

KYMEA POWER POST

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Energy Security

BY MICHELLE HIXON

The United States has experienced numerous incidents and disasters in the energy sector over the past couple of years. Ranging from cyber-attacks on infrastructure in the east to wildfires and rolling blackouts in Texas and California, the energy industry has dealt with more than its fair share of emergencies. As a result, Grid security has become a top-level concern for utilities and the Department of Energy (DOE). The energy world is rapidly changing, and in today's world, there are many factors to consider when discussing "Energy Security."

2021 proved to be a critical year with an increase in grid incidents. Texas and other nearby states experienced historic winter storms in February of 2021. Severe cold ravaged power plants from the 10th-20th of February, causing infrastructure and power failure to over 4.5 million homes and businesses.

On May 7, 2021, the Colonial Pipeline suffered a cyber-

attack, holding company operations for ransom. Operations finally resumed on May 12th, after the eastern half of the United States suffered fuel shortages, causing panic, flight cancellations, and the highest fuel prices since 2014. In 2021, systems in ERCOT experienced a historic polar vortex resulting in days of blackouts with financially crippling effects for many utilities. In addition, in 2021, water utilities in Florida realized they were being attacked when chemicals were changed remotely to toxic levels. Fortunately, what could have been a community nightmare had been caught and reversed before damage was done.

The topic of energy security is much broader and more complex in today's world than it ever has been. Research, analysis, and proactive steps must be taken to ensure the grid is safeguarded from physical, financial, and cyber-attacks.

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Bulk Power Reliability

BY DOUG BURESH



Greetings,

In the power industry, when we hear the word reliability, we equate it to “keeping the lights on.” Simply put, when the customer flips on a light switch, the customer has a very high expectation that the lights will come on and stay on.

BULK POWER GRID TRANSFORMATION

The U.S. electric power grid, once viewed as the most stable and secure power

system in the world is in the midst of undergoing a systemic transformation as grid operators are being forced to adapt to multiple challenges. Among these challenges are an anticipated surge in electricity demand, brought on by the proliferation of new electric vehicles and the digital systems needed to support the “Internet of Things,” and new generation coming online from renewable sources — with their inherent intermittency issues — along with electricity storage capacity from next-generation rechargeable batteries.

These exciting developments are coming very quickly, making it increasingly difficult for grid operators to maintain the high-reliability standard the U.S. power industry has provided for decades.

SOUNDING THE ALARM

The U.S. electric power grid is walking a reliability tightrope. Over the past decade, California (CAISO), Texas (ERCOT), and the Midwest (SPP and MISO) have had difficulties providing reliable power supply during extreme weather events resulting in rolling blackouts.

FERC and NERC are concerned and sounding the alarm, as confirmed by the quotes below.

PAST CHALLENGES

The U.S. electric power grid has had to overcome bulk power supply and reliability challenges in the past. In 1965, the northeast experienced a widespread blackout due to a transmission line failure that occurred while moving massive amounts of hydroelectric power from Niagara Falls to New York state. The blackout lasted 13 hours and affected 30 million people. In response to this outage, the North American Reliability Council (NERC) was formed to address the reliability of the North American bulk power system.

In the 1970s, a global oil price shock resulted in widespread panic and gasoline shortages due to instability in the Middle East and OPEC price hikes. In response to the energy crisis, President Carter signed the Fuel Use Act of 1978 which specified that no baseload electric power plant may be constructed or operated without the capability to use coal.

OUR LATEST SECURITY CONCERN

Today, we are experiencing issues similar to both 1965 and 1979. As the bulk power system adds renewable energy while simultaneously retiring nuclear, coal, and natural gas assets, the high-voltage transmission grid is scrambling to build a transmission network that will allow the renewable power to reach the load centers. Since renewable generation can be added at a much faster pace than transmission, there is a strain on the existing transmission infrastructure.

The Russian invasion of Ukraine amplifies our energy security concerns. The NATO allies' support of Ukraine has led Russia to retaliate and severely limit the flow of natural gas into Europe. Like the 1970's Middle East conflict, the European energy shortage has a global impact as liquified natural gas and coal from the U.S. and Australia are being shipped to Europe to supplant the Russian natural gas supply loss.

“WE’RE HEADING FOR RELIABILITY CRISIS.”

FERC Commissioner Mark Christie (May 2022)

“WE’VE BEEN SEEING A PROGRESSION OF RISKIER OUTLOOKS FOR THE ELECTRIC GRID FOR THE LAST FOUR OR FIVE YEARS ... WE’RE HAVING WHAT WE WOULD CALL A DISORDERLY RETIREMENT OF OLDER GENERATION, WHICH IS HAPPENING TOO QUICKLY.”

