

Towards nearly zero-energy buildings

## **Solar Thermal Ordinances = Making a commitment to local sustainable energy**

A cost-effective energy policy for sustainable municipalities



# Table of contents

<b>What is a Solar Thermal Ordinance (STO)?</b> .....	1
<b>Your commitment to use sustainable and renewable energy at local and regional level</b> .....	1
<b>The European legislative framework: Anticipate upcoming regulations</b> .....	2
<b>Benefits of a solar thermal ordinance for your community</b> .....	3
<b>A solar thermal ordinance in your community</b> Some sustainable cities and towns have already implemented a solar thermal ordinance.....	4
<b>Solar thermal ordinances and building codes in Europe - Some examples</b> .....	7
<b>How to plan a solar thermal ordinance?</b> .....	8
<b>Interested in setting up a solar thermal ordinance?</b> Take a look at our online tools and contact the ProSTO HelpDesk.....	9
<b>The ProSTO project</b> .....	10



[www.solarordinances.eu](http://www.solarordinances.eu)

**Heating with fossil fuels is becoming more expensive and represents an economic risk factor for citizens and business.** Although stricter insulation standards and greater efficiency in heating and cooling are urgently needed, they will not alone offset the ever increasing future energy demand. This is when renewable energies come into play for heating and cooling of buildings. There are already plenty of arguments to accelerate the inevitable transition to sustainable heat and cold supply.

Solar Thermal Ordinances (STOs) proved to be a very powerful support measure for boosting the introduction of solar thermal in national markets or at local level. In 1999, the City of Barcelona enacted its first STO later replicated by many Spanish local councils. This paved the way for the STO to be included in the national technical building code (CTE), approved in 2006. In Israel, a solar obligation has been in force as early as 1980 and this country has now become the world leader in terms of solar thermal usage. More and more countries are introducing similar STOs.

This brochure presents concrete example of local authorities which have set-up and successfully implemented solar thermal ordinances; it will guide you step by step towards the implementation of a solar thermal ordinance.

We wish you successful dialogues with local actors and civil societies and are looking forward to an increasing number of local communities making a strong commitment to sustainable energy!

#### **What is a Solar Thermal Ordinance (STO)?**

Solar Thermal Ordinances (STO) are legal provisions making mandatory the installation of solar thermal systems in buildings. The obligation mainly applies to new buildings and those undergoing major refurbishment. The owner must then install a solar thermal system meeting legal requirements. Most of the existing STOs are connected to national or regional energy laws and implemented through the municipal building codes. A growing number of European municipalities, regions and countries have adopted solar thermal obligations. Already today, more than 150 million people live in regions covered by a STO.

#### **Your commitment to use sustainable and renewable energy at local and regional level**

Besides the Covenant of Mayors - a commitment signed by town and cities to exceed the EU energy policy's objectives in terms of reducing CO<sub>2</sub> emissions - local production and use of renewable energy sources as well as enhanced energy efficiency are key to reducing our carbon footprint and our consumption of scarce, imported fossil fuels and natural resources.

As 50-80% of the steps required to halt climate change will take place in cities and regions, they can therefore be considered as "laboratories" for renewable energy technologies. Renewable energy projects, energy efficiency measures and other energy-related activities can be introduced in various areas of local and regional governments. Local and regional authorities play a vital role in setting-up and implementing solar thermal ordinances and when introducing a solar thermal ordinance they should take the opportunity to initiate a multi-stakeholders' consultation.

## “Cities, Towns & Renewables”

A new report issued by the International Energy Agency is aimed at motivating city stakeholders by showing how renewable energy systems can benefit citizens and business, assist national governments in better appreciating the role that local municipalities may play in meeting national and international objectives, and help accelerate the necessary transition to a sustainable energy future.

More information available at:  
[www.iea.org/publications/free\\_new\\_Desc.asp?PUBS\\_ID=2183](http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2183)

# The European legislative framework: Anticipate upcoming regulations

For the first time, the European Directive on the promotion of the use of energy from renewable sources (2009/28/EC) covers the heating and cooling sector, which is responsible for nearly half of Europe's energy demand.

