Strengthening Sustainable Energy Policies within the Covenant of Mayors Initiative

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A. Introduction

By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO_2 reduction objective by 2020
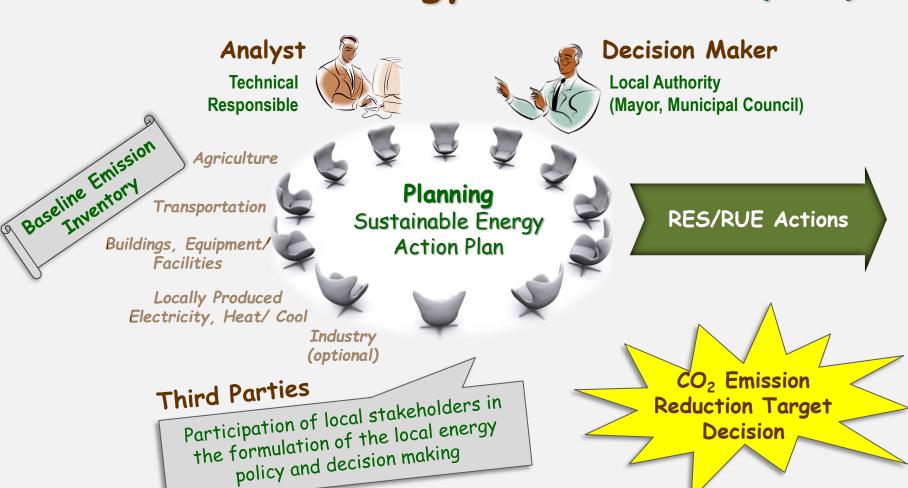
Commitments

↪ Submit a **Sustainable Energy Action Plan (SEAP)**, within the year following signature, outlining the key actions;

↪ Submit an **Implementation Report** at least every second year after submission of the Action Plan for evaluation, monitoring and verification purposes.

B. Sustainable Energy Communities (1/5)

Analyst

Technical
Responsible

Decision Maker

Local Authority
(Mayor, Municipal Council)

Baseline Emission Inventory

Agriculture

Transportation

Buildings, Equipment/ Facilities

Locally Produced Electricity, Heat/ Cool

Industry (optional)

Planning
Sustainable Energy
Action Plan

RES/RUE Actions

Third Parties

Participation of local stakeholders in the formulation of the local energy policy and decision making

CO_2 Emission Reduction Target Decision

B. Sustainable Energy Communities (2/5)

Existing Methodologies & Tools

Identification of more than 20 methodologies and tools!

	Energy Data Collection	Local Stakeholders Participation	Actions Evaluation	Monitoring & Targeting	Buildings, Institutions/ Facilities	Industry	Transportation	Local Electricity Production	Awareness Raising
ENOVA	★ ★	★	★ ★	★	√	√	√	√	
BELIEF	★	★ ★ ★	★	★					
CLIMATE COMPASS	★	★	★	★ ★ ★	√	√	√	√	√
ICLEI	★ ★	★	★	★	√	√	√	√	√
MODEL	★ ★ ★	★	★	★					
MOVING SUSTAINABLY	★	★ ★ ★	★ ★	★ ★			√		
MUSEC	★ ★	★	★	★ ★ ★					
PEPESEC	★ ★	★ ★	★	★					
SECURE	★	★	★	★					

➲ Toolbox of Methodologies on Climate & Energy

➲ Covenant capaCITY Training Platform

➲ CoMO's e-learning

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Source: *Bertoldi, P., Cayuela, D. B., Monni, S., Raveschootm R .P., 2009. Existing Methodologies and Tools for the Development and Implementation of Sustainable Energy Action Plans (SEAP). European Commission - Joint Research Centre (EC-JRC). Brussels, Belgium.*

B. Sustainable Energy Communities (3/5)

Existing Methodologies & Tools

⇨ Focused on urban territories, overlooking the special characteristics of rural communities.

⇨ Emphasizing in specific SEAP sectors:

✓ Agricultural sector (agriculture, forestry, fishery) distinguishes for its high energy consumptions.

✓ Urban transportation (rail, buses etc) and industry have secondary role in rural communities.

⇨ Do not offer an integrated framework for the SEAPs development and especially the selection of sustainable RES/RUE technologies.

