

Pilot experiences: Presentation of Final Scenario and Draft of Action

**Agriculture, Fisheries and Environment Regional Ministry, Andalusia
Enerscapes Meeting**

**19th and 21th of June 2012
Moravske toplice, Slovenia.**

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1. **SCENARIOS**
2. **CHOSEN SCENARIO**
3. **DRAFT OF ACTION PLAN**





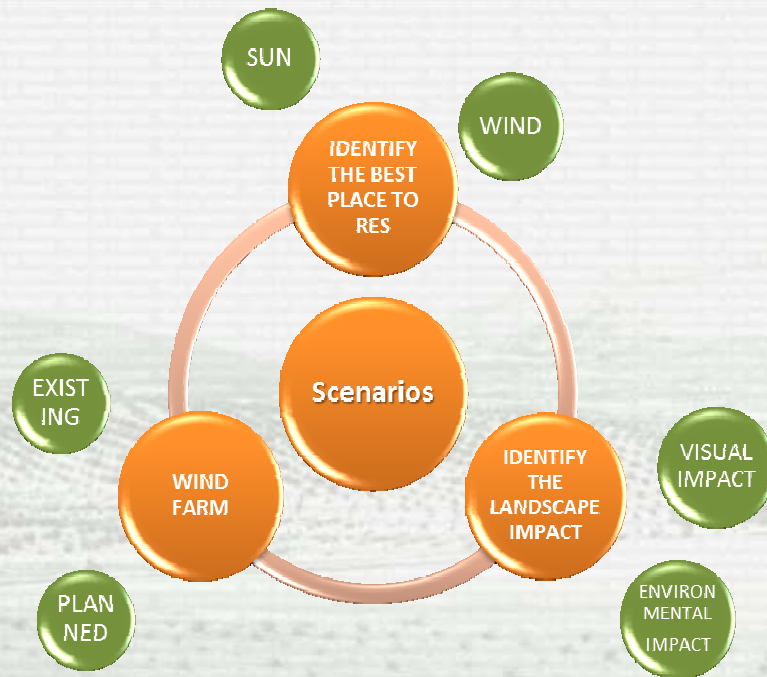
Scenarios – METHODOLOGY

Our pilot area is different to the other partners' pilot areas because it holds a very strong exploitation of RES (wind park).

Our scenarios' **stages**:

1. **To calculate the optimal locations.** We calculate the most favourable RES locations, based on the priority given to RES or on landscape's conservation. **We calculate the environmental impact and the visual impact: the sum of both is called "landscape impact"**. The landscape impact is calculated based on different kind of facilities, on height: 0m (like PV plant, biomass or geothermal facilities), 60m (like thermal tower or small wind farm) and 120m (like modern wind farm).
2. To reorder, where appropriate, existing wind farm impact (for "attention to landscape" and "priority to landscape").

Scenarios – METHODOLOGY



The scenarios are shaped by identifying:

- 1) The most favorable locations for the use of the more abundant natural energy resources in the area (wind and sun),
- 2) Places occupied by renewable energy installations that would present a minor impact on the landscape.

Finally, 3) Places of the existing wind farms and where five wind farms will be built shortly.

To generate the scenarios, we consider the following elements:

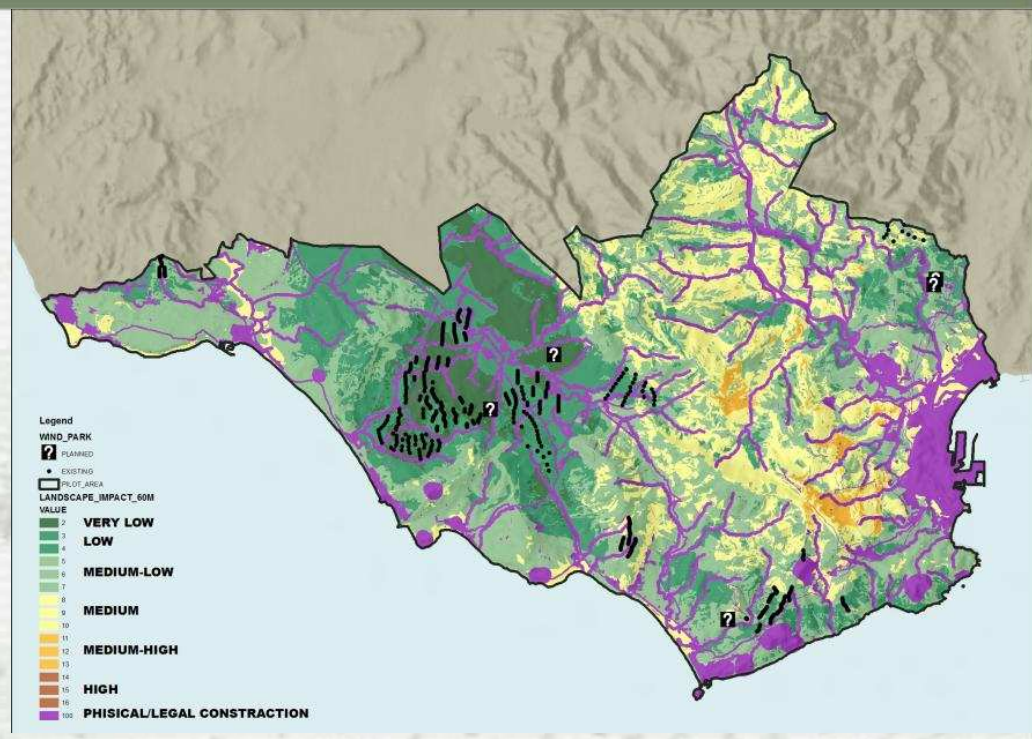
- Wind and sun potential
- Landscape impact, that is comprised by the visual impact and the environmental impact.
- Existing and projected wind farms' location.



