PowerPoint slides presented (19-30)

Participating 30 Life+ climate change projects

Julia 2030 (The Helsinki Metropolitan Area Council): This project will demonstrate and verify the positive impact of CO2 calculators in terms of increasing the knowledge and awareness of different stakeholders involved in the mitigation and adaptation to climate change in the Helsinki Metropolitan Area. The project will cover the following areas: public procurement, use of public premises, transport and waste management.

LACRe (Provinicia di Livorno, Italy): This project aims to develop "Local alliances" of public and private sector bodies committed to contributing to European policy on combating climate change. The alliances will engage local enterprises in adopting a Corporate Social Responsibility approach towards climate change.

LAKS (Comune di Reggio Emilia): The aim of this project is to make local actors more aware of and responsible for local action on climate change. Four cities will commit themselves on a long-term basis to significantly reduce greenhouse gas emissions.

PesticideLife (MTT Agrifood Research) seeks to construct and test an integrated pest management (IPM) model, including new technologies for field monitoring, and to discuss different options for ecological risk mitigation of plant protection products, which will form the central elements of the National Action Plan (NAP).

Renew building (GrAT Austria) aims at reduction of CO2 in the building industry. This is done by demonstrating and disseminating of climate friendly, ecological and innovative renovation techniques. Moreover, they will disseminate best practice knowledge of sustainable building with renewable resources and ecological materials and raise awareness about sustainable building

Rozas por el clima (Ayuntamiento de Las Rozas de Madrid) aims to apply and evaluate methods of municipal management for climate change, assessing their cost-effectiveness whilst meeting the goals for reducing greenhouse gases (GHG). An action plan to combat climate change will be adopted and new regulations for protecting the atmosphere, municipal planning of green spaces, parks and public gardens will be endorsed. A set of incentives and methods to encourage the involvement of businesses and commercial sectors in combating climate change will also be developed.

SEQ-CURE (Centro Ricerche Produzioni Animali) aims to cut greenhouse emissions. Its main aim is to show how organic residues (sewage sludge, manure) can be used in the agricultural production of plant biomass intended for the generation of renewable energy.

Smart-CHP (Research Committee Aristotle University of Thessaloniki)
The project will demonstrate an innovative small-scale mobile power-production unit, which will use agricultural residues generated in rural areas, where large amounts of biomass waste are available. The unit consists of a gasification reactor combined with an internal combustion engine, adjusted to work on produced gas for electrical power and heat, and achieving high energy and environmental performance.

SNOWCARBO (Finnish Meteorological Institute) demonstrates an innovative approach to net carbon balance mapping for northern latitudes in order to assess the real levels of carbon sinks and sources for future climate controlling treaties and policy making. The approach is based on a combination of different information sources describing snow evolution, phenology, land cover, and CO2 fluxes and concentrations.

SOILPRO (Consiglio per la Ricerca e Sperimentazione in Agricoltura)
The SOILPRO project has the overall objective of halting soil degradation in line with the Thematic Strategy for Soil Protection. It will achieve this by developing a web-based application tool (Soil Monitoring Software) that can support local and regional authorities and Member States in their efforts to effectively monitor, identify and assess areas at risk.

VACCIA (Finnish Environment Institute): This project will develop a vulnerability assessment of ecosystem services for climate change impacts and adaptation. Expected results include scenario development and derivation, database development, development and documentation of tools for vulnerability assessment (i.e. provision of GMES services based on satellite data), and inventories of adaptation measures.

WATER CHANGE (Centro technologico del Agua): This project aims to establish a methodology and develop tools for medium- and long-term water resource modelling according to different global change scenarios. Based on the results from simulations, adaptation measures will be proposed and analysed according to their cost-benefit ratio. A case study will be carried out in the Llobregat river basin.

Julia 2030 project

JOIN THE CLIMATE WORK!

Climate Change in the Helsinki Region
– Mitigation and Adaptation

Julia 2030 – from strategy to implementation

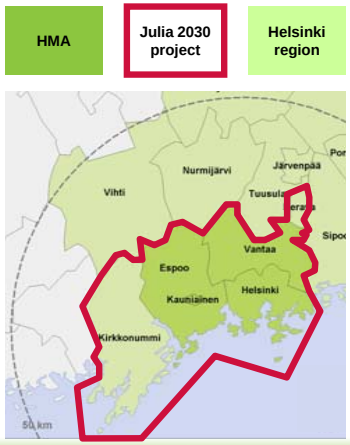
- Climate objective for the Helsinki Metropolitan Area (HMA) is a 39% reduction of the area's 1990 greenhouse gas (GHG) emission levels by 2030.
- The project's objective is to ensure an eco-efficient and good urban environment for today's children.
- The project was named Julia 2030 to honour the millionth HMA resident who was born in the spring of 2007.

Timetable and costs

- Project duration is 3 years, 2009-2011
- Overall budget amounts to 2,1 million Euros
  - 50% financed by the EU
  - 50% financed by HSY and project partners
- HSY's share during the 3 years amounts to 680 000 Euros

Partners

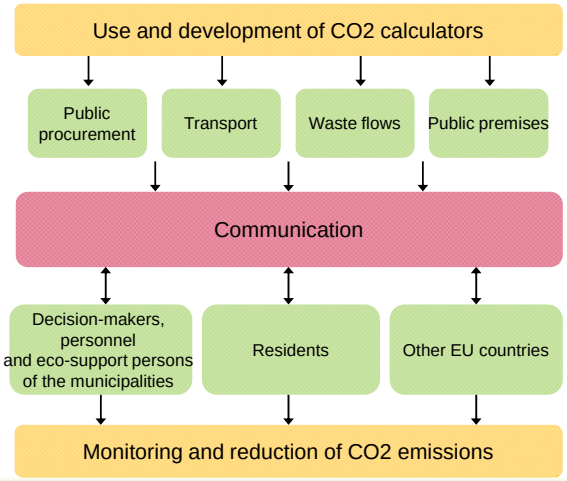
- HSY Helsinki Region Environmental Services Authority
- Municipalities of:
  - Helsinki
  - Espoo
  - Vantaa
  - Kirkkonummi
  - Kerava
  - Kauniainen
- Finnish Environment Institute SYKE
- Helsinki Regional Transport Authority (HSL)



Aims of the project

- Reducing greenhouse gas emissions in the cities of the HMA
- Developing tools for monitoring of GHG emissions for public, business, and private usage.
- Creating an eco-support network within partner municipalities.
- Preparing to adapt to impacts of climate change in the region

Method



Public procurements

- Choosing 4 - 6 goods and services that have a major impact on greenhouse gas emissions
- Developing GHG emission calculation tools for comparison of tenders

Public premises

- Development of a tool for estimation of GHG emissions of public premises. The tool will be used in about 35 pilot premises
- Training of 200 Eco-support persons, who will guide and motivate staff for climate work
- Incorporating energy conservation, waste prevention, and climate friendly practices into the organisations' everyday work

Transport

- Adding CO_2 emissions calculators to the Helsinki Region Journey Planner
- Developing models for households for assessing GHG emissions from travelling
- Motivating residents to choose climate friendly modes of transportation

Waste Flow Management

- Developing calculation of CO_2 emissions from waste management process
- Developing models for predicting municipal waste volumes
- Developing a tool for households for calculating their waste amounts and impacts on climate

Communication

- Project has a website presenting results of the project
  - www.julia2030.fi
- Most of the project materials will be produced in two languages (Finnish, English)
- The results of the project will be presented also in other EU countries.

Adaptation to climate change

- Assessing impacts of climate change to built and urban environment in the Helsinki Metropolitan Area
- Identifying the risks of climate change and their economic implications in the area
- Defining regional adaptation measures for the cities of the Metropolitan area

Thank you!

