



VIIth European Mountain Convention

"European Mountain Regions- A spirit of Innovation"

15th-17th September 2010, Lillehammer, Norway



Creating the Bologna Apennine sustainable energy district

Ing. Sergio Palmieri



Provincia di Bologna

Where we are

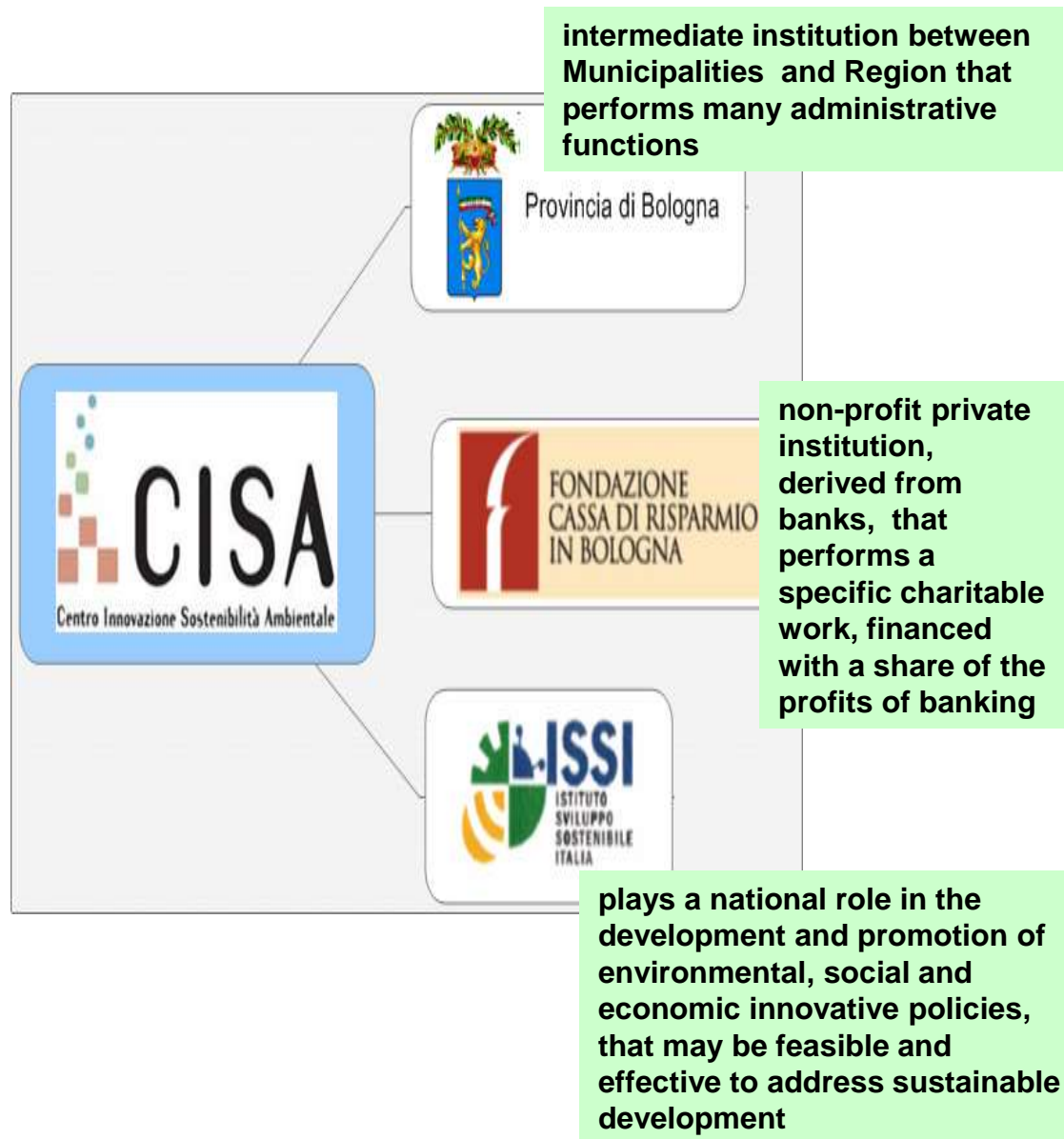
This project involves the central-northern areas in Apennine mountains, between Tuscany and Emilia-Romagna regions. It's a territory divided into parallel valleys with mountains reaching nearly 2,000 meters high, with an area of about 1,000 sq.km. and a population of about 80,000 inhabitants



