

Polar vortex shows importance of the MISO coal fleet

Michelle Bloodworth and Paul Bailey
America's Power

Last month's polar vortex hit the upper Midwest with near-record cold weather, as temperatures dropped below minus 20 degrees F in Chicago, Minneapolis and elsewhere across the region. Power demand spiked accordingly. As a result, the Midcontinent Independent System Operator—MISO, the grid operator responsible for delivering electricity to much of the affected region—was forced to follow emergency procedures to maintain grid operations on the coldest days of January 30-31.ⁱ To its credit, MISO kept the lights on because it was able to rely on a diverse electricity portfolio that includes coal, natural gas, nuclear and renewables. But what would happen during a future polar vortex if MISO's portfolio becomes less diverse than it is now? After all, almost 15,000 megawatts (MW) of coal-fired generation in MISO will have retired by 2020.ⁱⁱ

Nearly all of the generating capacity added in MISO this decade has been wind turbines, which have grown from a total of 8,000 megawatts MW in 2010 to over 18,000 MW today, and now represents ten percent of MISO's total electricity supply.ⁱⁱⁱ Some advocates are pushing for even more wind and solar. This might sound like good news to some people, except for one big problem. As electricity demand climbed during the polar vortex, many of these wind turbines were not able to produce electricity. According to trade press, wind farms were generating about half of MISO North's electricity on January 29.^{iv} A day later, wind supplied just 2.5 percent of the region's electricity. One of the reasons for this precipitous decline is that wind turbines are designed to automatically shut down at minus 20 degrees F.^v

MISO-wide, electricity output from wind dropped by two-thirds when it was needed the most.^{vi} On the other hand, the MISO coal fleet increased its output and was able to provide 44 percent of the region's electricity during the polar vortex.^{vii} The coal fleet also outperformed other electricity sources in PJM during the same polar vortex. These two instances clearly demonstrate the value of the coal fleet and why we are concerned about the premature retirement of coal-fired power plants in MISO, PJM and other regions of the country.

Just think for a minute about a future polar vortex without a coal fleet.

ⁱ Midwest ISO, *Preliminary MISO January 30-31 Maximum Generation Event Overview*, February 7, 2019. <https://cdn.misoenergy.org/20190207%20MSC%20Item%2004%20Jan%2030%20Max%20Gen%20Event317407.pdf>

ⁱⁱ“Retirement of Coal-Fired Electric Generating Units of February 7, 2019,” www.americaspower.org

ⁱⁱⁱ S&P Global Market Intelligence.

^{iv} *Energy Wire*, “Turbine shutdowns in polar vortex stoke Midwest debate,” Jeffrey Tomich, February 27, 2019.

^v *Ibid.*

^{vi}Midwest ISO, *Generation Fuel Mix Reports*, [https://www.misoenergy.org/markets-and-operations/market-reports/#nt=/MarketReportType:Summary/MarketReportName:Generation%20Fuel%20Mix%20\(xls\)](https://www.misoenergy.org/markets-and-operations/market-reports/#nt=/MarketReportType:Summary/MarketReportName:Generation%20Fuel%20Mix%20(xls))

^{vii} *Ibid.*