BAT SPECIALISTS STATEMENT ON BAT FATALITY MITIGATION PLAN AT KIYIKÖY WIND FARM

Kiyiköv Wind Farm presented high levels of bat fatality in 2019 (Boyle, 2019). Based on those findings, the Biodiversity Action Plan (BAP) set the following mitigation measure: "*adjust the wind turbine cut-in speed (the speed at which turbines start producing electricity) to 5 m/s for the 10 existing wind turbines with highest bat mortality between April and October (from sunset to sunrise) until the results of further monitoring studies will allow to define more specific measures in terms of turbines involved, periods and cut-in wind speed*". This general approach was defined as a precautionary measure, as several studies shows that this measure is effective in reducing bat fatality (Arnett *et al.,* 2013). However, the fatality reduction is not consistent among studies and shows high variation, ranging from **50% to 72%** mean reduction.

The determination of more specific mitigation measures requires an extensive database regarding bat activity at height as it is crucial to monitor bat activity where they are exposed to collision, i.e. at nacelle height and in the area within blade swept range. The relation between bat activity at height and fatality data will allow the identification of the periods when bats are more at risk. This information is essential to set mitigation measures that guarantee that turbines are not operational on those periods. For instance, recent studies using smart curtailment models (Hayes *et al.,* 2019) can reduce fatality on average of 85%. Others are applying turbine-specific curtailment algorithms (Behr *et al*., 2017), that increase the chances of achieving higher effectiveness in mitigation comparing to the current mitigation as well as lowering production losses. However, the applications of these studies require proper and extensive data on bat activity at height data that is not available for the site yet.

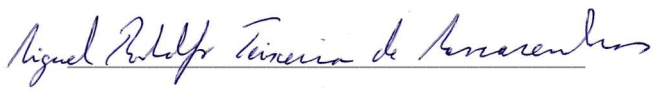
Bioinsight was appointed by the project owner, Borusan EnBW Enerji, to perform a study and gather the necessary data during the year 2020 and assess mitigation alternatives, including turbine-specific curtailment algorithms, to increase mitigation effectiveness for the following years. The study requires that seven automatic bat detectors are installed in the nacelle to continuously monitor bat activity within the risk area of the turbine. The observed bat activity is then related with estimated fatality for each turbine. However, turbines with bat detectors must not have any mitigation measure otherwise is not possible to establish the relation, as it will be biased, and the models will not be able to correctly predict the periods when bats are at risk of collision. Considering this, the defined mitigation in the BAP for 2020 poses limitations to the study and reduce the chances of adjusting these algorithms to the full extent possible. Hence, decreasing the possibility of achieving higher mitigation efficiency and greatly reduce fatalities in the long term.

Consequently, the mitigation set in the BAT needs to be adjusted to fulfil the needs of this study. This involved reducing mitigation during 2020 from 10 turbines with curtailment to 7 turbines. This will allow to have 7 turbines where the study could be performed, including turbines with low, medium and high levels of mortality.

Adjusting the current curtailment plan for 2020 will provide better data for the analysis and increases the chances of curtailment effectiveness in the following years. Thus, it will **protect more bats in the long term**,

even though it reduces mitigation effectiveness in 2020. That is why this change was considered as a good trade-off between 2020 biodiversity net loss and the following year's net gains.

Signed on this 29th of April 2020, on behalf of Bioinsight Ltd.



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