



*Identification and mobilization of solar potentials via local strategies*

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## **Work Package 3: Development of City Action Plans & Pilot Actions**

### **Deliverable 7: OVERVIEW OF LONG-TERM SOLAR TARGETS OF POLIS CITIES**

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## THE POLIS PROJECT

POLIS (*Identification and mobilization of solar potentials via local strategies*) is a European funded project under the Intelligent Energy – Europe Programme aiming at the implementation of strategic town planning and local policy measures to activate the solar ability of urban structures in European cities.

In recent years, diverse new technologies and legislative opportunities have been developed to undertake solar potential analyses and mobilize the solar potentials identified. The aim of POLIS project is to present and evaluate current developments and bring together key stakeholders of this process to improve planning and legislation practice towards a solar development, with the conviction that urban approaches are essential to enhance the integration of small-scale solar energy applications in the built environment.

With respect to the composition of buildings and urban structures the importance of solar energy is evident, since the shape of constructive structures and relevant surfaces are the basis for application of solar systems and also for receiving passive solar gains. Therefore, solar energy is more than other Renewable energy sources connected to the form, function and arrangement of buildings. To assure the ability of new structures fitting a solar energy supply, certain requirements need to be included in development planning and building legislation. In addition, also existing buildings need to be qualified for the application of solar systems: the knowledge of adequate building types and structures is therefore an essential requirement to improve strategic actions to mobilise the solar potential of existing built areas. In this respect several instruments are available to prescribe solar targets like municipal agreements, private law commitments or national building codes. The POLIS project focuses on local options regarding municipal commitments to elevated solar requirements to improve the solar qualification of new as well as of existing buildings and urban structures.

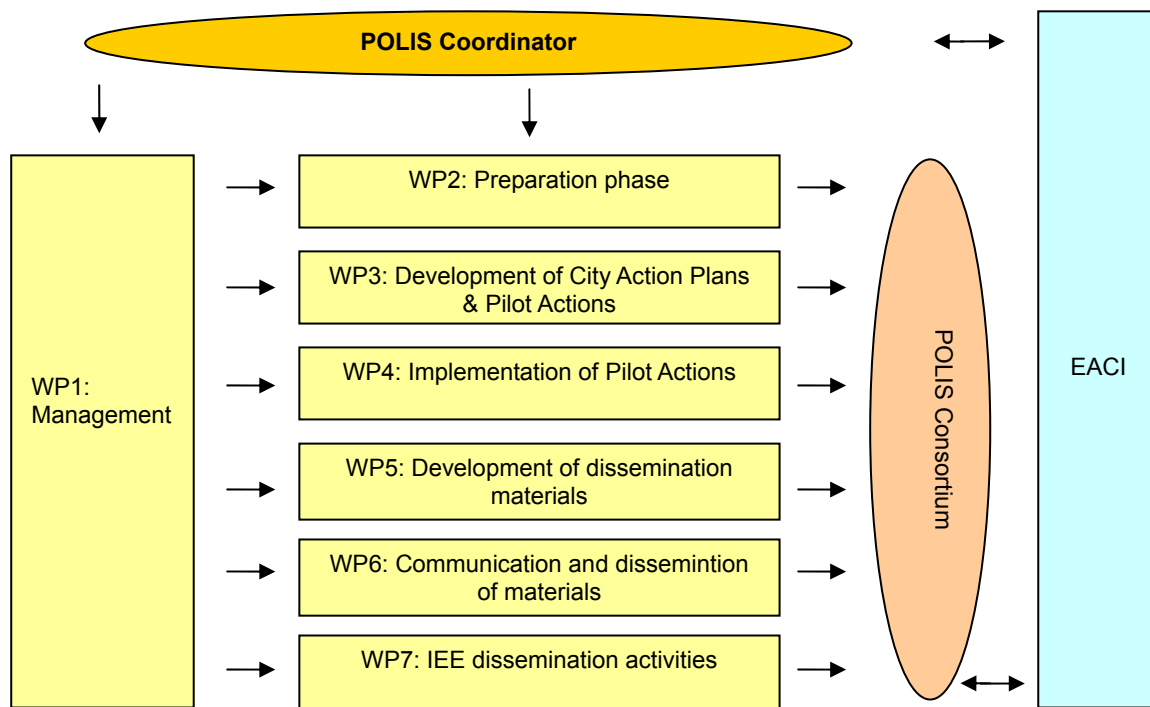
POLIS project brings together local authorities with different experiences and varying states of urban development from France, Germany, Portugal, Spain and Sweden, to share their knowledge on solar town planning and encourage further activities within the scope of an expert network for cities. Main results of the project will be:

- **Action Plans:** long-term strategic action plans to integrate solar energy at urban level embedded in overall planning strategies of POLIS participating cities: Lyon, Paris, Munich, Lisbon, Vitoria-Gasteiz and Malmö.
- **Pilot Actions:** short-term priorities to be developed in the participating cities within the project lifetime, such as identification of solar potentials, accomplishment of activities to mobilize identified potentials, development and implementation of town planning measures, financial and/or legislative measures.
- **Transfer of POLIS approach to other cities:** lessons learned and experiences from POLIS project will be described and evaluated as background for the development of planning references and legal guidelines. Together with the provision of a catalogue to promote urban planning instruments and best practices project the guidelines represent a major outcome of the project. The dissemination not only targets at the participating countries: workshops will address also other European cities, which will be supported through communication via a network for urban planners and municipal executives

The outcome of the POLIS project are expected to provide excellent circumstances for the implementation of small-scale RES in the participating cities with a roadmap for further

activities in the framework of solar developments. This will help to implement EU and national targets for renewable energies in 2020, as well as provide interested cities of all EU member states a pool of successful examples, strategies and instruments.

The structure of the project is summarised in the following diagram.



The composition of POLIS consortium guarantees an interdisciplinary approach to the work planned. Participation of local energy agencies, universities, consultancies, urban planning agencies and municipal planning departments provides a broad background of knowledge from the diverse fields of specialisation, as well as different perspectives and ways to approach the planned activities.

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#### *POLIS Consortium*

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**Ecofys GmbH** (Germany) – Project Coordinator  
**Climate Alliance – Klima-Bündnis** (Germany) – Leader of WP5  
**Universidad Politécnica de Madrid** (Spain) – Leader of WP3  
**Agence Locale de l'Energie de l'agglomération lyonnaise** (France)  
**Agência Municipal de Energia e Ambiente de Lisboa** (Portugal) – Leader of WP2  
**Lund University** (Sweden) – Leader of WP4  
**City of Munich** (Germany)  
**City of Vitoria-Gasteiz** (Spain)  
**Atelier Parisien d'Urbanisme** (France)  
**City of Paris** (France)  
**Skåne Energy Agency - Solar City Malmö** (Sweden)  
**Hespul** (France)

POLIS project started in September 2009 and will run until August 2012. More information about the project can be found at: [www.polis-solar.eu](http://www.polis-solar.eu)

## EXECUTIVE SUMMARY

Within the framework of POLIS project, six European cities (Lyon and Paris in France, Munich in Germany, Lisbon in Portugal, Malmö in Sweden and Vitoria-Gasteiz in Spain) have committed on long-term strategies to integrate solar energy at urban level that are consistent with existing CO<sub>2</sub> mitigation targets in solar Action Plans embeded in local planning.

Although the cities are in different situations regarding solar energy so that their strategies are also different, a common objective is shared, namely, to steer the future development of solar energy with respect to urban planning by: the assessment of existing climate strategies and targets at city levels, the evaluation of solar potential in city areas, the development of solar targets and the definition of possible measures in diverse planning areas connected to general renewable energy targets.

In this report an overview of POLIS cities long-term solar targets is presented. These targets have been established in solar Action Plans defined by Local Working Groups composed by municipalities and technical partners of POLIS project. More information about the solar Action Plans can be found in the report “Deliverable 4: Action Plans in POLIS cities”, available on the project web-site<sup>1</sup>.

