

Bo01



Location of Bo01



Bo01

location: Malmö, Sweden
dates: 1996-2001 Exposition phase, development continues
type: New construction in brownfield / formerly industrial harbour

use: Residential, some commercial, some services
size: 25 hectares, 1000 units supported by renewable energy

people:
actors: City of Malmö; National Board of Housing, Building, and Planning; the Ministry of the Environment; the Swedish Government's LIP Programme; EU; various developers; E.ON Sverige AB, formerly known as Sydkraft (private energy supplier).

goals:

- To be a local, national, and international leading example in sustainable urban development
- 100% locally produced renewable energy from sun, wind, water. "Over the course of a year the electricity and heat produced within the area will at least equal that consumed by its residents".

| energy use | KWh/m ² |
|--------------------------------------|--------------------|
| heating & electric, goal | 105 |
| heating & electric, achieved average | 120-150 |
| heating & electric, best | 87 |
| systems | |
| district heating | x |
| combined heat & power | |
| solar panels | x |
| solar cells | x |
| biomass and refuse | x |
| wind power | x |
| natural ventilation | x |
| forced vent.w/heat recovery | x |
| non-renewable energy | |
| individual metering | x |

construction

- wood construction
- concrete frame construction w/ infill environmentally certified material use

amenities

- proximity to public transport
- abundant public space
- waterfront access

special projects

- industrial land reclamation
- protection of marine ecology

site ecology

- green space factor
- European village
- wooden houses x 5
- resident participation
- solar thermal panels provide 15% heat
- 2MW wind turbine
- 120 m² PV panels
- Underground aquifers
- Biodiversity and quality of life
- Traffic
- Recycling

process and history

The city of Malmö was selected in 1996 by SVEBO, an organization formed by the National Board of Housing, Building, and Planning in Sweden, to host the first European Housing Exposition. The opportunity to host the exposition coincided with the building of the Öresund link between the city and Copenhagen via bridge and tunnel, which would create an instantly expanded and opportunity-rich metropolitan region; at the same time a loss of traditional maritime-based business and economic base as well as an economic recession in Sweden was forcing Malmö to reconsider its future in a pro-active manner.





process and history, continued

Coupling the hosting of this exposition with the creation of a new university, all within a redevelopment area adjacent to the city centre, became part of Malmö's plan to capitalize on the interest, energy, and capital beginning to flow into the region due to the Öresund link's realization.

While Sweden has a history of eco-village experimentation, the idea behind this housing exposition was to bring these principles directly into an urban context; creating a viable market for ecological housing in a city then became the primary challenge, and it was decided early on that potential residents should have no limits placed on their urban lifestyle and that ecological goals would be attained in other ways. "Eco-villages had been characterized by a gang of enthusiasts making sacrifices to save the world. This time no privations would be needed in order to help reduce environmental impact. Being able to do so would be both enjoyable and comfortable." (Persson, p.14)

To create the high environmental and social standards around which Bo01 would be created, a Quality Programme was developed over the course of 5 months. This consensus document between the expo organisation, the city, and the developers, set minimum levels of quality and environmental standards. This Quality Programme was included in the contract when developers purchased lots from the city. The Quality Programme involved the recommendations of experts from many fields, which were then tailored to realistic economic and time-frame conditions.

description of special project features

The organization of the project fell under the following eight focus areas, based on the Quality Programme which had the aim to create the high environmental and social standards around which Bo01 would be created:

- **planning:** creation of a dense and 'living' district. Less quantitative goals for human sustainability and quality of life were pursued along with the detailed criteria.
- **soil decontamination:** the process and procedures for creating housing on formerly industrial land brought about many differences of opinion in both evaluation and remediation; overall, the questions raised and the consensus achieved brought about a greater understanding of the issues and a body of experience to be drawn upon in the future.
- **energy:** creating a "system solution for 100% local renewable energy" has been a unique approach to creating a sustainable city district and has been a successful strategy. While many similar communities focus on reduction in energy use through building construction techniques, Bo01's concept presents an iconic and easy to understand approach of zero energy balance. To maintain a

high level of thermal comfort for the residents of Bo01, the renewable systems have been linked with existing energy systems in Malmö. This provides storage as well as energy reserves for the district, allowing thermal comfort to be maintained.

