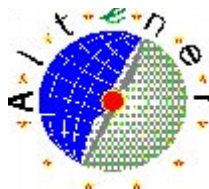


# RESET

**T**he aim of this project is to study and propose global strategies, tools and guidelines that will promote the efficient and cost effective global implementation of Renewable Energy Sources systems and techniques in new-build settlements in Europe. The specific objectives of the project include the combination and adaptation of scientific and technological knowledge with best engineering and architectural practice in order to study, develop, propose and disseminate global actions on the integration of RES systems and techniques in new-build settlements, the development of tools for best practice and economic efficient development and management of new-build settlements, the study of the existing legislative framework on the implementation of advanced RES systems and techniques in settlements, the assessment of five case studies on the global integration of RES in settlements planned to be constructed in Europe, the integration of the results and conclusions into a set of design guidelines for managers and designers of settlements, urban sites and utilities.



# RENEWABLES

## BALLTORP HOUSING DEVELOPMENT. SWEDEN

The housing development is located in the city of Molndal, close to the city of Gothenburg on the Swedish west coast. The project is a part of a major development of in totals 2000-3000 dwellings which is going to be realised during a 10 year period.

The project comprise 100 dwellings with mixed single family, semi-detached, linked and terraced houses in a former agricultural and forest landscape in the south-east part of the development. A golf course is presently under construction. Buildings will be designed with high standards regarding bioclimatic design, energy consciousness, sustainable building and healthy building materials.



Land owner: City of Molndal  
Developer: SKANSKA Sweden  
Area: 60 600 m<sup>2</sup>  
Latitude: 57,4 N  
Location: Molndal, Sweden  
Contact: Christer Nordstrom Architects (cna), cna@cna.se



## THE SOLAR SETTLEMENT IN FREIBURG

Location: Freiburg, SW Germany, 48°N, 7°E.

Project: Six multi family houses, 90 units (80% housing, 20% workspace)

Aims: Minimised energy demand, highest comfort, extra costs < 10%  
Contact: - The German partner of the RESSET-Project:

WIP-Munich, Mr. C. Epp, .....

- Developer, Architects, Author of the Case Study:

C/O Forum Vauban e.V., Mr. J. Lange and Mr. P. Spaeth, ...

In the south of the City Freiburg (200.000 inhabitants), located in the South-West corner of Germany, a new district (42 ha) is being developed for 5,000 inhabitants and will be completed in 2006. The new district is called "Quartier Vauban" after a French army barrack site on the same place, that was abandoned in 1992.

The Project "Solar Settlement in Freiburg" aims to erect six buildings with altogether 90 units for mixed use (ca. 80% housing, 20% workspace) in the North-Western corner of Quartier Vauban. The six multifamily houses will provide four storeys plus basement and will be of compact shape and in good exposition to the sun.

In consequence with the overall idea of a sustainable model city district, the building project "Solar Settlement Freiburg" follows the vision of a sustainability which is understood as social and environmental innovation.

The aims of the development are to provide housing with a minimum of energy demand for heating, high liv-

ing quality and fitting best into the neighbourhood and given infrastructure - while at the same time minimising the extra costs in relation to standard buildings to a minimum.

A team of architects and engineers, specialised on modelling low energy houses and solar gains, has been invited by a group of private investors to plan the six buildings.

The project is aiming to integrate

a) a maximum in reduction of CO<sub>2</sub> Emissions (80% compared to standard buildings)

b) with highest cost effectiveness (less than 10% additional costs (average + max. 150 Euro/sqm)

A profound cost benefit analysis helps to define the most cost effective ways of CO<sub>2</sub> reduction - i.e. measures that have a pay back time of less than 20 years.

To reach the CO<sub>2</sub> reduction targets, various innovative modules are



combined, namely:

- Optimised building envelope: Building in Passive House Standard with a heating demand of less than 15 kWh/m<sup>2</sup>\*a; optimised design concerning shading in summer and daylight in the building.

- Very detailed planning: and measurement programme to reduce heat leakage, extra insulation of tubes to reduce heat allocation losses.

- Active use of solar Energy: Solar thermal plant (46 m<sup>2</sup>) for hot water (100% in summer) Building integrated PV devices (combining shading, shelter and electricity production).

- Innovative heating system: Air conditioning with heat recovery (80%), Provision of the remaining heat demand with a decentralised CHP device (natural gas).

- Additional measures: Combined set-up of living and working space reducing the mobility need of the residents.

This overall set-up will bring an 80 % of reduction to common standard in the categories: energy demand for heating, hot water and electricity within the given financial framework (less than 10% additional costs).



## RESIDENTIAL "POU DEL MERLI". SPAIN

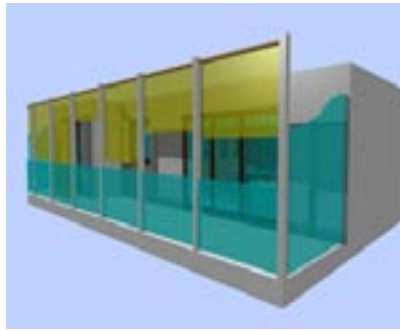
**P**ou del Merli residential area is located in the town of Martorell, 20 km from Barcelona, in Catalonia.

Martorell is a first residential area and an industrial town with a population of 22.500 inhabitants and a surface area of 12.9 km<sup>2</sup>. Surrounded for a highway in the south, seat factory in the north, and is projected a new principal road in the west. There is a small pine forest and hillock in the north.

The climate is Mediterranean, but 30 km from the sea, with some days of the year below 0 °C, the average wind speed of 2 m/s in dominant west direction, 66 % of average relative humidity.