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<sup>1</sup> [www.polis-solar.eu](http://www.polis-solar.eu) (Section: Publications)

## 1 Introduction

Within the POLIS project, Work Package 3 deals with strategic measures of urban planning and local policies, with the aim of integrating solar energy at urban level in new and existing developments.

Particularly, each of the 6 participating cities of POLIS project (see Figure 1, Lyon and Paris in France, Munich in Germany, Lisbon in Portugal, Malmö in Sweden and Vitoria-Gasteiz in Spain) have committed on long-term strategies to integrate solar energy at urban level that are consistent with existing CO<sub>2</sub> mitigation targets (related to national/regional requirements or voluntary commitments, for example, the Covenant of Mayors, signed by all POLIS participating cities) in solar Action Plans embeded in local planning.



Figure 1. POLIS participating cities

The Action Plans have been developed by the so-called “Local Working Groups” composed by municipalities (local urban planning departments and other departments) and technical partners (universities, consultancies, NGOs and local energy agencies) of POLIS project:

- Lyon (France): Grand Lyon Urbanism agency, Grand Lyon technical services, Agence Locale de l'Energie de l'agglomération lyonnaise (ALE) and HESPUL.
- Paris (France) : City of Paris (Urban Ecology Department, Urban Planning Headquarter, Social Housing Headquarter, Public Works Headquarter) and the APUR (urban planning agency of the city of Paris).
- Munich (Germany): City of Munich (Urban Planning and Building Regulation Department) and Ecofys Germany.
- Lisbon (Portugal): Lisbon municipality, Agência Municipal de Energia e Ambiente de Lisboa and Wee Solutions.
- Malmö (Sweden): City of Malmö (Environment Department, Real Estate Office, Urban Planning Department and Department of Internal Services), Skåne Energy Agency and Lund University.
- Vitoria-Gasteiz (Spain): City of Vitoria-Gasteiz (Urban Planning Department, Environment and Sustainability Department and Energy Agency of Vitoria-Gasteiz) and Universidad Politécnica de Madrid.

The Action Plans have been developed through a series of workshops and meetings, using information about the existing local background in terms of energy supply situation, user behaviour, urban structures, building typologies, solar actions and measures and urban planning practices regarding solar energy. Each city has then developed long-term solar targets that are consistent with existing CO<sub>2</sub> mitigation targets, as well as identified main areas of interest (focus areas), relevant stakeholders for the implementation of solar energy in connection with urban approaches (target groups) and short-term measures to support the upgrade of solar energy and reach the proposed targets. More information about the solar Action Plans can be found in the report “Deliverable 4: Action Plans in POLIS cities”, available on the project web-site<sup>2</sup>.

In this report an overview of POLIS cities long-term solar targets is presented. It must be pointed out that the participating cities are in different situations regarding solar energy, therefore, the long-term solar targets and the strategies designed to upgrade the use of solar energy at urban level also vary. A common objective is however shared, namely, to steer the future development of solar energy with respect to urban planning by:

- Assessment of existing climate strategies and targets at city levels;
- Evaluation of solar potential in city areas;
- Development of solar targets;
- Creation and evaluation of possible measures in diverse planning areas;
- Connection to general renewable energy targets.

In the following section, for each of the POLIS cities the existing targets related to CO<sub>2</sub> emissions reduction and general promotion of renewables are first described, followed by the long-term targets specifically related with solar energy (passive and active) established in the solar Action Plans developed within POLIS project. In the last section a summary of the long-term solar targets defined in POLIS solar Action Plans is presented.

## **2 Overview of long-term solar targets of POLIS cities**

### **2.1 Rationale**

The Intergovernmental Panel on Climate Change report proves the existence of climate change and the influence of mankind to this subject. Therefore countries, regions and also cities have been asked to develop strategies to fight global warming.

