New study probes impact of blackened wind turbine blades

Joshua S Hill 7 February 2022 , Renew Economy https://reneweconomy.com.au/new-study-probes-effect-of-blackened-turbine-blades-on-bird-collisions/



Image: Vattenfall

Swedish power company Vattenfall has announced plans to embark on further research into whether painting one of the three blades on a wind turbine black can help to reduce the number of bird collisions, with a new three-year study.

Despite stories spread by some media outlets and across social media platforms, wind turbines have been shown to be much less likely to kill birds compared to other man-made obstacles and threats, including coal-fired power plants, as one prime example.

Nevertheless, Vattenfall is seeking to mitigate the impact wind turbines can have on bird populations through a new study in the Dutch seaport of Eemshaven.

Vattenfall will paint a single turbine blade black on seven wind turbines in an effort to determine whether this method can reduce the risk of birds colliding with turbine blades.

In a study already underway through the compiling of a baseline measurement through 2022, the seven turbine blades will be painted black in early 2023 and be monitored for two years through to the end of 2024.

The study will also assess aviation safety and the impact of the painted blades on the landscape.

The three-year assessment will follow the results of an existing study partly financed by Vattenfall on the island of Smøla in Norway which found that painting one wind turbine blade can result in 70% fewer collisions.

“That has to do with the way birds perceive the moving rotor of a wind turbine,” said Jesper Kyed Larsen, environmental expert at Vattenfall.

“When a bird comes close to the rotating blades, the three individual blades can ‘merge’ into a smear and birds may no longer perceive it an object to avoid. One black blade interrupts the pattern, making the blending of the blades into a single image less likely.”

Put another way, the researchers – who published their findings in the journal *Ecology and Evolution* in mid-2020 – concluded that “Provision of ‘passive’ visual cues may enhance the visibility of the rotor blades enabling birds to take evasive action in due time.”

Further, not only was the annual fatality rate was significantly reduced at the turbines with a painted blade by over 70%, relative to the neighboring control … turbines” but, for some birds – notably the white-tailed eagle – the black turbine blade seemed to ensure no fatalities whatsoever.

Vattenfall also completed a separate study in 2020 assessing the behaviour of specific birds in the vicinity of the Klim Wind Farm in North Jutland, in Denmark.

“The research showed that the birds studied were much better at avoiding colliding the wind turbines than expected,” said Jesper Kyed Larsen. “Well above 99% of the pink-footed geese and cranes flying in the area were able to avoid the turbine blades.”

“The area is an important natural area and quite extraordinary, as 20-30,000 pink-footed geese and several hundred cranes roost here,” said Jesper Kyed Larsen, speaking in 2020.

“Thousands of birds fly past the wind farm in both the morning and the evening during the winter period, which is why it’s so positive to learn that the birds fly around or over the turbines to such a great extent. Hardly any of them hit the turbines, and the figure is considerably lower than previously believed.”

This second study will seek to replicate the findings in a new location, as the Netherlands is home to other bird species and the landscape and meteorological conditions vary significantly from that of Norway.

“We are continuously looking at ways to reduce the impact of wind turbines on the environment, and we are therefore very excited to be part of this study at Eemshaven to better understand the potentials of the black blade measure in a Dutch context,” said Jesper Kyed Larsen.

“If we could find other ways of reducing collision risk to birds than temporarily stopping the turbines, and losing renewable energy production, that would of course be better for everybody.”

As mentioned, the study will also assess the visual impact of a black blade for humans, and whether the surrounding landscape would be demonstratively affected.

“Norway’s west coast is not known for its blue skies and sunshine,” says Bjarke Laubek, who is also an environmental expert at Vattenfall.

“On the contrary, it often has grey and rainy weather or days with mixed cover of often fast-moving clouds giving a very patchy illumination of the landscape and turbines within it. The black blades therefore hardly stood out in the landscape, no more than the grey blades in any case.

“The people living in the area didn’t seem to be too bothered by it, and the black-painted blades were therefore allowed to stay until the end of their lifespan instead of just for the duration of the research project. In the Netherlands, we have clear blue skies more often than in Norway.

“The light setting on the turbines is therefore different, but it is still difficult to estimate how noticeable the black blades will be in a Dutch landscape.”

Finally, the study will also assess the practical and financial impact on painting wind turbines black, such as whether the paint will affect durability and increase the need for maintenance.