



# Adaptation and Mitigation- an Integrated Climate Policy Approach

Report on the Mitigation Scan  
Province of Ferrara

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## **Climate Scan Province of Ferrara**

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# Mitigation Scan Province of Ferrara

## 1. Status quo of local CO<sub>2</sub> - reduction in the Province of Ferrara

From the data elaborated by APAT (the national environmental agency) for the European Commission, emerges that in Italy in the 2005 greenhouse gas emissions were 13% above the value of 1990 and with the reduction goal being 6,5% approximately 20% away from the Kyoto goal.

In the Province of Ferrara the data of ATO 6 (Territorial Optimal Agency), the Agency for the public services of Ferrara, elaborated for the Provincial Energy Plan show the following estimates of tep (equivalent tons of oil) of energy consumption:

Sector	Total consumptions in tep						Total
	Oil	Diesel oil	Methane	gpl	Petrol	Electric power	
Domestic uses and services		12.085	338.004	6.600		265.462	<b>622.151</b>
Industry	48.350		947.510			161.586	<b>1.157.446</b>
Agriculture and fishing		45.347			636	20.347	<b>66.330</b>
Transports		117.068	9.840	12.650	100.791		<b>240.349</b>
<b>Total</b>	<b>48.350</b>	<b>174.500</b>	<b>1.295.354</b>	<b>19.250</b>	<b>101.427</b>	<b>447.395</b>	<b>2.086.276</b>

The mainly used energy vector appears to be methane followed by electric energy with gpl (liquefied oil gas) and oil lagging behind.

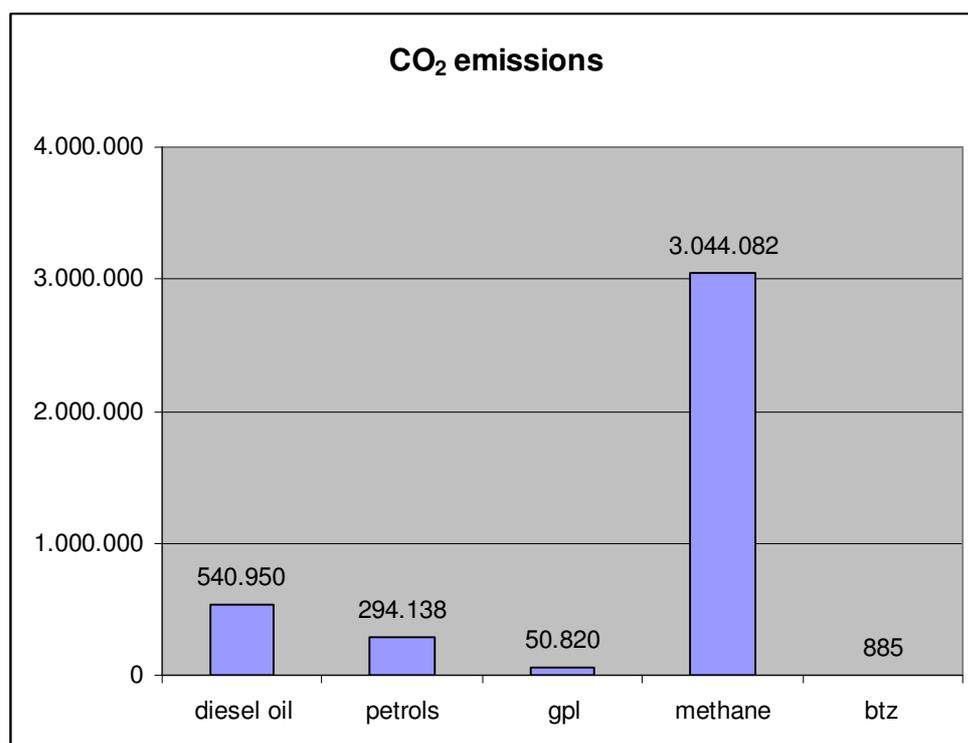
The highest energy consumption occurred in industry followed by the service sector.

