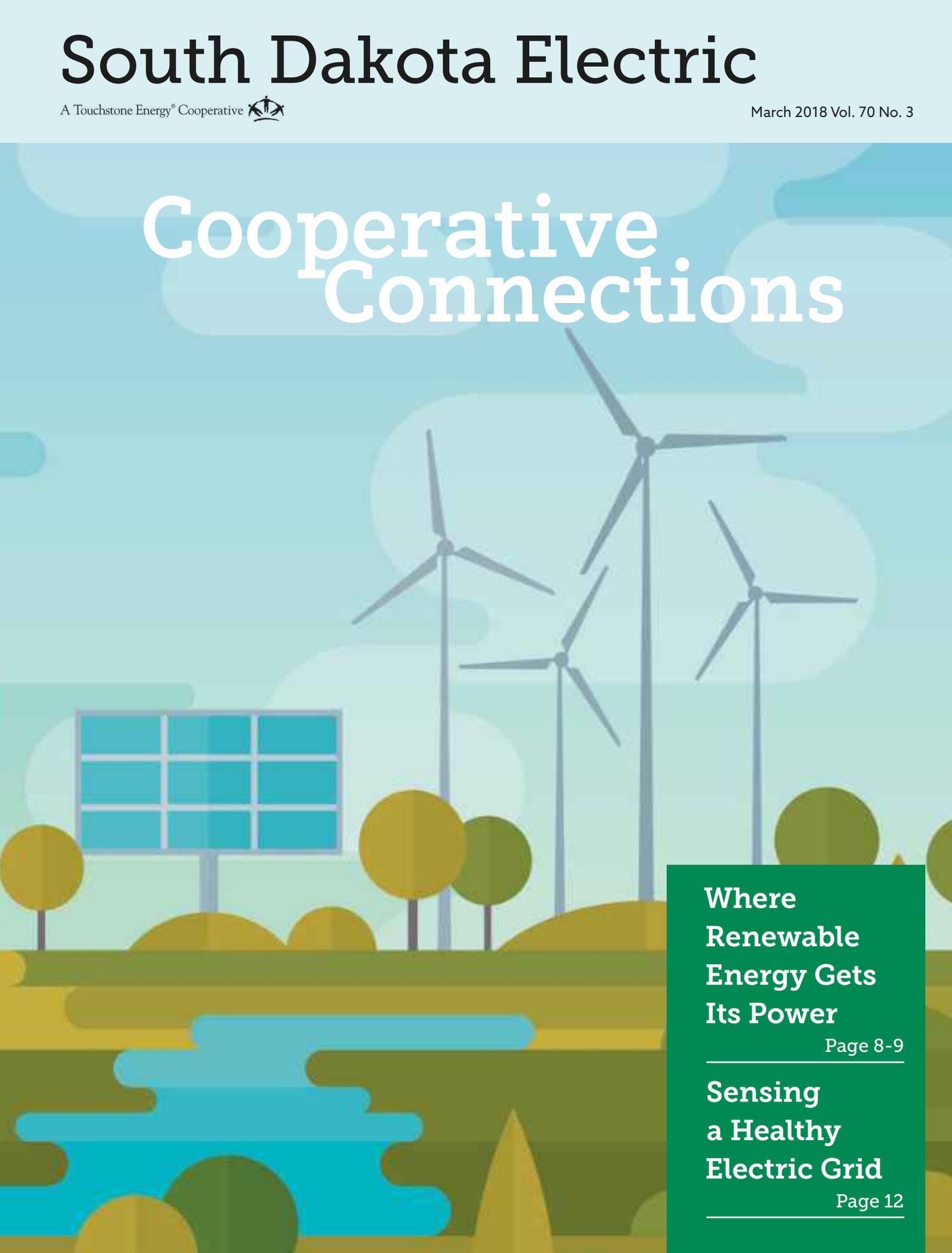


Cooperative Connections



**Where
Renewable
Energy Gets
Its Power**

Page 8-9

**Sensing
a Healthy
Electric Grid**

Page 12

KEEPING THE LIGHTS ON ISN'T ENOUGH.



We're not your typical electric company, we're a local not-for-profit electric cooperative. We power our community with more than just electricity. Our employees give time and resources to help build a better community.

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South Dakota Electric

Cooperative Connections

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 Codrington-Clark Electric,
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 Dakota Energy, Huron, S.D.
 Douglas Electric, Armour, S.D.
 East River Electric, Madison, S.D.
 FEM Electric, Ipswich, S.D.
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 Lake Region Electric, Webster, S.D.
 Lyon-Lincoln Electric, Tyler, Minn.
 Moreau-Grand Electric, Timber Lake, S.D.
 Northern Electric, Bath, S.D.
 Oahe Electric, Blunt, S.D.
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 Sioux Valley Energy, Colman, S.D.
 Southeastern Electric, Marion, S.D.
 Traverse Electric, Wheaton, Minn.
 Union County Electric, Elk Point, S.D.
 West Central Electric, Murdo, S.D.
 West River Electric, Wall, S.D.
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Leading the Energy Future

Each year, members of the National Rural Electric Cooperative Association (NRECA) gather for the NRECA annual meeting to discuss key topics and trends. The 2018 meeting was held under the theme “Leading the energy future.”



