

Case Study: Nieuw Terbregge in Rotterdam, the Netherlands

Introduction

Nieuw Terbregge in Rotterdam, the Netherlands is a new urban area in Rotterdam. Its 860 dwellings demonstrate an integrated sustainable approach with a reduced energy demand and optimized energy infrastructure based on renewable energy sources. All dwellings have an energy reduction of at least 25%.

Nieuw Terbregge located in a second ring around the city centre, on an undeveloped site between the main highway-ring road of Rotterdam and the river Rotte. The development is in hand of a commercial project developer, who works on the basis of performance requirements provided by and agreed with the City of Rotterdam.

Real estate developer Proper-Stok Woningen BV developed the whole of Nieuw Terbregge in close co-operation with the municipality of Rotterdam.

Design Concept

Different energy strategies have been allocated to various parts of Nieuw Terbregge and served a design consideration from the first start of the project. The main environmental aspects are reduction of energy use, application of renewable energy technologies, the use of environmentally sound materials, reduction of water consumption and nature development. The relatively polluted water of the nearby river Rotte will be filtered by halophytes before enters the area.

Government Policy

The City of Rotterdam required this project to meet the requirements of their Sustainable Building program. The choice of sustainable building materials has been a design input.

National Benchmarks: Since 1996 the Dutch Building Code contains an Energy Performance Standard for new houses. In 1998 and 2000 the maximum coefficient admitted was lowered. The RESTART project developed in 1996 demonstrates energy performances below the 2000 level. The measures taken reduce the emission of CO₂ by 25% to 55% compared to new houses in 1996. Further reduced levels are anticipated for the second part of Nieuw Terbregge which is still under development.

City Benchmarks: The project serves as an example for the 10,000's of houses Rotterdam shall build in the near future. New project initiative of the commercial developer already build on the RESTART Rotterdam project experiences.

Technologies

Active and passive solar design integration

A part of Nieuw Terbregge demonstrates the application of solar energy in buildings. As the aim was to focus on replicable technologies passive solar and active solar thermal systems are applied. Two storey sunspaces on the entrance façade of some houses and 6 sq. m. solar collectors contribute to the energy demand of space heating and domestic hot water.

Heat Delivery Stations

Other parts of Nieuw Terbregge demonstrate the integration of heat delivery through small scale combined heat and power stations. Each heat delivery station provides heat to about 40 houses, thereby minimizing the length of transportation pipes. Small scale combined heat and power (chp) units are placed “in cascade”, so that the heat load is optimized. Heat is temporarily stored in a central storage tank. Electricity enters the electricity grid and is partly used on site.

One heat delivery station also contains a ground water heat pump system. Combination of heat/power installations and heat pumps are especially efficient while the heat/power installation produces electricity that can be used for the heat pump.

User Manuals

In order to maximize the effects of the energy techniques a user manual was made for all inhabitants. This manual gives specific information for use of the installations and features of the dwelling and explains the backgrounds.

Reference:

Communities and Local Government (2008), Rotterdam: “European Green Building Forum”. Source: www.communities.gov.uk