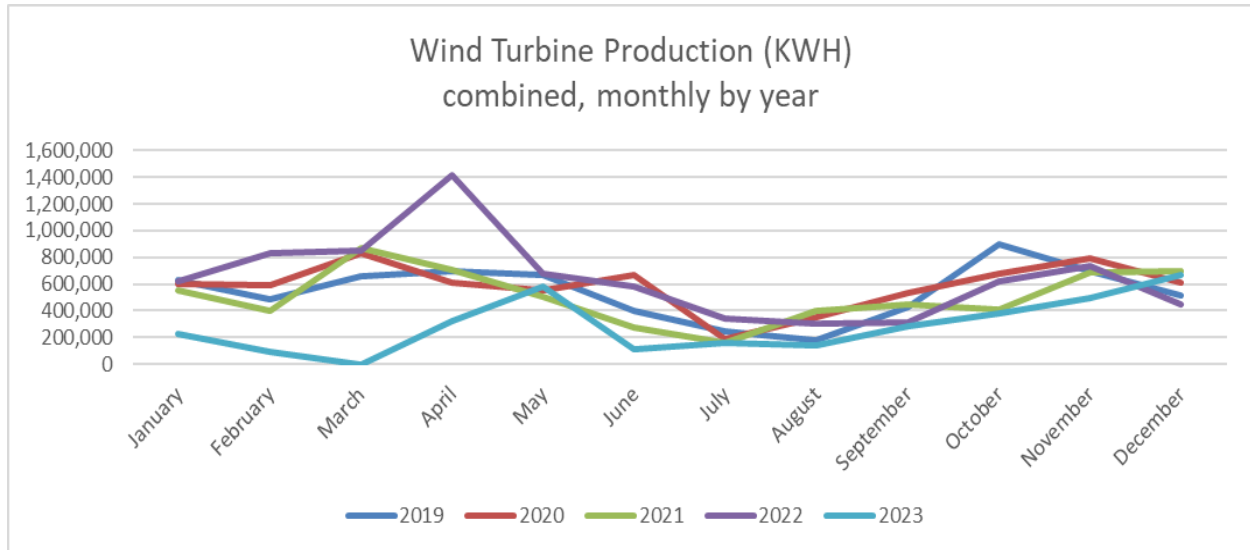




WILLMAR MUNICIPAL UTILITIES

December 2023 Wind Turbine Report

"Willmar Municipal Utilities will provide safe, reliable & quality utility services at competitive rates for their customers."



Annual Costs/kWh YTD: \$0.0526 Cumulative kWh: \$0.1472

	Production (KWH)		Availability (%)		Total	Major Outages
	#3	#4	#3	#4	KWH	
Dec 2023	311,167	357,380	98.6	96.9	668,547	
Nov 2023	183,550	312,355	72.3	89.0	495,905	#3 Hydraulic Leak/Communications Fault
Oct 2023	93,138	282,214	29.0	76.6	375,352	#3 Hydraulic Leak
Sept 2023	119,259	167,641	57.5	83.1	286,900	Positioning Sensor/Annual Maintenance
Aug 2023	24,590	119,144	35.5	61.4	143,734	Positioning Sensor
July 2023	96,562	64,030	94.1	67.9	160,592	Positioning Sensor, Ether-cat Faults
June 2023	41,562	68,613	42.0	52.0	110,175	#3 Pitch sensor #4 Elec.Faults/Coupler
May 2023	244,122	341,882	72.0	89.8	586,004	
April 2023	-	326,944	0.0	64.5	326,944	#3 Breaker Failure
Mar 2023	-	-	0.0	0.0	-	#3,#4 Breaker Failure
Feb 2023	92,772	3,640	25.3	41.6	96,412	#3,#4 Breaker Failure
Jan 2023	229,638	-	99.3	13.5	229,638	#4 Blade pitch failure
Dec 2022	288,452	155,753	66.4	74.3	444,245	CT/PT Faults, Icing from Storm
2023 Total	1,436,360	2,043,843			3,480,203	

Month	2019	2020	2021	2022	2023
January	624,884	598,668	551,509	619,722	229,638
February	484,162	590,960	397,869	828,786	96,412
March	656,272	827,205	866,500	851,870	0
April	699,956	611,169	709,639	1,416,112	326,944
May	668,434	552,522	509,051	680,683	586,004
June	400,456	667,898	269,811	578,540	110,175
July	247,502	184,774	156,572	343,435	160,592
August	176,047	352,244	400,452	298,933	143,734
September	426,860	531,071	444,730	311,668	286,900
October	895,781	675,543	413,446	616,414	375,352
November	695,008	788,202	685,170	733,123	495,905
December	514,858	613,308	693,954	444,245	668,547
Total	6,490,220	6,993,564	6,098,703	7,723,531	3,480,203

