Guidebook of Sustainable Neighbourhoods in Europe

February 2008
**Who is this guide designed for?**

The practical existing examples presented in this guidebook are prepared **for local authorities** in order to get inspiration to build attractive, healthy and self-sufficient, sustainable communities. Therefore, the purpose of this guidebook is to identify and present pioneer eco-community developments in Europe.

For a long time interdependent, **territorial development and energy supply** have more recently become strangers, leading to a significant gap between current trends of urban development and the desired sustainable energy future. What if the solution lies in the reconciliation of local and regional development with the future energy paradigm? Local authorities have definitely a strategic role to play.

The examples described in this guidebook show us the way forward. The **new districts** that have come into being over the last few years in cities like Hanover, Freiburg, Helsinki, London and elsewhere are all **laboratories for our future**. They all combine an integrated urban planning process with a (very) low energy use, high levels of renewable and decentralised energy supply. Furthermore, all attach much importance to being pleasant places to live in. How can local authorities learn from these examples and apply them to their own territories?

The diversity and complexity of the examples described are considered adaptable and replicable by any European local authority.
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1. Introduction

The evolution of energy and climate change trends mean local authorities must – as of today – re-conceive the way they develop their territories. The relation between the development of the territories and energy is a strategic one: for years, the approach to energy supply has determined sector-specific policies (e.g. in commerce, transport, agriculture, residences, etc).

For a long time interdependent, “territorial development” and “energy supply” have more recently become unaware of each other. We satisfy our appetite for energy by using resources increasingly distant from where we live, therefore consuming in an irresponsible way and never measuring the impact of our consumption. What if the solution lays in the reconciliation of local and regional development with the energy issues?

Bottom-up approaches are likely to support the reconciliation of such territories, their economic and social actors and the whole population, with the energy question. The responsibility for energy decisions must return to the local and regional levels in order to guarantee a sustainable energy future and more responsible modes of development that truly serve the needs of today’s citizens in this, and future, generations. This must include territories less vulnerable to the energy challenges and interdependent territories in order to decrease the energy and climatic vulnerability of the territories and their inhabitants.


2. Towards a new energy paradigm?

Today, it is an (almost) acknowledged fact that climate change and energy issues are a major source of concern for the future. However, all energy consumption curves are still trending up and a significant gap remains between current trends of urban development and the desired sustainable energy future. This can be explained by 2 territorial tendencies:

1. Schizophrenia

Even in our own territories, schizophrenic attitudes prevail. Local authorities know in a general way what direction they have to take (that is, divide by three the energy use and have renewable energy cover most of energy needs by 2050), but they do not take action - or only too timidly -, local authorities do not know how to get there or find it hard to imagine the future differently: town planning, building and mobility issues continue to be inspired by the past and present habits rather than the future. Local authorities have, however, no choice but to change.

Local authorities dispose of all they need to achieve the necessary changes: technologies, services, regulations, market and tax instruments, financial resources that they are often unaware of, and of course, the intelligence of men and women.

The relation between the development of our territories and energy is a strategic one: for years, our approach to energy supply has determined our sector-specific policies (e.g. commerce, transport, agriculture, residences, etc.). For a long time interdependent, territorial development and energy supply have more recently become strangers. What if the solution lies in the reconciliation of local and regional development with the future energy paradigm?
2. **Sporadic initiatives**

Some initiatives are showing us the way forward. All are laboratories for our future; combining low energy use with high levels of renewable and decentralised energy supply, attaching much importance to being pleasant places to live and work. However, these examples are still isolated. We are facing a big challenge where there is consensus that change is necessary but the level of involvement remains far from being sufficient to have any impact at National or EU level. In reality in order to enter a new sustainable energy paradigm, thousands of local authorities need to be involved in a democratic and bottom-up approach.

Fortunately, local authorities do not need to start from scratch. Many municipalities are prepared to sign commitments to voluntarily achieve EU objectives.

3. **The role of territories: The territory as a place for integration**

A ‘desirable future’ for territories and their energy systems becomes the starting point; such a desirable future must also be ‘sustainable.’ The territory integrates different sectors, functions and actors; this fact is of utmost importance and must be taken into account.

Why? Because a high ‘quality of life’ in the territories will not arise out of a juxtaposition between sectors and actors. Quality of life requires, in a given territory, a feeling of belonging (without which, territorial development is pure abstraction) where a sufficiently meaningful purpose exists to inspire an integration of activities, actors and aspirations. The territory is the place where integration takes place and local authorities that administer it have the responsibility for this integration and its organization as well as for social and territorial cohesion.

The territory is indeed a “transversal” place where the various sectors act and where the various actors have the collective responsibility to organize themselves to live together. Stripped of governance, the territory would only be a space on which activities and people are juxtaposed randomly, as it happens unfortunately in places where urban and rural planning doesn’t exist. Associated with governance, the territory defines rules, rights and obligations. It integrates not only short-term considerations, but also long term images. Isn’t it a role for leaders of territorial governance to transcend the daily and short-term pressures to ensure quality of life now and for future generations?

Local authorities are main actors in reducing vulnerability of territories and possibly, in providing the foundations for the return of a healthy economy.

Local authorities have all they need to achieve the necessary changes: technologies, regulations, financial instruments and resources that they are often unaware of, and of course, human capacity.

Tomorrow’s society will thus depend much on local authorities’ capacity to:

- adopt sober modes of energy consumption,
- use more decentralised, renewable sources and integrated production modes (e.g. combined heat and power) in places of consumption rather than resorting to systematically centralised or exogenous traditional modes,
- engage the entire society, not only traditional energy specialists focussing on the supply side, to co-create integrated solutions.

All levels of administration and governance at the international and European level as well as the local and regional level are now self-declared followers of ‘sustainable development,’ but they often play in their own ‘court’ giving priority to their institutional logic, at the expense of the goal of a sustainable society.
4. What kind of city do we want to live in?

Inevitably, the "Factor 4" city of 2050 will be rather different from the city of today. The major difference will not necessarily be reflected in the city’s appearance (taking into account the inertia suitable to the real estate and the roadway systems), but in the way people will live and make use of the city.

Some desirable features of the “Factor 4” city:

- New constructions will not consume fossil energy for the heating and air-conditioning and the majority will produce electricity: bioclimatic design, external insulation, triple glazing etc. All the roofs will contain thermal and photovoltaic solar collectors, which will have replaced the current tiles. The bicycle garage will be integrated systematically into new buildings.
- Old - and very old - buildings will have drastically reduced their heating use; therefore their consumption/m2 will not exceed 50kWh/M2/year (representing the half of the requirements foreseen in the regulation for new buildings).
- All heating installations, whatever their size will be in cogeneration, i.e. will produce electricity and heat at the same time.
- Fuel poverty will not exist anymore due to the very low impact of energy prices on the overall accommodation bills.
- Transport will be done by walking, cycling or public transport; car usage will be minor.
- Motor and vehicle traffic will mainly be absent in the urban districts and common spaces will be used once more by the inhabitants; access to bus and tram stops as well as all other services will be possible by walking or cycling. Urban districts will have more natural open spaces in order to allow contact with nature and to refresh urban areas.
- The local population and actors will be more closely involved in the design and implementation of urban projects and the rise of the ‘ecological culture’ in the society will have succeeded in changing the "non-sustainable" behaviour and practices.
- Large commercial and leisure areas in the outskirts of cities will be restructured; due to certain pressures like a strong reduction of the automobile use and the need for proximity, the food business and other daily services will be reinstated in the living places of the inhabitants.
- Competition between companies, developers, architects, etc will be done on the basis of the lowest possible energy consumption and CO2 emissions.
- Lighting will be ensured by using LED systems that have very low energy consumption and are adapted to requirements according to daylight.
- Energy requirements will be guaranteed mainly from renewable resources (solar, wood, geothermic, wind) or resulting from recovery (waste, heat from cogeneration). Economic activities will be directly related to energy production, replacing imported energy by local employment.
- A new urban-countryside relationship will be created in order to use biomass for energy production. Consequently, the management of the outskirts will be re-discussed to limit waste of space. Indeed, the agricultural crises of overproduction (especially food) of the last century will have disappeared and one will seek agricultural space to produce diverse materials and energy.
- The energy and climate indicator will be one of the main indicators of the municipality, as well as the employment rates, the number of inhabitants or safety; the investment process will take into account the energy and climate performance of territories.
- After being marked by the accumulation of physical goods (20th-21st centuries), the system of values will be more directed towards the pleasure of living, inventing, conviviality, culture etc. The culture of quantity and uniformity will make place to a culture of quality and diversity.
- Etc.
Many more features could be mentioned here and local authorities are the best placed to contribute to this utopia. Utopia? Let’s reverse our reasoning: which of these example features are not desirables and even realistic? Who would be able to state that the attractiveness of the cities would be based on a system that would be in opposition to the tendencies described above?