B. Sustainable Energy Communities (4/5)

Needs

Priority Sectors

Financial Sources

CO_2 Emissions Overall Reduction Target

Long term Vision & Overall Strategy

Support local and regional stakeholders…

Sustainable energy policy and SEAP development
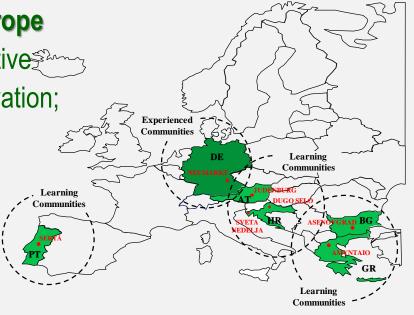
B. Sustainable Energy Communities (5/5)

Rural Web Energy Learning Network for Action

➲ Under the **"Intelligent Energy for Europe Programme"**, managed by the Executive Agency for Competitiveness and Innovation;

➲ **Duration of Action:** 21/06/2011 – 20/12/2013;

➲ **Coordinator:** EPU-NTUA.
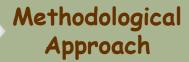
Website: http://erenet.epu.ntua.gr/

C. Methodology (1/8)

Methodological Approach

Aim

RES/RUE Suggested Actions

Baseline Emission Inventory

Actions' Evaluation

20% ↓CO_2

Emission Factors

SEAP Elaboration

Monitoring & Evaluation
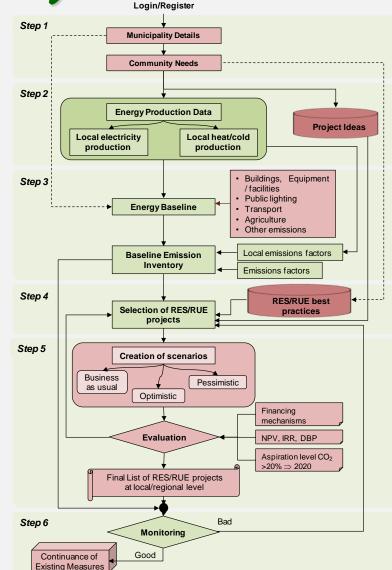
Final Energy Consumption & Local Production

C. Methodology (2/8)

The General Philosophy of the Proposed Methodological Approach

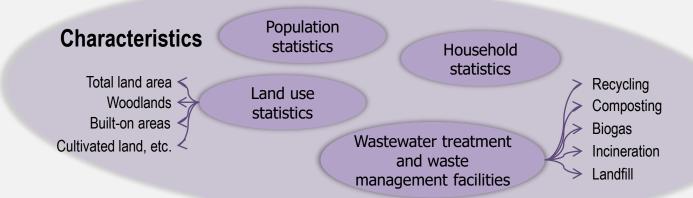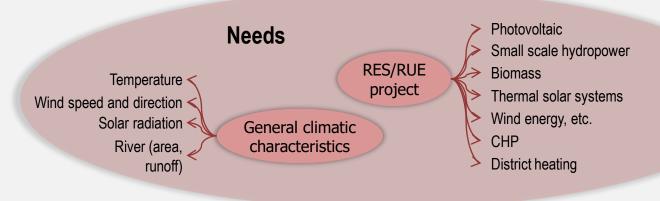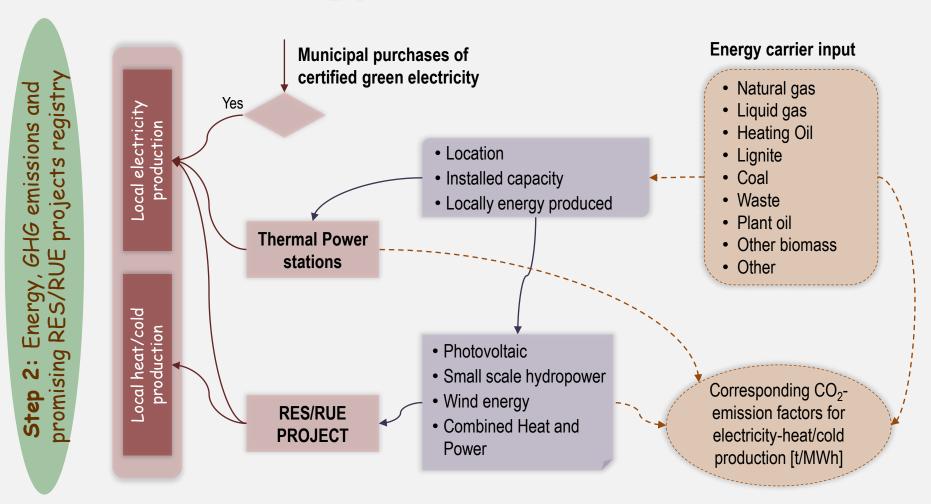# C. Methodology (3/8)

Step 1: Mapping the rural community's characteristics and needs

Characteristics

Population statistics

Household statistics

Total land area
Woodlands
Built-on areas
Cultivated land, etc.

