

Solar thermal legislation on municipal, regional and national level in Spain

Success and remaining barriers

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Introduction

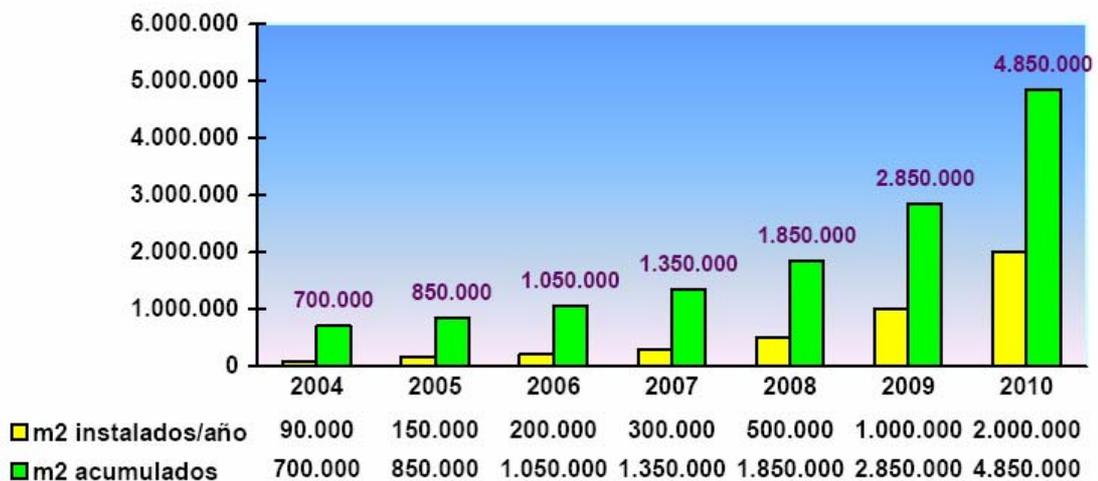
The solar thermal ordinance adopted by Barcelona City Council in August 1999 was the first in Spain. It made the installation of solar thermal energy systems mandatory for most new buildings and those undergoing major renovation. Since then, so many Catalan municipalities have followed this very successful example that by the end of 2005, already more than 50% of the region's citizens lived in municipalities with a solar thermal legislation. In parallel, the "Barcelona model" was adopted by other cities as Madrid or Seville. In February 2006, the Catalan Government adopted the so called Decree on Eco-efficiency, obliging all new buildings to install solar thermal energy systems. The Spanish transposition of the European Building Performance Directive (2002/91/EC), in force since September 2006, also includes the compulsory installation of solar thermal energy systems in new buildings.

Success of solar thermal legislation

The local initiative of Barcelona City Council making installation of solar thermal systems compulsory in new buildings resulted in extraordinary growth during the first years following introduction. Market penetration increased from 1.1 m²/1,000 inhabitants in summer 2000 to 20.7 m²/1,000 inhabitants in December 2005, roughly equivalent to a 2000% increase in just over five years, and nearly reaching the European average of installed collector area per capita. Concerning the distribution among the different building sectors, it can be stated that approximately 60% are residential blocks, 20% are hotels and 10% are sports facilities. Similar developments took place in lots of other Spanish municipalities that followed the "Barcelona Model". This success encouraged Barcelona City Council to revise the Ordinance in 2006 enlarging the number of construction types affected by the ordinance, so that – like in the national and regional building regulations – all new buildings must now comply with this legislation.

Ambitious objectives and market potential

Concerning the development of the solar thermal energy sector in the coming years and its contribution to increase the share of renewable energies in the overall energy consumption, both the Spanish as the Catalan Government have fixed ambitious objectives. The national target is of nearly 5,000,000 m² installed collector area in 2010, equal to far more than 50% annual growth for the coming years.



Graph 1. Solar thermal market development in Spain 2005-2010; Source: ASIT

Based on the existing legislation on the three mentioned levels – national, regional and local - and specific support activities, only for Catalonia, the regional governmental target foresees growth from the existing 90,000 m² installed collector area at the end of 2005 to 1.25 million m² in the year 2015, mainly in the residential sector.

Although the development of the last ten years is not expected to continue at such a high rate, the building sector has been the motor of the Catalan and Spanish economy for many years. By way of example, 812,000 new apartments were built just in 2005. Taking into account the mandatory installation of solar thermal energy systems in any new building and the increasing need for refurbishment in the housing sector, if the sector is able to meet the huge demand, the growth potential of the solar thermal energy market described above may even prove to be an underestimation.