5. New districts showing the way forward…

Good practices and lessons to learn from municipal projects

Overview of the case studies:

1. BedZed - an ecological footprint reduced by half
   BedZed (UK)
2. Kronsberg - planning for sustainability
   Kronsberg (DE)
3. Vauban - European example of local sustainability
   Vauban (DE)
4. Rieselfeld - quality and local life combined
   Rieselfeld (DE)
5. Weingarten - a model for urban renewal
   Weingarten (DE)
6. Hammarby Sjöstad - “building the city inwards”
   Hammarby Sjöstad (Stockholm - SE)
7. Vesterbro - poor and derelict district becomes an attractive place to live in
   Vesterbro (Copenhagen - DK)
8. Eco-Viikki - sustainability as a whole
   Eco-Viikki (Helsinki - FI)
9. EVA-Lanxmeer - residential participation and integrated functions
   EVA-Lanxmeer (Culemborg - NL)
1. BedZed (Sutton - UK)

| Project description | BedZED (Beddington Zero Energy Development) is the UK's first and largest carbon-neutral eco-community and is located in Sutton, a residential town 40 minutes South East from London.

BedZED consists of 82 residential homes with a mixture of tenures – 34 for outright sale, 23 for shared ownership, 10 for key workers and 15 at affordable rent for social housing – and 1'600 square metres of work space, an onsite shop, café, sport facilities, health centre and childcare facilities with a further 14 galleried apartments for outright sale. Residents have been living at BedZED since March 2002 and currently BedZed is home to 220 residents.

The BedZED design concept was driven by the desire to create a net 'zero fossil energy development', one that will produce at least as much energy from renewable sources as it consumes. Only energy from renewable sources is used to meet the energy needs of BedZED the development is therefore a carbon neutral development - resulting in no net addition of carbon dioxide to the atmosphere.

| Objectives | The project aims and objectives are:
- **No use of fossil fuels**
- 50% reduction of the energies used for transport
- 60% reduction of the domestic energy compared to the average British households
- 90% reduction of the heating needs
- Usage of renewable energies
- 30% reduction of water consumption
- Reduce waste and encourage recycling
- Use construction materials from local providers (located within less than a 60 km radius)
- Development of local resources (farmer network for local food)
- Develop biodiversity in the natural areas

| Driving factors | The main driving factor of the BedZed project was **environmental**.

The project was initiated by BioRegional as an example to show that a sustainable way of life is possible while keeping modern standards. BedZed was thought to reduce environmental impact at every level (home including construction, energy and food; work; transports; social life, etc.). The concept emphasises the fact that living in a local circle with local products is possible.

| Financing structure | BedZED is a mixed-use, mixed-tenure development. It is built on reclaimed land owned by the London Borough of Sutton, sold to Peabody at below market value due to the planned environmental initiatives. Peabody Trust, a London housing association and charity is the main investor of the project with the help of local authorities. The residential homes were sold at standard market prices, the actual price being balanced by the office activities and shop moving in the neighbourhood.

| Partners & Roles | BedZED was developed by the **Peabody Trust** in partnership with **Bill Dunster Architects (ZedFactory)**; **ARUP** and **BioRegional Development Group**, environmental consultants. BioRegional Development Group and Bill Dunster Architects now promote the concept in the BedZed Centre and the inhabitants are responsible for the neighbourhood activities as well as the management of the common infrastructure. The BedZED Pavilion is a community facility for the Hackbridge area. It was built by a partnership between **Sutton Council** and the Peabody Trust. It consists of a social area with a small beverage server area, a community room / seminar space at mezzanine level for up to 70 people and an outdoor adjoining grassed area. |
**Results/Achievements**

- **Transport:** A green transport plan promotes walking, cycling and use of public transport. BedZED has good public transport links, including two railway stations, two bus routes and a tramlink. BedZED was the first low car development in the UK to incorporate a car club. A 'pedestrian first' policy with good lighting, drop kerbs for prams and wheelchairs and a road layout that keeps vehicles to walking speed. The BedZED project introduced the first legally binding Green Transport Plan as a condition of planning permission. On-site charging points for electric cars are available in Sutton town centre.

- **Energy:** Buildings are constructed from thermally massive materials that store heat during warm conditions and release heat at cooler times. BedZED houses are arranged in south facing terraces to maximise heat gain from the sun, known as passive solar gain. 777 square meters are covered with solar panels. Each terrace is backed by north facing offices, where minimal solar gain reduces the tendency to overheat and the need for air conditioning. BedZED homes and offices are fitted with low energy lighting and energy efficient appliances to reduce electricity requirements. BedZED receives power from a small-scale combined heat and power plant (CHP). The heat from the CHP provides hot water, which is distributed around the site via a district heating system of super-insulated pipes. To enable residents and workers to keep track of their heat and electricity use, meters are mounted in each home and office kitchen.

- **Water:** Water use is reduced to 76 litres/day; out of which 18% represents rainwater or recycled water; use of aerated taps, low flush toilets, smaller bathtubs. One innovation at BedZED is the use of a reed-water biofiltration system that purifies blackwater into graywater for use in non-potable applications, such as toilet flush or water for gardening.

- **Waste:** separate waste collection system.

- **Local materials:** To reduce the embodied energy of BedZED, construction materials were selected for their low embodied energy and sourced within a 35-mile radius of the site where possible. Where possible, BedZED is built from natural, recycled or reclaimed materials.

- **Social:** 50% of the dwellings are allocated to low income families; construction of the BedZed pavilion

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**Difficulties faced and solutions found**

The total development costs for BedZed sum up to € 17 million: construction costs (€ 14 million); taxes (€ 2.5 million) and planning and audit costs (€ 0.5 million). The costs turned out to be 30% higher than expected. The price of a BedZed home is 20% higher than the average price of an apartment in the same area.
**Next Steps**
The BedZED Centre is constantly organising site visit tours, hosts exhibitions, the BedZED show home, meeting and seminar facilities and the offices of BioRegional Development Group. Regular training sessions in sustainable development are organised by BioRegional.

**Friendly advice to those who want to build new eco neighbourhoods**
After evaluation, it appeared that most of the objectives depend on inhabitants’ attitude. Infrastructure should be studied for an easier use. The result is that the environmental footprint of a BedZed inhabitant is of 2 planets instead of the 1 planned and the 3 of average British households.

It seems that with only 20% of the investments, 80% of the objectives could have been reached because some infrastructures are too complex and therefore underused or misused. A bigger neighbourhood would also have allowed better profitability of the collective infrastructures. The ZedFactory and Bioregional are constantly developing new concepts to improve environmental efficiency.

<table>
<thead>
<tr>
<th>Online information</th>
<th>Contact person:</th>
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<tbody>
<tr>
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Website: [www.bioregional.com](http://www.bioregional.com)
## Kronsberg (Hannover - DE)

### Project description

Kronsberg is a new eco-district in Hannover built on 1200 hectares of mainly agricultural land at the city margins. The district is located in the South-East of the city and represented the last remaining area in Hannover suitable for a large-scale building project. Kronsberg is close to the countryside, yet enjoying all the advantages offered by an urban neighbourhood: excellent transport connections, jobs, cultural, commercial and leisure centres and facilities.

When complete, it will comprise 6000 dwellings and will be home to around 15000 people. Almost 3000 new jobs have been created and are located in the immediate vicinity.

### Objectives

The main objective is to build a district with a good mix of functions (residences, leisure and cultural facilities, commerce and agriculture) by taking into account environment protection. Applying planning for sustainability in Kronsberg placed considerable obligations on all stakeholders and local actors to ensure the highest possible quality of life and to use natural resources sparingly.

### Driving factors

The development of Kronsberg followed the **regional planning principle**, according to which residential development should mainly expand along local public rail transport routes and be concentrated at urban densities in the catchment areas of the stops and stations.

The **EXPO 2000 World Exposition** was the occasion to apply this planning approach to the Kronsberg area. On the basis of two planning competitions and with the help of the Kronsberg landscape plan, a concept was devised in 1994 for the entire area that covered the EXPO grounds, the new settlement and the countryside.

Another major driving factor was the considerable **housing shortage** in Hannover in the early 1990s.