Scenario 0. «AS USUAL»

The **CERO** scenario proposes a planning development, “as usual”. We calculated the current landscape impact for the existing wind farm and the future landscape impact for the five new wind farm planned.

Capacity of RES installed (kW)	667,53 MW
Assessment of Res energy production (MWh/yr)	1.768.000 MWh/yr (estimated annual production).
Objective of energy production by 2020	378.517,65
Part of Res potential covered	101%
Part of ground areas (% of m ²) covered with RES plants	6.175.101 m ²
Part (% of m ²) of buildings (included protected) covered by RES plants	0
Part (% of m ²) of protected areas covered by RES plants	1.553.815 m ²
Strengths	Large RES energy production. Employment
Weaknesses	Landscape impact. RES saturation. Unplanned

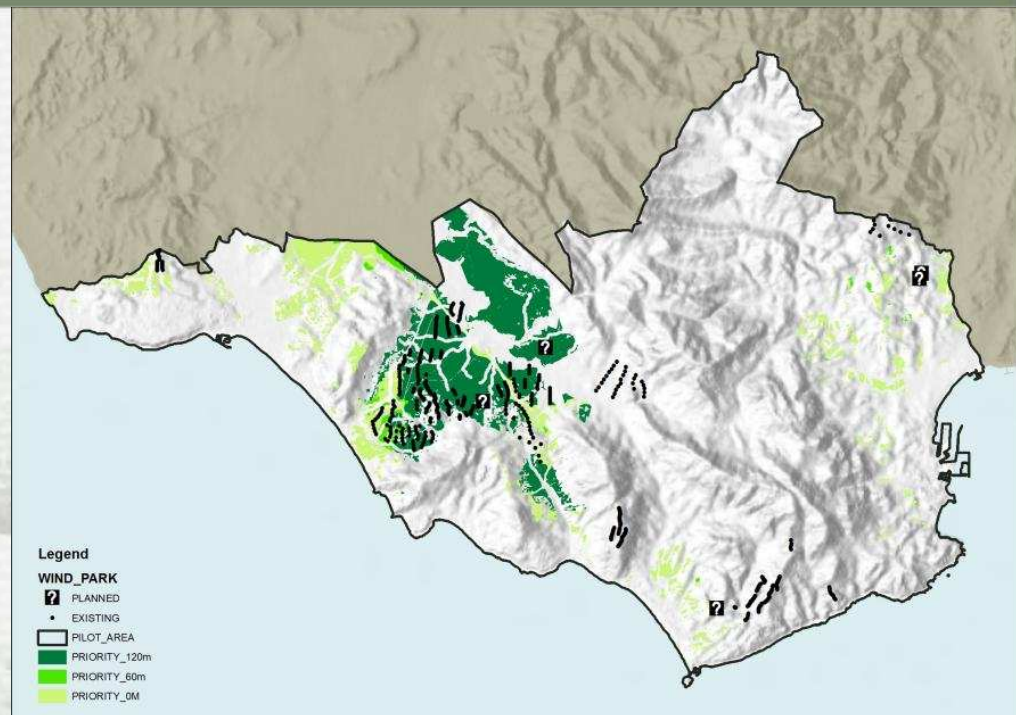




Scenario 1. PRIORITY TO LANDSCAPE

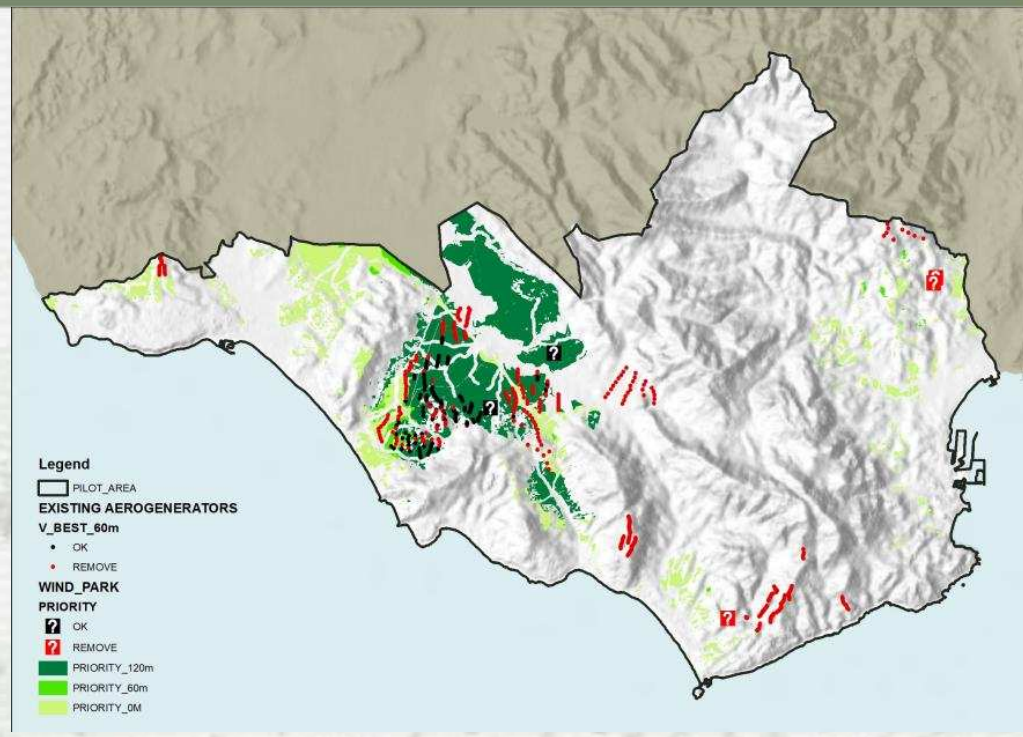


The **FIRST** scenario proposes a development of the pilot area based on the rational reorganization of the existing and planned wind farms, to minimize the landscape impact. First, we identify those areas with **VERY LOW** landscape impact and secondly, we **remove** the existing or planned wind farm outside these areas (not renewing the license). Consequently, in 5/10 years, in this scenario framework the current production of RES will **decrease**.



