated in the promotion of cycling in Tampere by organizing the Minä poljen (*I cycle*) campaign in 2012. The large-scale campaign involved the city of Tampere's department for Economic and Urban Development, Ekokumppanit Oy, and the local cycling associations Kaupin Kanuunat ry and Tampereen polkupyöräilijät ry.

The number of cyclists has increased by 47% between 2000 and the end of 2012.

The city's actions to promote cycling have not gone unnoticed on a national scale. The network of cycling municipalities selected Tampere the cycling municipality of the year in March 2013.



"We now have a recognized partner to work with. Cooperation with ECO2 has given more visibility to our events and operations in newspapers and radio. It's difficult for an association to make the voice of cyclists heard on its own."

Timo Lampila,
cycling association Kaupin kanuunat ry

10 actions to promote cycling in Tampere in 2012



1. Parking spaces will be provided for bikes.

2. A shared bike pump will be located in the city centre.

3. Various events and activities will be organized during the Cycling Days event.

4. More city bike rental points will be established.

5. The Rongankatu underpass for pedestrian and cycling traffic will be opened. The underpass will significantly improve the conditions for cycling in the city centre and complete the main east-western cycling route.

6. The pedestrian and cycling route guide will be updated.

7. The Rautatienkatu cycling route has been completed.

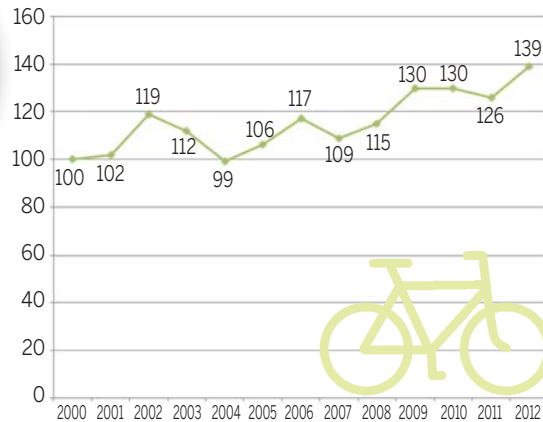
8. The Teiskontie cycling route was completed in 2013.

9. The Palatsinsilta bridge and Palatsinraitti have been completed: the pedestrian and cycling route combines the Tampella and Finlayson areas.

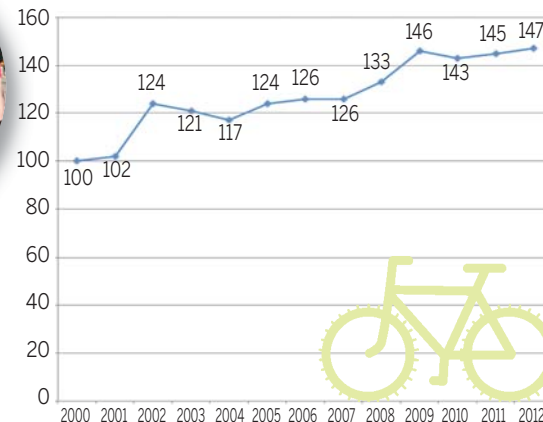
10. The city awarded a prize to the local team that covered the greatest distance in the national Kilometrikisa cycling competition.



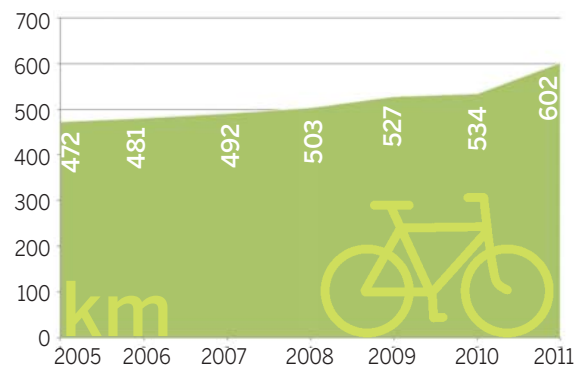
10. The city awarded a prize to the local team that covered the greatest distance in the national Kilometrikisa cycling competition.