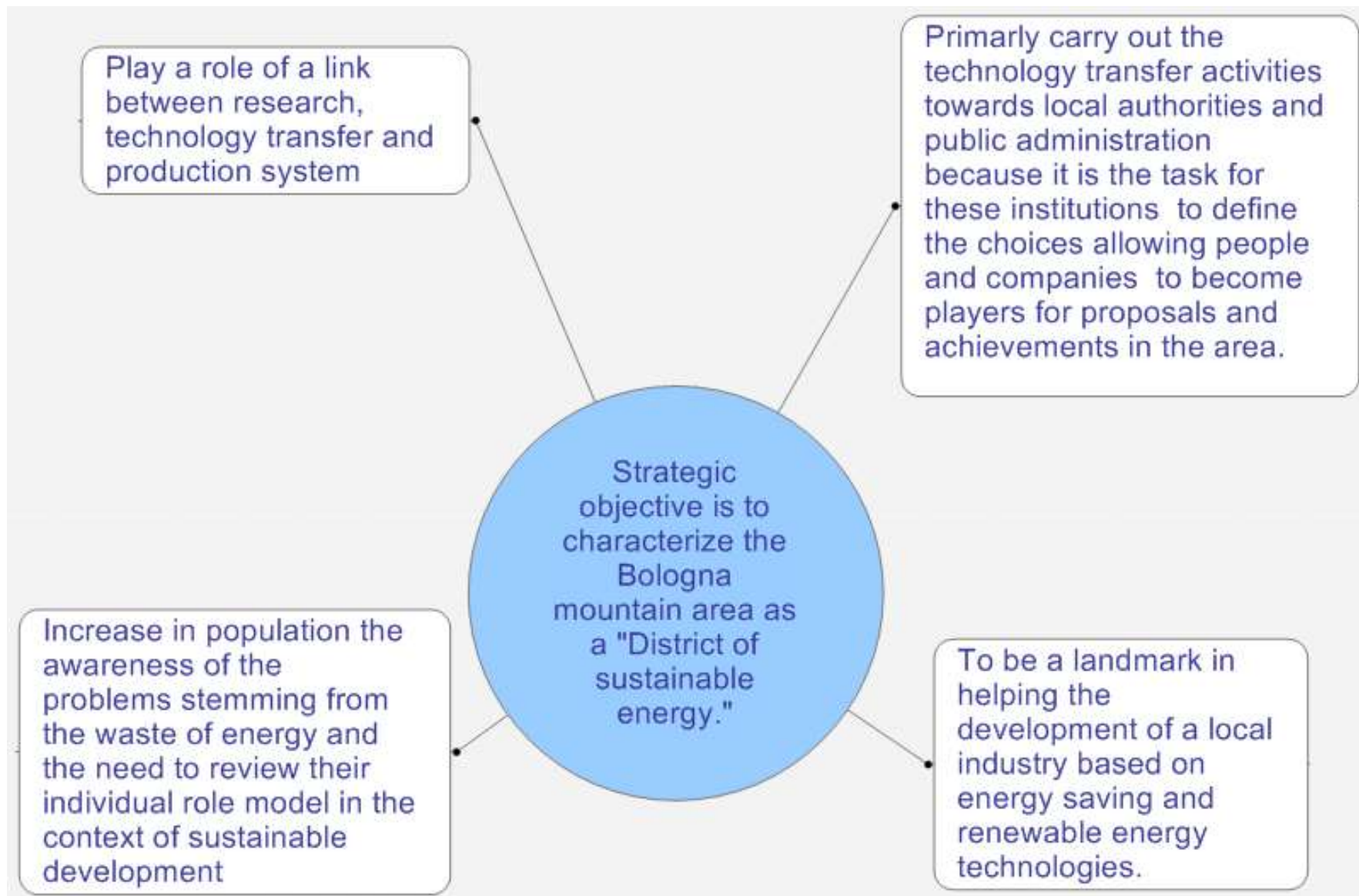
CISA (Center of Innovation and Environmental Sustainability) is a non-profit company formed by 3 partners to be a center for innovation and transfer of environmental technology, with special reference to weaker territorial areas as Apennine mountain.

CISA is a component of Emilia-Romagna High Tech Network, coordinated by ASTER (Emilia Romagna Association of Science and Technology)

