

EARLY SUMMER HEATWAVES EXPOSE GRID VULNERABILITIES



by Craig Buros, CEO & General Manager

Summer is here now, but a mid-May and June heatwave brought some unusually high demand for electricity and a grim report from MISO (Midcontinent Independent System Operator) that their 2022 seasonal assessment indicates a

deficiency between the anticipated summer peak and forecast of available generation. This deficit leaves MISO's North and Central Regions at an increased risk of rolling blackouts to help keep the grid online this summer.

The regional electric grid, managed by MISO, was strained on May 12 and again in mid-June with the combination of high electricity demand and limited generation and transmission resources. MISO uses Emergency Operating Procedures to help address grid constraints. In some circumstances, system conditions call for electricity demand reduction measures, such as the use of our load management program. On both occasions, Vernon Electric worked closely with our wholesale power provider, Dairyland Power Cooperative, to be prepared in case there was a need to reduce our cooperative's electricity demand.

Every MISO emergency warning or event scenario is unique. We must react to emergency grid conditions in a real-time manner and may have to call upon our members to start reducing their electricity demand at a moment's notice. Using our load management program for this purpose ensures we can quickly reduce demand to avoid overloading generation resources. This use of load management is different than non-emergency full load control events, which help avoid purchasing power during the most expensive times of the summer or winter. Using load management for emergency purposes supports grid reliability by reducing our electricity demand to levels that can be met by available generation resources. If demand exceeds what the grid can provide, rolling blackouts are the final step to keep the entire grid from going down, which can be a multi-day process to bring it back on-line.

Experiencing MISO Emergency Warnings so early in the season could be a sign of things to come. JT Smith, MISO's executive director – market operations, said a 2022 seasonal assessment indicates about a 5-gigawatt (GW) deficit between an expected peak forecast of 124 GW vs. 119 GW of expected "regularly available generation." For comparison, 1 GW is 1,000 megawatts (MW) of power or 1 million kilowatts (kW), which is approximately the size of the entire Dairyland Power system. Dairyland's 24 member cooperatives serve 284,000

homes and businesses in a four-state region.

MISO indicated key reasons for the projected shortfall include:

- Higher, volatile natural gas prices in the United States
- Coal-fired and nuclear power plant retirements outpacing the installation of new generation resources
- A significant amount of new generation resources coming on-line are wind and solar, which are intermittent and not always available when needed
- Electricity consumption continues to return to pre-COVID-19 pandemic patterns, increasing in the commercial and industrial sectors.

Although Dairyland Power has generation capacity and reserves to meet the load of Vernon Electric and other Dairyland system cooperatives, we are not immune to rolling blackouts as we are part of a regional electric network that covers the central part of the United States and part of Canada.

Generation and transmission owners are unable to disconnect and operate their systems on an island; therefore, generation shortages and transmission constraints can impact a large number of electric utilities across a very large region.



Even as new generation resources are brought on-line, MISO may experience transmission congestion, which means the grid operator has trouble moving the electricity from where it is generated to where it is needed. This can result in not only lost opportunities to utilize renewable energy when available, but also higher costs to consumers.

In May, one of the congested areas impacted the flow of electricity from wind farms in Iowa and southern Minnesota to the rest of the MISO North and Central regions.

Dairyland is partnered with American Transmission Co. (ATC), and ITC Midwest, LLC, to build the Cardinal-Hickory Creek (CHC) transmission line. CHC is a 102-mile,

345-kilovolt (kV) line from Dubuque County, Iowa, to Dane County, Wis. This project is one of many in the MISO region that are designed to help relieve congestion, reduce energy costs for consumers, improve electric grid reliability, support decarbonization goals and the interconnection of renewable generation in the Upper Midwest.

The fact is, we are facing the possibility of power shortages and transmission constraints this summer, but participation from members during our Summer Shift initiative (avoiding electric use from 11 a.m. to 7 p.m.) and/or enrolling your electric water heater in our load management program (\$75 credit for enrolling) can help reduce demand during the highest electricity peaks and aid our ability to keep the lights on and costs under control.



Save some of your energy-intensive chores like running the dishwasher or doing the laundry for later in the evening—or do them earlier in the morning. Here are some other simple ways you can help the cooperative manage its load and, ultimately, its wholesale costs:

- Wash your clothes in cold water, and hang your laundry outside to dry.
- Open the dishwasher after the wash cycle to let the dishes air dry.
- Use the microwave or grill instead of the oven to cook dinner.

POWER COST ADJUSTMENT (PCA) CHARGE LIKELY COMING

Mother Nature handed the utility industry a perfect storm in mid-May when an early heatwave scorched the region. High temperatures ramped up demand for electricity when some utilities had power plants off-line for spring maintenance in preparation for the summer. A lack of generation resources combined with high fuel prices and not enough transmission capacity strained the regional grid, causing wholesale electricity prices to rise well beyond forecasted levels.

“As a not-for-profit electric cooperative, we set our retail electricity rates as close to actual cost as possible,” said Craig Buros, CEO & general manager. “Given the extreme circumstances in the wholesale power market and increased cost of generation this year, VEC has received a couple Power Cost Adjustments on our wholesale power bill. High sales and low controllable costs have allowed the cooperative to absorb those PCA charges, but the continued high cost of generation could lead to additional power cost charges and the need for the cooperative to pass on adjustments that might come in future months.”

