

THE CURRENT



For Our Member Systems, Employees and Friends

SW Kansas future site of largest solar project in Kansas Mid-Kansas to add more renewable energy to generation portfolio

It was fitting that Mid-Kansas Electric Company announced a future solar project, designed to be the largest solar facility in Kansas, on a sunny, warm winter day.

The Feb. 28 announcement, which took place at Sunflower's headquarters in Hays, Kan., revealed the company's plans to purchase renewable energy from a 20-megawatt solar facility scheduled for construction in southwest Kansas. In attendance were Kansas Lt. Gov. Tracey Mann and dignitaries from Mid-Kansas, Lightsource BP, the National Renewables Cooperative Organization, employees and the media.

Lightsource BP, an independent power producer, will build, own and operate the solar facility near Johnson City, Kan., in Stanton County.

"Kansans have a long history of capitalizing on opportunities that make the most of our abundant resources," said Lt. Gov. Tracey Mann. "Gov. Colyer and I congratulate Mid-Kansas, Lightsource BP, and NRCO on their successful collaboration to construct what will be the largest solar project in Kansas. The Johnson Corner Solar Project illustrates a commitment to renewable energy resources that complement dispatchable energy resources."

"Harnessing the power of the sun is not a new concept. The economics are what have changed," said Steve Epperson, Mid-Kansas chairman of the board. "The decreasing cost of photovoltaic technology, along with other industry dynamics, makes it the right time to bring solar energy into our generation mix."

Diversity in Mid-Kansas' generation portfolio is another reason the Mid-Kansas board members decided to pursue the solar facility.

"Each generation fuel type has advantages, and the benefits of solar will add diversity to our existing generation portfolio," said Stuart Lowry, president and CEO of Mid-Kansas and Sunflower. "Along with other benefits, this solar facility will generate energy during our summer peak demand, providing protection against high market prices during times of increased energy demand."

Construction of the project is scheduled to begin in early 2019. The facility is expected to come online by late summer.



With a depiction of the future Johnson Corner solar facility in the background, Lt. Gov. Tracey Mann offers congratulations on behalf of Kansas Gov. Jeff Colyer for the commitment of Mid-Kansas, Sunflower and project partners to renewable energy resources. Seated behind Mann are Stuart Lowry, president and CEO of Mid-Kansas and Sunflower; Steve Epperson, chairman of Mid-Kansas Board of Directors; Kevin Christy, chief operations officer, Lightsource BP, North America; and Eric Spigelman, director of renewables development, National Renewables Cooperative Organization.



Prior to making the announcement that a 20-megawatt solar farm will be built near Johnson City, Kan., Steve Epperson, (front left), chairman of the Mid-Kansas Board of Directors, and Lt. Gov. Tracey Mann speak with public officials Shaun Musil and Sandy Jacobs, both Hays city commissioners; and Barbara Wasinger, Ellis County commissioner. Clare Gustin, Sunflower vice president, member services and external affairs, listens in.

Project Summary

- A collaborative project between Mid-Kansas, Lightsource BP, and the National Renewables Cooperative Organization (NRCO)
- Nameplate Capacity (AC): 20 MW (2% of combined system peak)
- Expected Accredited Capacity (AC): 15 MW
- Year 1 Capacity Factor: 31.7%
- Year 1 Expected Energy: 55,538 MWh (1% of combined system energy)
- Expected Commercial Operation: Second half of 2019
- Approximately 86,000 solar panels
- Racking Type: Single-axis tracking
- Location: 2 miles from Johnson City, Kan.
- 25-Year Power Purchase Agreement
- Acreage: 241



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Generation and transmission affected

Recent wind buildout brings about operational changes

Sunflower and Mid-Kansas board members continue to support diverse electric generation. This is the third article in a series that gives an overview of each electric generation fuel type and describes how it fits into the Sunflower and Mid-Kansas systems.