### Financing structure

Kronsberg projects are funded by a wide range of public and private institutions, including all levels of government, significant assistance from the State of Lower Saxony, and about 30 different investors.

A great deal of support was leveraged and additional attention was received due to the close relationship with EXPO 2000.

‘Energy Efficiency Optimisation at Kronsberg’, as one of the most advanced such projects in Germany, is funded by the European Union ‘Thermie Project,’ associated with the European Commission Directorate General for Energy and Transport.

The investments sum up to approximately € 2.2 billion.

### Partners & Roles

A partners’ network has been developed consisting of:

- Hannover Municipality
- Department of Lower Saxony
- Kronsberg Consulting Committee (founded by the municipality and composed of teachers, researchers, environment protection agencies representatives etc)
- Kronsberg Environmental Liaison Agency – KUKA (founded by the municipality for environmental communication; 51% of its capital is held by Hannover municipality and 49% by a local stakeholders’ consortium)
- The Energy & Environment Centre
- Building Research Institute
- Consumers’ Association
- Environmental Protection Centre
- Several investors such as housing agencies, local architects and civil servants.
**Results/Achievements**

**Transport:** Environmental compatibility and the compact community were the paramount aims of transport planning for the Kronsberg district. A new direct light rail transit service links the settlement with the city centre (17 minutes). Three rail stops are located so that nobody has to walk more than 600 metres to catch a tram. In the residential area the car access is forbidden, except for Kronsberg residents; cycle paths ensure access to all facilities in the neighbourhood.

All transport means (tram, subways, trains) had been planned so as to be ready for the first residents of the neighbourhood.

**Energy:** RES (wind energy, solar); 2 cogeneration plants used for heating needs of the district; energy efficiency measures were foreseen concerning construction of new buildings, training courses on low energy buildings were organised for constructors; 77 washing machines, 106 dishwashers, 122 refrigerators were financed from subsidies. KUKA distributed 2 water saving devices and 5 low energy light bulbs / household; in total 5615 low energy light bulbs were subsidised, the equivalent of 353MWh/year;

**Water:** all precipitation on built-up and paved areas is absorbed, collected and gradually released; equipment of all apartments with water saving devices.

**Waste:** innovative collection systems have been set; recycling rates of approximately 80% were achieved; during the construction phase building waste was sorted on site; the excavated soil was reused in the district for landscaping and environmental enhancement.

**Social:** different housing options (private apartments, social housing, 300 private homes); housing for disabled persons; housing for different ethnic representatives; old people centre; private childminding; second-hand shops; tenants’ association; district council office; citizens’ environmental campaign.

**Difficulties faced and solutions found**

Due to changes in growth patterns and a dramatically lower demand for new housing units than predicted in 1990, the Kronsberg development has been built at a much slower pace than originally anticipated. Instead of the project being completed by the year 2000, it is expected that the development could stretch out over 10-15 years.

Still, after the completion of the first phase, it can be said that the Kronsberg development is considerably more successful than the EXPO 2000 itself in expressing and communicating concepts of sustainable development.

**Next Steps**

Positive experience from the Kronsberg project motivated the city of Hannover to set and extend ecological standards to the entire city of Hannover taking into account several aspects: energy, soil, nature conservation, waste, water and building materials. As new building development in Hannover is very low, it is also necessary and effective to apply ecological measures to the existing building stock.

**Friendly advice to those who want to build new eco neighbourhoods**

- A political majority which sets a priority for sustainable development (since 1988 a coalition of social democrats – about 40% - and green party – about 14%)
- A city administration, planners and engineers, who accept and implement these priorities

**Online information**

[www.hannover.de](http://www.hannover.de)
[www.sibart.org](http://www.sibart.org)

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### Project description
In the South of Freiburg (3 km from the city centre), on the former area of a French barrack site, the **Vauban** district has been developed on 38 hectares of land in order to host more than 5,000 inhabitants and 600 jobs. 

The planning for the district started in 1993 and the implementation phase started in 1997. Right from the beginning all issues (mobility, energy, housing, social aspects etc.) were discussed in working groups which were open to residents. 

Raising public awareness was regarded as key component when planning an environment-oriented district as people have to be convinced that such action not only serves their interests from an ecological point of view but also helps to save money in the long term. Furthermore, change in people's belief system will bring about an acceptance of other policies (e.g. car-sharing, public transport) which are not directly related to the process of building a new house.

### Objectives
The main objective of the project is to implement a city district in a co-operative, participatory way which meets ecological, social, economical and cultural requirements such as:

- **Social**: balance of social groups, integration of future building owners, primary school and kindergartens, neighbourhood centre for social interaction, cultural events etc.
- **Environment**: priority to pedestrians, cyclists and public transport, privileges, co-generation plant and short-distance heating system, all buildings constructed at least with improved low energy standards (65 kWh/m²/year, preferences for building owners who reach passive house standard (15 kWh/m²/year) in special designed areas, extensive use of ecological building material and solar energy, rainwater infiltration into the ground, ecological sanitary systems, public green spaces, designed together with the local residents, conservation of the old trees and the biotopes of the bordering creek, etc.
- **Economic**: balance of working and living areas, district centre with shops for the daily needs, division of land into small lots and preferential allocation to private builders and co-operative building projects, etc.

### Driving factors
The main driving factor was the need to provide accommodation to an **increasing number of inhabitants**. Other major driving forces for the development of Vauban are **the ideas, creativity and commitment of people** involved and the common goal to create a sustainable neighbourhood. The principle "**Learning while Planning**" adopted by the city allowed flexibility in reacting to new developments.

**Green image** - The existence and popularity of Vauban helped the city of Freiburg to be recognised as the green capital of Germany.

### Financing structure
In 1992, The City of Freiburg bought the area from the Federal Authorities for € 20,000,000 (54euro/m² instead of 425euro/m² in the surroundings). 

The public equipments were funded by the local regional authorities for € 2,5 million (for a total cost of 30 million). 

To be able to invest, the City borrowed money at interesting rates from the banks. 

The network companies (water, electricity, heating, etc.) invested in the network structures and the users are expected to pay it back. 

The European LIFE programme and the Federal Environmental Foundation supported the project with € 42 million. LIFE contributed mainly to transport and mobility issues. The global cost of the Vauban quarter is estimated at 500,000,000 € representing only 3 to 5% more than a traditional construction site.
Partners & Roles

Three main acting bodies / institutions are:

- **Project Group Vauban** - the administrative coordination of the local authorities dealing with the Vauban project.
- **City Council Committee** - consisting of representatives from municipal political parties, from the administration and further consultative members such as Forum Vauban. It is the main platform for information exchange, discussion and decision making.
- **Forum Vauban** - association approved as official coordinator of citizens' participation by the City in early 1995.
- **Federal Environmental Foundation** - has supported the Forum Vauban association with a grant for a research project on the impact of citizens' participation in urban planning. This project aims to bring together know-how from difference sources (enterprises, planners, architects, scientists, futures tenants etc.) in order to improve the concept of citizen participation.
- **The EU LIFE project** on the implementation process in Vauban district is supported by the **City of Freiburg**, the **municipal public electricity company** and the **Genova housing association**.

Results/Achievements

- **Energy**: all new buildings consume 65 kWh/m²/year; 92 units were built to passive house standard consuming 15 kWh/m²/year; 10 units of improved passive houses, so called "plus energy houses" (houses which produce more energy than they need); district heating grid and co-generation plant (powered with wood chips: 80% and with gas: 20%), active use of solar energy (2500m² of photovoltaic panels and 500m² of solar panels) making Vauban one of the biggest European solar districts.

- **Traffic/public transport**: car usage reduction in the city district with a noticeably higher quality of life: no parking at the doorstep (for large parts of the residential area, the development plan prohibits the building of parking space on private property); private cars are parked in a community car park located at the outskirts of the residential area, cars being only allowed in the residential area for pick-up and delivery. The speed limit on the district's main road is 30 km/h, whereas in the residential area it is limited to "walking speed" (5 km/h). Shops and services can be reached by walking or cycling. For larger distances, residents may use a car from the car sharing association (1 500 members). Two bus lines and a tramway are connecting Vauban with the city centre, the main railway station and the "Hexental" recreation area.
• **Water:** rainwater infiltration into the ground: the system covers 80% of the residential area. New ecological sewage system within one pilot project: through vacuum pipes faeces are transported into a biogas plant. There they ferment anaerobically together with organic household waste, thus generating biogas, which is used for cooking. Remaining wastewater (grey-water) is cleaned in biofilm plants and returned to the water cycle.

