

ENVIRONMENTAL REGULATIONS REGARDING WIND ENERGY INVESTMENTS

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The average wind speed distribution in Romania highlights that after the mountain peak area, where wind speeds exceed 8 m / s, a second area that can be cost-effective used for windmills is the Black Sea coast, Danube Delta and Northern Dobrogea, where the average annual speed of the wind is around 6 m /s. A large part of the Dobrogea territory was introduced in Natura 2000, which is a network of protected natural areas consisting of special areas of conservation (SAC) and of special protected areas, (SPA).

All plans, programs and projects to be carried out in Nature 2000 sites or in their neighbourhood have to be assessed from environmental impact viewpoint. The paper presents an analysis of the difficulties that could be experienced by the potential investors in a wind farm project in obtaining environmental approvals/agreements, if these sites are in/ near the protected areas included in Natura 2000 in Dobrogea zone.

Keywords: wind energy, environmental regulation, Nature 2000, environmental impact.

1. Introduction

Natura 2000 is “a coherent European ecological network of special areas of conservation that shall enable the natural habitats types and species’ habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range”. All plans, programs and projects to be carried out in Nature 2000 sites or in their neighbourhood have to be assessed from environmental impact viewpoint. If an investor will want to conduct an economic activity in Nature 2000 site, he will be able to do so, only if he proves through an environmental rapport that this activity is not harmful for species and habitats from this site.

The paper presents an analysis of the difficulties that could be experienced by the potential investors in a wind farm project in obtaining environmental approvals/agreements, if these sites are in/ near the protected areas included in

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Natura 2000. The authors' contribution is a critical presentation of available data concerning the impact of wind farm on biodiversity comparative with the environmental regulation related to "Birds and Habitats Directives", aiming to encourage a balanced approach between the biodiversity preservation and the role of wind farms in combating climate change.

2. Protected areas in Dobrogea

The average wind speed distribution in Romania highlights that after the mountain peak area, where wind speeds exceed 8 m / s, a second area that can be cost-effective used for windmills is the Black Sea coast, Danube Delta and Northern Dobrogea, where the average annual speed of the wind is around 6 m/s [1]. Given the difficulties related to the location of wind parks in the mountain peak area (lack of access in the area, leading to enormous costs associated with the transport equipment and materials necessary for construction of wind parks), investors' attention has focused on different locations in Dobrogea. A large part of the Dobrogea territory was introduced in Natura 2000, which is a network of protected natural areas consisting of:

- special areas of conservation (SAC) established under the Directive Habitats (Directive 92/43 of 1992 on conservation of natural habitats and of wild fauna and flora)[2];
- special protected areas, (SPA) constituted under the Directive Birds (Directive 79/409 of 1979 relating to the conservation of wild birds)[3].

The authorisation, by the competent national authorities, of plans and projects likely to affect a SAC, a SPA or a Site of Community Importance (SCI) can only be granted to plans or projects not affecting the integrity of the site(s) concerned. On the other hand, its concrete application has to be done in the respect of the various steps provided for and in the sequential order established by the Directive Habitats.

Tulcea County represents an extremely important zone from biogeographic viewpoint with an interconnection of pontic, balcanic, under - mediteranean, central europene, caucazien and asian elements, with protected birds. The migratory path from Danube Delta to North Africa across Dobrogea from nord to south. By the Order no.1964 /2007 of the minister of Environment and Sustainable Development in Tulcea county were set the eight SCI and nine SPA included in Nature 2000 network. Consequently, any wind farm in Tulcea county will be inside or nearby a protected area, a SCI or/and a SPA[4].

Similar, in Constanta county according with the Law no.5/2000, Decision 1266/2000, G.D. 2151/2004, G.D. 1581/2005, G.D. 1143/2007 and local decisions, there are 38 protected areas in Constanța county, from a total area of this county of 19,646.54 ha[4].

All plans, programs and projects to be carried out in Nature 2000 sites or in their neighbourhood have to be assessed from environmental impact viewpoint. If an investor will want to conduct an economic activity in Nature 2000 site, he will be able to do so, only if he proves through an environmental rapport that this activity is not harmful for species and habitats from this site.

3. Are wind farms a threat to biodiversity?

One of the big shadows looming over further rapid development of wind farms is the effect of wind farms on humans and wildlife, particularly birds and bats. Most of the available evidence suggests the mortality rate for birds and bats from wind turbine collisions is less than five birds and five bats per turbine per year. There's also the question of wind farms interrupting bird and bat migratory patterns. The good news is a lot of this risk can be mitigated if farms are constructed in appropriate areas. The same goes for the impacts on humans - negative aesthetic impact, noise and shadow flicker. With some careful planning these problems should be minimized.

Wind farms can adversely affect biodiversity in three main ways[5-7]:

- clearing vegetation to allow for their construction and operation;
- bird and bat collisions with turbines; and
- behavioural disturbance to animals caused by their operation.

3.1. Vegetation clearance

The risks associated with vegetation clearance vary and will depend on the specifics of each development. In most cases wind turbines are located in cleared agricultural areas, meaning the risks associated with habitat loss are minimal. However, in some instances, developers seek to place turbines in vegetated areas to reduce costs or maximise available wind resources. In these cases, there is the potential for adverse biodiversity effects, particularly if the area supports threatened species or ecological communities.