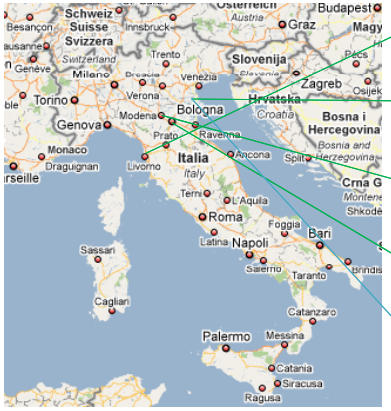
Provincia di Livorno Provincia di Ferrara

LIFE CLIMATE CHANGE SEMINAR

Helsinki 18-19 January 2010

Mauro Bigi

The Beneficiaries



Provincia di Livorno (Coord)
www.provincia.livorno.it

Provincia di Ferrara
www.provincia.fe.it

Associazione LA21 Italiane
www.a21italy.it

Impronta Etica
www.improntaetica.org

Indica
(external techincal assistance)
www.indicanet.it

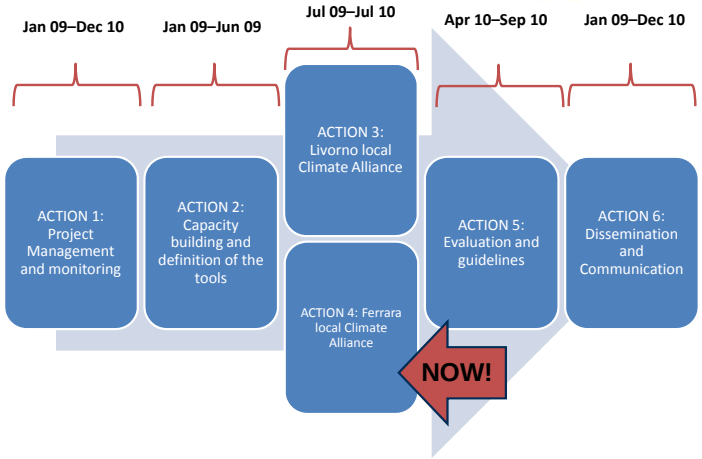
Duration

01/01/2009 - 31/12/2010

Budget

€ 593.992,00

The project development



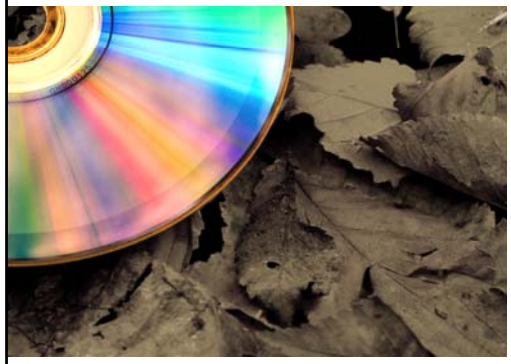
Objectives

To foster a common responsibility between private and public sectors towards climate change

To demonstrate that CSR is a strategic driver to involve local companies (not under ETS) in climate change mitigation policies

To promote among companies effective strategies for a local "low carbon economy"

The Drivers



CSR as a key for a new local governance approach

From Responsibility to Co-responsibility

Strategic approach

Long term Cyclic process

Accountability

The Idea

A public private partnership …

"People and organisations from some combination of public, business and civil constituencies who engage in voluntary, mutually beneficial, innovative relationships to address common societal aims through combining their resources and competencies."

(Copenaghen Centre)

… for climate protection and greening and boost the local economy

The climate Partnership

The agreement

Commitment charter

Signed in December 2009 between

- Provincia di Livorno
- API
- CNA
- Legacoop
- Confesercenti
- Provincia di Ferrara
- Chamber of commerce
- Ostellato Eco-district
- SIPRO
- Confagricoltura
- Unindustria
- CIA
-Legacoop

Companies commitment

Outputs

- Company carbon footprint
- Reduction commitments
- Process and product innovation strategy
- Communication of the carbon performances on a regular basys
- Trickle down effect

The tool is currently being tested in 2 pilot groups (about 25 companies) throughout:
- Field visit and carbon audit
- Training
- Support in the definition of the action plan
- Help desk

Promoters commitment

• Creation of a working group with banks and financial organizations to facilitate access to capital for the partnership members
• Matching the demand side for services and technologies for emission reductions with the supply side
• Information and support for accessing to national and European financing tools
• Homogenize urban planning legislations that regulate renewable energies in the municipalities
• Training and field visits

Lessons learned

The Partnership is actually an effective approach to involve economic sector in local environmental policies and strategies

In our context the economic sector (in particular SMEs) still fails to take the challenges and opportunities coming from climate change

A technical support is needed to involve a significant number of companies

WWW.LACRE.EU

THANK YOU!

info@lacre.eu

Local Accountability for Kyoto goals

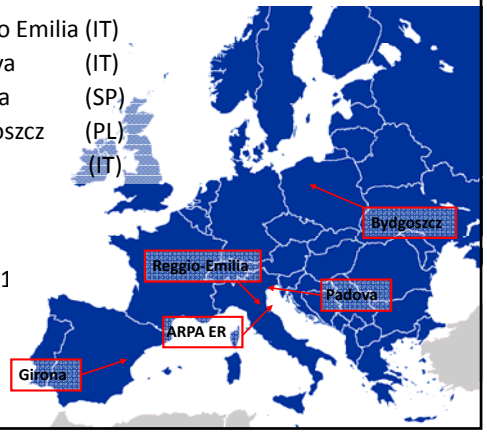
LIFE
Climate Change Seminar

Helsinki 18-19 January 2010

Nicoletta Tranquillo

The LAKs project

- **Partners:**
  - Municipality of Reggio Emilia (IT)
  - Municipality of Padova (IT)
  - Municipality of Girona (SP)
  - Municipality of Bydgoszcz (PL)
  - ARPA (IT)
- **Duration:**
  - 34 months January 2009 - October 2011
- **Budget:**
  - 1.304.758 €



The project objectives

- To locally contribute to the achievement of the EC Climate Action targets, leveraging with the subsidiarity of Local Authorities.
- To develop a tool and design a process to facilitate decision makers in introducing GHG emission reduction targets within the municipality policies.
- To develop a methodology to univocally assess the outcomes of policies and actions on emissions.
- To improve accountability within local authorities decision making on environmental and climate change issues.

The drivers

- Accountability

Transparency: of the decision taken toward all stakeholders.

Responsiveness: responding to stakeholder concerns.

Compliance: with the climate change European regulations (Climate Action Plan), but also with the precautionary principle and the scientific evidences produced by the IPCC.

- Measuring

To develop a successful mitigation and adaptation strategy it's fundamental to define *clear targets* and measure the achievements of the actions implemented.

The political decision making process must be a close loop (*plan-do-check-act*) .

- Twinning

To promote know-how sharing and capacity building among partners, in coherence with the EU Lisbon Strategy.

The project actions

We are here!

1.	2.	3.	4.
International review of tools and methods	*Audit and road map to the "Climate Accountability" system*	*Local application by the 4 cities*	*Results evaluation and international dissemination*
International review of tools and methods of environmental management and accountability	Analysis and comparing the environmental management and accountability systems already adopted by the developer partners	Local Application of the "Climate Accountability" system, based on current emissions evaluation and a cost/benefit analysis of the policies	Results evaluation and elaboration of the guidelines for international diffusion, done through a deep stakeholders involvement
OUTPUT: Report	**OUTPUT**: Definition a common greenhouse emissions accounting model , the "Climate Accountability" system	**OUTPUT**: Local approval of a "mitigation and adaptation local plan" and of a Climate Budget	**OUTPUT**: Guidelines and communication plan for the international diffusion of the system

The Climate Accountability system

Three main components of the system:

1. Emission Inventory

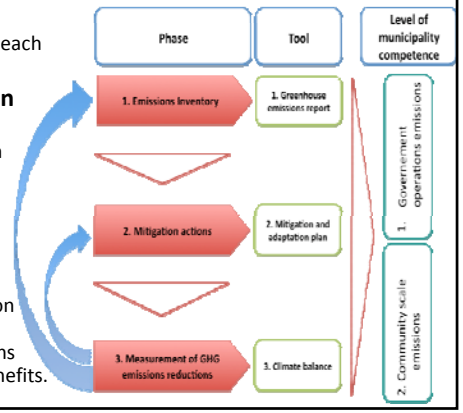
The inventory will be provided to each city, that will fill it in.

2. Mitigation and adaptation Plan

The climate accountability system include a phase when the Municipality develops a plan for emission reduction and Adaptation to climate change.

3. Climate Balance

Each year the 4 cities will report on the achievement of the actions implemented in terms of emissions reduction, investments, other benefits.



Evidences from the pilot phase

- Some Municipalities' departments still have a **low awareness** on the mitigation potential of their actions (i.e. urban planning, mobility).
- Local climate policies often are **not measured**, therefore it is impossible to evaluate their effectiveness or their eco-efficiency.
- A **political debate** on climate measures is often missing and it is never transversal to the whole administration.
- Not much has been done regarding **adaptation**. Often it is not even a priority.

Laks key responses

The accountability cycle driving the Lack model deals with the evidences previously presented by:

- providing a GHG emissions measuring tool, reliable and robust;
- requiring the definition of mitigation targets, that will then be yearly accounted for in the Climate Balance;
- introducing the climate change challenge in the political process of planning and control, thanks to the need of officially approve every year the Climate Balance.

