

# Country Condition Sheet

## Solar Urban Planning of SPAIN

### 1. Political framework conditions

#### 1.1. National goals

<b>Reduction of GHG emission base year 1990</b>	<p>Average emissions in the period 2008-2012 should not be higher than 15% of the emissions in the base year 1990.</p> <p>Source: Spanish Ministry of Environment <a href="http://www.mma.es/secciones/cambio_climatico/documentacion_cc/estrategia_cc/pdf/est_cc_energ_limp.pdf">http://www.mma.es/secciones/cambio_climatico/documentacion_cc/estrategia_cc/pdf/est_cc_energ_limp.pdf</a></p>
<b>Share of renewable energy in final energy consumption</b>	<p>2010: 13.2%</p> <p>Source: Spanish Ministry of Industry, Tourism and Commerce. <a href="http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf">http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf</a></p>
<b>Share of renewable energy in electricity consumption</b>	<p>2010: 32.3%</p> <p>Source: Spanish Ministry of Industry, Tourism and Commerce <a href="http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf">http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf</a></p>
<b>Share of renewable energy in final energy consumption for heat space heat, cooling and process heat and hot water</b>	<p>Not Available</p>
<b>Reduction of primary energy consumption base year 2008</b>	<p>2010: 7.1%</p> <p>Source: Spanish Ministry of Industry, Tourism and Commerce <a href="http://www.mityc.es/energia/balances/Balances/LibrosEnergia/ENERGIA_2008.pdf">http://www.mityc.es/energia/balances/Balances/LibrosEnergia/ENERGIA_2008.pdf</a> <a href="http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf">http://www.mityc.es/es-es/gabineteprensa/notasprensa/documents/npbalanceenergetico280311.pdf</a></p>
<b>Rate of building renovation</b>	<p>2009: 19% of total investment in the Construction sector</p> <p>Source: Aguirre Newmann, "Informe de Coyuntura Global del Mercado Inmobiliario Español", 2010. <a href="http://www.aguirrenewman.pt/eventos/estudios/Informe_Global_2010_RE_def.pdf">http://www.aguirrenewman.pt/eventos/estudios/Informe_Global_2010_RE_def.pdf</a></p>

## 2. Legal framework conditions

### 2.1. Urban planning

<b>Legislation/ Obligations/ Minimal requirements</b>
<b>Urban land use planning</b>
<p>The Urban Planning process in Spain is a hierarchical one, with different plans concerning regional and local scales. In general, there are no regional-scale Urban Development plans, this means that the Town Councils are responsible for urban planning. (Note: an exception exists in the Vasque Country, where Guidelines exists for Land use planning).</p> <p>The General Urban Distribution Plan is the main tool for urban planning: once developed and approved by the Town Council, the proposal must receive the final approval by the Regional Governments (called "Autonomous Communities"), in order to come into effect.</p> <p><i><a href="http://www.pvupscale.org/IMG/pdf/The_Spanish_planning_process.pdf">http://www.pvupscale.org/IMG/pdf/The_Spanish_planning_process.pdf</a></i></p>
<b>Local characteristics</b>
<p>It is not possible to compile all local characteristics of Spanish regions/municipalities. The ones existing in city of Vitoria-Gasteiz, participating in POLIS, are described next, including links for additional information:</p> <p>The urban planning legal framework in Vitoria-Gasteiz, as the rest of other Spanish cities, is set by the General Urban Development Plan or "Plan General de Ordenación Urbana-PGOU". In the case of Vitoria-Gasteiz, the current PGOU is being revised and a technical study of the PGOU has been made to start elaborating the new PGOU which aims to introduce more sustainable criteria for the urban planning of the city. This new PGOU also pursues the design of a compact city, avoiding the urban sprawl and the building of new neighbourhoods in the peripheral areas. This way, it bets for a city with more social cohesion, avoiding long distance transport and a more efficient use of energy.</p> <p>Besides de PGOU, cities also have local sectorial ordinances and plans with different measures and actions that go beyond or complement the PGOU. These ordinances and plans set the legal framework and objectives for different themes as the promotion of energy efficiency and renewable energy in buildings, refurbishment, special or interim urban plans, , etc...</p>

### 2.2. Passive Solar

<b>Legislation/ Obligations/ Minimal requirements</b>
No national legislation exists regarding the use of passive solar energy.
<b>Local characteristics</b>
Municipal bylaws may include planning requirements regarding the passive use of solar energy. Examples are: Zaragoza Eco-efficiency ordinance, Alcorcón bioclimatic ordinance.

