



## WP4 Task 4.4 Sustainable Energy Action plans

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# 1 PREMISE

## 1.1 THE EUROPEAN ALTERENERGY PROJECT

Alterenergy (Energy Sustainability for Adriatic Small Communities) is a Strategic Project strategic project funded within the **cross-border Cooperation Programme IPA-Adriatic 2007-2013**, which relies on **12.5 Million Euro total budget**, launched in September 2011 and it will last until August 2015. The initiative is led by the **Mediterranean Department of Puglia Region** with the scientific support of the **Technology and Innovation Regional Agency (ARTI Puglia)**, relying on a partnership of 18 organizations, regions, ministries and energy agencies all belonging to all the countries of the Adriatic area: **Italy (7 Adriatic Regions), Albania, Bosnia and Herzegovina, Croatia, Greece, Montenegro, Serbia and Slovenia.**

The precise aim of the project is to develop replicable models of sustainable management of energy resources through attended participated approach involving public administrations, policy makers, citizens and local stakeholders, improving their ability to plan and manage integrated actions of energy saving and the production of energy from renewable sources. Alterenergy aims to promote sustainability in small Adriatic communities through an integrated approach for the efficient use of energy and its production from renewable sources. Communities refer to a wider concept than “city”, including, besides the residential area, the industrial zone neighbouring the city and the rural territory that surrounds it.

The idea to focus on small communities comes from many reasons, among which the more relevant are:

- Small communities represent one of the most spread modalities of human settlements in the Adriatic area;
- Sustainable models of integrated energy production and use are easier to implement in small communities, given their tighter connection with the surrounding natural resources (e.g. woods and water flows) and the higher relevance of agricultural activities, with their availability of biomasses;
- The relatively low population number of typical small Adriatic communities (less than 10.000 inhabitants) creates better conditions for involving the local population in a participated planning process aimed at an energy use/production paradigm shift.

The Alterenergy work programme is made up of 6 Work Packages (WP):

- WP 1-Project Management
- WP 2- Communication and information
- WP 3-Integrated Energy management models
- WP 4-Sustainable Energy Action Plans
- WP 5-Business and investments support
- WP 6- Pilot project and demonstrative Actions implementation

As foreseen by the IPA Adriatic cross-border cooperation programme, the Alterenergy project has identified small communities as its specific target (population under 10,000), located within the provinces of Padua, Venezia and Rovigo; in this sphere, Veneto Agricoltura has identified the local community of Polverara through a public assessment and negotiation procedure.

## 1.2 COVENANT OF MAYORS, BEI AND SEAP

In December 2008, the European Parliament approved the climate-energy package aimed to achieve the goals the EU set for the year 2020: reduce greenhouse effect gas emissions by 20%, reach 20% energy savings and increase renewable energy consumption to 20%.

Many of the actions taken on energy demand and renewable energy sources necessary to fight climate changes impact local governments and cannot be pursued without the decentralised support of politicians, citizens and stakeholders. Local administrations, due to their vicinity with citizens, are in an ideal position to comprehensively meet the challenges. In fact, they can work “bottom up” and target all those energy-consuming sectors they directly control such as the construction, transportation and IT sectors.

Administrations can also contribute in reconciling public and private interests and integrate the use of sustainable energy in local development goals.

For this purpose, in February 2009, the European commission launched the Covenant of Mayors that set the Sustainable Energy Action Plan (SEAP), continuously updated and implemented, based on a Baseline Emission Inventory (BEI). The programme text introduces global problems and the general context in which the Pact originated in the premise and illustrates the commitments and endorsement Mayors undertake with European authorities in representing their territories and citizens. The SEAP and BEI and all local energy government and management mechanisms that they put into place emerged from these principles and endorsements.

The Sustainable Energy Action Plan identifies measures to be implemented in the defined sectors that range from buildings to town infrastructures, urban transport and zoning to decentralised energy production from renewable sources. The SEAP range of action covers the whole geographical area of the local authority, creating important interactions with surrounding towns and their local agencies.