PesticideLIFE

Reducing environmental risks in use of plant protection products in Northern Europe

Sanni Junnila
MTT/Plant Production

18.01.2010

2010 – 2013, 4-years project
1,024 m€, 50% from Life+ 08 ENV
Policy area CHEMICALS

BENEFICIARIES
Cordinating: MTT Agrifood Research Finland
Associated beneficiaries (2):
Finnish Environment Institute
NSL, Nylands Svenska Lantbrukssällskap

Project Manager: Sanni Junnila, sanni.junnila@mtt.fi
Senior Supervisor: Kari Tiilikkala, kari.tiilikkala@mtt.fi

Demonstration farms at three area :
Cereal cultivation: Glyphosate - herbicide
Prothioconazole - fungicide
Alpha-cypermethrine - insecticide

Challenges

In the northern crop protection area/FINLAND

Major contradictions between EU requirements to minimise the dependency on pesticides

AND

Trend of increasing dependency on pesticides linked to changes in climate, land use and technology

---

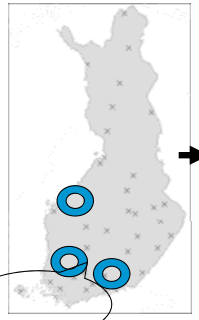
EU ENVIRONMENT AND PESTICIDE POLICY

Directive on sustainable use of pesticides

LifePlus

National Action Plans

PesticideLife tests
3X3 farms > 3 products



Implementation
IPM principles
Training, education
Roles and resources
IPM information

RESULTS:
1 Web page
2 Policy review
3 Watershed reports
4 Farm demonstrations
5 IPM reports
6 Thresholds
7 Resistance strategy
8 Products, LCA policy
9 Ecotoxicology
10 IPM material
11 Nordic/Baltic synthesis
12 Farm visits
13 Media
14 Seminars x 3
15 Risk-indicators

HORTICULTURE LIFE ?

Low environmental and healthy risk

Objectives

To support the building and updating of *National Action Plans* – minimicing environmental risks in use of pesticides when moving to IPM methods

> learning, interaction, confidence

-Data transmission: for decision making and education

-Integration: all available knowledge and practice in common use

-Verification: three demonstration areas > sustainability between environment and economy under current and future climate

-Development of risk indicator(s) for estimating realization of NAP

-Profitable plant production continues and fullfills the requirements of EU environmental policy

-Dissemination of results between Nordic/Baltic countries via existing channels (NJF, NorBaRag)

-Consumer oriented information transmission

Expected results

1) Benefits and weaknesses of IPM-methods and their interdependence of changes in *climate, soil use and techniques; direct and indirect* influences on envirenment risks
2) Monitoring and identification systems and threshold values for pests are developed
3) Their use and suitability for cereals are tested and introduced with plant protection programmes at the demonstration farms
4) Strategy for pesticide resistance in cereal production
5) Producing material and tools for IPM rules and training in cereals cultivated in northern circumstances
6) Developing risk indicator for plant protection
7) Network within whole plant protection area broad and effective

Final impacts

1) Increase in pesticide use will stop inspite of increasing need in continuously warming climate
2) Amount and frequence of pesticide leaching/runoff to the water systems are not increasing although the risk grows because of added rains in winter time
3) NAP and IPM -rules will enable profitable crop production in Finland and in the northern EU zone
4) Consumers have possibility to get domestic quality products and knowledge about the production and environment effects
5) Social responsibility in food chain is noticed (LCA)

RENEW BUILDING

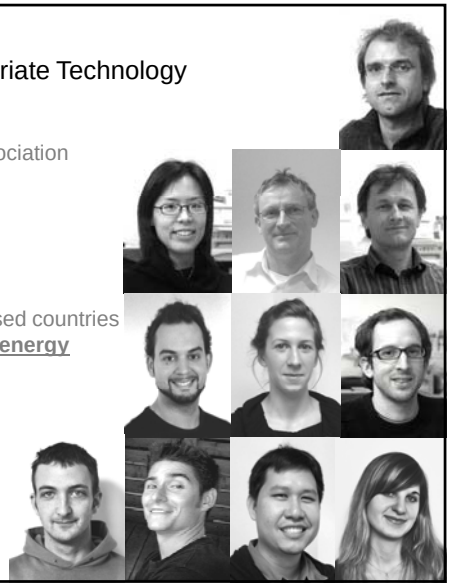
Demonstration and Dissemination
of Climate and Environmental friendly Renovation and Building
with Renewable Resources and Ecological Materials

Dr. Robert Wimmer, GrAT, Austria

LIFE climate change seminar
Helsinki, 18.-19. January 2010

GrAT : Center for Appropriate Technology

- Independent research association
- Inter/national R&D
- Consulting Co. & Gov.



Research Area

- Appropriate Technology in developing and industrialised countries
- **Renewable resources and energy**
- **Sustainable building**
- Product Service Systems
- **Eco-design**
- Cleaner Production

Sustainable Technologies

Thematic parc for Sustainable Technology development
in Böheimkirchen NÖ
.
- S-HOUSE
- Show case garden
- Laboratory

Project Objectives

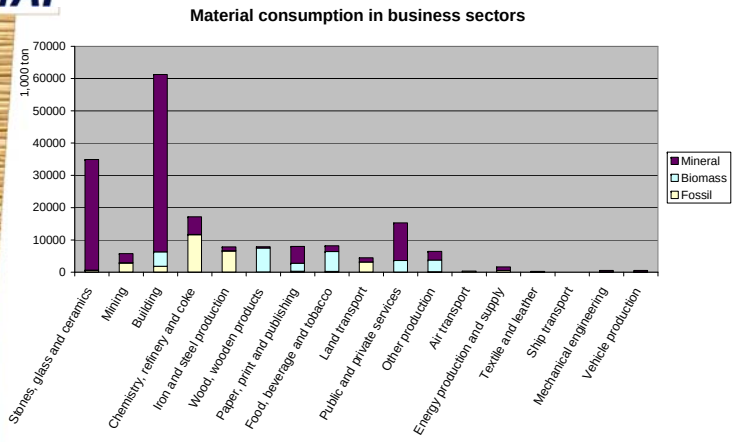
Reduction of CO_2 in the building industry

Dissemination of best practice knowledge of sustainable building with renewable resources and ecological materials

Demonstrating and disseminating of climate friendly, ecological and innovative renovation techniques

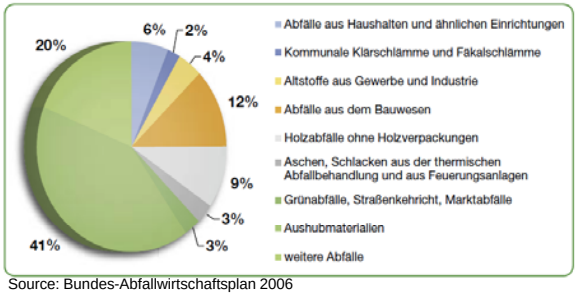
Awareness-raising about sustainable building for target groups in the building sector involved in renovation and restoration

Resource Demand of Building Sector



Material consumption in Austrian industries in 2003 (Statistik Austria, 2004)

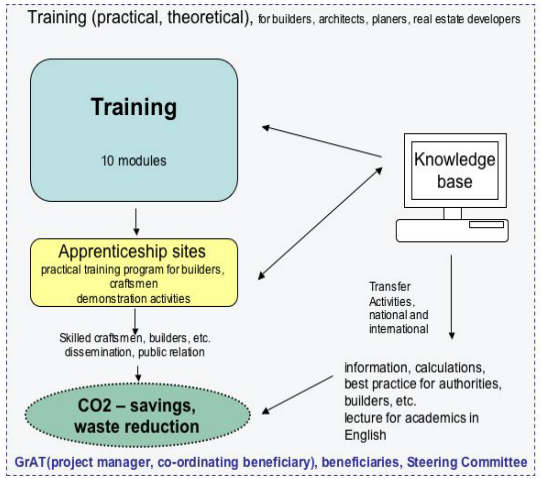
Building Waste



Source: Bundes-Abfallwirtschaftsplan 2006

Building related waste in Austria counts for more than 50% of total waste

Project structure



Project phases

Preparation work and feasibility investigation
potential of renovation sector identified, Know-how availability investigated, stakeholder cooperation, steering committee

Methods and implementation work
New didactic methods, defining quality criteria, developing knowledge base, training programme, demonstration activities, practical training units, prototyps, ...