### 2.3. Photovoltaic PV/ Solar thermal

<p><b>Legislation/ Obligations/ Minimal requirements</b></p> <p>Spanish National Technical Building Code (Royal Decree 314/2006)</p> <ul style="list-style-type: none"> <li>• All new buildings and retrofitted buildings must incorporate Solar thermal systems for Hot Water provision.</li> <li>• Specific buildings (commercial, warehouses, offices, hotels/guesthouses, hospitals/clinics and showgrounds) with minimum characteristics (dependent on building type) must incorporate Photovoltaic systems.</li> </ul> <p>Source: Spanish Ministry of Development (Ministerio de Fomento)  <a href="http://www.codigotecnico.org/ingles/introduction/">http://www.codigotecnico.org/ingles/introduction/</a>  <a href="http://www.codigotecnico.org/cte/export/sites/default/web/galerias/archivos/DB_HE_abril_2009.pdf">http://www.codigotecnico.org/cte/export/sites/default/web/galerias/archivos/DB_HE_abril_2009.pdf</a></p>
<p><b>Local characteristics</b></p> <p>Municipal bylaws may include additional requirements to increase the use of active solar systems. Examples are: Barcelona solar thermal ordinance, Sant Joan Despí solar thermal &amp; PV ordinance, Madrid solar thermal ordinance, Pamplona solar thermal ordinance, Sevilla solar thermal ordinance, Las Palmas PV ordinance, Rivas-Vaciamadrid solar thermal &amp; PV ordinance, Valle de Mena solar thermal &amp; PV ordinance, amongst others.</p> <p><a href="http://www.polis-solar.eu/current-practice-in-europe/spain/article/best-practice-31">http://www.polis-solar.eu/current-practice-in-europe/spain/article/best-practice-31</a>          (See examples under topic "Policy and legislation")</p>

### 2.4. Opportunities for future improvements

- To establish agreements between local administrations and local small, medium and large companies
- To promote the installation of PV installations in industrial areas, as a complementary economic activity and as means to produce clean electricity for local and community use.
- To regulate, by means of encouraging ordinances solar passive design and active solar systems in cities.
- To involve companies from the PV sector in local energy management activities.
- Training of companies as energy managers of local residents buildings, including assessment, technical evaluation and financing.
- To guarantee discipline in case of failures to comply with the law.

## 3. Economic framework conditions

### 3.1. Urban planning

<p><b>Subsidy/ grants</b></p> <ul style="list-style-type: none"> <li>• There are no subsidies or grants for solar urban planning in Spain</li> </ul>
<p><b>Favourable credit/ soft loans</b></p> <ul style="list-style-type: none"> <li>• There are no favourable credits or soft loans for solar urban planning</li> </ul>
<p><b>Tax privilege</b></p> <ul style="list-style-type: none"> <li>• There are no tax privileges for solar urban planning</li> </ul>

Status: 22 December 2011

<b>Cost effectiveness / Example</b>
-------------------------------------

Not available
---------------

### 3.2. Passive Solar

Note: Passive solar is not considered specifically in Spanish regulations. Since it helps to improve buildings energy efficiency, it is considered regulated by the Plan described below.

<b>Subsidy / grants</b>
-------------------------

“National Plan of Housing buildings and Renovation 2009-2012”

- Integral Renovation of Historical areas, Urban centers, degraded neighbourhoods and rural municipalities (ARIS): Subsidies for Housing renovation related with energy efficiency improvement and renewables use: maximum of 40% of the applicable budget (and max. 5.000 €/housing unit)
- RENOVE Plan for Housing renovation: Subsidies related with energy efficiency improvement and renewables use: not quantified.
- Subsidies for energy efficient new state subsidized housing, according to the Energy Qualification label: 3500 €/unit for level A, 2800 €/unit for level B and 2000 €/unit for level C.

Source: Spanish Ministry of Development (Ministerio de Fomento)

[http://www.fomento.es/MFOM/LANG\\_CASTELLANO/DIRECCIONES\\_GENERALES/ARQ\\_VIV IENDA/\\_INFORMACION/NORMATIVA/NOVE\\_LEGISLA/PlanEVR9-12.htm](http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ARQ_VIV IENDA/_INFORMACION/NORMATIVA/NOVE_LEGISLA/PlanEVR9-12.htm)

<b>Favourable credit / soft loans</b>
---------------------------------------

National Plan of Housing buildings and Renovation 2009-2012”

- Integral Renovation of Historical areas, Urban centers, degraded neighbourhoods and rural municipalities (ARIS): soft loans for promoters of Housing renovation related with energy efficiency improvement and renewables use: repayment in max. 15 years, with up to 3 years of grace period.
- RENOVE Plan for Housing renovation: Subsidies related with energy efficiency improvement and renewables use: repayment in max. 15 years, with up to 2 years of grace period.