## Directive on the promotion of the use of energy from Renewable Energy Sources (RES)

Following the adoption of the RES Directive, the 27 EU Member States' governments had to submit, before the end of June 2010, detailed National Renewable Action Plans. These plans set out Member States' national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling in 2020 as well as adequate measures to achieve these targets, including the introduction of renewable heat ordinances.

## New buildings to be 'nearly zero-energy' constructions by 2020

On 18 May 2010, the recast of the Directive on energy performance of buildings (2002/91/EC) was adopted by the European Parliament. It introduces for the first time a European-wide definition of 'nearly zero-energy buildings'.

Up to now, only a handful of Member States had definitions for low energy/plus energy or zero carbon buildings, and these were all different. Nearly zero-energy buildings are now defined in the EPBD as constructions that have "a very high energy performance".

Any energy they use should come "to a very significant extent" from renewable energy sources. New buildings will have to be nearly zero-energy buildings by 31 December 2020 with public buildings having to fulfill this standard two years earlier. In effect, the European Performance of Buildings Directive (EPBD) sets out a renewable energy obligation for buildings by 2020.

Under this Directive, the Member States must set minimum requirements in connection with the energy performance of new and existing buildings, ensure the certification of their energy performance and require the regular inspection of boilers and air conditioning systems in buildings.

With both the Renewable Energy Directive and the EPBD paving the way for a gradual phase-in of renewable energy in buildings, it is crucial that not only EU Member States but also local communities take a proactive stance and do their utmost to coordinate the implementation of both pieces of legislation.

Directive 2009/28/EC, Art. 12.4:

"In the building regulations and codes or any way with equivalent effect, Member States shall by 2015 at the latest, where appropriate, require the use, of minimum levels of energy from renewable sources in new buildings and in existing buildings that are subject to major renovation."

# Benefits of a solar thermal ordinance for your community



Solar thermal can play a crucial part in reducing CO<sub>2</sub> emissions and improving the quality of life in your community. Almost half of the energy consumed in Europe is used for providing heat and cold for buildings and industry applications and there already exists a well-established industry offering reliable solutions for sustainable heating and cooling.

A major benefit of solar thermal ordinances is their effectiveness combined with low costs and limited administrative overheads for public authorities. As part of the building permit process, the inspection with regard to the renewable energy requirement is simple and thus does not strain the public budget.

The introduction of a solar thermal ordinance prevents market fluctuation caused by inconsistent incentive programmes. It provides a stable planning environment for market actors and investors, encouraging local economical growth and creating new jobs in this sector. It is estimated that about 75 % of the solar heat value is generated at local and regional level.

## Building the future today!

The building stock in your community must meet the post-oil and gas era challenge. Buildings constructed today will use energy for future decades. Incidentally, solar thermal ordinances have a positive impact outside their ambit in promoting the voluntary use of solar over and above required levels.

In a future fossil free energy economy, solar thermal can potentially contribute at major shares of the heat and cold supply; a general introduction of this technology now will allow your community to reach ambitious climate protection goals. Solar thermal plants have a proven track-record as a cost-efficient heat source for domestic hot water and space heating in many countries. Promising applications such as solar cooling, solar process heat and solar district heating are currently coming onto the market.

The image of your community will be improved by adopting this modern, forward looking and ecological energy policy, especially as fossil fuel damage to the environment emphasizes the need to move beyond petroleum!

# A solar thermal ordinance in your community

Some sustainable cities and towns have already implemented a solar thermal ordinance

## Barcelona

The first European municipality to introduce a solar building code was Barcelona in August 2000. This was revised in February 2006 and now applies to further types of building with and increased solar fraction.

The effect is already measurable: before the law was adopted 1,650 m<sup>2</sup> solar collectors had been installed in Barcelona, which correspond to an area of 1.1 m<sup>2</sup>/1,000 inhabitants. Eight years later this figure has increased to 25 m<sup>2</sup>/1,000 inhabitants and 40,095 m<sup>2</sup> have now been installed in the city. The target set by Barcelona Energy Improvement Plan (PMEB) is for approximately 96,300 m<sup>2</sup> of solar collectors to be operational in the city by 2010.

