Landscape dimensions

Reflections and proposals
for the implementation
of the European
Landscape Convention

COUNCIL OF EUROPE
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Council of Europe

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Contents

Preface

The Council of Europe European Landscape Convention (ETS No. 176) is a ground-breaking international treaty adopting an approach to spatial development that takes account of the landscape, in other words the quality of the environmental life of individuals and societies. In keeping with the Organisation's concerns with regard to human rights and democracy, it invites member states to involve the public at all stages of landscape policies.

Since the European Landscape Convention was adopted by the Committee of Ministers of the Council of Europe in Strasbourg, and opened for signature in Florence in 2000, the Council of Europe has examined and illustrated some of the themes relating to the convention; in other words, certain "dimensions of the landscape":[1]

- landscape and wind turbines;
- management of the territory: landscape management as a process;
- landscape and education;
- landscape and leisure;
- landscape and advertising;
- landscape and economy: an approach from the European Landscape Convention;
- wealth and variety of terms, instruments and approaches to landscape in Europe;
- landscape and democracy.

1. See the previous publication: Council of Europe (2006), *Landscape and sustainable development: challenges of the European Landscape Convention*, ISBN 92-871-5989-0, Council of Europe Publishing, Strasbourg, and Council of Europe (2012), *Landscape facets: reflections and proposals for the implementation of the European Landscape Convention*, ISBN 978-92-871-7080-4, Council of Europe Publishing, Strasbourg, available at: www.coe.int/en/web/landscape/publications.

This publication is a collection of the relevant reports drawn up by Council of Europe experts, in the light of the conclusions of the meetings of the workshops, for the implementation of the European Landscape Convention.[2] These reports were also presented at Council of Europe conferences on the European Landscape Convention, held at the Palais de l'Europe in Strasbourg on 3 and 4 May 2011, 26 and 27 March 2013 and 18 to 20 March 2015. The representatives of governments and international governmental and non-governmental organisations who participated in these were able to discuss the issues addressed in order to make progress in the implementation of the convention.[3]

Following the order in which these reports were presented, we would like to express our gratitude to the experts for the high quality of their work and for their important contributions: Mr Emmanuel Contesse; Mr Jaume Busquets Fàbregas and Mr Albert Cortina Ramos; Mrs Annalisa Calcagno Maniglio; Mr Niek Hazendonk, Mr Jean-Philippe Strebler; Mrs Marlies Brinkhuijsen, Mrs Chantal de Jonge, Mr Hugo de Jong, Mr Dirk Sijmons; Mr Joaquín Romano; Mr Jean-François Seguin; and Mr Yves Luginbühl.

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2. Proceedings of the Council of Europe workshops for the implementation of the European Landscape Convention, Council of Europe Publishing, European spatial planning and landscape series, available at: www.coe.int/Europeanlandscapeconvention; www.coe.int/en/web/landscape/publications.
3. Conference reports, cf. documents of the Council of Europe, European Landscape Convention: CEP-CDPATEP (2011) 18; CEP-CDCPP (2013) 12 and CEP-CDCPP (2015) 34 available at: www.coe.int/en/web/landscape/conferences.

Chapter 1

Landscape and wind turbines

Emmanuel Contesse, Council of Europe expert

SUMMARY

The purpose of this report[1] is to provide the Council of Europe member states with a basis for wind energy development which integrates the landscape dimension. It is divided into four parts. The first introductory part sets out the general terms of the problem and summarises the feedback from the questionnaire sent by the Secretariat of the Council of Europe to member states.[2] The second part is dedicated to spatial planning, which should be the basic tool for wind energy development in a state or region. The third part, in conjunction with the second, gives an overview of the process involved in developing a landscape project for the construction of wind turbines. Lastly, the fourth part sets out the main principles to consider in order to take into account the landscape dimension.

In the current development and growth context, planning of spatial development is a vital guarantee of the legibility of the landscape and its attractiveness for future generations. Spatial planning tools facilitate co-ordination with other types of planning and infrastructure and ensure overall spatial coherence.

A plan to integrate wind turbines into the landscape, on a site or area level, calls for extensive preliminary work to "read" the landscape. Morphological, historical and sociocultural factors must be considered. Technical (access, etc.) and biological (species and biotopes) aspects also need to be taken into account in the early stages of planning. The analysis stage is essential to identify the issues at stake in order to define an integration strategy which guarantees landscape coherence. Furthermore, it must be comprehensible to a substantial proportion of stakeholders in the region concerned. Communication should accordingly have an important place in the landscape project.

1. This report has been produced in the framework of the Council of Europe activities for the implementation of the European Landscape Convention with the support of the Federal Office of the Environment of Switzerland.
2. Council of Europe, CEP-CDPATEP (2011) 12 Bil.

The criteria for landscape evaluation of wind turbine construction vary from one region to another and it is impossible to have uniform criteria for all territories. There are, however, some basic principles which apply to all cases. These mainly concern factors related to the morphology of the area and the proportions of the landscape. It is also important to consider aspects relating to the co-visibility of wind turbines. Lastly, it is important to define strategies for special and/or legally protected landscapes, and to establish exclusion zones.

In conclusion, it is recommended that the harnessing of wind energy be planned on a wide scale and that siting strategies be drawn up as far in advance as possible of any specific projects that may be submitted to local or regional authorities.

INTRODUCTION

Individual wind turbines are often viewed positively by observers, whether they are local residents or visitors. Assessments of entire wind farms are more nuanced. The degree to which the landscape in which the wind farm is located is enhanced or, on the contrary, degraded by their presence is more difficult to gauge.

