Wind energy or biodiversity? How stakeholders evaluate the green-green dilemma – and how solutions can look like

The replacement of fossil and nuclear energy sources for electricity production by renewables such as wind, sun, water, and biomass is a cornerstone of Germany's energy policy. Wind energy production is the most important sector among all renewable energy sources. However, energy production from wind is not necessarily ecologically sustainable. It requires relatively large areas for installation and operation of turbines, and bats and birds die after collisions with rotors in significant numbers. For these reasons, wind energy production often operates in direct conflict with the legal protection of endangered species. The almost unanimous opinion of experts from authorities, environmental NGOs and expert offices is that existing mechanisms for the protection of bats in wind power projects are insufficient. This is one conclusion from a survey by the Leibniz Institute for Zoo and Wildlife Research (Leibniz-IZW) published in the "Journal of Renewable and Sustainable Energy".

More than 500 representatives of various expert groups involved in the environmental impact assessment of wind turbines took part in the Leibniz-IZW survey. This group included employees of conservation agencies and authorities, representatives of non-governmental organisations in the conservation sector, consultants, employees of wind energy companies and scientists researching renewable energies or biodiversity. The survey targeted at beliefs and assessments on the contribution of wind energy to energy system transformation, on ecologically sustainable installation and operation of wind turbines, and on possible solutions for the green-green conflict between tackling climate change and protecting biological diversity.

"We found both significant discrepancies and broad consensus among participants," states PD Dr Christian Voigt, department head at Leibniz-IZW and first author of the survey. "The overwhelming majority of respondents certified a direct conflict between green electricity and bat protection. Most importantly, they considered the protection of biodiversity to be just as important as the contribution to protect the global climate through renewable energy production." The majority of expert groups agreed that losses in the yield of wind power plants caused by consistent application of conservation laws both in electricity production and in financial terms, must become acceptable. Additionally, shutdown times in electricity production must be compensated. "We will probably have to accept a higher price of green electricity for the purpose of effective nature conservation in order to compensate for the

shutdown times of wind turbines," Voigt sums up. "However, this still leaves us with the unsolved issue of how to deal with habitat loss, especially when wind turbines are placed in forests, in order to achieve an ecologically sustainable energy production".

The conflict between wind power projects and nature conservation has intensified in recent years because the rapidly rising number of windmills – now there are around 30,000 on the mainland in Germany – has made suitable locations scarce. As a result, new plants are increasingly erected where conflicts with wildlife are more likely, for example in forests. "According to members of conservation authorities, only about 25% of wind turbines are operated under mitigation schemes such as temporary halt of wind turbine operation during periods of high bat activity, for example during the migration season, at relatively low wind speeds, and high temperatures; even though the legal framework enforce the protection of bats," adds author Marcus Fritze of Leibniz-IZW. In addition, it became clear from the survey that members of the wind energy industry hold very different views on some aspects of the green-green dilemma compared to all other expert groups. "Representatives of the wind energy industry consider compliance with climate protection targets as more important than measures to protect species. All other expert groups disagree with this notion," said Fritze. "A consistent dialogue between all participants therefore seems particularly important in order to enable ecologically sustainable wind energy production."

The survey also showed that

- more than 95% of respondents consider the energy system transformation (“Energiewende”) to be important and all expert groups agreed on aiming for an ecologically sustainable energy transition,
- two thirds of the stakeholders from the wind energy industry shared the view that wind energy production should be promoted more strongly than energy production from other renewable sources, while 85% of the other expert groups disagreed with this, and
- 86% of the survey participants outside the wind energy sector gave green electricity no higher priority than the protection of wildlife, while only 4% of members of the wind sector shared this opinion (almost half were undecided or consider wind power to be more important than biodiversity protection).

For the purpose of this survey, the authors selected bats as representative for all animals affected by wind turbines, because large numbers of bats die at turbines, they have a high level of protection at national and international level, and therefore

play an important role in planning and approval procedures for wind turbines. Indeed, the high collision rates of bats at wind turbines may be relevant to entire bat populations. The Common noctule is the most frequent victim found at wind turbines; this species is rated as declining by the Federal Agency for Nature Conservation in Germany. At the same time, the results of many years of research in the department headed by Voigt at the Leibniz-IZW show that the losses affect both local bat population as well as migrating individuals. Thus, fatalities at wind turbines in Germany may not only impact bat populations in Germany, but also populations in other European regions where these bats originate from.

On the basis of the survey results, the authors plead for a stronger consideration of nature conservation objectives and for the targeting of biological diversity goals. To this end, they make proposals on how the cooperation of all those involved in the planning of wind power projects can be improved in line with the legal basis.

Publication

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