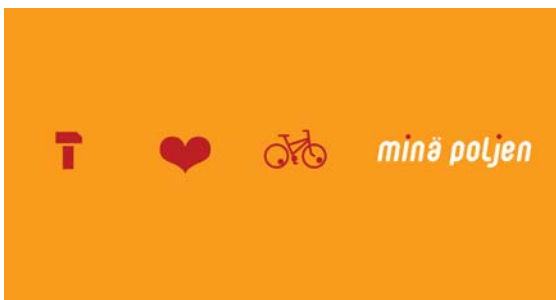
The volume of cyclists in Tampere in summertime (15 May – 15 September) in 2000-2012. → Source: City of Tampere Department of Economic and Urban Development.



The volume of cyclists in Tampere throughout the year in 2000-2011. → Source: City of Tampere Department of Economic and Urban Development.



The length of the cycling network in Tampere in kilometres.





"I'm cycling" poster by Nalle Ritvola.



Tampere City Transport TKL started an experiment with hybrid buses in 2012. Feedback so far has been positive.

Tekes. The city has acquired the first electric cars and a test environment for electric vehicles has been established in the Tampere Adult Education Centre.

The office car pooling project investigated the available operating models for a commercially competitive car pooling service in Tampere and Porvoo. Based on the survey, car sharing services are still rare in Finland, and to be profitable would have to be adopted by a large operator such as a city council. On the other hand, cities could reduce the number of cars they own, and could also cut back on the driving and parking rights they grant to their employees.



Nice to bike. The mayor of Tampere Anna-Kaisa Ikonen.

A recharging point for electric cars in P-Hämpi underground parking facility.

Towards cleaner motoring

ECO2 project has invested in reducing the emissions of motoring by comparing the emissions and costs of gas buses and other low-emission buses and by investigating the availability of electric cars and office car pooling in Tampere.

Tampere has also participated in EVELINA, a national testing and research project on electric vehicles that is coordinated by Hermia and funded by







Summary: A three-year effort

Four objectives were set for the ECO2 project:

1. Reducing greenhouse gas emissions
2. Developing operating models for a low-carbon city
3. Promoting environmental business
4. Making Tampere a climate policy forerunner.

Have these objectives been achieved?

Emissions have reduced

Between 2010 and 2012, greenhouse gas emissions were reduced by 18% in Tampere. Up until 2010, emissions had increased slowly each year. CO₂ emissions by electricity production at Tampereen Sähkölaitos Oy (Tampere Power Utility Ltd) were cut by 24% during the same period. The proportion of renewable energy doubled in three years, from 8% to 16%.

Several events have made this development possible. The proportion of renewable energy in heat and electricity production has increased significantly. The recession has slowed down the growth in consumption and car traffic. Changes in the energy markets have made it unprofitable to produce only electricity with natural gas in CHP plants.

At the end of 2012, ECO2 ordered from Ramboll Oy an emission impact assessment on the impact of the activities started within the first three years of the ECO2 project on the greenhouse gas emissions in Tampere. Based on the assessment, a reduction of over 600 000 CO₂ tons can be achieved through energy and climate projects by 2020. This is around 20% of the total emissions, which means that Tampere can reach the objective of the EU Covenant of Mayors.



There are four hydropower plants on the Tammerkoski Rapids, three of which are owned by Tampereen Sähkölaitos Oy. Together they account for around 4% of the company's electricity production.

Majority of the emission reductions are generated through the increased use of renewable energy in Tampereen Sähkölaitos Oy's heat and electricity production. This is also the sector that the city can influence the best, as the power utility is owned by the city of Tampere and therefore committed to the city's strategic emission reduction targets.

Low-carbon urban development

Energy and climate objectives are a vital part of the Tampere city strategy. Indicators have been defined for the objectives, and these are monitored by the City Board. Objectives have also been set for increasing the density and coherency of the city structure, the proportion of public transport and pedestrian and cycling traffic, and renewable energy use.

Eco-efficiency tools have been tested in city planning, and energy audits have been conducted on master plans. Such audits have improved the efficiency and structural planning of plans. They have also facilitated the setting of target values for the energy-density of the areas and for the use of renewable building- and area-specific energy sources.

In building control, new services include energy consultancy and instructing constructors on energy-efficient solutions. The Energy Consultancy Centre for Construction and Housing (RANE) is the City's information bank for single-family house constructors and renovators.