Agriculture is in the last place with a consumption of 66.330 tep. With the value of the total provincial energy demand it is possible to establish the relative emissions of CO<sub>2</sub> in the atmosphere and to indicate the sectors that need priority actions in environmental matter.

Energy source	CO <sub>2</sub> Emissions (tons per year)
Diesel oil	540.950
Petrol	294.138
gpl	50.820
Methane	3.044.082
btz	149.885
<b>Total emissions</b>	<b>4.062.793</b>

The transformation from tep to tons of emitted CO<sub>2</sub> has been made with the values indicated in the CIPE (Interministerial Economic Planning Committee) of 25 February 1994.

We have only considered the actual emissions in the provincial territory for energetic uses, not the imports from the national power system.



Methane represents the greatest CO<sub>2</sub> emitter being the most used energy source. Through the study of the sources of emission and the estimate of the amounts of gas emitted, it has been possible to identify the sectors of activities that determine the greatest contributions to the green house gas emissions.

The figures show that the emissions in the provincial territory are strongly influenced by traffic (especially in the urban areas) and by industrial emissions (where there are big industrial activities).

These emissions combined with the meteorological conditions, determine a bad air quality especially during certain periods of the year. The Province of Ferrara considers of primary importance the

definition of actions to reduce the emissions from the industrial sector on the basis of an energy plan and from the mobility sector.

Although from a normative point of view CO<sub>2</sub> need not be inserted into the Air Quality Plan of the Province of Ferrara because in Italy the laws on air quality do not list it among the polluting gases, this gas will have to be considered for specific actions.

The specific actions of the Province of Ferrara for the reduction of CO<sub>2</sub> emission concentrate on the optimisation of the combustion processes, the boosting of the production of energy from renewable sources and the promotion of energy saving. These actions contribute in general terms to the quality of the air.

## **2. Description of the activities relevant to climate protection in the Province of Ferrara**

As part of the "Air Quality Plan" of the Province of Ferrara the Regional Agency for the Environment ARPA has done a survey of the greenhouse gas emissions.

The data elaborated for the region of Emilia Romagna have been broken down to the provincial level according to the guidelines of the *Intergovernmental Panel on Climate Change* (IPCC). The fields considered are: energy, industrial processes, use of solvents, agriculture, land use, forestation and reforestation, and waste.

The study indicates a value inferior to 3.000.000 tons of CO<sub>2</sub> equivalent per year. Moreover the "Provincial Energy Plan" indicates the emissions of CO<sub>2</sub> for the year 2004. The Province of Ferrara, with its Deliberation n. 199 of May 24, 2005, has approved the "Partnership protocol between the Province of Ferrara and ATO 6, the Public Service Agency of Ferrara to draw up the Provincial Energy Plan". The Province of Ferrara is active in the requalification of its buildings and transport fleet with improved technologies and inducing behavioural changes to save energy and reduce CO<sub>2</sub> emissions. In this context the Province of Ferrara has connected all its buildings to urban district heating-net and substituted old boilers with more modern and efficient ones (condensing boilers), and is aiming to improve the thermal efficiency of its buildings in the course of maintenance.

Further improvements will be obtained through the retrofitting of the buildings and through correct management of the heating systems. The substitution of all the old boilers with new ones (where the connection to the district heating is not possible) will be completed in the near future.

Moreover for the construction of the so called "House Without Frontiers", destined to become the centre of the "Faculty of the 'Mondialità'", the Province of Ferrara has decided to use bio-materials and new technologies (also experimental ones, such as concentration photovoltaic generators with heat recovery) for the energy supply.

The Province is also engaged in the installation of 300kWp of photovoltaic panels to reach a coverage of 15% of the energy demand from renewables in accordance with the "Kyoto Protocol Pact".

The new systems will be installed in several schools, that have the correct structural characteristics. The schools have been chosen in a didactic perspective, bringing the students into contact with applied technology in the context of an education for sustainability.

