Wind Turbine Setbacks and Decommissioning

The setbacks being proposed in text amendments TX20-2, TX20-3, and TX20-4 for the Christian County wind energy conversion systems are already antiquated by at least three years. They do not correspond to the heights and potential throw distances of modern wind turbines nor do they account for potential noise and resonance issues in nearby structures.

The largest wind turbines in northern Illinois are smallish when compared to what is now operational in Douglas County and to what is being proposed for Christian County. The largest operating wind turbines in Illinois are currently several Vestas V-150s located in Douglas County. They have an overall height of 590 feet. If approved, the proposed wind turbines for Christian County will be 70 feet taller than the V-150s in Douglas County.

Using the manufacturer's data and simple physics, the V-150 machines can throw ice or pieces of storm damaged blades a little over 2,300 feet. Not surprisingly, Vestas, the turbine manufacturer, has a recommended setback distance of approximately 2,600 feet in case of a runaway turbine and resulting catastrophic failure. Vestas believes and recommends safety. A proposed 660 feet tall Christian County wind turbine could throw a projectile up to 2,430 feet. This calculation assumes at top rpm of 15 and a 73.7 meters blade length. This estimate is probably a little conservative as many of the modern turbines spin at 16 rpm or a little better.

As a renewable energy instructor, I train students to service wind turbines. Vestas recommends wearing bump or hardhats within 500 meters (1,640 feet) from an operating wind turbine on a 90 meters tower. Former students employed as wind technicians have said that they will wait until the ice melts off the blades before approaching the machines to service them. The above-mentioned amendments don't seem to take these concerns into explicit consideration but there seems to be an implicit acknowledgement some danger.

Section VI. Design and Installation H. Setbacks 1. of TX20-2, TX20-3, and TX20-4 list setbacks of 1,500 feet, 1,600 feet, and 1,000 feet, respectively, from a primary structure or residence. However, all three give a setback of 2,000 feet from all residential districts.

Why the difference in setback between a primary residence and a residential district?

If the wind developers truly believe the wind turbines can be safely operated within 1,600 feet of a single residence, why change it for a residential district? Is someone aware of the manufacturer recommendations as well as the law of averages? Maybe someone doesn't want to play too much Russian roulette with residential districts and that is really is being a good neighbor.

Who is liable when these turbines cause property damage by being sited too closely to a home or other building? In many cases, liability rests with the wind farm operator and the landowner who has leased the property.

If this Zoning Board of Appeals passes the setbacks proposed in the three above-mentioned text amendments, then it has basically placed those citizens living among the wind farm in a shooting gallery.

If built, these turbines will require replacement and/or decommissioning fifteen to twenty years from now. Replacement with fewer but larger turbines is the typical procedure. What of future setbacks for these future machines?

The money for the decommissioning and remediation of the wind farm must be set aside. It should be held in escrow by a third party. Because of the fluctuations of the scrap market and the need to break down and separate the materials, the estimates for removing a turbine today vary. I commend the City of Roses and Rolling Farms Wind Farms for discussing funding for decommissioning this evening. However, decommissioning estimates vary widely from $53,000 for a 2.5 MW turbine at an 89 meter mounting height in McLean County, IL (which assumes a 92% return on recycling to offset the decommissioning costs of the turbine) to Xcel Energy's (in Minnesota) estimated cost of over $530,000 (in 2019 dollars) to remove each of their 2 MW turbines on 100 meters towers. The Christian County machines will be 3 – 5 MW turbines on 120-150 meters towers.

Each of the proposed Christian County turbines will require between 700-900 cubic yards of concrete and 15-20 tons of steel rebar for a foundation. There will be literally miles of underground electrical conductors and cabling. During decommissioning, the older unused towers are taken down but only that concrete and cabling within 4 to 5 feet of the surface are generally removed. Everything else usually stays. Ground compaction will lessen the fertility of the soil and there will be solid, massive concrete structures and electrical cabling in the ground for the rest of time on Earth.

The Zoning Board of Appeals has a chance to show leadership. In the quest for added tax revenue, you have a duty to also uphold public safety. You can ask the wind developers to provide you the safety manuals and setback recommendations from the appropriate turbine manufacturer before rendering a decision. You can also contact the turbine manufacturers and request the information. When the Christian County Zoning Board of Appeals renders its final decision, may it show itself wise in making decisions which can protect the safety of its citizens as well as increasing some tax revenue.

Finally, to answer a question posed earlier by a gentleman on the ZBA, the Production Tax Credit for these wind farms is 1.5 cents/kWh or $15/MWh if ground is turned on construction before Dec. 31, 2020.