Transfer
University lecture, events, workshops, modern media

Dissemination
Information material, national and international dissemination

Innovations

Holistic approach

Combining new developments (passive housing) and traditional knowledge

Innovativ didactic methodes:
Connecting a central knowledge base with local tangible demonstrations sites

Training programme modular, theory and practise linked

E-learning

Adopted to target group of builders and craftsmen

Demonstration sites for high quality and sustainable renovation with renewable resources and ecological materials

Expected Results

50% reduction of building waste at demonstration sites and CO_2 reduced by 90% due to the use of renewable building materials

Knowledge data base with hundreds of building products and 40 best practice system solutions, including practical examples, FAQs

E-learning platform

Training programme, Test run of training programme with 20 participants

Network of experts, stakeholders and craftsmen

Demonstration buildings, one in lower Austria and one in Upper Austria

Dissemination material (brochures, poster, folder, presentations)

Academic Lectures

Newly developed training methodes

RENEW BUILDING at EU Scale

Project results will be adaptable for other european countries

High potential of renovation in the EU

Transfer of sustainable renovation techniques

Project Team

Project coordinator:
GrAT

Dr. Robert Wimmer, rw@grat.at
DI Hannes Hohensinner, hh@grat.at
www.grat.at

Project partner:
BIA - Bau Innovation Austria
TU Wien/IHT - Institut für Hochbau und Technologie
Raiffeisen Leasing

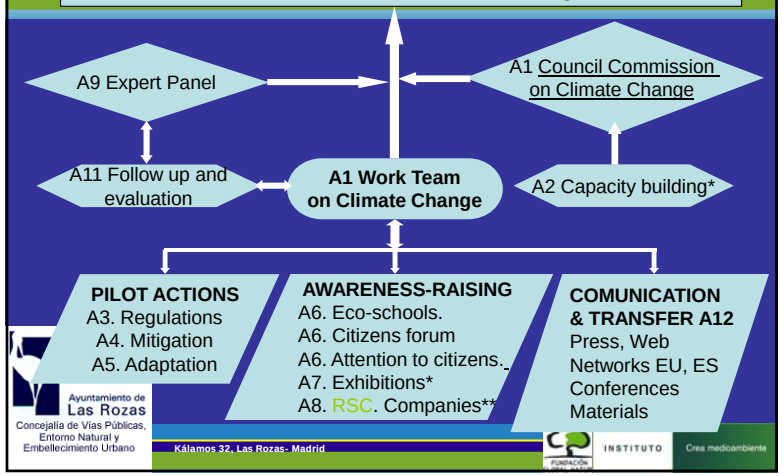
Local Action Plan to prevent Climate Change in "Las Rozas de Madrid": Application and Evaluation of Municipal Management Methods.

FUNDACIÓN GLOBAL NATURE
INSTITUTO Crea medioambiente
Ayuntamiento de Las Rozas

Project specific objectives

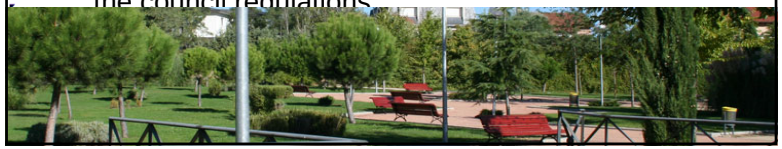
- Implementing counter-climate change policies
- Studying, modeling, analyzing and evaluating effective environmental management methods.
- Testing economic and technical support models
- Disseminating information and raising awareness about climate change among citizens, commercial and business sectors and among all the economic agents at the local level.

A10. Council Action Plan for Climate Change 2014-19



Expected results

- Action Plan: objectives of the council for the prevention of Climate Change.
- Coordination among the different departments and offices.
- Personnel of the City Council (806 people), informed and 130 City Council professionals qualified to adapt their management to climate change.
- Measures of mitigation and adaptation included in the council regulations.



Expected results

- Three new by-laws published
- Study: Integration of mitigation and adaptation methods in the council regulations.
- Action plan to create a green-way network project in the Council.
- Training 48 municipal officials in efficient driving.
- Action Plan with necessary measures for energy-saving in municipal facilities.

Ayuntamiento de LAS ROZAS
Local Action Plan for Fighting Climate Change in Las Rozas de Madrid: Application and Evaluation of Municipal Management Methods.

Expected results

- Implementation of an Environmental Management System in 21 schools.
- Setting up of Solar photovoltaic panels in a public building and promoted through an exhibition.
- Creation of CO_2 sinks: reforestation in 26,08 ha.120 t CO_2/3 years.
- Reduction of water consumption : Centralized Watering Management System in Parks and Gardens, and pilot groundwater collection measures.

Ayuntamiento de LAS ROZAS
Local Action Plan for Fighting Climate Change in Las Rozas de Madrid: Application and Evaluation of Municipal Management Methods.

Expected results

- Reduction of energy, water consumption and waste production in the commercial and business sector. 25% of companies certified.
- Calculation of the baseline (CO2/person GHG totals) at the beginning of the project
- Communication strategy of climate change for the Council.
- Publication of four guides on saving water
- Reaching and informing the public target audience.
- Wide distribution through news in national, regional and local press. Four Breakfasts with the press.

LIFE climate change seminar

Helsinki, 18th – 19th January 2010

Seq-Cure

Integrated systems to enhance sequestration of carbon producing energy crops by using organic residues

Marco Ligabue - Elena Bortolazzo
C.R.P.A S.p.A
Reggio Emilia (RE), Italy

The area

Seq-Cure

The Emilia-Romagna Region

Seq-Cure

The LIFE Seq-Cure Project

Seq-Cure

- LIFE ENVIRONMENT PROJECT
- 1st December 2006 to 30th June 2010
- Total budget: 1.917.051 €
- Beneficiary: C.R.P.A. SpA
- Scientific responsible: Prof. Giovanni Riva
  Università Politecnica delle Marche

Partners & Co-funders

Seq-Cure

Partners

- CRPA SpA - Reggio Emilia
- Fondazione CRPA Studi e Ricerche – Reggio Emilia
- Cooperativa Terremerse - Ravenna
- Azienda Sperimentale Tadini Piacenza
- Azienda Sperimentale Stuard Parma
- CIA Piacenza - Piacenza
- Max Planck Institute for Biogeochemistry – Jena (Germany)

Co-funders

- Emilia-Romagna Region
- Parma Province
- Reggio Emilia Province
- Modena Province
- Bologna Province
- Ferrara Province
- Ravenna Province
- Forlì-Cesena Province
- ENÌA (Multiutility)
- HERA (Multiutility)
- Caviro

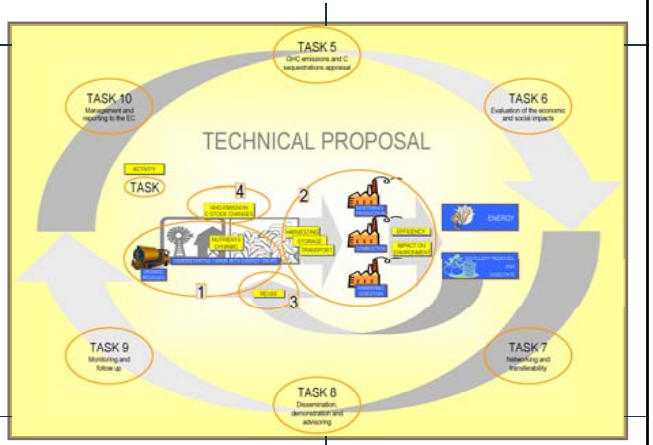
Main objectives

Seq-Cure

- **Promotion** of the start-up of agroenergy production chains sustainable both from the environmental and economic point of view
- **Reduction** of the environmental impact by using organic residues to fertilise energy crops
- **Increase** farmers' and technicians' knowledge on GHG emissions and C sequestration resulting from farming practices and agroenergy production cycles
- **Development** of a calculation method for the estimation of GHG emissions and C sequestration deriving from soil uses' changes

The project

Seq-Cure



Activities for the development of energy chains

Seq-Cure

- Demonstrative fields with energy crops: sorghum, triticale, hemp, sunflower, rape seed, poplar.
- Biomass characterisation
- Biomass management and energetic conversion
- Monitoring of the environmental, energetic and economical effects.

Activities for the monitoring of the environmental impact

- Agronomical trials on the use of residues of energy conversion
- Measurement of GHG emissions
- Monitoring of storage of organic matter in soil
- Development of an Internet service for the calculation of GHG emissions and C sequestration in soils. (together with Max Planck Institute)

Web application

Implementation a web application for the calculation of GHG emissions and C sequestration in soils addressed to technicians.
www.crpa.it/seqcure

INPUTS
Soil characteristics
Crop rotation
Fertilisation

→

OUTPUTS
N_2O emissions
C sequestration in soil

Networking, dissemination, demonstration and advisoring ...