In March 2006, after other municipalities followed the Barcelona model, the Spanish government adopted a new Technical Building Code (CTE, Código Técnico de la Edificación) which includes an obligation (from September 2006) to meet some of the Domestic Hot Water (DHW) demand with solar thermal energy. This obligation applies to all new buildings and to those undergoing major refurbishments.

The required solar contribution varies between 30 and 70% depending on three main factors:

- Domestic Hot Water demand of the building (liters/day),
- Climate zone,
- Conventional fuel to be replaced (only applicable to refurbishments).

Some exceptions are incorporated in the law; mainly for buildings that either satisfy the DHW demand by other renewables or by cogeneration.

It is important to point out that the municipal solar obligations, adopted in recent years in dozens municipalities, including Barcelona in 2000 and Madrid in 2003, remained in force until such time as they were superseded by the national obligation included in the CTE. The effects on demand have been partially offset by the unexpected downturn in the Spanish construction market in 2008 and 2009. However, solar obligations became a key driver in the Spanish solar thermal market.

## Murcia: Quality Assurance as part of a solar thermal ordinance

On 29 September 2008, Murcia City Council published a solar thermal obligation as part of its Local Strategy against Climate Change to boost energy efficiency and supports renewable energy.

In compliance with Murcia's solar thermal obligation Article 11, a register of solar thermal systems installed in the city was created as an extra measure to monitor the effects of its implementation while outlining the environmental benefits achieved. It is considered as a step towards the full implementation of the solar thermal ordinance which came into force in October 2008.

The city's department of environment has designed a template to be completed by builders who specify solar thermal systems for hot water production and this will provide some data, especially concerning the anticipated energy savings. It will be compulsory to submit this document in order to obtain the license to sell the building. As a flanking measure to this ordinance, Murcia City Council organised a training course for its own technicians in 2009. The objective of this course was the optimization of these systems' calculation and design as well as receiving some feedback from designers and maintenance staff's experience.

In the summer of 2010, the City Council will also check the performance of 20 privately-owned systems already in operation. As a signatory to the Covenant of Mayors, the City of Murcia will use all the above measures to monitor renewable energy as part of its energy plan.

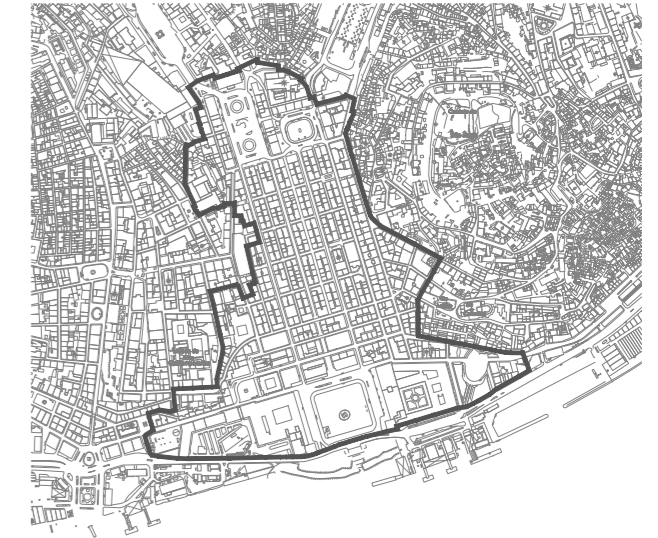
More information: [www.murcia.es/OrdenMun/Pdf/OOcaptacionSolar.pdf](http://www.murcia.es/OrdenMun/Pdf/OOcaptacionSolar.pdf)

## Lisbon: Architectural integration and handling of protected buildings

Historic buildings are presently seen as an exemption within the Portuguese national legislation on buildings energy performance regarding the obligation for installing solar thermal systems in residential buildings: Although one can easily understand the importance of preserving the national patrimony, this exemption is often misunderstood by investors and property developers that heritage buildings should not comply with the actual requirements for energy efficiency and comfort in residential buildings. As a consequence these districts are abandoned and left derelict, a common situation in several European countries. To overcome this trend it is important to upgrade residential historical buildings to modern standards, including the possibility of integrating solar technologies.