Who we are

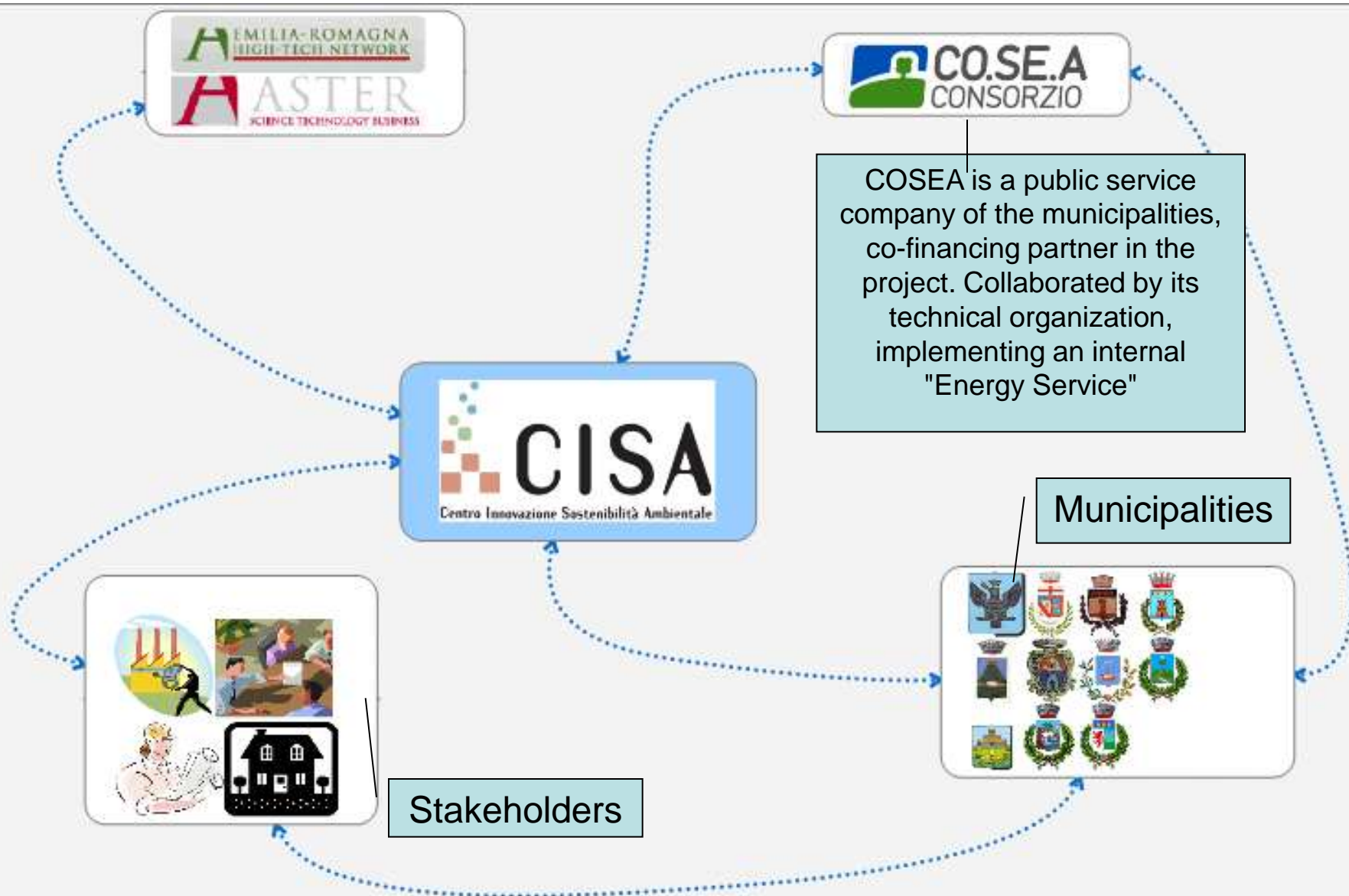


Our mission



Local Context

Outline of Relationships



Let's start the project

Centro Innovazione per la Sostenibilità Ambientale

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 Progetto CISA BO134

Sei in: Home Page

Tecnologia > Ambiente > Montagna
 Gli impianti tecnologici del CISA sul territorio

I CISA, nei Comuni Obiettivo 2 dell'Appennino bolognese, progetta e concretizza esperienze pilota ad alto contenuto di innovazione, tramite la realizzazione di **impianti tecnologici sperimentali ed integrati**. Si persegue l'obiettivo di far nascere il DISTRETTO dell'ENERGIA SOSTENIBILE APPENNINO BOLOGNESE (DESAB), ovvero di creare un contesto in cui si svolgono pratiche di eccellenza sul piano ambientale a partire dai temi di energie rinnovabili e di biodiversità. Ad oggi:

- [il Centro Civico - Centro Antelmi di Pontereta Terme](#): un progetto geotermico solare
- [L'impianto a biomassa del centro visite del parco dei laghi di Suisana e Basimone](#)
- [L'impianto idroelettrico di Panigale \(Lizzano in Belvedere\)](#)
- [L'impianto idroelettrico di Castel del Rio](#)
- [Nuova sede del Parco Regionale del Comandino alle Scale](#)
- [Impianto biomassa di Castiglione dei Pepoli](#)

La diffusione delle tecnologie

L CISA, presentato ufficialmente a **Porretta Terme il 18 marzo 2006**, per una maggiore diffusione di innovative tecnologie ambientali ed una nuova cultura del risparmio energetico e della biodiversità, con gli strumenti propri dell'Agenda 21 Locale, è attivamente impegnato nelle **iniziative di informazione e sensibilizzazione**, nel coinvolgimento delle scuole presenti sul territorio e nella attività di ricerca, nonché nella **realizzazione di seminari e workshop tematici**:

- **Presentazione del progetto CISA**
- **Risistemazione Ex Ferrhotel**
- **CO2: il bosco sostenibile**
- **Processi biochimici di utilizzo delle biomasse da bosco**
- **Il programma di monitoraggio di CISA**
- **Biomasse e sostenibilità**
- **Programma Regionale per la Ricerca Industriale, l'Innovazione e il Trasferimento Tecnologico**
- **Incentivi finanziaria 2007**
- **Banca dati delle opportunità ambientali**
- **La finanziaria 2007, obblighi ed incentivi per il settore pubblico e privato**
- **Acqua da non sprecare: presentazione dello studio di CISA sull'uso dell'acqua intercettata dalla galleria della variante di valico**
- **target="blank">Aspetti finanziari, tecnici, normativi e amministrativi dei decreti attuativi legge finanziaria 2007**
- **Il mini e micro solco nell'Appennino bolognese**
- **il motore idraulico dal mulino affidrottefrico**
- **Acqua da non sprecare**
- **Tecnologie ambientali nel campo degli impianti per il risparmio energetico e le energie rinnovabili**