Jim Robb, President and CEO, North American Electric Reliability Corporation (NERC) (June 2022)

“WE’VE BEEN DOING [RELIABILITY ASSESSMENTS] FOR CLOSE TO 30 YEARS. THIS IS PROBABLY ONE OF THE GRIMMEST PICTURES WE’VE PAINTED IN A WHILE.”

John Moura, NERC Director of Reliability Assessment and Performance Analysis (May 2022)



KYMEA'S RESPONSE

To provide security and risk mitigation for our members and their customers, KYMEA has "steel-in-the-ground" purchase power agreements with firm transmission paths. By tying our PPA capacity to tangible assets coupled with firm transmission access, KYMEA is less likely to be curtailed by grid operators in the event curtailments become necessary due to a lack of bulk power.

The KYMEA approach is to provide a competitive, stable, and reliable power supply. While the PPA capacity and firm transmission provide security comfort, the Agency is also prepared to respond if curtailments are necessary during extreme weather events. KYMEA's Emergency Operating Procedures outline the plan to follow due to a power

emergency. This past summer, in which there were many days over 100 degrees, the power grid operator requested voluntary curtailments to alleviate pressure on the grid. KYMEA, in turn, requested help from our members and their customers. The voluntary curtailment request occurred seven times this past summer.

KYMEA would like to thank our members' customers for helping out by raising their thermostats and cooking and doing laundry during off-peak hours. Your help was greatly appreciated!

Welcome New Directors!

Welcome to the Team! KYMEA's newest Board Directors, Tim Lyons and Jamie Miller will be a tremendous asset to KYMEA's Board. We look forward to their leadership and want to thank them for their commitment to the Agency.



TIM LYONS
 KYMEA Director
 General Manager
 Owensboro Municipal Utilities



Tim Lyons, Owensboro Municipal Utilities' (OMU) new General Manager, is not a new face to KYMEA. Tim has served as the KYMEA Alternate Director for OMU since September of 2018. Before his position as General Manager, he was the Director of Delivery and has served OMU since 2007.



JAMIE MILLER
 KYMEA Director
 City Manager
 The City of Paris



Jamie Miller was named the City of Paris City Manager on April 26, 2022. She is an experienced professional in municipal matters. Before moving to Paris, Jamie served as the Deputy City Manager for Port Orange, Florida, where she held several other roles during her decade with the city.

Emergency Response

BY MICHELLE HIXON

Wildcard events are not new to the energy industry, but today's mitigation efforts are much different than in times past, and we must plan and prepare accordingly here at home in the Commonwealth. Power grid operators such as MISO, PJM, ERCOT, CAISO, and SPP have warned that as we endeavor to replace fossil fuel plants in the United States with renewable generation, we may not be replacing them fast enough to keep up with demand and to manage the corresponding change in the load curve.

Solar and wind generation is undoubtedly proving to be the energy resources of the future, which will also include other alternative clean energy options over time. Each new generation resource has a unique set of limitations to manage as they are dispatched onto the grid. Solar and wind generation are limited by weather, time of day, and location; most importantly, they are intermittent generating resources. The intermittency associated with renewable resources can cause generators to struggle in keeping up with demand, leading to power shortages across the grid. The industry should be mindful of this effect as more fossil fuel resources are retired and replaced with renewable resources. Prudent planning and decision-making are critical to providing continued reliability to the grid during this transition period.

The Agency recognized and heard these warnings from grid operators and developed its Emergency Operating Procedures to establish a formal process for handling emergency conditions that may arise. The Emergency Operating Procedures help to do the following:

- Identifies possible types of emergency conditions;
- Defines each emergency situation;
- Provides guidelines for troubleshooting and action steps; and
- Acts as a guide to communicating with KYMEA members during an emergency situation.

