Casale Monferrato is an ancient city in North Italy, built around the 11th century. Ronzone district is mainly characterised by private residential houses, built at the beginning of 1900 as a consequence of the expansion of Casale due to the settling of the first cement industries in North Italy. The industrial settlement of Ronzone covers an area of 200,000 m2. The main street gives a clear idea why the city of Casale was named "the White City": in fact, it crosses two continuous lines of cement factories and from their size one can understand the amount of workers once employed, with enormous risk for their health and for the public health.

Ronzone is the district hosting the cement-asbestos industries (ETERNIT), and the other cement industries of Piedmont. Now the area has been reconditioned, with an important building renovation programme to start.

Beside the private housing stock, most of the building infrastructure belongs to the private industries headquarters and abandoned factories. In addition is a limited public housing stock, belonging to the Municipality and to the Housing Association.

The very conventional energy supply includes gas and electricity network, in addition to oil products. The still operating cement industry is a large consumer of electricity.
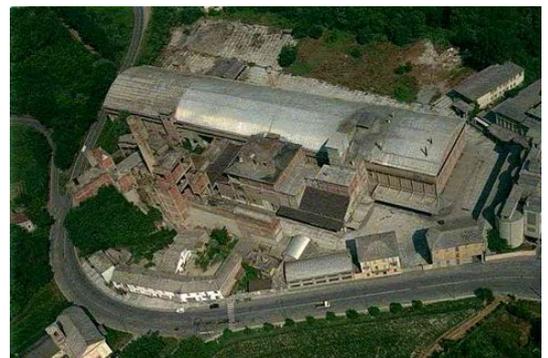
Demolishing and replacement schemes

The abandoned factories, after demolition, are replaced by an eco-village, integrating a large number of eco-technologies: bioclimatic design, passive solar, PV modules, biomass heating system on the village scale, water conservation and recovery for irrigation, use of recycled materials for basements, in order to meet the high performance standards requested by an eco-settlement

Planning of the restructuring

Making a mixed-use area with dwellings and facilities for the local community. The plan consisted of the following:

- the creation of a natural park in place of the former cement-asbestos factories (Eternit)

- refurbishment of the Ronzone main street housing, with application of energy label concepts and financing schemes

- development of a new residential eco-village (61 detached dwellings)

- refurbishment of a court housing block owned by the city and managed by the housing association

- refurbishment of an old building hosting a riverwater pumping plant, landmark of the district, to be used as "Community Centre"

- development of a passive solar school for children, as a revitalisation step for the district

- creation of a sustainable energy system at the district scale, with use of biomass (eco-village), small hydro (old riverwater pumping plant), solar and passive (kindergarden)

- new main street with cycle-lane and riverside walk

- remodelling of waste management in the area, with pre-selection, underground storage, organised collection, information campaign

Use of calculation models

Two calculation models are used:

- the "TEP Model", for modelling the residential energy consumption of existing building stocks. This was developed under a EC-DG Tren Contract for modelling the energy consumption of the residential sector of the Umbria Region in Italy.
- the "Energy&Building Model", for modelling the energy consumption and saving, including passive contributions, of residential buildings, following the italian codes.

A Scenario Workshop and a Design Workshop have been performed on site for the preliminary planning. Other methods are adopted to focus on specific issues: the eco-village, the passive solar school, the renovation of the old buildings, the district energy system:

Expected potential of CO2-reduction

The potential CO2 reduction is variable in relation to the different building stocks. For the new **eco-village**, the planning consists of saving the 100% of CO2 emission, by adopting a 100% renewable energy system: passive solar, PV, and biomass heating system. Considering the existing building stock, the forecasted rate of renovation and the energy conservation goals, the potential CO2 reduction could reach the 40% of current emission.

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