

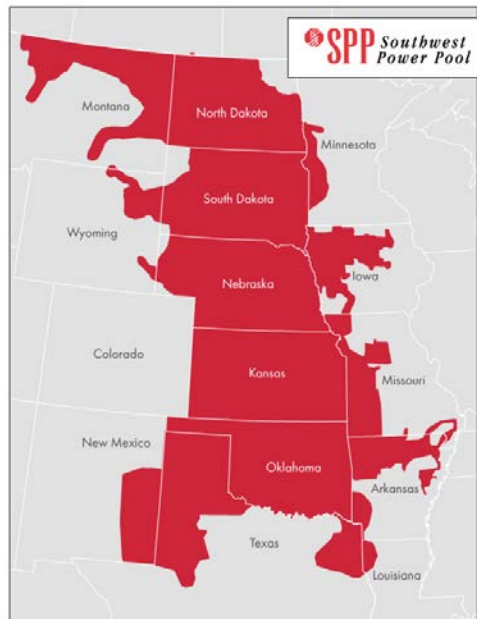
City of Fremont Update

Date: February 19, 2021

To: City Employees/ City Boards/ Mayor & City Council

Extreme Cold Forces SPP to Enact Rolling Blackouts and Natural Gas Problems—How Fremont Minimized the Impacts

The Southwest Power Pool (SPP) is a nonprofit regional transmission organization mandated by the Federal Energy Regulatory Commission to ensure the reliability of the electric grid. SPP was founded in 1941 when eleven regional power companies pooled resources to serve a national defense customer. Since SPP has grown by adding members in 17 states (including all utilities in Nebraska) encompassing a 552,000-square-mile region that includes more than 60,000 miles of high-voltage transmission lines. SPP is one of nine independent system operators across the U.S. that control the electric grid. The map on the right shows SPP footprint.



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When the electric grid is stressed, SPP uses three levels of Energy Emergency Alerts (EEA) to notify its customers. Level 1 of an EEA means SPP foresees or is experiencing conditions where all available power plants are running to meet load obligations and that there is no extra electrical power for contingencies. An EEA Level 2 is when power plants can no longer meet expected electrical requirements and SPP requests assistance from other neighboring utility operators to avoid rolling blackouts. The last level is EEA Level 3 when SPP requires load-serving utilities to immediately schedule rolling blackouts in order to keep the electric grid from going down.

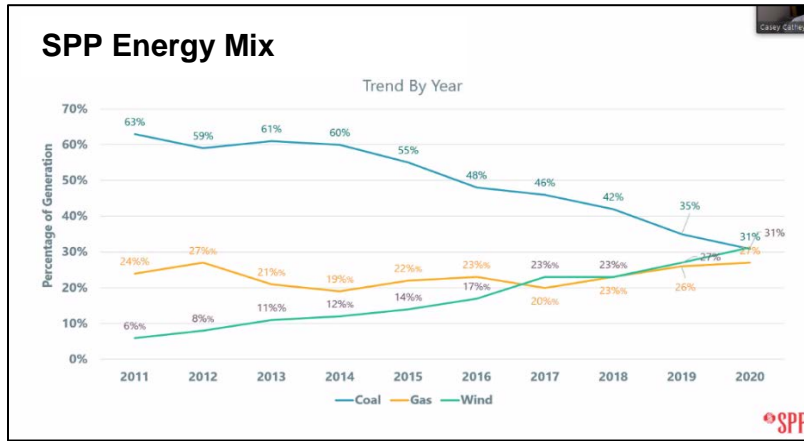
On Sunday, February 14, the Southwest Power Pool (SPP) declared an Energy Emergency Alert (EEA) Level 1, effective 5:00 am central time on Monday, Feb. 15. Then on Monday, February 15, several hours after calling an EEA Level 2 alert, SPP declared an EEA Level 3, requiring all load-serving utilities in the SPP footprint to immediately schedule rolling blackouts. Utilities across the SPP region immediately began rolling blackouts, shutting off selected areas in 30-minute intervals, in order to prevent a complete blackout. Although Fremont is a load-serving utility in the SPP footprint, we were NOT impacted by rolling blackouts because our coal-fired generation was enough to supply Fremont's electrical needs.