Source: Spanish Ministry of Development (Ministerio de Fomento)

[http://www.fomento.es/MFOM/LANG\\_CASTELLANO/DIRECCIONES\\_GENERALES/ARQ\\_VIV IENDA/\\_INFORMACION/NORMATIVA/NOVE\\_LEGISLA/PlanEVR9-12.htm](http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ARQ_VIV IENDA/_INFORMACION/NORMATIVA/NOVE_LEGISLA/PlanEVR9-12.htm)

<b>Tax privilege (EXENCIONES FISCALES)</b>
--

Not available
---------------

<b>Cost effectiveness (RENTABILIDAD)</b>
--

Not available
---------------

## Photovoltaic/ Solar thermal

### Payment tariffs

#### • Feed-in tariffs

Feed-in-tariffs in Spain are only available for Photovoltaic installations and are currently regulated by the Royal Decree 1578/2008. They depend on whether the PV installation is installed in an urban area (building or shading structure) or on rural land (open areas). Feed-in-tariffs are guaranteed for 25 years, the values for PV installations approved in the 2<sup>nd</sup> quarter of 2011 are: 29.01 c€/kWh (PV systems up to 20 kW on urban areas), 20.37 c€/kWh (PV systems over 20 kW on urban areas) and 13.48 c€/kWh (PV systems on open areas).

Source: Spanish Ministry of Industry, Tourism and Commerce  
<http://www.mityc.es>

Renewable Portfolio Standard (RPS) Not Applicable in Spain

### Subsidy / grants /

Almost no subsidies/grants are available for Photovoltaic grid-connected systems alone. Exceptions are the Regional Governments of Valencia and País Vasco. Most Regional Governments have subsidies for isolated Photovoltaic systems. For solar thermal systems, some regional subsidies are available (typically between 30% and 50% of eligible costs), provided that the installations are not part of the obligations stated by the National Technical Building Code.

[http://www.polis-solar.eu/IMG/pdf/Spain\\_National\\_Assessment.pdf](http://www.polis-solar.eu/IMG/pdf/Spain_National_Assessment.pdf)

Also applicable is the “National Plan of Housing buildings and Renovation 2009-2012”:

- Integral Renovation of Historical areas, Urban centers, degraded neighbourhoods and rural municipalities (ARIS): Subsidies for Housing renovation related with energy efficiency improvement and renewables use: maximum of 40% of the applicable budget (and max. 5.000 €/housing unit)
- RENOVE Plan for Housing renovation: Subsidies related with energy efficiency improvement and renewables use: not quantified.
- Subsidies for energy efficient new state subsidized housing, according to the Energy Qualification label: 3500 €/unit for level A, 2800 €/unit for level B and 2000 €/unit for level C.

Source: Spanish Ministry of Development (Ministerio de Fomento)

[http://www.fomento.es/MFOM/LANG\\_CASTELLANO/DIRECCIONES\\_GENERALES/ARQ\\_VIVIENDA/\\_INFORMACION/NORMATIVA/NOVE\\_LEGISLA/PlanEVR9-12.htm](http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ARQ_VIVIENDA/_INFORMACION/NORMATIVA/NOVE_LEGISLA/PlanEVR9-12.htm)

### Favourable credit / soft loans

Favourable credits are available for investments related with renewables, provided by the Official Credit Institute (Sustainable Economy Fund)

<http://www.ico.es/web/contenidos/7446/index?abre=7448>

<http://www.ico.es/web/contenidos/7464/index?abre=7465>

Also applicable is the “National Plan of Housing buildings and Renovation 2009-2012”:

- Integral Renovation of Historical areas, Urban centers, degraded neighbourhoods and rural municipalities (ARIS): soft loans for promoters of Housing renovation related with energy efficiency improvement and renewables use: repayment in max. 15 years, with up to 3 years of grace period.
- RENOVE Plan for Housing renovation: Subsidies related with energy efficiency improvement and renewables use: repayment in max. 15 years, with up to 2 years of grace period.