In the Baixa Pombalina's urban regeneration plan, Lisboa E-Nova, in cooperation with the Lisbon Municipality and IGESPAR (the entity responsible for the management of the national archaeological and architectural heritage), promote the programme 'Solar Systems Integration Potential in the Lisbon Baixa Pombalina Area'. The project outcomes will be incorporated in the area's urban regeneration plan to promote the integration of solar systems during refurbishment while following cultural heritage requirements. To complement this potential assessment there will be an Integration Manual, to be developed according to existing market solutions on solar systems and to the relevant criteria for integrating such systems in historical buildings. The solutions identified can be adopted in this area but also in other protected historical areas across Europe.

More information: [www.lisboaenova.org](http://www.lisboaenova.org)



Priority to solar thermal in Lisbon's Baixa Pombalina Area



# A solar thermal ordinance in your community

## Lazio Region: solar thermal ordinances, urban sustainability and green building

In the middle of 2008 and within the scope the ProSTO project, the Lazio Region adopted a new law concerning regional provisions on sustainable architecture and green building. This is a “framework law” on urban sustainability and building which includes solar thermal obligations for the production of hot sanitary water in new buildings and those undergoing refurbishment. The real innovation in this legislation, which has a holistic approach to energy saving in buildings and use of renewable energy to produce heat and electricity, is the promotion of training courses targeted at industry operators, technicians and local authority staff as well as train the trainer workshops.

The law is helping to spread STOs in the territory and raise awareness on environmental issues among the population.

More information:

[www.regione.lazio.it/web2/contents/energie\\_rinnovabili/argomento.php?vms=6](http://www.regione.lazio.it/web2/contents/energie_rinnovabili/argomento.php?vms=6)

## Israel, 30 years of experience with solar thermal ordinances

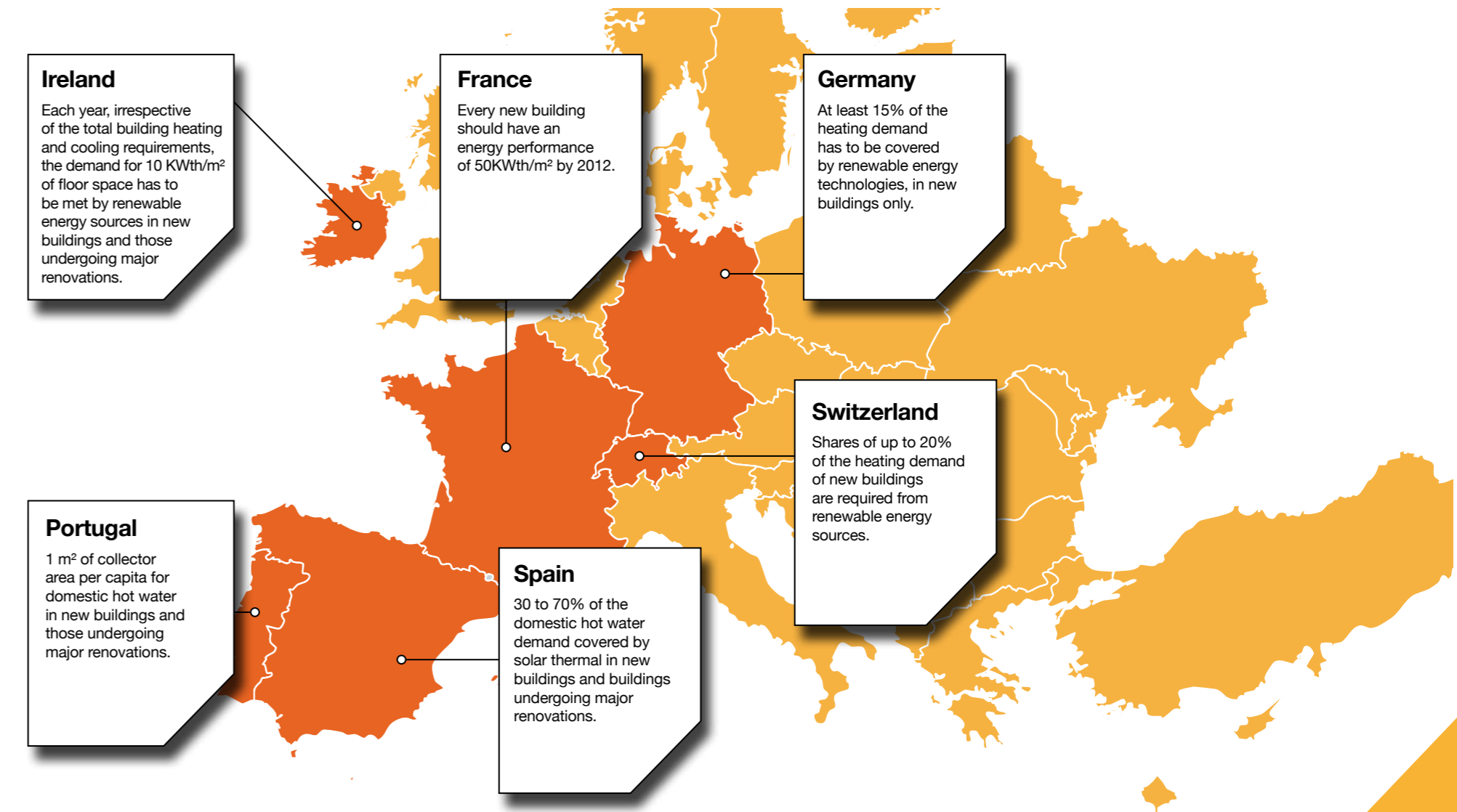
Thirty years ago, Israel was the first country to pass legislation on solar thermal installations. With the second oil crisis at the end of the 1970s, members of parliament examined ways to make their country less dependent on imported energy. The result was a law which made solar water heaters mandatory in new buildings such as residential housing, hotels, guest houses and old people's homes up to 27 metres high. The legislation entered into force in 1980.