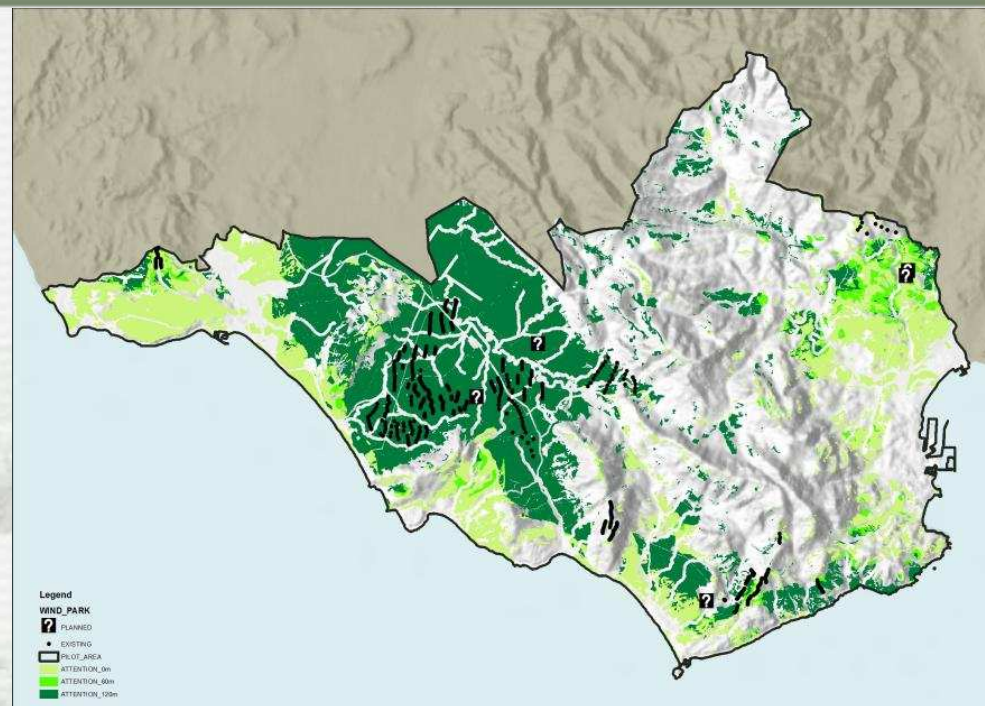
Scenario 1. PRIORITY TO LANDSCAPE

Capacity of RES installed (kW)	153,53 MW
Assessment of Res energy production (MWh/yr)	406,640 (estimated annual production).
Objective of energy production by 2020	378.517,65
Part of Res potential covered	23-24%
Part of ground areas (% of m ²) covered with RES plants	1,420,273 m ²
Part (% of m ²) of buildings (included protected) covered by RES plants	0
Part (% of m ²) of protected areas covered by RES plants	357,377 m ²
Strengths	Landscape impact decreases and increases the quality of life for the inhabitants. Possible positive effects in others productive sectors (like tourism).
Weaknesses	RES production and employment decreases



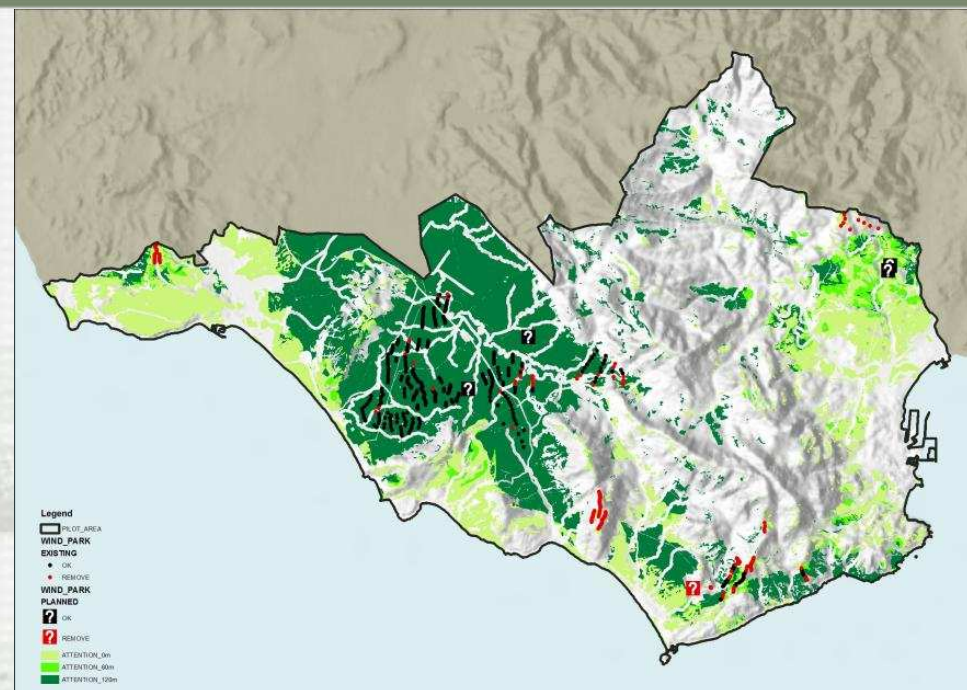
Scenario 2. ATTENTION TO LANDSCAPE

For the **SECOND** scenario we use the same methodology already used in the previous scenario, but identifying those areas of **LOW** landscape impact. We **remove** the existing or planned wind farms outside these areas (not renovating the license). Also, in 5/10 years the current production of RES will decrease, but less than in the first scenario.



