RE-START: NIEUW TERBREGGE - ROTTERDAM
INTEGRATED ENERGY EFFICIENT AND SUSTAINABLE URBAN SCHEME

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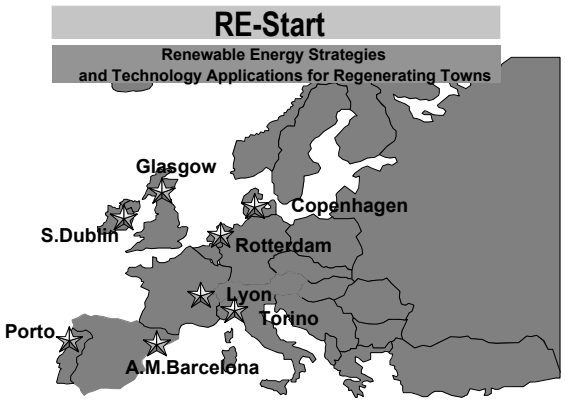
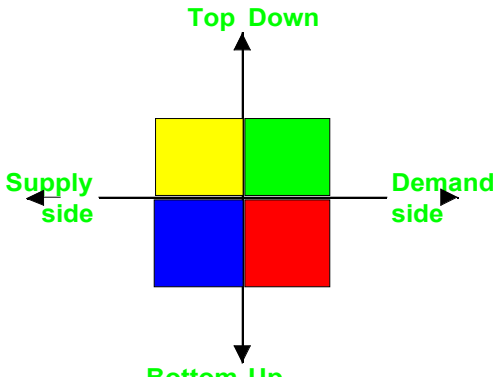
RE-Start is a project involving 8 European Cities, addressing Renewable Energy Strategies and Technology Applications for Regenarating Towns.



Exemplary Urban Projects were demonstrated between 1996 and 2001 under the EU Programme Thermie:

- Each RE-Start City demonstrates a district where a regeneration project is executed, with new comprehensive rules
- The area of influence of each City-Project allows a strong impact on the decisional mechanisms of the city
- A mix of functions are comprised in REStart, representing the complexity of urban situations



Implementation of Renewable Energies in City Policies requires an integrated approach addressing at the same time:

- **Top-down approach** - Related mainly to the activity of governments and/or institutions when introducing new regulations
- **Bottom-up approach** - Organising the needs of a community and preparing the policies which comply with these needs
- **Demand-side approach** - Concerning the end-uses of citizens and their needs
- **Supply-side approach** - Refers to the capability of the market to organise the production of goods and technologies which respond to consumers' needs.

Integrated Urban Design

The City of Rotterdam is part of RE-Start through the demonstration project Nieuw Terbregge. The main environmental aspects are reduction of energy use, the use of environmentally sound materials, reduction of water consumption and nature development. The relatively polluted water of the nearby river Rotte, for example, will be filtered by halophytes before it enters the area.

Public Private Partnership
Nieuw Terbregge is innovative for its energy technology application at large scale. Also the process is innovative.
The development of the whole project of 860 houses is in hand of a commercial project developer, who works on the basis of performance requirements provided by and and agreed with the City of Rotterdam.

The public private partnership created the possibility to integrate urban and architectural design of various parts of Nieuw Terbregge. Four architects were developing parts of Nieuw Terbregge while one was in charge of the urban development.
The energy strategies became integral part of urban and architectural design.

landscaping – highway-ringroad Rotterdam

Nieuw Terbregge is separated from a major highway by a hill containing well kept and controlled polluted sand. This hill is developed into a linear park, from which one can overlook the highway and the buildings.

landscaping – existing waterfront

On its north border Nieuw Terbregge faces dykes of the Rotterdam river Rotte.

INNOVATIVE ENERGY TECHNOLOGIES

Active and passive solar systems

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 the houses and 6 m2 solar collectors contribute to the energy demand of space heating and domestic hot water.

Design integration heat delivery station

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.
Several solutions of planning and design integration are demonstrated in Nieuw Terbregge, Rotterdam.

Small scale combined heat and power

Small scale combined heat and power (chp) units are placed 'in cascade', so that the heat load is optimised. 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.
Combinations 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.
The heat delivery stations are developed, managed and maintained by the utility company.

High-insulating glass (U-value of 1.0 W/m^{2}K) and appropriate insulation levels (U values below 0.3 W/ m^{2}K) have been applied to minimize the heat demand.
The City of Rotterdam also 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 RE-Start 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 currently under development.

CONCLUSIONS
The RE-Start Rotterdam project Nieuw Terbregge demonstrates the how innovation can be achieved on the scale of the development of an area of 860 houses. The project serves as an example for the 10,000 's of houses Rotterdam shall build in the near future.

Site visit of Rotterdam alderman

Commercially valid
The project developer experienced how commercially valid the project was. Their policy to use urban, architectural and technical quality as a benchmark allows the integration of energy issues. New project initiatives already build on the RE-Start Rotterdam project experiences.

Monitoring and evaluation results shall become available by the end of 2001 when the full project is in use for over a year.

References:

1. More information on RE-Start can be found at www.resetters.org