PO.346

Worldwide standard for automatic bats & birds mortality monitoring

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Abstract

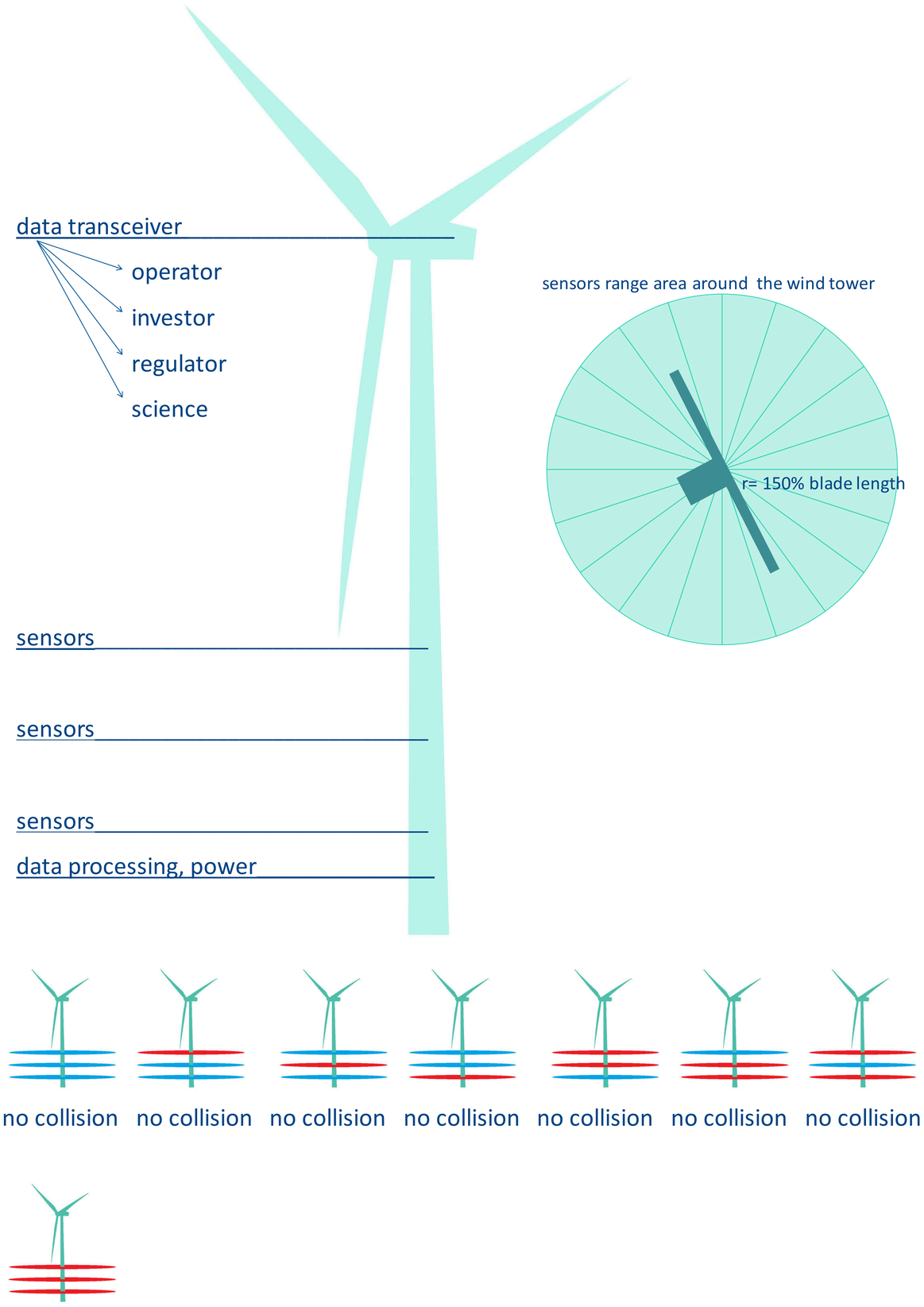
Bats & birds mortality monitoring for wind farms are founded on inaccurate methods [4]. Moreover, sketchy input data are the basis for mitigation measures such as temporary switching off. This kind of solutions can reduce up to 3% of annual power productivity [1]. The mortality monitoring methods without full efficiency and clarity, open doors for ambiguity, subjective risk assessment and application by regulators the precautionary principle. Wind power industry urgent needs transparent mortality monitoring method, separate from human mistakes and external factors. Sensors cover this demand of 100% efficient mortality monitoring. Sensors have all requirements to be a global standard in bats & birds mortality monitoring, especially on offshore projects.