Wind turbines cannot be hidden. Their large size, combined with the very large areas required for the construction of wind farms, makes them particularly conspicuous features in the landscape. As spatial planning with regard to wind turbines cannot (or only with difficulty) apply the principle of landscape integration, the underlying assumption of this recommendation is that their spatial integration has due regard to the specific characteristics of the receiving landscape. Wind turbines can thus become a landscape management tool which enhances or preserves the value of an area. The construction of wind turbines must therefore form the subject of a landscape project in the same way as any other type of infrastructure. It is also important to undertake landscape assessments for offshore wind turbines. Coastal zones and the open sea should be regarded as landscape in the same way as land areas. This project-based approach takes all factors into account – large or small, exceptional or ordinary, natural or man-made – and can determine the absorption or transformation capability, ensuring coherence of the landscape and, hence, a positive perception by the population and visitors.

According to the definition given in the European Landscape Convention, landscape results from human action on the environment. The aim of this recommendation is not therefore to protect "valuable" landscapes from the construction of wind turbines. On the contrary, the aim is to define a method for placing wind turbines in the landscape while preserving its coherence.

This report sets out the main, general and theoretical aspects which apply to all landscapes and whose criteria and detailed analysis vary according to the particular area.

Background and issues

The sources of renewable energy production, which include wind power, are essential for future energy independence. As a new feature in the landscape, wind turbines

and their "landscape integration" are the subject of much discussion. At the same time, there are growing pressures on landscapes and recurrent conflicts of interest. The exponential development of wind energy presents member states with an additional landscape issue. In view of their large size and the problems connected with energy transportation, noise and shadow (among others), wind turbines constitute a particularly difficult problem in spatial planning.

Approach

This report outlines the main issues associated with the development of wind farms and possible approaches to ensure their successful integration in the landscape, as defined in the European Landscape Convention. It does not claim to be exhaustive or to offer a detailed approach to wind energy planning that could be implemented in every member state. The specific landscape, cultural and political features that define each area, and the way they are perceived, vary greatly from one state to another.

The first part of the report defines the general approach to be applied to landscape planning in connection with wind energy and the main project stages. The second part deals with the landscape principles to be taken into consideration in every wind energy project. This means all the general aspects which are decisive for the proper integration of wind turbines into a landscape, or their exclusion, having due regard to its specific characteristics. These two parts apply not only to individual wind farm projects but also to master planning, when a region has several potential wind farms.

The spatial planning processes and landscape principles expounded in this document are also valid for coastal wind or offshore farms. These areas should be considered in the same way as the rest of the territory and siting strategies should ensure that areas of particular value (for example, the view from and towards coasts) are preserved.

The aims of the report are to:

- provide a general approach to landscape planning in connection with wind turbines, without defining a fixed methodology, in order that it can be applied in all the member states;
- suggest tools and a general methodology for drawing up plans for wind farms that are compatible with the landscape;
- define the landscape principles that should be taken into consideration when deciding on the location of wind turbines, or excluding them.

1. SPATIAL PLANNING

1.1. Need to plan spatial development

As a result of economic growth and the expanding needs that accompany it, territories (and hence landscapes) undergo rapid and continuous change. If that development is not planned and controlled, landscapes may become more difficult to "read". The population may therefore cease to identify with its landscapes which may lose their

special character. It is for this reason that the public authorities have put in place spatial planning instruments which can be used to influence spatial development.

One of the challenges of spatial planning is to preserve or restore the coherence of landscapes, whether they are areas of "beauty" or special interest, or have no exceptional characteristics.

Wind turbines, like other infrastructure (roads, industry, housing, etc.) have to be incorporated into the spatial planning processes. This means considering not only wind turbines in themselves, but also all ancillary infrastructure required (power lines, roads, etc.).

1.2. Inclusion of wind turbines in spatial planning

This section sets out the general principles to be applied when including wind turbines in spatial planning. The specific landscape-related aspects (landscape analysis, criteria, selection, exclusion, etc.) are dealt with in the following section.

Wind energy planning is usually the subject of a sectoral plan which will be included in an overall plan. The wind energy plan has to be co-ordinated with the administrative authorities of neighbouring areas. In all cases, wind energy facilities should be planned at the highest administrative level of the state concerned. Co-ordination with other sectoral plans (tourism, housing, industry, etc.) is also important to avoid conflicts in planning and achieve optimum spatial concentration of the different types of infrastructure.

To sum up, it is necessary to:

- assign wind energy planning to the highest possible supra-regional authorities within the state;
- co-ordinate planning principles with neighbouring states or administrative regions;
- co-ordinate wind energy planning with other sectoral plans;
- apply the principle of concentration at regional level when designating planning or exclusion zones;
- encourage grouping with other types of infrastructure to form clusters dedicated to renewable energies and other compatible industrial uses.

2. PROJECT-BASED APPROACH TO LANDSCAPE INTEGRATION

A landscape project for the integration of wind turbines should not be carried out in isolation. It forms part of a whole, consisting of all the other parallel or prior studies that have to be carried out in order to achieve coherent spatial planning. In short, it may be said that good planning consists of:

- negative planning: exclusion of areas for reasons which may be technical (connection to the grid, wind energy potential, noise, etc.), biological (protection of birds and bats) or landscape-related (protected or emblematic areas); and

- positive planning: selection of favourable areas in terms of wind and infrastructure.

All these sectoral studies should form part of an iterative process with ongoing co-ordination. The landscape project comes in mainly after the negative planning stage. This will ensure that the project is as coherent as possible, because it will then be unnecessary to make frequent adjustments to it, and the underlying concept will not be constantly called into question.

