

BIOCLIMATISM

Urban settlements

ZOETERMEER

The Netherlands

Bioclimatism (i.e. using natural energy provision without conversion into another form of energy, be it electric, thermal or mechanical) is a form of renewable energy, in the sense that it is inexhaustible and, moreover, very cheap. Bioclimatism includes, first, analysing the microclimate and aspect of the building, specifically its windows and roof, using natural ventilation and air-conditioning, and optimizing the building's use of natural light. In Zoetermeer, two new urban settlements are demonstrating that bioclimatism and the active use of solar energy can work hand in hand. Two more projects are to follow.

THE CITY

Zoetermeer is a city in the western part of the Netherlands, about 15 km from The Hague and 60 km from Amsterdam. It has an excellent railway connection and a rail rapid transit line connected directly to The Hague.

Zoetermeer is a very young city and is steadily growing. Today the city has about 109,000 inhabitants living in more than 44,000 houses. 30 years ago only 4,000 people lived here.

Climatic data :

Degree days (basic 15°C):	2585
Annual mean temperature :	10 °C



CONTEXT

In Zoetermeer the City Council has engaged in a sustainable energy policy for more than 5 years. In June 1996 a policy plan for 15–25% energy savings (average) addressing different target groups was approved. However it was found very difficult to achieve the ambitious aims. Consequently the city, supported by the SAVE Programme of the European Commission, set up in April 1999 a local energy agency, the Energie Agentschap Zoetermeer (EAZ). The EAZ management board integrates main local players, such as the chamber of commerce, a bank, the utilities and a consumer organization. The key role that EAZ is playing is to bridge the gap between policy and actual projects. The functions performed by EAZ include those of initiator, advisor and project leader.

In the past three years many projects have been managed by EAZ in a broad range of sectors, such as housing, service-sector institutions, mobility and the use of renewable energy sources. They have included an energy-saving project in 75 primary schools preparing an educational and behavioural tool-kit, energy advice and arranging of funding for the ice-hall and event centre, and a campaign to stimulate the use of renewables, specifically solar thermal collectors. On 1 October 2001, a major Energy-Saving Campaign addressed to about 10,000 households in Zoetermeer was launched. The aim is that 5% of them carry out measures in 2002.

EXPERIENCE OF ZOETERMEER

Due to the very high demand for new residential housing, the Dutch government drew up the VINEX Plan in 1990, providing for 20 urban development areas across the country. The VINEX Plan is a tool of national spatial planning that aims both to protect the environment and develop the economy. It seeks a balance between urban zones and landscape zones, in order to control the expansion of urban areas and ensure a good mixing of functions. It is a declared goal of the VINEX Plan to regulate the growth of urban agglomerations and to preserve at the same time the green heart of the country. Zoetermeer is one of these 20 projects, specifically Oosterheem, a district that will have about 8500 new housing units when finally completed in the year 2007, in addition to the associated infrastructure. The comparatively modest 'de Boomgaard' (the tree garden) construction project was already completed in the immediate vicinity in 2001.

'De Boomgaard' new development area

This development area, comprising 228 terraced housing units, was designed according to the criteria of the 'duurzaam bouwen' (sustainable building) guideline developed in the Netherlands.

Following a number of years of practical experience, the guideline was thoroughly revised in 1999. Today it addresses 6 aspects of sustainable building in detail, namely: energy, building materials, waste, water, indoor air quality and noise.

The provisions relating to energy proceed essentially from the national Energy Performance Ratio (EPR), which, as a synthetic factor, expresses the energy efficiency of a building. The EPR integrates energy conservation measures with the choice of fuel and the use of renewable energy sources.



Being the owner of the building plots, the local authority was able to stipulate numerous provisions in the plot purchase contracts, with which the building developers had to comply. These include:

- > Installation of solar collectors (700 m²) and photovoltaic modules (53 kW_p) on each house roof. A display fitted inside the house makes it possible to observe the level of solar power generation at all times.
- > Installation of condensing boilers and low-emissivity glazing
- > Heat recovery in the ventilation system
- > Hot water connection for washing machines and dishwashers
- > Use of CFC-free building materials
- > Waste prevention and waste collection points.

By implementing these measures, the energy consumption for space heat has been reduced by 33–47% compared to new construction standards. This realization of the construction project in accordance with the criteria of 'duurzaam bouwen' moved the World Wildlife Fund (WWF) to award its logo to the project and to permit the developers to use it in their advertising.

An effort was made from the outset in Zoetermeer to let the future occupants co-determine the design of the project; this was done particularly in the interior fittings of the buildings and in the design of the open outdoor spaces. There is also scope for the arts in this construction project, as illustrated by a short look in the Internet at <http://www.onzeboomgaard.nl>.

The first units were occupied in the summer of 2001. By the end of 2001 all had been sold, at a purchase price of 1250–1600 €/m² (including the land). This price is thus only slightly above the standard; the extra price is swiftly paid back by the energy savings.

Oosterheem development area

The EAZ is also involved in the development of the Oosterheem area. This urban area is also to be realized in an exemplary manner. However, here the process is far more difficult, as the town of Zoetermeer is not the owner of the building plots. Consequently voluntary agreements have to be made with all property developers. With much finesse, this has succeeded for the 2500 housing units currently under construction – it is impossible to say at present whether this can be continued in the coming years.



Within the Oosterheem development area, the EAZ and the Zoetermeer local authority have initiated the 'De Groene Kreek' project. This comprises 55 zero-energy houses, i.e. houses that no longer use any fossil fuel to meet their energy requirement. A property developer who will implement this pilot project has already been found. At present, the finishing touches are being put to the final energy plan. The marketing of the houses is to begin in mid-2002 and construction work shall then commence in 2003.

EVALUATION AND OUTLOOK

The construction of 228 housing units in 'de Boomgaard' has realized a project that does justice to all criteria of sustainable building and thus can truly be labelled a 'sustainable community'. Encouraged by this success, the Zoetermeer local authority and the EAZ are now attempting to also develop the huge development area in Oosterheem according to a similar pattern. However, this is hampered by the circumstance that the town is not the owner of the building plots and the liberalization of energy markets in the Netherlands has as yet created only meagre incentives for energy supply from renewable sources. The 'de Groene Kreek' pilot project stands for the effort of the local authority to work against the current trend. The demand for housing units in the zero-energy estate, i.e. the success in marketing the houses, will show to what extent occupants in the Zoetermeer region are sensitized to the issue and which market share these house types can capture in the near future. The zero-energy houses will be completed in late 2003 and their qualities will then become apparent.

Finally, the efforts undertaken by the EAZ to promote wind energy over the past 2 years should not go without mention. In addition to 3 smaller units in the class around 250 kW on the south-eastern fringe of the town, the first 1.5 MW unit in the Netherlands commenced operation in the industrial estate of Zoetermeer in 2000. A visitor centre has been set up below the turbine and has attracted great interest. A large part of the guided tours for delegations that come from all over the world is conducted by the EAZ. In late 2001, the EAZ completed a study on the erection of four further units in this size class in Zoetermeer.

FOR FURTHER INFORMATION

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