• **Social:** extended citizen participation with Forum Vauban and its standards of communication, interaction and integration. The social work being part of the developing process, it helps to set up stable community and neighbourhood structures. Many groups of building owners and the Genova housing association have developed a sensitively balanced community life (co-operative food store, farmer's market initiative, mother's center, shared gardens and green spaces, schools and kindergartens, etc.).

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<th>Difficulties faced and solutions found</th>
<th>10 to 15% of the decisions were taken by the local authority because an agreement could not be met between the inhabitants.</th>
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<td>In Vauban planning is conducted according to principles that treat participation of potential residents over and above legal norms as a vital input. As responsibilities for this process lie with the private Forum Vauban association, there is a tendency for this organisation to rapidly become an agent of the local residents and, in consequence, representing their interests instead of serving general public matters. A similar conflict also affects the membership itself since if, for example, the association is in favour of a car-free planning approach, it may neglect the interest of members who are car owners.</td>
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<th>Next Steps</th>
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<td>Friendly advice to those who want to build new eco neighbourhoods</td>
<td>The feature of cooperative local planning is an outstanding characteristic of the Vauban case that can be transferred to other cities. Issues of awareness raising and integration of residents’ individual interests have been put into practice in an exemplary manner. It is important to achieve a high level of motivation among potential residents as well as among local politicians and persons in charge of implementation.</td>
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<th>Online information</th>
<th><strong><a href="http://www.vauban.de">www.vauban.de</a></strong>&lt;br&gt;<strong><a href="http://www.passivhaus-vauban.de">www.passivhaus-vauban.de</a></strong>&lt;br&gt;<strong><a href="http://www.forum-vauban.de">www.forum-vauban.de</a></strong>&lt;br&gt;<strong><a href="http://www.freiburg.de">www.freiburg.de</a></strong></th>
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### 4. Rieselfeld (Freiburg - DE)

**Project description**
The district of Rieselfeld is situated in the West of Freiburg and is providing 4200 residential units for about 10,000 to 12,000 inhabitants. The construction of the district of Rieselfeld started in 2004 is planned to be completed by 2010. Rieselfeld is being constructed on an area of 70 hectares, situated in the Eastern part of a former 320 hectare sewage farm which served the South-Western part of Freiburg for more than 100 years. After carrying out extensive ground surveys and all the necessary steps such as soil removal, the area fulfilled the conditions for residential construction.

**Objectives**
The political guidelines for the town planning concept have been in effect since 1994.
- Traffic systems that give priority to public transport and foot- and bicycle traffic.
- Well-integrated public and private infrastructure from the beginning.
- Orientation towards ecological objectives: low-energy construction standard (65kWh/m²a), district heating networks fed by a combined heat and power plant, integration of solar energy, a concept for rain water use; upgrading of the surrounding area to nature reserve status.
- High quality of private and public green spaces and of leisure centres.
- Constructing an urban district of high population density (90% collective, 10% private)
- A flexible urban design principle which allows for current development and provides the possibility to adapt future planning.
- Specifically incorporating the concerns of women, families, as well as handicapped and elderly people.
- Overcoming the separation of living and working space through the integration of mixed and industrial construction areas.
- Creating a balance of structures and housing forms.

**Financing structure**
The city covered the costs for Rieselfeld in terms of planning, development, public mechanisms and financing of the project. The total investment summed up to approximately € 145 million. The financing runs outside of the municipal account over a trust account covered by the KE LEG GmbH and - on a small scale - by subsidies for building of the schools and other public buildings. Subsidies came also form the Building-Priority-Program of the federal state of Baden-Württemberg.

**Partners & Roles**
The project is not being carried out by external developers, but by a project group which is part of the city administration; nevertheless it operates outside the regular administrative hierarchy. The City of Freiburg and KE LEG (a municipal service-providing company from Stuttgart) have appointed a joint project management team which leads the Rieselfeld Project Group. At the head of project development and implementation, the project group functions as the central control unit for the project. The core team is supported by specialists from the city departments for planning, real estate and housing.

**Results/Achievements**
- **Transport**: priority for public transport, pedestrians and cyclists; easy access to the public transport for all residents; a general speed limit of 30 km/h; several "play streets" in which playing kids have priority; right-before-left rule of priority for speed reduction

For more information, visit [http://www.urba.ucl.ac.be](http://www.urba.ucl.ac.be)
- **Environment**: use of low-energy buildings with a maximum level of energy consumption of 65 kWh/m²/year; binding obligation to connect all structures to the district heating network fed by a combined heat and power plant in Weingarten; use of renewable energy sources (solar energy, wood pellet heating and heat pumps).

- **Water**: separate collection of surface water, and complete recirculation into the western part of the Rieselfeld area (which has been upgraded to nature reserve status) after a biological purification process. Thus the typical local vegetation - marshes and swamps - is to be preserved.

- **Social**: equal attention has been paid to the district's social and cultural life as well as to technical aspects, marketing, and urban building. The development of the building process is being accompanied by a public interest and involvement. The social infrastructure includes a secondary school and its gymnasium; a primary school, a kindergarten, three children's day care centres, a sports-kindergarten, two outdoor-kindergartens, a private sports club; a district meeting centre for youth projects, a media centre for children and teenagers, a church etc. The residents publish their own district newspaper.

**Difficulties faced and solutions found**

Marketing of real estate started in 1993. Initially, planning and marketing were aimed at subsidized low-cost housing, privately financed rental housing investment projects, and private apartments and houses. At the end of the 90s, however, state support for residential construction was discontinued and tax advantages for investors were cut, bringing about substantial changes in the business environment of real estate. The project group's reaction was a modification of the development strategy in favour of single and multiple dwelling units. Also, investor acquisition for the construction of real estate for private ownership was intensified, and a flexible marketing strategy was developed which includes services for industrial building. As a result, till today demand is excellent in the areas of both smaller investors’ projects and of private and industrial purchasing groups.

**Next Steps**

Bordering on the north of the new district Rieselfeld, the new sport and leisure areas “Untere Hirschmatten” is being planned. This will be an extensively used public area with ground for two sports clubs which should function as an extension to the “recreational task” of the district's parks. Through the construction of this area, the free-time activities should be steered to Rieselfeld’s Northern half in order to take some of the pressure off the nature reserve in the west of Rieselfeld.

In 2007, about 370 building units were under construction. About 270 units in different projects are in planning and should enter the building phase in the next 12-15 months. The development of Rieselfeld should be completed in 2010.

**Online information**

[www.rieselfeld.freiburg.de](http://www.rieselfeld.freiburg.de)

**Further information**

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### 5. Weingarten (Freiburg - DE)

| Project description | The district of **Weingarten** was built at the end of the 1960s due to housing shortage in the City of Freiburg and 15,000 people of different origin are currently living in the neighbourhood. It was built according to former standards: condensed and with many high-rise buildings. About 80% of the flats were built for social housing and are property of the Freiburger Stadtbau GmbH housing company. Weingarten-Ost contains about 840 flats with 2500 residents and was declared as refurbishment project in 1992 after intense efforts of the “Forum Weingarten 2000”. In 2005 the refurbishment of Weingarten-Ost was completed. The refurbishment was carried out over 11 years and covered the following: • Reconstruction of the dwellings: new windows, heat insulation, refurbishment of the entrance area etc • Neighbourhood improvement • Construction of a footpath and bicycle lane, adventure playground for children, pedestrian-friendly deconstruction of the road |
| Objectives | The **main aims** and objectives are: • Communication and development of social networks • Support of inhabitants in solving district conflicts • Establishing a feeling of environmental responsibility and identification with the district • Stabilisation and improvement of the social situation in the area) • Establishment of residents’ rooms in the four multi-storey buildings • Presentation of a residents’ participation model for the introduction of new tenants • Since 2003, availability of caretakers free of charge for small reparations and daily problems (garbage, broken basements...) • Local employment project for long term jobless people by the Club For Development Of Municipal Employment Measures • The Playground Push - an open pedagogic and leisure centre for children. |
| Financing structure | The retrofitting of Weingarten represents one of the biggest projects of the City of Freiburg summing up to approximately € 30 million of expenditures. The labour costs (2.8 social worker and 50 % workload job for administration) as well as rental fees and material costs are paid by a municipal grant. |
| Partners & Roles | The Forum Weingarten 2000 is an active member club of local residents in charge of: • The "**District Bureau**"- is informing, planning and coordinating the district work to achieve a successful neighbourhood and stabilisation of the district. • The “Spieloffensive” (**Playground Push**) - is a leisure park for children containing adventure playground, wendy house for group proposals and mobile contractor’s shed for open playgrounds at changing locations. • **Residents** - one of the important concerns for the district bureau was to secure the residents’ involvement. Therefore the employees carried out questioning polls and organised residents’ meetings. The residents elected a tenants’ council for two years which established a democratic involvement. • The **Refurbishment Council** - was an essential committee which consisted of elected residents’ agents, municipal agents, agents from district initiatives and business men (all with voting power). • **Experts** from the municipality and housing company “Freiburger Stadtbau GmbH” |
Results/Achievements

**Environmental:** refurbishment of the existing dwellings with new windows, heat insulation, refurbishment of the entrance area. Construction of a footpath and bicycle lane, building an adventure playground for children, pedestrian-friendly deconstruction of the road.