Objectives

We would propose breakthrough solution for knock-out from wind power sector unclear monitoring methods based on ground searching or limited technical methods, and give the industry simple, automatic, universal, worldwide, onshore and offshore ready, transparent tool for bats & birds mortality monitoring. The device functioning is based on the principle of sequenced readings of the animals flight across several zones of sensors. The killed animals always fall onto the ground at specific, defined parameters. Algorythms distinguish their fall from the flight of a live animal based on their flight's different parameters. The results are reporting automatic to users phone or computer with details like time of collision and GPS location of victim on the ground [3]. Sensors based mortality monitoring has the accuracy, simplicity and transparency to become global standard.

Methods

How do sensors around tower work?



Results

Comparison of bats & birds mortality monitoring methods.

	method						
human / automatic							
category							
factor							
	1	2	3	4	5	6	7
day operation	YES	YES	YES	YES	YES	YES	YES
night operation	YES	YES	NO	YES	YES	YES	YES
day species identification	YES	YES	YES	NO	NO	NO	YES
night spec.identification	YES	YES	NO	NO	NO	NO	YES
searching support	NO	YES	NO	NO	NO	YES	YES
victims location	YES	YES	NO	NO	NO	YES	YES
weather influence	YES	YES	YES	NO	NO	NO	NO
observer influence	YES	YES	NO	NO	NO	NO	NO
analyst influence	YES	YES	YES	YES	NO	NO	NO
vegetation influence	YES	YES	NO	NO	NO	NO	NO
scavenger influence	YES	YES	NO	NO	NO	NO	NO
time-consuming	YES	YES	NO	YES	NO	NO	NO
efficiency	5-80%[2]	70-80%[5]	<50%[3]	>50%[3]	>50%[3]	100%[3]	100%[3]
barotrauma ready	YES	YES	NO	YES	NO	YES	YES
offshore operation	NO	NO	YES	YES	YES	YES	YES
automatic online report	NO	NO	NO	NO	YES	YES	YES
standard	NO	NO	NO	NO	YES	YES	YES
results compared	NO	NO	NO	NO	YES	YES	YES
TOTAL STRENGTHS	6	7	7	8	12	16	18
TOTAL WEAKNESSES	12	11	11	10	6	2	0

Conclusions

Bats & birds mortality monitoring methods can be grouped into three categories consider the human and technology engagement:

Traditional victims search (**method 1, 2**) is based on human fieldwork and lab work without automatic devices. This group, most common on onshore projects, has numerous weaknesses howewer is the only sure way to identify species.

The camera recording methods (**method 3, 4**) are supported by human work in analytical matters but generally the recording is automatic. Some applications can identify medium and large size birds species but only during the day with good weather conditions. Collision identyfication is not the main application of this group of method.

Sensors (**method 5, 6, 7**) are totally automatic and in that way input and output have standard attributes. There is no human impact on the monitoring results and no human work engagement in the field (**method 5, 6**). The only weaknesses of sensors is lack of species identyfication. They are incomparably more effective than any other method and are the only effective solution for offshore monitoring. Tower sensors (**method 6, 7**) are better than blade sensors, because of detection of barotrauma victims, higher efficiency and support for searching (**method 7**) through victims localization.

Species identyfication is secondary problem in mortality assessment. The first question is annualy mortality number per turbine. Tower sensors (**method 6, 7**) are the simplest way to automatic mortality monitoring and, thanks to victims localization, radically reduce time and costs of searching on ground (**method 7**). Information collected by sensors during long time and worldwide, correlated with data like time, weather conditions or moonlight phase, can precisely identify factors affected the mortality risk. Onshore projects can implement sensors methods (**5, 6**) as a standard, supported by searching (**method 7**), when species identyfication is necessary. Sensors seems to be the only effective way of mortality monitoring on offshore projects.

References

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