What is a Power Cost Adjustment?

A PCA occurs in two forms: charge and credit.

Dairyland Power Cooperative, our wholesale power provider, has an obligation to secure enough generation resources to cover the electricity needs of all 24 member cooperatives when they are at their peak demand. As a member-owner of Dairyland, Vernon Electric receives most of its electricity needs from Dairyland. Power is provided in multiple ways:

- The power plants Dairyland owns (coal, natural gas, hydro, biogas)
- Purchase power agreements (PPAs) where Dairyland has agreed to purchase the electricity generated by a facility (solar, wind, hydro)
- Purchasing power, if needed, from the regional grid operator, MISO

A PCA credit can occur when fuel costs are low and electricity production and sales are high, as we experienced in 2020 and 2021. Power cost adjustment credits received by the cooperative were passed back to the members. This year power cost charges are likely due to multiple factors:

- Higher-than-budgeted fuel costs (mainly, natural gas and coal);
- Transmission congestion within the regional grid, which limits the amount of available energy—especially renewable energy—that can be delivered where it is needed;
- Unexpected heat waves when power plants are unavailable due to maintenance;
- Higher-than-budgeted costs to purchase energy from the market when power plants are unavailable.

“Dairyland nor MISO can predict what Mother Nature will throw at us next, but we are closely monitoring other outside pressures that will impact our wholesale power rate, including supply chain, interest rates, fuel prices and energy market prices,” said Dairyland’s President and CEO Brent Ridge. “Sustainable, safe, reliable and cost-effective electricity is our priority. Our members are counting on us.”

Employees in Dairyland’s System Operations Center balance members’ electricity needs against MISO’s pricing for electricity. If members can do the Summer Shift and move unnecessary electricity use to the hours before 11 a.m. or after 7 p.m., electricity demand during times of peak pricing within the MISO system can be reduced, thus keeping overall rates stable and affordable.



Forest as Classroom



By Leah Call

The phrase, “There’s no bad weather, only bad clothes” could be the unofficial motto of the Kickapoo Valley Forest School (KVFS), a charter school that opened its doors in fall 2021 with a goal of year-round, nature immersion education taking place outdoors the majority of each school day. In Wisconsin, that can be a challenge, even for the hardest outdoorsman.

“That’s the number one question we get— ‘are you really outside all the time?’” said Jonel Kiesau, education director for the Kickapoo Valley Reserve on Vernon Electric Cooperative lines. “The answer is, yes.”

Kiesau is on a five-member leadership team making operational decisions for KVFS. She was also involved in obtaining the \$700,000 grant that funds this public charter school connected to the La Farge School District.

In her role as education director at the Kickapoo Valley Reserve, Kiesau observed the impact that extended time in nature had on children. That observation led her to create nature immersion programming for 4K students from the La Farge School District, eventually launching a tuition-

based drop-off program. “We wanted to make it accessible to everyone,” said Kiesau. “So we applied for a charter school grant through the Department of Public Instruction.”

Securing the grant in 2020, the KVFS welcomed 29 four- and five-year-old children one year later.

Nature-based learning

Curriculum for the 4K and 5K students focuses on building social and emotional skills along with core academic skills around nature-based subjects. “The children are really leading us to show us what their interests are,” said Kiesau. “Last fall the children were really interested in the mushrooms that were popping up on the forest floor, so we were reading books about mushrooms, and drawing mushrooms, and counting mushrooms, and spelling mushrooms.”

As a public charter school, the KVFS team conducts assessments each spring and fall to ensure it meets required benchmarks. Following the La Farge School District calendar, children arrive at 8 a.m. and leave at 3 p.m. each day. In fall 2022, the school will add first-grade programming with second grade added the following year. Enrollment for the upcoming school year resulted in 16 new 4K students who will begin in September.

“We had more applicants than spaces, so we had to go to a lottery,” noted Kiesau. “There are some families on a waiting list.”

An alumnus of the La Farge School District, Kiesau returned to the area in the early 2000s, using her degree



Jonel Kiesau, Kickapoo Valley Forest School Education Director

and experience in conservation work to create the environmental programming at Kickapoo Valley Reserve. Bringing that programming and additional students to the district is rewarding for Kiesau.

“La Farge has been struggling with declining enrollment, and the charter school is starting to turn that around for the district,” she said, noting that 75% of KVFS students enrolled through the state’s school choice voucher program.

Kiesau is also proud of the learning outcomes exhibited by the forest school’s first-year students—not just academic. “Children are able to balance on logs, jump over puddles, run and stretch their legs. Parents say their children are sleeping better, eating better. Parents also report their children are able to name plants and animals around them. They can estimate distances, what’s farther and closer, being able to use comparisons in their world.”

After a successful first year, the leadership team is looking at possibly extending the charter to include third, fourth, and fifth grades in the future. Whether remaining at the forest school or moving on to another school, the children at KVFS are “completely prepared to enter whatever school system their parents choose,” noted Kiesau.

“The thing we see on a daily basis is children who are using their whole bodies to learn, who are getting stronger physically, mentally and socially. It is super exciting for us to watch these children develop throughout the year.”

Photos courtesy of Drew Shonka Photography



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