As to the transport sector, the entire vehicle fleet of the Province is catalyzed, moreover all the new vehicles fall into the "Euro 4" category. The remaining vehicles will be converted to methane or GPL fuel or discharged. The future EMAS registration of the Province testifies that the reduction of the energy consumption and CO<sub>2</sub> emissions are focal points in this Administration's environmental programs.

The prevalent activity in the Province of Ferrara is agriculture. The Regional Law n. 28/98, that finances technical modernisation in agriculture calls for so-called “common actions”, that is local activities managed from the Province in order to divulge sustainable agriculture. In the Province of Ferrara a great part of these activities regard the “homogenous zones”, that is groups of farmers, coordinated by a technician, that apply techniques of integrated pest management for the more important crops.

The Province provides to these homogenous zones net-based agro-meteorological data for planning agricultural activities. These information is also provided through a television broadcast on a local station and through SMS. At present there are 7 homogenous zones in the provincial territory and this communication net could become the vector for a wide range of data.

The new Regional Plan to implement the (CE) Reg.1698/2005, foresees for the Province of Ferrara the transformations of agricultural land into woods.

The Province of Ferrara promotes and supports didactic farms, that are in great part biological, and function as environmental training centres for the schools.

The Province of Ferrara has a central role in the production of bio-ethanol and bio-diesel from sugar with important perspectives for the agriculture of the territory. Also the new Regional Plan foresees actions for the construction of small biomass plants on the farm level for the production of energy.

The Province of Ferrara is also active in maintaining and improving approximately 2250 hectares of forest furthering the biodiversity. Moreover the administration is engaged in measures of reforestation through conventions with public and private bodies. Until now approximately 102 hectares have been planted.

The Service “Protection of Flora and Fauna” of the Province realises actions of “green retrofitting” of old non-used streets under its administration for the creation of “ecological corridors”, and cycle tracks.

### **3. Mitigation Scan of the Province of Ferrara**

#### **3.1 North-South Cooperation**

The decentralized cooperation has a prominent role among the strategies against poverty and the preservation of peace. Among the activities of the Province of Ferrara there are the establishment of partnerships between local administrations, civil society, associations, and NGOs in the north and the south.

The target is to construct between these various subjects networks with cultural, professional, political and financial resources to initiate and promote an economically, socially and ecologically sustainable development.

Decentralized cooperation among local communities contributes thus to sustainable development on a global scale and to the solution of some of the problems subject of the Agenda 21 like desertification, poverty, the role of women, deforestation, participation, and education.

The Province of Ferrara has established in the context of its Local Agenda 21 activities a working group named “Local Agenda 21 and decentralized cooperation”. The variety of the subjects that the A21L has actively dealt with - ONG, associations and citizenship - represents an excellent opportunity for exchanges, for gaining knowledge of international cooperation and presents a chance for the involvement of civil society.

The working group has defined an “Action Plan” developed in a shared participatory way. It indicates priorities and the actions to take in order to realise activities of decentralised cooperation and education

for peace in accordance with the Aalborg commitment 10.5: “From local to global” and for the transfer of the sustainability principles and participation to the cooperation plans.

### North – South climate scan

#### Step A – Promote north-south and indigenous issues

- “Kajika, corazon del mundo” support to traditional educative processes of the U'wa population (Colombia).
- “Huilio” support to the promotion of the mapuche communities (Chile) through the consolidation of a process of development finalised to self-management.
- initiatives of sensitisation with the Ken Wiwa (Ogoni in Nigeria) and representatives of the people of the U'wa (protection of the indigenous populations and ecological debt)

#### Step B - Make your procurement fair

- “Tsunami economic relief” (Sri Lanka) - housing, micro credit and promotion fair trade
- deliberation for the promotion of green procurement and fair trade of the Province of Ferrara and in its territory
- membership in the “Fair Cities” campaign

#### Step C – Promote global learning

- “Acqu@online” and “Water Education. Active Citizenship Education” on-line courses, for teachers and educators, to promote culture about “water as a common good”
- University of the Common Good - Faculty of the *Mondialità*, in collaboration with the “World-Wide Contract for the water Committee”; an educational plan to promote the concept of common goods through the deepening of the understanding of the processes for the living in harmony with the planet and the world system
- “Festival of the Human Rights” initiatives of sensitisation and education addressing schools and the community dedicated, every year to a specific theme.