2.1. Defining the area to be studied

Wind turbines can easily reach a total height of 140 metres (180 metres in the case of the latest models) and are visible from over 10 kilometres away in overcast conditions, and from much greater distances in clear weather conditions. Given their size, they form highly conspicuous and imposing structures exceeding the usual proportions of landscape features. In comparison, the spire of Strasbourg cathedral rises to a height of 142 metres.

Consequently, when designing a wind farm or drawing up a master plan, we must extend our analysis well beyond the planned location. Ideally, the whole area in which the wind turbines will be visible should be considered. Within this wider area, issues of co-visibility with other wind farms must be included in the analysis. In areas within a radius of 5-10 kilometres (depending on the number of wind turbines planned and their size) questions of scale and proportion will play an important role. In these close areas, all landscape principles must be taken into account.

Provision must be made for co-operation with regions adjacent to the planning area, in order to increase the coherence of the landscape project and make it more acceptable to the local population.

2.2. Assessment of non-landscape aspects

In landscape planning, every effort should be made to deal with the other, non-landscape aspects (wind energy potential, access, energy transportation, conservation of species) in advance, so that any problems can be foreseen and, if necessary, the planned location(s) can be abandoned or adapted. In the case of master planning by a regional or local authority, such preliminary analyses are more difficult because of the costs to which they may give rise. Financing arrangements can be found, however, through co-operation with the various stakeholders involved in wind energy production.

2.3. Technical aspects

In addition to the wind energy potential, the energy transportation and access possibilities must be known. A classification of areas can be produced on that basis, showing the sectors which should be selected or excluded, and those for which additional co-ordination is necessary.

Where noise and shadow nuisance are concerned, there are still gaps in scientific knowledge. Some cases of noise problems following the construction of wind turbines have been identified. Allowance should therefore be made for sufficiently large buffer zones around areas where people live. Problems arising from operating restrictions and resulting financial losses can thus be avoided.

2.4. Species and biotopes

The protection of species and biotopes should be addressed prior to landscape planning.

In the preliminary studies, an overall analysis of existing data should be carried out, and a strategy for the preservation of natural areas, protected areas and species should be devised. These areas in question are those protected by decrees or laws (Natura 2000 sites, for example). For all these different areas, it is important to devise an overall strategy at regional or national level, and to keep to it. What must be determined is whether the protection goals of these areas are consistent with the construction of wind turbines or what kind of development is desired for these landscapes in future. It is desirable, however, to exclude listed and/or protected areas in order to limit conflicts and planning difficulties (special studies, etc.).

Birds and bats are two groups of species particularly affected by wind turbines. A badly-situated wind energy facility (migration corridors, hunting or swarming areas for bats) can have serious effects on the populations of these species. Experts on these fauna groups are able to conduct preliminary analyses of an area and make an assessment of the risks. This is a relatively inexpensive process compared with the subsequent costs which may arise as a result of a failure to address these problems. The Swiss Co-ordination Centre for the study and protection of bats (CCS) has devised a method for evaluating wind energy sites, based on five risk levels. Similar studies exist in the case of birds.

2.5. Understanding the existing landscape

A study on landscape integration of wind turbines should be regarded as a landscape project for the future. Prior analysis and understanding of the territory form an integral part of the project. The importance of this phase should on no account be minimised. It enables the planner to apply objectivity to landscape diagnosis. The process of analysing the landscape should be conducted iteratively in conjunction with the projection phase. The ideas contained in the project can thus be tested against the reality in the field, and then adapted as field knowledge increases.

An understanding of the existing landscape, its history, its social characteristics and its development will be instrumental in giving the project a coherent shape and ensuring its continuity. This is not only preservation at any price, but also controlled development in appropriate areas, based on the key features of the landscape, which can be identified through analysis of the site.

2.6. Morphology

In a wind energy project, particular attention must be paid to the morphology of the landscape. This means charting and understanding the sequence of topographical features, their regularity or irregularity, the distance of the horizon and the proportions between landscape components (for example, height of a hill in relation to other landscape features). The landscape units and the relations between them (areas of transition and discontinuity) must be defined. An understanding of morphology is central to a landscape project and will have an influence on subjective aspects related to the cultural aspects of the landscape and how it is perceived.

2.7. Landscape heritage

The landscape heritage is not confined to areas of special interest. As elements are shaped by human action, all landscapes have a specific testimonial value. The difficulty of identifying that value may vary according to its exceptional or ordinary nature. All the components of a landscape's identity must be identified by searching through historical records and drawing on the knowledge of the local population. Land ownership, farming and building patterns are some of the factors to be taken into account. Particular attention should be paid to areas and sites with recognised emblematic value. The construction of wind turbines should not detract from their importance. It is therefore desirable to exclude emblematic areas or sites.

2.8. Sociocultural aspects

Landscape in the "picture postcard" sense is related to the observer's personal experience and social background. Broadly speaking, most inhabitants of a region share a similar perception of what is "beautiful" and what is "ordinary". These constants of landscape perception must be identified and understood in order to guide the landscape project, so that a large proportion of the population can understand and assimilate it. It is important, therefore, that representatives of the local population should be involved in the discussions. In this process of collecting information, the point is not to ask the population whether the wind turbines can be integrated or not. What should be brought out are the key factors or components in their perception of features as being "beautiful" or "ordinary" and a landscape project should be framed accordingly.