**Social:** The district bureau was opened in 1989 and offers infrastructure for different working circles of the forum, the publication of a district journal, local cultural activities. To measure the satisfaction of the residents with the refurbishment, the district bureau carried out surveys on each construction stage in which approximately 60% of the residents participated.

Different working teams and initiatives from residents meet under the umbrella of the „Forum Weingarten 2000“, such as the Working team „Living with each other“ (intercultural activities), the Working team „Garbage“, the Working team „Active for Weingarten“, which is working actively on the improvement of living and housing qualities in Weingarten-West or the Working team „Social welfare“, where the institutions of social welfare join forces to coordinate the district work in monthly meetings and work together on district relevant subjects.

The Forum Weingarten 2000 is also member of the Freiburg Initiative “Constructive Conflict Solving in Districts and Neighbourhoods”. People from different districts, states and generations are educated to being “Mediators” and are working voluntarily on the mediation of neighbourhood conflicts. It is the goal to use the method of mediation to help solving conflicts constructively and develop a new culture of constructive controversy.

**Difficulties faced and solutions found**

In April 1994 the Thomas-Armbruster-Residents’ Companionship was founded to buy the multi-storey building Krozingen Str. 4 and to refurbish it self-dependently. With the principles of self-determination, one’s own responsibility and self-administration the continuing dilapidation of the building should have come to an end. The project failed, but the companionship finally managed to introduce a completely new refurbishment concept.
| **Next Steps** | ** „Weingarten-West“**  
Before the refurbishment of „Weingarten-Ost“ was finished, the residents, with the support of the district bureau, founded a working team and lobbied for a refurbishment of the „Weingarten-West“ district with about 1500 dwellings. The district bureau will also organise residential involvement here. The first elections for a tenants’ council are already done and a refurbishment committee will be implemented.  
**Tenants’ Council „Weingarten“**  
The tenants’ council (elected board of residents) will be expanded to another residential district “Weingarten-West”. In January 2006, a district-wide tenants’ council was founded in order to cope with important subjects concerning the neighbourhood. |
| **Online information** | **www.forum-weingarten-2000.de** |
| **Further information** | **Contact:**  
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Tel: +4976146611  
E-mail: info@forum-weingarten-2000.de  
6. Hammarby Sjöstad (Stockholm - SE)

**Project description**

Hammarby Sjöstad (Hammarby Sea City or Hammarby Lake City) is a new district in Stockholm built on a previously industrial and harbour area. Hammarby is meant to provide 10000 apartments for 25 000 inhabitants and occupies 200 hectares of land, in Southern Stockholm, close to the city centre. Hammarby was planned to support Stockholm’s request for hosting the 2004 Olympic Games.

The district is Stockholm’s largest urban development project for many years; the building activities started in 1994 and are foreseen to end in 2010.

Hammarby Sjöstad is a well-planned area with its own recycling model and local sewage treatment plant. Energy is produced in the district heating plant in the area and is based on renewable fuels. Combustible waste is also recycled in the form of heat.

This integrated model for energy, waste and water management is known as the **Hammarby model**.

**Objectives**

The **overall goal** is that the environmental impact caused by emissions from Hammarby shall be 50% lower than the corresponding level for housing areas from the early 1990s. To obtain these goals, integrated planning, innovative solutions and new technologies have been necessary.

**Objectives for 2015:**

- **Transport & mobility:** 80% of travelling by using public transport; 25% electric / biogas vehicles
- **Energy:** energy consumption of buildings of 50 kWh/m² out of which 15 kWh/m² for electricity; 100% RES; usage of 80% energy from waste; biogas production from sludge; all waste and waste water coming from the inhabitants will be recycled and returned to the area in the form of renewable energy.
- **Water:** 60% reduction of water consumption/person
- **Waste:** 90% reduction of landfill waste and 40% reduction of all waste produced; reclaim of one half of the nitrogen and water, and about 95% of phosphorus, in the waste in order to use these as fertilizer for agricultural activities in the area.
- **Urban planning:** inner-city architecture; 10000 apartments for 25000 inhabitants living and working in Hammarby
- **Social:** citizen involvement; attractive and sustainable places to live and work
## Driving factors

**Photo: Victoria Henriksson**

### Growing population
Since 1990, Stockholm’s population increased by 80,000 habitants, therefore the city needed to construct new dwellings by limiting its urban sprawl.

### Legal framework
The Environmental Code (gathering all fundamental rules of environmental protection) came into effect on 1st January 1999 and is inflicted on all other legislation. It requires integration of environmental needs to every planning document, no matter the type of action (i.e. individual actions or high scale urban planning).

## Green image

The idea of environmentally friendly Hammarby came into being in order to support Stockholm’s application for hosting the 2004 Olympic Games.

## Financing structure
In Sweden the cities have a large legal and financial autonomy. Thus, Stockholm has a 4.4 billion annual budget and has developed its own Local Investment Programme for ecological sustainability (LIP) investing 693 million euros in its environmental programme. The Hammarby project is estimated to cost 15-20 billion Swedish Crowns.

## Partners & Roles

There is great emphasis placed on the importance of collaboration and synergistic thinking between diverse actors, each having responsibility for different segments of the closed-loop integrated Hammarby system. The main partners are: the city of Stockholm, environment and health committee of Stockholm, real estate, infrastructure and mobility departments, environmental protection agencies, technical and economic partners (building company, land owners etc), the Local Investment Programme Council, researchers, urban planning and environmental coordination committee, Stockholm Water Company, Stockholm Waste Management Administration, Birka Energi, the environmental information centre (GlashusEtt). GlashusEtt was jointly created by Stockholm Water Company and Stockholm Real Estate Administration Office. The “Hammarby Model” was jointly developed by the water, waste and energy companies; this model binds together the entire environmental programme.

## Results

Today, more than half of the project area is already complete and 10,000 people live in the area.

- **Land use:** sanitary redevelopment, reuse and transformation of old brownfield sites into attractive residential areas with beautiful parks and green public spaces. To create a sustainable city area, in Hammarby Sjöstad the environmental program and the eco-cycle model were integrated in the planning process from the very beginning. The motto of the Stockholm City Plan 99 is “build the city inwards” meaning (re)develop already used land rather than using virgin land.

- **Energy:** RES, biogas products and reuse of waste heat coupled with efficient energy consumption in buildings. 23,000 tons of sludge treated and 3,500,000 m³ of biogas produced. District heating is supplied to all Hammarby from 2 main sources: energy recovery from waste incineration and energy recovery from waste water treatment process.

- **Water & sewage:** as clean and efficient as possible - both input and output – with the aid of new technology for water saving and sewage treatment.

- **Waste:** thoroughly sorted in practical systems, with material and energy recycling maximised wherever possible. Original waste collection system: individual households dispose of their solid waste into a vacuum-based underground collection system that allows for separating the waste into organic, recyclable and other forms. Combustible garbage is processed and returned to the community as electricity and hot water.

- **Transport:** fast, attractive public transport – tramway, ferry (departure every 10 minutes), combined with cycling paths, car sharing system, individual car parking places are voluntarily limited, ensuring numerous bicycle parking places.

- **Building materials:** healthy, dry and environmentally sound; selected according to the Stockholm ecological construction programme taking into account the whole material life cycle causing limited impact on resources and environment.

- **Economic:** 8,000 jobs created; reduced waste collection costs.

- **Social:** use of common space, various public and commercial establishments: schools and kindergartens, homes for elderly people, sports facilities, libraries, bookshops, concert hall, hairdressers, restaurants, pharmacies, post offices, etc.

