

**Comune di Padova**  
**LAKs Inventory & MAP provides focus on savings and renewable energy**

**Introduction**

<b>Name of the municipality</b>	Comune di Padova, Italia
<b>Project logo &amp; City Logo</b>	 
<b>Case study abstract</b>	<p>The Municipality of Padova has produced a GHG inventory and a Mitigation and Adaptation Action Plan (MAP) as part of their involvement in the LAKs Project. The inventory noted that GHG emissions from the municipality were just below 9 tCO<sub>2</sub>e/ head in 2005.</p> <p>Implementation of measures included in the local mitigation and adaptation action plan has begun and the city aims to reduce GHG emissions by around 21% on the 2005 level by 2020.</p> <p>Measures included in the action plan aim at increasing the share of renewable energy used, making the city a greener and more energy efficient place to live, improving innovation and promoting the low environmental-impact economic activity, improving transport flows, and making the city a more resilient place for residents.</p> <p>Actions already completed by the municipality include installation of solar electric (PV) and solar thermal systems on many municipal buildings; replacement of many oil-fired heating boilers with new boilers that burn biogas; recovery of biogas from the waste treatment plant to generate electricity (300 MWh/year); freight deliveries to the town centre rationalised to reduce environmental impacts and emissions from big trucks; and purchase of bio-fuel cars for the city fleet.</p> <p>Other proposed actions, included in the MAP that are now waiting for financial approval or implementation partners include: providing subsidies or for installation of more PV and solar thermal systems, and funding for more on other schools and sports centres; the implementation of an organic waste-to-energy system; changes to street lighting and traffic light bulbs to improve energy efficiency; actions to support a shift of 25% of municipal transport-needs to walking and bicycles; the use of methane and bio-fuels in the municipal bus fleet; support for the use of low-emission private cars. The city is also investigating support for better broadband (tele-commuting) facilities, a green procurement scheme, and energy recovery from a natural gas processing facility that will generate electricity (6000 MWh/year).</p>
<b>General overview for the LAKs project</b>	<p>The LAKs project (Local Accountability for Kyoto goalS) was established as a LIFE+ project in 2009 with the aim of demonstrating the potential for cities to grasp opportunities and</p>



	<p>create synergies to actively contribute to the achievement of the Kyoto goals and targets set by the European Commission within the 2008 climate action and renewable energy package.</p> <p>As direct representatives of the population, municipalities are very important actors in the struggle to implement climate protection policies and actions. They have the role of planner and implementer of the visions and plans to improve the climate resilience of their community.</p> <p>Municipalities are appropriate bodies to implement local climate protection policies, implement local actions and administer incentives aimed at encouraging effective GHG emissions reductions within a community. Municipalities can ensure that proposed actions also look after the health and welfare of local people, and that appropriate benefits from local actions will flow to their community.</p>
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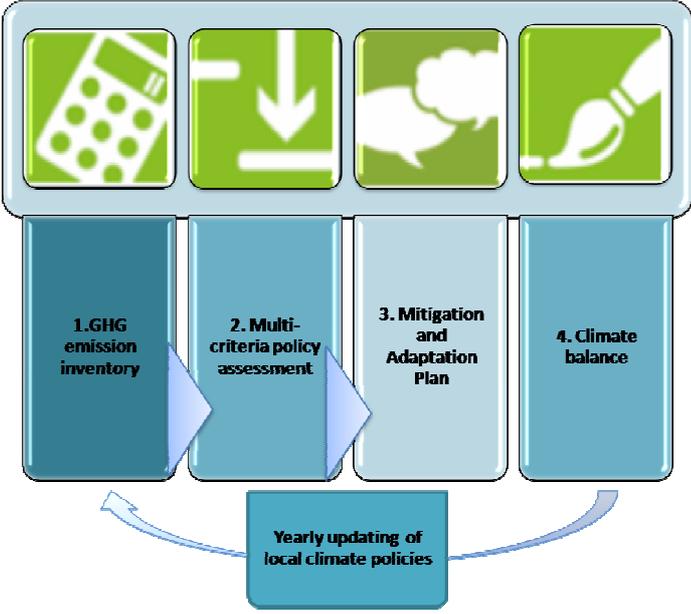
**Municipal profile**