In April 2007, the European Commission formally launched the Climate and Energy Package, which assumed reduction in greenhouse gas emissions targets for 2020 based on the European situation in 1990. The objectives aspire to 20% reduction in greenhouse gas emissions, increased by 20% the contribution of renewables in energy consumption and increased by 20% the European levels of energy efficiency.

European leaders have signed up to a binding EU-wide target to supply 20% of their energy needs from renewable energies, including biomass, hydro, wind and solar power, by 2020. To meet this target, EU leaders agreed a new directive on promoting renewable energies, which set individual targets for each member state. Directive 2009/28/EC requires

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<sup>2</sup> [www.polis-solar.eu](http://www.polis-solar.eu) (Section: Publications)



each Member State to adopt a national renewable energy action plan. These plans are to set out Member States' national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling in 2020, taking into account the effects of other policy measures relating to energy efficiency on final consumption of energy, and adequate measures to be taken to achieve those national overall targets, including cooperation between local, regional and national authorities.

In addition, many municipalities have agreed to fix CO<sub>2</sub> mitigation targets until 2020 or 2050 voluntarily. For instance the Covenant of Mayors is a commitment by towns and cities to go beyond the objectives of EU energy policy in terms of reduction in CO<sub>2</sub> emissions through enhanced energy efficiency and cleaner energy production and use.

In the following sections the targets established by POLIS participating cities are presented.

## 2.2 Lyon

In December 2007, Grand Lyon councillors unanimously voted a Climate Action Plan through which Grand Lyon has adopted European Union goals on a local level, fixing targets for greenhouse gas reductions, reduction in energy consumption and an increase in the share of renewable energies. The Climate Action Plan specifies:

- A reduction in greenhouse gas emissions of 20% and an increase to 20% share of renewable energies within the Grand Lyon council area and own organisations by 2020 (compared to 2000).
- A reduction of 75% (= national french engagement of "Factor 4"<sup>3</sup>) in greenhouse gas emissions within the Grand Lyon council area and own organisations by 2050 (compared to 2000).

The Climate Action Plan is one of the main vectors for the Agenda 21. Local authorities have requested that the Action Plan be developed further to put the Grand Lyon on the track towards a "Factor 4" scenario in 2050. To reach these targets, Grand Lyon has created the Climate Action Plan Project Committee.

Regarding solar energy, the Lyon solar Action Plan has defined the following long-term targets:

- Passive solar share of the heating demand reaches at least 20% in all new development areas > 100 units (residential) from 2012. A requirement already exists for buildings on ground owned by the Grand Lyon municipality. An objective for solar passive share of residential buildings built on ground not owned by the municipality (minimum 20%, precise target to be defined) will be introduced in the new Urban Local Plan, which will imply a specific rate between height and distance between buildings.
- Through Polis measures PV and solar thermal capacities will have increased by factor 4 and 3 in 2020. In order to reach the targets of the Grand Lyon Climate Action Plan the following yearly increases of capacity installed will be necessary: 50% per year for PV installations and 40% per year for solar thermal installations.

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<sup>3</sup> French National scenario willing to divide by 4 the global energy consumption of the country by 2050.

## 2.3 Paris

In 2007 the City of Paris voted a plan to combat greenhouse gas emissions generated by various activities in Paris: the Paris Climate Protection Plan. This strong commitment is based on a “factor 4” approach and aims to result in 75% less greenhouse gas emissions from its own activities and those of parisian territory by 2050 compared to 2004. Targets set for Paris in 2020 are more ambitious than EU objectives, namely:

- 25% less greenhouse gas emissions;
- 25% less energy consumption;
- 25% of Paris’s energy consumption to come from renewable energy sources.

Thus the development of renewable energy is a major strand of the Climate Plan of Paris to reduce the carbon footprint of the territory.

To reach these objectives, the City of Paris has launched a major refurbishment plan of the municipal park to reach these objectives, including, the objective of 55 000 refurbished social dwellings, or 25% of the park by 2020. These renovated homes aim for a performance of 80 kWh per square metre of net floor area per year instead of 270 on current average. To achieve this goal the use of renewable energies will be essential and the sun will probably be the first option considered. The other major objective is the refurbishment of 600 schools by 2016 to reach a reduction of 30% of energy consumption for each building.