Scenario 2. ATTENTION TO LANDSCAPE

Capacity of RES installed (kW)	532,33 MW (-135.2 MW)
Assessment of Res energy production (MWh/yr)	1.456.771 MWh/yr (estimated annual production).
Objective of energy production by 2020	378.517,65 MWh/yr
Part of Res potential covered	82.40%
Part of ground areas (% of m²) covered with RES plants	5.088.283 m²
Part (% of m²) of buildings (included protected) covered by RES plants	0
Part (% of m²) of protected areas covered by RES plants	1.209.485 m²
Strengths	Slight decrease of landscape impact. Slight potential positive effect in others productive sectors (like tourism).
Weaknesses	RES production and employment decrease





Scenario 3. ATTENTION TO RES.

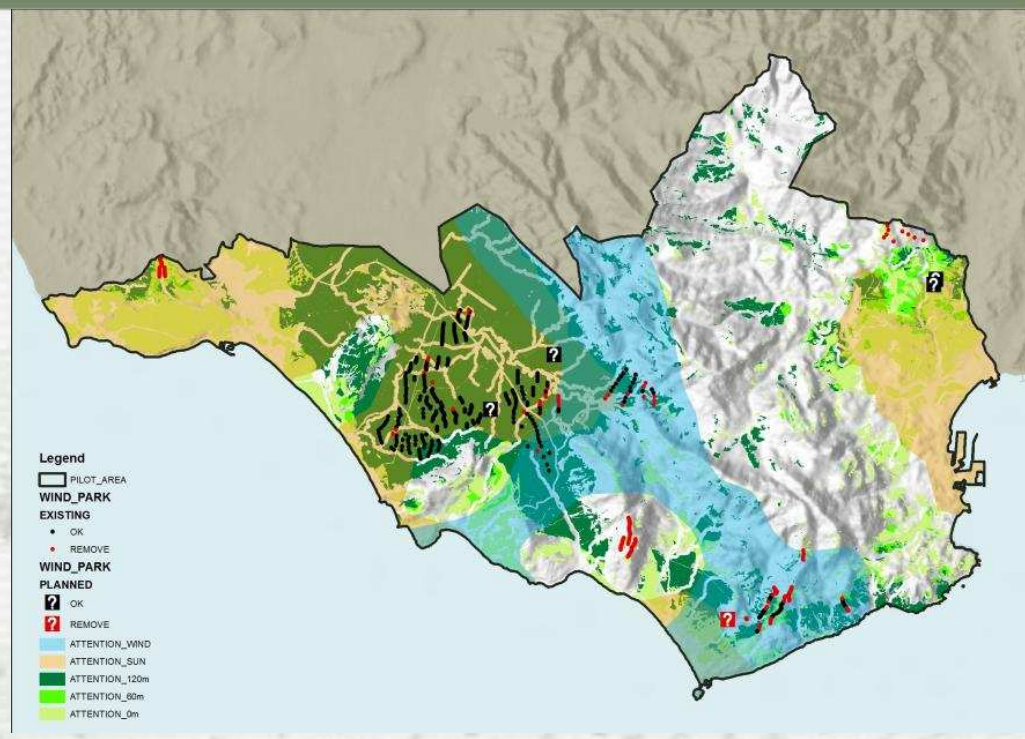
For the **third** scenario we identified: at first, the areas with high energy potential (solar and wind) and secondly, the low landscape impact areas.

We propose the **relocation** of existing or planned aero generators that are outside the low landscape impact areas, **(or their replacement by PV/solar thermal RES)** in the areas where **converge** the low landscape impact and the high solar or wind potential.

So, the currently installed power would be the same (or higher, if the enterprise decide to repowering the aero generators taking advantage of their displacement), but the landscape impact is fewer.