<b>Population</b>	210.000 (2010)
<b>Land area</b>	91,85 km <sup>2</sup>
<b>Municipal annual budget</b>	500 M Euro
<b>Baseline emissions / capita</b>	9 tCO <sub>2</sub> eq per capita per year in 2005
<b>Baseline energy use / capita</b>	31 MWh per capita per year in 2005



**The case study**

<b>Case Study</b>	<b>Developing a climate action plan for Comune di Padova</b>
<b>Context of Padova</b>	<p>Padova, a city of around 220,000 people, is located in the Padua-Treviso-Venice metropolitan area of more than 1,6M people. The city has one of the largest industrial zones in Italy (and Europe) with industrial companies employing around 50,000 workers. But it is also one of the most polluted air quality areas of Europe. Emissions of particulate matter (PMs) and CO<sub>2</sub> are high as are all other air pollutants. The concentration levels of air pollutants related to energy consuming activities (especially PMs and NO<sub>x</sub>) are well above EU standards.</p> <p>All these elements compel the local authority to act urgently to produce strategies and plans to achieve long term reductions of emissions.</p> <p>Strategies related to energy and CO<sub>2</sub> emissions started with the first Energy Plan in 1999, but with the completion of the recent Sustainable Energy Action Plan (SEAP) in July 2011, the whole city now has clear technical and political emissions reduction visions. Sustainability is high on the political agenda for the municipality, which has established a goal of reducing emissions by more than 20% by 2020.</p> <p>Actions to improve the sustainability of the area include increasing renewable energy usage, improving the energy efficiency of public and private buildings, increasing the use of public transport by providing more high quality services, and providing more public transport encouragement and support campaigns.</p>
<b>LAKs climate accountability system, audit and roadmap processes</b>	<p>The LAKs project (Local Accountability for Kyoto Goals) was conceived to embed policies that help tackle climate change into each municipality's decision making and accountability processes. To be effective, climate change policies need to be implemented across all sectors and departments of a municipality. This means that is more difficult to coordinate and monitor the results than with other policies, and they can be competing for resources.</p> <p>Overcoming these issues is very challenging and this can be a reason for the lack of commitment of cities to climate protection activities. For this reason, the LAKs Project developed a range of planning and implementation tools and processes to simplify the process for municipalities that have committed to deal with climate issues. The LAKs climate accountability process is shown in the diagram below</p> <p>All the LAKs project planning tools and methodologies developed were conceived by Indica in collaboration with the four city partners and ARPA. Peer-review site-visits to each municipality were conducted by the LAKs partners and Indica, in order to assist the municipality audit existing energy and climate related policies and processes and to review opportunities for inclusion in their local action plan.</p>