It must be pointed out that local authorities in France are not empowered to take dispositions on their territory with legal binding ahead of national regulations. That’s why in France, a mayor has no authority to impose a solar code or plan. Instead, he can impose urban rules for constructions (energy efficiency) applicable to projects in which the State is involved (buildings on the sessions of public land or on ZAC —urban development zones—, public housing); private operations are not required to apply those rules. Within the Climate Action Plan, Paris imposes an energy performance of 50 kWh/m<sup>2</sup>.year for new construction and 80 kWh/m<sup>2</sup>.year for important refurbishments (more ambitious than the existing “Effinergie building” limits for very low energy housing: 65 and 104 kWh/m<sup>2</sup>.year respectively). Therefore, to achieve these energy performance levels required by the Climate Plan of Paris, building constructors can make use of renewable energies such as solar.

It is expected that the new Environment Law adopted on May 2010 will facilitate in the future that municipalities can incorporate solar requirements in local urban planning legal documents.

Within Paris solar Action Plan the following long-term targets have been defined:

- Detailed assessment of the solar thermal and PV potential of the whole city building stock by 2012, combining the results of ongoing studies about renewable energies potential and feasibility studies regarding solar energy on municipal public and private properties in an interactive map for professionals and citizens.
- Installation of 200 000 m<sup>2</sup> of solar panels in Paris by 2014 to reduce the Parisian carbon footprint.
- Definition of realistic targets for solar technologies (solar thermal and photovoltaic) in the whole city area by 2012, based on the feasibility studies about renewables and specifically solar technologies and the assessment of solar potential of the city building stock.
- Set of requirements for solar energy is integrated in the local Urban Planning Plan by 2013, thus anticipating the opportunity opened by the new Environmental Law.

## 2.4 Munich

The City of Munich is one of the pioneer German cities in relation to sustainability concepts of energy supply. As owner of the the Munich City Utilities (Stadtwerke München, SWM), it is responsible of relevant initiatives, such as the use of district heating, geothermal energy, production and commercialisation of green electricity, a subsidy programme on energy saving and informal activities of the Munich Construction Center.

Munich has also proven to be a marketing pioneer in terms of energy-related aspects of building construction, by developing a heating index for private residential buildings back in the 1990s. At present, in addition to the instruments introduced at national level (Energy Certificate according to the German Energy Savings Regulation), the requirements according to the German Renewable Energies Heat Act (“EEWärmeG”) or the certificate issued by the German Society for Sustainable Building Construction, Munich has introduced specific requirements for residential buildings in the Munich Quality Standard for Renovation and Building Construction in early 2009, which are linked to the allocation of subsidies. Another relevant obligation set by the City of Munich is a list of ecological criteria defining the requirements for an allocation of municipal property, including an explicit mention to the objective of building of solar power plants and photovoltaic arrays for power generation from renewable energies. In this sense, the City of Munich supports public participation projects with free usage rights for roofs of public buildings.

Within Munich solar Action Plan the following long-term targets have been established:

- Support and mobilization of a PV potential of 3.5% of Munich’s power demand addressed through the “Solar Initiative Munich (SIM)” by 2015.
- Solar Photovoltaic facilities: increase of the total share of electric power demand in Munich to additional 3.5% in 2030.
- Solar thermal facilities: increase of the total share of heat demand in Munich to 3% in 2030.
- Passive solar energy: Guarantee to reach a high share of passive solar gains (25%) of the overall heating demand in all new areas > 100 units from 2012.

## 2.5 Lisbon

Following the context of European Directives 2009/28/CE and 2006/32/EC on energy end-use energy efficiency and energy services, in 2008 Portugal adopted the National Action Plan for Energy Efficiency (PNAEE), which defines at the level of the various sectors the measures and programmes to implement in order to achieve by 2015 an improvement on energy efficiency equivalent to 10% of final energy consumption. The programmes are set in various areas of activity, with the renewable energy sectors being addressed by the Program “Renewable on time”, which includes two measures, “Micro-production” (small-scale systems to be installed in residential systems) and “Solar Thermal” measures.

