



This is the print version of the [Skeptical Science](http://sks.to/windfall) article '[Wind turbines are error prone and a threat to human health and safety](http://sks.to/windfall)', which can be found at <http://sks.to/windfall>.

Are wind turbines error prone and a threat to human health and safety?

What The Science Says:

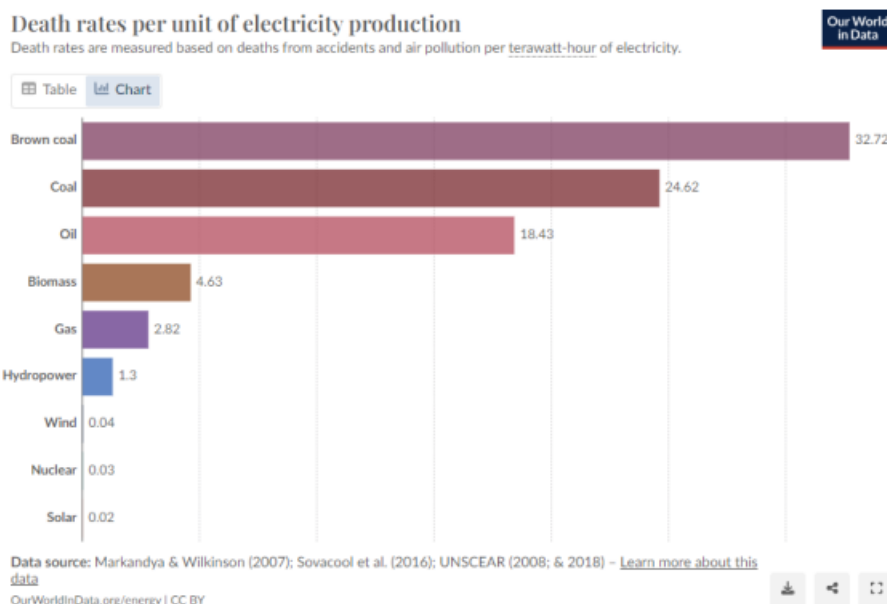
Turbine collapse or breakage are extremely rare, utilising safety mechanisms to survive extreme weather conditions, and the mortality rate from wind energy pales in comparison to the risks associated with fossil fuels.

Climate Myth: Wind turbines are error prone and a threat to human health and safety

"There are many health hazards associated with living near turbines as a result of . . . broken flying blades." ([Save Piatt County](#))

Turbine collapse or breakage are extremely rare, and utility-scale wind turbines are fitted with safety mechanisms to survive extreme weather conditions, such as hurricanes. Turbine blade breakage does not pose a significant threat to humans (McGugan et al. 2015). The Department of Energy has noted that, although the risk of turbine blades becoming detached during operation "was a concern in the early years of the wind industry," such failures "are virtually non-existent on today's turbines due to better engineering and the use of sensors."² Turning to all turbine blade failures, rather than just turbine blade detachment, a 2015 study found that wind turbine blades fail at a rate of approximately 0.54% per year globally³. The Department of Energy has further reported that "catastrophic wind turbine failures . . . are considered rare events with fewer than 40 incidents identified in the modern turbine fleet of more than 40,000 turbines installed in the United States as of 2014."⁴

When looking at deaths per terawatt-hour of energy produced, the mortality rate from wind energy pales in comparison to the risks associated with fossil fuels. Brown coal causes 32.72 human deaths per terawatt-hour, while black coal causes 24.6 human deaths, oil causes 18.4 human deaths, natural gas causes 2.8 human deaths, and wind energy causes only 0.04 human deaths⁵.



Footnotes:

[1] [How do wind turbines survive severe storms?](#), Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, (June 20, 2017)

[2] [Wind Energy Projects and Safety](#), Dep't of Energy (last visited March 25, 2024)

[3] GCube Insurance Services, Inc. GCube report: breaking blades: global trends in wind turbine downtime events (2015), summarized in Chen & Eder (2020), [A Critical Review of Damage and Failure of Composite Wind Turbines Blade Structures](#), IOP Conference Series: Materials Sci. and Engineering (2020)

[4] [Wind Vision: A New Era for Wind Power in the United States](#) U.S. Department of Energy, 105 (2015)

[5] Hannah Ritchie, [What are the safest and cleanest sources of energy?](#) To the extent that wind-related fatalities tend to occur disproportionately during the construction phase, this analysis may overstate the fatalities per terawatt-hour of wind, which would be expected to decline over time. See Benjamin K. Sovacool et al. (2016), [Balancing safety with sustainability: assessing the risk of accidents for modern low-carbon energy systems](#), 112 Journal of Cleaner Production 3952, 3960, Jan. 20, 2016, (showing in Table 5 that most wind-related deaths occurred during construction)

This rebuttal is based on the report "[Rebutting 33 False Claims About Solar, Wind, and Electric Vehicles](#)" written by Matthew Eisenson, Jacob Elkin, Andy Fitch, Matthew Ard, Kaya Sittinger & Samuel Lavine and published by the [Sabin Center for Climate Change Law](#) at Columbia Law School in 2024. Skeptical Science sincerely appreciates Sabin Center's generosity in collaborating with us to make this information available as widely as possible.

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