

LAW REGULATIONS ON ENVIRONMENTAL PROTECTION AS PRECONDITION FOR INSTALLMENT OF WIND POWER PLANT ON THE TERRITORY OF THE FEDERATION OF B&H

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ABSTRACT

Adequate measuring of wind characteristics and determining its potential began in Bosnia and Herzegovina in 2002. This measuring has proven that there were many suitable sites for building wind power plants in this region.

Current law regulations of Federation of Bosnia and Herzegovina which deal with the area of the environmental protection and are related to the wind power plants should be adjusted to the regulations of the EU countries. This project explains the current regulation on wind power plants of Federation of Bosnia and Herzegovina, and it gives some suggestions on its possible improvement.

Keywords: wind power, law regulation, environment, Bosnia & Herzegovina

1. INTRODUCTION

According to the law on the environmental protection and the regulation on plants and machinery which need prior testing of their influence on environment, wind farms can be built and used only if they are granted environmental approval, [1,2]. The fact is that there are only two legal regulations in Federation of Bosnia and Herzegovina (FB&H) which mention machinery for the consumption of wind power. Such undefined regulation in this area could raise certain confusion and possibly make the implementation of similar projects very difficult. For these reasons, it is necessary to revise the law regulations of EU countries experienced in this field, and thus complete the missing regulations in our legal system.

2. PUBLIC RELATION TOWARDS WIND ENERGY

In Europe, the wind energy has been used as means of mechanical power; in other words, 700 years ago wind was used as the power source for pumps and wheat mills. This old machinery can be found across Europe even today, though these mills are mainly used as inns or tourist destinations.

As mentioned, permanent education and public awareness of restrictions and devastation caused by the combustion of fossil gas have set the need for renewable sources of energy (especially the energy of wind) as proposal acceptable for the local community. If other useful effects were added, e.g. building local infrastructure, the uniqueness of the area, tourist attraction, ownership structure, etc, then it could be said that the conditions of the society were satisfied, and the public would happily accept the idea of the wind power plants. This fact can be proven with the research done in some EU countries (Spain, the United Kingdom, Denmark and Sweden) where the society is more interested in consumption of wind energy than of other sources of renewable energy.

In Denmark, where in January 2007, 38% of its total energy requirements was satisfied by the wind power plants, about 150 000 families own windmills or shares in the companies dealing with the production of the electricity from the wind power plants.

3. ENVIRONMENTAL FACTORS AND INFLUENCE OF WIND ENERGY UTILITY

If we carefully examine the influence of wind-farms on the environment, we can assume that there could be certain negative influence on the environment, such as: visual, fitting into the landscape, noise, rotating shades, influence on birds, etc. Some of these effects will be further discussed.

The environment could be more or less sensitive on changes. Beside its natural characteristics, visual perception is determined by the cultural tradition, together with the economic situation of the landscape 'user'. Modern wind power-stations are units of enormous dimensions, [3,4], which are built on the sites with good wind characteristics for the economical reasons. The high, tops of hills, flat and even surfaces are very often the most suitable sites for their settlement, and so are some other locations. Due to the dimensions and rotating hands of the wind power-stations, they are easily spotted on these locations and thus represent the new dominant element of the landscape which must be carefully planned in the process of projecting. Visual impression of the wind power-stations causes the subjective reactions of their viewers. This mostly depends on the acclimatization period, similarly to the buildings, high tension lines, bridges and other architectural achievements. In the process of planning of wind farms, the possibilities of visual animation should be considered by the means of specialized programs, [5,6].

Every living creature reacts differently on the sounds in their environment. In terms of the sound characteristics, this influence can cause some unwanted effects on fauna and humans inhabited in the area of the noise emitters. Research on noise influence on humans is studied enough to define the specific environmental protection criteria that would follow modern systems in designing technical products. Sound influence and its characteristics on the wide range of species is still to be examined and legally defined, in order to protect the life balance in nature. Sounds affect humans through the sense of hearing. Subjective sense of hearing helps man detect sounds through its three features: tone pitch, timbre and intensity. Naturally, the noise is produced when building wind-farms. The sources of this noise in the process of building are transportation, machinery, possible mining at the location, etc. This noise is temporary, and it should be seen as such, as this work is done during the work hours.

The noise from the windturbine itself depends on many factors (the characteristics of equipage, territory type, distance from the source, etc). If we can say that this was the problem for the first generation of the windturbines, then this kinds of problem are certainly minimized, [7]. Figure 1 shows the characteristics of the sound levels for one kind of the windturbine as primarily selected.

