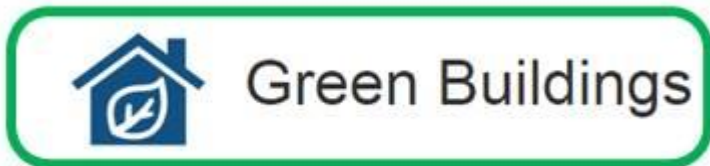




Europe-China Eco-Cities Link
中欧低碳生态城市合作项目



Case Studies

GB Case Finland

→ Helsinki, Eco-District Viikki



Source: GIZ. 2013. Technical Offer, Europe-China Eco-Cities Link Project.



CASE STUDY

Helsinki, Finland: Eco-District Viikki

Problems to resolve: Urban Heat Islands; Global warming through CO2 emissions, loss of bio diversity and quality of living.

Means: Reduction CO2 Emmisions through use of Renewable Energies and increase of vegetation. Generous provision of public and private open spaces..



Secondary Tools: Finger plan layout, urban agriculture, solar heating, efforts in wasteless construction.

Case 1 Helsinki, Finland: Eco-District Viikki

Background.

The eco-district in Viikki, Finland is the result of two design competitions plus a number of seminars and debates. The master plan competition was won by a proposal based on a finger-like structure with alternating buildings and green open spaces. The layout permits functions to be combined naturally, nutrients and water to be recycled (composting, allotments, collecting surface water run-off), and the utilisation of solar energy. Another competition was organised for the first blocks. The proposals were evaluated using eco-criteria drawn up by an interdisciplinary working group. The eco-criteria defined levels of five different aspects: pollution, natural resources, health, bio-diversity and urban agriculture. An environmental profile was calculated for each competition proposal. In this system, points for those five aspects are added up. A zero-points scheme fulfils the strictest minimum criteria for conventional residential building. A ten-point design represents an ecologically excellent scheme and to exceed twenty points requires exceptional innovations. ⁱ Eco-Viikki is part of the sustainable cities of Europe initiative.



Site plan of Eco-District Viikki, Finlandⁱⁱ

In December 1998, the Government approved a programme of ecologically sustainable development for the construction and property sector, which focuses partly on arriving at models of good practice. In 1998-2000, a special subsidy for pilot projects in line with the principle of sustainability was linked with the Government experimental building programme. During the period 1998 to 2002, an experimental area of ecological building of international importance is being constructed at Viikki, a district to the Northeast of the centre of Helsinki.

Viikki is situated 7 kilometres from the heart of Helsinki. Buses began running between Viikki and the city centre in autumn 1999. In the future the area will also be served by the new orbital 'Jokeri' line, running across the Helsinki Metropolitan area. Since 2010, Viikki residential district is completed, with a Science Park nearby. The Science Park is an international centre of excellence evolving as part of the University of Helsinki situated in Viikki which specialises in biology and biotechnology. Viikki will provide 6,000 jobs, places for 6,000 students and homes for 13,000 people.

Housing.

The Viikki eco-neighbourhood blocks are the result of long-term work aimed at putting ecological principles into practice in actual building. The layout permits functions to be combined naturally, nutrients and water to be recycled (composting, allotments, collecting surface water run-off), and the utilisation of solar energy. The proposals were evaluated using eco-criteria drawn up by an interdisciplinary working group. The eco-criteria define levels of five different aspects: pollution, natural resources, health, bio-diversity and growing food. An environmental profile was calculated for each competition proposal. In this system, points for those five aspects are added up. A zero-points scheme fulfils the strictest minimum criteria for conventional residential building. A ten-point design represents an ecologically excellent scheme and to exceed twenty points requires exceptional innovation.



Low-rise apartment buildings, Eco-District Viikki, Finlandⁱⁱⁱ



Housing with solar heating in Viikki, Finland^{iv}

Internal evaluation.

The housing blocks are considered an ecologically excellent scheme, but do not show any exceptional innovations. Plenty of data is available based on detailed evaluation of the plans and construction.^v In the Viikki projects, carbon dioxide emissions are expected to be cut at least by 20% in relation to conventional building and consumption of pure water by

more than 20%. Waste during construction is 10% less than normal and, when the buildings are in use, the amount of mixed refuse (max. 160 kg/person/year) is aimed to be 20% less than normal. The use of non-renewable fossil fuels and greenhouse gas emissions are prevented by cutting energy consumption. A good 60% of normal heating energy is used (105 kWh/m²/year) and 45 kWh/m²/year of electricity. Consumption of primary energy (energy bound up to materials) also has been reduced by one fifth that of conventional building. Emission targets over a 50 year lifespan are 2,575 kg/gross sqm which is approximately 30% less than in conventional buildings. Water efficiency is calculated at 126 l/person/day, or 22% less than without water-efficient fixtures. Domestic recycling of solid waste reduces the available wastes to 160 kg/resident/year which is about 20% than in conventional settlements.

Lessons. There exists a preoccupation concerning the location of Viikki, since the area is far away from the existing services. Public transport is insufficient as an alternative to private motorised mobility, and continued private car use will eliminated the benefits of residential energy efficiency. This matter needs to be assessed. The solar heating project included in Viikki schemes has been approved for funding under the EU Thermie Programme.



Low-rise apartment buildings, Eco-District Viikki, Finland^{vi}



Housing with solar heating in Viikki, Finland^{vii}

Credentials

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Sources and Further Reading

ⁱ <http://www.cardiff.ac.uk/archi/programmes/cost8/case/holistic/viikki.html>; see also: The Finnish Association of Architects. 2000. Towards a Sustainable City. The Viikki Eco Neighbourhood Blocks. Eco Community Project. Helsinki; Helsinki City. 1998. Ecological building criteria for Viikki. Helsinki City planning Publications 1998:6; Helsinki City. 1999. Viikki. A Science Park at the Centre of a New University District. City of Helsinki, City Planning Department.

ⁱⁱ Source: http://www.hel.fi/ksv/english/projects/vikki_kivikko/latokartano/#

ⁱⁱⁱ Source: http://skanska-sustainability-case-studies.com/pdfs/39/39_Eko_v001.pdf

^{iv} Source: <http://www.cardiff.ac.uk/archi/programmes/cost8/case/holistic/viikki.html>

^v Skanska.2008. Eco-Viikki, Finland.

[http://group.skanska.com/Global/About%20Skanska/Our Green Initiative/The Green City/Casestudies/Eko Viikki cs.pdf](http://group.skanska.com/Global/About%20Skanska/Our%20Green%20Initiative/The%20Green%20City/Casestudies/Eko_Viikki_cs.pdf)

^{vi} Source: http://skanska-sustainability-case-studies.com/pdfs/39/39_Eko_v001.pdf

^{vii} Source: <http://www.cardiff.ac.uk/archi/programmes/cost8/case/holistic/viikki.html>