Inaugurazione degli impianti tecnologici realizzati

[Inaugurazione dell'impianto solco di Castel del Rio](#)
[Inaugurazione della Centrale termica a Biomassa a Castiglione dei Pepoli](#)
[Inaugurazione del nuovo Centro Civico di Pontereta Terme](#)
[Inaugurazione dell'impianto di Micro Idroelettrico in località Panigale \(Lizzano in Belvedere\)](#)

Il ciclo del carbonio nei boschi dell'appennino bolognese

I CISA ha avviato una linea di ricerca volta a sviluppare un **Modello di calcolo, su supporto GIS, di CO2 nei boschi dell'Appennino bolognese e di assorbimento di biomassa**, in un contesto che la produzione di energia e di riscaldamento del legno viene vista come un sistema integrato e radicato nel territorio per l'utilizzo di risorse locali attualmente poco valorizzate, nel pieno rispetto degli impegni sanciti nel Protocollo di Kyoto.

Il Contatore di emissioni e di assorbimento della CO2

I **Contatori di emissioni e di assorbimento di CO2** del CISA mira a fornire una stima del bilancio di biossido di carbonio, il principale gas ad effetto serra, per ognuno dei Comuni Obiettivo 2 dell'Appennino Bolognese.

CISA
 Centro Innovazione per la Sostenibilità Ambientale
 Video: L'Appennino bolognese - un distretto per l'energia sostenibile

La biodiversità

Tecnologie solari
 Uso della luce naturale
 Impianti fotovoltaici

Tecnologie per edifici
 Impianti solari termici
 Pompe di calore geotermiche

Eventi

03 aprile 2007, ore 20.30
 Cinema Kursaal, Via Mazzini,
 Pontereta Terme
 "una seconda verità"
 Film documentario di Ai Dora

Bandi e preventivo
AVVISO D'AFFIDAMENTO A TRATTATIVA PRIVATA DELLE OPERE PER LA REALIZZAZIONE DI UNA NUOVA RUOTA IDRAULICA DA INSTALLARE NEL MICRO IMPIANTO IDROELETTRICO SITO IN LOCALITA' PANIGALE - COMUNE DI LIZZANO IN BELVEDERE (BO)

Avviso d'affidamento

Realizzazioni tecnologiche

ECOMPIANTI - Realizzazioni tecnologiche del progetto CISA 2005 - 2006 - 2007

[Scarica il documento](#)

First Step - startup

Direct construction of experimental and technologically integrated facilities



Park lakes Suviana and Brasimone
Visitor center and Forest Museum
woodchip heating plant (35 kWth) with
small district heating network



Park "Corno alle scale" – Panigale
micro hydroelectric (5 kW) old-like plant



Le Selve Resort - Castel del Rio
small wind turbine (6 kW)



Second Step - Municipalities

Construction of experimental and technologically integrated facilities in financial collaboration with the municipalities and their public company COSEA

CIVIC CENTER - Porretta Terme:
Biobuilding - integrated solar thermal + geothermal + PV
in collaboration with Porretta Terme municipality



Castiglione dei Pepoli – Primary School
400 kWth Wood chips plant with district heating network
in collaboration with COSEA



Castel d'Aiano – Primary school and swimming pool
35 kWe + 140 kWth Wood chips CHP Plant (gasifier +
Stirling engine),
in collaboration with COSEA



Zero CO2 mobility in Porretta Terme



Third Step - (SMEs)

Construction of technologically integrated facilities in financial collaboration with municipalities and local small and medium-sized enterprises (SMEs)

Through the "move with the sun" project, developed and organized by CISA, and co-financed between CISA and the municipality, some services of the City (social and technical services) are equipped with electric vehicles, also a group of electric bicycles are made available to citizens and tourists.

The required energy (about 20.000 kWh/year) is supplied by a 20 kW PV plant on the roof of a municipal warehouse

A local small enterprise built in project financing the 20 kW PV plant retaining the incentives to pay plant and leaving produced electricity to the municipality

Technology dissemination

INFORMATION AND AWARENESS -OBJECTIVES

promote a sustainable forestry management and maximum recovery of the crop residues for energy use

raise the attention of local political and administrative institutions towards a model of sustainable development through the introduction of energy conservation and renewable energy principles

