

# ***THE TECHNICAL BUILDING CODE (TBC)***

## ***SPANISH EXPERIENCE***



*Andrés Paredes*  
*Solar Department*  
*Institute for the Diversification and the*  
*Saving of Energy (IDAE)*

1. INTRODUCTION
2. EVOLUTION AND PRESENT SITUATION
3. LESSONS LEARNED FROM THE APPLICATION OF THE CODE
4. CONCLUSIONS



# 1. INTRODUCTION

## THE TECHNICAL BUILDING CODE

IN MARCH 2006 THE SPANISH GOVERNMENT ADOPTED A NEW CODE.

It established a new regulatory framework for buildings and defined basic requirements of quality, security and living conditions.

THE CTE ESTABLISHES SIX BASIC QUALITY REQUIREMENTS FOR BUILDINGS:

DB-SE: Structural Safety

DB-SI : Safety in case of fire

DB-SU: Safety of use

DB-HS: Hygiene, Health and Protection of the environment

DB-HS: Protection against noise



DB-HE: Energy Saving and thermal isolation

# 1. INTRODUCTION

## THE DB-HE DEFINES FIVE BASIC REQUIREMENTS FOR ENERGY SAVING

Basic Requirements HE1: Limitation of energy demand

Basic Requirements HE2: Efficiency of thermal installations

Basic Requirements HE3: Energy Efficiency of lighting installation

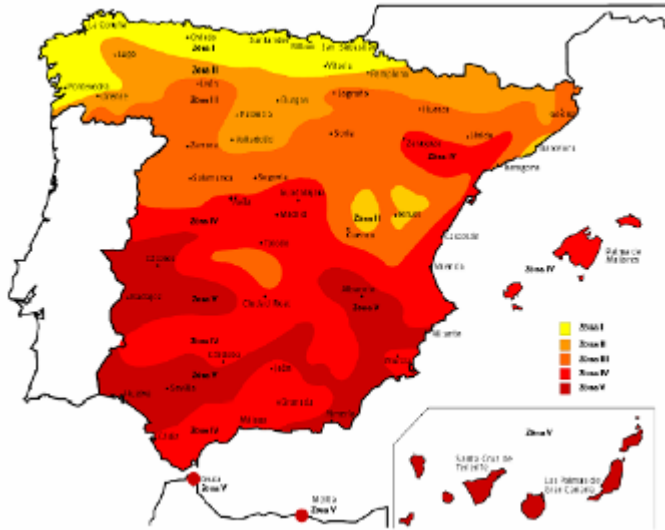
Basic Requirements HE4: Minimal solar contribution for sanitary hot water

Basic Requirements HE5: Minimal photovoltaic contribution for electric power

**HE4 ESTABLISHES THE OBLIGATION TO COVER 30 – 70 % OF THE DOMESTIC HOT WATER REQUIREMENT USING SOLAR THERMAL ENERGY.**

# 1. INTRODUCTION

## CLIMATIC ZONE

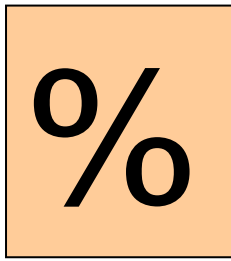


## DHW DEMAND

Demand criterion	Litres of DHWD/day at 60° C	
Single-family dwellings	30	per person
Multi-family dwellings	22	per person
Hospitals and clinics	55	per bed
Hotel ****	70	per bed
Hotel ***	55	per bed
Hotel/Hostel **	40	per bed
Camping	40	per site
Hostel/Boarding house *	35	per bed
Homes for the elderly, student dormitories, etc.	55	per bed
Dressing rooms/collective showers	15	per service
Schools	3	per pupil
Barracks	20	per person
Factories and shops	15	per person
Administrative premises	3	per person
Gyms	20 to 25	per user
Laundromats	3 to 5	per kilo of clothing
Restaurants	5 to 10	per meal
Cafeterias	1	per meal

