

Tools and criteria for the assessment of landscape impact in the Guide for Landscape Integration of Andalusian Wind Parks



Energy Landscape

Perception, Planning, Participation and Power
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Andalusian Landscape Integration Guidelines for Wind Farms

Overarching aim: to contribute to the development of methods, tools and instructions, available to both developers and administrators, that make possible the design and appraisal of sustainable energy plants with minimal landscape impact



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REDIAM

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Landscapes and impacts

Mitigation criteria

Optimal location

Morphology



Institutional framework



REDIAM (Environment Information Network of Andalusia):

Its overarching goal is the integration of all the information in written, graphic or any other form regarding the Andalusian environment, including its landscape, generated by all the dedicated centres in the region



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SCIPA (Shared Landscape Information System of Andalusia):

Aims to make possible the implementation, evaluation and monitoring of the Andalusian Landscape Strategy and, in general, all interventions affecting landscape.

It covers three theme areas:

1 KNOWLEDGE AND MONITORING	2 PLANNING AND MANAGEMENT	3 AWARENESS-RAISING AND DISSEMINATION
MAPA, CATÁLOGOS E INVENTARIOS	REGULATORY FRAMEWORK	AWARENESS
Landscape Map Landscape inventory: sierra morona andaluzá Landscape inventory: litoral Landscape inventory: arco atlántico Landscape catalogue: Seville Landscape catalogue: Granada Landscape catalogue: Málaga	Specific regulatory framework Related regulatory framework	Publications Cartography viewers Audiovisual
VISIBILITY SYSTEM	PAISAJE y PLANIFICACIÓN	USE AND ENJOYMENT
Methodology Database Visual characterization of Andalusia	territorial planning Urban planning	Public facilities Itineraries
OBSERVATORIO	GUÍAS y MANUALES	
Landscape image-bank Interprinted images	Natural landscape Agricultural landscapes Urban landscape Cultural landscapes River landscapes Landscape and infrastructure Landscape and renewable energy	
DINAMICAS Y SEGUIMIENTO	GOOD PRACTICES	
Landscape indicators Landscape and climate change Social perception	Mediterranean landscape award Other	

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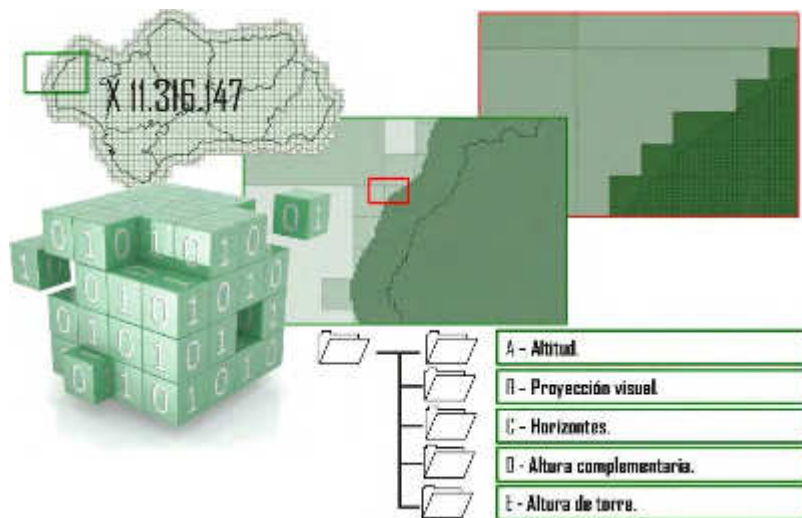


Institutional framework

SVA (Visibility System of Andalusia):

An information system encompassing data and methods, amounting to a fully-calculated visibility model of all of the Andalusian territory.

The most outstanding benefits of the SVA comes from its strategic approach. It provides a dataset that covers the necessary evaluation criteria for visual impact from the outset.



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Establishing and characterising visual impact

Landscape character:

A particular ensemble or a combination of elements, which is consistent and recognisable as part of a given landscape, rendering it different from others.

Landscape resilience:

A landscape's capacity to adapt when subjected to external disturbances

Landscape impact:

Any disruption of landscapes due to natural processes or human action



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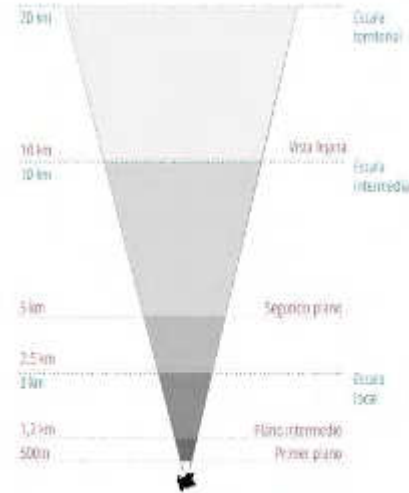
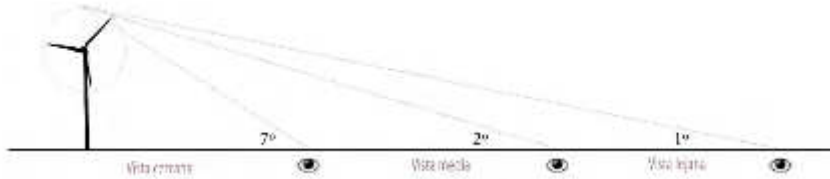
Optimal location