2.9. Identifying issues and goals

On the basis of the information obtained during the analysis phase, it will be possible to identify the landscape issues and the other aspects of the plan. It is also during this phase (which must run continuously from the start of the project) that the interrelations between the landscape and the other aspects of the plan will be identified and co-ordinated. All aspects, however insignificant, must be noted. The issues to be addressed will not be identified until a later stage, when a fresh cross-cutting analysis will be made of the factors and interests involved. During this assessment

phase, clear goals will need to be set and approved by as many parties as possible. The goals determine the landscape strategy and prioritise the issues identified. In the case of each area or landscape feature, it will be stated whether the intention is to preserve (through exclusion zones), transform or add, and reasons will be given.

2.10. Drawing up the landscape integration plan

The landscape project can be based on two types of approach: establishing landscape criteria for the selection or exclusion of sites, or producing a drawing of the new landscape with wind turbines justified by explanatory texts.

The first approach involves establishing landscape criteria based on the landscape analysis and the objectives set after identification of the issues at stake. The application of these criteria then makes it possible to exclude or select sites from the landscape standpoint. The criteria must, as far as possible, be pragmatic and comprehensible. It is desirable that these criteria should be approved by as many stakeholders as possible before they are applied. Such consultation makes it possible to reduce the subjective element in the approach, because the criteria have been understood and approved.

The drawing-based approach is more conceptual. Its success depends on sound arguments and high-quality graphic illustrations. It is nevertheless difficult to limit the subjective element.

The ideal solution is to use both methods simultaneously. The conceptual approach provides an overall picture of the wind farm, or a region's sites, and the landscape criteria settle the details relating to specific factors. The establishment of buffer zones around conservation areas or of rules governing the proportions to be respected from certain vantage points are two examples of typical criteria.

2.11. Communicating about the project

Ideally, opportunities for communication should be provided throughout all the planning stages. Consultation during the landscape analysis stage, and that of defining the issues at stake, is as important as the final project. As we have already mentioned, landscape analysis forms an integral part of the landscape project and is instrumental in guiding it. The inclusion of representative figures from the region or various interest groups during the analysis stage and throughout the subsequent stages of the project will give the final document greater credibility.

The other aspects of spatial planning (conservation of species, noise, etc.) should also be included in the communication strategy. This strategy should not focus on the landscape, but should present the overall concept. All the other aspects are equally important and will have a considerable effect on how the population affected by the wind turbines perceive their environment.

Current technologies offer various possibilities for visual communication (3D modelling, photomontage, films, etc.). These tools should be used, but should not be the only means of communicating a project or plan. For example, there is a subjective

element in the choice of a vantage point for a photomontage. When visual aids are used, therefore, a range of vantage points should be selected, including some showing the view from ordinary areas. This provides for some degree of exhaustiveness in relation to the future zones of visibility of the planned wind turbines. It is essential to produce visibility grids based on a digital terrain model (three-dimensional digital model of an area). These can be used to show all the areas from which the wind turbines will be visible.

3. LANDSCAPE PRINCIPLES

This section identifies the main effects of wind farms on the landscape as defined in the European Landscape Convention: that is, both the natural, visual landscape and the subjectively perceived landscape. The categories of effects are described in the sections below.

3.1. Scales, rhythm and coherence of units

A landscape can be divided into landscape units. These may be defined as follows: units that are clearly demarcated and uniform in terms of topography, land use and the features that give the landscape its structure. A unit may be very large, especially in lowland regions, or very small in hilly and mountainous regions. In the case of small units, the views are varied and the horizon is close. An area with small units involves constant changes of morphology and vista.

The geomorphology of the area is one of the key factors in a landscape. It determines the sequence of structures and influences the uniformity or otherwise of the landscape. A landscape with very uneven terrain will offer a wide range of 360° panoramas, each different from the rest. On the other hand, a very uniform landscape will offer less variety and will be shaped, above all, by its vegetation and buildings.

Together with geomorphology, the factors that give structure to a landscape (hedgerows, villages, roads, land ownership, etc.) form the basis for the landscape's identity. Consequently, they are naturally the most important aspects to be addressed in connection with the siting of wind turbines.

In the course of the analysis, the landscape's topographical and structural lines of force should be identified and described. This will make it possible to determine the strong elements which should be preserved or supported by the construction of wind turbines, in order to preserve the value of the landscape or alter it in a coherent manner.

Given their size, wind turbines have a significant effect on the landscape. They are often much larger than the existing landscape components, or are visible from more than one landscape unit.

A landscape plan should consider the geomorphology of the area and its proportions, and the way structures are arranged, in order to prevent the wind turbines from overshadowing the features of the landscape or disturbing its pattern. Wind turbines should therefore be sited in uniform areas and avoid areas of uneven terrain with

many changes of morphology and areas densely structured by various components. Moreover, the geomorphological or structural lines of force should be enhanced or preserved depending on their size and their identity-forming value. When siting wind turbines, it is also important to follow the rhythm imposed by the geomorphology and structures of the landscape. All these principles apply on a small or large scale, depending on the situation. For example, a path may be regarded as an important linear structuring element, as may a river in a valley.

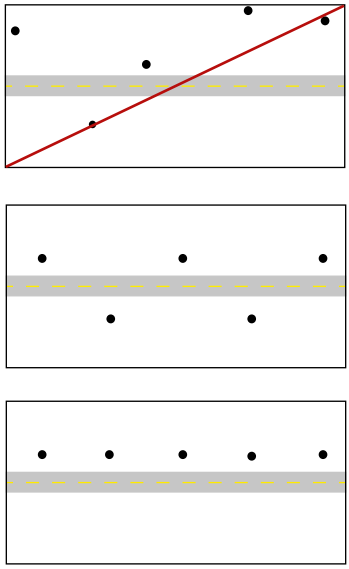
Generally speaking, a wide, relatively even landscape with distant horizons is more suitable for the siting of wind turbines than a hilly or mountainous landscape.