The City of Lisbon approved in December 2008 the Energy-Environment Strategy for Lisbon, setting targets for energy consumption reduction at the Municipality and the complete city level of 8.9% and 9.4% respectively, by the year 2013 (based on 2002 consumption levels). Focusing on this same baseline, the City of Lisbon also undertook the Covenant of Mayors compromise to reduce CO<sub>2</sub> emissions over 20% by 2020. The current local energy policies

already focus the dimension of energy efficiency and renewable energies, especially at the micro-production level.

At the level of municipal regulations for building and urbanization the Lisbon Municipality has already narrowed more demanding requirements that, in compliance with current legislation in force<sup>4</sup>, promote a more efficient adoption of renewables. The Municipal Regulation of Urbanization and Construction of Lisbon (RMUEL) already requires the architectural integration of solar thermal collectors and, among others, demands the installation of a centralized solar thermal system for hot water supply in new buildings. RMUEL also defines incentives to foster innovative building projects using renewables (for example, reduction of urban taxes). In the City of Lisbon, the current focus of public policies now aims at urban requalification and building refurbishment, bringing together the best practices and adoption of new technologies with the built heritage.

For the city of Lisbon, an initial assessment has been done out to extrapolate national PNAEE targets for micro-production and solar thermal systems on residential buildings, giving a total amount of 2 MWp and 13,600 m<sup>2</sup> for PV and solar thermal technologies, respectively. The definition of more specific long-term targets for the adoption of solar technologies has to take into account the actual urban potential based on existing conditions, which is unknown yet. Therefore, a detailed study to quantify the urban solar potential of the city is considered of highest priority for the municipality of Lisbon and will be carried out as specific Pilot Action within POLIS project, as indicated in Lisbon solar Action Plan (see the report "Deliverable 4: Action Plans in POLIS cities"). The adoption of public policies for the integration of solar urban planning guidance will derive also from the results of the assessment carried out at the local level.

## 2.6 Malmö

In June 2006, the Swedish Parliament set the target that specific energy use in residential buildings and commercial premises should be reduced by one fifth by 2020, further reducing to half of present day levels by 2050. In addition, by 2020, the dependence of the built environment on fossil fuels for energy supplies should be broken.

The City of Malmö aims to be a world-leading climate city. Broad-based efforts to achieve such objective have been already identified covering traffic, energy and city planning, and also consumption, education and lifestyles. Several initiatives have been approved (2009) by the City Council of Malmö to contribute to the previous objectives:

- The "Energy Strategy", which establishes switching to renewable energy sources ia an important strategy for decreasing the environmental impact and securing a future energy provision (with solar energy being one fo the solutions considered for electricity and heat production).

The long-term vision (2030) for Malmö is to rely only on renewable energy sources and to have an effective and safe energy use that contributes to the long-term sustainability of the city. In order to take important steps towards this vision, by the year 2020 the energy use should have decreased by at least 20 % per capita compared to the average annual use during the period of 2001 to 2005, with a share of renewable

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<sup>4</sup> Particularly with regard to the mandatory installation of solar thermal panels defined in Thermal Performance Building Regulation.

energies of at least 50 % of the total energy use. For Malmö municipality's own operation, more ambitious goals have been set as a part of the public sector's strive to serve as a role model and positive example to others: the energy use in the municipality's departments and companies should during the same period have decreased by 30 % and consist of 100 % renewable energy.

- The "Environmental Program (2009-2020)", which connects to the same renewable energy targets set in the Energy Strategy. In addition, the program has a target that by 2020, Malmö should be the world leader when it comes to sustainable urban development. Solar energy, wind power, hydropower and biogas will be phased in, and fossil fuels will be phased out.