The choice of the most efficient actions is guaranteed by the production of the Baseline Emission Inventory (BEI) meaning a database that quantifies local energy consumption starting from a suitably defined year of reference. Final energy consumption specifically refer to electricity consumption, heating/cooling, fossil fuels and renewable energy produced and consumed in the local geographical area.

SEAP involves and empowers different stakeholders, from the public administration in charge of being the spokesperson and example to be followed, to production and service companies to private citizens. In addition to identifying stakeholders, the plan strives to define the work schedule and, lastly, recruits and assigns human and financial resources to guarantee implementation.

Another feature of the SEAP is the definition of monitoring and self-assessment tools necessary to monitor obtained results and adapt the plan during the implementation phase. These tools guarantee stakeholders' continuous involvement.

This document incorporates the suggestions proposed in the European and provincial guidelines, indications on data collection, analysis and adaptation methods as well as the measures to be implemented in the various sectors.



### 1.3 THE INTEGRATED SUSTAINABILITY PLAN

The Integrated sustainability plan is the soul of the Alterenergy project and indicates the strategic guidelines, implemented on the local level, intended to achieve more sustainable energy consumption and production in line with the new European sustainable energy culture. The Plan defines a shared group of management models and relevant financial frameworks, suited for the small Adriatic communities, organised to create more widespread public and local economic stakeholder awareness on the opportunities and benefits of energy efficiency.

With regards to Veneto Agricoltura and, especially, target community needs, the plan is made up of a key streamline and operating document containing the summary of the results of all the activities completed and validated technical proposals including a series of additional in-depth analysis documents and well-organised database.

Territorial planning has taken shape at the same time of this work and, where already existent, was integrated with that set and shared in this project. Drafting the SEAP, updating construction regulations as well as TLP<sup>1</sup> with that assumed in the WP4 project led to the integration of the existent plan with new outlooks, according to a more orderly and efficient development plan. Collective participation contributed in the diffusion of the designed concepts in the analysis territory.

Special focus was placed on:

- Developing good relations with the public administration through periodic meetings, telephone conversations, emails, field inspections
- obtaining consistency between the extra-territorial plan (local, regional, national and community) and the assigned plan
- promoting stakeholder participation processes in various forms and on various levels
- using updated data from reliability sources that allow for a realistic outline of the community
- Researching pilot cases that can reflect local problems and the study of the applied solutions
- Researching and studying the latest technological innovations
- Developing relations with local agencies and institutions such as provinces, towns and universities in elaborating studies and plans on improving energy efficiency with wide-reaching stakeholders in the territory.

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<sup>1</sup> Adoption of the Territorial Layout Plan with Town Council Resolution no. 4 dated 27/04/2012.

## 1.4 PARTICIPATION PROCESSES

Veneto Agricoltura, under the IPA Adriatico Alterenergy WP2 project, developed an activity dedicated to training and information on energy efficiency improvement and savings topics holding a series of meetings with public administrations and citizens.

All the meetings were held in Polverara at the Casa delle Associazioni in Via Volparo 2.

The first round of meetings, addressing Public Administrations, were held on:

- Thursday, March 13, 2014: “Financing for renewable energies”
- Thursday, March 20, 2014: “Energy savings methods”

The purpose of the meetings was to involve both public sector technicians interested in potential public building and infrastructure energy reclassification works, and administrators, as those responsible for budgeting, making energy investments possible. The national and European legislative framework that introduced the Geothermal Energy Bill tool, potential bill users, the types of feasible interventions, maximum endorsement ceilings and documentation required to receive benefits were discussed during training sessions and supported by practical examples. Topics on white certificates were also discussed from the regulator and application standpoints, comparing past experiences in town implementing European energy policies in the field such as public lighting efficiency improvement and school or public building heating/air conditioning system renovation.

Three conclusive meetings expressly focused on analysing the public’s needs, highlighting the goals of the Sustainable Energy Action Plan, residents and local businesses’ key roles in reaching Plan goals and current tax deduction benefits. The meetings were held on:

- Thursday, March 27, 2014, on “European energy meet the citizens of Polverara”;
- Thursday, April 3, 2014, on “Energy savings at home and at work”;
- Thursday, April 10, 2014, on “Home and business energy renovation”.