Below are some schematic examples relating to landscape geomorphology and structures.

3.2. Respecting lines of force

Landscapes possess "lines of force" (rivers, roads, valleys, ridges, etc.) which make a major contribution to their coherence. These are often features which have influenced the entire shaping of the landscape over the centuries or, in the case of infrastructure, which have adapted to natural or morphological constraints. The siting of wind turbines should bring out rather than obscure these lines of force.

Figure 1. Example of the siting of wind turbines along a line of force or a major structural element – here it is a road



3.3. Respecting proportion and rhythm

If wind turbines are sited on either side of a high point, one should also be placed at its summit to ensure that it is not visually overshadowed by the other two structures.

Figure 2. Example of wind turbines close to and at a high point; the scale of the landscape must be preserved

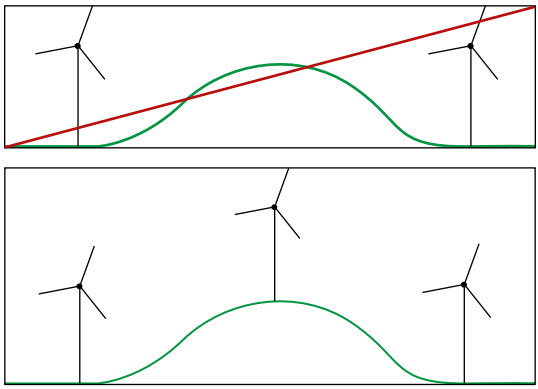


Figure 3. Situation to be avoided: the natural proportions of the landscape are disrupted

Source : Natura biologie appliquée Sàrl

On uneven terrain, wind turbines of the same size should be used for the whole site and they should be integrated with the morphology of the terrain (Figure 4). It is also important to avoid a situation where, owing to the perspective effect, wind turbines no longer respect the morphology of the terrain when viewed from a particular vantage point.

Figure 4. Example of wind turbines in areas of uneven morphology: it is important to follow the pattern of the terrain and reproduce existing patterns

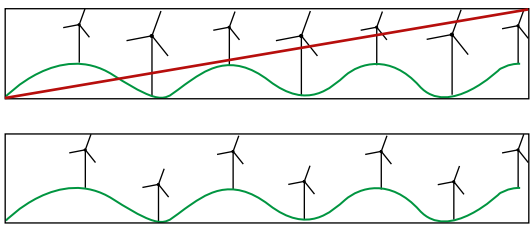


Figure 5. Landscape rhythm imposed by topography

The discontinuous line marks the horizon which wind turbines should follow from a vantage point determined in the landscape survey, in order to respect the rhythm imposed by the topography.

Source: Natura biologie appliquée Sàrl

Wind turbines should not be as tall as the summit on, or near to which they are erected, so as to preserve the scale imposed by the morphology of the landscape. Ideally, the ridgeline should be twice as high as the planned wind turbine.

Figure 6. Proportions to be respected between the height of a wind turbine and that of a summit

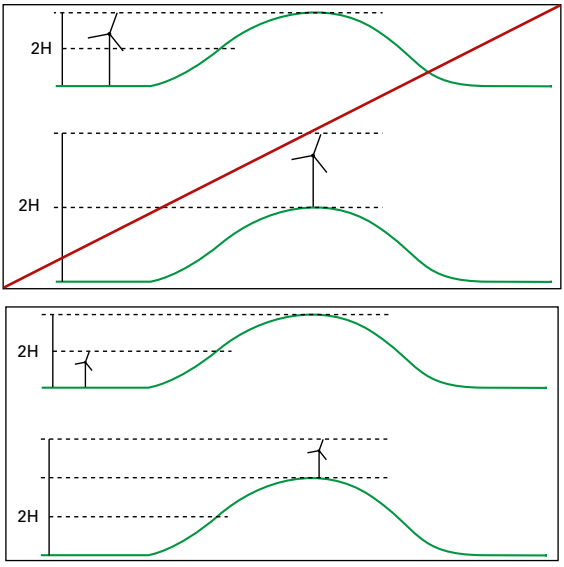


Figure 7. Wind turbines on a low ridge

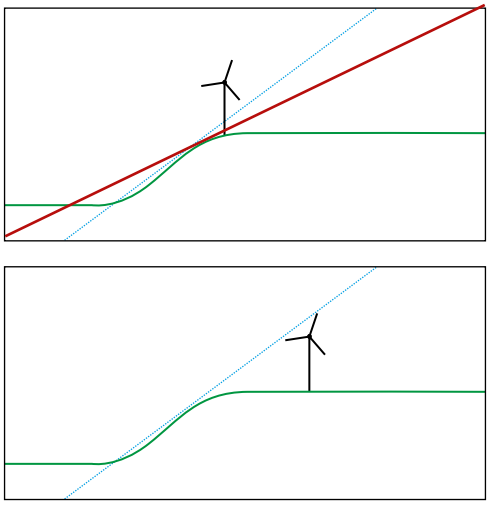
Source: Natura biologie appliquée Sàrl

Figure 8. Wind turbines on a ridge significantly higher than the wind turbines

Source: Natura biologie appliquée Sàrl

The perceived size of wind turbines is significantly increased by optical effects, for example resulting from a low-angle view. Wind turbines should be situated within limits imposed by the existing slope lines in order to avoid low-angle effects.