#### Step D - Support of the preservation of tropical rain forests

- purchase of one portion of “Karen M. Reserve” forest in Costa Rica (a sink of 7.775 tons of carbon dioxide in the next 50 years)
- “Liberalaria” Contribution to the construction of a small wind farm in Swaziland
- environmental project near the “Wilaya of Smara”, Sahrawi fields in Algeria, for the collection and removal of waste and education in environmental and sanitation issues.

#### Step E - Implement international co-operations and global partnership

- Documentation of the Local A21 activities and of the roundtable on cooperation
- membership in the Climate Alliance of European Cities
- constitution of territorial networks for actions in Algeria (sahrawi fields), Chiapas, Rumania, Sri Lanka.

See the climate scan matrix in the attachments chapter.

## 3.2 Agriculture & Forestry

The agriculture sector is responsible for 6% of the gross total product (almost twice the average value of the Emilia Romagna region). This sector counts 9000 farms with 180.000 hectares of land.

The Province of Ferrara is currently the 4th province in Northern Italy, after Imperia, Cremona and Mantova, for the contribution of the agricultural sector to the gross total product. Historically, the long “epic story” of the land reclamations before, and the land reform of the Po River Delta then, have redesigned the landscape of Province of Ferrara, and with it the map of crop production. The protagonists of the agricultural activity also changed in this period, while the mechanisation has favoured extensive crops. The importance of the sector is evident from a gross production of around 500 million euros, excluding salaries, transformation and induced activities.

There are more than 10.000 permanent and non permanent work places in the sector, a remarkable size of structural investments, a strongly flexibility in the job relationships and a consistent process of reorganisation of the associations and cooperative structures.

In conclusion, the territory of the Province of Ferrara represents an example, where environment, culture and agricultural development do not represent alternative and antagonistic options or “models”, but determine instead a balanced “human sized” increase still characterised by the value of the “good life” and of human culture.

The forest planning is one of the instruments for the environmental safeguard and requalification of the Po plain territory of the Province of Ferrara, where the anthropic influence is particularly intense and diffuse.

The territory of the Province of Ferrara’s contains naturalistic emergencies in terms of landscape and ecological cycles of great scientific interest. The protection and the maintenance of the existing biotopos assumes under these conditions a high priority with a close cooperation in the management of the environmental resources between organisms and agencies for the protection of the woods like the State Forestry Corp, the Provincial Service for the safeguard of the Air and Water, the Emilia-Romagna Forest Resources, the Regional and the Provincial Administrations as a whole and the Council of the Province. Other local organisms that are involved are the UU.SS.LL. (Local Health Units), the Reclamation and water distribution Companies, the environmental Associations, the Voluntary Vigilance Corps, the cultural, tourist and recreational Associations. All these are engaged in common actions for environmental sensitisation and for the safeguard and the management of the natural resources.

In order to protect and promote the environmental assets the Province of Ferrara gives particular attention to the smaller natural areas, that characterise the Po Plain, like old maceration sites, hedges, isolates monumental trees and alleys.

In parallel with the direct environmental actions, the Province organises environmental education and activities with young citizens mainly in the schools and with the community at large, in order to stimulate an awareness for the ecological functions of the woods, the specificity of the autochthonous flora and fauna and to increase the public and private green areas.