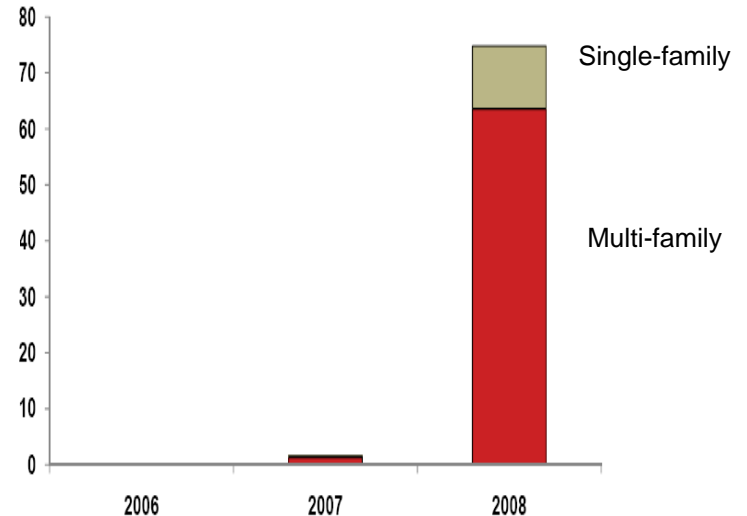
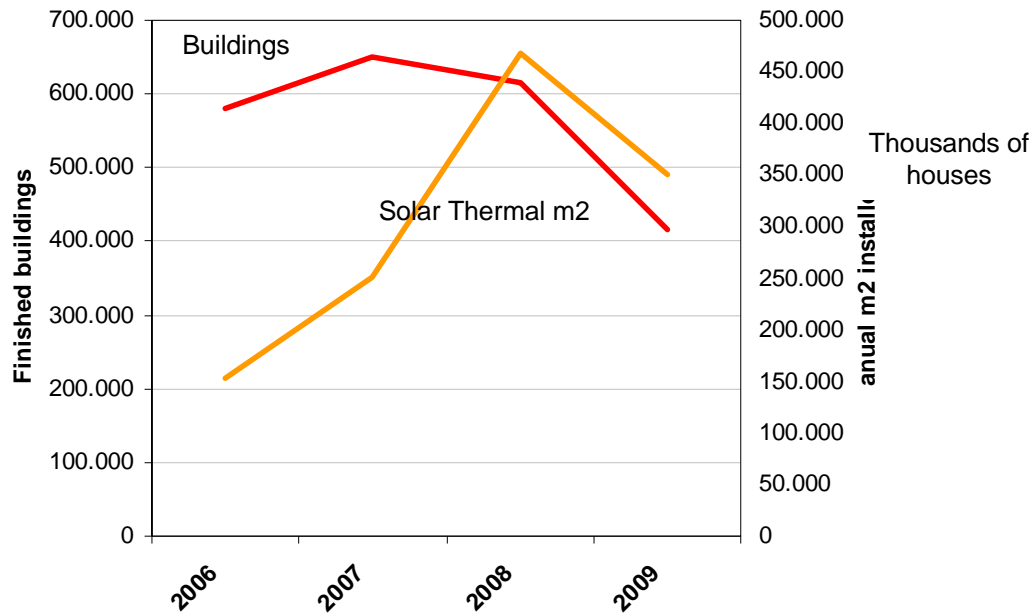
HE 4 also determines the **TECHNICAL CONDITIONS** for building Solar facilities

Total Domestic Hot Water Demand of the building (l/d)	Climatic zone				
	I	II	III	IV	V
50-5.000	30	30	50	70	70
5.000-6.000	30	30	55	70	70
6.000-7.000	30	35	60	70	70
7.000-8.000	30	45	63	70	70
8.000-9.000	30	52	65	70	70
9.000-10.000	30	55	70	70	70
10.000-12.500	30	65	70	70	70
12.500-15.000	30	70	70	70	70
15.000-17.500	35	70	70	70	70
17.500-20.000	45	70	70	70	70
> 20.000	52	70	70	70	70



## 2. EVOLUTION AND PRESENT SITUATION

- The Solar Thermal market **has grown with the growth of the building sector.**
- We have moved from **150,000 m2** in 2006 to **468,000 m2** in 2008.
- The slump in the building sector since 2007 affects the Solar Thermal market from **2009 onwards.**