The local Agenda 21 was established in close cooperation with the citizens; an environmental profile calculation tool was designed: [www.miljoporten.stockholm.se](http://www.miljoporten.stockholm.se). The residents’ involvement is an important part of the environmental work. The environmental information centre GlashusEtt provides tips, advice and answers on how to use the technology and conserve resources.
Next Steps

| The project runs until 2016, and today more than half of the project area is complete. Further, when the project is complete, Hammarby Sjostad aims to achieve a compact urban community served by a fast train, pedestrian and bicycle-friendly environment in order to reduce the need for cars. All of these steps, taken together, will ensure a more attractive, healthier and more environmentally-friendly community. 40,000 people from around the world have been to the visitors center to learn about Hammarby and the project is already inspiring developments in other cities around the world. |

| Friendly advice (to those wanting to build new eco-districts) |
| Projects like Hammarby can significantly reduce the use of fossil fuel use, help mainstream RES and EE, will provide significant cost savings for all residents while also improving human health and local, regional environment, reducing GHG emissions. Hammarby offers great example and potential for closed-loop economies in other towns and cities around the world. |

| Online information |
| www.stockholm.se  
www.hammarbysjostad.se/glashusett |

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Website: www.stockholm.se |
### Project description

Vesterbro (Western Bridge) area was built between 1850 and 1920 and is located immediately near the city centre. The housing standard was very low: lack of central heating and warm water (64%), lack of toilets (11%) and of bathrooms (71%).

The district had a high concentration of socio-culturally 'vulnerable' people. Most of the residents disposed of a low income and the unemployment rate was around 20%.

In 1990 Copenhagen municipality decides to refurbish Vesterbro by taking into account environmental aspects. This is a major urban renewal programme (6-10 years). The district is mainly a residential area, comprising 23 five-six storey buildings (4 000 apartments) for 6 500 inhabitants as well as open spaces, offices, bars and enterprises.

### Objectives

The project aims and objectives are:

- Urban renewal to be carried out as sustainable renewal
- Housing units to be upgraded to fully modern standards
- Installations and fittings in the buildings shall minimise the use of resources (i.e. water consumption should be reduced to 110l/person/year by 2010; use of rainwater: reduce waste production by 60%);
- A well-balanced composition of the inhabitants of Vesterbro
- Involve residents in the urban renewal process
- To establish a large demonstration project in Copenhagen to provide an example of environmentally sound urban renewal

### Driving factors

**Neighbourhood Revitalisation**

In 1997 the Danish Government's Urban Committee entered into an agreement with the city of Copenhagen and other organisations to carry out a new form of urban renewal designated as 'Neighbourhood Revitalisation' - in Danish known as 'Kvarterloeft'.

**Guidelines for sustainable urban renewal and public supported development for housing**

These guidelines were drafted by the municipal construction department in collaboration with the office of environmental control. They apply to all urban construction and refurbishment projects, including building insulation, sustainable building materials, etc.

**Legislation**

Since 1986 the Danish law on refurbishment enforces participation of inhabitants to urban renewal projects. In 1997, the new building legislation states that each Danish house must dispose of an ‘energy label’. “Energie 2000” – the action plan of the Danish energy policy – promotes district heating and cogeneration.

**Growing population**

Copenhagen is growing rapidly and needs more housing, more businesses, more leisure spaces and better infrastructure. As stated in the ‘City development strategy’, the municipality aims to manage this growth smartly and in a sustainable way. ‘Copenhagen remains a city for everyone’; thus affordable and sustainable housing must be provided.

### Financing structure

The refurbishment costs are rather high, reaching approximately 17 000 DKK/m² (2280 euros/m²).

The project is financed by the national government in co-operation with the municipality. In 2000, 40% of the national urban renewal budget was allocated to the city of Copenhagen (approx. 72 million euros).

The Danish Ministry of Housing, the Municipality of Copenhagen and the Urban Renewal Centre covered the costs of urban renewal: re-housing of inhabitants during the renewal process, building costs, architects’ and engineers’ fees, etc.

The National Government financed the ecological projects: solar panels, separate waste collection system, etc.

The various experiments concerning optimal use of energy were financed by Thermie, a European programme.

The investment in this ecological neighbourhood is only 30% higher that in a traditional district. Return on investment will be assured from the savings made and higher rents.
**Partners & Roles**

The main stakeholders are:
- Copenhagen Municipality
- Urban Renewal Company (SBS Byfornyelse) – responsible for urban renewal planning and elaboration of proposals for the urban renewal action plan.
- Urban Renewal Centre - established in 1990 and financed by Copenhagen municipality, the centre is a meeting place among project management, municipal departments, tenants, trade associations etc. The centre has also a library and a cafe used as places for information and social work.
- Other stakeholders are: the Danish Government, Copenhagen environmental protection agency, district associations, inhabitants, owners, consultants.

The Danish legislation supports stakeholder cooperation and citizen involvement, thus in Vesterbro the action plan has to go through this procedure:
- Inventory: The urban renewal companies collect all data on housing standards, social structure etc.
- Statement: The municipality publishes an urban renewal statement which contains guidelines and different proposals for each block.
- Public hearing: Discussion sessions for a period of eight weeks.
- Provisional Urban Renewal Decision: The municipality publishes a second statement which takes into account new arguments from the discussion forums.
- Public hearing: Second round of discussions for eight weeks.
- Final Urban Renewal Decision: The plan of action is passed by the local authorities.

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**Results/Achievements**

After the first phase of the renewal project CO₂ emissions in Vesterbro were reduced by 14% (2,500 tonnes) per year.

- **Energy:** RES due to integration of solar panels, high quality ventilation system and insulation; efficient energy consumption in buildings; 20% savings in terms of heating. Individual energy consumption monitoring screens are visible at the entrance of each apartment.

- **Water & sewage:** 14% savings in terms of hot water despite additional bathrooms and toilets installed in the buildings. Sanitation facilities were all equipped with water saving fittings and rainwater is used for toilets (12 m² from a 170 m² surface).

- **Waste:** separate waste collection system.

- **Transport:** cycling paths, many bicycle parking places. Most of the time Vesterbro inhabitants cycle or walk to work, supermarkets, schools etc

- **Economic:** creation of new employment opportunities offering unemployed people the chance to get on-the-job training and instruction. Unskilled labourers were employed on demolition and similar work in Vesterbro. These workers have been given a “head-start” in terms of seeking future employment in the construction sector by learning environmentally-friendly building, renovation and maintenance techniques.

- **Social:** use of common space in the buildings and of common gardens, various public and commercial establishments.

Due to the city's ongoing urban-renewal and clean-up efforts, the decayed Vesterbro is attracting chic restaurants, shops, clubs and customers. In the centre of it all, a new café square, Halmtorvet, has been constructed. An area where you might not normally go has become a must-go spot to see the latest trends.

Residents involvement in the planning and refurbishment projects was key in the Vesterbro urban renewal programme. The Urban Renewal Centre is publishing a quarterly magazine on urban refurbishment and supports debates among inhabitants. The magazine is distributed to all residents free of change.
Difficulties faced and solutions found

- Although both central and local governments have invested huge sums in this district, urban renewal has been met with resentment and opposition in the beginning. One of the principal objections has been that the efforts to counter the complex problems of a district have been tackled by purely physical methods of urban renewal. As a solution, greater emphasis was set on the direct participation of inhabitants.
- There has also been great concern that the social problems in a district were being solved merely by exporting the problems to other parts of the city.
- In certain parts of Vesterbro the rent doubled over 5 years time; thus residents with lower incomes were obliged to move out of the neighbourhood.
- The long time period required to complete urban renewal work caused residents to lose their interest to move back in their apartments. As a solution, it has been established that refurbishment work should not take longer than 3 years.

Friendly advice to those who want to build new eco-districts

- Urban development projects offer great potential to reduce environmental destruction in cities. In particular, fixing environmental standards in renewal and restoration projects is an important step; in Europe more than 70% of national investment in the building sector is focussed on renovation of existing parts of the cities.
- On the political and administrative level cross-sectoral co-operation is recognised as an important precondition to identify ecological potentials. In Copenhagen the support from different departments has been highly relevant for all stages of the renewal project.
- It has to be taken into account that ecological achievements are not solely a matter of installation of technical infrastructure but also a question of residents commitment; thus inhabitants should be involved from an early stage.

