The Barcelona Solar Thermal Ordinance
A local contribution to global sustainability

Barcelona's Solar Thermal Ordinance regulates the introduction of active systems to capture and use low temperature solar energy (solar thermal collectors) in order to produce domestic hot water in buildings and constructions in the township, regardless of whether they are public or privately owned.

The Ordinance was approved in July 1999 and entered into effect in August 2000. The text was later revised and the version approved in February 2006 incorporates various amendments to encourage the installation of solar thermal energy in the city.

BARCELONA
ENERGY AGENCY

Ajuntament de Barcelona

The Ordinance was prepared and approved thanks to the political will of the local administration to promote solar thermal energy in Barcelona. This initiative came about through the active participation of various actors and groups which contributed their experience and knowledge.

- Asociación Española de Empresas de Energía Solar y Alternativas [Spanish Association of Solar and Alternative Energy Firms] (ASENSA).
- Asociación de Promotores Constructores de España [Spanish Association of Construction Promoters] (APCE).
- Asociación de Promotores de Energías Renovables de Cataluña [Association of Renewable Energy Promoters of Catalonia] (APERCA).
- Asociación para la Promoción de las Energías Renovables y el Ahorro Energético [Association for the Promotion of Renewable Energy and Energy Savings] (BARNAMIL).
- Colegio de Administradores de Fincas de Barcelona y Lérida. [Association of Property Managers of Barcelona and Lerida]
- Colegio de Aparejadores y Arquitectos Técnicos de Barcelona. [Barcelona Association of Master Builders and Technical Architects]
- Colegio de Arquitectos de Cataluña. [Catalonia Architects Association]
- Colegio de Ingenieros Industriales de Cataluña. [Catalonia Industrial Engineers Association]
- Federación Catalana de Gremios de Instaladores [Catalan Federation of Installers Unions] (FERCA).
- Organización de Consumidores y Usuarios de Cataluña. [Catalan Organisation of Consumers and Users] (OCUC)
- Administración del Estado: Instituto para la Diversificación y el Ahorro de la Energía (IDAE), Ministerio de Medio Ambiente, Ministerio de la Vivienda. State Administration: Institute for Energy Diversification and Saving (IDAE), Ministry of the Environment, Ministry of Housing.
- Catalonia Regional Government: Departament of Industry and Employment, Department of the Environment and Housing, Catalan Energy Institute (ICAEN).
- Barcelona City Council Departments: Urban Planning, Urban Services and the Environment, Municipal Institute of Urban Landscape and Quality of Life, Municipal Institution of Housing.

The Barcelona Council for the Environment and Sustainability, through its Energy Group, also participated in this revision process.

Scope of the regulation

The terms of this ordinance, revised and approved in 2006, are applicable to the cases in which both following circumstances occur:

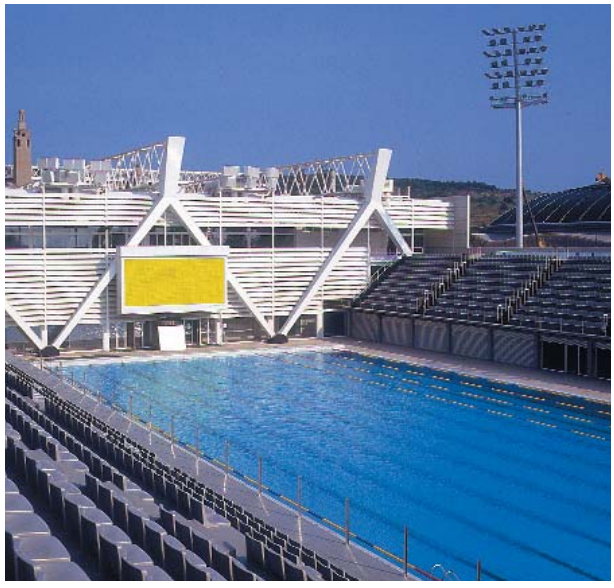
1. In the case of:
- new buildings or constructions,
- complete rehabilitation of buildings or constructions,
- change in the use of the whole building or construction.

2. When the use of the building implies the use of domestic hot water, heating of water to condition swimming pools, or use of hot water for industrial purposes..

In order to determine the scope of the application, it is considered that a building project to promote several buildings with the same or different use is a single project.

The buildings covered by the regulation are those intended for the following uses: residential, health, sports, commercial (in special cases), industrial (if hot water is needed for the industrial process or if showers are to be installed for the staff), and in general any other use that entails the presence of dining rooms, kitchens or collective laundries.

The design and execution of a system to produce hot water with thermal energy must take the following minimum solar contribution into account:
- To heat domestic water: the values specified by the Ordinance, according to the various demand levels (from a minimum of 60%), for a reference temperature of 60°C: general if the auxiliary source of energy is heating oil, propane, natural gas or other gas (general gas), or the Joule effect if electricity is the auxiliary source.
- To heat water of covered swimming pools: 30%
- To heat water for industrial processes, from the temperature of the water network to 60°C: 20%. The heating of uncovered swimming pools will only be allowed with a system of solar energy collection.