OBJECTIVES

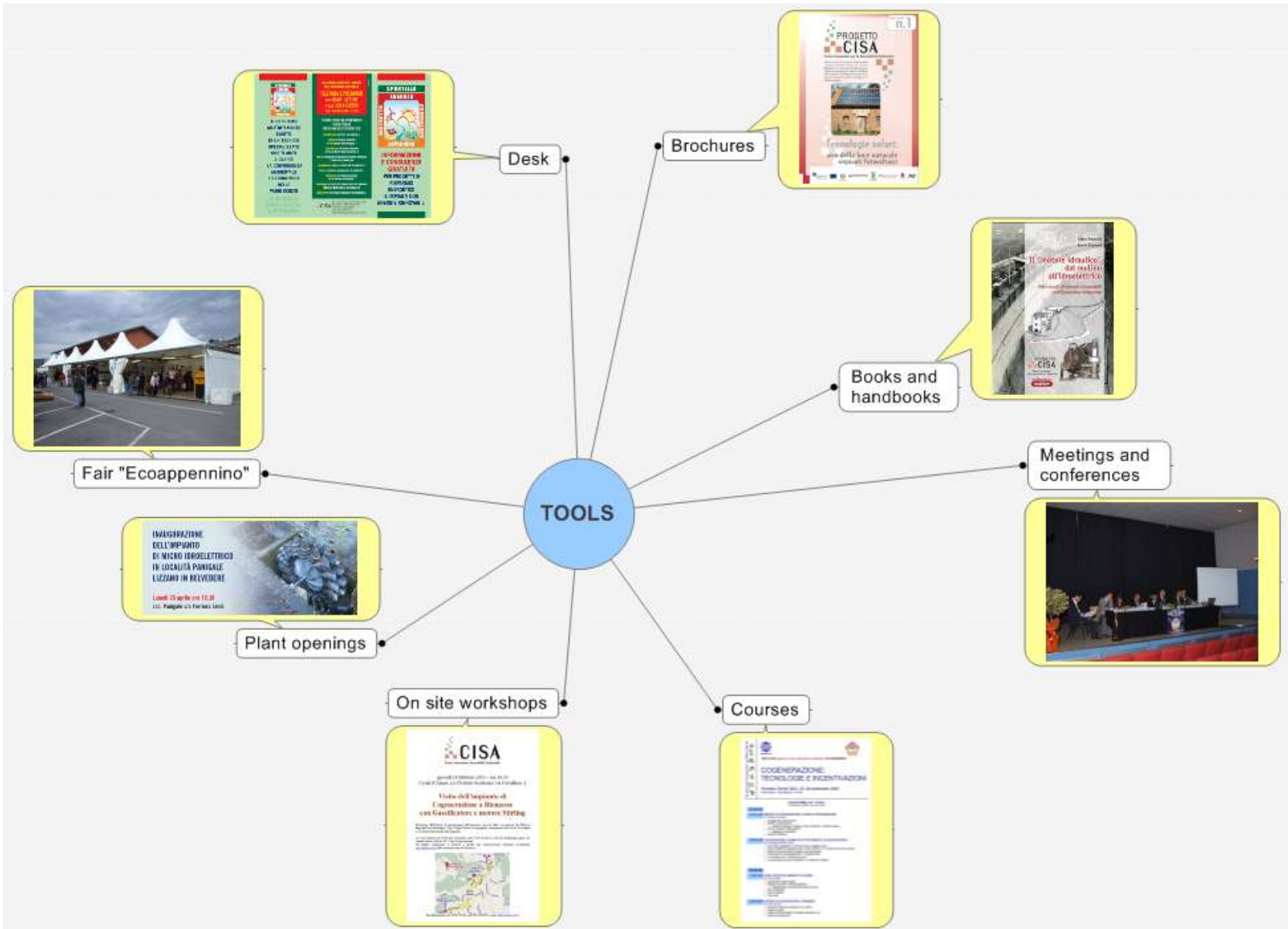
promote the widest possible use of technologically advanced power plants to heat from woody biomass according to the criteria of renewability and environmental protection

raise awareness of energy conservation and renewable energy sources in both public opinion and local industry (especially SMEs)

disseminate best practices

Technology dissemination

INFORMATION AND AWARENESS - TOOLS



Technology dissemination Desk for people

People book an interview and CISA's technicians arrange a meeting in the rooms made available by various municipalities to give information and provide an initial general advice

we provide you the free assistance of a technician to help you understand the environmental and economic advantages of the various choices

SPORTELLO ENERGIA
 DISTRETTO SOSTENIBILE APPENNINO

TI OFFRIAMO GRATUITAMENTE L'AIUTO DI UN TECNICO SPECIALIZZATO CHE TI AIUTI A CAPIRE LA CONVENIENZA AMBIENTALE ED ECONOMICA DELLE VARIE SCELTE

RISPARMIO RINNOVABILI APPENNINO

DA GENNAIO 2009 PER I COMUNI DELL'APPENNINO BOLOGNESE TELEFONA E PRENOTATI ALLO 0534-521104 O ALLO 3254122589 Lun - Ven Ore 9,30 - 12,30

TI VERRÀ FISSATO UN APPUNTAMENTO CON UN TECNICO PRESSO UNA DELLE SEGUENTI SEDI:

- Portoferra** c/o CISA - P.zza Libertà, 13
- Vergato** c/o Palazzo Comunale in P.zza Capitani della Montagna, 1
- Sasso Marconi** c/o Palazzo Comunale in P.zza dei Martiri della Liberazione, 6
- Vado** c/o Delegazione Comunale del Comune di Mezzano a Vado in P.zza Libertà, 8/a
- Castiglione del Popolo** c/o ufficio URP P.zza Marconi, 1
- Fiasso** c/o Palazzo Comunale in P.zza dei Martiri, 1
- Montevicchio** c/o Palazzo Comunale in P.zza Guerrino De Giovanni, 1
- Montevoglio** c/o Centro San Teodoro del Parco Regionale Abbazia di Montevoglio in via Abbazia, 28
- Castel del Rio** c/o Palazzo Comunale in via Montanara, 1