Figure 9. Wind turbines on top of a ridge



Wind turbines on top of a ridge. Avoid a plateau-edge location to reduce the impression of being overwhelmed when looking up from the valley floor.

3.4. Co-visibility and situation of saturation

Reference is often made to the attractiveness of wind turbines to the public, in view of their novelty and the fact that they symbolise sustainable energy production. However, a saturation point may be reached beyond which wind turbines are no longer an attraction but a nuisance to the population, if too many wind farms are constructed in a region and are visible from the same place. Viewed from a given angle, wind turbines are dominant and highly conspicuous features. If every line of vision takes in wind turbines, observers may experience a sense of saturation or fatigue.

Spatial planning or plans for a new wind farm in a region must therefore address co-visibility issues. This involves cataloguing the areas from which more than one wind farm is visible. Areas with high concentrations of housing, tourist areas recognised for the quality of their landscapes and particular vantage points should not be in a situation where several sites are co-visible. Co-visibility analysis should not only be carried out for sites that are equidistant from a vantage point but should take into account all the wind farms that lie within the area defined at the beginning of the study. The production of visibility grids for wind turbines is a very useful contribution to this analysis of co-visibility.

The term co-visibility is also used sometimes to refer to the simultaneous visibility of a wind turbine and another feature in the landscape, such as a church spire.

3.5. Special landscapes

By this we mean all areas which have a special legal status and for which landscape aspects are of paramount importance. The term may also refer to areas that do not

have a special legal status but which are recognised for the quality of their landscapes, for example an emblematic regional site or a tourist area of special interest in terms of landscape.

The question of special landscapes should no longer arise in the planning of a wind farm, because they should have been excluded at the prior spatial planning stage.

Spatial planning should identify the particular landscapes one wishes to exclude or, on the contrary, enhance, through the construction of wind turbines. This choice should be based on criteria defined in the landscape analysis.

Generally speaking, landscapes enjoying legal protection should be excluded in order to avoid subsequent conflicts of interest. Natura 2000 sites are an example of areas to be avoided. The same applies to areas without any special conservation status. If, however, the construction of wind turbines does seem compatible with the area, a major effort must be made to justify the choice and communicate it. It is the landscape project which must either justify the construction of wind turbines or not. Communication involves describing the entire project process, from the analysis stage to the proposed final result.

The landscape's heritage and historical aspects, its rarity and the number of visitors to it are factors to be taken into account when defining selection or exclusion criteria. Research should also be done into any social, cultural or political events having a connection with the area in question. This can serve to identify aspects which are not immediately visible but which may be an important factor in the value attached to the landscape by the population.

Lastly, when analysing a special or protected landscape, it is important to consider the entire landscape unit or the "viewshed" in which the protected site is located. The quality or special nature of a landscape area recognised by a political decision sometimes extends further than its cartographical boundaries and forms a coherent whole with the surrounding areas. The construction of a wind turbine close to the protected site could therefore have as much impact as if it were constructed within its boundaries. It is therefore advisable to designate buffer zones around special or protected landscapes.

Generally speaking, it is important to consider the landscape as a whole and not simply exclude or select areas on the basis of boundaries set in a political decision.

3.6. Relationship with built-up areas

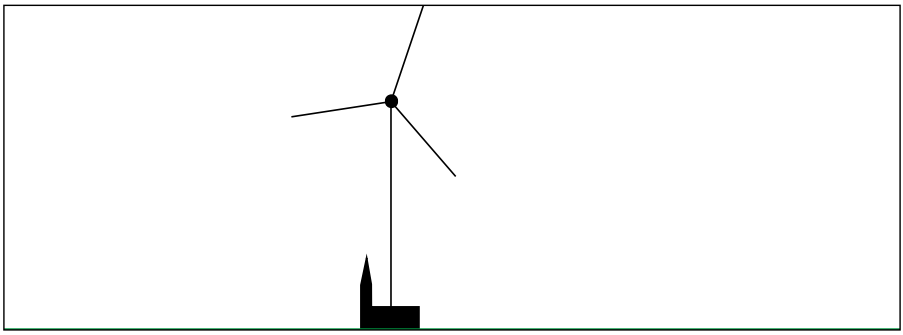
This section is concerned only with the landscape issues associated with built-up areas. It does not deal with aspects such as noise and shadow. It is important, however, that both these aspects should be addressed with a great deal of care and precaution. A study which deals insufficiently with these aspects is likely to give rise to numerous social problems during the operational phase.

Issues of scale also apply to built-up areas. These are major features in a landscape which attract attention and are often linked to natural features in the surrounding landscape, with which they form a coherent whole. In uniform landscapes with distant

horizons, buildings and villages take on an even greater structural importance than in areas of uneven terrain.

Beside a wind turbine, even a large building becomes insignificant and loses its prominence in the landscape. From a given vantage point, a wind turbine situated in line with a village or building should not be more than twice the height of the built structure in question. Ideally, the wind turbine should not be in the line of vision of significant vantage points identified in the landscape analysis.

Figure 10. Wind turbine alignment: situation to be avoided



Avoid constructing wind turbines directly in line with a village or an individual monument.

Figure 11. Buildings dominated by wind turbines: situation to be avoided

Avoid constructing wind turbines on a scale which dominates nearby buildings or monuments.
Source: Natura biologie appliquée Sàrl

The views from a locality towards an unconstructed area should also be considered. The lines of vision offered by streets or squares towards the outside should be avoided in order not to disturb the proportions and perspectives defined by the existing buildings.