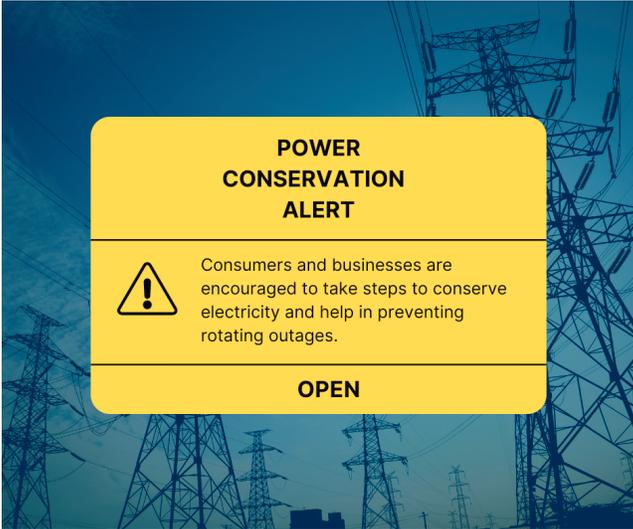
The fundamental guidelines provided in the Emergency Operating Procedures were developed for managing emergency conditions as they arise. As a result, the staff is able to identify and carry out a predetermined plan to mitigate the potential effects of an operating emergency. In addition, emergency response is closely coordinated with members and the local balancing authority.

Important Dates

September	
22nd	Board Meeting
23rd	BROC Meeting
October	
27th	Board Meeting
November	
16th	Budget Committee Meeting
16th	Board Meeting

Included in the Emergency Operating Procedures, staff developed a voluntary conservation program to allow members' customers to respond by voluntarily conserving electricity in the event that MISO, LG&E-KU, or PJM issue capacity advisories that may affect the system.

The Power Conservation Alert (PCA) Program notifies members, who in turn will notify their customers of KYMEA's request for voluntary power conservation measures. The Power Conservation Alert program preemptively advises KYMEA members to conserve energy to avert a potential involuntary brownout or blackout situation similar to what California and Texas residents have experienced in the past several years.



Emergency Response

Continued

The program allows KYMEA to declare a Power Conservation Alert and automatically notify members via e-mail and/or text that a conservation event has occurred, to which their customers may voluntarily respond to conserve energy.

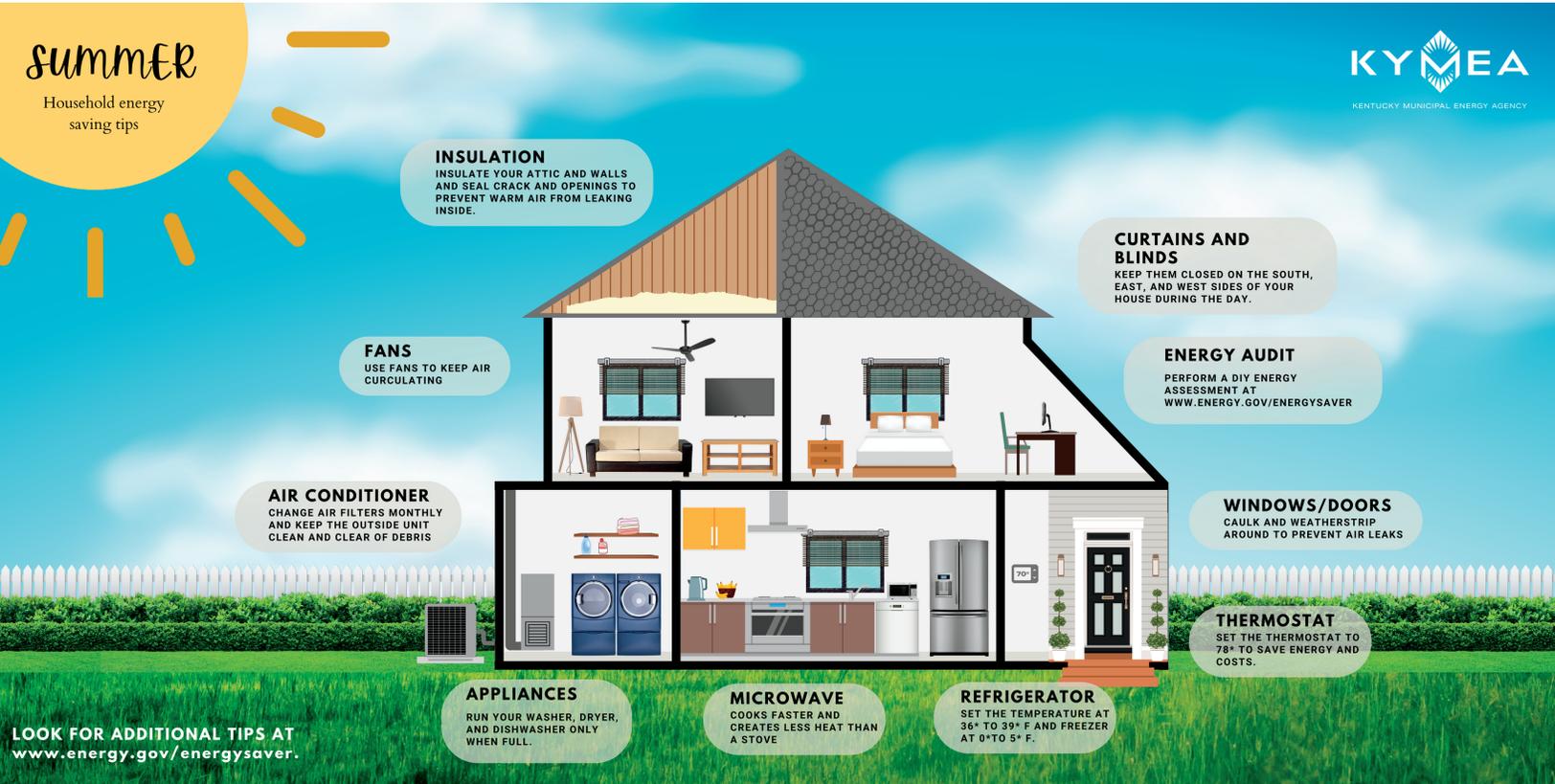
KYMEA created the "Household Energy Savings Tips" (shown below) to help customers save energy.