European Orientation group

Intensive courses

Demonstration days

Information days

Articles, Internet website (www.crpa.it/seqcure)

Newsletters

Workgroups

Biomass Information offices

Biomass information offices
Sportello-biogas@crpa.it
Sportello-olio@crpa.it
Sportello-legno@crpa.it

Marco Ligabue - Elena Bortolazzo
www.crpa.it/seqcure

Monitoring and assessment of carbon balance related phenomena in Finland and northern Eurasia

SNOWCARBO

Ali Nadir Arslan (ali.nadir.arslan@fmi.fi)
Jouni Pulliainen (jouni.pulliainen@fmi.fi)

PROJECT LOCATION: Helsinki

BUDGET INFO:

Total amount: 2 155 000 €

% EC Co-funding: 1 046 000 €

DURATION: Start: 01/01/09 **- End:** 31/12/12

PROJECT'S IMPLEMENTORS:

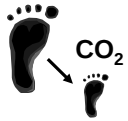
Coordinating Beneficiary: Finnish Meteorological Institute (FMI)

Associated Beneficiary(ies): Finnish Environment Institute (SYKE), Commissariat à l'énergie atomique – Laboratoire des Sciences du Climat et de l'Environnement (CEA-LSCE)

Project objectives

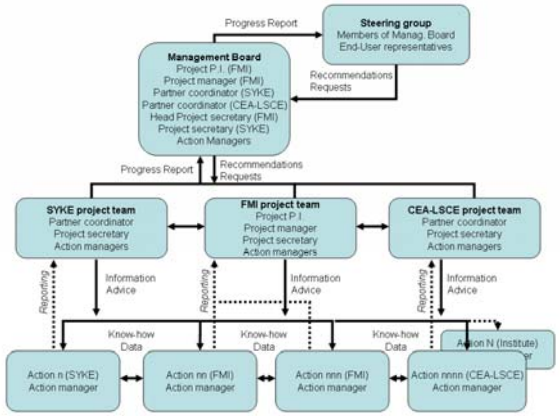
1. *Provide accurate map information on net carbon dioxide balance in boreal forest zone in order to assess the real levels of carbon sinks and sources for future climate controlling treaties and policy making*
2. *Provide and demonstrate methodologies to extract anthropogenic influence from natural background CO2 sources in order to enable the development new legislative means for CO2 regulation. These methodologies include the use of Earth observation data as a comprehensive data source (together with models and in situ data).*
3. *Provide information for the future needs of required in situ, Earth observation and land cover data needs of continental scale carbon balance mapping/monitoring (focusing on northern areas)*

Project's "carbon footprint"



- **SnowCarbo project is committed to minimise its carbon footprint:**
  - minimise the number of meetings and travel
  - SYKE: ISO 14001 certified environmental management system
  - FMI: WWF Green Office standard
  - Work meetings primarily by teleconferences
  - National travel by public transportation
  - Project documentation in electronic form (as much as possible)
- **Two Carbon Footprint reports issued during the project (2010 and 2012)**

Project management



Project primary stakeholders

- **National stakeholders**
  - Ministry of Transport and Communications (governing body of FMI)
  - Ministry of the Environment (governing body of SYKE)
  - Ministry of Agriculture and Forestry, National Forestry Board (Metsähallitus) and forestry industry
  - Statistics Finland
  - Finnish Forest Research Institute (METLA)
  - Agrifood Research Finland (MTT)
- **European Comission**
  - Green Paper follow up (adaption policy development)
  - European Climate Change Programme II (ECCP)
- **International environmental monitoring activities including**
  - Arctic Monitoring and Assessment Programme (AMAP)
  - Sustained Arctic Observing Networks (SAON) initiative of the Arctic Council
  - Global Atmosphere Watch (GAW) programme of the World Meteorological Organization (WMO).

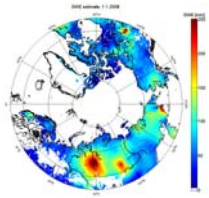
Secondary stakeholders

- **The spatial and temporal changes in snow cover have widespread impacts on ecosystems and human activities**
  - flooding, water resources management, agriculture, transportation, hydropower production, reindeer husbandry, game management, biological diversity, insurance, tourism and recreational use of nature.
- **=> national and international organizations and companies related to these issues are secondary stakeholders of the project**
- **Secondary stakeholders include organizations that support the snow monitoring systems used in the project**
  - Snow and phenology monitoring services of FMI and SYKE applied in the project are part of European Space Agency's (ESA) GMES (Global Monitoring of Environment and Security) Services (projects Polar View and Land).
  - Environment Canada snow melt monitoring data (based on space-borne microwave scatterometers) covering northern Eurasia and America.

DATASET

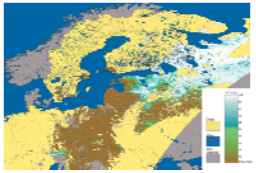
- **Weekly SWE (mm)**
- **Snow melt onset (date, spring)**
- **Snow clearance (date, spring)**
- **Land Cover Data**
- **MODIS (Moderate Resolution Imaging Spectroradiometer)**
- **AVHRR (Advanced Very High Resolution Radiometer)**
- **European Centre for Medium-Range Weather Forecasts (ECMWF) snow depth observations (used as input for SWE product)**

Land cover data

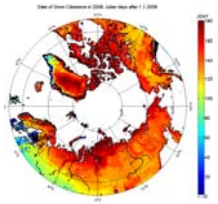


SWE distribution over northern hemisphere (Jan 10 2007)

The distribution of the CO2 flux Stations in Finland



Example of snow cover area (SCA) product



Snow clearance date in northern hemisphere (0.25 deg EASE grid), 2008. Julian day from Jan 1.

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SYKE

METHODOLOGY

- The atmospheric general circulation model ECHAM5 (MPI, Hamburg) coupled with a modular land surface scheme for the ecosystem-vegetation interactions (JSBACH, Jena Scheme for Biosphere-Atmosphere Coupling in Hamburg,MPIs of Jena and Hamburg, Germany), will be used for global CO2 balance predictions that serve both as reference and as optional boundary data for the regional CO2 balance simulations.

- Regional model (REMO+JSBACH) is used for high resolution of determining a detailed map of carbon balance of the Northern Europe

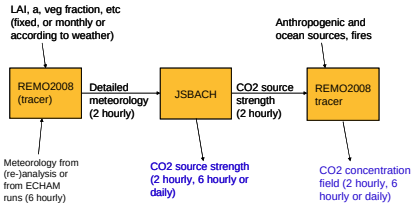
- Modelled CO2 balance will be compared to measurements from flux sites and concentration measurements from the Pallas GAW station in Finland.

- The model will be used in resolution of 0.1667 degrees for a domain covering Finland, Sweden, Norway and Denmark as whole as well as the Baltic countries: Estonia, Latvia and Lithuania; together with areas from most Northern Germany and Western parts of Russia.

- The simulations will cover the target years of the project 2001-2011.

- Three approaches will be considered:

1. Introducing input parameters estimated by using satellite data to the models externally
2. Nudging the models externally in addition to gridded meteorological data, also by using satellite data
3. Modifiying formulas in the models that the external parameters which are obtained using satellite data can be included.



FLOW CHART for MODELING WORK

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SYKE

Dissemination of knowledge

- **Information will be disseminated to stakeholders through workshops that present and evaluate project results**
  - Midterm end-user/stakeholder consultation workshop: January 2011
  - Dissemination workshop: November 2012
- **Relevant project material will be delivered to stakeholders (reports, maps, res, databases, methodological information/algorithms)**
- **Stakeholders will also participate the preparation of CO2 assessment report provided by the project**

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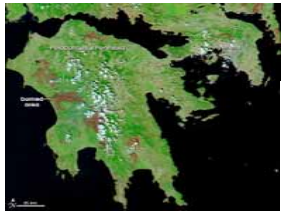
SYKE

Monitoring for soil protection



- PARTNERS
  - COORDINATING BENEFICIARY
    - CRA-ABP
  - ASSOCIATED BENEFICIARIES
    - NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS
    - REGION OF PELOPONNESOS
    - REGIONE SICILIANA
- TOTAL COST: 1,450,192.00 EURO
- DURATION: 1/01/2010-31/12/2013

AIM

The SOILPRO project has the overall objective of halting soil degradation in line with the Thematic Strategy for Soil Protection.

