

Wind Turbine Recycling and Disposal

As more wind farms are re-powered and technology improves, companies are responding to the need for responsible turbine recycling through innovative solutions.

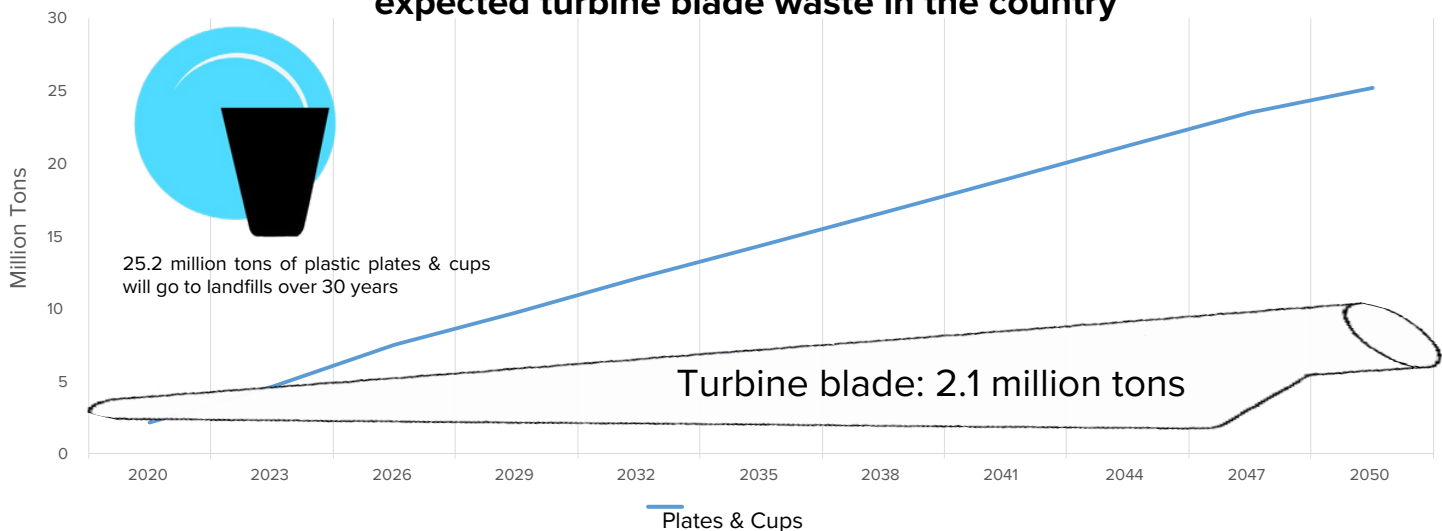


“Turbine blades are the most inert, non-problematic waste we’re accepting.”
- Casper Solid Waste Manager, Cynthia Langston²

Currently, between 80-94% of a turbine’s parts can be recycled or sold, including the foundation, tower, gear box, and generator.¹

- Fiberglass turbine blades are non-toxic and completely safe for landfills.
- Although turbines blades are large, all turbine blade waste through 2050 represents approximately 0.05% of all the municipal solid waste going to landfills every year.¹
- 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.³

Plastic cups/plates will take up 12 times more landfill space by 2050 than all expected turbine blade waste in the country⁴



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: <https://windindustrynd.com>

Members: Clean Grid Alliance, Apex Clean Energy, EDF Renewable Energy, Enel Green Power North America Inc., Invenery, NextEra Energy Resources, Ørsted.

Recycle

Wind turbine blades are largely made up of recyclable materials, such as steel/iron, aluminum, and copper. The Carbon Rivers project is funded by the U.S. Department of Energy, and is working to commercialize technology to recycle fiberglass from decommissioned wind turbine blades creating a circular economy and generating jobs.

Reuse

In Europe, some blades are repurposed as sound barriers, thermal insulation, or even bridges.⁶ The U.S. Department of Energy is partnering with businesses like Re-wind to research practical ways to repurpose wind turbine blades, such as using decommissioned blades in buildings, infrastructure, landscape and public art.^{1,7}



Reduce

As wind technology improves, turbines grow more efficient and generate more electricity per turbine. According to the American Clean Power Association, "Improvements to wind resource assessment and modelling allow manufacturers to better understand the loads on blades, leading to improvements in life and maintenance costs."¹

Sources:

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3. Electric Power Research Institute, 2018, "End-of-Life Disposal and Recycling Options for Wind Turbine Blades", <https://www.epri.com/#/pages/product/3002012240/?lang=en-US>
4. United States Environmental Protection Agency, 2017, "Nondurable Goods: Product-Specific Data". <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/nondurable-goods-product-specific-data>
5. U.S. Wind Energy Technologies Office, 2022, "Carbon Rivers Makes Wind Turbine Blade Recycling and Upcycling a Reality With Support From DOE," <https://www.energy.gov/eere/wind/articles/carbon-rivers-makes-wind-turbine-blade-recycling-and-upcycling-reality-support>
6. Grist, 2021, "Today's wind turbine blades could become tomorrow's bridges," <https://grist.org/energy/todays-wind-turbine-blades-could-become-tomorrows-bridges/>
7. Re-Wind, <https://www.re-wind.info/>