It seems as if they are popping up everywhere across the nation—giant “pinwheels” used to generate electricity from the kinetic nature of wind. Electric cooperatives are playing their part with more than 550 co-ops in 37 states incorporating wind into their energy resource mix.¹

Most co-ops acquire their wind via Power Purchase Agreements (PPAs) with independent power producers that have capitalized on the production tax credit (PTC) available to wind developers. Government subsidies pay wind producers \$23 per megawatt hour, and typical PPAs include a “must take” clause that requires the buyer to purchase all energy produced regardless of demand.²

Sunflower and Mid-Kansas have been invested in wind energy since 2007. At present, the two companies have PPAs totaling 178 MW. The reasons for the investments were to achieve fuel diversity, have a fixed-priced hedge against volatile energy prices, and meet the renewable energy requirements then mandated by the state of Kansas.

During the last decade, the region, including the territory served by Sunflower and Mid-Kansas, has experienced a surge of wind development, primarily due to the PTCs that are slated to begin phasing out in 2020. This escalation has resulted in the rise in wind energy from 556 MW interconnected to the Sunflower/Mid-Kansas system in 2008 to approximately 3,491 MW by the end of 2018. This equates to 297% more wind energy than peak energy demand on the Sunflower/Mid-Kansas system. This overabundance of wind energy has caused Sunflower and Mid-Kansas to adapt to new ways of doing business.

Changes in operations

Just a few years ago, Sunflower and Mid-Kansas supplied wholesale energy to their members from their own fleet of generating resources powered by natural gas, coal and wind. Operations changed when the Southwest Power Pool, the Regional Transmission Organization of which Sunflower and Mid-Kansas are members, launched the Integrated Marketplace (IM) in 2014. With the IM, Sunflower and Mid-Kansas no longer generate energy just for their members. Instead, Sunflower and Mid-Kansas sell generation from their resource fleet into an energy market that serves a 14-state region and take advantage of the market's competitive pricing to purchase energy for their members.

The abundance of wind energy often creates market conditions in which demand for the Sunflower and Mid-Kansas fossil-fuel generation is sporadic. Not only do the



On the Kansas prairie, the Smoky Hill Wind Farm, located in Lincoln and Ellsworth counties, stands as a technological contrast to the quiet beauty of nature.

generating plants ramp up and down to follow the fluctuation of wind, but they are also often operated at reduced levels of production or even stand idle to make way for wind energy.

“Sunflower’s 360-MW coal-fired unit is now often cycled from minimum to maximum load, creating maintenance issues that weren’t as prevalent when the unit was operated more consistently,” said Corey Linville, vice president, power supply and delivery for Sunflower and Mid-Kansas. “Our gas-fired internal combustion engines and combustion turbines also get cycled when they run. They are started more frequently, typically with short run times, partly to follow wind and provide ramping support to the Southwest Power Pool.”

3,491 MW

This equates to 297% more wind energy than peak demand on the Sunflower/Mid-Kansas system.

The availability of traditional dispatchable generation, such as coal and natural gas, remains necessary to ensure that reliable electricity is always available to Sunflower’s and Mid-Kansas’ members. However, operating units in a manner in which they were not intended causes mechanical issues that are usually costly to repair. In addition, no matter the level of operation, staff must remain on hand to maintain each generation unit or operate it when it receives SPP’s notification to run. This new way of doing business comes with other costs as well.

Focus on transmission

The energy produced by each wind farm requires adequate

transmission infrastructure to carry it from its point of origin to where it is needed. When sufficient transmission capacity is not available to support the flow of power, the result is transmission congestion, which can cause energy price volatility in the IM, impair grid reliability and make an area more vulnerable to outages.

Some solutions to congestion include transmission construction and upgrades, solutions that come at a cost to energy ratepayers. To keep electric rates as reliable and affordable as possible, staff representing Sunflower and Mid-Kansas consider all options to mitigate transmission problems, such as working with other utilities to share costs on transmission projects, analyzing the need for additional transmission and studying alternative solutions such as generator modifications and batteries that are less expensive than new transmission.

Rate pressures caused by wind

“With wind energy, it is challenging to balance energy supply and demand,” said Linville. “There is substantially more wind generation connected to our system than demand for energy, also known as ‘load.’ Because wind typically blows the most when we have the lowest energy demand, it’s not uncommon to have wind generation injected into our system almost triple the amount of load we are serving from the system.”