Morphology

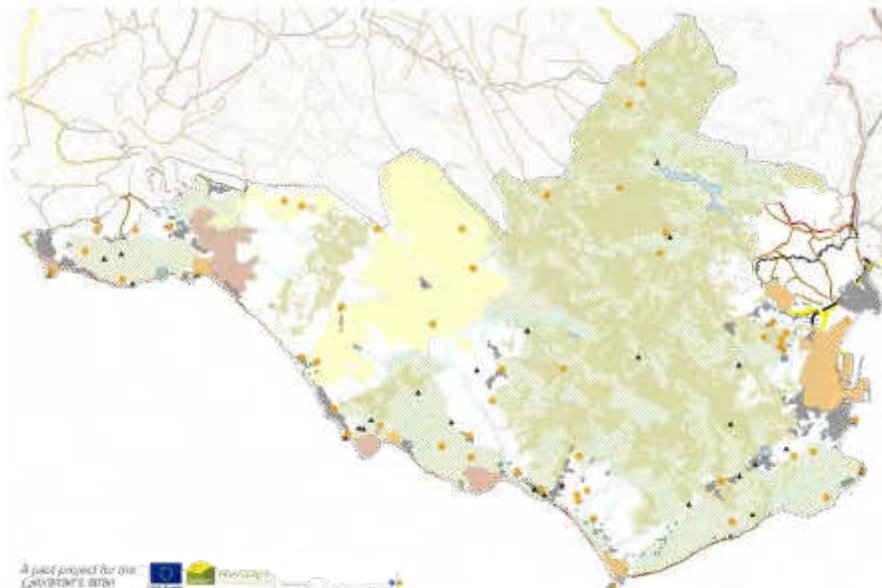


Characterising landscapes and identifying impacts

1.- Delimitating the area of study



2.- Characterising landscape: natural, anthropic and visual.



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Characterising landscapes and identifying impacts

3.I- Visual relations of landscape: establishing a landscape's visual vulnerability.

Quantitative analysis: frequency of massive viewsheds:

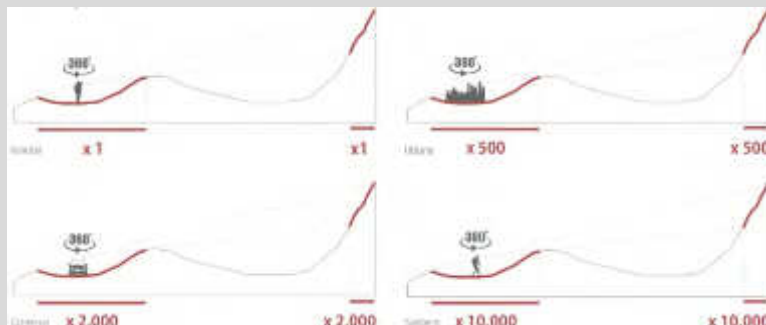
Visual exposure:

one observer per viewpoint

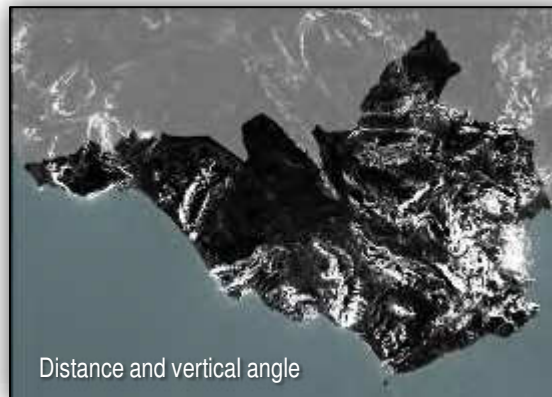


Visual accesibility:

one or more observer per viewpoint (land use + observer's sensitivity)



The analysis considers additional human visual perception parameters: (vertical angle and distance).