The eco-efficient Housing Fair in Vuores, Tampere, served as a successful opening of goal-driven and close cooperation between constructors, planners, and the city.



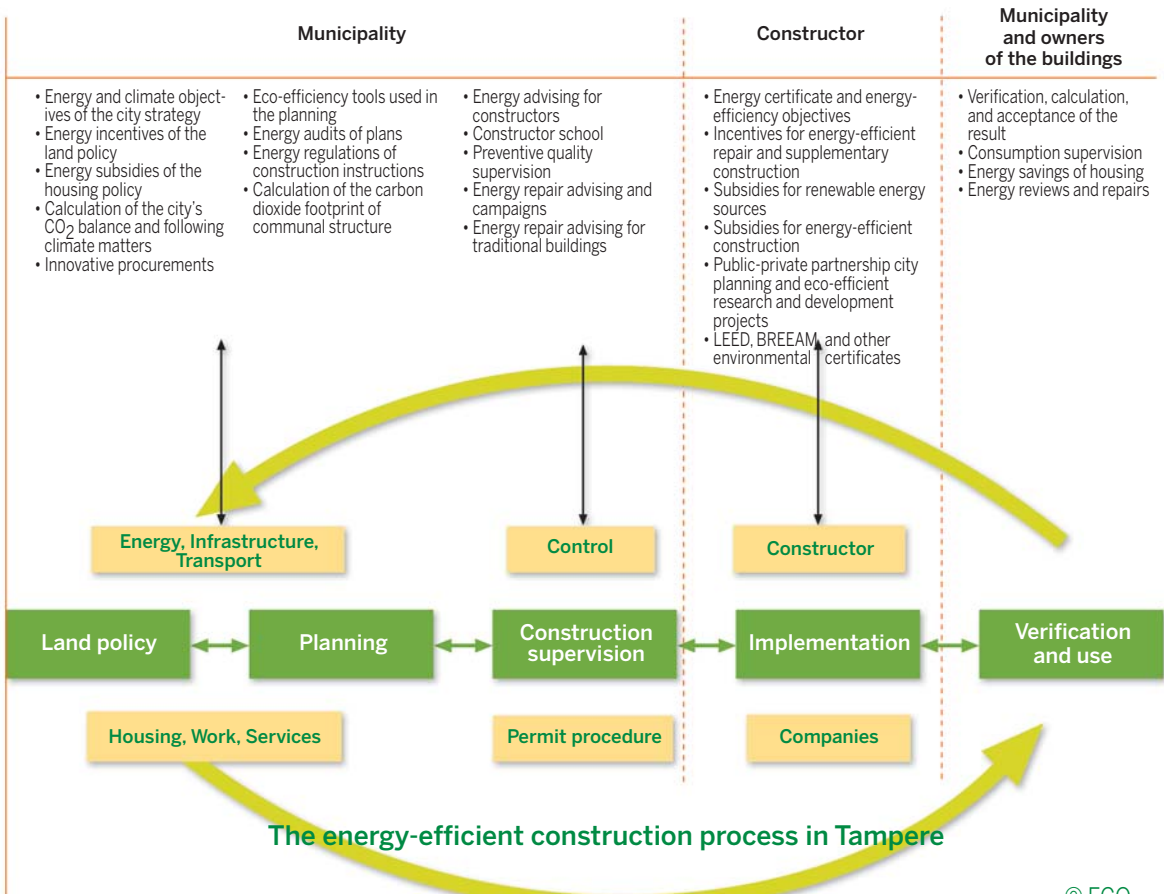
A quality group will supervise the quality of the architecture in Vuores. The picture shows an apartment block designed by Arkkitehtitoimisto Lahdelma-Mahlamäki Oy.