Online information

- www.miljoe.kk.dk
- www.akf.dk/udgivelser_en/98/bryforny

Further information

<table>
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<tr>
<th>Contact person</th>
<th>Name: Finn Terp</th>
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<tr>
<td>Position:</td>
<td>Organisation: Agency of environmental protection</td>
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## 8. Eco-Viikki (Helsinki - FI)

### Project description

Eco-Viikki was built between 1999 and 2004 and is situated at about 8 km from Helsinki city centre, near an extensive area of open farmland that forms a vital green belt for an important wetland nature reserve. The Viikki Science Park and Helsinki University’s Biocentre are located close to the new housing project as well, consisting of apartment blocks and row houses for 2000 inhabitants and services: 2 daycare centres, social and health centre, clubhouse, school and local shop. The mix of housing types is typical for Helsinki: approx. 50% of the homes are owner-occupied, 15% are rented, and the remaining homes are right-of-occupancy homes. The whole Viikki housing area has a built area of 6400 m².

During the planning and construction of Eco-Viikki exceptionally strict ecological criteria were set by the City of Helsinki as conditions for the transfer of building plots to housing construction companies. Point scores were calculated for construction plans on the basis of a special set of ecological criteria defined by external consultants. The 17 criteria mostly related five main issues:

- reduction of pollutants (CO₂, sidewater, site debris caused by construction, domestic waste, ecolabels),
- use of natural resources (reduce fossil fuels/purchased heating energy, primary energy, the convertibility of living area floor plans, the communal use of spaces, and the multi-purpose use of spaces),
- healthiness (indoor climate, moisture risk control, noise, the wind-free and sunny qualities of the site, alternative floor plans),
- biodiversity (plant choices and habitat types, storm water),
- nutrition (plants, soil).

Strict environmental controls have been regularly carried out during the construction phase. The City of Helsinki controls the evaluation process as a client and supervisor.

### Objectives

The main objectives were:

- To implement design and construction according to ecological building trends and gain experience for future projects: a display window of Finnish know-how.
- To support National Program of Ecologically Sustainable Buildings.
- Energy: use of low temperature technologies, geo-thermal heating and RES - solar energy (15% of the total heating demand of the area), wind- and solar-energy-boosted natural ventilation, wood-heated communal saunas and novel cold-storage solutions; cut CO₂ emissions by 20% when compared to a conventional building
- Water saving technologies (target: 40-50 l/person/day).
- Waste: 20% less than usual (max 160 kg/person/year)

### Driving factors

#### Government programme

During the 1990s, ecological planning and construction objectives were defined in Finland. In 1998, the Finnish government started an experimental sustainable building programme guaranteeing the framework for ongoing and new construction projects. On the initiative of the City of Helsinki, Eco-Viikki was selected to be a testing ground.

#### Planning competition

Once the project area was defined, a planning competition was organised to find an ecologically sustainable planning model for the whole area. Detailed planning was then started on the basis of the winning proposal. Furthermore, architectural competitions were organised for housing blocks, emphasising the role of ecological innovation and practical environmental friendly construction design.

### Financing structure

The project was mainly financed by the city of Helsinki, the National Technology Agency (TEKES) and Ministry of Environment (€ 4 million). The project is also part of the energy demonstration project – Thermie, EU PV-Nord project. Closely linked to the government programme, in 1998-2000 a special subsidy plan for sustainable pilot projects was developed and Viikki benefited also from this subsidy.
Partners & Roles

In 1993, the Finnish Ministry of the Environment, the Association of Architects and the Municipality of Helsinki launched a design competition for the creation of Eco-Viikki. 91 applications were received and the competition jury was assisted by a wide multi-disciplinary expert group. The main partners are:

- City of Helsinki
- Technology Agency Tekes
- The European Commission
- Implementation team: developer, architects, engineers, contractors
- Inhabitants, users (active participation in the decision-making process concerning their neighbourhood block)

Results/Achievement

All the approved construction projects surpassed the minimum environmental standards set for Eco-Viikki, which were much stricter than those usually applied in Finland at the time.

- **Energy**: solar energy, 2 local solar heating schemes cover a total of 10 properties; low energy housing design; co-generation-based district heating network,. One apartment block uses electricity collected by more than 200 square metres of solar energy panels, which have been integrated into apartments' balcony railings. The heat-collecting panels have a total area of 1,400 m² making this the largest such project in Finland.
- **Materials**: flexible timber construction techniques have also been innovatively applied at Eco-Viikki; many natural construction materials were used (mostly wood)
- **Land use**: conveniently located allotment plots where residents can grow their own vegetables; combined housing areas with parks and green spaces
- **Water**: new uses for rain water for gardening and green spaces
- **Waste**: 10% less building site waste generated
- **Social**: Viikki garden cultivation centre: residents can rent an allotment garden of 500-1000 m²; creation of Viikkari Park for children and young people; shared sauna and laundries in apartment blocks; construction of kindergartens; local commercial centre comprising large department store, various shops and restaurants; varied green spaces and abundance of vegetation species.

Difficulties faced and solutions found

There were no banking or postal services in the area, and only one grocery store, which cannot meet the demands of a population of almost 2,000. The situation is not helped by public transport in the area, which consists of only one bus line to the city centre. According to residents, the bus is too slow and too crowded during rush hours. Consequently many residents have considered buying or have even bought a car. Obviously, such a situation is not in harmony with the goals and the basic idea of Eco-Viikki. Today, as a solution, a shopping centre was built near Eco-Viikki, featuring the most important public services – although not quite within easy reach for all pedestrians.

Next Steps

Building mistakes are being corrected, systems are adjusted and people are learning to use them.

Friendly advice to those who want to build new eco neighbourhood

The Eco-Viikki experience shows that ambitious goals and ecological criteria do not automatically create the desired end result. In order to achieve the goals set, a sufficiently concrete monitoring and feedback system is needed; furthermore knowledge, goals and responsibilities must permeate the whole production chain. The development work entails a long-term commitment to goals, and in the building sector the central committing factor seems to be the money.

Online information

http://cic.vtt.fi/eco/viikki
www.helsinginenergia.fi/kaukolampo/ekoviikki.html

Further information

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### 9. EVA-Lanxmeer (Culemborg - NL)

**Project description**

Eva-Lanxmeer is a social-ecological district of 24 ha that has been built on a former farmland surrounding a protected drinking water extraction area.

Located near the Culemborg railway station, Lanxmeer consists of 250 dwellings, 40,000 m² of offices and business units, an urban ecological farm (assuring biological food and contact with nature), an information centre, wellness centre, congress centre, bars, restaurants and a hotel.

Lanxmeer integrates different urban functions providing good equilibrium between social, economic, cultural, educational, recreational and sustainable interests.

The Lanxmeer project features far-reaching residential participation, inhabitants took active part in workshops and in the overall planning process.

Environmental measures include a closed water circuit, an integral water management system, a biogas production facility, use of sustainable building materials, use of RES, organic food production.

Today, Lanxmeer is a national and international reference in terms of sustainable town planning and social development.

<table>
<thead>
<tr>
<th>Objectives</th>
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<td>The Lanxmeer ecological project is meant to promote sustainable development by being an example of integrated approach towards sustainable planning.</td>
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The chosen approach is to integrate technology/innovation ('hardware') and the environment and behavior ('software') to achieve preservation of natural resources in every day life.

The final Lanxmeer project programme contains six areas which form the Lanxmeer coherent and integrated Eco-framework: energy, water, landscape, mobility, chain management and communication and education.

Moreover the municipality set ‘integration of functions’ as a one of the crucial criteria for the district.

- Energy: sustainable energy systems - striving towards zero-energy balance: energy production + minimised consumption of fossil energy sources; energy production from waste and sewage, energy-independent dwelling, not being connected to the grid
- Water: integrated water management system and local biological water treatment; rainwater for toilets and washing machine; the sewage is used for biogas production
- Materials: sustainable building programme; the chain management objective is to close down material cycle in terms of origin, transport, production, use, reuse and recycling.
- Land use: sustainable city planning - good balance between urban land use and green spaces, public and private gardens
- Transport: support public transport and limit car use
- Food: ecological agriculture, biological food, contact with nature
- Social: co-production and inhabitants involvement in the building process; variety of dwellings according to architecture, size and price leading to social diversity
- Integration of different functions: living, working, recreation, education, social etc
The Netherlands follows an integrated policy on sustainable building, addressing eco-efficiency, construction issues and socio-economic issues; explicit attention is paid to energy saving, health and building materials. Simultaneously, sustainable building policies focus on consumers (‘the demand-side’) and the physical environment of buildings. The Dutch government sets minimum quality levels through legislation but the aim is to achieve higher levels of quality through financial arrangements and covenant agreements with relevant stakeholders in the housing and building sector.

