

# SIENA CARBON FREE:

*a local solution to a global challenge*



**FMPS**  
Fondazione Monte dei Paschi di Siena



Provincia di Siena



The amount of greenhouse emissions (GHG) in the atmosphere is generally offset by the quantity of CO<sub>2</sub> absorbed by the local ecosystem (forests, arboreal coltures, vineyards, olive groves and orchards) from some years in the province of Siena. A far-sighted aim reached in comparison with the planetarian goals recently set up in COP 21 (Paris, December 2015)

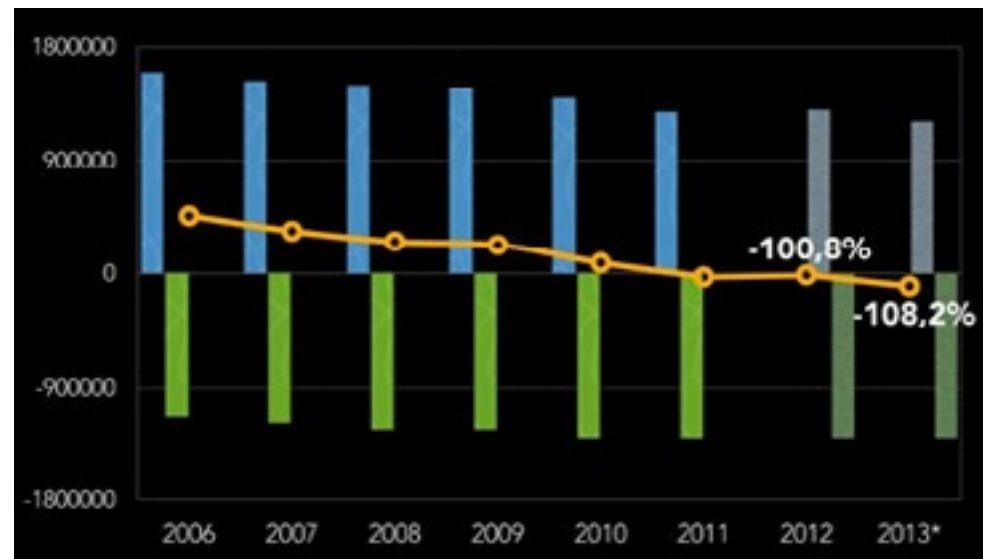


# INNOVATION



**[Scientific approach]** This achievement is based on an annual monitoring performed by the Ecodynamics Group (University of Siena) in compliance with the IPCC2006 guidelines (Intergovernmental Panel of Climate Change) including the following sectors: energy; industry; agriculture and breeding; waste management and forestry.

**[Control/certification]** Results from the GHG inventory have been controlled and reviewed by the certification body RINA SpA and finally certified in compliance with the ISO14064 standard (Carbon Balance). This is the first world case of a certified GHG inventory at the territorial scale.





# SCIENTIFIC APPROACH

The GHG inventory is a standard method for monitoring GHG emission of Nations. The active engagement of local authorities is a strategic condition for achieving the national goals of GHG emission mitigation and decrease. Knowing the state of carbon emission and absorption in sub-national regions is a valuable requisite for planning more specific solutions at the local level. The REGES project provides a systematic GHG inventory in the area of the Province of Siena. The inventory includes anthropic and biogenic GHG emission sources, and carbon sinks (i.e. carbon uptake by local ecosystems), based on a bottom-up approach (data directly collected in the area) in compliance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Outcomes from the 2008-2013 time-series analysis allowed for detecting the initial state (in terms of GHG emission) of the regional system and its progress in time and to estimate the effects of concrete actions promoted by the administration in different sectors. The annual carbon emission-absorption balance has two main outcomes: i) it informs policy makers and addresses choices based on real data monitoring; ii) it highlights effects of good practices and accomplished policies, contributing to maximize results.



Decreasing energy demand: on behalf of the provincial administration, APEA started a monitoring campaign of residential heating systems in order to control their performance through annual checks and guarantee a high efficiency standard (users were asked to pay 5-6 euros per year). After a wide campaign of system maintenance and efficiency improvement (applied to over 90,000 heating systems), the demand of natural gas for residential use has progressively decreased.



Increasing renewable energy: the Province of Siena added 2Mln euros to the national incentives and made approving procedures easier for small size PV systems. Since 2008, 70MW PV systems were installed within the Province with an estimated investment of around 25M euros and a majority of local enterprises engaged. The total electricity demand is covered by renewable energy generated within the Province of Siena (92.2% geothermal; 4.2% PV, 3.6% waste).



Integrated waste management: a specific GHG monitoring has been developed for the waste treatment plants of the Province of Siena addressed to develop an integrated waste management system. Main actions were: closure of landfills to be progressively replaced by a coherent waste treatment chain process including enhanced differentiated collection, advanced selection, recycling, organic composting, incineration.



Biofuel powered public transport: a number of buses were replaced by biofuel or gas powered vehicles. This action was not very relevant in terms of emission decreasing but quite important in terms of communication. It helps rise awareness on green policy and sustainable goals.