### Agriculture climate scan

Step A - Set up a local strategy for a climate friendly agriculture

- creation of 7 “homogenous zones”

Step C - Support a climate compatible agriculture

- reforestation of agriculture terrain

Step D - Use your powers as landowner

- use of the best technologies

Step E - Make your citizens aware of agriculture's climate relevance

- specific programmes on a local television station
- creation of 7 "homogenous zones"
- didactic farms

Step F - Train farmers and agricultural institutions

- specific courses for farmers
- creation of 7 "homogenous zones"

Step G - Incite farmers to produce renewable energy

- specific courses for farmers
- creation of 7 "homogenous zones"

### **Forestry climate scan**

Step H - Assign a place to forest in your land use planning

- production of the inventory of the woods in the provincial territory with the Regional Forest Survey.
- The plans for the public woods are done in the form of annual programmes approved by the Provincial Council, with the sustainable development of the forest development as a priority.
- The public forestry is also done through appropriate partnerships with the Councils.
- All the public property forest areas in the provincial territory are protected and are included in the Provincial Territorial Plan.

Step I - Improve the municipal/provincial forest management

- In the forest plan of the Province of Ferrara, the conservation of the forest areas is a priority.
- All the forest areas of environmental interest of the Province of Ferrara are "Oasis of protection of the fauna" in which hunting is forbidden.
- The forest areas of the Province of Ferrara do not serve productive purposes; they are managed exclusively for nature conservation and tourism and for environmental education.

Step J - Involve private forest owners

- Many publications of the Province are dedicated to the protected areas, to monumental trees, to the forest improvement, to the promotion for the cultivation of trees and native shrubs also by private owners.
- In various cases the Province has contributed to financing forest improvements on private property.

Step K - Use the forest as renewable energy source

- The Province of Ferrara replaced the diesel boiler of the Visitors' Centre of the "Massenzatica Fossil Dunes Natural Reserve" with a photovoltaic system and a wood-pellets stove.
- The province of Ferrara has a central role in the conversion of the sugar industry into plants for the production of bio-ethanol and bio-diesel.

#### Step L - Use the forest as a place for education

- The Province of Ferrara has mounted numerous displays in its forests and nature reservations to inform and educate the public.
- The Province of Ferrara does initiatives of free distribution of little forest trees to the citizens and the local schools for educational purposes.
- The Province organizes in its forests didactic workshops for schools. Near the Province's Mesola Environmental Education Centre, an appropriate section is dedicated to the provincial wood areas, and didactic initiatives like naturalistic laboratories are done with the schools.
- The Flora and Fauna Protection Service of the Province has assigned expert personnel to environmental education activities.

## 4. Mitigation Scan

North-South-Cooperation					
	Step:	1: getting started	2: moving forward	3: forging ahead	4: taking the lead
A	<b>Promote north-south and indigenous issues</b>	Organise presentations and events	Join municipal north-south activities	Link local north-south activities on a regional and national level	Link local north-south activities on a European and international level
B	<b>Make your procurement fair</b>	Supply trade fair products for municipal consumption	Organise campaigns to boost the sale of fair trade products	Use fair trade criteria as basis for supporting projects and for local policy	Twin your city/municipality with cooperatives of the Southern hemisphere
C	<b>Promote global learning</b>	Inform and educate with the Climate Alliance	Set up awareness raising campaigns	Offer education courses and training	Integrate north-south aspects in the local policy
D	<b>Support the preservation of tropical rain forests</b>	Inform your staff and the citizens about the impact of our behaviour on the tropical rain forests	Inform about buying certified paper and wood	Bet for certified wood	Apply the national Convention of Biological Diversity guidelines in your local authority
E	<b>Implement international co-operations and global partnerships</b>	Set up partnerships and networks for the development of north-south activities	Participate actively in north-south co-operation projects	Develop a local action plan of international cooperation	Implement innovative projects in the field of north-south co-operation

