Solar village in Pefki

The Solar Village Programme has been implemented within the framework of the Agreement on Scientific and Technical Co-operation between the competent Ministries of Greece and Germany. A housing project of the Greek Workers Housing Organisation in Pefki (a suburb in the Athens area) was selected as a suitable large scale project for the implementation of the Solar Village Project. It consists of 435 apartments in 30 buildings, an energy centre, a solar information centre and a commercial and community centre, as can be seen in the aerial view of the village (fig. 1).

Figure 1: View of Solar Village in Pefki

The program comprised of 3 phases:

a) The design phase (1979-1981)

b) The construction phase (1984-1988)

c) The evaluation phase (1988-1991)

The total cost of the project amounts about 22 millions Euro.

Technical data

Because of the scientific research character of the project, several active and passive solar systems were included, with the aim to reduce the energy consumption for space heating and domestic hot water preparation. Some of the systems used are the following:

Space Heating:

- High performance (vacuum tube) solar collectors with oil back-up
- Same solar collectors with inter-seasonal storage (insulated water tank) and oil back-up
- Air solar collectors with electrical back-up

- Central air-to-water heat pump, oil-fired with heat recovery and oil back-up for 230 apartments in district heating
- Decentralised electrically driven air-to-water heat-pumps with oil back-up
- Passive heating (Trombe-walls of different types, greenhouses) with electrical back-up

Domestic hot water heating:

- Flat-plate solar collectors with central storage (per building), oil back-up in winter and electrical back-up in summer
- Individual (per apartment) thermosyphon solar heaters with electrical back-up.

The buildings are heavily insulated (10 cm polystyrene), facing south, and of various heights (from 2 storeys to 6 storeys). There are apartments of 60 m^2, 70 m^2, 80m^2 and 100m^2.

Sociological aspect

The basic concept of the Solar Village Project - which lay in testing the solar energy systems under conditions of real social life in an inhabited settlement - and not under laboratory conditions - objectively lent in a significant inherent social character: Its main working hypothesis being that the energy systems installed could satisfy the inhabitants' needs for heating and hot water implied that the efficiency of the energy systems and the saving of energy in general in the Solar Village would in practice depend on the acceptance and rational use of the systems by the resident-users.

This working hypothesis at the same determined the main objective of the sociological part of the Solar Village Research & Demonstration Programme: to measure and evaluate the degree of acceptance and rational use of the applied energy systems by the inhabitants.

To cover the entire range of duties which had to be carried out within the framework of the sociological part of the Solar Village Project, two different fields of activity were distinguished:

a) Social interventions to ensure the quality of social life and the environment in the community.
b) Measurements and evaluations of the social parameters in the village.

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