Within Malmö solar Action Plan the following long-term targets have been set :

- Identification of measurable targets for active solar systems (PV and solar thermal) for the whole city area in 2012 for new and existing buildings.
- Introduction of solar energy requirements in the urban planning process in 2012 by using the new Environmental Program, Energy Strategy and Environmental Building Program South.
- Exploitation and purchase agreements are developed with respect to solar energy requirements and are used in special areas from 2011.

## 2.7 Vitoria-Gasteiz

In Spain the National Action Plan for Renewable Energies 2011-2020 that will comply with the EU Directive 2009/28/CE is under development. However, present estimations of the Spanish Government about RES contribution to final net energy consumption will amount to 22.7% in 2020 (exceeding the national target established at 20%) and 42.7% for RES contribution to electricity generation in the same year. The objectives of the existing National Plan for Renewable Energies 2005-2010 have been already met in relation to PV technology but for solar thermal systems estimations indicate that 49% of the target will be achieved by the end of 2010.

The City of Vitoria-Gasteiz has signed several commitments related to energy and sustainability, such as the Aalborg Charter, Local Agenda 21, Aalborg+10 Charter and the Covenant of Mayors. In 2007 the Local Energy Plan 2007-2012 was approved, setting targets for energy consumption reduction of 9% (compared to 2004). In addition, due to the signing of the Covenant of Mayors in 2009, Vitoria-Gasteiz has to adapt its targets to the new commitment of going beyond the 20% CO<sub>2</sub> emission reduction and the promotion of renewable energy. For this reason, the municipality is currently working on a new "Fight against Climate Change Plan", a "Climate Change Adaptation Strategy" and an "Energetic Ordinance" where new targets and actions will be set to reduce CO<sub>2</sub> emission and promote renewable energies. The existing draft of the "Fight against Climate Change Plan" already establishes the following targets: 70,000 m<sup>2</sup> of solar thermal, 10 MWp of solar PV, 9% on energy savings and 24.5% of CO<sub>2</sub> emission reduction by 2020. As it was the case with Lisbon, a detailed study to quantify the urban solar potential is considered of highest priority within the Action Plan in order to identify the realistic possibilities of solar energy use at urban level.

Within the Vitoria-Gasteiz solar Action Plan the following long-term targets have been set :

- Identification of the realistic solar potential at municipal level by 2012.

- Integration of solar requirements in the Urban Master Plan and Energetic Ordinance by 2015.
- Mobilization of 10% of the assessed solar potential in the existing industrial area of the city by 2015.

### 3 Summary

Within the POLIS project, the 6 participating cities (Lyon, Paris, Munich, Lisbon, Malmö and Vitoria-Gasteiz) have committed on long-term strategies to integrate solar energy at urban level that are consistent with existing CO<sub>2</sub> mitigation targets in solar Action Plans embeded in local planning.

The following table summarises the long-term solar targets of POLIS cities defined within the solar Action Plans.

Country/ City	Local Working Group and long-term targets of solar Action Plan
France/ Lyon	<p><b>Local Working Group:</b> Grand Lyon Urbanism agency, Grand Lyon technical services, Agence Locale de l'Energie de l'agglomération lyonnaise and HESPUL (technical partner)</p> <p><b>Long-term targets of solar Action Plan</b></p> <ul style="list-style-type: none"> <li>▪ Passive solar share of the heating demand reaches at least 20% in all new development areas &gt; 100 units (residential) from 2012.</li> <li>▪ Through POLIS measures PV and solar thermal capacities will have increased by factor 4 and 3 in 2020. In order to reach the targets of the Grand Lyon Climate Action Plan the following yearly increases of capacity installed will be necessary: 50% per year for PV installations and 40% per year for solar thermal installations.</li> </ul>
France/ Paris	<p><b>Local Working Group:</b> City of Paris (Urban Ecology Department, Urban Planning Headquarter, Social Housing Headquarter, Public Works Headquarter) and Urban Planning Agency of the City of Paris (technical partner)</p> <p><b>Long-term targets of solar Action Plan</b></p> <ul style="list-style-type: none"> <li>▪ Detailed assessment of the solar thermal and PV potential of the whole city building stock by 2012, combining the results of ongoing studies about renewable energies potential and future feasibility studies regarding solar energy in an interactive map for professionals and citizens.</li> <li>▪ Installation of 200 000 m<sup>2</sup> of solar panels in Paris by 2014 to reduce the Parisian carbon footprint.</li> <li>▪ Definition of realistic targets for solar technologies (solar thermal and photovoltaic) in the whole city area by 2012, based on the feasibility studies about renewables and specifically solar technologies and the assessment of solar potential of the city building stock.</li> <li>▪ Set of requirements for solar energy is integrated in the local Urban Planning Plan by 2013, thus anticipating the opportunity opened by the new Environmental Law.</li> </ul>
Germany/ Munich	<p><b>Local Working Group:</b> City of Munich (Urban Planning and Building Regulation Department) and Ecofys Germany (technical partner)</p>