Eco-efficient urban development process

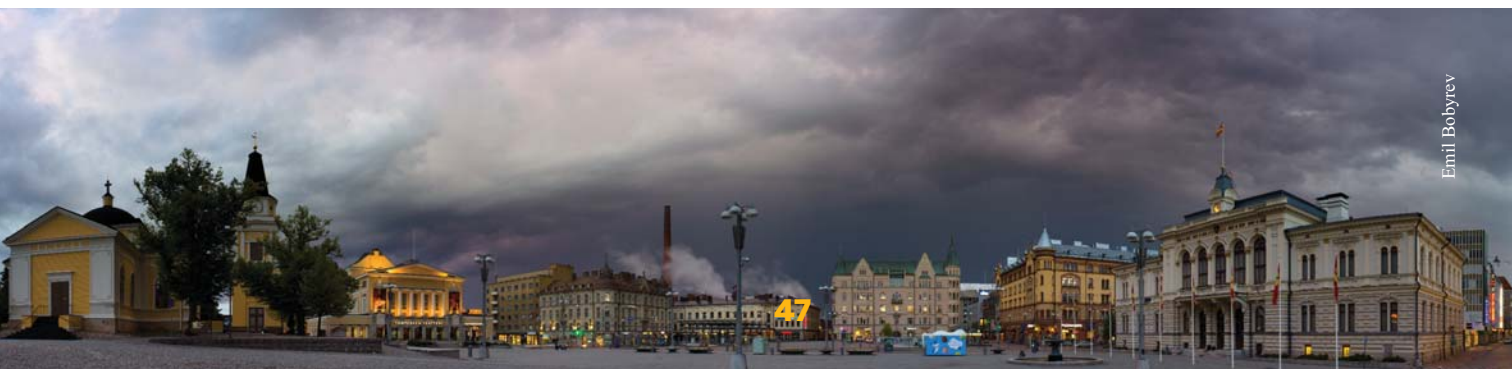
Responsibility

Tools and means of control

Process stages



© ECO₂





The city's Real Estate Department and ECO2 have together developed criteria for energy efficiency and carbon footprint in site allocation competitions and tested reductions in plot rent for eco-efficient small houses.



Erecting a house made of prefabricated solid wood elements in Pispala, Tampere.

Innovative procurements are only starting to gain importance in the promotion of eco-efficiency. The most visible example is the planning of the Isokuusi area in Vuores. Several top-class plans were submitted in the invitation competition, which were backed up by the best know-how and corporate consortiums in Finnish wood construction.

Climate change generated new business

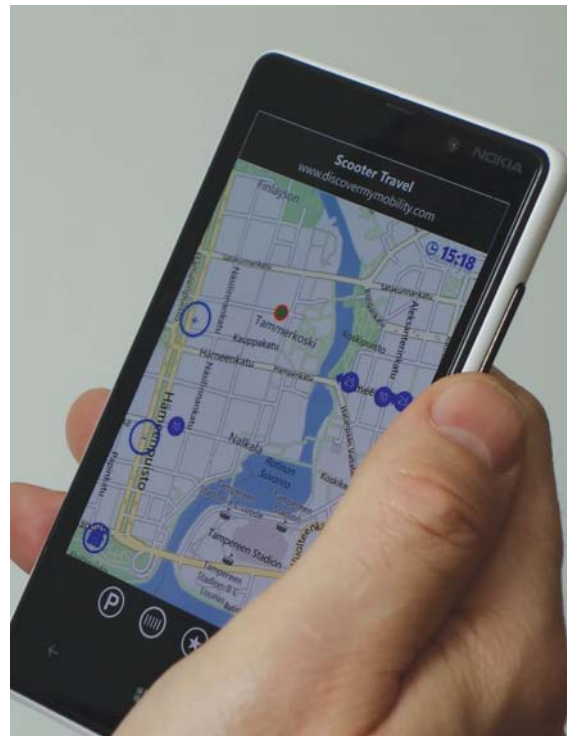
The third objective of the ECO2 project is to promote production, technology, and business operations that preserve natural resources and reduce the spoiling of the environment. The main cleantech sectors in Tampere and the Tampere region include mechanical engineering, energy, and forest industries and the ITC sector. In terms of export operations, the energy cluster in particular has a very strong position in the Tampere region.

