

ONSHORE WIND TURBINE FACT SHEET

Wind Production Tax Credit – The wind production tax credit expired in 2022. [1]. But, with the current administration it is likely to be reinstated if they can pass the Build Back Better legislation in 2022. The previous tax credit was 30% of the project costs.

There are other government funded programs that Renewable (Wind Turbine) Projects can qualify for, which may likely apply to the Bijou Basin Development. These are the New Markets Tax Credit - <https://www.cdfifund.gov/programs-training/programs/new-markets-tax-credit>

Wind Turbine Capacity Factors – HIGH 55% / MEDIUM 43% / LOW 38% [2] - these Capacity Factors are important as it reflects the “net” average generation capacity of an onshore wind turbine power plant. The intermittency issue with wind turbines is that the speed and direction of the wind matter. If the wind speed is too low, the turbine cannot spin fast enough to produce electricity. If the wind speed is too high, it can over-speed the turbine which can result in catastrophic failure, thus safety systems are in place to “brake” the turbine in place.

To put these numbers into perspective, a commercial 1000 MW wind installation in a HIGH rated location, with a capacity factor of 50% could only be relied on to produce 500 MW, thus twice the number of turbines would be required to meet the “nameplate” capacity.

The hidden costs that are not discussed –

- Changing the role of the grid’s existing coal fired power plants, or gas turbine combined cycle plants with very high availability when operating on full load from primary to backup for wind/solar have other costs that emerge due to physical realities.
- Upgrades to the grid that are required to support the addition of intermittent electrical production are not included.
- Coal power gen or GTCC (Gas Turbine Combined Cycle) plants cannot quickly be turned off and on, so capital costs increase and efficiency decreases. In addition, cycling the plants increases wear and tear as well as maintenance costs.
- *Locations with a large portion of the local power supply generated from renewable energy will require flexible power generation to provide for demand when there is inadequate electricity being supplied from the renewable sources. Peak shaving gas engine generators are NOT included in the LCOE analysis.*

Other “problems” with wind

- Require massive footprint. The Cedar Springs 2 Wind Project, Wyoming has 192 Turbines, 499 ft tall, and is a 400 MW plant. The footprint is over 71 000 acres (from google maps) [3].
- The blades are NOT recyclable. Disposal of Wind Turbine blades is a significant landfill issue [4].
- Flashing lights to warn aircraft flying at night [5].
- Wind turbines cause functional habitat loss fo migratory soaring birds [6].
- Wind turbines generate low-frequency noise (LFN), which may pose a health risk to nearby residents. Effects include headaches, difficulty concentrating, irritability, fatigue, dizziness, tinnitus, aural pain sleep disturbances. Clinically, exposure to LFN may cause increased risk of epilepsy, cardiovascular effects, and coronary artery disease.[7]
- Significant construction that destorys the natural environment, and most leases do not include land reclamation or remediation. The construction can cause significnat damage to rural roads and may lead to significantly decreased land productivity. [8]

References:

1. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, *Advancing the Growth of the U.S. Wind Industry: Federal Incentives, Funding and Partnership Opportunities.*
2. *Lazard’s Levelized Cost of Energy Analysis – Version 14.0, October 2020.*
3. NextEra powers up Cedar Springs, Stimson, C., Budget, D., via Wyoming News Exchange, Dec 16, 2020.
4. <https://www.bloomberg.com/news/features/2020-02-05/wind-turbine-blades-can-t-be-recycled-so-they-re-piling-up-in-landfills>
5. <https://www.wind-watch.org/news/2020/12/12/wind-farms-weigh-in-on-technology-to-ease-blinking-red-lights-at->