The project comprises 120 dwellings, divided in 75 paired houses in file (18 units of 4 houses and 1 unit of 3 houses) and 45 social rent flats in 2 blocks, in an area of 18.000 m<sup>2</sup>.

Microclimate aspects are considered in two areas: one area of minimum of 60 % of the land is going to be preserved for vegetables gardens and parks (trees and a two big ponds to refresh hot south air in the summer), and a constructed area through the use of caduceus trees in south orientation to avoid solar gains in summer and take profit in winter, and perennial trees in north and east to avoid high way noises and winter winds.



The project chose south slope orientation with the aim to of integrating the buildings into the environment while rationalising solar contributions and the typical winds in the area as much as possible (not dwelling with only north face). In the way to take profit of solar energy the main material used on the outside face of walls is thermo-clay, a low-density type of delftware with remarkable properties relating thermal insulation and energy storage capacity. The building also envisaged the layout and the area of balconies and windows in order to avoid an indoor temperature rise in the flat due to excessive solar radiation. Therefore, most of the windows are located in the south façade and their size is conceived for suitable year-round use in agreement with the inner area of influence. Fixed and dynamic solar protections on the façade and mobile ventilation systems are also used as control devices for natural light

and ensure a good thermal behaviour. In the case of windows, a SAV design -Solar, Acoustic and Ventilated- contributes to air-condition the dwellings by introducing or expelling hot air according to the time of the year, in addition to saving energy, easing air renovation and preventing humidity-related problems, being the system managed by a central computer s in which residents will be able to monitor their energy consumption.

The project contemplate two scenarios for the heating and cooling: one centralised district heating and cooling with a 1000 m<sup>2</sup> solar field and 4 microgeneration of natural gas, or a decentralised system of one high efficiency boiler for each group of 4 paired houses and each residential block.

Other aspects of the urbanisation is the use of ecological materials (paints, varnishes, building materials without PVC), efficient water cycle (low consumption systems and use of rainwater) and reduction of energy impact of mobility (streets and car park efficient designs).

Project management organisation is centralised in a building joint the solar field for management of district heating, water treatment, waste management and maintenance of gardens and parks.

## Overview-Introduction

**T**he municipality of Kekropia has remised to DEPOS an area of 548.422 m<sup>2</sup> for the construction of a village named "Roumeliotiko". The aim of the Greek government is the conservation of the Greek cultural identity. The responsibility for the planning



and the construction of the creation of the village "Roumeliotiko" was taken by the Ministry of Public Works and Department of Public Housing Organisation. Greek government offers these houses to people that have migrated Greece and are returning. DEPOS aims to give emigrants the opportunity to buy an environmentally friendly house at low cost.

The aim of the project is to propose economic solutions, friendly to the environment. Innovative ideas about the heating, ventilation and cooling, have been applied.

The village "Roumeliotiko" intends to provide:

- Properties of 400 sq. meters area each, containing a vacation house.
- One central plaza of 6.500 sq. meters.
- Athletic centres (football, basket, volley, tennis) of 9700 sq. meters.
- Playgrounds of 2300 sq. meters.
- One cultural centre.
- A church.
- Small shops

State of the art applications will be incorporated in the areas of microclimate, vegetation, building integrated technologies such as night ventilation, district cooling, seawater for the efficient cooling of central chillers, advanced insulation, solar control, advanced glazing and natural ventilation will be employed. Solar assisted district cooling will be an integrated part of the settlement.

## Ealing Family RESSET Scheme - West Hendon Regeneration



The scheme is located in north-west London, United Kingdom, approximately 10 miles, or 15 minutes by train, from the centre of London. It is a densely populated part of the city, with a number of important transport routes running through, or very close to it (A5, M1 motorway, mainline trains, inner ring road - North Circular Road).

It is a mixed residential & commercial site to be partly refurbished & partly redeveloped. There are 1572 homes spread over a site area of 8.05 hectares. The proposed scheme includes 315 new homes for rent & shared ownership through the housing association, as well as 233 rented units retained by Barnet Council & over 900 homes developed for private sale.

The development is proposed to be a mixture of multi-storey flats for families & single people/couples, some single-family houses. It will be a mixed tenure development with housing association rented, local authority rented, private housing

for sale & some commercial units for letting.

Building Integrated Renewable Energy techniques being considered

- Active Solar DHW systems

We are looking at 3m<sup>2</sup> collectors, either flat plate or evacuated tube, integrated into the roof structure on free south facing elevations of houses & blocks of flats, with the expectation of delivering around 1800 kWh per year per unit.

The market for solar for pre-heating DHW is relatively more established in the UK than for PV & the site layout & south/south-westerly orientation make this a particularly attractive option as a renewable energy source on West Hendon.

- PV systems

Proposed for communal safety & feature lighting. Lighting to communal areas will also be boosted by passive systems such as sun pipes, light wells & light trays.

In the UK roof mounted PV panels

can generate sufficient power for most of the summer domestic needs for the individual home they supply. Even if homes are not fitted with PV at present, they should be designed to cater for retrofit at a later date.

On the multi-storey apartment blocks the roof could accommodate an array of PV panels to produce electricity to provide communal lighting throughout the block, in communal areas & where landlord supplies are required. A modest stand-alone system could be provided on a number of blocks to provide safety & feature lighting.

Open green spaces and improve air quality

West Hendon benefits from the proximity of the Welsh Harp lake and York Park. Maximising and opening up green spaces and access to these areas will improve the well being of the community. Furthermore green spaces offer a major opportunity for the protection of the existing site ecology and for enhancing and creating new habitats.

## PARTICIPANTS

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