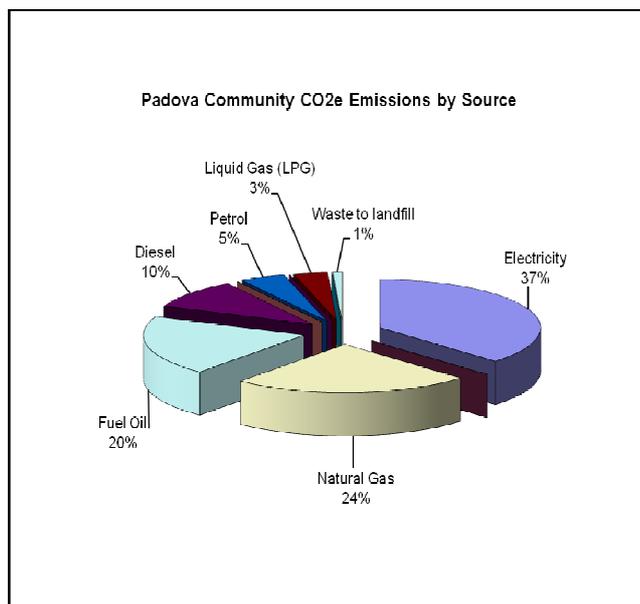
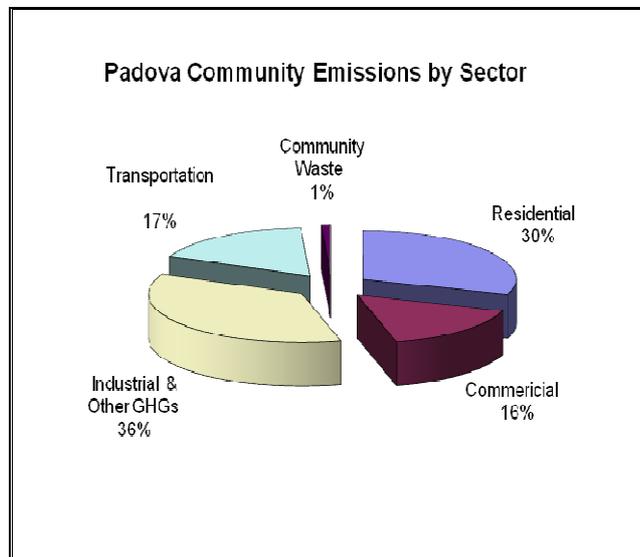
	
<p><b>LAKs GHG inventory Toolkit</b></p>	<p>ICLEI Europe and ARPA Emilia Romagna contributed to the LAKs Project by helping develop the LAKs GHG Inventory Toolkit as a calculator with supporting reference documents, to help the quantification of municipality emissions by sector and by fuels used.</p> <p>The LAKs calculator is an easy-to-use spreadsheet calculator (adapted for EU from ICLEI's CCP calculator) which converts data from energy used (fuels, heat and electricity) plus agriculture and waste activities into GHG emissions using appropriate nationally-acceptable emission factors. The emissions results are expressed in tonnes of carbon dioxide equivalent (t CO<sub>2</sub>e).</p> <p>Separate country versions of the LAKs GHG calculator were produced for Italy, Spain and Poland to ensure that the emissions factors used were acceptable for municipalities in each of those countries.</p>
<p><b>Padova GHG Inventory results</b></p>	<p>A GHG inventory is essential for analysing emissions from the municipality's operational activities in a city, and for the whole community. The inventory provides information that allows the city staff to focus first on big emitters and prioritise potential actions.</p> <p>In Padova, the community inventory highlighted the industrial sector as the largest area of community emissions – a total of 36% of all community emissions.</p> <p>The industrial sector is traditionally dominated by large, energy-competent companies that are quick to improve efficiency and reduce emissions if they are subjected to economic pressure. Local industry-municipality energy efficiency partnerships are a possibility for smaller industries, but the industrial sector is one of the hardest sectors for any municipality to help reduce emissions.</p> <p>The commercial and institutional sector in Padova accounts for another 15% of total emissions, and emissions reduction measures in this sector, developed in partnership with the city, could achieve significant results.</p>



However, the residential sector, with 29% of total emissions, and the transport sector with 17% of total emissions are other areas where the municipality can work in partnership with residents to make a large impact.

The inventory also provides a picture of the individual fuels and energy sources that cause most of the emissions. For Padova, electricity is the energy source producing the majority of emissions (37%), and so measures to increase supplies of renewable electricity will have a reductions impact on all sectors.

Other fuel sources with large emissions footprints, identified in the inventory, include natural gas (24% of total emissions) and fuel oil (20% of emissions). The city has identified many potential actions for municipality-owned buildings that will help reduce emissions from using fuel oil for heating, including use of biogas from waste systems or from installation of solar water heating systems.





