GREEN–GREEN DILEMMA

Could painting a pattern on wind turbines make them safer for birds?

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Conservationists hope that a pattern on a wind turbine's blade may reduce the number of collisions with birds.

The climate emergency underscores the urgency of transitioning away from fossil fuels and towards renewable energy sources. However, these sources, such as wind energy, are not without their own environmental harm, a principal one being birds colliding with the spinning blades of the turbines. This wind turbine–wildlife conflict represents a green–green dilemma, where renewable energy is desirable but conflicts with conservation goals when birds die in collisions.

Blade patterning is one method that has been proposed to reduce the impact that wind turbines have on birds. The idea is simple: by patterning one of the blades you can increase the visibility of the spinning blades and thereby reduce the risk of collision. The concept is that patterning only one blade reduces 'motion smear', making the spinning blades more visible and thus more likely to be avoided.

So far this approach has only been formally tested at a single wind farm (in Norway), where just a few turbines were patterned. However, the results from this study, published by Roel May and colleagues in 2020, suggested blade patterning could significantly reduce bird mortality at wind farms. While the results were encouraging, considerable uncertainties remain about the effectiveness of blade patterning in southern Africa, given our different climate and species assemblages.

It is therefore paramount to establish whether blade patterning is effective in a South African context before it can be rolled out as a valid mitigation measure. With this in mind, we are about to embark on a large-scale experiment at a soon-to-be-built wind farm in the Eastern Cape. We hope this will be the first of many new wind farms to participate in a national experiment that aims to demonstrate whether blade patterning can reduce avian mortality rates. At this site, a third of the turbines (12) will be patterned with large red stripes and the remaining unpatterned turbines will act as the controls. Over the coming years, normal post-construction mortality monitoring will be carried out by means of regular searches for dead birds under the turbines. We will then explore whether fewer birds are found dead at the patterned turbines than at the unpatterned ones, establishing the effectiveness of this potential mitigation measure.

By patterning the turbines in the factory, the costs incurred by the developers are much lower compared to patterning the blades *in situ* on existing turbines. However, at a few operational wind farms where mortality rates have been particularly high, some blades are being patterned *in situ*. At one of these sites, the initial results already appear promising. We hope that by combining data from these sites with the data from this experiment, we can firmly establish the benefits of this approach. Other similar experiments are also taking place in Europe and North America, and it is hoped that in the next few years we will know for sure if this mitigation measure is successful.

We are currently urging developers who are in the early stages of constructing wind farms to join our experiment by patterning a blade on some turbines in what we hope will be a definitive national test of this mitigation method.

If successful, this approach could not only reduce bird fatalities, but also help expedite the approval and construction of wind farms in areas previously deemed too risky for bird populations. This would accelerate the shift to renewable energy in a coal-dependent country.

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Scan this QR code to view the Blade Patterning Guidelines published by BirdLife South Africa and the South African Wind Energy Association.

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