## 1.5 COORDINATION AND ORGANISATION STRUCTURES

With the approval of its sustainable energy action plan, the town of Polverara has initiated a complex administrative procedure that is systematically managed throughout the procedure requiring appropriate internal organisation, allocation of suitable budget resources and the support of external stakeholders. Counting on the fact that foreseen investments can be economically beneficial to the town’s budget with a significant reduction in energy bills, the possibility of new investment forms arise to create innovative energy efficiency improvements and gradually install renewable energy exploitation plants in the territory.

The structure designed to implement the Action Plan includes the direct active participation of the town joint committee and council, thus both the local administration’s government and planning and control boards. This way, both the Joint Committee and Council can be constantly informed of plan implementation process progress.



To promote the achievement of plan goals, the administration chose to “adapt” the articulation of public devices according to the following scheme, defining the specific meeting tasks and sites, to identify specific responsibilities while facilitating information exchanges.

The specific reorganisation of public structures requires a Committee, directed by the Mayor and Councillor for Environmental Policies, organised in association with the Public Works and Environment manager, in which the Chairman of the Town Council and all directors involved in SEAP development activities are involved.



## 2 GENERAL STRATEGY

### **The ethics of local commitment that looks towards global horizons**

For years, Polverara has focused its environmental protection and sustainable development policies, with special focus on energy efficiency and renovation topics, and the use of renewable energy sources, not as a declaration on intent, but actually investing public resources and smart energies in a series of innovative and original projects and actions for the territorial context in which we operate.

The baseline emission inventory, an analysis tool that is an integral part of this SEAP, highlights the results of the choices made, indicating the need and will to go further.

### **The ambitious goal that Polverara intends to achieve with this plan is to reduce CO<sub>2</sub> emissions in 2020 by 35% from 2007 use as the reference year.**

The Public Administration's choice is not only due to the main ethics but also and above all to the important chance to limit fixed costs by better managing and re-distributing the increasingly fewer resources available to local stakeholders where there is higher need.

When the Covenant of Mayors was signed, Polverara was not fully aware of the type of commitment required and how complicated it would be to achieve the goals of limiting carbon dioxide emissions to at least 20%. However, it was clear that the foundations had been laid for good results.

The baseline emission inventory highlighted the specific division of heat, electric and transport consumption in the various town sectors and their relationships with residential and tertiary consumption, indicating how much savings and efficiency could be improved in school and recreational buildings, buildings that house administrative offices and, more in general, public buildings, to balance fixed costs in the administration's budget. However, the figures demonstrated how the weight of public consumption is negligent in the total emission pie and, therefore, the need to intervene on private citizens' consumption appeared evident. In fact, the residential sector seems to be the most responsible for greenhouse effect gas emissions.

Polverara's biomass district heating service - thus the most significant investment made by the administration in renewable energy terms - does not and will not have favourable effects only within public buildings, but also on a significant amount of connected private apartments, thus exactly where the Action Plan indicated the highest need to intervene.

The network extension, that recently connected all new public buildings, is the ideal continuation of the launched procedure. The diffusion of the service will improve energy and environmental performance and significantly contribute in reducing climate-altering gases. No less important is the fact that Polverara only purchases green electricity (thus produced from renewable sources) and has equipped all suitable public building roofs with photovoltaic systems.

When considering the fact that in recent years this town experienced a significant demographic increase and thus had to provide the community with new spaces, meeting places and, obviously, services in general, it can be

said that Polverara's energy and environmental policies fully compensated for the urban expansion's environmental impact.

Based on these considerations, the town's vision can be summarised as follows:

**“Sustainability development of our community: more services, higher efficiency, less CO<sub>2</sub>”**

The firm believe lies in the pursuit of a method which, due to the example provided by interventions on public buildings and thanks to the educational interventions at schools (solutions thoroughly illustrated in the following plan actions), consolidating the sustainability and smart energy culture in which the EU has highly invested will be possible.