CONCLUSIONS

As with other important infrastructures, wind turbines should be planned on an area-wide level based on the application of spatial planning principles. This is the key to successful integration into the landscape and, hence, to overall coherence that is understood and accepted by a large proportion of the population.

This report only sets out general guidelines for proper landscape planning incorporating wind turbines. All the aspects covered should be explored in greater detail, the extent of this depending on the specific characteristics of the state or region concerned. To this end, it is recommended that authorities develop their own landscape criteria in line with the European Landscape Convention, and that they draw up overall spatial plans for wind energy. In areas where wind energy is not yet present, the drawing up of comprehensive plans will make it possible to forestall a good many conflicts that will be more difficult to resolve once specific projects have been submitted to the bodies responsible for authorising them.

There is also intensive pooling of information and experience between member states, as well as a very great demand for support from the Council of Europe. Thanks to this, specific knowledge of the many fields affected by wind turbines, which is still incomplete in some cases, will be able to increase rapidly.

Chapter 2

Management of the territory: landscape management as a process

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INTRODUCTION

Definition and characteristics of landscape management

Landscape management is a recent concept, one which emerged much later than others used in the same field, with which it is sometimes confused. The present report uses the definition of the concept provided in Article 1 of Chapter 1 of the European Landscape Convention:

- "Landscape management" means action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonise changes which are brought about by social, economic and environmental processes.

The same article sets out the definitions making up the basic conceptual framework of the European Landscape Convention:

- "Landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors;
- "Landscape policy" means an expression by the competent public authorities of general principles, strategies and guidelines that permit the taking of specific measures aimed at the protection, management and planning of landscapes;
- "Landscape quality objective" means, for a specific landscape, the formulation by the competent public authorities of the aspirations of the public with regard to the landscape features of their surroundings;
- "Landscape protection" means actions to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value, derived from its natural configuration and/or from human activity;
- "Landscape planning" means strong forward-looking action to enhance, restore or create landscapes.

So we shall be adopting a concept which is defined in the framework of an international treaty, consistently with other parallel concepts closely bound up with the fundamental objectives of the European Landscape Convention, namely "to promote landscape protection, management and planning, and to organise European co-operation on landscape issues".

Drawing on these definitions as set out in the convention, this report will develop the landscape management concept as the process of formulating, articulating and developing a set of strategies geared to enhancing a specific landscape and improving the quality of human life, as part of a sustainable development approach using the appropriate instruments and implementing the programmes and actions set out in a landscape management project.

This definition highlights the four main features of landscape management as one of the objectives pursued by the convention:

1. *the social dimension:* given that landscape is a social product resulting from interaction between nature and society, its management must incorporate the social dimension, with both its aspects of being an object of study and a subject of management. This requirement involves participation by the social partners in the various phases of the management process and consideration of their perceptions of, and ambitions concerning, the landscape;
2. *the sustainable perspective:* given that the convention's objectives include protecting landscape features and values, landscape management must be based on the principles of sustainable development, and foster the establishment of harmonious relations between human activities and the environment in which they happen;
3. *the operational approach:* all the concepts defined in the convention are based on the action principle, which means that landscape management is intended to be operational and influential. That is, it must be geared to action and have an impact on the landscape and the social, economic and institutional players, drawing on the initial objectives and formulations of the management project instigators;
4. *the time dimension:* landscape is changeable in nature and so its management must be conceived as a process providing for programming actions over time, in accordance with a number of local strategies and sequences.

Landscape management aims

The management concept remained secondary to other concepts relating to landscape (analysis, design, protection, planning, programming, etc.), which took pride of place in the research field and in professional practice. So what has been the reason for the increased role taken on by landscape management over recent years? In our view, there have been a number of factors in this change of direction:

a. the increasing pace of landscape change, which has occurred with unprecedented intensity over the last 50 years, and the general spread of

landscape transformation processes to ever larger areas, now covering virtually all regions and geographical environments;

b. the lack of appropriate strategies and methodologies to cope with the changes affecting landscapes with no special protection status (ordinary landscapes), which constitute the majority of landscapes as perceived by individuals;

c. the social concern at landscape changes and the concern to retain democratic control over these changes, which are continuing at a vertiginous rate, as if unavoidably linked to economic growth;

d. consideration of landscape as a useful variable in contemporary urban and spatial planning, similar to other variables traditionally used in these areas;

e. in contemporary societies, the demand for greater well-being; this includes the individual and collective right to a quality environment and a non-depersonalised landscape which embraces significant values that help improve the quality of human life;

f. the status of cultural and natural heritage attributed by society to the landscape, given that an increasing number of landscapes have become a rare, threatened asset which must be cherished and protected.

All these factors point to the fact that landscape management can be a mode of dealing with the landscape and a professional technique which – taking into account the aspirations of the public and the input from the various sectors involved – provides society with a working method for promoting the landscape, sustainable development and quality of human life. The main aims of landscape management are to:

- promote the harmonious preservation of landscapes and creation of new quality landscapes;
- foster local development on the basis of the values and opportunities provided by landscapes;
- improve the quality of life of individuals by rationalising a mode of socio-economic development respecting the landscape;
- improve the efficiency of spatial organisation of local activities;
- help determine landscaping guidelines for subsequent implementation in spatial and urban planning and sectoral policies;
- provide criteria, methods and instruments in pursuit of landscape quality objectives;
- increase the landscape capital of a specific area, landscape being understood as a forefront economic and (natural and cultural) heritage resource;
- trigger social debate on the environment and landscape and help establish consensus by involving the social partners;
- facilitate decision making and development of joint strategies by social and institutional actors in the area, by means of landscape consultation and mediation processes.