- **waste management:** intentions to create a 'cradle to cradle' approach to waste for the whole neighbourhood resulted in many recycling and reuse techniques, including neighbourhood source separation, two different organic waste separation systems, and biogas extraction.
- **traffic:** traffic solutions were based on creating as many alternatives as possible for the residents and visitors of this neighbourhood. Bus stops were integrated into the schemes to make them easily accessible, car parking provided was just 0.7 parking spaces per household, and most of the area is open to pedestrians only.
- **bio-diversity in the dense city:** storm-water retention and use of storm-water in water features, as well as habitat-rich green and open space, were integral to the shaping of this development. Tools for increasing biodiversity are used like green space factor and green points list.
- **building and living:** variety in building appearances, construction types, and provisions for student and senior housing contribute to a varied population and interesting experience. The adjacency of so many different solutions located in one development provides an opportunity for research into which methods work best when trying to create an energy

A nearby 2MW wind turbine provides much of the electricity for Bo01, the rest coming from solar panels (120m²). 1400m² of solar collectors on 10 of the buildings provide 15% of the heating, but a more important source is a heat pump connected to aquifers 90m (297ft) underground. The water in the limestone bedrock is used to provide heat in winter and cooling in summer. Out of 1400m² of solar collectors 200m² are vacuum collectors (evacuated-tube collectors) while the rest are flat-plane collectors. Bo01 is connected to the energy systems in the city for district heating, district cooling and electricity grid - so surpluses can be used elsewhere in the city, or more can be drawn in if necessary.

Information and IT solutions: consistent with its development as an exhibition project, Bo01 has acted as both site and catalyst for the dissemination of knowledge and ideas. Bo01 and the specific projects within it continue to be evaluated and discussed both locally and internationally. The internet has played a large part in this, including the web-based MiljöTV, an environmental communication tool that serves residents as well as the public at large. Within the project, IT solutions for reading meters and controlling ventilation and energy have been tried and are showing promise as a means to be aware of energy use; also, broadband internet throughout the development can provide residents with a means to work from home, reducing transportation needs.

Green points and the green space factor

Bo01, in partnership with the city of Malmö, developed a system of 'green points'. Developers had to choose 10 green points from a list of 35 that they would integrate into their landscape plan. Subject to approval, developers could also create their own 'green points'. This approach was created so that "the residential courtyards would contribute towards strengthening biodiversity and developing Bo01 into a 'habitat-rich' city district." (Persson, p.51) Planning approval for projects was contingent upon demonstration of these green points. Examples of green points that benefit biodiversity; A bird nesting box for each apartment, bat boxes, part of courtyard left to grow in natural succession, courtyard containing at least 50 Swedish wild flowers.

The Green Space Factor, an urban planning principle developed by the City of Berlin, was a requirement for all Bo01 building projects. This works similarly to a floor area ratio requirement; a green space factor is required but it is up to the developer how to achieve it. At Bo01, a green space factor of .5 was required. For example if the lot was 50% built up or contained sealed surfaces, receiving a 0.0 rating for that portion, and 50% of the lot contained planting beds on natural soil, receiving a 1.0 rating for that portion, then Bo01's green space factor of .5 was achieved. There are other ways of attaining this factor of .5, however; green roofs receive a .8 rating, climbing plants covering a specified amount of the building surface can receive a .2 rating, bodies of water on the ground receive a 1.0 rating, etc. "The more heavily the developer chooses to exploit his plot, the greater will be the demands for compensation through various arrangements within the buildings and the plot." (Persson, p.52)

funding

For the environmental initiatives of Bo 01, the amount of 250MSEK (~25 mil Euro) was set aside by the Local Investment Programme (LIP). Also 1,9 mil Euro was provided by the EU.

results

Best results for energy consumption were measured at the LB house, which consumes 87kWh/m² annually - compared with about 200kWh/m² for some other buildings in Bo01.

The aim was to transfer the experiences and systems for sustainable city development from Bo01 to the other parts of the Western Harbour. In 2007 the first multi family house using passive house technology is being built in the Western Harbour area, at an area close to Bo01.

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sources:

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