The February 2021 Cold Weather Event: What Happened Here and Why Texas is Not a Model for Missouri Legislation

Written by Renew Missouri

In February of 2021, states experienced record low temperatures and unprecedented rolling blackouts. While this event effected many states across the country, none was hit harder than Texas. This memo discusses the impact the February cold weather event had on Missouri, and why the consequences in Texas were more severe.

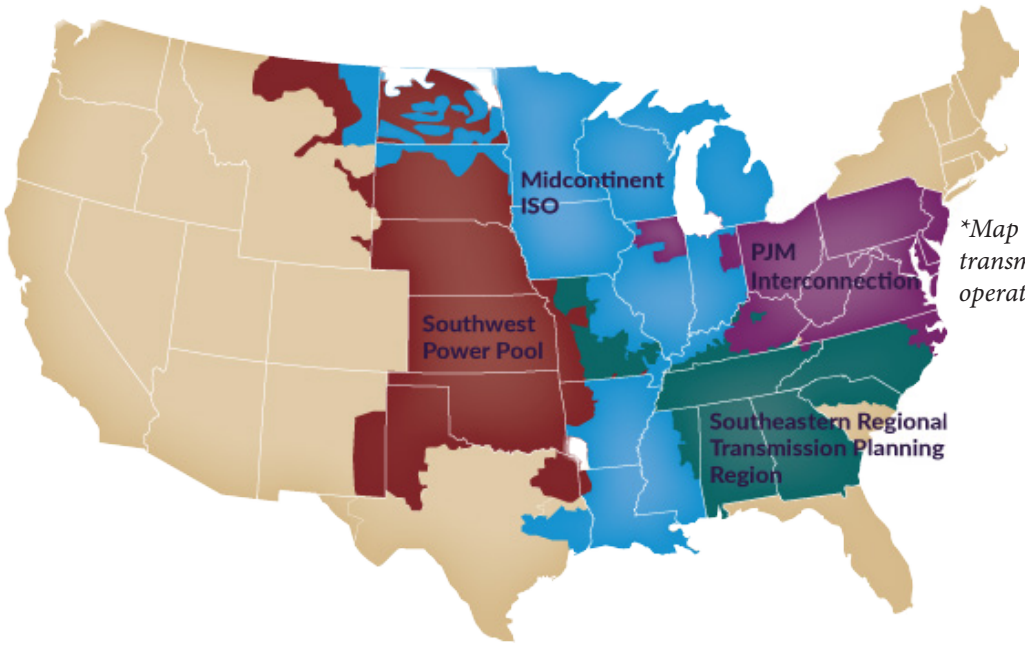
Missouri

This cold snap resulted in the largest challenge to the reliability of the bulk electric system in Southwest Power Pool (SPP) history. The SPP provides power to 14-states, including the western half of Missouri. Missouri, like most other states in the SPP, experienced low temperatures and above average snowfall. This fact, coupled with fuel supply shortages and equipment malfunctions led transmission system equipment to approach unsafe operating limits.

Missouri is served by two regional transmission operators (RTOs). The Midcontinent Independent System Operator ("MISO") serves the eastern part of the state, while the SPP serves the western side, encompassing both Evergy and Liberty's territories. RTOs are responsible for coordinating, controlling, and monitoring multi-state electric grids. When the cold weather even hit in February, MISO ordered some areas in its territory to shed load, or lighten strain on the electric grid by temporarily disrupting customers' electric usage – but not Missouri. During this time, the SPP ordered its transmission operators to shed load on February 15th and again on the 16th, including transmission operators in Missouri. This led Evergy and Liberty-Empire to implement rotating planned outages in accordance with their extreme weather protocols and marked the first instance of regional curtailments in SPP history.

According to a report published by the SPP, the lack of access to natural gas was the largest contributing factor to the severity of this event. Natural gas is delivered to Missouri through a network of pipelines and wellheads. Because natural gas straight from the ground cannot safely be transported through interstate pipelines, it must first be transported and processed to meet safety and quality standards. Power outages caused by extreme weather events inhibit gas transport and processing immensely. Finally, wellheads that have not been weatherized may freeze and block off the flow of gas. All these factors contributed to the substantial under performance of gas during the February cold weather event.