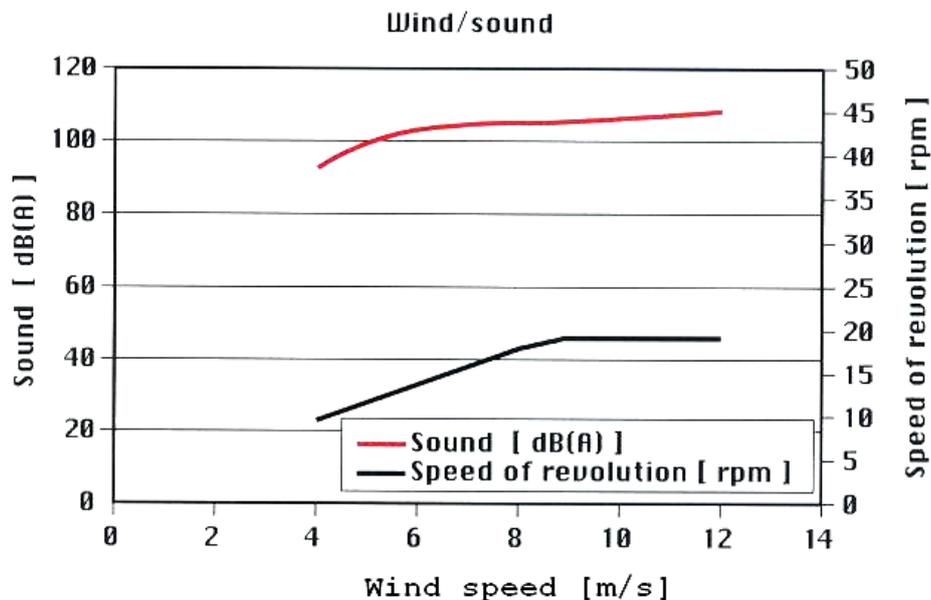


Figure 1. The relationship between wind and sound levels and speed revolutions for turbine V80-2.0

Figure 2 represents the noise levels as they appeared on different occasions, so that we can carefully compare them. Here we can conclude that this problem is, conditionally said, exaggerated in the terms of their dimension.

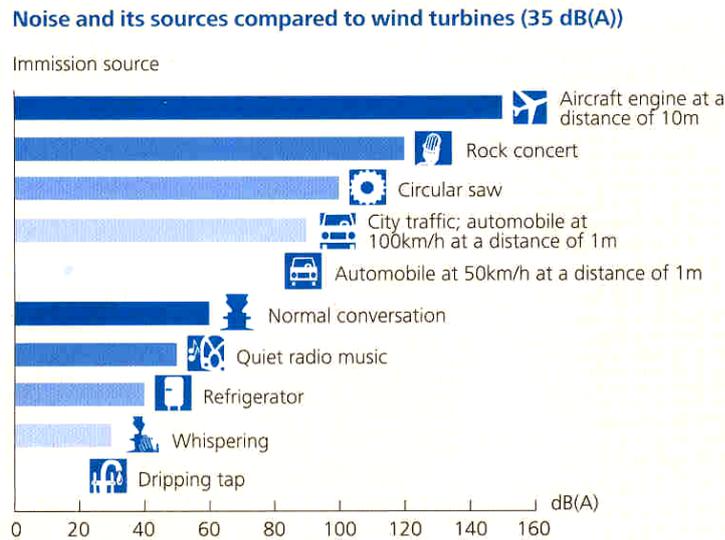


Figure 2. Comparing the different sources of noise

Legal and technical policy in the countries of EU regulate the techniques of measuring the noise and its levels, [8,9], as well as the minimal distance from the wind-turbines. While projecting wind-farms, certain simulation models for programming were of great help for determining the level of noise, e.g. [5,6].

Influence of the wind parks on birds depends on the territory and its conditions. They are more related to the overlapping or the migration interruption than to disturbance or influence on their habitat or eco-system. For the past 20 years, a numerous explorations have been studied on influence of wind parks on birds in Germany, Denmark, Spain, the USA, etc. These studies show that the bird death risk caused by the crashing into the wind-turbines is relatively small. For example, it is estimated that around 33 000 birds is annually killed due to the work on wind-turbines in the USA, average of 2.2 accidents for each 15 000 turbines. Studies in Spain show that there is annually 0,13 dead birds per turbine. For the sake of comparison, it is estimated that in the USA around 100 and 1 000 million birds die each year as the result of the crashing into the vehicles, buildings, high tension lines and other structures, whereas the wind power-station is responsible for less than 1 on each 10 000 bird accidents. Of all the bird life-threats situations across the globe, 99% is closely related to the human activity, and that is the most serious cause for their habitation loss.