SPORTELLO ENERGIA
 DISTRETTO SOSTENIBILE APPENNINO

INFORMAZIONE E CONSULENZA GRATUITA PER PROGETTI DI RISPARMIO ENERGETICO E IMPIANTI CON ENERGIE RINNOVABILI

CISA
 Centro Iniziative per la Sostenibilità Ambientale
 Piazza Libertà, 13 - 40140 Portoferra (BO) - Tel. 0534/521104 - Fax 0534/4122589
 cisa@comune.portoferra.bo.it
 Progetto Distretto Energie Sostenibili Appennino Bolognese

Call and book an interview

information and free advice on energy saving projects and renewable energy plants

Technology dissemination The fair

ECOAPPENNINO - The exhibition dedicated to the energy-saving technologies and the use of renewable energies in mountain areas



September 2007 and September 2008 in Porretta Terme,

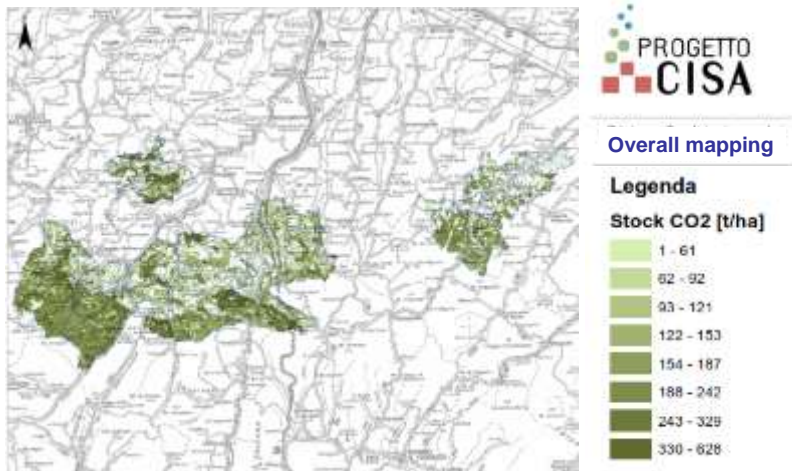
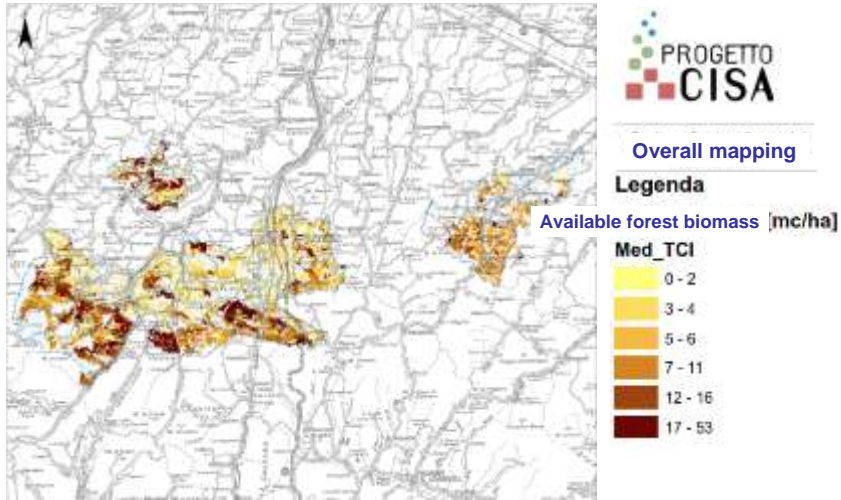
The whole town has been transformed into a large outdoor exhibition and all squares hosted thematic areas to solicit people's interest and facilitate contact with new technologies



Research - Biomass

CO2 ABSORPTION AND ENERGY USE

Model – GIS System to calculate the stock and increase of CO2 and forest biomass available for energy use



Wood biomass was identified as the component with the highest chance of good effects in the territory as a source of energy and for the function of forest and as a reservoir of CO2

For this reason, many resources were used to develop research in this field to evaluate the stock and increase of CO2 and the forest biomass available for energy use according to the criteria of renewability and environmental protection