Coal outages in SPP territory remained consistent throughout the cold snap, however, coal delivered a lower percentage of its generation capacity than wind. In fact, wind nearly doubled its contribution to the



**Map of the regional transmission operators in the U.S.*

November, 2021

generation mix during the most critical point of the cold weather event. Prior to the cold snap, 11,000 MW of wind in SPP territory was offline, partially due to a significant icing event on February 7th. However, winds performance exceeded expectations as the cold weather event persisted, wind outages actually decreased to 8,000 MW, meaning that around 3,000 MW of wind generation was restored to service during this time.

Texas

This trend holds true for Texas as well, where the fallout from the 'Texas Freeze' created a flurry of misplaced anti-wind hysteria. 46% of energy generation in Texas comes from natural gas, followed by wind (23%) and coal (18%). Because wind availability varies, grid operators forecast how much wind production will occur during a time of year. It was forecasted that electricity production from wind would be approximately 7% in February of 2021. As such, blaming wind power as the cause of the energy crisis is incorrect, because wind power was not a major fuel source at the time. Meanwhile, natural gas was responsible for nearly 2/3 of the total deficit and about 40% of natural gas was unavailable during the crisis.

Much of Texas' grid failure stemmed from its failure to sufficiently weatherize electric and gas infrastructure. Overall, the state faced 30 GW of electric outages as demand reached unprecedented highs. This gap in production and demand forced ERCOT to cut off supply to millions of customers or face a grid collapse that, by some accounts, was minutes away.

To understand Texas, it is necessary to understand the deregulated nature of the state's energy sector. In 2002, Texas isolated its power grid from two major national grids to reduce power costs and deregulate the energy sector. Being disconnected makes it difficult for Texas to import electricity from other states, whereas the SPP was able to import additional power from MISO and another RTO. No other state has such a sequestered energy grid.

The near-collapse of Texas' electric grid can be partly traced to the state's market-based patchwork of energy retailers, transmission companies, and private generators. Texas' deregulated status creates few financial incentives for utility companies to invest in equipment weatherization and maintenance because separate companies are responsible for grid reliability. Given the competitive nature of a deregulated state, any company that invests in such precautions would put itself at a competitive disadvantage.

In addition, the Electric Reliability Council of Texas (ERCOT), Texas' single RTO, operates with an "energy-only" market, meaning power plants are only paid if they generate electricity. This contrasts with capacity markets, where some operators are paid to have backup capacity whether or not they run. By being self-contained in Texas, ERCOT avoids federal regulations. However, this self-containment directly contributed to the energy crisis. Several cities in Texas, such as El Paso and Beaumont experienced little or no power outages because they were not part of ERCOT and are connected to other grids. In addition, El Paso had invested in winterization of its equipment.

Lessons Learned

More gas would not have prevented this freezing event. Had facilities been winterized and production stayed online, the blackouts might have lasted hours, rather than days. Simply put, winterizing gas production and gas plants is an important step, but it is not enough. Texas faces issues satisfying peak demand during the summer too. High summer temperatures and drought-induced water limitations for cooling means that the winter freeze was only the first of the state's energy issues. Reducing the demand for energy is a crucial piece to the puzzle.

Demand-side strategies in buildings, and investments in energy efficiency throughout the state could reduce the need for electricity during periods of extreme cold or heat, thereby avoiding some of the strain in the first place. Investments in heat pumps, LED lights, drill-and-fill insulation, among other measures could reduce energy demand in buildings.

The Texas energy crisis stemmed from a culmination of a too isolated energy grid, negligent weatherization practices, and bad weather. What happened in Texas is not a one-time occurrence, but Missouri can and should learn from the insufficiencies of Texas policy. "This experience should be a warning to other states: if an energy-abundant, rich state that likes to invest in infrastructure can suffer a significant energy crisis,