Most energy consumption and CO<sub>2</sub> emissions on the world level are attributable to the energy metabolism of cities and the multiple activities conducted therein. A policy whose goal is to limit consumption must, therefore, address citizens, providing them with clear information and suggestions that contribute in altering incorrect habits and making those energy savings interventions that we often underestimate and delay more convenient and feasible.

Goals, commitments, strategies	Actions and interventions
High focus on RES and the generation of low CO <sub>2</sub> content energy	Improved efficiency and promotion of the district heating network connected to co-generation plants.
Public building interventions	Reduction of energy consumption operating on: <ul style="list-style-type: none"> <li>Town buildings (replacing town and elementary school windows/doors, town hall cladding, town hall and elementary school roof)</li> <li>Public lighting (replacement of all lamps with more efficient models such as high pressure sodium vapour or LED)</li> </ul>
Zoning and private construction policies that promote energy efficiency and RES	Optimise RUE indications (Zoning and building regulations) for new zoning, demolitions with reconstruction and renovation of existent buildings to increase energy performance and reduce the final energy demand.
Higher efficiency and energy savings, involving all consumption sectors and all citizens	<ul style="list-style-type: none"> <li>Organisation of specific information and awareness events for citizens, businesses and administrators</li> <li>IT portal on renewable energy and energy efficiency in key city sectors, with information for citizens and on good practices in the city</li> <li>Involvement of private companies to develop and improve the Action Plan</li> </ul>
Endorse ecological mobility and transport	<p>Increase bicycle and pedestrian routes (safe, enjoyable, well-lit, marked with signs, subject to constant maintenance, integrated with public transport (former bicycle racks at bus stops), greenery, roads and buildings in urban areas.</p> <p>Strengthen the use of technologies (ICT) to implement online administrative procedures, so that citizens need not move to access public offices.</p> <p>Reinforce the image of cycling as a true means of transportation.</p>
Exploit territorial resources for energy production	Plant trees in land owned by the town to produce chips for the district heating plant.