Land use statistics

Wastewater treatment and waste management facilities

Recycling
Composting
Biogas
Incineration
Landfill

Needs

Temperature
Wind speed and direction
Solar radiation
River (area, runoff)

General climatic characteristics

RES/RUE project

Photovoltaic
Small scale hydropower
Biomass
Thermal solar systems
Wind energy, etc.
CHP
District heating

C. Methodology (4/8)

C. Methodology (5/8)

Step 3: Developing energy & GHG emissions baselines

Alternative methods for the calculation of final energy consumption

Emission Baseline Inventory

Total Energy Consumption — Aggregated Data

Prefecture Level Data — Population or Vehicle Ratio

Bottom Up Approach — Energy calculations with the use of specific energy indicators (kwh/m^2)

Combination of "Bottom Up" Approach and Prefecture level data — Prefecture energy consumption data and use of energy indicators

Final Energy Consumption

CO_2 Emission Factors

- Electricity
- Heat/Cold
- Natural Gas (0,202 tCO_2/MWh)
- Liquid Gas (0,227-0,231 tCO_2/MWh)
- Heating Oil (0,267 tCO_2/MWh)
- Diesel (0,267 tCO_2/MWh)
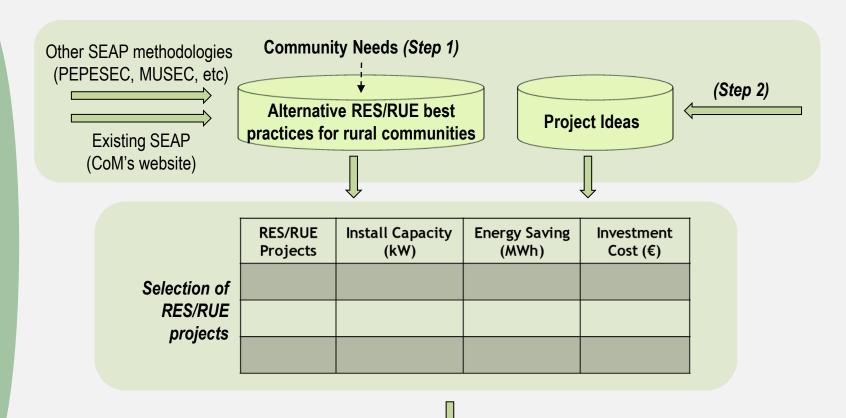- Gasoline (0,249 tCO_2/MWh)
- Biomass (0,4 tCO_2/MWh), etc.

C. Methodology (6/8)

Step 4: RES/RUE priorities' identification

Other SEAP methodologies (PEPESEC, MUSEC, etc)

Existing SEAP (CoM's website)

Community Needs *(Step 1)*

Alternative RES/RUE best practices for rural communities

Project Ideas

(Step 2)

Selection of RES/RUE projects

	RES/RUE Projects	Install Capacity (kW)	Energy Saving (MWh)	Investment Cost (€)

Quantitative Objective

20 % CO_2 emissions reduction

Energy Vision

C. Methodology (7/8)

Step 5: Scenario analysis

(Step 4)

Selected RES/RUE actions

Creation of scenarios

Projections

Business as usual | Optimistic | Pessimistic

Aspiration level

Filtering (CO_2 emissions reduction >20% $\Rightarrow$ 2020)

- Population growth
- Per capita GDP
- Heating and cooling degree days
- Rates of electricity and fuels prices

No — **Step 4 (*Selection of RES/RUE projects*)**

Yes

Financing mechanisms (e.g. loans, subsidies, third party financing)

NPV, IRR, DBP

Evaluation

No — **Step 4 (*Selection of RES/RUE projects*)**

Yes

Final List of RES/RUE projects at local/regional level

C. Methodology (8/8)

D. Web Application (1/3)

The Web Tool

Web Tools

Instructions

- Complete the following actions in any order.
- You can edit any action at any time, if you wish to change something.
- You can see the results in the Review tab.

Action 1	Mapping the rural community's characteristics and needs.	Edit	Review
Action 2	Energy, GHG Emissions and Promising RES/RUE projects registry	Edit	Review
Action 3	Developing Energy and GHG emissions baselines	Edit	Review
Action 4	Stakeholders' engagement in the decision making process and RES/RUE priorities' identification	Edit	Review
Action 5	Scenario analysis and identification of bankable Res/Rue options	Edit	Review
Action 6	Monitoring	Edit	Review

http://erenet-tools.epu.ntua.gr/

D. Web Application (2/3)

D. Web Application (3/3)

E. Conclusions

⮕ Customization of existing methodologies and tools, in order to fit rural municipalities' characteristics

⮕ Implementation under web environment can make the difference for the interested stakeholders who are not "experts" in the field, saving resources and time.

⮕ Decision Support Systems & Integrated Information System ⇒ Support of decision makers & promotion of regional development

Thank you for your attention!

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