With adequate justification, in some cases the contribution level of the solar collector installation can be diminished or it can be exempt from the obligation.

Results of the implementation

The solar collector's surface approved by the Barcelona City Council by December 2005 – 31,050 m^2 (21.7 MWth capacity) - represents an energy saving of over 25.000 MWh/year, and will save over 4,300 tonnes of CO_2 equivalent emissions. The energy produced is equal to the domestic hot water demand of a population of 45,000, or in other words the needs of some 20 health care centres on the order of Barcelona's Vall d'Hebrón (1,400 beds).

By the end of 2005, 20% of the total solar thermal capacity area approved for the buildings covered by the Ordinance had been installed and was operational. This figure is consistent with the lapse of time between the revision of the construction's basic project and granting the building permit, and the time when the building is actually occupied and the solar installation enters into use.

The Barcelona Energy Improvement Plan (PMEB) sets the objective of attaining, by the year 2010, some 96,300 m^2 of solar collectors installed in the city, for an estimated thermal generation of some 778 GWh/year (280,000 GJ/year).

Buildings and surfaces covered by the Ordinance (December 2005)

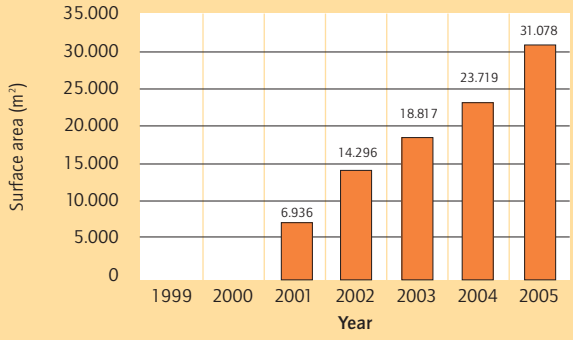
Indicator	Value
Number of Buildings	428
Solar thermal collectors capacity approved	31.050 m^2
Ratio area/population	20,75 m^2/1.000 h
Increase in relation to the solar thermal capacity in operation before the Ordinance entered in force	1.782%
Share of new buildings affected and covered by the Ordinance	**25%**

Potential environmental and economic advantages (December 2005)

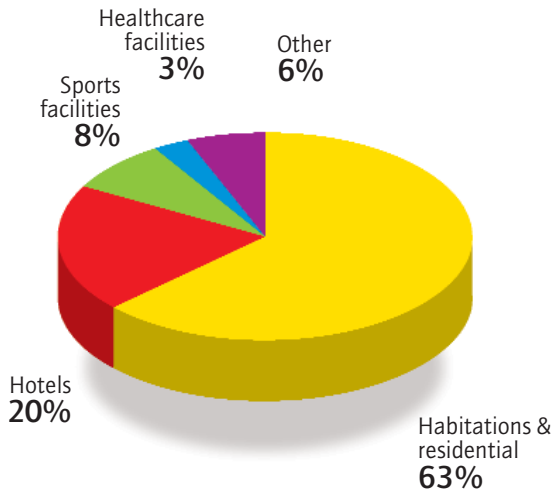
Indicator	Value
Estimated energy production	24.840 MWh/year
Estimated CO_2 emissions saved	4.368 ton/CO_2 eq.
Estimated economic savings	**1.376.150 €**

The progress made thus amounts to a rate of 20,75 m^2 surface installed per 1,000 inhabitants, almost 4,000 MWh of energy produced annually, an economy of EUR 220,000 and some 700 tonnes of CO_2 equivalent not emitted into the atmosphere.

Evolution of the solar thermal collector area under the obligation of the Ordinance (1999-2005)



Solar thermal collector area under the obligation of the Ordinance, by use of the buildings (2004)



The Barcelona Solar Thermal Ordinance, the first regulation of this type to be adopted in a large European city, has been presented to autonomous bodies, local administrations, networks of cities, institutions and various other fora.

It has been used by other municipalities as a basis to draft their own regulations. At present 39 municipalities in Catalonia and 26 in the rest of Spain have followed Barcelona's example and have now adopted solar ordinances.

The Solar Thermal Ordinance was driven by the energy policy developed by the Barcelona City Council to promote the use of clean and renewable forms of energy; improve the efficiency of energy systems; reduce CO_2 emissions, and thus take local actions to further the accomplishment of international agreements on climate change.

For further information

Barcelona Energy Agency
www.barcelonaenergia.com

This publication has been prepared with funding from the European Commission in the framework of the European project K4RES-H, coordinated by ESTIF. The sole responsibility for the content lies with the authors. The European Commission cannot be held responsible for any use of the information included herein.

Intelligent Energy Europe

Key Issues for K4RES-H Renewable Heat in Europe

ESTIF

July 2006