Faciliating timely and responsible development of wind energy

AMERICAN WIND WILDLIFE INSTITUTE 10 YEARS

while protecting wildlife and wildlife habitat

Technology Innovation

AWWI's cutting-edge work in Technology Innovation is a catalyst and expert forum for the development of advanced technologies to avoid and minimize the impacts of wind energy on wildlife. By advancing these critical solutions, AWWI's focus on technology innovation supports maximizing power production and facilitating the expansion of wind energy while improving conservation outcomes.

The Challenge: Verifying Results

Technologies can provide solutions to avoiding and minimizing risk from wind energy operation to wildlife. Yet the technologies available or being developed are few, and of those that have undergone independent testing, only limited results are available. Given the expense, time, and uncertainty associated with use of these technologies, regulators and wind energy companies are hesitant to use them without knowing their effectiveness. Testing technologies at multiple facilities will verify effectiveness in diverse environmental conditions, and establish statistically robust data from which to draw conclusions.

The Approach: Technology to Minimize Impacts

Technologies can avoid or minimize wildlife collisions with wind turbines through one or more of the following components:

- **Detect** approaching wildlife using cameras, radar, thermal imaging, or acoustic monitoring with sophisticated software or artificial intelligence.
- **Curtail** (automatically shut down) wind turbines when risk of collision is determined to be high for key species based on environmental factors or based on detection by a detection technology.
- **Deter** wildlife from approaching or draw the animal's attention to the turbine by deploying audible or visual deterrent signals.

The Solution: Technology Innovation and Verification

AWWI engages with researchers to conduct scientific evaluations of emerging and available technologies at commercial wind energy facilities, raises project funding, and oversees the design and execution of the tests to ensure that results can be compared across multiple projects and are scientifically rigorous. AWWI:

- Promotes transparency by ensuring test and evaluation results are peer-reviewed and made public by publishing results in scientific journals.
- Coordinates with the U.S. Fish & Wildlife Service and state wildlife agencies to ensure evaluations are carried out with their insights and input considered.

By pooling resources and expertise from wind industry partners, AWWI can coordinate and replicate rigorous verification studies, leading to more rapid and widespread adoption of successful technologies.

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Completed Evaluations

- **UV light as a potential deterrent for raptors (2014)**: Results published in the *Journal of Raptor Research* September 2015.
- **Proof of Performance (POP) test of the IdentiFlight system, an automated camera-based detection system (2017):** Results will be available soon.
- **Commercial-ready raptor detection-deterrent system (2017):** Results will be available soon.

Current Evaluations

DOE-Supported Eagle Technology Projects:

In 2017, AWWI was awarded funding from the U.S. Department of Energy to evaluate two eagle impact minimization technologies:

- IdentiFlight, an eagle detection and smart curtailment system
- DTBird, an eagle detection and deterrent system

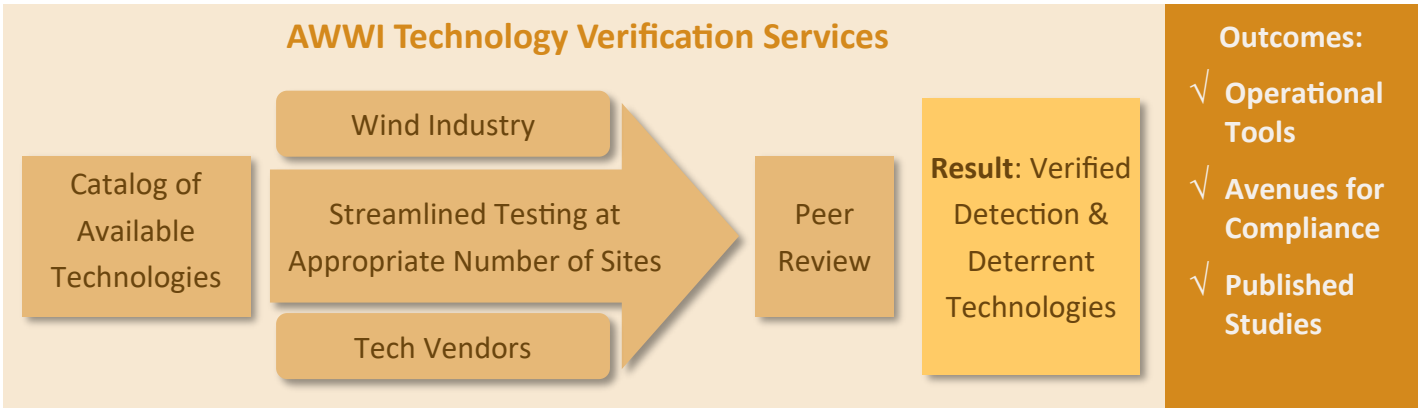
The technologies will be evaluated over two years at multiple operational wind facilities, in collaboration with scientific researchers, technology developers, and members of the wind industry.

Bat Technology Evaluations:

AWWI is in the early stages of planning for testing and evaluation of minimization technologies for bats. One such project, in partnership with the Electric Power Research Institute (EPRI), is the evaluation of the TIMR® technology that intends to detect and inform curtailment to optimize production gains and reduce risk for bats.

Broadening the Reach of Technology Innovation

AWWI is working to expand the reach and increase awareness of technology innovations through outreach and strategic partnerships, such as through collaboration with the National Renewable Energy Laboratory (NREL) and EPRI. To promote both industry adoption of technologies and acceptance from broader stakeholder groups, AWWI will share objective, reviewed results and findings. Upcoming outreach activities include webinars and seminars for different stakeholder groups focusing on the bridge between technology, end-users, and biological objectives.



AWWI brings together conservation organizations and members of the wind energy industry to develop tools and strategies that facilitate the timely and responsible development of wind energy while protecting wildlife and wildlife habitat. To accomplish this mission AWWI combines the power of science with the voice of collaboration and a unique governing structure. For more information about AWWI, Partners, and initiatives, visit **www.awwi.org**.

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