It will develop a web-based application tool (Soil Monitoring Software, SMS) that can support local and regional authorities and Member States in their efforts to identify and assess areas at risk, as well as to monitor the effectiveness of soil protection measures

Others important aims

•Dissemination (video, newsletters, guidelines, e-learning….)

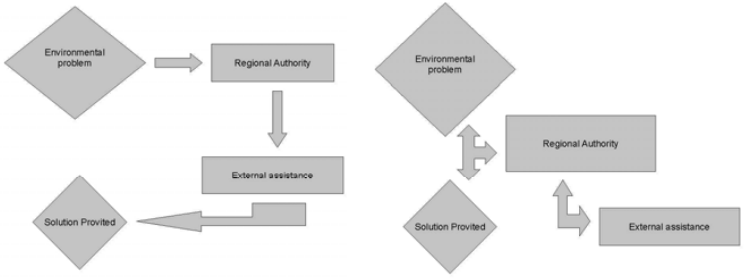
•Awareness-raising campaign about soil conservation and CC (conferences, questionnaires, hand-books,....)

•Training of personnel for the SMS (potential users)

•Regional plan of soil protection measures (elaboration and implementation)

SOILPRO

APPROACHING ENVIRONMENTAL ISSUES



Conventional approach

Innovative approach

SOILPRO

Environmental problems targeted

- **Forest fires**
- **Soil salinisation**
- **Soil erosion**
- **Decline in soil organic matter**
- **Soil compaction**
- **Decline in biodiversity**
- **Local and diffuse soil contamination**
- **Floods and landslides**
- **Soil sealing**

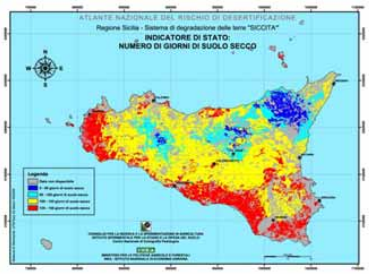
SOILPRO

DPSIR framework

Soil degradation system: aridity				
Determinants	**Pressures**	**Indicators and indexes of state and response**		**Impacts**
Climate Agriculture	**Limited rainfall, high evapotransp.**	**State**	***Aridity Index***	
		State	***Soil moisture and temperature regimes***	**Vulnerable lands (regional level)**
		State	***Annual number of days when soil is dry***	
		Response	***Irrigated lands***	**Risk mitigation or enhancement**

SOILPRO

Soil degradation system: aridity



Vulnerable lands

Mitigated lands (by irrigation)

SOILPRO

Soil degradation system: water erosion				
Determinants	**Pressures**	**Indicators and indexes of pressure State and response**		**impacts**
Climate Agriculture Selviculture, other human actions	**Climatic aggressivene ss, wildfires, land management**	**Pressure**	***Overgrazing***	**Sensitive lands or risk enhancement**
		Pressure	***Forest fires***	**Risk enhancement**
		State	***Slope***	**Vulnerable lands**
		State	***Rooting depth***	
		State	***Erosion phenomena***	**Sensitive lands or risk enhancement**
		State	***Vegetation cover (NDVI)***	**Unproductive or sensitive lands; risk enhancement or mitigation**
		Response	***Protected area***	**Risk mitigation**
		Response	***Agro-environmental measures***	**Risk mitigation**

SOILPRO

Soil degradation system: water erosion

Vulnerable lands (natural areas bare or scarsely vegetated)

Mitigated lands (protected areas)

SOILPRO

Creation of impact maps

- Existing information
- Regional information systems
- Remote sensing

Validation

- Field trip
- Laboratory analysis

SOILPRO

Actions

1. **Project Management and Monitoring**
2. **Development of software for the application of the soil monitoring methodology developed by CRA ABP – Creation of a Manual for the adaptation of Soil Monitoring Software web application (SMS) in different EU Regions**
3. **Implementation – Pilot Application of the SMS in two EU Regions: Sicily and Peloponnese – Identification of risk areas and targets for actions**
4. **Demonstration of the use of SMS and RAI to other Regional Authorities (RAs)**
5. **Training to potential users**
6. **Pilot Application of soil protection measures in two EU Regions: Sicily and Peloponnese**
7. **Use of the SMS to monitor the effectiveness of soil protection measures**
8. **Awareness campaign against soil degradation process targeting soil users and all stakeholders – outreach**
9. **After life communication plan**

SMARt - CHP

Demonstration of a Small scale Mobile Agricultural Residue gasification unit for decentralized Combined Heat and Power production

Coordinating beneficiary

Aristotle University Thessaloniki

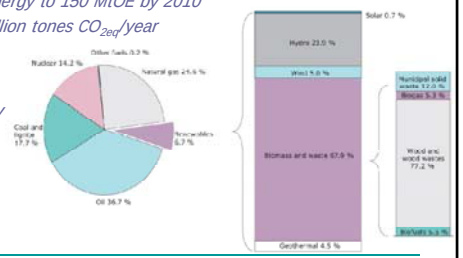
Associated beneficiaries

District Heating Municipal Company of Ptolemaida

Union of Agricultural Coop of Amyntaion

Biomass & Climate Change

- Biomass ranks 4th energy source (14% world's energy needs, 4% of EU's total energy consumption→ 2/3 of Renewable Energy)
- "Biomass action plan" – December 2005
  - *Increase biomass for energy to 150 MtOE by 2010*
  - *Reduce GHG by 210 million tones CO_{2eq}/year*
- Biomass systems:
  - *Wide range of applicability*
  - *Small-scale applications*
  - *Decentralized energy*



SMARt - CHP

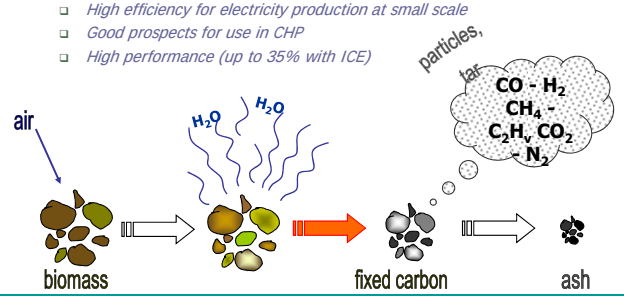
Decentralized CHP

- Small-scale decentralized CHP benefits:
  - *Support of agricultural and forestry sector*
  - *Ecological impact reduction of biomass routes*
  - *Increase in the share of biogenic fuels within energy market*
  - *Reduction of fossil fuel use and substitute imported energy flow*
- Energy situation in rural Greece:
  - *Low efficiency/reliability*
  - *High cost of electricity supply*
- Small-scale biomass installations for CHP are very promising technologies for decentralized energy → SMARt - CHP

SMARt - CHP

CHP & Gasification

- The combined heat and power unit consists of a gasifier coupled with a gas fired power generation set
- Gasification advantages:
  - *High efficiency for electricity production at small scale*
  - *Good prospects for use in CHP*
  - *High performance (up to 35% with ICE)*



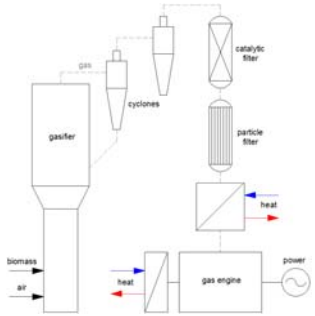
SMARt - CHP

The SMARt – CHP concept

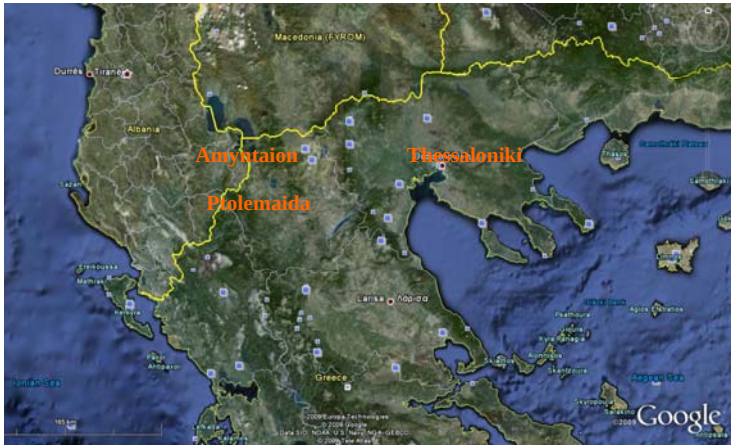
- A mobile gasification unit able to utilize a variety of biomass residues generated in an energy efficient and environmentally friendly way
- Issues to be examined through SMARt – CHP
  - *Fuel feed versatility*
  - *Gasifier capability of handling wide variety of feedstock*
  - *Agricultural residue logistic management*