When this happens, the principles of supply and demand kick in. When there is more energy being supplied to the Sunflower/Mid-Kansas transmission system than there is demand to consume it, the excess energy has to be exported. This export energy flows on transmission lines that were designed to serve rural western Kansas load, not to export substantial amounts of wind energy to other parts of the country. When flows begin to approach the design limitations of the transmission facilities, the lines are said to be “congested.”

The IM uses a pricing method in an attempt to relieve congestion. Energy prices on the upstream side of the congestion are lowered to encourage generators to produce less, while energy prices on the downstream side of the congestion are raised to encourage generators to produce more. Because wind producers receive a production tax credit on all energy produced, energy prices often have to drop to negative values before wind generators respond and reduce output. For buyers, the drop in the price of energy is good. For those who have energy to sell, including Sunflower and Mid-Kansas, the depressed pricing hurts the bottom line.

“Like every other energy resource, wind energy has its pros and cons,” Linville said. “Sunflower and Mid-Kansas are not fuel biased; we are member biased. Each and every day our staff strategizes about the best way to utilize our assets while participating in the IM in order to provide our members with the best service possible.”

Sources:
¹America’s Electric Cooperatives. “Wind.” <https://www.electric.coop/wp-content/Renewables/wind.html>.

²Moorefield, Laura. “Growth of Wind Generation in the Electric Cooperative Community.” June 2017. Business & Technology Strategies.



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System Backbone Project planning continues

Sunflower continues to plan the System Backbone Project, a multi-phase project that will include three substations and 25 miles of 115 kV radial transmission line in Gray and Finney counties. The project is a least-cost solution to enhance reliability and relieve congestion, as well as provide economic benefits.

This project was evaluated in the 2015 Southwest Power Pool (SPP) planning process and gained SPP's endorsement.

Project participants include Sunflower members Lane-Scott Electric Cooperative, Wheatland Electric Cooperative, and The Victory Electric Cooperative.

Building this project rather than constructing temporary solutions to address the lack of reliability in their area, Lane-Scott and Wheatland will save money. Victory will also benefit from this project, as it will provide a redundant feed to a large load pocket in its service territory.

Route selection for the next project phase is still underway as many factors must be considered. Some of these factors include the requests of residents, future transmission planning, and terrain.

A landowner meeting for properties near possible line routes was held on March 1 at Wheatland's Garden City

office. The meeting informed landowners about route options and benefits of the project.

Sunflower plans to begin right-of-entry work in late spring of 2018 after the final route is selected. Construction is scheduled to commence by the third quarter of 2018.

Sunflower remains committed to including the public in the project planning process. To stay up to date on project developments, visit the project website at <https://www.sunflower.net/system-backbone-project/>.

Transmission Update:

Harper-to-Milan Project

The Harper-to-Milan Project, consisting of 75 miles of 138 kV transmission line and one new substation, is located in Kingman, Harper and Sumner counties.

As the project enters its fourth year, transmission line construction is nearing completion. The Rago-to-Harper portion of the Harper-to-Milan 138 kV transmission line was energized in December 2017. Some cleanup remains. The next segment that will likely be energized is the Harper-to-Anthony segment. Nearly all the foundation work is finished, structures are being set, and the stringing of conductor has begun. The same level of completion has been achieved on the Anthony-to-Bluff Creek segment.

Once the entire Harper-to-Milan Project has been energized, the project area will have a robust and redundant line that will enhance the local delivery of reliable energy. Also, the line's voltage, higher than that of the previous line, will allow for continued commercial and industrial growth.

Walkemeyer-to-Harbinger Project

The Walkemeyer-to-Harbinger Project, located in Stevens County, will include a one-mile 115 kV transmission line, the new Harbinger Substation, and the expansion of the existing Walkemeyer Substation.

Easement procurement was completed in mid-2017, and construction materials arrived on site in mid-February. By late February, substation dirt and concrete work was completed, and transmission poles were being erected.

All the transmission poles will likely be erected by early April, followed by the completion of the Harbinger Substation and Walkemeyer Substation expansion.