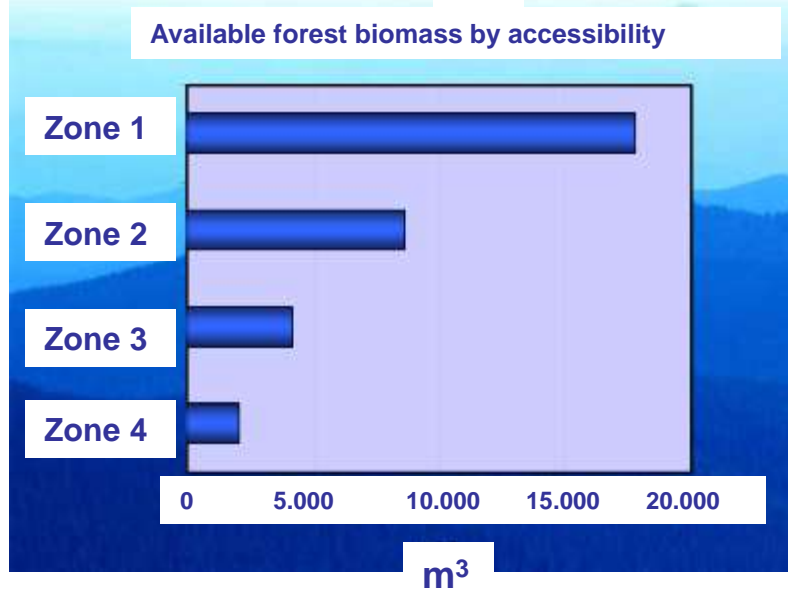
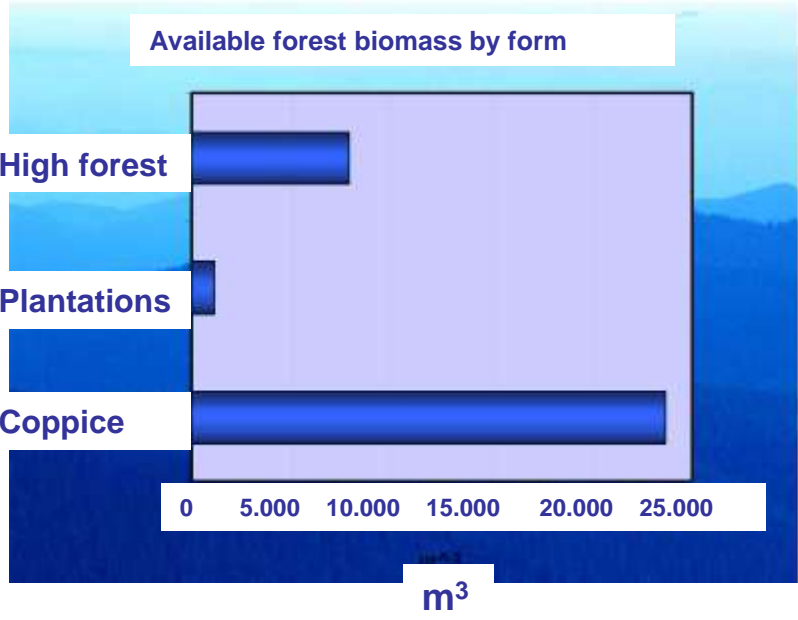
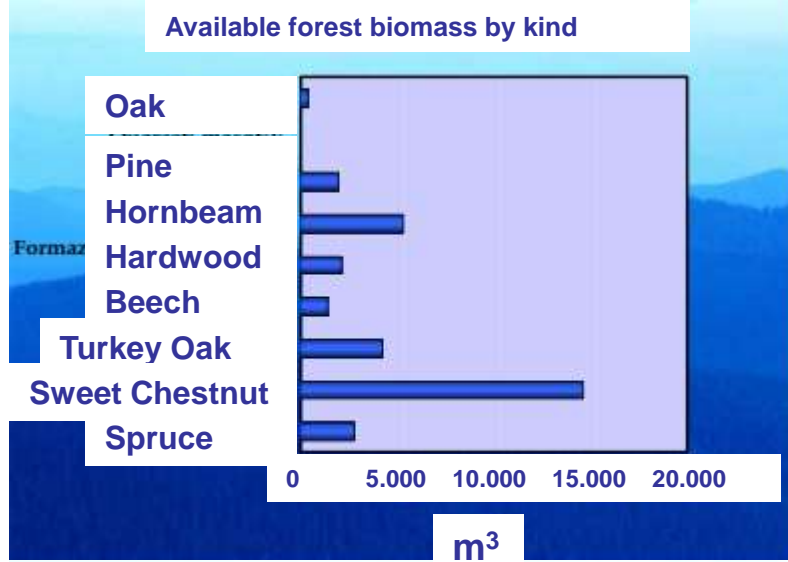
The model provides fairly accurate information on the maximum quantities of timber withdrawable from the forests to ensure sustainability and therefore also allows an evaluation of the number and power of the plants to be installed in the area

Research - Biomass

CO2 ABSORPTION AND ENERGY USE

Example for a municipality

| | | |
|----------------------------------|---------|----------------|
| Population | 5.982 | Inhabitants |
| Total area | 6.580 | ha |
| Population density | 91 | Inhab./ sq.km |
| Woodiness index | 68% | % |
| Forest area, total | 4.465 | ha |
| Forest area subject to | 93 | ha |
| Epigeal CO2 stock | 742.262 | t |
| CO2 annual absorption | 23.354 | t |
| Epigeal forest biomass CO2 | 747.743 | m ³ |
| Available forest biomass (gross) | 32.675 | m ³ |