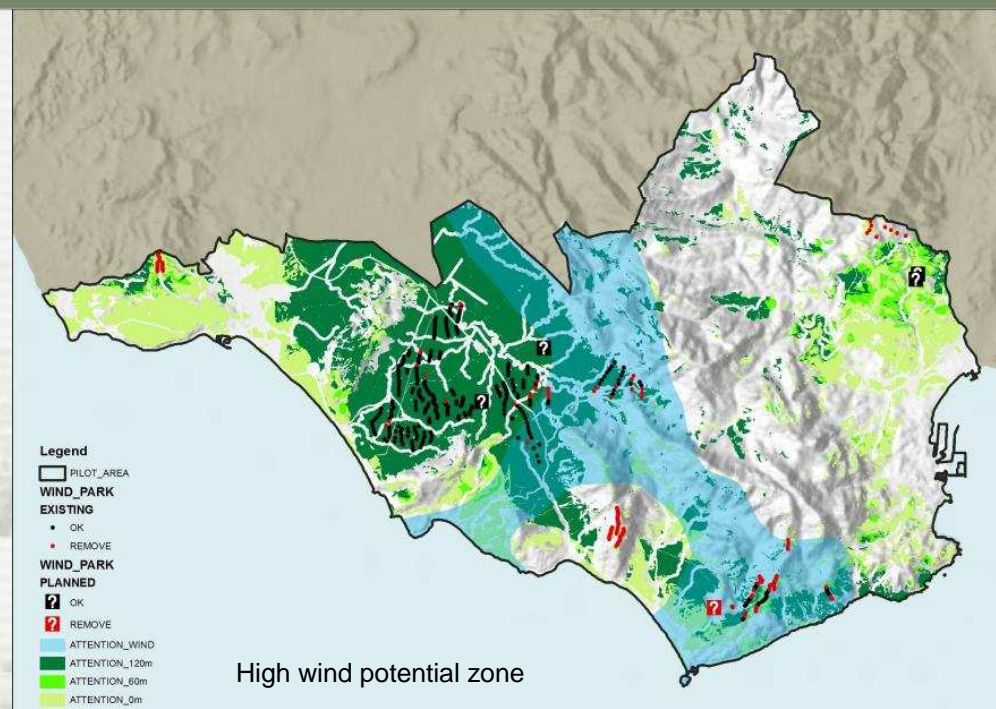
The chosen scenario



Scenario 3. ATTENTION TO RES.

The chosen scenario

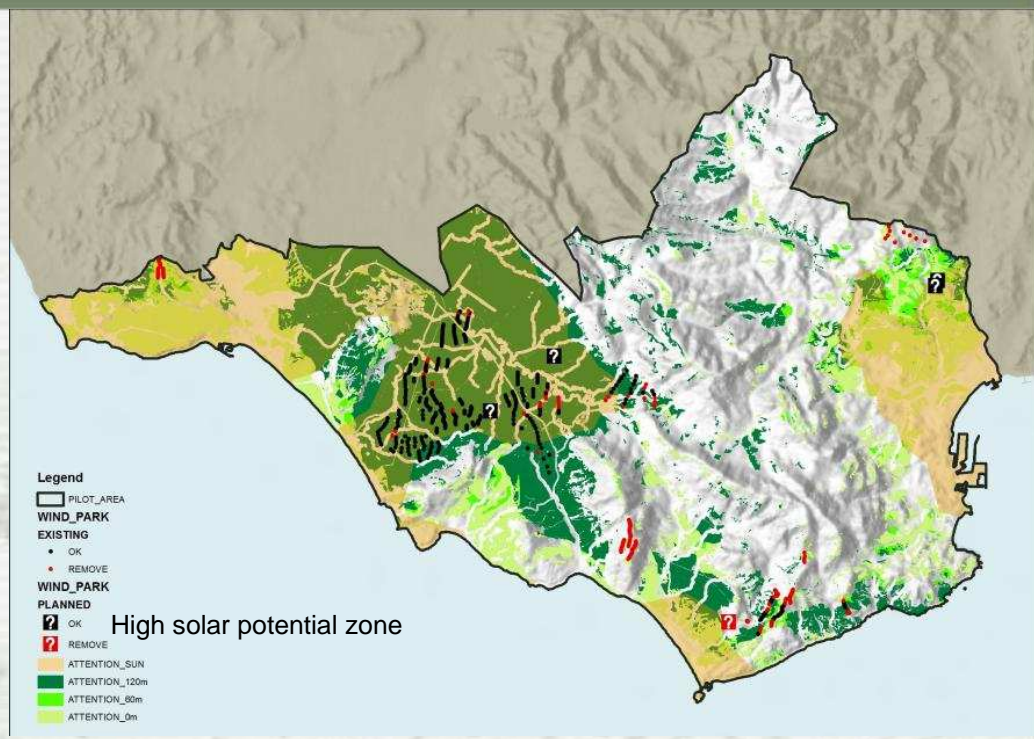
Capacity of RES installed (kW)	667,53 MW
Assessment of Res energy production (MWh/yr)	1.944.800 MWh/yr (estimated annual production).
Objective of energy production by 2020	378.517,65 MWh/yr (20% of pilot area's estimated annual electrical consumption in 2020: 1892588,26 MWh/yr).
Part of Res potential covered	103% (estimated annual electrical consumption in 2020: 1.752.583,14 MWh/yr).
Part of ground areas (% of m²) covered with RES plants	6.175.101 m²
Part (% of m²) of buildings (included protected) covered by RES plants	0
Part (% of m²) of protected areas covered by RES plants	Between 619.589 / 1.553.815 m²
Strengths	Some improvement RES and employment level Slight decreases of landscape impact. Slight potential positive effect on others productive sectors (like tourism).
Weaknesses	Low landscape improvement





Scenario 3. ATTENTION TO RES. *The chosen scenario*

Capacity of RES installed (kW)	667,53 MW
Assessment of Res energy production (MWh/yr)	1.944.800 MWh/yr (estimated annual production).
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Strengths	Some improvement of RES and employment level Slight decreases of landscape impact. Slight potential positive effect on others productive sectors (like tourism).
Weaknesses	Low landscape improvement