<p><b>The Mitigation and Adaptation Plan</b></p>	<p>Measures included in the Mitigation and Adaptation Action Plan aim at reducing emissions from the city by a total of 21% of the 2005 level by 2020. In order to achieve this challenging objective the proposed measures have been identified and grouped into six main activity areas.</p> <p><b>1. New low carbon energy</b></p> <p>Padova has concentrated most of its actions in this area, and several projects have been already approved and will soon be completed. Padova aims to cut 4% of total CO<sub>2</sub> emissions from the development and use of renewable sources of energy.</p> <p>These measures will amount to a reduction of 70.335 tCO<sub>2</sub>. Some of these measures are:</p> <ul style="list-style-type: none"> <li>• installation of photovoltaic plants on public and private buildings (more than 9.000 kWp by 2020)</li> <li>• 36% of all electricity purchased by the municipality to come from renewable sources</li> <li>• energy recovery from a natural gas processing facility will be used to generate electricity (6000 MWh/year).</li> <li>• implementation of an organic waste-to-energy system</li> </ul> <p><b>2. A greener and more efficient city</b></p> <p>This area includes actions to increase energy efficiency in public buildings, the residential sector and the development of new green areas. The target is to reduce emissions by 7% of the 2005 level by 2020 through the diffusion of energy efficiency in buildings, improved city planning policies, and through the increase of green areas. These measures will reduce emissions by 135.000 tCO<sub>2</sub></p> <p>Some of these measures are:</p> <ul style="list-style-type: none"> <li>• energy efficiency initiatives in private and public buildings (including universities, hospitals etc.)</li> <li>• realization of 1.285 ha of new green areas (60 trees/ha on average)</li> </ul> <p><b>3. Smarter city and services</b></p> <p>Padova will achieve a 3,7% reduction in emissions through improved efficiency of grids, systems and services. These interventions will achieve a reduction of 70.824 tCO<sub>2</sub>.</p> <p>These measures include:</p> <ul style="list-style-type: none"> <li>• substitution of 15000 lamps of the public lighting service with more efficient units.</li> <li>• reduction of per-capita generated waste by 100kg a year.</li> </ul> <p><b>4. A city which moves better</b></p> <p>Activities in the field of public and private transport aim to achieve a 3% reduction of emissions by 2020 through implementation of improved mobility policies. Mobility measures will contribute to a cut of 61.207 tCO<sub>2</sub>. Some of these measures are:</p> <ul style="list-style-type: none"> <li>• A municipal cycling plan has been approved with the target of achieving at least 25% shift of transport-needs to walking and bicycles (59 km of new cycle paths proposed)</li> <li>• Two new lines of tram will be developed to increase public</li> </ul>
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	<p>transport options</p> <ul style="list-style-type: none"> <li>• Support is proposed for zero or low-emission private cars.</li> </ul> <p><b>5. A low carbon economy</b></p> <p>Activities supporting the development of a low carbon economy are designed to support sectors related to industry, commerce, logistics, agriculture and green public procurement (GPP). The target is to reduce more than 2% of total emissions through the promotion of a low carbon economy. These measures will amount to a reduction of 46.417 tCO<sub>2</sub>. These measures include:</p> <ul style="list-style-type: none"> <li>• Reduction of around 300.000 commercial vehicles through enhancement of the interporto (road and rail transport interchange area).</li> <li>• Implementation of the energy efficiency plan developed by the “confindustria” (association of Italian enterprises) in Padova.</li> <li>• Increase of the use of GPP policies by the Municipality.</li> </ul> <p><b>6. A resilient city</b></p> <p>This last section of the Mitigation and Adaptation Action Plan includes the policies that the Municipality will implement to address the problem of necessary adaptation to the changing climate. This area is in an early stage of consideration, and has not yet been investigated in depth. Some of the initial actions include:</p> <ul style="list-style-type: none"> <li>• creation of a group within the municipality responsible to investigate possible adaptation policies</li> <li>• collaboration with the local university to analyze potential vulnerabilities and sectors for priority intervention.</li> </ul>
<p><b>Initial results achieved</b></p>	<p>Actions already completed by the municipality include installation of solar electric (PV) and solar thermal systems on many municipal buildings; replacement of many oil-fired heating boilers with new boilers that burn biogas; recovery of biogas from the waste treatment plant to generate electricity (300 MWh/year); freight deliveries to the town centre rationalised to reduce environmental impacts and emissions from big trucks; and the purchase of bio-fuel cars for the city fleet.</p>
<p><b>Lessons Learned?</b></p>	<p>Major issues addressed in the creation of the Mitigation Action Plan (MAP):</p> <ul style="list-style-type: none"> <li>• it pushed the Municipality to think about and plan for a Long Period (to 2020)</li> <li>• the periodical interviews between technicians and councillors to select the list of actions that would be included in the Plan, and the on-going process to monitor and assess the results has achieved high-value understandings and relationships for cooperation inside the Municipality and with other local institutional actors.</li> <li>• The involvement of local –non institutional – stakeholders is necessary to achieve good outcomes</li> <li>• The themes are highly technical, and there is a need for periodical training, information and communication initiatives (both inside and outside the municipality)</li> </ul>