Agriculture					
	Step:	1: getting started	2: moving forward	3: forging ahead	4: taking the lead
A	<b>Set up a local strategy for a climate friendly agriculture</b>	Organise information events about local planning and development projects	Develop a local agriculture plan with ecological requirements and for the protection of agricultural areas	Consider the preservation of contiguous agricultural areas and their renaturation	Involve the farmers in your local development plan in terms of extensification provisions for (green) fields
B	<b>Set an example and initiate activities</b>	Use regional/ecological products in municipal catering	Constitute and conserve local patterns of commercialisation	Set up or conserve processing establishments with the local authority acting as operator or lessor	Transform field in grassland, cultivate hedges and field wood, etc. to assert nature conservation
C	<b>Support a climate compatible agriculture</b>	Track European, national or regional funding programmes	Promote models and projects on climate compatible agriculture, livestock husbandry and commercialisation	Promote services for farmers (joint machinery, regional commercialisation patterns, the treatment of animal excrements, etc.)	Stimulate agricultural support services and livestock husbandry modifications
D	<b>Use your powers as landowner</b>	Inform your tenants about the objectives and benefits of eco-agriculture	Set up a working group with your tenants to develop a joint strategy for a climate compatible agriculture	Adopt for a low nitrogen input of municipal areas under cultivation for a climate compatible agriculture	Lease municipally owned agricultural areas with additional requirements to support your climate strategy
E	<b>Make your citizens aware of agriculture's climate relevance</b>	Inform your citizens about the objectives and benefits of eco-agriculture	Involve local media to inform about agriculture and climate	Organise action days/weeks for the promotion of regional products, publish a regional shopping guide	Offer educational activities for children and young people about climate relevant aspects of agriculture
F	<b>Train farmers and agricultural institutions</b>	Inform farmers regularly about environmental and climate relevant topics in agriculture	Establish an agriculture working committee under the participation of different players	Work together with agricultural training colleges offering courses for a climate compatible agriculture	Participate in research projects linking agriculture and climate protection
G	<b>Incite farmers to produce renewable energy</b>	Take stock of the potentials for biomass production or collection	Inform farmers about the opportunities and benefits to produce their own heat / electricity from biomass	Offer consulting to farmers on the implementation of projects for biomass use	Support / carry out local projects for energy production from biomass

<b>Forestry</b>					
	<b>Step:</b>	<b>1: getting started</b>	<b>2: moving forward</b>	<b>3: forging ahead</b>	<b>4: taking the lead</b>
<b>H</b>	<b>Assign a place to forest in your land use planning</b>	Take stock of the forests in your municipality and their relevance for recreation, local economy, etc.	Design the development for the forests in your area	Consider afforestation in local planning, also in urban areas	Include avalanche forest and nature orientated recreational forest areas in land use planning
<b>I</b>	<b>Improve the municipal forest management</b>	Improve the stability of your forests	Consider hunt activities as forest conservation and development	Reorganise your forest as nature oriented as possible	Let your municipal forest get certified according to FSC-Standard
<b>J</b>	<b>Involve private forest owners</b>	Organise an information campaign on sustainable forest management	Support regional wood processing	Promote FSC-Certification towards private forest owners	Set up co-operations with private forest owners on sustainable forest management
<b>K</b>	<b>Use the forest as renewable energy source</b>	Promote the energetical use of wood in private homes	Set up wood-harvesting schemes for individuals in your forests	Support / set up local biomass power stations	Promote / support regional marketing and distribution structures for wood
<b>L</b>	<b>Use the forest as a place for education</b>	Present exhibitions, offer guided tours in the your forest	Organise tree-planting actions with citizens	Develop a pedagogic programme on forests and forestry for schools	Assign municipal staff for forest pedagogics and environmental education activities

## **B. Identification of additional measures**

### **1. Andreas Drack, Upper Austrian Academy for the Environment and Nature**

#### **1.1 Strategy to promote renewable energy sources especially biomass**

The region of Ferrara is famous for agriculture. Climate change, pressure from changing market conditions and new EU-goals for RES (for example biomass action plan) can be a chance for biomass production as an energy source in the heat, electricity and transport sector. An integrated strategy to promote biomass should be worked out taking into account several questions:

- actual biomass potential, for example use of biomass waste material
- share of farmland, which is now and in the future available for the production of biomass, taking into account changed conditions (market changes, higher salinity caused by sea level rise, etc.)
- options for sustainable ways to produce biomass taking into account the condition of the soil, climate, energy demand in the different sectors (heat, electricity, fuel)
- research on the best economic scale for projects (small, middle or large scale facilities) and available technologies (boilers, CHP-installations, biogas fed in into natural gas lines, etc.)