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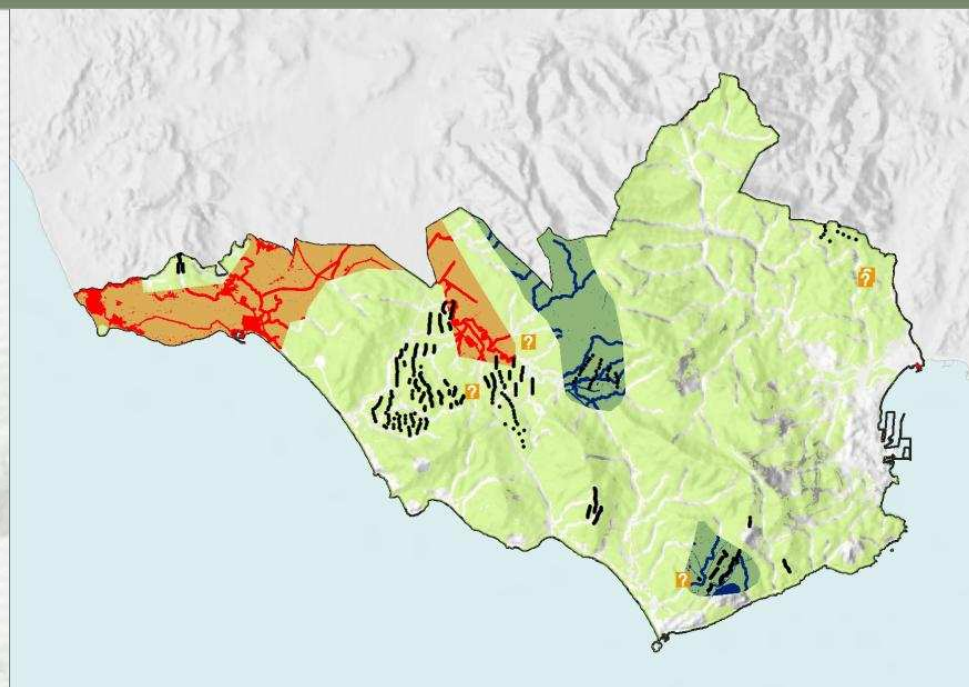
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Scenario 4. PRIORITY TO RES



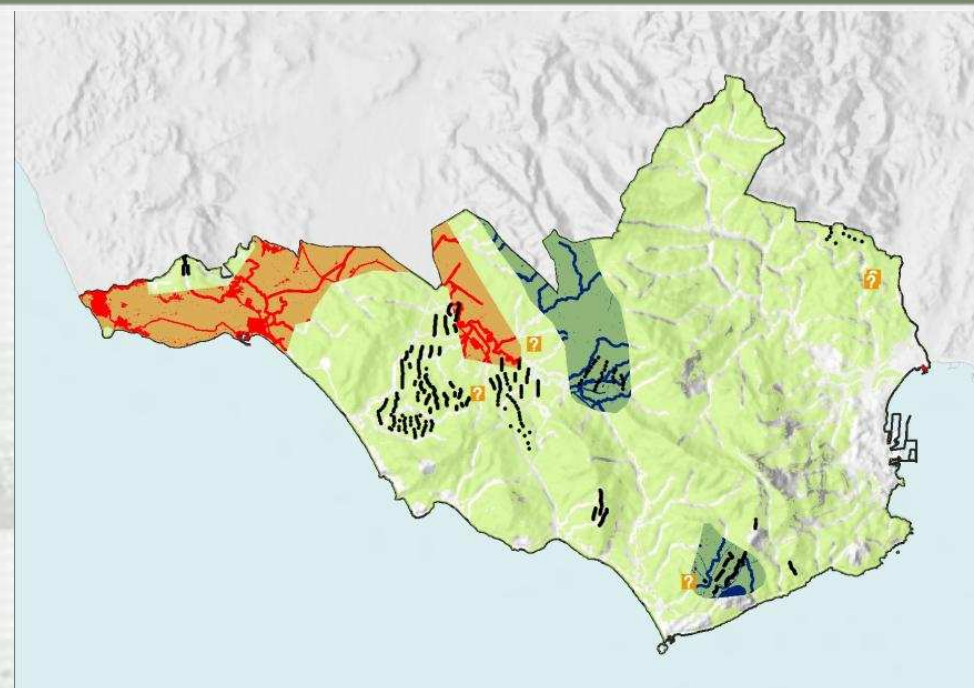
This scenario proposes the very best location for RES facilities, with a medium landscape impact. And we add + 10% of current RES production.



Scenario 4. PRIORITY TO RES



Capacity of RES installed (kW)	734,28 MW
Assessment of Res energy production (MWh/yr)	1.944.800 MWh/yr (estimated annual production).
Objective of energy production by 2020	378.517,65 MWh/yr (20% of pilot area's estimated annual electrical consumption in 2020: 1892588,26 MWh/yr).
Part of Res potential covered	103%(estimated annual electrical consumption in 2020: 1.752.583,14 MWh/yr).
Part of ground areas (% of m²) covered with RES plants	6.175.101 m² / 6.792.611 m²
Part (% of m²) of buildings (included protected) covered by RES plants	0
Part (% of m²) of protected areas covered by RES plants	619.589 / 1.553.815 m² or more
Strengths	Increase RES production and employment
Weaknesses	Increase of landscape impact and decrease of inhabitants' quality of life. Decrease of the potential negative effects in others productive sectors (like tourism).



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Chosen scenario: ATTENTION TO RES

The most important characteristic of this scenario is its **sustainability**, reconciles the “energy” uses with the other economic resource of the pilot area: the tourism.

The main **difficulties** are:

- to provide the financial incentive for the relocation of wind turbines in the action plan
- to provide a new authorisation procedure in the action plan to prevent the placement of wind parks in areas with high landscape impact
- to provide the action plan with a new instrument that authorises and justifies the non-renewal of licenses for those wind parks outside the low landscape impact areas.

