New Wind Turbines Mimic Hummingbird Wings

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A unique biomimetic design could take wind power in a whole new direction, both for small-scale and large-scale renewable energy systems.

By Glenn McDonald

A North African company has developed what it contends is a paradigm-shifting wind turbine technology based on the flapping of hummingbird wings.

Any potential paradigm shifts are down the road a bit, but based on some remarkable images and new demo videos, the clean energy machine may be the prettiest wind turbine ever invented.

Developed by Tyer Wind, a startup based in Tunisia, the turbine uses biomimicry principles to replicate the mechanical action of hummingbird wings. The design is fundamentally different from standard rotor-based wind turbines because instead of converting linear motion — wind blowing across the land — into a circular motion, it converts it into a figure-eight pattern. Not only is that shape the same as the one hummingbird wings make while the birds hover, but it also generates energy on both the upstroke and the downstroke.

“This is the first time that the motion of the hummingbird wings was mimicked mechanically in a very efficient way,” Aouini told Seeker in an email exchange from Tunisia. “This opens new horizons regarding the way electricity could be produced in the future. Major U.S. research centers have extensively worked on the hummingbird’s aerodynamic behavior and confirmed that it is more efficient than bladed rotors.”

The Tyer Wind website has plenty of schematics and images of the hummingbird turbine, including videos of an operational prototype up and running on the Tunisian savanna. Wingspan on the prototype is about 12 feet, producing around 450 RPMs in high wind. (Bonus trivia: North American hummingbirds flap their wings 50 times per *second*.)

Tyer Wind hasn't released any hard numbers on the electrical output of the device, relative to conventional wind turbines, but Aouini said the system is still in the very early stages of testing. The system is designed to be efficient in both small consumer systems and large industrial wind farms.

"Given the uniqueness of its design, Tyer technology is perfectly scalable and could be adapted to various uses and areas," Aouini said.

He's got bigger plans, too. Aouini has dubbed his proprietary technology 3D Aouinian Kinematics and said it has potential applications in mechanical pumps, combustion engines and marine propulsion.

The hummingbird turbine isn't the first to try a flappy wings approach to wind power, but when you watch the thing in motion, it definitely looks like nothing else out there. See for yourself in this demo video, which features the single most dramatic musical score ever applied to a technology video.

Click here to watch "Tyer Wind Converter": https://youtu.be/4r4qnfLns_s