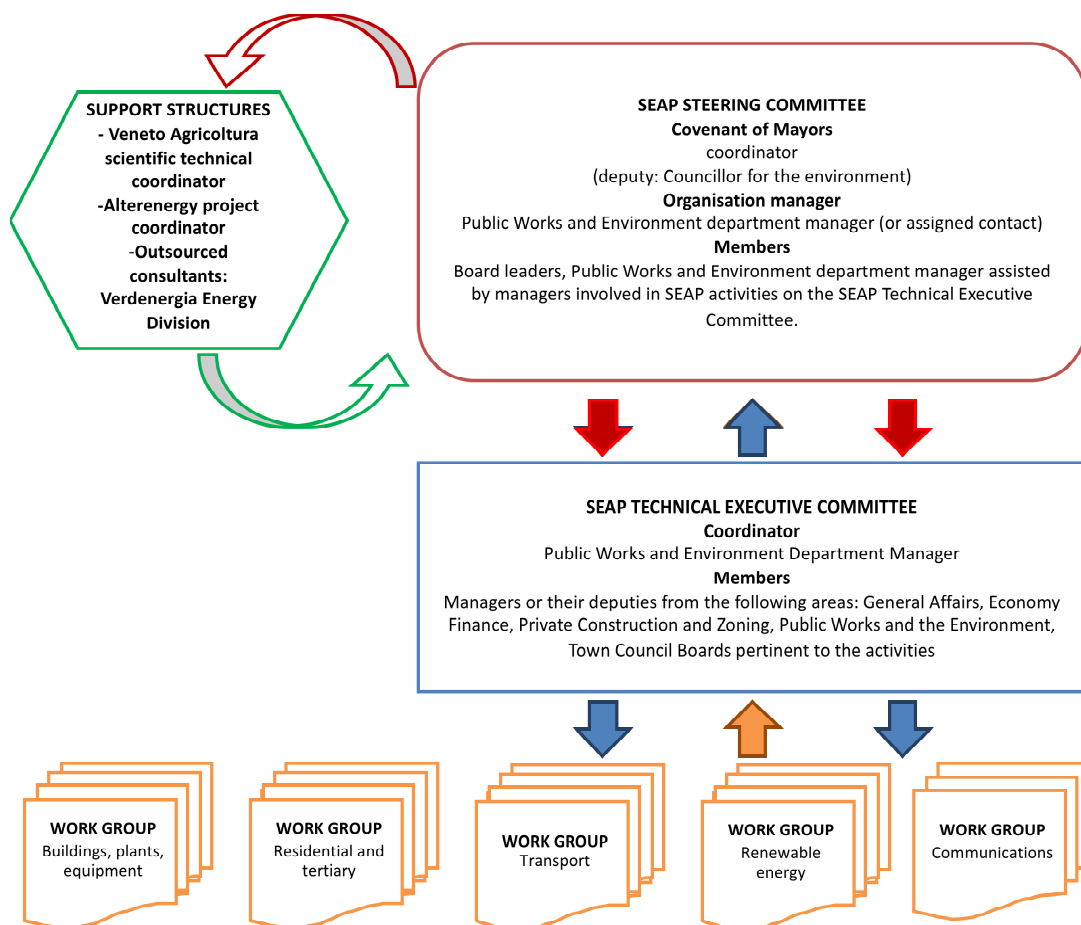


Figure 1. Administrative structure adopted to develop Polverara SEAP and to implement local energy policies.



## **2.1 CURRENT AND FUTURE INITIATIVES: BIOMASS IN POLVERARA**

In recent years, the town of Polverara is focusing high attention on energy production spheres starting with renewable resources and towards initiatives dedicated to promoting efficiency and energy savings and environmental and energy sustainability.

In this context, some important strategic initiatives are worthy of note:

- the establishment, in 2004, with Town Council resolution no. 16 dated April 26, of the “District for natural renewable energy”, in order to improve energy transformation processes, reduce energy consumption and improve territorial environmental conditions;
- the establishment, in 2007, along with other towns in Saccisica (geographic area in which the town lies) and PadovaAttiva Srl from the province of Padua, of Verdenergia E.S.Co. Srl, a company with public majority shareholdings that provides services for energy savings and for the production and use of renewable energy;
- the establishment, in 2008, with Town Council resolution no. 26 dated July 16, of public urban district heating service, with centralised biomass heat production and heat distribution to users connected to the network.

The promotion of this initiative was accompanied by the gradual development of energy chains based on the use of biomass as an alternative to the traditional use of fossil fuels. Given the rural context in which the town is located, the raw material used in this chain is essentially of agricultural and/or agro-forestry nature.

## **2.2 BIOMASS PLANTS IN THE TOWN**

### **2.2.1 THE WOOD BIOMASS PLANT**

The plant is found in the immediate vicinity of the centre of town but still relatively isolated, the logistics and circulation dedicated to servicing it are rather functional and do not create disturbances and excessive impacts on the community in terms of traffic associated with combustible biomass transport vehicles.

It has average power (just under 700 kWt) and the partial owner, partial concessionary and manager is Verdenergia E.S.Co. Srl, a town Energy Service Company with public majority shareholdings (the organisation that holds the most shares is the town of Polverara).

The plant operates six months a year, from September to May, and is assisted by a methane backup/recovery boiler located in the "Giovanni XXIII" elementary school and whose consumption is covered by the district heating concessionary company.

The urban district heating network provides public services in the form of centralised heat production and exclusive distribution of heat energy to connected users and services a total of about eighty users, both public and private, distributing and providing heat energy (heating and hot water). The district heating network allows heat to be distributed (supply of heating and hot water) through an underground pipe network that connects the centralised heating plant with connected end users, eliminating all the individual heat production structures, accounting for heat distributed to single users through individual meters.

The raw material used is wood biomass (chipwood).