Biomass CHP

- Objectives:
  - *A mobile CHP unit operating on 4 – 4.5 kg/h biomass (electrical efficiency ~20%)*
  - *Promotion of the innovative concept to local actors and entrepreneurs*
  - *Biomass energy potential evaluation and contribution to national road mapping for decentralized CHP*



Area of activity

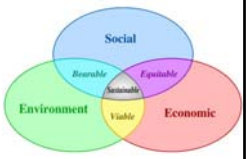


Actions to be developed

- Regional biomass availability profile
  - *Detailed survey of generated agricultural residue streams in the region of Western Macedonia & estimation of selected species' suitability for gasification*
- SMARt – CHP unit development
  - *Design and manufacture of a 5kWel/12kWth mobile unit which consists of a gasifier combined with a power generator set*
- Demonstrative operation
  - *Demonstrative operation at 4 locations for 2 weeks each & preparation of a report concerning technical and administrative aspects*
- Demonstration results & sustainability analysis
  - *Evaluation of system performance and highlight of technical and administrative obstacles*
- Dissemination of project issues and results
  - *Create awareness about the project results through high publicity events and documentation*

Expected results

- Expected benefits and results
  - *Innovative approach of biomass energy utilization with CO_2 emissions reduction*
  - *Sustainable rural areas development boost & enhancement of decentralized energy market potential*
  - *Promotion of the concept to stakeholders & continuity of the project*
  - *Increase of public awareness over energy & environmental issues*



SMARt - CHP

Contact

- Zissis Samaras, Professor, Lab of Applied Thermodynamics, Aristotle University Thessaloniki, Greece, zisis@auth.gr
- Anastasia Zabaniotou, Assoc. Professor, Lab of Chemical Process and Plant Design, Aristotle University Thessaloniki, Greece, sonia@cheng.auth.gr

VACCIA-project: Vulnerability assessment of ecosystem services for climate change impacts and adaptation

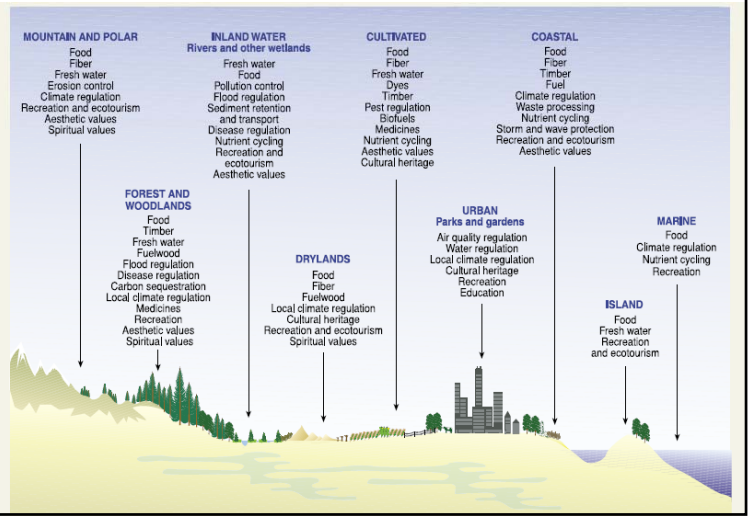
Martin Forsius
Division Manager
Finnish Environment Institute (SYKE)
Ecosystem change

www.environment.fi/syke/vaccia

VACCIA

SYKE

Ecosystem services



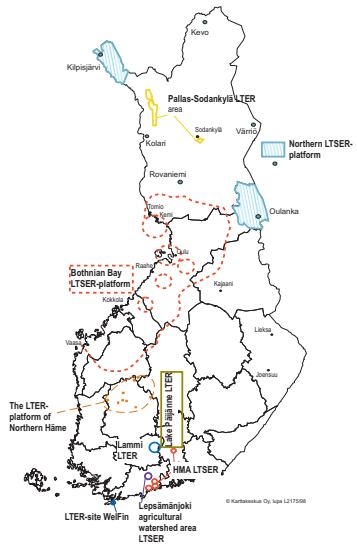
VACCIA-project

- Based directly on Finnish network of Long-Term Ecosystem Research (LTER) sites, called FinLTSER
- The FinLTSER-sites have top-class infrastructure, long-term data, and are well integrated in the local economy.
- Partners: SYKE, Finnish Meteorological Institute, Universities of Helsinki, Jyväskylä and Oulu
- Total budget 3,2 milj. € (50% EU LIFE+)
- Duration: 1.1.2009 - 31.12.2011
- Coordination SYKE (Forsius)

8.2.2010

SYKE

FinLTSER network

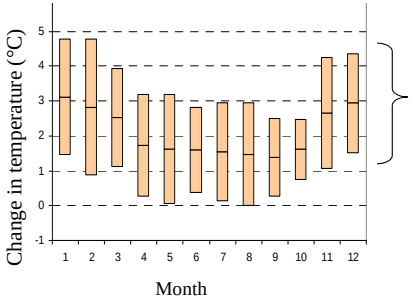


8.2.2010

SYKE

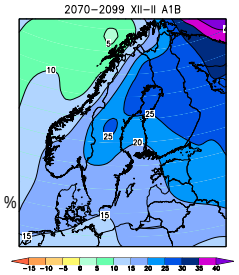
Temperature and precipitation in Finland are predicted to increase particularly during winter

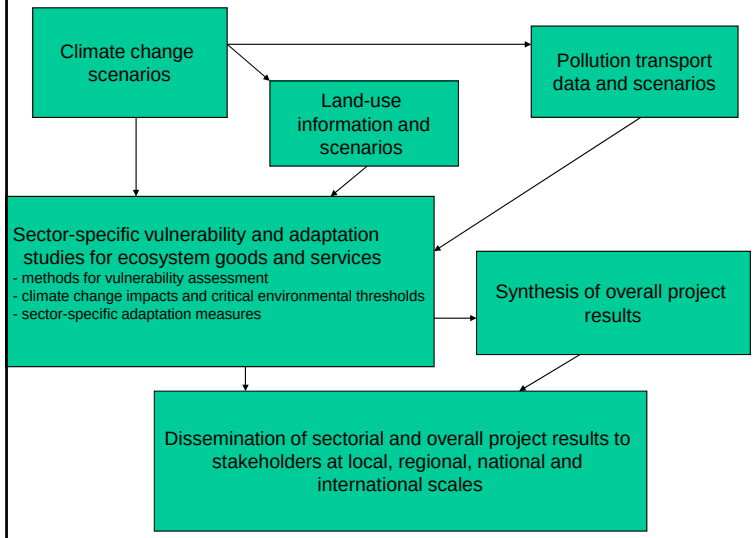
Finland 1971-2000 => v. 2020-2049



Best estimate and 90% confidence interval (A1B scenario)

Precipitation change %





Sectors in VACCIA-project

- Coastal ecosystems
- Land use in urban environments
- Agricultural production
- Forest production and C-sequestration
- Water quality
- Fishery production
- Biodiversity
- Nature-based tourism

SYKE

Expected results of biodiversity action

- sensitivity analyses for key species
- spatially explicit population models
- established *ex situ* conservation network

CETaqua

WATER CHANGE

Medium and long term water resources modelling as a tool for planning and Global Change adaptation. Application to the Llobregat Basin.

Laurent Pouget (CETaqua)

LIFE climate change seminar – Helsinki 18-19 January 2010

INTRODUCTION

- **Objective:** study the Global Change impacts on water resources in order to propose adaptation measures
- **Duration:** from 01/01/09 to 31/12/11 (3years)
- **Budget:** Total amount: 1.238.280 € (49.75 % EC Co-funding)
- **Partners: CETaqua – CRAHI**
- **Stakeholders involved:**
  - Spanish River Basin Agencies, ACA (Catalan Water Agency)
  - Spanish Office of Climate Change
  - Private companies (Agbar, Iberdrola)
  - Other regional institutions

WATER CHANGE

BACKGROUND

- Challenges in long-term Water Resources Management

Water Resources
- Climate change
- Land use change

⟷

Water Demand
- Population increase
- Change in water use

Sustainability
- Environmental objectives of the WFD (2015, 2027)

- GLOBAL CHANGE : all the anthropic changes, such as changes in climate, water demand or land use, affecting directly or indirectly the water quality and the water quantity, influencing the sustainable management of the water resources in a river basin.