Nowadays over 80% of Israel's households get their domestic hot water from solar rooftop heaters. A typical domestic unit consists of a 150 litre insulated storage tank and a 2 m<sup>2</sup> collector. These hot water heaters save the country the need to import about 4% of its energy needs, and replace about 9% of the electricity production.

The law has now become redundant. More than 90 % of the solar systems are installed on a voluntary basis, i.e. they are installed in existing buildings, or the systems are larger than required by the obligation.



# Solar thermal ordinances and building codes in Europe - Some Examples



# How to plan a solar thermal ordinance?

From the baseline assessment to the implementation of the STO

A solar thermal ordinance is developed and implemented in three phases:

## 1 Baseline assessment

A **baseline assessment** is carried out by a limited promoter group in order to assess the framework for developing a solar thermal ordinance on the territory in question. What are the effects you can achieve with the wide introduction of solar thermal? Are there a sound legal basis and sufficient support from sponsors for an ordinance in your community?

## 2 Preparation

During the solar thermal ordinance **preparation** phase the process becomes 'public' including consultations with political decision makers, stakeholders and expert advisors in order to reach a broad support for the solar thermal ordinance to be implemented. In this phase the solar thermal ordinance is drafted: Keep it simple and smart!

## 3 Implementation

The **implementation** phase starts with the enacting of the solar thermal ordinance. Even the best ordinances should be reinforced by flanking measures, e.g. information campaigns targeted at raising quality and awareness amongst consumers and installers. Ensure a good efficiency of the solar thermal ordinance and monitor its impact!



# Interested in setting up a solar thermal ordinance?

Take a look at our online tools and contact the ProSTO HelpDesk

At [www.solarordinances.eu](http://www.solarordinances.eu) you can read all about case studies on the successful implementation of Solar Thermal Ordinances. You will also find there useful tools to help you plan your local Solar Thermal Ordinance and guide you through the whole process.

### STO Developers ToolBox

The **STO Developers Toolbox** provides useful and practical tools to all those who are preparing, implementing or supporting a **STO in their community**. The various tools range from text proposals for the ordinance over background reports and best practice examples to software tools for mapping the potential of solar thermal in your community.