#### **1.2 Strategy to promote organic farming**

Organic farming has several advantages in environmental protection including a reduction of CO<sub>2</sub>-equivalentes in the range of 50%. The share of organic farming in the region of Ferrara is presently around 3%, which could be boosted in a realistic way up to 10% compared with other European regions. The goal can be reached step by step working both on better conditions for the agrarian economy and the buyer-market. An integrated strategy takes into account the national incentives and hurdles (are there organisations?, control systems?), regional potential of farmland, the distribution possibilities (farmers shops, weekend markets, supermarkets, house delivering services) and pr-activities. The public sector should in a first step enlarge its own use of bio-products (biological canteens).

### **2. Lianda Sjerps, Climate Alliance Netherlands**

#### **Climate change as an integral part of environmental communication**

More consistent and encompassing integration of climate change arguments in all environmental communication of the Province, emphasising the possibility of acting in ones own home or company.

Many measures and projects in Ferrara have not been started because of climate change, but for other reasons. It is time for a low lying region like Ferrara, to become aware of climate change and take measures for prevention and adaptation. The projects already done can be used as a stepping stone to generate awareness of climate change and to prepare the hearts and minds of local people and politicians to step further towards real climate change projects. Although not started as a climate change project, do use the examples you already have to tell the story about climate change prevention and adaptation. Put the examples in a brochure and a website. Ask for projects form the private sector and

add these to your brochure as well: maybe some local people or companies already can show nice examples of renewable energy and energy saving that can be an inspiration for others. Show what you already do and what people do in their company and homes to generate enthusiasm to jump further to energy saving, renewable energy etc.

For example communicate the CO<sub>2</sub> impact of the new developed green spaces and forests. Also integrate this in the tourism industry.

Combine the green spaces with biomass production and other renewable energy production.

The water-management in one of the nature development areas suffered from the water levels needed for agricultural use of the surrounding land. Using a separate water system with a solar powered pump can help the nature development and be a tiny showcase of solar energy.

The LA21 projects aiming at North – South co-operation can be used to get the message through: communicate the suffering from climate change (for example extreme flooding and droughts) in Bangladesh, Africa and other developing areas. And communicate the connection between these climate change problems with the solutions: the connection with the energy consumption in the North (Ferrara). By saving energy and using renewables, people in Ferrara can help in their every day lives at home, to help preventing climate change.

Also communicate the (possible) climate change problems near-by (extreme weather, elderly people suffering from heat etc.) and then connect this with the opportunities people have to prevent climate change by taking simple measures at home (use energy saving lamps etc.) and more difficult ones as a region (bio-energy production).

Ask the NGO's such as the Red Cross, WWF and others to tell the story of climate change and ask the environmentalists to tell the story of how to prevent this. In this manner, awareness is raised.

Use kids television, schools and other media doing so.

### **3. Karl-Ludwig Schibel, Climate Alliance Italy**

#### **Energy Efficiency and renewable energies for the pumping system in the land reclamation territories**

The territory of the Province of Ferrara is characterised by numerous and large land reclamations, with a network of channels and pumping stations with high energy consumption. A joint project of the Province of Ferrara and the Reclamation Agencies could point at optimising energy efficiency in these systems, in their management and the motors used and in producing a share of the electric energy from renewable resources (biomass, photovoltaic).

Beyond the immediate impact of reducing the energy consumption and substituting fossil with renewable energy the integration of these technologies in the didactic materials and an accessible presentation of the installations in the territory would be an important integration of nature conservation education with education on energy issues.