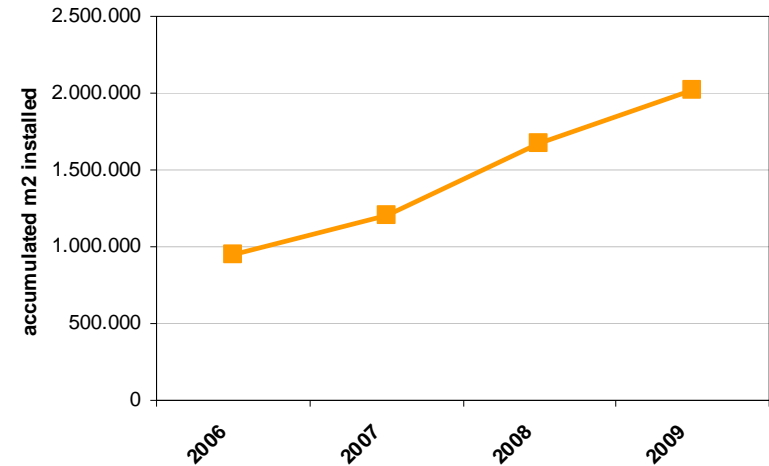
**75,000 domestic buildings directly affected in 2008 by the HE4:**

- 85% were multi-family
- 40% in Barcelona and Madrid

### 3. LESSONS LEARNED

### POSITIVE RESULTS

Since 2006 almost **TWICE THE SURFACE AREA** installed



1. Increase of **Solar Thermal installed surface area**
2. **Reduce the costs** of the solar facilities
3. **Improve integration of the solar facilities** in new buildings
4. Increase the **knowledge of the different technical actors** involved in the different phases of the project.
5. Increase the **knowledge of the users**
6. The general public is **more familiar** with Solar Thermal technology

### 3. LESSONS LEARNED

### NEGATIVE EFFECTS

#### 1. THE PROMOTERS AND USERS NOW HAVE AN **OBLIGATION TO BUILD SOLAR FACILITIES**

**PROMOTOR:** Lack of interest in the final use

Low investment costs causes deficiencies in the design and the installation of the solar facilities

**USER:** He is an obligated user.

This causes insufficient monitoring and maintenance. (ignorance of the benefits and costs).

#### 2. LACK OF EFFECTIVE CONTROL MECHANISMS IN EACH PHASE OF THE PROJECT

The new norm implies that the promoters are looking for ways to avoid installing the facilities.

It isn't enough to make rules (Laws, Royal Decrees, etc.). It is necessary to help the users from the public administration to claim their rights.

1. **IMPROVE THE KNOWLEDGE** OF ALL THE DIFFERENT ACTORS INVOLVED ABOUT THE POSSIBILITIES OF THE TECHNOLOGY.
2. IDAE WITH THE ASIT COLLABORATION IS MAKING OFFICIAL **SOFTWARE**, TO FACILITATE DESIGN CHECKS.
3. ALLOW USERS UNDERSTAND **WHAT IS HAPPENING IN THEIR FACILITIES**.
  - Awareness about their rights and the economic benefits of the installation
  - Allow subsidies to afford changes in the control system
  - Implement means to facilitate the users monitoring of the energy production

## 4. CONCLUSIONS

## GENERAL CONCLUSIONS

1. **CHANGE THE CURRENT GRANTS** WHICH ARE LINKED TO THE SOLAR SURFACE AREA TO ENERGY PRODUCTION.

Nowadays we are working to create a new regimen of subsidies linked to renewable energy production.

2. FACILITATE FINANCIAL SUPPORT OF FACILITIES IN THE **ESCO 's FRAMEWORK**.

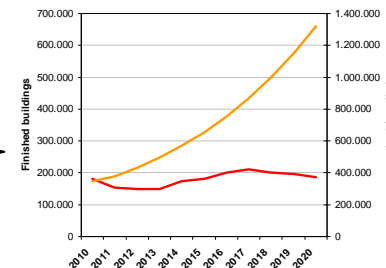
Impulse of ESCO business, financial lines to support it (IDAE has launched the SOLCASA program in may 2010).

3. **LOOK FOR NEW MARKETS:** INDUSTRIAL, SOLAR COOLING, DHC, ETC.

The link of the Solar Market to the building market is limited by the possibility of stagnation.

**TBC POTENTIAL**

**3,4 Million m2**



***THANK YOU FOR YOUR ATTENTION***

***Institute for the Diversification and the Saving of Energy***



***Andrés Paredes***  
***Solar Department - IDAE***