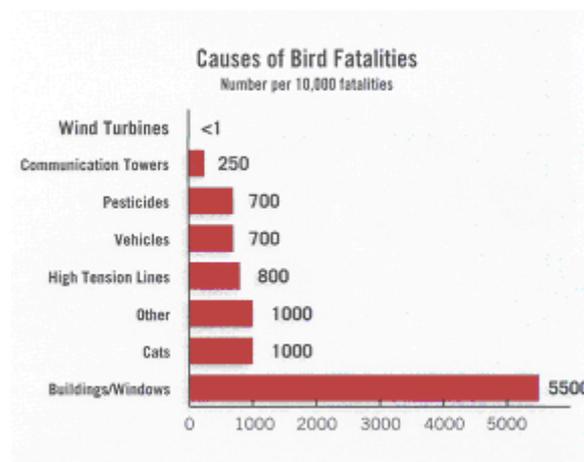


Figure 3. Causes of bird accidents[10]

Figure 3 shows the causes of bird mortality according to [10]. Anyhow, wind power-stations, just as any other constructions or mega-structures should not be built where the bird habitation is located. As far as height is concerned, the bird migration takes place on relatively higher altitude, so the wind

power-station should not be on their way. The rest depends on the bird adaptation on the new object in site, as well as on other constructions. It is recommended to fulfill the conditions set by the ornithology experts for the monitored area.

4. CONCLUSION

Measuring the wind characteristics in Bosnia and Herzegovina have shown that there are good conditions for wind parks building on certain locations.

Considering the current law regulations, it can be concluded that it is possible to implement many wind power station projects. Nevertheless, the political arrangement of Bosnia and Herzegovina has caused the conditional and complicated procedures for realizing these projects. Added to this, current regulations need to be familiarized with the positive acts from the EU.

This equally deals with the fields of environmental protection that are related to the wind power-stations in Federations of Bosnia and Herzegovina.

5. REFERENCE:

- [1] Zakon o zaštiti okoliša (*Regulation on environmental protection*), Sluzbene novine FBiH 33/03
- [2] Pravilnika o pogonima i postrojenjima za koje je obavezna procjena uticaja na okoliš i pogonima i postrojenjima koji mogu biti izgrađeni i pušteni u rad samo ako imaju okolinsku dozvolu (*Regulation on plants and machinery which need evaluation of their influence on environment and plants and machinery can be built and used only if their environmental approval is granted*), Sluzbene novine FBiH 19/04
- [3] www.vestas.dk
- [4] www.enercon.de
- [5] www.emd.dk
- [6] www.resoft.co.uk
- [7] Noise from Wind Turbines, British Wind Energy Association, available at www.britishwindenergy.co.uk/ref/noise.html
- [8] IEC 61400-11: Acoustic noise measurement techniques
- [9] IEC 61400-14: Declaration of apparent sound power level and tonality values
- [10] Erickson, et.al, 2002. Summary of Anthropogenic Causes of Bird Mortality
- [11] M. Behmen, E. Zlomušica, F. Čatović, E. Sarač, "Environmental Factors of Wind Energy Usage – Noise Emission", 10th International Research/Expert Conference "Trends in the Development of Machinery and Associated Technology", TMT 2006, Barcelona-Lloret de Mar, Spain, 11-15 September, 2006.
- [12] www.ewea.org
- [13] Van Kuik G., Ummels B., Hendriks R: Perspectives of Wind Energy, Proceedings of International Conference Advances in New and Sustainable Energy Conversion and Storage Technologies, Dubrovnik 2006, p. 61-79.
- [14] C. Ender: International Development of Wind Energy Use – Status, DEWI magazin August 2006, nr. 29, p. 38-44.
- [15] Zlomušica E., Behmen M.: Methodological approach to the selection of wind farm location, 12th International Symposium on Power Electronics-Ee 2003, Novi Sad, Serbia & Montenegro, 2003.,
- [16] Behmen M., Zlomušica E., Čatović F.: The Influence of Electro-Supply Capacities on the State of the Environment in B&H, Status and Perspectives, 8th International Research/Expert Conference Trend in the Development of Machinery and Associated Technology-TMT 2004, Neum, Bosnia and Herzegovina, 2004.
- [17] Čatović F., Behmen M., Zlomušica E., Trends in the development of the electric power systems based on wind energy in world and in Bosnia and Herzegovina, Journal of Environmental Protection and Ecology-Official Journal of the Balkan Environmental Association (B.EN.A), Vol. 5, No 4, 2004.
- [18] FP6 Project: South-East Europe Wind Energy Exploitation – Research and demonstration of wind energy utilisation in complex terrain and under specific local wind systems