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Week No 4 ENVIRONMENTAL MANAGEMENT IN THE PUBLIC SECTOR
Athens, Dec. 1997

Cost Efficient Zero Energy Houses as Mediterranean Standard

What is the subject

The aim of my project is to design and to develop a Zero Energy House adjusted to the climatological conditions of Mediterranean in order to persuade people that houses with no space heating or cooling are also cost efficient. The site, where it will be implemented, will be in the Island of Thasos at the North Aegean.

Zero Energy Houses are buildings in which a comfortable climate can be achieved without an active heating and air-conditioning system. To permit this, the specific annual demand for space heating must be kept lower than 15kWh/(m2a), and the total final energy demand for space heating, domestic hot water, ventilation and household electricity must not exceed 40 kW/(m2a). This forms the basis to cover the remaining energy requirement totally by Renewable Energy Sources.
In low energy houses the total energy demand is among 150 and 100 kWh/(m2a) and at the rest of the buildings about 200 kWh/(m2a).

The main objective of the Zero Energy House is to be a simple solution without any expensive components. The cost of such a building will not be higher than 20% of the cost of a normal house and the payback period no more than 15 years in order to be competitive in the building market and not just a research project.

The problem

Today most buildings are built without energy assessment concerning energy efficiency and energy is lost in high consuming buildings. Even low energy houses which have appeared on the building industry in previous decay are not enough efficient as Zero Energy Houses. The total demand for energy in a Zero Energy House is equal with the demand of energy just for space heating in Low energy houses and the total cost of the building could be the same in both cases. Even it is a cost effective and environmental friendly way of building needs a lot of efforts from engineers to inform the public and to promote the zero energy house with or without the support of the governments.

The actors

The actors will be the customers which they have to be persuaded, the engineers which they have to be informed through conferences, the construction companies to co-operate and the government which has to implement new regulations and standards in order to promote the proposed model of building.

Possible scenarios could be the following:

1. Zero Energy House is not only Mediterranean standard but European. Thousands of Zero Energy Houses are built all around Europe and the power which is supplied to them is from Renewable Energy Sources. Renewable Energy Sources covers the 30% by the year 2020 of the power production in E.U. and no Nuclear energy is needed any more.
2. Only parts of the technologies of the Zero Energy House are implemented in low energy Houses.

3. Zero Energy house remains just a research project but influence positive the European Commission to set new standards for insulation in buildings and energy assessment is required for every new building.

4. More projects are built in the whole Mediterranean and the rest of the Europe, Public is informed for Zero Energy Houses and demand from the engineers to build Zero Energy Houses

5. Zero Energy Houses are sponsored and supported from the European Commission and the member states through finance programmes in order to decrease Green Houses emissions.

6.Zero Energy Houses are not widely implemented but set new standards in Energy consumption in Buildings.

7. Zero Energy House remains just a research project and houses are built with just a few reduction in energy consumption.

The criteria will be the following:

1. Public acceptance. It is difficult to persuade people that no heating or cooling system is required in this building
2. Education for the public and for the engineers
3. Cost is the main criteria in building industry
4. technological feasibility
5. Impacts to the environment
6. Climatological conditions
7. Legislation feasibility
8. Co-operation of the member states
9. Behaviour of the consumers
10.Finance programmes in order to support the Zero Energy House only at the beginning
11.Payback period