During ECO2 forums and projects, networks have been created for example with operators in the solar and wind power and bio-energy sectors. Innovative procurements have promoted environmental busi-

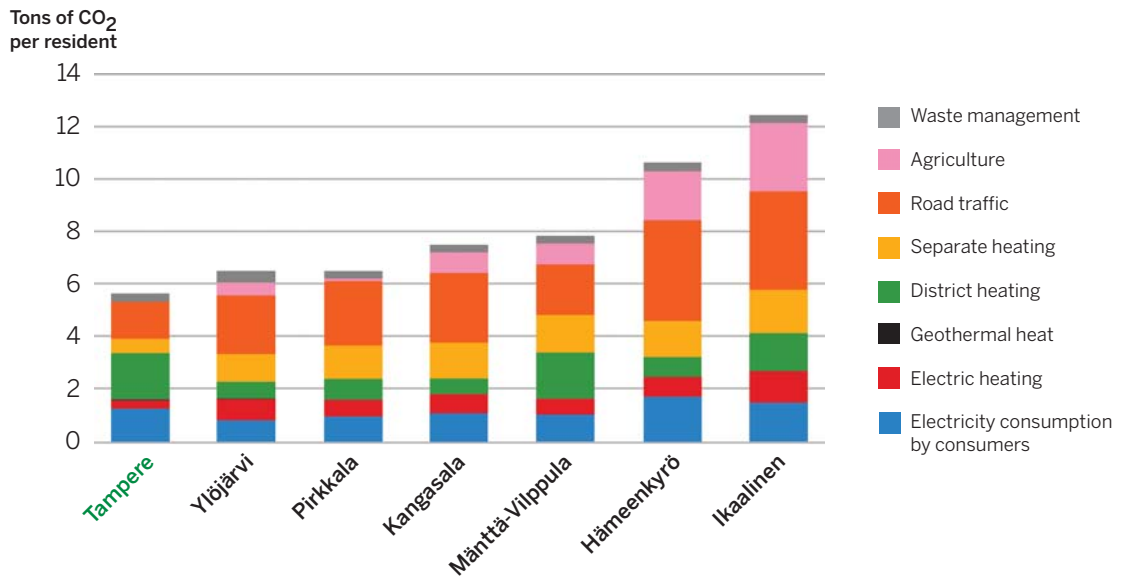
ness. The significance of public procurements can exceed their monetary value as a reference.

Tampere has excellent starting points for developing new business operations under the Smart City theme in the fields of city planning, construction, traffic, and infrastructure. Information technology can be used to direct the energy consumption of buildings as well as traffic and energy, water, waste, and IT-systems towards increased energy- and resource-efficiency.

The city of Tampere will participate in the national Innovative Cities programme (INKA) that will start in 2014. Tampere will be responsible for the Smart City theme and Renewable production, which focuses on the cleantech and other sectors.



In Tampere, buses can be monitored in real time by mobile phone.



Comparing emissions of the Tampere region municipalities covered by the CO₂ report. Source: Benviroc Oy 2012.

Tampere, a pioneer in climate matters

The fourth objective of the ECO2 project was to make Tampere a climate policy forerunner. By the end of 2013, the EU Covenant of Mayors has been signed by 4342 European cities and municipalities with a total of 165 million residents. As a signatory, Tampere is part of this large climate-conscious mainstream.



The mayors of Finland's six largest cities established a mayors' climate network in 2011.

Municipalities in the Tampere region signed a joint climate strategy in 2010. The emission reduction target of the city area, 30% by 2030, is on a good level on a Finnish scale. In the Tampere City Strategy 2025, this target was increased even further: the city aims to reduce climate emissions by 40% by 2025.

Of the municipalities in the Tampere region, the total emissions per resident are the lowest in Tampere. Compared to all other monitored municipalities in Finland, the emissions of the city of Tampere are the third lowest. This reflects the energy efficiency of the community structure and the efficiency of combined heat and electricity production in Tampere.

In its 2010 environmental policy, Tampere City Council adopted the goal of reducing greenhouse gas emissions by 80% by 2050. The remaining emissions would be compensated by means of carbon sinks and by purchasing emission allowances. The 80% emission reduction target is in line with the Finnish national objective.

Low-carbon and eco-efficient urban construction is one of Tampere's strengths as a climate-friendly

city. The Vuores already has the largest natural storm water and drainage water treatment system, modern pneumatic waste collection system, a lot of environmental art, high-quality pedestrian and cycling networks, excellent green and park areas, passive and zero-energy houses, and premium architecture. All this makes the suburb a highly attractive destination for those interested in sustainable city planning on a global scale.

The tramline would make Tampere a city of sustainable transportation also. The decision on the construction of the tramline will be made by the City Council in 2014 and, according to the plan, the first line will be opened for public in 2020. Currently, the only tramline in Finland is in Helsinki.