The Power Conservation Alert program provides customers an opportunity to conserve energy, gives them a choice in their consumption, and allows them to be a part of the solution. KYMEA's Board of Directors proactively developed and implemented the Power Conservation Alert program in hopes that voluntary curtailments will avert rolling blackouts.

So, what happens if voluntary curtailments are not enough? The grid would do its best to generate as much energy as possible, but it still may not be able to keep up, especially if it's a really hot day and demand is unsustainably high. This situation creates "peak" conditions, where demand may reach its highest level, and generators are not able to meet that demand.

Reaching peak conditions can create the following impacts:

- Price Volatility: Prices during an energy emergency can be highly volatile. During the 2021 Polar Vortex, real-time market prices in ERCOT shot up to over \$9,000 per megawatt hour. Consuming energy during peak hours when there is an emergency can cost ratepayers significantly and financially harm a utility in a single crisis.
- Rolling blackouts may be unavoidable if demand outpaces supply.
- If demand remains critically high, the Balancing Authority or Reliability Coordinator may begin curtailing load, causing automatic blackouts to avoid severe damage to the power grid and customer equipment.



KMUA Annual Meeting In Owensboro

BY MICHELLE HIXON

The Kentucky Municipal Utility Association (KMUA) met for its Annual Meeting on July 21st. The meeting was hosted by Owensboro Municipal Utilities at the Bluegrass Museum. Thursday morning began early with 18 holes of golf at Ben Hawes Municipal Golf Course, followed by a Telecommunications Committee Meeting and a utility vendor expo.

Mayor Tom Watson opened the evening with an enthusiastic welcome to Owensboro. The City of Owensboro created an impressive waterfront venue, complete with a beautiful scene of the Ohio River, comfortable swings, parks, and restaurants just a few blocks away.

Dave Carroll, General Manager of the Paducah Power System, introduced the keynote speaker, Commissioner Bobbi Jo Lewis, with the Department of Rural and Municipal Aid. The department is a liaison to local governments for transportation needs. They also oversee the Office of Local Programs and The Office of Rural and Secondary Roads. Ms.

Lewis discussed the progress they are seeing with several significant projects, including the Brent Spence Bridge Corridor Project.