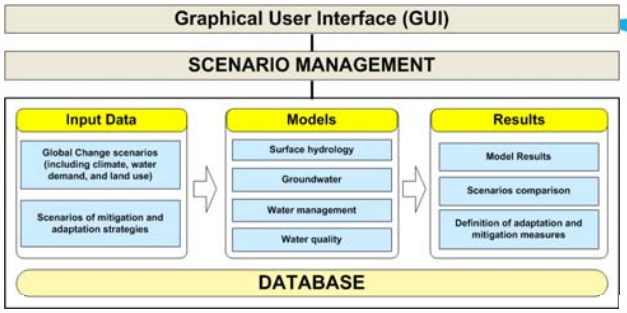
WATER CHANGE

PROJECT MAIN ACTIVITIES

- **Develop a methodology to:**
  - study the impact of Global Changes on the water resources of a river basin
  - formulate adaptation & mitigation measures
- **Develop a modelling system that can:**
  - link a wide range of models, such as hydrological, water quality, and water management models
  - simulate the impacts of different scenarios of Global Change on the water availability for water supply
  - compare results via graphics, tables and GIS viewer
  - assessing water management and land development adaptation strategies
- **Application of the methodology and the modelling system to the Llobregat river basin**

WATER CHANGE

MODELLING SYSTEM



- **Automatic link between models**
- **Creation of Global Change scenarios and adaptation scenarios**

WATER CHANGE

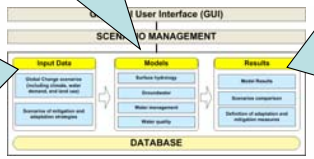
MODELLING SYSTEM (Example)

What could be the possible impacts of Global Change in my river basin?

MODELS: **Hydrology** + **Water management**

> 3*2*2 = 12 simulations

- 3 scenarios of **Climate** projection
- 2 scenarios of **Land use** evolution
- 2 scenarios of **Water Demand** evolution



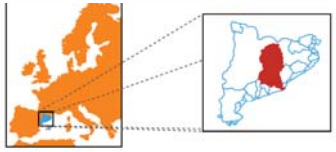
Compare results, see range of impact for all the "possible future"

How to adapt in a sustainable way??

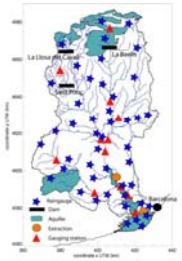
WATER CHANGE

CASE STUDY: The Llobregat basin

- Small river basin (4948 km2), highly populated and urbanized Dense raingauge network
- Water supply for Barcelona urban area using dams and aquifers
- Actual situation: demand = resources
- Prediction: important impact of Climate Change in Spain (water resources reduction), possible increase in water demand



Llobregat basin in the Catalonia region.

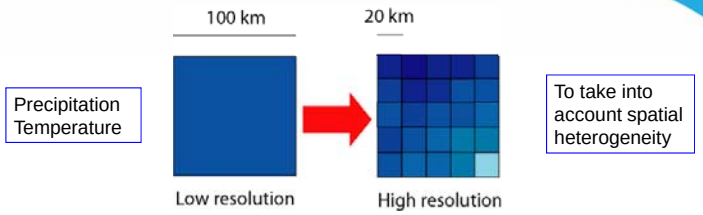


- Dense raingauge network
- 3 Dams: capacity 213 hm^3
- 2 water extractions: 3 m^3/s
- Pluviometry: 850 mm/yr

WATER CHANGE

CASE STUDY: Global Change scenarios

- Climate change: downscaling from IPCC scenarios

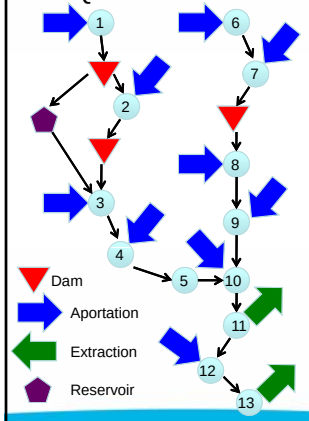


- Demand change: projections from water agencies
- Land use change: urban planning, change in vegetation cover

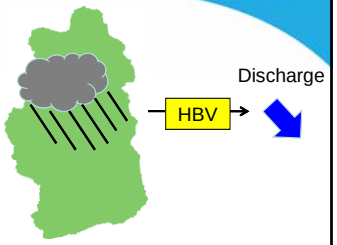
WATER CHANGE

CASE STUDY: Models

- Management model: AQUATOOL



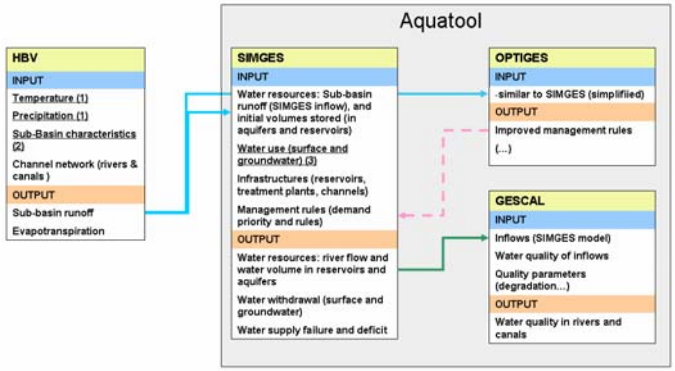
- Hydrological model: HBV



- Water quality model: GESCAL

High salinity and conductivity values

CASE STUDY: Links between models



Parameters directly linked to Global Change impacts on water resources:
(1) Climate Change, (2) Land use change, (3) Water demand change

Expected results

- To have a **decision support tool for planning**, having into account the evolution of water resources and the possible impacts
- To improve the **knowledge of Global Change** impacts on the availability and quality of water resources
- To establish **mitigation and adaptation measures**
- To improve **knowledge about costs and benefits, economical and environmental**, of each different measure
- To bring objective data in order to help to shape the **social perception of the Global Change problem**
- To orientate and improve the current and **future policies** of water resources, infrastructures and water services

Project WATER CHANGE

- Thank you for your attention

www.life-waterchange.eu

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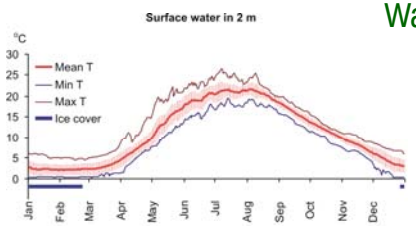
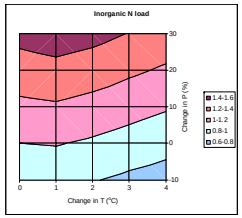
Water quality action

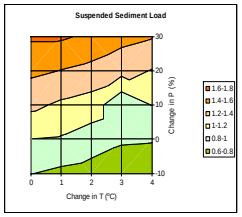


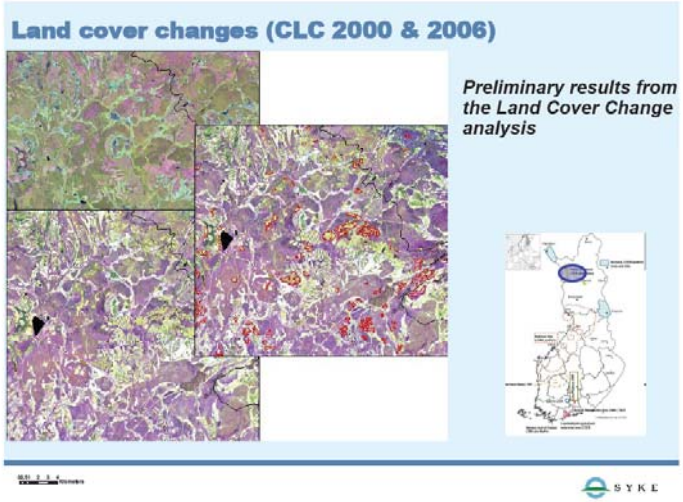
3 winters without ice cover during 20 years long period

Effect of ECHAM4 A2 scenario on surface temperature and ice cover on lake Pääjärvi

Response surfaces of inorganic N load and suspended sediment load







Expected results of VACCIA-project

- Demonstration and use of satellite data based GMES-services (maps, databases).
- Data analysis and tools for vulnerability assessment of key ecosystem services (reports, GIS-based platforms, modelling tools).
- Derivation of critical thresholds for environmental change (reports, databases).
- Inventories of adaptation measures together with stakeholders.
- Dissemination material and workshops.
- Contribution to the development of national and European climate change and adaptation policies.
- Contribution to the development of international observation networks (LTER-Europe, ILTER, SAON, GAW, UNEP).