3.2. Bird and bat collisions

Birds and bats can potentially collide with either the moving rotor blades or the 'essentially stationary elements' of wind turbines (i.e. tower and nacelle). Bird and bat collisions with stationary objects are relatively rare. Consequently, the risk posed by towers and nacelles is generally considered to be 'negligible'.

The main problem relates to the risk of birds and bats colliding with moving rotor blades. The tips of the blades generally rotate at speeds between 200 and 300 km/h, meaning that there is a high risk of mortality if animals do come in contact with them while they are moving. However, most modern wind turbines consist of three rotor blades that are between 30 and 45 metres in length attached to towers that are generally between 65 and 100 metres tall. As a result, there is a considerable amount of space between the rotors, which reduces the risk of

collisions. Notwithstanding the extent of the space between the rotor blades, bird and bat strikes do still occur. Most of the available evidence, which is relatively limited, suggests that the mortality rate for birds and bats from wind turbine collisions is low – typically less than five birds and five bats per turbine per year

Scottish Natural Heritage Guidance note describes a methodology for assessing in full the impact of wind farms on ornithological interests, taking account of each of these effects[8]. The methodology includes a two-stage process for the assessment of collision risk.

No-avoidance collision risk calculation aims to estimate the number of bird collisions over a period of time such as a year. The calculation proceeds in two stages:

Number of birds colliding per annum = number flying through rotor (Stage 1) x probability of bird flying through rotor being hit (Stage 2) – fig 1 and 2.

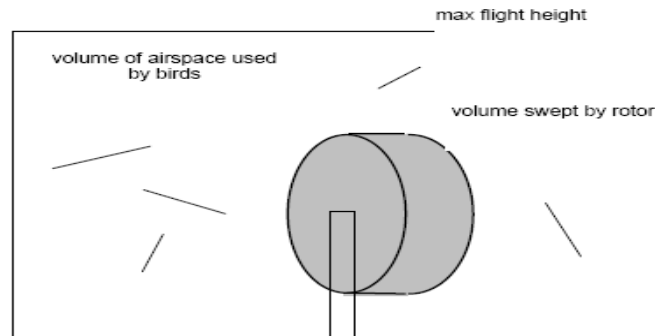


Fig 1. - Birds using wind farm space[8]

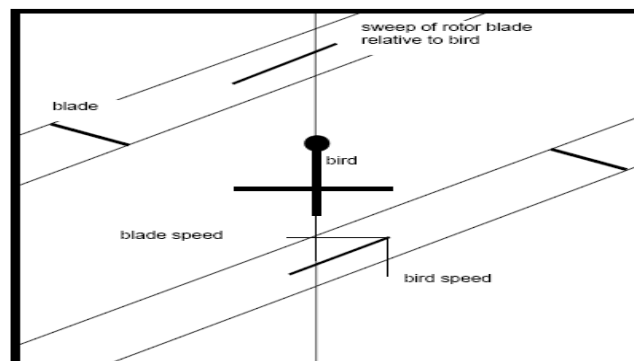


Fig. 2: Collision risk flying through rotor [8].

Although the number of deaths is likely to be relatively small, bird and bat mortality from collisions with wind turbines is an issue that should be considered with all wind farm proposals. The major causes of human-related mortality are vehicle collisions (50 deaths), poisoning (40), electrocution (32), collisions with

wires and fences (30) and shootings (20). This is illustrated by US study that found that wind turbine collision deaths 'probably represent from 0.01% to 0.02% (i.e., 1 out of every 5,000 to 10,000 avian fatalities) of the annual avian collision fatalities in the United States' The researchers concluded that the greatest causes of collision mortality amongst birds in the US were buildings, windows, vehicles and powerlines[5-7].

3.3.Behavioural disturbance

There is some evidence that the behaviour of certain bird species can be affected by the construction and operation of wind farms. In most cases, this has involved a small number of species avoiding the area around wind turbines and, as a consequence, being displaced from important habitats As with the risk of collisions, the nature and significance of the behaviour-related risks associated with wind farms will vary considerably depending on the location and the species involved. Provided wind farms are sited and managed appropriately, the behaviour-related risks will generally be negligible.

4. The environmental assessments of the implications of the plan or project for the site

The preliminary assessment of the impacts of a plan or project on the site, enables the competent national authorities to arrive at conclusions regarding the consequences of the initiative envisaged in relation to the integrity of the site concerned. If these conclusions are positive, in the sense that no reasonable scientific doubt remains as to the absence of effects in the site, the competent authorities can give their consent on the plan or project. In case of doubt, or negative conclusions, the precautionary and preventive principles should be applied. The text of Article 6.4 of the Habitats Directive said: "If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest". This provision forms part of the procedure of assessment and possible authorisation, by the competent national authorities, of plans and projects likely to affect a SAC, a SPA or a SCI[2,3].

The decision to go ahead with a plan or project must be documented that:

1. The alternative put forward for approval, is the least damaging for habitats, for species and for the integrity of the Natura 2000 site, regardless of economic considerations, and that no other feasible alternative, exists that would not affect the integrity of the site.