To achieve the effective efficiency of the plan, it is very important to:

- Adopting the “sub-regional development plan of La Janda”.
- Its claim by local authorities and populations.





Chosen scenario: ATTENTION TO RES

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Córdoba. Technician's meeting about enerscapes project (11 June 2012).
Next meeting: 22 of June, 2012).



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Action plan. Guiding Principles.

Governance: in contrast to the traditional position that implies that decisions about public affairs can be taken unilaterally and hierarchically, governance is a new style of government that might be called "networked government" and focuses on collective action.

Sustainable development: the concept of sustainable development has a component of intergenerational solidarity and integrates the three dimensions of sustainability: environmental, social and economy. In landscape terms the sustainable development is expressed in the sustainable use of resources, maintenance of ecosystem functioning, in avoiding fragmentation, in maintaining the diversity and beauty and in preserving their peculiarities, guiding its development and respecting the sense of belonging of the population.

Subsidiarity: principle widely adopted in policy, for example, of the European Union, where decisions should be taken as close as possible to the citizens and that determinates the central authority (or highest rank) to intervene only when the problem can not be solved efficiently at the local level.

Prevention and precaution: a proactive approach to a reagent which acts once the problem appears

Ecological integrity: the most comprehensive and inclusive of the concepts that informs about the level of ecosystems' conservation. In this approach, landscape management should be prioritised to maintain the territorial integrity and the functional integrity of biotic, abiotic and human elements, from a global perspective.

Actions connected with legislative frame

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Zoning regulations	Establishment of: -Wind Zones Exclusion, which prohibits the installation of renewable energy -Conditional zones, in each case we will analyse the compatibility of these facilities with environmental and landscape values -Areas without specific conditions, land suitable for RES. -Preferred areas of renewable energy, particularly suitable land for the installation of RES, by type.	Spatial planning of energy resources	Municipalities and regional government	Municipalities	6 month
Planned Sectorial Schemes (PSS)	The PSS define the location of wind parks and their infrastructure in a area of the action plan by: -Determination of "Programming sectors ", which are continuous and coherent zones with wind potential > = to 50MW, and common infrastructure evacuation of at least 80% of generated power. -Landscape impact assessment (environmental + visual) with the identification of high / medium and low impact area's. -Study of the main landscape resources (natural, cultural and scenic) -Type of construction of the RES facilities for better landscape integration	Defines a new and coherent authorisation procedure system.	Municipalities	Energy enterprises	Always
Economic incentives	To provide the action plan of the financial incentive for the relocation of wind turbines	Reducing the landscape impact on the through the reordering of existing facilities.	Regional ministry	Promoters, renewable energy enterprises	Always. To be created in 6 months max.
Authorisation procedure	Will not renew operating licenses for those RES facilities with medium / medium high and high landscape impact and for those RES facilities with legal constriction's zone.	Reducing the current landscape impact	Regional ministry	Municipalities	Always. To be created in 6 months max.

Actions connected with communication

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Information on the existence of the action plan	Local press releases about the enerscapes' project and action plan. Municipalities and county council's webs Advertising on the municipality's boards	information	Regional ministry and municipalities	inhabitants	6 mounth
Information about the creation of the monitoring committee	Local press releases about the enerscapes' project and action plan. Municipalities and county council's webs	information	Regional ministry and municipalities	inhabitants	6 mounth
Landscape awareness plan	Deepening in the landscape's concept and in the need for its management and planning. Improving the knowledge on local landscapes and their values. Convey the concept of landscape as an economic resource.	information	Regional ministry and municipalities	inhabitants	Always
Awareness campaign: Costs and energy savings.	Campaign to raise awareness of energy waste and energy saving measures at home, energy efficient buildings, energy efficient appliances. Promotion of the consumption of products and services with high energy rating.	Creation of a collective awareness against the energy issue and climate change.	Regional ministry and municipalities	inhabitants	Always

Actions connected with local governance

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Inter-administrative coordination	Coordination between the management bodies of territorial, sectoral and urban planning, in regional, provincial, inter-municipal and municipal scale.	Greater administrative coordination will improve the protection of the territory and facilitate and expedite the creation of new RES facilities	Regional ministry	Junta de Andalucía, delegaciones provinciales, órganos gestores de los parques naturales, diputaciones provinciales y ayuntamientos.	Always
Coordination between territorial instruments	Coordination between the Action Plan and the sub-regional development territorial plans of "Janda" and of "Campo de Gibraltar"	Coordination in territorial planning	Regional ministry	Departments of Regional ministry	Always
Commission to monitor the management of renewable energy resources of the Strait of Gibraltar	Creating a non-binding advisory body whose membership would be voluntary, that is consulted by government when they have new projects for renewable energy installations. This body shall be constituted by the social actors involved in land management.	It will allow social consensus on new RES projects, like a required tool for citizen participation.	County Council and chairman of the committee (elected).	Associations and NGOs in defense of territory or historical heritage, farmers' associations, tourism promoters, etc.	Always. To be created in 6 months max.
To promote the recovery and to improve the natural landscape and the cultural heritage local resources.	Actions to restore natural and cultural landscape resources, visual decontamination and enhancement of resources like tourism by requiring landscape criteria in urban planning.	Improvement of local landscape resources and his management	Municipalities	Municipalities	Always