Fire risk decreasing: a detailed fire prevention plan was developed in order to decrease frequency and dimension of fires. The reduced number of fires together with new forested areas, allowed for increasing carbon uptake within the Province of Siena.



Dissemination: information and good practice sharing among citizens is a crucial point to avoid inefficiency and energy waste. A communication campaign has been developed to condition people behaviour.



Creation of a green brand: a specific brand for green activities, namely "Terre di Siena" (meaning "Lands of Siena"), combined with different claims ("carbon free", "green", etc.) has been created. This intends to highlight and certify the sustainability vocation of different private activities, including agriculture, tourism, manufacturing, sport and food.



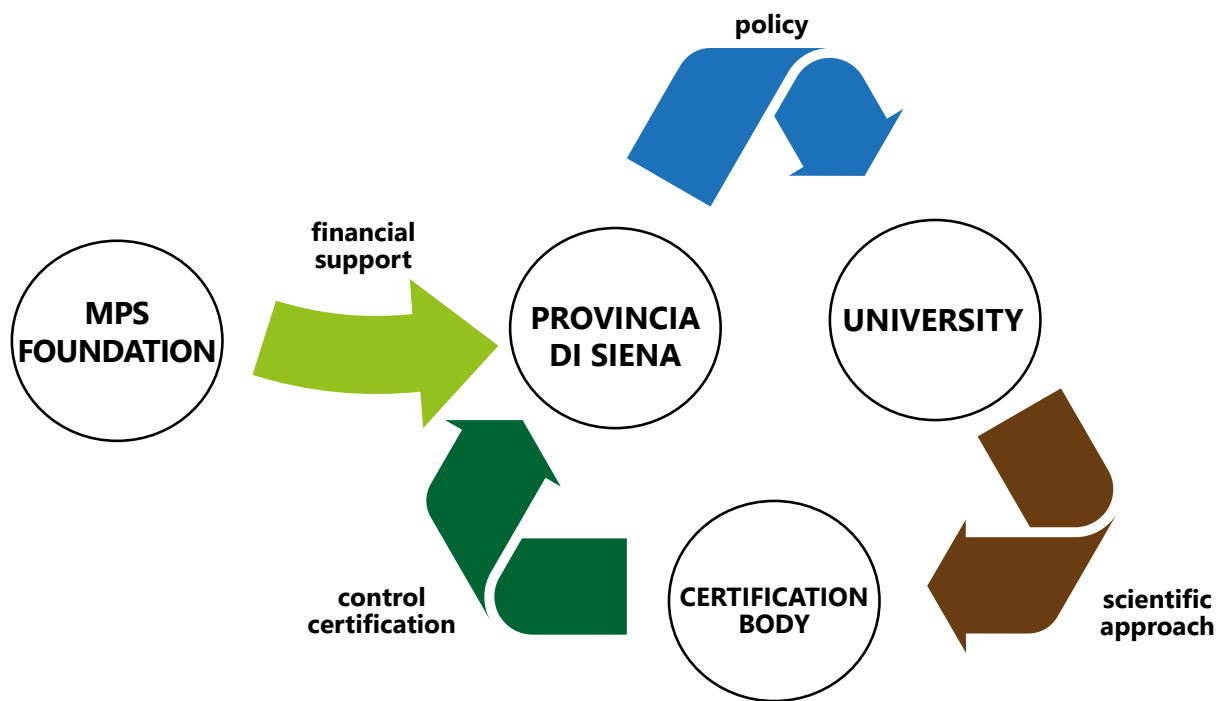
# MITIGATION MEASURES

Based on outcomes from the GHG inventory, possible mitigation solutions and measures have been promoted in different sectors of activity. These were part of a political plan, namely Siena Carbon Free 2015. A list of the main actions promoted by the administration, together with the Provincial Agency for Energy, Environment and Sustainable Development (APEA), follows.



# THE ACTORS

Since 2000 and over the years, MPS Foundation has funded the local administration, Provincia di Siena, with many grants, which has allowed to reach Siena Carbon Free goal through a virtuous institutional cooperation





## REPEATABILITY OF THE PROJECT

The GHG inventory is a standard method for monitoring GHG emission of Nations. The active engagement of local authorities is a strategic condition for achieving the national goals of GHG emission mitigation and decrease. Knowing the state of carbon emission and absorption in sub-national regions is a valuable requisite for planning more specific solutions at the local level.

The REGES project provides a systematic GHG inventory in the area of the Province of Siena. The inventory includes anthropic and biogenic GHG emission sources, and carbon sinks (i.e. carbon uptake by local ecosystems), based on a bottom-up approach (data directly collected in the area) in compliance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Outcomes from the 2008-2013 time-series analysis allowed for detecting the initial state (in terms of GHG emission) of the regional system and its progress in time and to estimate the effects of concrete actions promoted by the administration in different sectors. The annual carbon emission-absorption balance has two main outcomes: i) it informs policy makers and addresses choices based on real data monitoring; ii) it highlights effects of good practices and accomplished policies, contributing to maximize results.



**FMPS**  
Fondazione Monte dei Paschi di Siena



Provincia di Siena