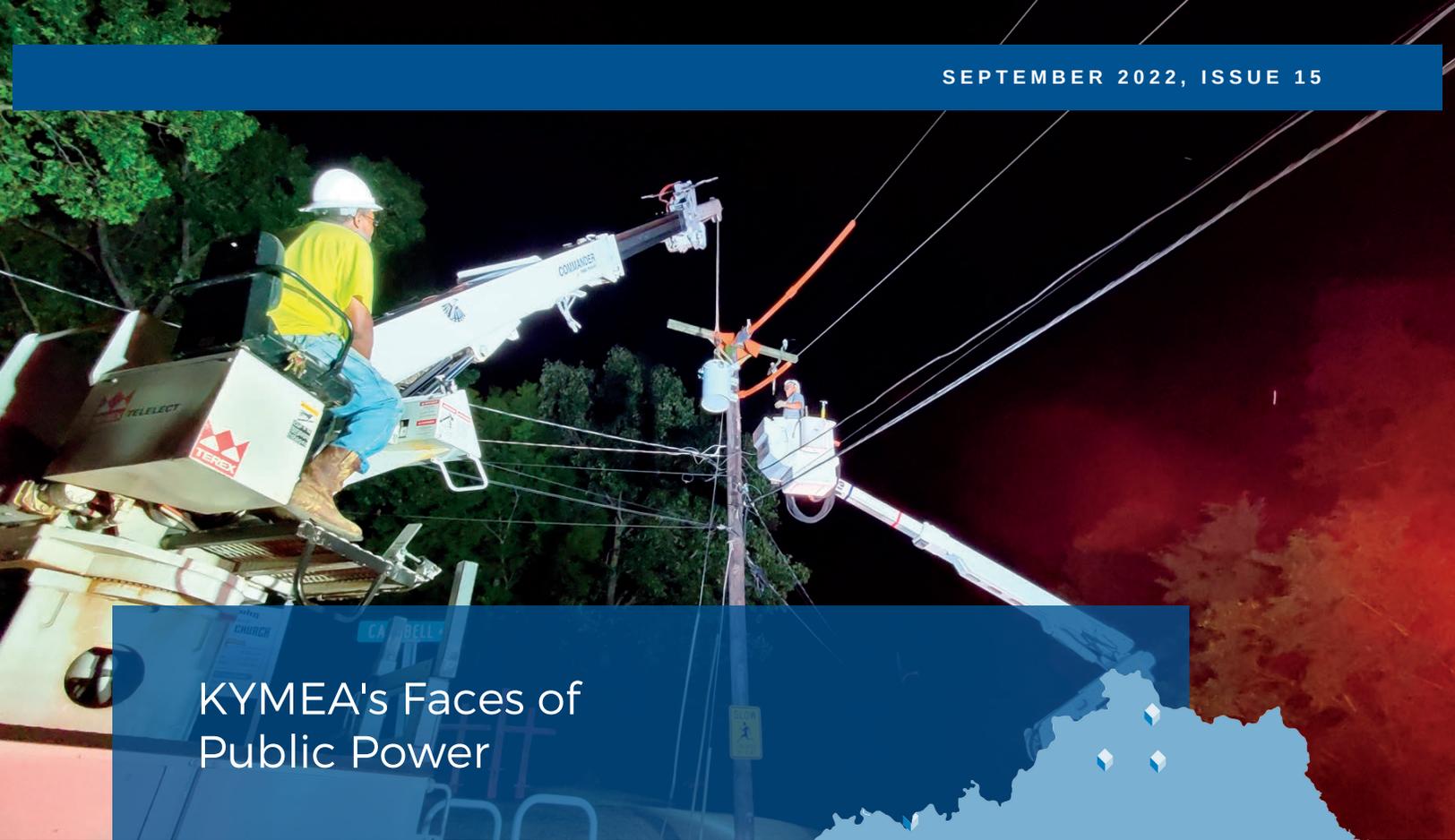
Next was Suzanne Miles, representing the 7th District in the Kentucky House of Representatives, followed by a well-deserved moment of honor and award presentation to former OMU General Manager Kevin Frizzell. Kevin was in full celebration mode as he was only a few days away from his official retirement date. Congratulations, Mr. Frizzell, for many years of work and dedication to OMU!

Finally, Annette DuPont-Ewing presented Gary Zheng, General Manager of The Frankfort Plant Board, with KMUA's inaugural Excellence in Utility Management award for his outstanding work at the Plant Board over the past four years. Congratulations, Mr. Zheng, for your exceptional contribution to Public Power.



KMUA Annual Meeting
 KMUA hosted its Annual meeting at the Bluegrass Music Hall of Fame & Museum in downtown Owensboro, Kentucky.





KYMEA's Faces of Public Power



Thomas Jenkins (TJ)

TJ grew up in Bardwell and began his work with the City of Bardwell in September of 2007. He served as the Street Superintendent for Bardwell and has since become certified as a natural gas operator and an electrical lineman. He is a friendly face to all of Bardwell's citizens and goes out of his way daily to help those in need. It is not unusual to see TJ hop out of his truck to help someone unload their groceries or help wherever needed.

David Hutchinson (Hutch)

David is also from Bardwell, and in 1997, at 18 years old, he joined the city as a firefighter. Since then, he has obtained a long list of certifications to help the city by obtaining certification in natural gas operations, sanitation/sewer, water operation/distribution, and electrical lineman. David has also served as Bardwell's Fire Chief since 2008.

TJ and David wear multiple hats and play an integral role in their community. We are proud of their hard work in Bardwell to keep the lights on and citizens safe. Thank you, TJ and Hutch, for all that you do!





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If you have ideas for the next Power Post, please email Michelle Hixon at mhixon@kymea.org.



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