Regional strategies / support to overcome remaining barriers

However, there are still important barriers to overcome which may slow down this possible take-off. These include continuing general lack of information concerning solar thermal energy systems among the actors of the building sector and the general public. Furthermore, although there is increasing interest among conventional installers and plumbers in acquiring knowledge on solar thermal, trained craftsmanship and especially those with experience in monitoring and maintenance programmes to guarantee the thermal energy

yields over the lifetime of the installation are still rare. At the administrative level, although a huge number of municipalities now have a solar thermal ordinance, the integration of the installations as an architectural element is still unusual and quite often parallel building ordinances oblige the installation to be located out of sight from the street so as not to disturb the visual perception of the overall urban landscape. Finally, the existing national procedure to certify the quality of solar thermal equipment – a compulsory requirement to receive public subsidies for installing a solar thermal system – does not facilitate either the introduction of foreign companies into the Spanish market or the commercialization of new national product developments.

With the aim of overcoming or at least significantly reducing some of these barriers, the Catalan Energy Institute (ICAEN) has undertaken a huge number of different activities in recent years, from general awareness building campaigns to specific support lines for research and development of new solar thermal applications. In order to improve the quality of the installations, special training material and programmes for installers have been designed and used in fact-to-face and on-line courses offered in collaboration with professional associations of the sector. To strengthen the municipal level, two years before the approval of the new building code (CTE), a solar ordinances support centre was created to help identifying possible difficulties in the implementation of existing local solar ordinances and to promote the development and adoption of new ones. Another very successful initiative is the Solar Schools Network that, at the end of 2006, included more than 100 educational centres with a total solar thermal collector area of 1,500 m² and several hundred kW_p fotovoltaics, monitored and with real-time published energy yields available via internet.

Another important fact to mention is the economic support to solar thermal energy systems by annual subsidy schemes, despite the mandatory introduction in the frame of the new Spanish Building Code CTE. In this sense, in 2006, nearly half of the overall budget of 5,000,000 € subsidies for renewable energy systems was allocated to solar thermal projects. The maximum subsidy was fixed at 37% of the investment costs, equivalent to approximately 260 € to 300 € per m² collector area, but innovative projects as solar cooling, solar thermal for process heat in industry or the promotion of Energy Service Companies (ESCOs) selling solar heat were eligible for substantially higher subsidies in order to facilitate the market introduction of these technologies or business models.

The demonstration project “CAP Roger de Flor”

Another important activity of the Catalan Government to promote solar thermal energy consists in giving maximum publicity to systems installed in public buildings, such as hospitals, schools, community centres or administrative buildings. A perfect example for this policy is the new built health centre “CAP Roger de Flor” in the city centre of Barcelona, which is one of seven demonstration buildings for energy efficient building design in the frame of the European Commission co-financed project SARA (“Sustainable Architecture Applied to Replicable Public Access Buildings” –

contract nº 503694), under the leadership of Universitat de Barcelona, aiming at cost effective, high energy performance, public-access eco-buildings.

The centre was designed with a holistic approach concerning the reduction of the overall energy consumption, taking into account the embodied energy of construction materials as well as the energy demand during the use of the building. In this sense, the building's envelope is highly insulated avoiding thermal bridges, well shaded, and includes a central patio to increase natural ventilation and day lighting of the interior spaces. An innovative cooling and heating system designed around radiant ceiling panels and a dehumidification system based on lithium chloride should reduce energy consumption for space heating and cooling by about 25%.

24 m² of unglazed solar collectors AS (Energie Solaire SA) on the roof top are installed to meet at least 60% of the demand for heating domestic water. The monitoring and building management system (BMS) allows the solar thermal energy yields and contribution to the domestic water heating to be controlled, monitored and visualised graphically in real-time. This information will be available on the project's web-site: www.sara-project.net and also used in training and education activities. With the experience from the Solar School's Network, the online availability of real data has shown an increased interest in renewable energy technologies and is considered a useful tool for raising awareness. Information on the project and the performance of the renewable energy systems will be also projected on the large-size screen installed in the entrance of the centre to attract public attention.



Conclusion

Solar thermal legislation has been shown to be an excellent tool for pushing a take-off of this renewable energy technology in the market at local, regional and national level in Spain. Nevertheless, a number of accompanying measures, from dissemination activities to specialized training of professionals, are necessary to build awareness and ensure the quality of the installations.