Country/ City	Local Working Group and long-term targets of solar Action Plan
	<p><b>Long-term targets of solar Action Plan</b></p> <ul style="list-style-type: none"> <li>▪ Support and mobilization of a PV potential of 3.5% of Munich's power demand addressed through the "Solar Initiative Munich (SIM)" by 2015.</li> <li>▪ Solar Photovoltaic facilities: increase of the total share of electric power demand in Munich to additional 3.5% in 2030.</li> <li>▪ Solar thermal facilities: increase of the total share of heat demand in Munich to 3% in 2030.</li> <li>▪ Passive solar energy: Guarantee to reach a share of passive solar gains (reference 25%) of the overall heating demand in all new areas &gt; 100 units from 2012.</li> </ul>
<b>Portugal/ Lisbon</b>	<p><b>Local Working Group:</b> Lisbon municipality, Agência Municipal de Energia e Ambiente de Lisboa and Wee Solutions (technical partner)</p> <p><b>Long-term targets of solar Action Plan</b> An initial assessment has been done out to extrapolate national targets for micro-production and solar thermal systems on Lisbon residential buildings. The definition of more specific long-term targets for the adoption of solar technologies has to take into account the actual urban potential based on existing conditions, which is unknown yet. Therefore, a detailed study to quantify the urban solar potential will be carried out as specific Pilot Action within POLIS project, as indicated in Lisbon solar Action Plan. The adoption of public policies for the integration of solar urban planning guidance will derive also from the results of the assessment carried out at the local level.</p>
<b>Sweden/ Malmö</b>	<p><b>Local Working Group:</b> City of Malmö (Environment Department, Real Estate Office, Urban Planning Department and Department of Internal Services), Skåne Energy Agency and Lund University (technical partner)</p> <p><b>Long-term targets of solar Action Plan</b></p> <ul style="list-style-type: none"> <li>▪ Identification of measurable targets for active solar systems (PV and solar thermal) for the whole city area in 2012 for new and existing buildings.</li> <li>▪ Introduction of solar energy requirements in the urban planning process in 2012 by using the new Environmental Program, Energy Strategy and Environmental Building Program South.</li> <li>▪ Exploitation and purchase agreements are developed with respect to solar energy requirements and are used in special areas from 2011.</li> </ul>
<b>Spain/ Vitoria-Gasteiz</b>	<p><b>Local Working Group:</b> City of Vitoria-Gasteiz (Urban Planning Department, Environment and Sustainability Department and Energy Agency of Vitoria-Gasteiz) and Universidad Politécnica de Madrid (technical partner)</p> <p><b>Long-term targets of solar Action Plan</b></p> <ul style="list-style-type: none"> <li>▪ Identification of the realistic solar potential at municipal level by 2012.</li> <li>▪ Integration of solar requirements in the Urban Master Plan and Energetic Ordinance by 2015.</li> <li>▪ Mobilization of 10% of the assessed solar potential in the existing industrial area of the city by 2015.</li> </ul>

Table I. Summary of long-term solar targets defined in the solar Action Plans of POLIS cities