

## 283 - The Implementation of the Regulations on Solar Collectors at Buildings

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The increase of solar energy use constitutes a great concern of national and international bodies, as a result of a strategic policy towards green energy consumption. The Portuguese regulations on building thermal behaviour and energy efficiency, recently enacted by the Portuguese Government, in line with the European Union Directive 2002/91/CE, have introduced the obligatory use of solar collector technology for hot water production integrated with the conventional energy solutions, applied to new building projects and to some retrofit works. To cope with the prescriptions of this regulation, the solar technology market is growing rapidly and has just started a new period of solid implementation. The existent solar systems need to be improved and new ones must be developed. Therefore, the Portuguese designers and construction professionals face new challenges on dealing with this new legal framework.

These thermal regulations establish, as an important parameter, the solar collector surface for each household of a building thermal zone but do not specify about the system efficiency and the particularities of each climate zone. This measure, recognised as a government policy effort to increase solar energy use in Portugal, can bring some questionable situations about the viability and return of a solar collector investment.

Other problems faced actually are the lack of a mandatory project design for solar systems and also some difficulties on the compatibility between these kinds of systems and the building water distribution project design. In addition, Portuguese Civil Engineers are one of the legal responsible professionals for doing this type of project design but the majority of the Institutions of Higher Education in Portugal still do not provide the required competencies in these subjects.

The purpose of this study is to identify and analyse the major problems and initial impacts of the obligatory implementation of solar collector technology in buildings and provide some contributions to improve solar energy use in the future.

Using the computer program *Solterm*, developed by the Portuguese R&D institution INETI, obligatory by law, a number of different simulations were made, using only the collector surface imposed by regulation or in other case using other parameters related with the collector's efficiency. There were considered, for example, some climate scenarios, the different year seasons and even the possibility of obstructing or rotate part of the panel.

The results demonstrate that following only and strictly the collector surface prescript by regulations, we can get an excessive collector surface in summer, with an energy dissipation problem. And in many situations, the solar collector is not contributing with the green energy we pretend initially. This probably calls for the implementation of some control and management measures during the life time of the solar collectors, especially in summer, to guarantee the durability of the system, a better efficiency and therefore turning this investment profitable.

The main implications of the study are that the project designers are struggling to adapt to regulations and to a new methodology and they are looking for training to know how to deal with this technology.