ENVIRONMENTAL INDICATORS & GIS IN THE ENERSCAPES PROJECT
THE CASE OF TUSCIA ROMANA

Workshop on Life Cycle Assessment
and GIS Tools for Energy planning (TW3-TW4)

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ENERSCAPES: OBJECTIVES AND OUTPUTS

The ENERSCAPES project is designed to:

1. Define an environmental assessment methodology for RES plants.
2. Identify and assess scenarios for RES development.
3. Serve as a basis to define country-specific action plans.
4. Address policy makers.
5. Ensure coherence between energy programmes and landscape/heritage protection.
6. Ensure proper localisation of energy plants.

These ecological perspectives are intended to affect Mediterranean landscape patterns.
A: Setting the context and establishing the baseline

- Context Analysis
- Recognition of landscapes assets and values
- Sensitivity evaluation and definition of Landscape Quality Objectives

B. Scenario Analysis

- Identifying/evaluating alternative scenarios:
  1. Priority to Landscape
  2. Balance between Landscape & RES, emphasis on Landscape
  3. Balance between RES & Landscape, emphasis on RES
  4. Priority to RES
- Consulting Authorities with environmental responsibilities

C: Assessing the effects of the plan
PROJECT APPROACH
SCENARIOS

Scenarios are **projections on the hypothetical future development of a given situation**, built starting from the analysis of the current situation and of the existing factors (drivers). Different scenarios can be outlined according to how these factors mutually interact and gain or lose importance in the future.
ENVIRONMENTAL INDICATORS

- CO2 emissions reduction
- Large RES plants
- Small RES plants
- Employment in RES sector
- Rural/cultural landscape
- Urban landscape
- Quality agriculture
- Functional mix of farms
- Rural/nature tourism
- Urban sprawl
- Biodiversity and ecological networks

11 indicators
• High degree of landscape protection
• Low development of RES, low degree of employment in this sector
• Little problems related to land consumption
• Biodiversity and quality agriculture are preserved with a positive influence on related tourism
Focus on Scenario 4:
- The development of RES is fostered, generating employment in the sector
- Reduction in CO2 emissions
- Functional mix of farms
- Maximised land consumption
- Deterioration of landscape negatively affects quality agriculture and tourism
PILOT EXPERIENCE: TUSCIA ROMANA

- Environmental restrictions can prevent installation of types of RES.
- Tuscia Romana is prone to include partner countries/regions.
- Pilot actions were carried out in.
- ENERSCAPES project defined environmental assessment methodology for RES plants.
- Identifies and assesses scenarios for RES development.
- Resilience and sustainability are described and assessed for.
TERRITORIAL FRAMEWORK

- 13 Municipalities
- Provinces of Rome and Viterbo (Lazio Region)
ENVIRONMENTAL FEATURES

- Parks and Protected Areas
- SCIs (Sites of Community Importance) / SPAs (Special Protection Areas) / RAMSAR
- Woodlands
- Hydrographic network - basins, lakes, etc.
- Hydrographic network - rivers, canals, etc.
- Areas of high agricultural value
- Elements of geomorphological interest
FOCUS ON WIND ENERGY

environmental restrictions is prone to Tuscia Romana include partner countries/regions were carried out in Pilot actions was tested through environmental assessment methodology for RES plants identifies and assesses

can prevent installation of
types of RES include are described and assessed for
wind power plants can be developed according to are specified into Scenarios for RES development

Wind energy development Scenarios to 2021
**WIND ENERGY DEVELOPMENT SCENARIOS**

- **Baseline Scenario:** no development of wind energy
- **Scenario 1:** small number of wind generators <20 kW in unconstrained rural/urban areas, ground-based or on rooftops
- **Scenario 2:** micro wind generators <2 kW even in constrained areas
- **Scenario 3:** generators <20 kW even in constrained areas
- **Scenario 4:** large 50 MW plants in agricultural areas

<table>
<thead>
<tr>
<th>Scenarios to 2021</th>
<th>Baseline Scenario</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
<th>Scenario 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total installed power in the area, 2021</td>
<td>0 MW</td>
<td>0.57 MW</td>
<td>4.55 MW</td>
<td>13.95 MW</td>
<td>113.95 MW</td>
</tr>
<tr>
<td>Installed power per inhabitant in the area in 2021</td>
<td>0 kW/inh.</td>
<td>0.007 kW/inh.</td>
<td>0.05 kW/inh.</td>
<td>0.16 kW/inh.</td>
<td>1.3 kW/inh.</td>
</tr>
</tbody>
</table>
WIND ENERGY – SCENARIO 4

Yearly average wind speed at 100 m above ground

Overlay of non-irrigated arable areas over yearly average wind speed at 100 m above ground

Wind energy development Scenarios to 2021

- envisage also
- large wind turbines
- can be installed in
- areas with high wind speed
- are displayed in
- wind speed maps
- can overlap/combine
- GIS
- help identify
- suitable wind power plants installation areas

- non-irrigated arable areas
- are displayed in
- land use maps
- are not considered
- valuable rural landscape

Malta Intelligent Energy Management Agency
WIND ENERGY – SCENARIO 4

Identification of the **most suitable areas** for the installation of wind power plants:
Non irrigated arable land with highest wind speed
THANK YOU

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