Technical actions: KNOWLEDGE

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Detailed study on birds	Research project on local birds, migration, impact on birds of existing wind farms, etc..	Improved knowledge about wildlife impact.	«Migres» fundation Regional ministry	Technicians	1 year
Detailed study of renewable resources	Research project on the local energy potential : detailed wind map, detailed insolation map, predictive maps, etc.).	Improved knowledge of local RES	Agriculture, Fisheries and Environment Regional Ministry Andalusian Energy Agency	Technicians	1 year
Detailed studies of local landscape	Research project on the local landscape: identification, characterisation, qualification and evaluation.	Improved knowledge of local landscape	Agriculture, Fisheries and Environment Regional Ministry	Technicians	1 year
Detailed study on the social perception of existing wind farms	Research project about the degree of acceptance / rejection of each existing wind farms.	Improved knowledge about social perceptions	Andalusian Institute of Social Studies	Technicians	1 year
Guide of landscape impact assessment and integration of renewable energy facilities	Digital publication of a guide	Possible improvement of existing RES' facilities	Agriculture, Fisheries and Environment Regional Ministry	Technicians	1 year
Manual of good practices on landscape integration of renewable energy facilities	Digital publication of a manual	Possible improvement of existing RES' facilities	Agriculture, Fisheries and Environment Regional Ministry	Technicians	1 year
Research on wind energy utilisation	Experimental plant "Tarifa" R & D on wind energy. Experimental plant for the development and technological improvement of wind turbines, including offshore technology. In collaboration / coordination with the Advanced Technology Centre of Renewable Energies.	Improving the efficiency of wind turbines	Higher Council for Scientific Research Andalusian Energy Agency Advanced Technology Centre of Renewable Energies.	Technicians	All time

Technical actions: MANAGEMENT

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Reorganisation and improvement of the efficiency of the existing electricity grid and other infrastructure services for wind farms.	Plan to reorganize the lines of high, medium and low voltage connecting wind farms with electrical grid. Improving the efficiency of the existing electrical grid.	Reduction of existing landscape impact, improving energy efficiency	Regional ministry	Technicians	2 year
Reordering of existing wind farms, as chosen scenario	Reordering of existing wind turbines. Not to renew operating licenses for those RES facilities with medium / medium high and high landscape impact and for those RES facilities with legal constrictions zone. It will enable their relocation to areas of greatest wind potential.	Reduction of existing landscape impact	Regional ministry	Technicians	5/10/20 year
Qualifying landscapes associated with the production of wind energy ("energy landscape")	Development of guidelines and criteria for integration of existing infrastructure into the landscape. Actions to restore and to promote landscape integration of existing wind farms.	Reduction of existing landscape impact	Regional ministry	Technicians	5 year

Technical actions: MANAGEMENT and MONITORING

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
To encourage the installation of PV plant in business and industry concentrations zone.	Promote the provision of electricity by the PV plant in industrial and business areas.	Increased RES production, low-impact in the landscape	Regional ministry	Owners	Always
To promote energy efficiency criteria and to use renewable energy in agriculture.	This measure aims to promote the replacement of agricultural machinery with in more efficient manner. The promotion of more energy efficient building systems in greenhouse agriculture and the development of energy programs to modernise the irrigation systems. It will promote the use of biofuels in tractors and agricultural machines, as well as conducting energy audits of existing irrigation facilities.	Rational use of energy	Regional ministry	Owners	Always
Encourage the installation of photovoltaic solar energy in remote areas.	This measure aims to use solar energy for homes that are faraway of the electrical grid, with particular attention to the Rural Settlements.	Rational use of energy	Regional ministry	Owners	Always
NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Monitoring	Continuous Environmental and landscape assessment, using the indicators of the action plan. Maintenance of the geodatabase generated.	Monitoring	Municipalities and Agriculture, Fisheries and Environment Regional Ministry	Technicians	Always
Scientific Support	Accompanying the municipalities responsible for the Action Plan by specialists of the Andalusian regional ministry	Monitoring	Agriculture, Fisheries and Environment Regional Ministry	Technicians	Always

Educational actions

NAME	DESCRIPTION	ASSESSMENT IMPACT RES/LANDSCAPE	RESPONSIBLE	TARGET GROUP	DEADLINE
Primary and secondary education	Creation of educational materials for primary and secondary school. Photo Contest.	Local social benefits.	regional ministry	Local students	Always. To be created in in 1 year max.
University education	Summer schools and university specialisation courses. Technical seminars and conferences.	Economic profits and local social benefits.	Andalusian Universities.	University students.	Always. To be created in in 1 year max.
Specific professional training.	Courses, technical seminars, lectures for experts on energy: wind farms, solar farms and thermosolar, with the aim that local people could benefit from the jobs generated by the facility, being able to respond to local demand in different sectors.	Economic profits and local social benefits.	Municipalities, businesses, Commerce Chambers, regional ministry	Local people	Always. To be created in in 1 year max.
Specific business training.	Program and training courses targeting business people, especially young people, for the creation of companies in the energy sector. To favour the exchange of knowledge and technological transference.	Local economic profits.	Municipalities, businesses, Commerce Chambers.	Local people	Always. To be created in in 1 year max.
Training companies in the field of renewable energy and energy saving.	The measure provides the development of specific programs to train experts in the field of energy management, responsible for the implementation of management plans for energy in the large energy consumers centres.	Energy expenditure management.	Municipalities, businesses, Commerce Chambers.	Local people	Always. To be created in in 1 year max.
Awareness campaign for farmers.	A campaigns will be carried out to train farmers in the efficient use of energy (cultivation techniques, efficiency improvement of machinery, efficient use of water, etc.) and the opportunity of renewable energies in the sector.	Energy expenditure management.	Municipalities, regional ministry	Local farmers.	Always. To be created in in 1 year max.