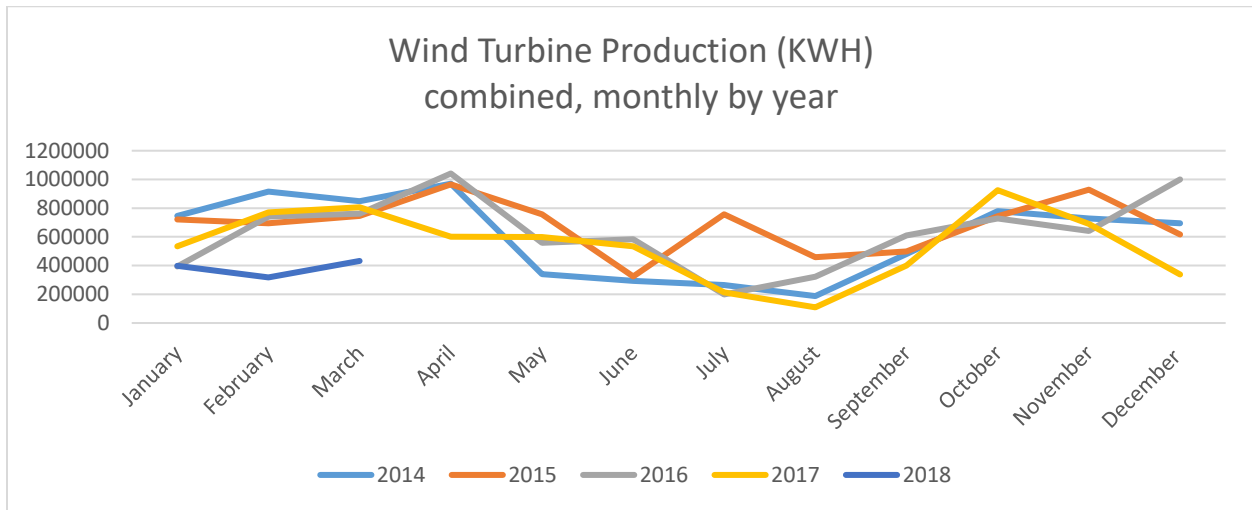




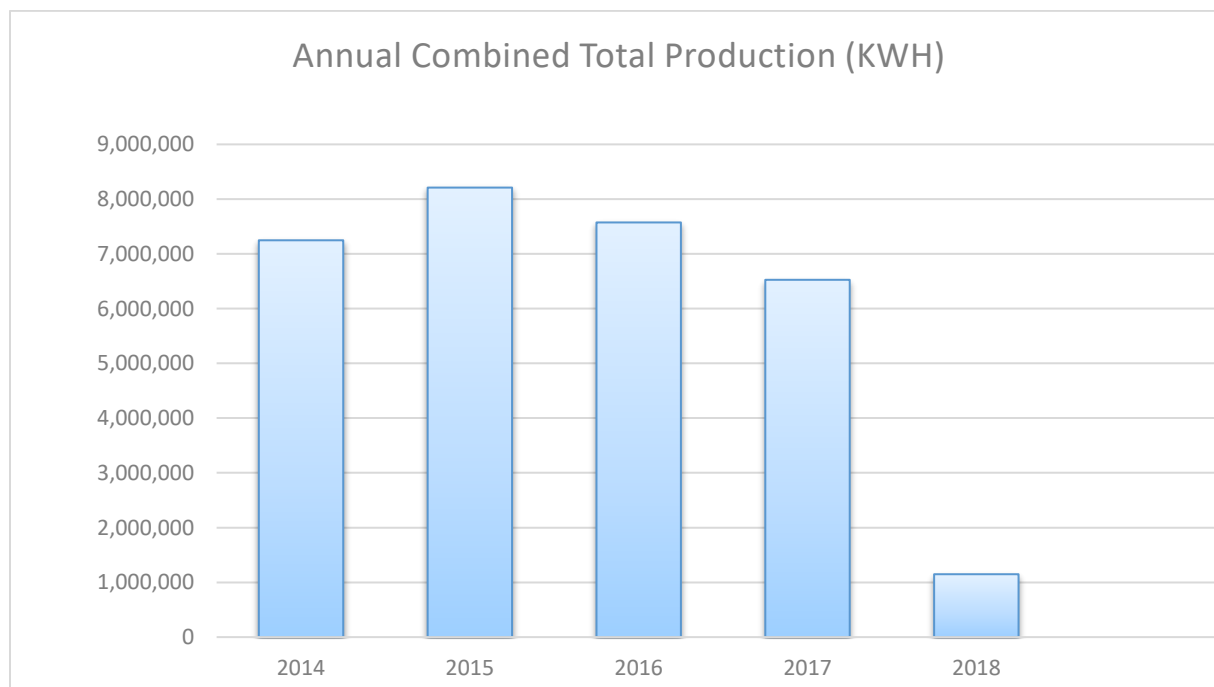
WILLMAR MUNICIPAL UTILITIES

March 2018 Wind Turbine Report



	Production (KWH)		Availability (%)		Total KWH	Major Outages
	#3	#4	#3	#4		
Mar. 2018	389,456	42,709	93.6	6.9	432,165	#4 Blade Pitch Control Unit Failure
Feb. 2018	317,618	-	99.6	0.0	317,618	#4 Blade Pitch Control Unit Failure
Jan. 2018	398,844	-	92.0	0.0	398,844	#4 Blade Pitch Control Unit Failure
Dec. 2017	338,980	-	91.7	0.0	338,980	#4 Blade Pitch Control Unit Failure
Nov. 2017	404,496	286,351	94.7	73.7	690,847	
Oct. 2017	468,821	456,179	97.8	92.7	925,000	
Sep. 2017	192,873	207,337	62.2	67.4	400,210	#3 Control Software Malfunction #4 Hydraulic System Overheated
Aug. 2017	109,215	-	66.0	0.0	109,215	#3 Control Software Malfunction #4 Hydraulic System Overheated
July 2017	91,860	122,444	61.8	93.2	214,304	#3 Control Software Malfunction
June 2017	257,597	277,065	98.0	97.6	534,662	
May 2017	294,078	304,030	94.2	99.0	598,108	
Apr. 2017	299,044	302,779	86.8	86.3	601,823	
Mar. 2017	409,026	397,910	88.0	91.3	806,936	
2018 Total	1,105,918	42,709			1,148,627	

Month	2014	2015	2016	2017	2018
January	745643	720369	393,477	534,867	398,844
February	916093	695143	740,655	771,227	317,618
March	848017	746045	761,028	806,936	432,165
April	970215	965530	1,041,382	601,823	
May	340154	755889	557,947	598,108	
June	292744	324005	583,043	534,662	
July	264420	755889	199,043	214,304	
August	187490	457386	321,326	109,215	
September	480586	499215	609,004	400,210	
October	779328	744572	727,379	925,000	
November	728534	929609	640,522	690,847	
December	694570	616700	998,977	338,980	
Total	7,247,794	8,210,352	7,573,783	6,526,179	1,148,627



Fun Fact: If someone asked you when the first electricity-generating wind turbine was made in America, what would say? The 1940s or 50s? The very first was constructed long before that. In 1888, Charles Brush, an Ohio-based engineer, built a 60-foot tower with a 56-foot rotor to generate up to about 12kW of electricity