Line energization is scheduled for June 2018.

Legislative advocacy leads to passage of SB 323

During the current legislative session, Sunflower and its members were particularly interested in SB 323. Strong co-op participation and interaction with legislators were instrumental in the advancement of the bill. After being passed unanimously in the House and Senate, the bill was signed by Gov. Jeff Colyer on March 5. SB 323 includes the following provisions:

- **Regulation of municipal agencies.** This provision will allow the members of a municipal energy agency to vote to deregulate from Kansas Corporation Commission (KCC) jurisdiction for rate matters between the MEA and the members. MEAs will be required to obtain a certificate of convenience for transmission rights only when constructing transmission assets that cross another utility's service territory.
- **Requirements for service territory annexation.** Municipalities will be required to give an incumbent rural utility a 30-day notice of consent annexation. The municipality, when determining which utility will serve

the newly annexed property, will consider a proposal from the incumbent electric supplier to provide service. Current law provides a formula for compensation to the rural utility when a city annexes existing rural utility customers into a city municipal utility or another retail provider. New provisions provide compensation when land is annexed for future development and when the rural utility loses the right to provide electric service to the property.

- **Elimination of dual regulation of transmission-owning electric cooperatives.** The KCC governs Kansas' electric transmission rates, which are also regulated by the Southwest Power Pool and the Federal Energy Regulatory Commission (FERC). These levels of jurisdiction create problems for Kansas cooperatives when the various jurisdictions disagree about rate matters. Going forward, rates charged as part of SPP and FERC will not be governed by the KCC.

Electric Utilities Power America with Energy, Jobs

Consider a cooperative career

- The electric power industry supports more than 7 million jobs, 2.6 million from direct employment
- Utilities will hire as many as 25,000 new employees in the next 5 years due to retirements; 6,000 retired last year
- Employment needs are driven by a high-tech society that "demands electricity to power or charge nearly every new product or technology that comes to market"

Source:
"Powering America: The Economic and Workforce Contributions of the U.S. Power Industry," Aug. 2017.

- Accountant
- Administrative assistant
- Architect
- Building and grounds coordinator
- Coal handler
- Communications
- Compliance
- Contracts supervisor
- Control systems coordinator
- Corporate trainer
- Custodian
- Database coordinator
- Economic development
- Electrician
- Energy specialist
- Engineer
- Environmental specialist
- Equipment operator
- Graphic designer
- Human resources
- Information technology
- Laboratory technician
- Lawyer
- Line worker



- Lubrication specialist
- Maintenance planner
- Manager
- Mechanic
- Operator
- Payroll specialist
- Photographer
- Power market analyst
- Power plant operator
- Power supply analyst
- Production supervisor
- Project manager
- Public relations
- Purchasing agent
- Regulatory specialist
- Safety technician
- Security officer
- Simulator instructor
- Supervisor
- Supply chain coordinator
- System operator
- Telecommunications
- Videographer
- Warehouse worker
- Welder
- Writer
- And more...



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THE CURRENT

The Current is published three times per year for the Member systems, friends and employees of Sunflower Electric Power Corporation and Mid-Kansas Electric Company.

If you have a story idea or would like to subscribe, please send an email to chertel@sunflower.net or write to The Current News, PO Box 1020, Hays, KS 67601; (785) 259-4822.

Member Memo

Youth tour, leadership camp reflect co-ops' principles

"Education, training and information" is one of the seven cooperative principles. Sunflower's members, along with other electric cooperatives across the nation, promote this principle each year when they invite students in their service territories to compete to participate in either the Electric Cooperative Youth Tour in Washington, D.C., or the Cooperative Youth Leadership Camp in Steamboat Springs, Colo.

2018 marks the 58th year for Kansas electric cooperatives' participation in the youth-tour program. Kansas students first attended the leadership camp in 1977. Both events reward students for academic achievement and community leadership, educate them about the role of electric co-ops in the national economy and build leadership skills so that they continue to make a difference in their communities.