The third strength of the city in terms of climate-friendliness is the energy-efficient district heat and electricity network that covers 90 percent of the households in Tampere. This is rare on a European scale.

The ECO2 project is in itself an example of the efficient implementation of climate objectives. No other municipalities in Finland have a corresponding large-scale climate project. ECO2 has received international recognition also.

In 2011, ECO2 won the shared first prize in the Nordic Practical Solutions to Combat Climate

Change competition that was organized by the Nordic Council of Ministers and the Associations of Finnish, Swedish, and Danish Local and Regional Authorities. The aim of the competition was to find local practical solutions to combat climate change.

In the same year, ECO2 made its way to the finals of the Nordic Energy Municipality competition. ECO2 also did well in an EU wide competition aiming to find good practices in the public sector that was organized by EPSA, the European Public Sector Award. In this competition, ECO2 was among the top five in the Going Green: Concrete Solutions from the Public Sector series. The judges especially liked the project's focus on networking in its operations and the city's role as the project coordinator. They also appreciated the active communication, comprehensiveness, and inter-administrative approach of the ECO2 project.



Climate objectives of some European cities.

London	- 60 % 2025
Hamburg	- 40 % 2020
Copenhagen	carbon neutral 2025
Stockholm	carbon neutral 2050; - 40 % 2015
Freiburg	carbon neutral 2050; - 40 % 2030
Helsinki	carbon neutral 2050, - 20 % 2020
Tampere	carbon neutral 2050; - 40 % 2025

→ Source: Websites of the cities, visited 1 March 2012.



Rami Saarikoski



Towards 2020

The launch phase of the ECO2 project between 2010 and 2012 was a success, and has strengthened the city's role as a forerunner in climate and energy matters. The structural transition of the energy system from fossil fuels to renewable energy sources is a huge, generation-long effort, as are the transitions to a low-carbon built environment and from private to public transport.

The funding from Sitra's Energy Programme ended at the end of 2012, as intended. In the 2013 budget, the City Council decided that ECO2 will be continued as the City's own project from 2013 to 2015.

ECO2 will shift its focus from promotion of joint climate concerns more towards the promotion of low-carbon urban development projects. ECO2 will prepare and coordinate projects relating to energy, construction, and traffic, seek for cooperation partners and funding and acts as an expert unit in energy and eco-efficiency. Projects will be implemented in cooperation with the City's regional development projects and the City's other units.





© Studio Daniel Liebeskind for NCC

Tampere Central Arena is a project aiming to build a new multifunctional-and eco-efficient arena in Tampere. The Arena will be above the railway, located near Tampere railway- and bus stations. The arena will be a part of a larger consortium that includes offices, hotels, apartments and shops.

VISION – Eco-efficient Tampere 2020

In 2020, the City of Tampere will be a resource-efficient and low-carbon place to live — a smart eco-city. The carbon footprint of the local residents has reduced, as the proportion of renewable energy in heat and electricity production has increased significantly. Renewable local energy such as heat pumps, bio-fuels, and solar panels has become more common in single-family house areas in particular. The first tramline is already in use, and combines the largest housing and working areas to the city centre. The city itself has been turned into a pedestrian, cycling, and public transport-oriented city. In the planning of new areas, eco-efficiency and the CO₂ footprint will always be assessed. New construction projects will always aim at near-zero energy level and financial incentives and instructing is used to en-

courage constructors to conduct energy repairs. References and active innovation platforms have been set up in Tampere for cleantech companies.



Ambassador of the United States to Finland Bruce Oreck speaking in November 2012 about eco-efficient city solutions at the ECO2 project's *The Year 2020* forum.



The architectural view of Daniel Libeskind of the Central Arena and the buildings to be constructed on the Deck.
© Studio Daniel Libeskind for NCC

Appendices

The ECO2 Steering group 2010–2012

Kaisu Anttonen, Director, Environmental Policy (chairman)
Vesa-Matti Lahti, Senior Lead, Sustainable Wellbeing Research (Sitra)
Johanna Kirkinen, Leading Specialist, Ecological Sustainability (Sitra)
Timo Hanhilahti, Deputy Mayor
Ari Vandell, Planning Manager
Pertti Tamminen, Director, Vuores Project
Sakari Leinonen, Planner
Mikko Nurminen, Director, Real Estate
Eija Muttonen-Mattila, Building Inspector
Ilkka Ojala, CEO, Tampere Real Estate Services
Mika Pekkinen, Director, Business Development, Tampereen Sähkölaitos Oy
Anna-Maria Maunu, Communications Director

Pertti Koivisto, Director, Tampere Real Estate Services
Harry Edelman, Professor, Tampere University of Technology
Jukka Lintusaari, Account Manager, University of Tampere



Mayor Timo P. Nieminen (2007–2012).