Status: 22 December 2011

Source: Spanish Ministry of Development (Ministerio de Fomento)  
[http://www.fomento.es/MFOM/LANG\\_CASTELLANO/DIRECCIONES\\_GENERALES/ARQ\\_VIVIENDA/\\_INFORMACION/NORMATIVA/NOVE\\_LEGISLA/PlanEVR9-12.htm](http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ARQ_VIVIENDA/_INFORMACION/NORMATIVA/NOVE_LEGISLA/PlanEVR9-12.htm)

#### Tax privilege

Deduction of 10% of the investment cost.  
<http://www.boe.es/boe/dias/2004/03/11/pdfs/A10951-11014.pdf>

#### Cost effectiveness

Given the variety of companies, and the continuous changes in the Spanish regulatory framework applicable to Photovoltaic systems, it is not possible to provide figures of amortisation times, net present value or return of investment.  
For solar thermal systems, amortisation time is between 5-10 years, depending on the replaced energy source (lower times for electricity, higher for natural gas)

### 3.3. Opportunities for improvements

- Institutional coordination of all economical tools existing at national, regional and local levels.
- To award incentives to the associations of property owners that invest in passive renovation of façades, voids and roofs (not individually to the owners).
- To promote competitions and awards in new construction sectors including requirements of solar energy use (passive and active).
- To promote investments in solar passive and active renovation with specific incentives given by municipalities.
- To make compulsory the use of photovoltaic systems in big urban private containers, such as commercial centers, business parks, leisure and sports parks, etc.

## 4. Technical framework conditions

### 4.1. Urban planning

There are no specific technical framework conditions regarding solar urban planning in Spain, only particular experiences.

#### Planning background of solar settlement

---

#### Potential

---

#### Best practices/ Examples

- "Valdespartera Eco-city", Zaragoza.  
Valdespartera Ecocity was created to respond to social sectors housing demand, to foster new social and public housing. The design was based on the conviction that the project had to establish its origin in the best relationship between housing and Environment, adopting principles of energy efficient and using solar energy (Passive and Active: solar thermal and PV).  
<http://www.valdespartera.org>  
[http://www.polis-solar.eu/IMG/pdf/VALDESPARTERA\\_ECOBARRIO\\_7.pdf](http://www.polis-solar.eu/IMG/pdf/VALDESPARTERA_ECOBARRIO_7.pdf)

Status: 22 December 2011

- “Sarriguren Eco-neighbourhood”, Navarra.  
The objective of this project was to generate a new urban development near Pamplona consisting of 4,200 dwelling units, coexisting with other complementary urban uses. To achieve the application of the three concepts of energy conservation, renewable energy integration and implementation of green building principles were applied. In Sarriguren Ecocity there are spaces diversity, which are divided into five groups: residential areas, Innovation and Technology Park, community equipments, green spaces and other urban and infrastructure spaces. Solar passive and solar active (thermal and PV) are used.  
[http://www.polis-solar.eu/IMG/pdf/SARRIGUREN\\_ECOBARRIO.pdf](http://www.polis-solar.eu/IMG/pdf/SARRIGUREN_ECOBARRIO.pdf)
- “Santa Bárbara Urban development”, Sevilla.  
Santa Bárbara” is a new urban development in Sevilla which has been planned according to sustainability criteria. Climatic conditions were analyzed in detail. Then a shadow study was made in order to ensure solar access to every single house. Besides solar passive, solar thermal systems are also used.  
<http://sevilla-santabarbara.es/>  
[http://www.polis-solar.eu/IMG/pdf/\\_SANTA\\_BARBARA\\_URBAN\\_DEVELOPMENT\\_SEVILLA\\_2.pdf](http://www.polis-solar.eu/IMG/pdf/_SANTA_BARBARA_URBAN_DEVELOPMENT_SEVILLA_2.pdf)
- “South expansion area”, Alcorcón, Madrid.  
Alcorcón south expansion area is an urban development which aims at reducing the energy consumption and CO2 emissions in more than 50%, promoting environmental criteria in buildings and public spaces and increasing the green spaces in urban areas. In order to achieve these goals, a maximum height of the buildings was fixed depending on the width of the street, in order to ensure the solar access to every single house. The percentage of voids allowed in each façade is also different depending on the orientation. Besides solar passive, solar thermal systems are also used.  
<http://www.emgiasa.es/>  
[http://www.polis-solar.eu/IMG/pdf/\\_SOUTH\\_EXPANSION\\_AREA\\_ALCORC\\_=N\\_1.pdf](http://www.polis-solar.eu/IMG/pdf/_SOUTH_EXPANSION_AREA_ALCORC_=N_1.pdf)
- “Montecorvo Eco-city”, Logroño  
MVRDV, GRAS architects and LMB developer won in 2007 the Montecorvo urban development competition. This new district of the Rioja's capital aims to achieve 100% self-sufficiency with on-site energy generation. The program consists of approximately 3.000 social houses and their complementary program: schools, social buildings, sports facilities – all developed in a sustainable way. The blocks are facing south, so that solar power is easily generated through a photovoltaic panels tapestry on the mountain. Besides solar passive and solar photovoltaics, solar thermal systems are also used.  
<http://www.larioja.org/npRioja/default/index.jsp>  
[http://www.polis-solar.eu/IMG/pdf/ECO\\_CITY\\_OF\\_MONTECORVO\\_4.pdf](http://www.polis-solar.eu/IMG/pdf/ECO_CITY_OF_MONTECORVO_4.pdf)
- “Toledo Eco-city”, Toledo  
The Eco-barrio area is located in Sta. María de Benquerencia of Toledo. This district is the most populated of the city of Toledo and has one of the largest social, economic and urban projections of the Castilla-La Mancha Capital. The “Ecobarrio” idea arises in order to provide an Environmental friendly urban space, more suitable to citizens enjoyment and recreation. It develops an urban model that would combine the built space, public space and landscape, in a land where urban integration is underdeveloped. Winner of EUROPAN 6.