Students interested in the trips show their seriousness and commitment to representing their local co-ops by preparing for and completing the application process. Each member co-op establishes its own criteria by which candidates will be judged. Requirements range from a single essay to a combination of an application/résumé, test, or face-to-face interview with multiple judges.

"We try to give the kids a taste of what it's like to go through a formal application process," said Drew Waechter, Pioneer Electric communications specialist.



Pioneer Electric employees Dee Longoria, energy services coordinator, and David Norton, communications specialist, make a surprise visit to a math class at Ulysses High School to announce to Cindy Nolasco-Rios that she was selected to attend the Cooperative Youth Leadership Camp in Steamboat Springs, Colo., this summer. Longoria and Norton traveled to all the schools of Pioneer's finalists to inform them of their selections and the events they will attend, either the Electric Cooperative Youth Tour in Washington, D.C., or the leadership camp.

This year, the youth tour is scheduled for June 7-14. During the tour of the nation's capital, students will learn about the democratic process, gain a personal understanding of American history and their role as citizens and meet their representatives and senators. Visits to Arlington Cemetery, Capitol Hill, Smithsonian museums and Lincoln Memorial are also on the itinerary. Those selected for the leadership camp, held from July 13-19, will join other students from Colorado,

Oklahoma and Wyoming to learn about the cooperative model, rural electrification, leadership, energy and safety. They will also enjoy a banquet, games, swimming, rafting on the Colorado River and shopping in Steamboat Springs.

"The youth tour and leadership camp are among the most important community and member engagement programs we have," said Shawn Powelson, Wheatland Electric director of communication. "Besides the obvious benefits of the trips themselves for the students, we've developed relationships with them, their parents and the schools. They are effective tools to communicate the cooperative difference in very tangible ways."

Sponsorship of the youth tour and leadership camp fulfills another principle for cooperatives.

"One of the cooperative principles is 'commitment to community,'" said Dee Longoria, Pioneer Electric energy services coordinator. "Programs like these provide a great opportunity to invest in the communities we serve. Our hope is that these students will take the skills and knowledge gained from these trips and apply them to bettering their communities, wherever that may be."

Cooperative Youth Leadership Camp		Electric Cooperative Youth Tour	
<p>Lane-Scott</p> <ul style="list-style-type: none"> Gentry Shapland, Dighton Jaqueline Gonzales, Healy <p>Pioneer</p> <ul style="list-style-type: none"> Rebecca Johnson, Hugoton Cindy Nolasco-Rios, Ulysses <p>Prairie Land</p> <ul style="list-style-type: none"> Kailey Gill, Norton Ashley Karnopp, Norton Tayln McKenzie, Smith Center 	<p>Western</p> <ul style="list-style-type: none"> Zach Gillespie, Grainfield Micah Bolton, Ellsworth <p>Wheatland</p> <ul style="list-style-type: none"> Brant Cotta, Argonia Sammie Strnad, Caldwell <p>Southern Pioneer</p> <ul style="list-style-type: none"> Brayden Schmidt, Sharon Desiree Doherty, Kiowa <p>Victory</p> <ul style="list-style-type: none"> Aria Knedler, Dodge City Alejandro Rangel-Lopez, Dodge City 	<p>Lane-Scott</p> <ul style="list-style-type: none"> Burke Shapland, Dighton Melanie Whipple, Dighton <p>Pioneer</p> <ul style="list-style-type: none"> Nikki Wilken, Ulysses Slater Heglin, Ulysses <p>Prairie Land</p> <ul style="list-style-type: none"> Brandy Beougher, Stockton Hadley Hauser, Norton Nathan Ohide, Clyde 	<p>Western</p> <ul style="list-style-type: none"> Paul Brull, Plainville Josiah Bolton, Ellsworth <p>Wheatland</p> <ul style="list-style-type: none"> Sebastian Torres, Tribune Cade Dvorak, South Haven <p>Southern Pioneer</p> <ul style="list-style-type: none"> Josh Diazdeleon, Liberal Makalah Henke, Medicine Lodge <p>Victory</p> <ul style="list-style-type: none"> Cody Frink, Cimarron Regan Rhodes, Mullinville

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