Wind Turbine Blades: Cleaner Materials for Cleaner Energy

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Wind turbines stand as a symbol of humanities progression towards safe, clean energy. But the towering behemoths which stand on the plains across the United States and other countries hold a dark secret that lies in their construction. Wind turbines typically last for 20-25 years. Its base, made from aluminum, is easily recyclable, as is most of the other pieces of the machine. The blades of wind turbines, however, provide a unique challenge in the decommissioning process. Formed out of carbon or glass fibers, the blades are extremely costly and hard to recycle. Often the blades, which can be as much as 350 feet in length, end up in land fills or are buried. While the towers harness clean energy, the waste produced during the decommissioning process takes up time, money, and space. This project explores alternate materials and designs for wind turbines to achieve a recyclable model of the turbines. In the experiment, the fabrics Protera and Nomex Ripstop, both high durability fabrics used in bullet proof and fireproof clothing, were tested as possible materials for wind turbine blades. A wire frame was created and connected to a central hub. The frame was wrapped in both the Protera and Nomex Ripstop fabrics. The Protera fabric performed better, with a higher average voltage than Nomex Ripstop.

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