## 3 EMISSION BALANCE SHEET

### 3.1 REFERENCE INDICATORS

The preliminary survey has allows for the main environmental features under analysis to be identified and its main purpose is to indicate the changes experienced by the territory to promote better comprehension and more careful planning.

The European guidelines suggest the most important indicators be identified and used in assessing the reference framework, also with reference to the role they can assume in the subsequent monitoring phase for the definition of all aspects illustrated in the BEI.

The following table summarises the most interesting indicators identified.

DESCRIPTION OF REFERENCE INDICATORS		
SCOPE	PARAMETER	INDICATOR
CLIMATE FRAMEWORK	Degrees Day	<ul style="list-style-type: none"> <li>– Total energy/Degrees Day;</li> <li>– Total thermal energy/Degrees Day;</li> </ul>
DEMOGRAPHIC FRAMEWORK	Population No. of families	<ul style="list-style-type: none"> <li>– Total energy/population</li> <li>– Total thermal energy/population</li> <li>– Total electrical energy/population</li> <li>– Total energy/no. of families</li> </ul>
BUILDING ASSETS	No. homes Building sq. m. Building cubic m.	<ul style="list-style-type: none"> <li>– Total energy/total no. property units</li> <li>– Total energy/no. of occupied property units</li> <li>– Total energy/building sq. m.</li> <li>– Total energy/building cubic m.</li> </ul>
PRODUCTION SECTORS	No. of workers	<ul style="list-style-type: none"> <li>– Total energy/no. workers employed</li> <li>– Total electrical energy/no. workers employed</li> <li>– Total thermal energy/no. workers employed</li> </ul>
PUBLIC LIGHTING	No. light points Road km	<ul style="list-style-type: none"> <li>– Road km/No. light points</li> <li>– Electrical energy from PL/No. light points</li> </ul>
TRAFFIC AND MOBILITY	Km roads Km bicycle paths No. owned vehicles Population	<ul style="list-style-type: none"> <li>– Km roads/km bicycle paths</li> <li>– Population/no. owned vehicles</li> <li>– BEI traffic/km roads</li> <li>– Km bicycle paths/population</li> </ul>

## DESCRIPTION OF REFERENCE INDICATORS

SCOPE	PARAMETER	INDICATOR
RENEWABLE ENERGY	<b>BEI traffic</b>	
	Photovoltaic power installed $P < 20 \text{ kW}_p$	
	Solar heat power installed	– $\text{kW}_p / 1000 \text{ pop.}$
	Biomass power installed	– $\text{kW}_t / 1000 \text{ pop.}$
	<b>population</b>	

## 4 SEAP ACTIONS

### 4.1.1 SMART METHOD

The construction of plan actions follow the principles summarised in the SMART acronym, that indicates that each action must be: *Specific, Measureable, Achievable, Realistic and Time-bound*, meaning that a detailed time schedule must be planned. This method corresponds to an efficient management principle.

The following questions must be answered to set SMART goals:

### 4.1.2 KEY CONCEPTS

A “**direct action**” is a precise, defined and measurable action that leads to the reduction of CO<sub>2</sub> emissions as its immediate consequence. Replacing a traditionally fuelled car with a methane or electric one, is a direct action, just as replacing tradition incandescent light bulbs with energy savings ones or simply turning off the lights in a room where they are not needed on are direct actions.

“**Indirect actions**” are mainly cultural actions which, while not producing an immediate benefit in terms of carbon dioxide emissions in the air, extend awareness, demonstrate new available skills and technological developments applicable to our daily energy use. For example: a conference on the economic quantification of domestic energy savings which discusses waste due to electronic devices in “stand-by”, comparisons between home appliance energy labels, is an indirect type action, that can lead, in addition to improved participant awareness, to a series of *subsequent direct actions*.