2. There are imperative reasons of overriding public interest, including 'those of a social or economic nature'.

Taking into account the precautionary principle and applying a preventive approach might also lead to the decision not to proceed with the plan or project.

Appropriate assessments of the implications of the plan or project for the site concerned must precede its approval and take into account the cumulative effects which result from the combination of that plan or project with other plans or projects in view of the site's conservation objectives. This implies that all aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those objectives must be identified in the light of the best scientific knowledge in the field [9].

Assessment procedures of plans or projects likely to affect Natura 2000 sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity.

In line with the need to prevent undesired impairment to the Natura 2000 network, the thorough revision and/or withdrawal of a proposed plan or project should be considered when significant negative effects on the integrity of a site have been identified. This should be observed especially in the case of effects on priority habitats and/or species protected under the Habitats Directive [2] or globally endangered bird species listed in Annex I of the Birds Directive [3]. The competent authorities have to analyse and demonstrate first the need of the plan or project concerned. Thus, the zero option should be considered at this stage. In the absence of alternative solutions - or in the presence of solutions having even more negative environmental effects on the site concerned, with regard to the above-mentioned conservation aims of the Directive - the competent authorities have to examine the existence of imperative reasons of overriding public interest, including those of a social or economic nature, which require the realisation of the plan or project in question. The compensatory measures constitute measures specific to a project or plan, additional to the normal practices of implementation of the "Nature" Directives. They aim to offset the negative impact of a project and to provide compensation corresponding precisely to the negative effects on the species or habitat concerned. The compensatory measures constitute the "last resort". For instance, if an SPA which has a specific function to provide resting

areas for migratory bird species in their way towards the north is negatively affected by a project, the compensatory measures proposed should focus on the specific function played by the site. Therefore, compensating with measures that could recreate the necessary conditions for resting of the same species in an area out of the migratory path or within the migratory path but far away would not be sufficient to ensure the overall coherence of the network. In this case, compensation should provide for suitable resting areas for the targeted species correctly located in the migratory path so that they will be realistically accessible to the birds which would have used the original site affected by the project.

In order to ensure the overall coherence of Natura 2000, the compensatory measures proposed for a project should therefore: a) address, in comparable proportions, the habitats and species negatively affected; b) provide functions comparable to those which had justified the selection criteria of the original site, particularly regarding the adequate geographical distribution. Thus, it would not be enough that the compensatory measures concern the same biogeographical region in the same Member State. Compensatory measures under the Habitats Directive must be established according to reference conditions that are defined after the characterisation of the biological integrity of the site likely to be lost or deteriorated, and according to the likely significant negative effects that would remain after mitigation. Biological integrity can be defined as all those factors that contribute to the maintenance of the ecosystem including structural and functional assets. In the framework of the Habitats Directive, the biological integrity of a site is linked to the conservation objectives for which the site was designated as part of the Natura 2000 network. As an example, in designing compensation, clear objectives must be established:

- Identify the total numbers of species affected
- Identify the principle species affected and the broad proportion of the total population(s) that these occur in;
- Identify the principle function(s) of the habitats that will be adversely affected that the species depend on e.g. feeding, roosting, etc;
- Identify the likely populations of species and the habitat functions at favourable conservation status;
- Identify the measures needed to offset the damage to the habitat functions and species affected so that they are restored to a state that reflects the favourable conservation status of the area affected.

Compensatory measures must be feasible and operational in reinstating the ecological conditions needed to ensure the overall coherence of the Natura 2000 network (i.e. the ecological structure and functions impaired and the habitats and species involved). The estimated timescale and any maintenance action required to enhance performance should be known and/or foreseen right from the start in view of the implementation of the measures. The competent national authorities

have to inform the Commission of the compensatory measures adopted. The information about compensatory measures must enable the Commission to appreciate the manner in which the conservation objectives of the site in question are pursued in the particular case.

6. Conclusions

Relatively little research has been done on the risk of bird and bat collisions with wind turbines in Romania. This makes it difficult to estimate the likely number of collision related deaths at wind farms.

All plans, programs and projects to be carried out in Nature 2000 sites or in their neighbourhood have to be assessed from environmental impact viewpoint. If an investor will want to conduct an economic activity in Nature 2000 site, he will be able to do so, only if he proves through an environmental rapport that this activity is not harmful for species and habitats from this site.

The authorisation, by the competent national authorities, of plans and projects likely to affect a Special Area of Conservation (SAC), a Special Protected Area (SPA) or a Site of Community Importance (SCI) can only be granted to plans or projects not affecting the integrity of the site(s) concerned. On the other hand, its concrete application has to be done in the respect of the various steps provided for and in the sequential order established by the Directive Habitats.

When wind farms are properly sited, a small number of animals and plants are still likely to be adversely affected, but these impacts must be put into perspective and weighed against the threat posed by climate change. Consequently, while care should be taken in the siting and operation of wind farms, the risks to biodiversity should not be exaggerated and must be weighed against the potential for wind farms to contribute to reducing the severity of the impacts of climate change.

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