1. DEVELOPING A LANDSCAPE MANAGEMENT PROJECT

1.1. Definition of a landscape management project

A landscape management project is an instrument that systematically implements all the stages in a landscape management process (territorial vision, diagnosis, formulation, implementation, dissemination and follow-up to proposals and actions), geared to enhancing a specific landscape and improving human quality of life, in line with the landscape quality objectives established.

The operators and actors in any landscape management project are the promoter, the landscape manager, the landscape management team and the landscape partners.

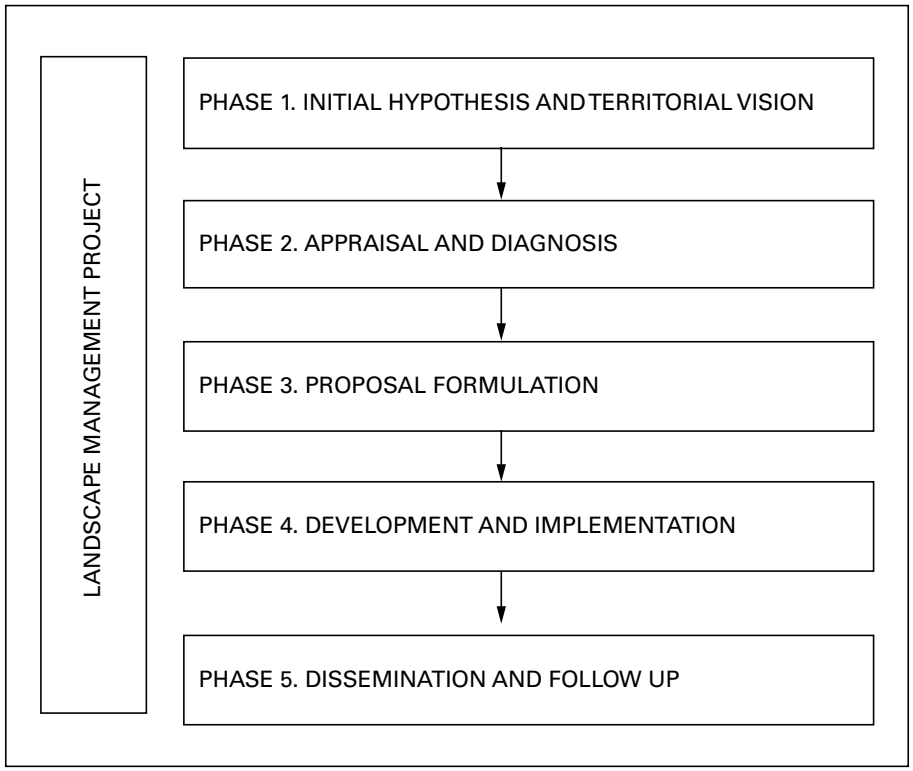
- the landscape management promoter may be a social, economic, institutional or professional operator implementing or instigating landscape management processes and projects, and taking the requisite action for their success. This may include providing the manager or management team with the necessary resources for developing the project;
- the landscape manager is the professional directing or actively participating in the teams working on landscape management processes or projects;
- the landscape management team is interdisciplinary, comprising professionals and experts who play an active part in developing the project, co-ordinated by a landscape manager;
- the landscape partners are a group of social, economic and institutional operators working in a given area who participate throughout the management process, interacting with the manager or management team.

1.2. Phases in the landscape management project

Landscape management is a dynamic process which embraces the formulation, articulation and development of a set of strategies, geared to enhancing a specific landscape and improving human quality of life by using the appropriate instruments and developing programmes and activities set out in a landscape management project. Under this process, all landscape management projects break down into five main phases (see Fig. 12), which run seamlessly into each other.

The first phase, "the initial hypothesis and territorial vision", involves entering into contact with the local area and the landscape phase 1 to be covered by the project. Drawing on the initial hypothesis put forward by the project promoter, the landscape manager or management team uses their professional experience and interdisciplinary knowledge to conduct a preliminary analysis of the territory and provisionally delimit the area to be covered by the management project, put forward a number of key ideas and present an outline description of the themes to be developed on the ground. We refer to this professional activity as producing a territorial vision.

Figure 12. Phases in the landscape management project



Source: Jaume Busquets and Albert Cortina

The second phase, "appraisal and diagnosis", is geared to guaranteeing that the project is based on a thorough and systematic analysis of the landscape. This phase involves finalising the delimitation of the chosen area and working at the territorial level most suited to the management project in question. The territorial analysis, the diagnosis of the current and prospective future state of the landscape, its tendencies and dynamics, knowledge of existing studies and documentation, the relevant prescriptive and planning framework, the interaction with the landscape partners by means of interviews with the major social, economic and institutional operators and identification of their social networks: all these factors help the landscape manager or management team to present a diagnosis that will enable them to instigate the subsequent management phase.

After this initial appraisal and a diagnosis, both rigorous and single-minded and focused on confirming the initial hypothesis and the territorial vision, we come to phase 3, "the proposal formulation phase". Here, via an opposite process of social participation, the objectives of the management project are finalised, its key ideas and the basic project description defined. During this phase, which has both methodological and creative dimensions, the manager or management team confirms or corrects the initial hypothesis and territorial vision with an eye to articulating the objectives and key ideas, by means of a main thread or argument providing