Status: 22 December 2011

<http://www.jccm.es>

[http://www.polis-solar.eu/IMG/pdf/ECO-CITY\\_OF\\_TOLEDO\\_5.pdf](http://www.polis-solar.eu/IMG/pdf/ECO-CITY_OF_TOLEDO_5.pdf)

## 4.2. Passive Solar

There are no specific technical framework conditions regarding the use of passive solar energy in Spain, only particular experiences.

<b>Planning background/ Local characteristics</b>
---
<b>Potential</b>
--
<b>Best practices/ Examples</b>
See best practices described in 4.1.

## 4.3. Photovoltaic/ Solar thermal

<b>Planning background/ Local characteristics</b>
<p>Spanish National Technical Building Code (Royal Decree 314/2006)</p> <ul style="list-style-type: none"> <li>• HE4 Document: Minimum solar contribution to hot sanitary water provision. All new buildings and retrofitted buildings must incorporate Solar thermal systems for Hot Water provision, with specific "Solar fraction" coverage (between 30-70%, dependent on the type of system and regional location of the building). Maximum limits for solar losses due to solar collectors location and shadows are provided.</li> <li>• HE5 Document: Minimum photovoltaic contribution to electricity. Specific buildings (commercial, warehouses, offices, hotels/guesthouses, hospitals/clinics and showgrounds) with minimum characteristics (dependent on building type) must incorporate Photovoltaic systems, the size (power) being dependent on the building type, regional location and built area. Maximum limits for solar losses due to solar collectors location and shadows are provided.</li> </ul> <p>Source: Spanish Ministry of Development (Ministerio de Fomento)  <a href="http://www.codigotecnico.org/ingles/introduction/">http://www.codigotecnico.org/ingles/introduction/</a>  <a href="http://www.codigotecnico.org/cte/export/sites/default/web/galerias/archivos/DB_HE_abril_2009.pdf">http://www.codigotecnico.org/cte/export/sites/default/web/galerias/archivos/DB_HE_abril_2009.pdf</a></p>
<b>Potential</b>
<p>No specific analysis of solar technologies potential has been done in Spain by public authorities. A potential study done by researchers of CIEMAT for PV systems in buildings, based on data of 1991 identified a net area for PV systems of 444 km<sup>2</sup>. Exploitation of such potential would entail an expected annual generation equivalent to 40% of national electricity demand in 1999 and 170% of electricity demand of residential buildings.</p> <p><a href="http://www.polis-solar.eu/IMG/pdf/Spain_National_Assessment.pdf">http://www.polis-solar.eu/IMG/pdf/Spain_National_Assessment.pdf</a></p>
<b>Best practices/ Examples</b>
<p>See best practices described in 4.1.          Also, for PV Systems in buildings:  <a href="http://www.pvdatabase.org/">http://www.pvdatabase.org/</a></p>



Status: 22 December 2011

#### **4.4. Opportunities for improvements**

- To guarantee quality of active solar systems and the fulfillment of the energy service they should provide (for example, solar fraction in solar thermal systems).
- To improve the knowledge of professionals about solar passive conditioning techniques and solar active installations.
- To promote debate and sharing of information amongst professionals from different sectors, in order to guarantee transverse knowledge about the possibilities of solar energy use (passive and active), including costs and maintenance aspects.
- To give example of good solar conditioning techniques implemented in municipal buildings and services.
- To implement specific measures to improve the exterior microclimate, green spaces and open areas by means of techniques and proper uses agreed with local population.

#### **5. Further reading/information**

See references included in previous sections of this document.