Macro intervention categories

All actions foreseen under SEAP can be divided into various intervention sectors into which the plan (*macro categories*) is divided, meaning the same that are analysed in the territorial data collection and Baseline Emission Inventory:

- PB public buildings
- RES renewable energy sources
- RB private residential buildings
- PL public lighting
- M mobility
- GP “good practices”
- TER tertiary economic sector
- IND industrial sector



#### 4.1.3 MONITORING AND REPORTING

Once the SEAP is adopted and actions defined to bring carbon dioxide emissions to a minimum 20% reduction – summing the results of those already achieved and those to be implemented, the SEAP process requires *two-year activity monitoring and periodic result reporting to the Covenant of Mayors*. Thus, a responsible method, necessary to evaluate whether the estimates made correspond to the actual values measures (Plan efficiency) and, if this is not the case, understanding the reasons and applying corrective measures to return the general framework defined in the programming phase to the foreseen conditions.



## 4.2 HOW TO READ A SHEET

SEAP is a plan that addresses several public and private stakeholders and, as suggested by its name, must be a real action tool. The direct actions it contains cannot be simply indicated in a qualitative manner. The economic entity of the interventions must be quantified in both expense terms and consequent energy savings, also estimating the environmental benefit in terms of reducing CO<sub>2</sub> emissions. Always in quantity terms, the action's return on investments must be calculated, knowing that not all actions, albeit "virtuous" in CO<sub>2</sub> emission terms, can be repaid on the short or medium term from the economic standpoint.

The proposed sheets have different interpretation levels to promote a different level of analysis of the problems in question.

First of all, the sheet includes the identification of the **intervention sector** (i.e.: private residential building or public lighting, etc.) and an identification code to create an univocal index of the proposed actions.

Moving on, the **action title** is found accompanied by a **subtitle** that is a *brief description of the designed measurement goal*.

The next body of text is accompanied by an in-depth explanation of the proposed measure.

The **introduction** generally explains **WHY** the specific action is taken and generally describes the problem to be solved, the technological market opportunities, incentives and the economic, financial and social resources to be reaped.

The **premise**, divided into local introductory topics (**WHERE**), describes the particular local context of the intervention and special conditions of the geographic area, buildings or plants (for example, number of buildings constructed according to a specific construction method, number of lamps in the territory, and so on). It identifies business costs and benefits, opportunities and risks.

The **goal** part specifically indicates **WHAT** the action aims to achieve

The **description** includes the methods to be pursued to achieve the result (**HOW**).

The **schedule** defines the work times (**WHEN**). Periods between 2007 and 2020 are identified in which the actions can be completed as well as the time necessary to complete preparatory activities.

The action **manager** is the department or individual assigned to ensure the proposed goals are actually achieved (**WHO**).

**Stakeholders** are identified who will be involved in the action.

The sheet is completed with the identification of:

**budgeted costs** necessary to achieve the goal (total or parameterised expressed in Euro);

**pay-back**, a simple estimate of investment returns time and identified financial resources;

**Expected results** in terms of **energy savings** (MWh/Year), any **energy production from renewable sources** (MWh/year) and **avoided CO<sub>2</sub> emissions** (CO<sub>2</sub>/year).

The **monitoring** item identifies the criteria and indicators that will be adopted to guarantee the actual conclusion of the foreseen activities.

## 5 ACTION INDEX

Code	Description	Scope	Estimated cost	Pay-back [years]	Energy [MWh/a]	Avoided CO <sub>2</sub> [tCO <sub>2</sub> /a]
RES.001	Heating up in the network	Public	0	---	---	150
RES.002	Planting the town's wood	Public	0	---	---	23
RES.003	Green electricity from greenery	Public	0	---	---	---
RES.004	A ray of sunlight in public buildings	Public	0	---	9	0
RES.005	100% green electricity	Public	1.011 €/year	---	---	163
RES.006	Private photovoltaic systems	Private	---	---	403	194
PB.001	At school with good grades	Public	---	---	---	0
PB.002	Photovoltaic systems at school	Public	0	---	20	0
PB.003	Integrated lighting services	Public	---	---	7	0
RB.001	55% and 65% tax deductions	Private	---	---	733	148
RB.002	Goodbye incandescent bulbs	Private	---	---	580	280
RB.003	I choose the label	Private	---	---	1.147	554
RB.004	G.A.S. training and promotion	Public	---	---	---	---
RB.005	Tree party	Public	720 €/year	---	---	---
PL.001	The end of Mercury	Public	23.000 €	3	---	0
PL.002	Rationalising public lighting	Public	2.160 €	1	---	0
M.001	The town runs on methane	Public	14.000 €/car	---	---	1
M.002	Running on methane	Private	---	---	---	15
M.003	Over 70 card	Public	1.174 €	---	51	12
M.004	Pedibus	Public	---	---	32	0,8
M.005	Town cycling paths	Public	2.800.000 €	---	---	90
GP.001	European energy meets Polverara	Public	0	---	---	---
GP.002	Student project: theatre education	Public	0	---	---	---
GP.003	Web page	Public	0	---	---	---
GP.004	Liberambiente project	Public	0	---	---	---
GP.005	The hen fair	Public	0	---	---	---
IND.01	Energy and innovation	Private	0	---	---	---
<b>TOTAL</b>						<b>1.631</b>