Members of the steering group. From left: Pertti Tamminen, Kaisu Anttonen, and Timo Hanhilahti.

The ECO2 Steering group, 2013–

Pekka Salmi, Deputy Mayor (chairman)
Jyrki Laiho, Director, Economic and Urban Development
Mikko Nurminen, Director, Real Estate
Taru Hurme, Planning Director
Kaisu Anttonen, Director, Environmental Policy
Pertti Tamminen, Director, Vuores Project
Mika Pekkinen, Director, Business Development, Tampereen Sähkölaitos Oy

The ECO2 Advisory board 2010–2012

Timo P. Nieminen, Mayor (chairman)
Timo Hanhilahti, Deputy Mayor
Jukka Noponen, Director, Ecological Sustainability (Sitra)
Vesa-Matti Lahti, Senior Lead, Sustainable Wellbeing Research (Sitra)
Kari Kankaala, Executive Director
Jyrki Laiho, Director, Economic and Urban Development
Kaisu Anttonen, Director, Environmental Policy
Risto Laaksonen, Purchasing Manager
Ritva Kangasniemi, Planner
Reija Linnamaa, Strategy Director
Jussi Laitinen, Managing Director, Tampereen Sähkölaitos Oy
Anne-Mari Järvelin, Director, Business Development, Tredea Ltd. (moved to other tasks)
Riitta Koskinen, Member of City Council, chairman of a City Council group
Pia Viitanen, Member of Parliament
Oras Tynkkynen, Member of Parliament



Visitors to ECO₂'s
The Year 2020
forum.

Markku Kivikoski, President, Tampere University of Technology

Kaija Holli, Rector, University of Tampere

Riitta Varpe, Director, Pirkanmaa Centre for Economic Development, Transport and the Environment, from 2011 Leena Vestala

Juha Koski, Director, Tampere Chamber of Commerce & Industry

Jukka Alasentie, Director, Regional Development, the Council of Tampere Region

Jari Jokilampi, CEO, Federation of Enterprises in Tampere Region

Päivi Nurminen, Director, City Region Unit

Petri Nieminen, Programme Director, Hermia Ltd., from September 2010 Programme Director Toni Sulameri, from November 2011 Development

Director Paula Hakola

Jouko Kinnunen, CEO, Motiva Ltd.

Project Secretaries:

Elina Seppänen (1.4.–30.6.2010)

Wilhelmina Karikko (1.9.–31.12.2011)

Krista Willman (16.8.2012–31.1.2013)

Kirsi Viertola (15.2.2012–)

Trainees:

Laura Mustonen (30.5.–30.6.2011 ja 8.8.–30.9.2011)

Krista Willman (1.6.2012–15.8.2012)

Olga Juutistenaho (15.6–31.8.2012)

Financial secretaries:

Tarja Hannonen (2010)

Maija Sihvonen (from 17.1.2011)

ECO2 project staff 2010–2012



Project Director:

Pauli Välimäki,
Special Advisor,
Mayor's Office



ECO2 project specialists Jari Jokinen and Tiina Sahakari, and project secretary Kirsi Viertola.

Project Specialists:

Elli Kotakorpi, Antti Nikkanen (15.5.2010–31.8.2012),

Elina Seppänen, Jari Jokinen, Tiina Sahakari



Elli Kotakorpi



Elina Seppänen



Antti Nikkanen



ECO₂ thanks all its
colleagues and partners
and wishes that
cooperation will
continue in
the coming years.





Tampella



SITRA

ECO₂
Eco-efficient
Tampere 2020

First



years

This
publication
describes
Tampere's
journey
towards
becoming
an
eco-
efficient
city.



ClimateCalc CC-00025/11