Research

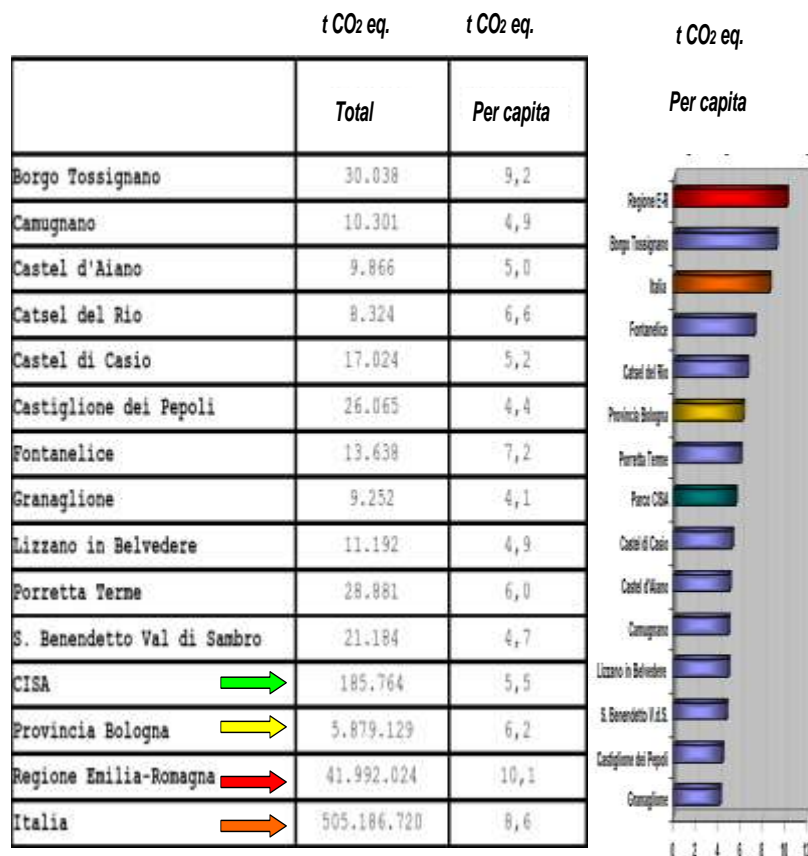
Greenhouse emissions at the municipal level

To estimate emissions of greenhouse gases at the municipal level, according to the IPCC methodology emphasizes problems hard to solve, starting from difficulties in obtaining the necessary data.

Therefore, we adopted a mixed top-down and bottom-up method, starting from the given total emissions data produced by the National Environment Protection Agency for the Province of Bologna, distributed among the various municipalities on the basis of a differential detected on a number of significant energy parameters.

These parameters are linked to the consumption of natural gas, LPG, gasoline, diesel, heat transfer fluids and electricity; the data are produced by utilities companies and other agencies at the provincial level and for each municipality.

This methodology has been implemented with special software and is being extended to other municipalities in the province of Bologna.



Impacts - 1

First we can certainly say that most of the project objectives have been achieved and in particular we can here remember those which were the most important results:

□The municipal authorities started to become aware of innovations in energy saving and renewable sources: this has led to continue investments and intervene in the simplification of procedures; some municipalities have also taken the path of the energy certification of public buildings and drafting of municipal energy plans.

□Many schools have been able to use the documentation and dissemination of programs offered and the teachers were able to incorporate significant elements of innovations in energy saving and renewable sources in their educational programs.

Impacts - 2

- ❑ Many **install equipment companies**, including small size ones, could know better new technologies, putting them in their service offerings and some **larger companies**, with more financial resources, evaluated the convenience of entering into the trend of "green economy" and made proposal for the construction of public facilities by the system of project financing;
- ❑ Many **design teams** and engineers have participated in specialized courses organized within the project, acquiring new skills.
- ❑ Many **people**, through fair and the establishment of an information desk, are aware of the possibilities offered by new technologies and the use of renewable sources and the action of information and environmental education, increased greatly **in population** the awareness of the problems stemming from the waste of energy and the need to review their individual role model in the context of sustainable development.

Impacts - 3

- ❑ **The team of young engineers and technicians** who participate in the project development from the beginning get a remarkable expertise which remains in mountain area. Moreover the building of the experimental cogeneration woodchips small plant (gasification and Stirling engine cycle) allowed to play an important role within the international group of experts.
- ❑ **At regional level**, the access into the High Technology Network of Emilia-Romagna allowed to leave the narrow confines of the territory affected by the project and to act as a reference model in cooperation with other centers and laboratories in the network, broadening horizons to other operational areas and other initiatives.

The essential elements for the transferability of the project are:

- ❑ **One organization already in the area** that has local knowledge and can serve as "incubator" of the project by providing its organizational structure;
- ❑ **A project manager** with technical and organizational skills but also with good knowledge of procedures and regulations;
- ❑ **A team of young engineers**, with a team leader able to motivate them;
- ❑ The presence of **universities or research centers** to support the initiative;
- ❑ The availability of **local companies capable** of building plants and **banks** who can co-finance, with the system of project financing too;
- ❑ The availability of **public funds to support the initial stages** of organization and planning and subsequent monitoring and dissemination of results.

The new project

The project we talked about is ending (december 2010)

A new project will be launched for the period 2011 - 2013

The topics are as follows

- **Implementation of the methodologies developed during the first project and territorial extension of the research**
- **Concentrated Solar Power system (CSP)**
- **Small size CHP plants**
- **Smart grids**
- **Development of new systems of public-private partnership for construction and facilities management**
- **Municipal energy plans**

Thank You for Your attention

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