Available online at www.sciencedirect.com
ScienceDirect
Renewable and Sustainable Energy Reviews
11 (2007) 2166–2178

RENEWABLE & SUSTAINABLE ENERGY REVIEWS

www.elsevier.com/locate/rser

The use of solar energy in the buildings construction sector in Spain

Javier Ordóñez García[a,*], Eulalia Jadraque Gago[a], Javier Alegre Bayo[a], Germán Martínez Montes[b]

[a]*Dr. Ingeniero de Caminos, Canales y Puertos, Department of Civil Engineering, ETS de Ingenieros de Caminos, University of Granada, 18071 Granada, Spain*
[b]*Dr. Ingeniero de Caminos, Canales y Puertos, Proyectos de Ingeniería, Departamento de Ingeniería Civil, ETS de Ingenieros de Caminos, University of Granada, 18071 Granada, Spain*

Received 10 March 2006; accepted 24 March 2006

Abstract

The recent commitment made by many countries to combat the harmful effects of fossil fuel energy has centered world attention on the implementation of policies geared towards an optimal energy performance and the use of renewable energies. The construction of buildings with sustainable energy systems necessarily plays an important role in such policies, given the fact that in 2005 more than 800,000 housing units were constructed in Spain, a country with more than 2500 h of sunlight per year. This article reviews the European and Spanish legislation regarding construction and renewable energies. Within this context, a description and analysis are given of the progress made by the construction sector in the implementation of new energy-related technologies with special emphasis on solar energy.
© 2006 Elsevier Ltd. All rights reserved.

Keywords: Solar energy; Construction sector; Building

Contents

*Corresponding author. Tel.: +34 958 24 94 38; fax: +34 958 24 61 38.
E-mail addresses: javiord@ugr.es (J.O. García), eulalia.jadraque@sgs.com (E.J. Gago), fjalegre@ugr.es (J.A. Bayo), german00@ugr.es (G.M. Montes).

1364-0321/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.rser.2006.03.010

1. Introduction

In the last five years there has been a spectacular construction boom in Spain. According to the National Association of Architects,[1] the number of new housing units in this period has doubled, going from 400,000 in 2000 to a record 800,000 in 2005.

Because of its geographic location, Spain has over 2500 h of sunlight per year, and is the European country with the third highest quantity of photovoltaic power, amounting to 11.7 MW p in 2004. However, when it comes to using solar energy for domestic activities such as heating water, Spain lags farther behind, only ranking eighth. This fact is significant because domestic energy use is intimately related to the construction sector [1]. Spain's low ranking here means that the country still has a long way to go to fully benefit from this type of energy, and that greater use should be made of solar power in the design and construction of houses.

It is our assertion that in a national context in which there is a record-breaking number of new housing units built every year, it is crucial to see exactly how the issue of energy supply is presently being dealt with. The construction boom in Spain also comes at a time when an increasing number of voices are being raised in favor of the development and construction of sustainable housing [2].

There are a wide range of possible measures that could be taken to foment the use of renewable energies [3]. One possibility would be to oblige architects and developers to include a set of minimum requirements for efficient energy use in the project designs of new buildings, as well as to inform the purchaser and/or client of the contents of European Directive 2002/91/EC on the Energy Performance of Buildings [4].

In this article, we analyze European and Spanish legislation that regulates the use of renewable energy in the construction of housing developments. We emphasize the fact that the legislative framework regarding construction will soon experience significant modification in the near future with the passing of the *Código Técnico de la Edificación*[2] (CTE). The purpose of our study is to review the European and Spanish legislation concerning construction and renewable energies [5], as well as to describe the progress made by the construction sector in the implementation of new energy-related technologies with special emphasis on the use of solar energy.

2. Solar energy in Spain

Spain is located in the south eastern part of Europe (see Fig. 1). More specifically, it is situated in the temperate zone between latitudes 43°47′24″ N (Estaca de Bares) and

[1] In Spain this type of professional association is known as the *Colegio de Arquitectos*.
[2] Technical Building Code.

Download English Version:

https://daneshyari.com/en/article/1752332

Download Persian Version:

https://daneshyari.com/article/1752332

Daneshyari.com