The Lanxmeer project was initiated by the E.V.A. Foundation in 1994. The Lanxmeer concept was developed by a group of scientists having diverse backgrounds. Some of them were already keen to settle in Lanxmeer. The network grew quickly and a group of future inhabitants was created and regularly met to co-create the foundations of the project. In 1996, 80 families had already subscribed, having a positive impact on the elected representatives of Culemborg municipality. The future inhabitants participated in several workshops; additionally an Urban Development Plan was drafted in dialogue with (future) residents and users. Following a ‘sustainable development’ training course and being aware of the wide interest of possible future residents, Culemborg municipality took interest in the project. Today, Lanxmeer is a co-production of Culemborg municipality and E.V.A. Foundation.

### Financing structure

- **Subsidies and funds granted:**
  - German Ministry for Education, Science, Technology and Research chose Lanxmeer as a European demonstration project and provided funding
  - Dutch Ministry for Housing, Spatial Planning and the Environment provided subsidies for guidance of the residents in drafting an urban development plan
  - Stimulation Fund for Architecture – offering a private grant

### Partners & Roles

The (private) Ecological Centre for Education, Information and Advice (EVA) played a key role in developing Lanxmeer, in cooperation with the Culemborg municipality, the Ministry of Housing, Spatial Planning and the Environment (providing subsidies) and many private parties.

To create the plan according to its ambitions, the need of commitment of the involved parties was necessary. So future residents, architects, consultants, the urban development agency, the municipality, the building contractor etc were involved in preparation and execution activities of the Urban Development Plan for Lanxmeer.

Apart from the master plan, residents also took part in designing the green areas in the neighbourhood.

### Results/Achievements

- **Energy:** annual energy use of 50 GJ / household (approx. 1250 m² gas and 2500 kWh electricity) / year; mainly RES: small Canadian windturbines installed; biomass station for power and heat generation; most houses dispose of solar panels for electricity and solar collectors for hot water; excellent insulation. Where entire roofs are covered by solar panels, electricity is fed in the public grid during summer and partly in spring and autumn. In order to keep track of electricity use most residents take part in a monitoring program.

- **Water & sewage:** separate water delivery system: rainwater running off roofs is led to retention pools by a drainage system; rainwater running off road surfaces is collected in a sewer system flowing into ditches; waste water from kitchen sinks and washing machines is collected in another sewer system, treated and lead into ditches; waste water from toilets is collected separately, fluids are filtered and the solid component is used for biogas production.

- **Transport:** fast and attractive scheme of bicycle routes and foot paths; walking distance to Culemborg central train and bus station; limited car use; approx. 55 households share a fleet of seven cars: 0.7 cars/household; car free district: parking places situated at the edges of the housing area; cars allowed for delivery only.
**Economic:** living and working on the spot saves travelling time and money; several jobs created at the EVA information centre and at the urban ecological farm (sustainable agriculture).

**Social:** The bottom up approach of involving the intending residents in all aspects of the project's conception, planning, design and construction is showing positive results in terms of awareness and sustainable behavior. Inhabitants are organized in a residents’ association which takes care of the maintenance of the area. In the neighborhood, there are many forms of cooperation, focused on subjects such as the maintenance of nature, energy, education and the urban ecological farm. While it may have taken more time than a developer led project, EVA Lanxmeer is paying clear dividends in providing aesthetically pleasing houses for living and creating a community that will work socially and ecologically with employment on site.

**Land use:** built according to the "pergola" plan meaning smooth transitions between private and common (no walls nor fences), cultivating food in the area for the residents, limit of transport and trade beside participation of the people on the farm; live-work-recreate close to each other; 4 inter-connected main green areas communicating with private gardens, municipal land and the urban farm; integrated functions: the need for work places, manufacturing, food production, community areas, and private and social houses.

**Materials:** dwellings are built using sustainable construction materials.

### Difficulties faced and solutions found

The neighbourhood of Lanxmeer is a former farmland that surrounds a protected drinkwater extraction area. Normally it is not allowed to build around such areas, but special foundation techniques and landscape design made it possible to create a neighbourhood like Lanxmeer.

In order not to disturb ground water layers houses have a five foot thick foam concrete foundation instead of piles; and retention pools have a non permeable floor to prevent rainwater running off from roofs and street surfaces mixing with the ground water.

### Next Steps

EVA Foundation is currently developing a public training course focused on awareness raising concerning urban built environment. The programme will consist of: development of convivial sustainability (People, Planet, Profit); sustainable urban and landscape planning, participative processes, education, consumption behaviour etc.

Ongoing construction: several apartments; 1 individual house, 2 offices, 8 houses for elderly.

### Friendly advice to those who want to build new eco district

Public participation has proved to be an effective instrument toward the creation of a convivial and sustainable community. The integration of different interested actors allows a better balance between components of sustainable districts: eco-efficiency, socio-economic issues, construction, involvement of inhabitants, conviviality.

### Online information

- [www.evacentrum.com/info.html](http://www.evacentrum.com/info.html)
- [www.culemborg.nl/level1/index.aspx](http://www.culemborg.nl/level1/index.aspx)
- [www.bel-lanxmeer.nl](http://www.bel-lanxmeer.nl)
- [www.kwartee.nl/volgende/container.html](http://www.kwartee.nl/volgende/container.html)
- [www.werkwerf.nl](http://www.werkwerf.nl)

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6. Conclusions

1. Sustainable districts came into being due to **diverse driving factors**: growing population; strong municipal environmental commitment; green image; national policy and legislation; strong bottom-up initiatives; need of refurbishment of certain derelict urban areas and districts.

2. In order to ensure successful development of new neighbourhoods in line with environmental principles a common **vision of sustainability** need to be defined in cooperation with all interested stakeholders and actors at the early stage of the project.

3. **Participative and integrated planning and implementation** is key when conceiving sustainable districts therefore, all relevant stakeholders need to be involved throughout the entire decision-making, planning, construction, information and communication phase.

4. Transport energy accounts for a large proportion of the energy consumption of any development. Therefore, it is absolutely necessary that a **green transport plan** is developed from an early stage of the project consisting of: public transport facilities (stops at walking distance), development of cycling and pedestrian paths, car pool systems, limited driving speed and parking spaces.

5. The development of a green energy policy represents one of the major characteristics of a sustainable district in order to reduce diverse environmental, economic and social impacts related to energy use. Therefore, **low energy consumption, use of renewable energy sources and implementation of green urban heating system** are essential aspects of sustainable neighbourhoods.

6. All sustainable neighbourhoods described include a **water cycle management plan**: use of rainwater, treatment of waste water, reduction of water consumption (equipment with water saving devices), and implementation of efficient rainwater infiltration systems.

7. Efficient waste management practices are already part of everyday life in Northern Europe. All eco-districts presented have an **integrated waste management plan** consisting of separate waste collection system, incentives for waste reduction and recycling, minimised building waste.

8. Whenever possible, a sustainable neighbourhood is built from **natural, recycled or reclaimed materials**.

9. It is of utmost importance to include **social aspects of sustainability** when creating an eco-district: good balance among social groups; community centres; residents’ involvement and participation in decision-making, planning and implementation processes; residents’ association; regular information and communication to all inhabitants; collective urban farming system; common green spaces; access to sports and leisure activities by all residents no matter the social group.

10. **Mix of functions**: a sustainable district ideally integrates housing areas with working spaces (employment on site), leisure and cultural facilities and services, commercial centres and services, educational and sports amenities, child care centres and retirement homes etc.
7. References

1. www.peabody.org.uk
2. www.zedfactory.com
3. www.bioregional.com
4. www.oneplanetliving.org
5. www.arup.com
6. www.hannover.de
7. www.sibart.org
8. www.vauban.de
9. www.passivhaus-vauban.de
10. www.forum-vauban.de
11. www.freiburg.de
12. www.rieselfeld.freiburg.de
14. www.stockholm.se
15. www.hammarbysjostad.se/glashusett
16. www.miljoe.kk.dk
17. www.akf.dk/udgivelser_en/98/byforny
20. www.helsinginenergia.fi/kaukolampo/ekoviikki.html
23. www.evacentrum.com/info.html
25. www.bel-lanxmeer.nl
26. www.kwarteel.nl/volgende/container.html
27. www.werkwerf.nl
29. www.caetshage.org/index.php?option=com_frontpage&Itemid=1
30. www.dubocentrum.nl
31. www.ecoattitude.org