## 6 SCHEDULE

MACRO CATEGORY CODE	ACTION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RES.001	Heating up in the network														
RES.002	Planting the town's wood														
RES.003	Green electricity from greenery														
RES.004	A ray of sunlight in public buildings														
RES.005	100% green electricity														
RES.006	Private photovoltaic systems														
PB.001	At school with good grades														
PB.002	Photovoltaic systems at school														
PB.003	Integrated lighting services														
RB.001	55% and 65% tax deductions														
RB.002	Goodbye incandescent bulbs														
RB.003	I choose the label														
RB.004	G.A.S. training and promotion														
RB.005	Tree party														
PL.001	The end of Mercury														
PL.002	Rationalising public lighting														
M.001	The town runs on methane														
M.002	Running on methane														
M.003	Over 70 card														
M.004	Pedibus														
M.005	Town cycling paths														
GP.001	European energy meets Polverara														
GP.002	Student project: theatre education														
GP.003	Web page														
GP.004	Liberambiente project														
GP.005	The hen fair														
IND.01	Energy and innovation														



## 7 THE 2020 CO<sub>2</sub> EMISSION REDUCTION GOAL

Demographic growth is forecasted for the town of Polverara for 2020. Thus, **pro-capita** emission values were selected for BEI and IME calculations to determine the target and relevant territorial energy policies and plans.

From this standpoint, the minimum 20% CO<sub>2</sub> emissions compared to 2007, with increasing population in time, can be pursued if the single residents do not increase their consumption and the proposed actions are implemented with an efficient plan.

Each demographic increase should thus have lower effects, in pro-capita terms, compared to the emission quota for each resident, net of the perfect reduction goal value.

Substantially, faced with **12,399 tonnes of CO<sub>2</sub> emitted in 2007**, from a **population of 2,754**, the starting pro-capita value is **4,502 t CO<sub>2</sub>/pp** (tonnes/person), while the minimum goal the community decided to reach after voluntarily joining the covenant of mayors, corresponds to a **20% reduction in 2020**, is **3,6018 t CO<sub>2</sub>/pp**. Considering that the estimate population increase for 2020 is 3,780, a **13,615 tonne CO<sub>2</sub>** value will be admissible to reach the maximum pro-capita emission goal for the town of Polverara in 2020

The proposed actions allow for this goal to be achieved and exceeded thanks to the activities to be implemented by the entire community and thanks to the new features introduced by recent national directives aimed to save energy and improve efficiency.

Should the actions be fully successful, the expected results is **(12.399-1.631) 10.768 tonnes of CO<sub>2</sub> emissions a year in 2020**, equal to less **1.631 tonnes of CO<sub>2</sub>/anno** total emitted compared to the initial 2007 value that corresponds to **2,849 t CO<sub>2</sub>/pp** (tonnes pro capita), meaning a **pro-capita reduction of 37 %** over the 2007 starting value.

Two-year monitoring, with implementation reports, must permit partial results to be checked, permitting gradual progress towards the set goal to be verified thanks to an analysis of selected indicators to promote the comprehension of available intermediate data.