	<ul style="list-style-type: none"> <li>• For the preparation of the SEAP, access to “Bottom Up” territorial data was essential.</li> </ul>
<p><b>Replication potential</b></p>	<p>The European Commission’s flagship <i>Covenant of Mayors</i> programme is now providing a strong driver for similar activities by all municipalities in Europe. The LAKs partners believe that the methodologies and tools developed within this project could be very beneficial for other municipalities.</p> <p>Many of the tools and methodologies developed are available in 4 languages (English, Italian, Spanish, Polish) and they include:</p> <ul style="list-style-type: none"> <li>• LAKS GHG Inventory tool: allows an easy calculation of all the emissions generated at a local level through an excel sheet divided in different sectors</li> <li>• GHG emissions report: summarises the main findings of the inventory in an easy to read report</li> <li>• Multi criteria policy assessment tool: This is a spreadsheet that assists with analysing a list of policies and activities that can reduce emissions at a local level so that they may be included in the mitigation and adaptation plan;</li> <li>• Multi criteria policy assessment report: This tool includes a brief introduction on the methods employed for the multi criteria analysis.</li> <li>• Mitigation and Adaptation Plan draft tool: This was developed to assist the development of the plan by guiding the municipality to divide potential interventions into long term and short term actions.</li> <li>• Methodologies for calculating CO<sub>2</sub> reductions: This tool assesses some relevant methodologies to calculate CO<sub>2</sub> reductions deriving from the experience of the LAKS project.</li> <li>• Mitigation and Adaptation Plan template: This tool is a word format that you can use as starting point to draft your plan</li> <li>• Climate balance template: It is structured to check the implementation of all projects mentioned in the Mitigation and Adaptation Plan, following the same structure with government and community sectors. This will help to have a coherent structure in order to facilitate comparison between the two documents (the first where projects have been planned and the second where they are monitored)</li> <li>• Updated GHG Emission Report: An updated GHG Emissions Report will help your Municipality to check the progress obtained at local level by comparing the results with the baseline year.</li> </ul>



**Information**

<p><b>Key contacts</b></p>	<p>Comune di Padova, Environment Department, via dei Salici 35, 35124 Padova</p> <p>Email: Ms Daniela Luise, padova21@comune.padova.it Web: <a href="http://www.comune.padova.it">http://www.comune.padova.it</a></p>
<p><b>Municipality reference documents</b></p>	<p>Mitigation &amp; Adaptation Action Plan: <a href="http://www.comune.padova.it/">www.comune.padova.it/</a></p> <p>Mitigation and Adaptation Plan for Comune di Padova was submitted to Covenant of Mayors on 6th June 2011</p>
<p><b>LAKs Project contacts</b></p>	<p>LAKs Project Coordinator Email: laks@municipio.re.it Web: <a href="http://www.municipio.re.it/laks">http://www.municipio.re.it/laks</a></p>
<p><b>Acknowledgements</b></p>	<p>This case study and all the activities and instruments developed by LAKS project have been possible thanks to the support of the LIFE+ financial instrument of the European Union.</p>



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**The LAKs climate accountability system**

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