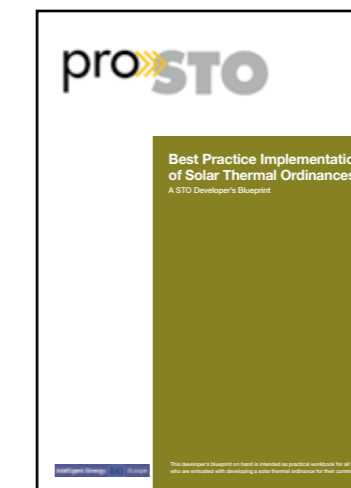
This STO Developers Toolbox includes the following sections:

- **Context** - gives background information on STOs, communications and in particular all the pro arguments for the adoption of a STO in your community.
- **Baseline Assessment** - provides analysis tools in connection with the status, potential and feasibility of a STO in your area.
- **Ordinance Components** - contains approved texts and legal approaches for drafting a tailor-made ordinance.
- **Flanking Measures** - lists supporting activities proposals to strengthen the STO.
- **Monitoring** - this is useful for monitoring the STO's impact. In addition, some assessments of existing projects are available in the project outcomes section under the ProSTO Project tab.

New tools have been developed and already available instruments have been compiled by the ProSTO project partners.

### ProSTO Blueprint

This practical working document, available for download at [www.solarordinances.eu](http://www.solarordinances.eu), provides detailed information on how to plan, implement and promote a solar thermal ordinance in your community.



### ProSTO HelpDesk

If you wish to receive some guidance on how to plan a solar thermal ordinance in your community, please contact us at: ESTIF, tel: +32 2546 19 38, [info@estif.org](mailto:info@estif.org).



ProSTO  
HelpDesk

Email: [info@estif.org](mailto:info@estif.org)  
Tel: +32 2546 19 38

# pro»»STO

## The ProSTO project

The objective of the ProSTO project is to boost the use of solar thermal systems in Europe by promoting an efficient implementation of solar thermal ordinances and to support European local authorities in planning, developing, introducing and managing efficient solar thermal ordinances (STOs).

The main stakeholders regarding STOs are local authorities. Within the ProSTO project, the Lazio region and the cities of Lisbon, Murcia, Stuttgart and Giurgiu have come together to showcase best practice examples. They aim at the implementation of optimized solar thermal ordinances, consisting of model regulations, fine-tuned criteria, efficient administrative procedures and flanking measures.

A large number of practical tools are already available on the project website such as the STO database and the STO toolbox. Moreover, a STO Helpdesk shall provide some qualified guidance to local authorities prepared to introduce a solar thermal ordinance. Moreover, the dissemination of project results via the project partners network as well as presentations at international conferences and events should persuade local communities to introduce solar thermal ordinances.

For further information, visit: [www.solarordinances.eu](http://www.solarordinances.eu)

## Project consortium

### Project coordinator

Ambiente Italia, Italy

### Project partners

European Solar Thermal Industry Federation (ESTIF), Belgium  
City of Stuttgart, Germany  
Solites, Germany  
INETI, Portugal  
SPES, Portugal  
Murcia City Council, Spain  
Ecofys ema SL, Spain  
Lazio Region, Italy  
Reseda, Italy  
City of Giurgiu, Romania  
ASTER Consulting, Romania

### Contact

European Solar Thermal Industry Federation (ESTIF)  
Renewable Energy House  
Rue d'Arlon 63-67  
B-1040 Brussels  
Tel: +32 2 546 19 38  
Fax: +32 2 546 19 39  
Email: [info@estif.org](mailto:info@estif.org)  
Website: [www.estif.org](http://www.estif.org)



## Energy Days: Turn your city into a frontrunner of Europe's energy revolution

The Sustainable Energy Europe Campaign is gaining momentum. If you believe in a low-carbon future and want to change the landscape of energy in Europe, you can take an active role in organising an Energy Day in your town or region.

ProSTO is official partner of the Sustainable Energy Europe Campaign: [www.sustenergy.org](http://www.sustenergy.org)



### Copyrights

Lisboa e-Nova, Solites, Wagner & Co.

### Disclaimer

This publication is a combined effort of the ProSTO project partners. ProSTO is co-funded by the European Commission through the Intelligent Energy Europe Programme. The sole responsibility for the content of this publication lies with the authors. It does not represent the opinion of the European Communities. The European Commission is not responsible for any use that may be made of the information contained herein. Brussels, 2010.