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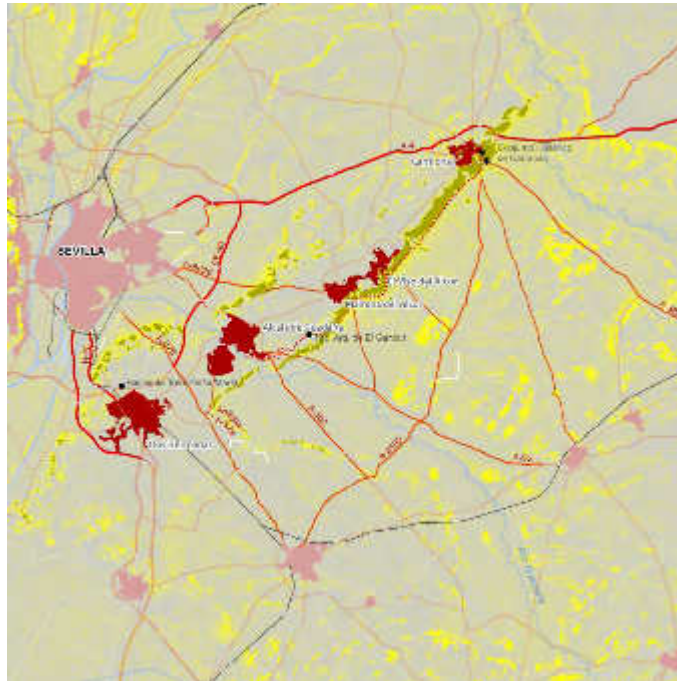
Morphology



Characterising landscapes and identifying impacts

3.II - Visual relations of landscape: establishing a landscape's visual vulnerability

- **Qualitative analysis:** Identifies the components of a landscape's visual structure: visual skylines, scenic background, landmarks.



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Characterising landscapes and identifying impacts

4.- Conclusion: how to analyse visual impact?

- Fragmentation, saturation, visual disorder and covisibility
- Changes in visual relation between significant structures

Tower hight

What height should be added to the viewpoint in order to begins to see the wind farm?



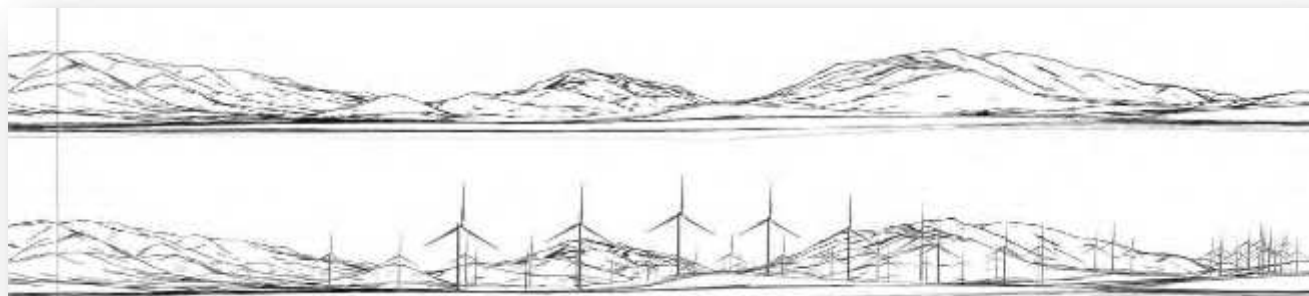
Complementary hight

What height should be added to the wind park in order to begins to see the viewpoint?



Visual relation between significant structures:

Shielding. Area for which the observed is no longer visible to the observer, due to the screen.



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Impact mitigation criteria

These guidelines break down the elementary characteristics of wind farms in terms of **location** and **morphology**, and establish best practice design in relation to the assessment variables that can be extracted from the SVA.



Optimal location :

- Productivity
- Zoning
- Rational land use
- Rapport with scenic structure
- Remoteness and visibility
- Visual dominance
- Co-presence / covision
- Social value

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Impact mitigation criteria

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Morphology:

- Density and homogeneity
- Turbine morphology
- Noise
- Reflectance
- Shadow
- Beacons
- Colour
- Foundations
- Auxiliary structures

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Impact mitigation criteria

Criteria for landscape integration can be summarised in a set of principles for impact mitigation:

Harmony

- Balance
- Coherence
- Scale
- Avoid non-dynamic landscapes
- Avoid frequented landscapes

Legibility

- Use simple layouts following existing geometries
- Protect frequent or significant skylines
- Respect the continuity of landscape units
- Do not compete with outstanding landscape features

Significance

- Negotiate thresholds with local residents



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Concluding thoughts

Andalusia has also made significant progress in the development of a high-capacity technical (landscape database) and administrative infrastructure (landscape strategy).

The Andalusian Landscape Integration Guidelines for Wind Farms are a first attempt at connecting this database with landscape management.

Ad hoc thresholds of landscape impact are still development.

There is a clear need to seek agreements with stakeholders.



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Thank you

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http://www.juntadeandalucia.es/medioambiente/portal_web/rediam/productos/Publicaciones/guia_parques_eolicos/index.html