

Wind Turbine Recycling and Disposal



20 - 30 years

THE NEED FOR ENVIRONMENTALLY RESPONSIBLE TURBINE RECYCLING AND DISPOSAL IS GROWING

- A wind turbine's life spans 20-30 years.
- As turbines near the end of their useful life, strategies for effective recycling and disposal are essential.
- Fiberglass turbine blades are non-toxic and completely safe for landfills.

Source: American Clean Power Association



0.05%

RECYCLING PROCESSES WILL AID IN OVERALL WASTE

- Although turbine blades are large, all turbine blade waste through 2050 represents approximately 0.05% of all the municipal solid waste going to landfills every year, according to data from Electric Power Research Institute.
- Startups like Global Fiberglass Solutions are developing processes to break down wind turbine blades and repurpose them into other useful materials, like railroad ties and panels.



85-90%

TURBINE RECYCLING AND DISPOSAL IS SUSTAINABLE

- Currently, between 85-90% of a turbine's parts can be recycled or sold, including the foundation, tower, gear box, and generator.
- The EPRI estimates there will be 2.1 million tons of cumulative blade waste combined through 2050. By comparison, 2.1 million tons of plastic cups and plates end up in landfills every 2.5 years!

Sources: Research Gate, "Wind turbine waste in 2050"; Electric Power Institute, United States Environmental Protection Agency



RECYCLING



MECHANICAL RECYCLING

- Cutting and dismantling blades on-site
- Shredded into raw fiberglass material that produces fine and coarse particulates that can be mixed with rock, plastic, or other fillers
- Mixture is then turned into thermoplastic fiberglass pellets or panels used in various products
- Pellets can also be used in:
 - Injection molding and extrusion manufacturing processes
 - Decking boards
 - Warehouse pallets
 - Parking bollards
 - Manhole covers
 - Building walkways



THERMAL RECYCLING

- Crushing and burning blades
- Composition portion is combustible when burned and can be used for electricity generation or industrial processes like cement production
- Leftover glass and carbon fibers go through co-processing in which the fibers are mixed with fillers and reused



16%

THERMAL RECYCLING CAN REDUCE CARBON DIOXIDE EMISSIONS FROM CONCRETE PRODUCTION BY UP TO 16%



WIND is a coalition of industry members and supporters who believe North Dakota should harness its abundance of wind for the continued benefit of its communities and residents. Find out more: windindustrynd.com

Members: American Clean Power Association (ACP), Apex Clean Energy, Capital Power, EDF Renewables, Enel North America, Invenergy, NextEra Energy Resources, and Orsted.