DTBird system Pilot Installation in Sweden. Possibilities for bird monitoring systems around wind farms. Experiences from Sweden's first DTBird installation. Ecocom AB. 21-12-2016

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Pilotinstallation av DTBird-systemet i Sverige Möjligheter med skyddssystem för fågelfaunan vid vindkraftanläggningar – erfarenheter från Sveriges första installation av DTBird. *Ecocom AB. 2016-12-21)*

Report´s summary translated to English by DTBird.

Summary

DTBird's monitoring system is used today on wind turbine farms in a number of European countries but to date, DTBird installations and similar technical systems have not been used in Sweden.

In order to keep pace with continual investment in renewable energy in Sweden – where wind power is widely used – it is all the more important to look at the possibilities on offer to reduce the effects of wind turbines on avifauna. Against the problematical background that wind turbines kill birds, in 2015 Ecocom, in collaboration Vindform, initiated a pilot project 1) to install and showcase the DTBird system, and 2) to evaluate how the DTBird system performs under Swedish conditions. Part 1 of the project comprised a presentation and seminar on two occasions in Lundsbrunn during the course of 2015, where wind turbine designers, authorities and law practitioners were invited. Part 2 of the project, that comprises evaluation of the pilot installation, is reviewed in this report.

Within the framework of the pilot project, a DTBird System[1] was set up at a wind turbine near Lundsbrunn in Sweden. During July-September 2015, i.e. during the breeding and migration period of birds, data was collected from the system to be subsequently analysed.

Testing recorded how effective the DTBird system was in warning away birds from the wind turbine and therefore from the collision risk area, from how far away the warning sound can be heard and whether the installed system on the wind turbine in Lundsbrunn was observed to disturb breeding birds or was deemed to have a negative effect by local residents. The total system activation time has also been recorded and therefore energy production loss that wind turbine stoppages would have led to.

1 *DTBird note: The DTBird model installed was DTBirdV4D4 of 2015, that was upgraded in 2016. Currently new models specially designed for large on&offshore wind turbines are in the market: DTBirdV4D8 and DTBirdV8D10.*

The pilot installation indicates the following results:

• The system is viable for bird detection and enables species identification of large and medium-sized birds.

• The system offers effective protection above all for large birds by reducing their dwell time in the risk area between 61-87%.

• The system triggers avoidance behaviour in 88% of cases where the bird is on a collision course with the wind turbine. An individual observation was performed for the White-tailed Eagle (*Haliaeetus albicilla*) where the avoidance behaviour was noted as well.[2]

• In an area beyond 100 metres from the wind turbine, it was not possible to observe any negative changes in the bird activity during the study period.

• The system's warning sounds were activated for 4 minutes and 45 seconds per day on average. The average duration of a single warning sound was 22 seconds for a warning sound and 32 seconds for a discouraging sound.

• The theoretical range of warning sounds is strongly affected by the topology around the installation site. The limit for 40 dBA does not exceed 750 metres from the sound emitter in most topological scenarios. This concords well with the sound perceptions of local residents over more than a year.

• Out of nine interviewed local residents within one kilometre of the wind turbine, four persons interviewed had heard the warning sound on a few occasions while outdoors. None of the interviewees had perceived this as disturbing. However, one person had indicated that heard the sound frequently, even indoors, and had found the sound irritating.[3]

• If the DTBird system had been connected to the wind turbine's SCADA system, the wind turbine would have been stopped for 2 hours and 32 minutes in total during the 61 days over which testing took place.[4]

The pilot test shows that DTBird works under Swedish conditions and is in line with test results that the manufacturer (Liquen) has previously published. The installation of DTBird does not offer 100% collision protection for avifauna, but results in a sharp risk reduction.

As early as in phase 1 of the pilot project, i.e. during the seminars, the question of whether DTBird system's warning sounds could risk disturbing breeding birds and consequently not be admissible as laid down in the Swedish Species Protection Ordinance was addressed. The pilot study has indicated that any such disturbance is not the case. According to a decision by the Swedish Land and Environment Court of Appeal, admissibility for protective measures shall also be tested within the framework of environmental testing, and not directly in relation to the Swedish Species Protection Ordinance.

The DTBird system, and other similar systems, are therefore admissible as a protective measure within the framework of the authorization process for wind farms. The use of operational protective measures should open up ways in the authorization process to facilitate both the application and authorization phases. Arbitrary buffer zones to protected species´ nests are presently used as the only protective measure despite the fact that such a measure is oversimplified. DTBird and similar systems constitute a tool with which buffer zones can be adapted.

2 *DTBird Note. Link to the* White-tailed Eagle avoidance flight.

3 *DTBird Note: During the testing period DTBird system operated without wind turbine's SCADA connection, thus not accomplishing the Collision Avoidance module service specification "sounds are emitted at standard volume only when the wind turbine is in operation, and no sound or lower level is emitted when the wind turbine is not operating". If there is no wind, the ba<ckground sound level is at its lowest, and the emission of DTBird sounds at that time could be perceived by residents in a higher degree. DTBird kind of sound, emission levels and emission protocols can be changed at any time remotely.*

4 *DTBird Note: Referred to the virtual operation of DTBird Stop Control module, that did not operate during the test and which efficiency was not tested due to lack of connection with the wind turbines´ SCADA.*

DTBird can also be used to perform bird surveys – especially in those cases where long time series of data are of importance – or in those cases where the location of wind farms is decided in advance. Such scenarios are likely to become in the future when many of today's wind turbine installations shall become next generation or when applying for new authorizations for existing wind turbines.

Lastly, technical systems for monitoring avifauna constitute a standardized method for data collection. This implies not only having the capacity to follow wind farms' effects over time in a better way than performed at present, but also to create the preconditions to establish operational control protocols – i.e. to adjust management of wind turbine production based on factual local conditions.