There are at least three conditions that contributed to SPP initiating an EEA Level 3.

- 1) The arctic weather. As extremely cold weather spread across the SPP region, the demand for electric power as well as the demand for natural gas increased to new highs. (I will explain why natural gas impacted the electric grid when I talk about the conditions two and three.) While I don't have the numbers from SPP or Northern Natural Gas (NNG), I can use our numbers to make my point. This week we set an all-time high for winter electric demand at 84 megawatts (MW). The prior winter peak was 80 MW. Also, had we not asked some of our largest customers (WholeStone, LPP, and ADM) to curtail their electric usage, this number would have likely been 90 MW, not 84 MW. The same is true for natural gas. Our contracted pipeline capacity is 19,700 MCF per day. Had it not been for our interruptible customers and our propane peaking plant, our pipeline capacity would have been around 21,500 MCF per day. So...as you can see, both electric and natural gas demand was at record levels during the cold weather.

There is no job so important and no service so urgent that we cannot take the time to do the work safely!

2) The SPP energy mix. The graph on right shows a steady decline in the amount of electricity produced by coal and an increase in electricity produced by wind and solar. As baseload coal plants are being shuttered, many utilities are replacing with resources that are not dispatchable (available called upon), like wind



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turbines and solar farms. What that means is when temperatures drop and the demand for electricity increases, the wind must blow and the sun must shine before SPP can rely upon electricity produced from the wind and solar. Unfortunately, this week, when the temperatures dipped to record lows, the wind was not blowing and sun was not shining. So...SPP was unable to rely upon 31% of its energy mix, wind.

3) The natural gas pipeline was constrained and gas prices increased exponentially. This week confirmed that natural gas can be unreliable too. On Saturday, February 13, NNG declared an Operational Alert/Critical Day due to the severe weather conditions, well-heads freezing in Texas, and the significant increase in natural gas prices. When NNG calls a critical day, it means pipeline customers (like Fremont) are held to their contracted pipeline capacity. In Fremont's case, (as stated above) we have contracted capacity of about 19,700 MCF per day. If you exceed this number, the penalty is three times the cost of the daily price of gas plus the cost of the gas. The chart below shows what the daily cost of natural gas was during the cold snap and the penalty and cost of gas that Fremont would have paid if we exceeded our contracted pipeline capacity on the NNG critical days.

Date	2/18	2/17	2/16	2/15	2/14	2/13	2/12	2/11	2/10	2/9
Daily \$	19.5	188.3	154.9	154.9	154.9	154.9	15.4	6.9	4.1	4.2
\$ Penalty	\$140,400	\$1,355,760	\$1,115,280	\$1,115,280	\$1,115,280	\$1,115,280				

Please note the massive increase in the daily price from \$4.20/MCF on Feb. 9 to \$188.30/MCF on Feb. 17. Again, thanks to our largest customers curtailing their gas usage and the City's propane peaking plant, Fremont avoided paying any penalties.

So, what effect did all this have on SPP calling an EEA Level 3? In essence it was a trifecta: an increase in electric demand due to arctic weather, little wind or sunshine so virtually 30% of the SPP energy mix was unavailable, and a constrained natural gas pipeline because of frozen well-heads in Texas resulting in significant daily natural gas price increases. The result was rolling blackouts.

There are several lessons we learned over the past week that apply to Fremont. First, having our own electric generation facilities saved us from rolling blackouts. We certainly must maintain and preserve these resources. Second, although we added 40 MW of wind, we didn't shutter a coal plant in exchange nor should we. Third, cooperation from our largest customers to curtail their electric and natural gas usage saved us. If they had not curtailed, we would have been purchasing power off the grid and SPP would have forced us to schedule rolling blackouts. Also, it would have cost our natural gas customers nearly \$5,960,000 in penalties and gas, which would have caused our customer's natural gas bills to more than quadruple in price for the month. Wouldn't that have surprised customers when bills will already be higher due to the cold weather!

A big thank you to the power plant staff for keeping the plants running, the gas department for keeping the propane peak shaving plant online, our large customers for shaving their electric and gas usage when we asked, and especially to the prior decision-makers who made the tough decisions to build our power plants and gas peaking station. Because of your work, Fremont stayed bright and warm!

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