Jim Matheson

NRECA CEO

The meeting focused on the fact that electric cooperatives are uniquely positioned to lead the energy future while ensuring that their members benefit from cutting-edge technologies. That’s because we have a business model that can’t be beat. We are driven to exceed the needs and expectations of co-op members.

That goal has already taken us to great heights. But it has not changed our fundamental mission to provide reliable and affordable electricity. In fact, that mission is our springboard to the future.

The local control and unique community relationship empowers co-ops to be hubs of innovation where member demands and new technology can intersect – in many instances for the very first time.

The very nature of the electric industry is changing. And many cooperatives are on the cutting edge of this transformation, which gives consumers greater control over how they use electricity and access new energy options.

That’s why electric co-ops were among the earliest adaptors of new technology to automatically detect outages and improve system reliability while expediting power restorations.

Electric cooperatives across the nation are working to harness smart grid advances to provide consumers with new energy-saving opportunities.

As they work to lead the energy future, nearly 100 electric co-ops are bringing broadband internet to their communities – creating jobs and boosting rural economies. This connectivity serves two fundamental purposes: bridging the digital divide for co-op members and enhancing the co-op business operation network, improving their ability to offer new energy management options to members.

Electric co-ops are driven by close ties to their local communities. As part of this commitment, co-ops are taking meaningful steps to make the energy future a possibility for each of their members.

Jim Matheson is CEO of the National Rural Electric Cooperative Association (NRECA), the national service organization that represents the nation’s more than 900 private, not-for-profit, consumer-owned electric cooperatives.

Generator Safety

Portable or permanently installed standby generators can come in handy during long-term power outages. However, if you do not know how to use them properly, they can be dangerous. Contact a qualified



vendor or electrician to help you determine what generator is best suited to your needs. Before using, be sure to read and follow manufacturer's instructions.

If you are installing a permanent generator, it must have a transfer switch. The transfer switch prevents energy from leaving your generator and going back onto the utility electrical equipment when it could be dangerous to a lineman or others near downed power lines, a process known as "back feed." A qualified electrician should install your generator and transfer switch.

Safe Electricity has the following tips to use portable generators safely:

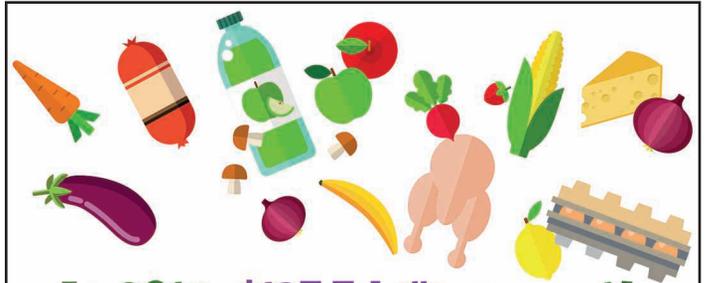
- Operate it outdoors in an area with plenty of ventilation. Never run a generator in a home or garage. Generators give off deadly carbon monoxide.
- Do not plug a generator into the wall to avoid back feed. Use heavy-duty extension cords to connect appliances to the outlets on the generator itself.
- Turn the generator on before plugging appliances to it. Once the generator is running, turn your appliances and lights on one at a time to avoid overloading the unit. Remember, generators are for temporary usage, prioritize your needs.
- Generators pose electrical risks especially when operated in wet conditions. Use a generator only when necessary when the weather creates wet or moist conditions. Protect the generator by operating it under an open, canopy-like structure on a dry surface where water cannot form puddles or drain under it. Always ensure that your hands are dry before touching the generator.
- Be sure the generator is turned off and cool before fueling it.
- Keep children and pets away from portable generators at all times. Many generator components are hot enough to burn you during operation.

Safe Electricity suggests that these safety guidelines as well as basic operating instructions be posted in the home and with the generator.

Source: safeelectricity.org

March 18-24, 2018

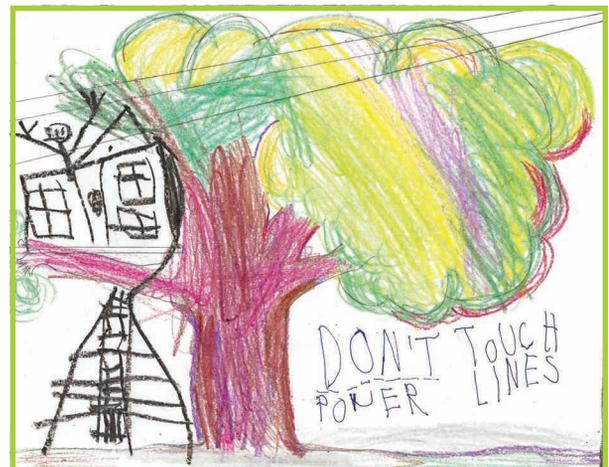
National Ag Week



In 2016, \$135.5 billion worth of American agricultural products were exported around the world.

Each American farmer feeds about 144 people! America needs agriculture...and we need our farmers, who provide Food for Life. This is why we're celebrating all things Ag on National Ag Day, March 20. Find out more: <https://www.agday.org/>

KIDS CORNER SAFETY POSTER

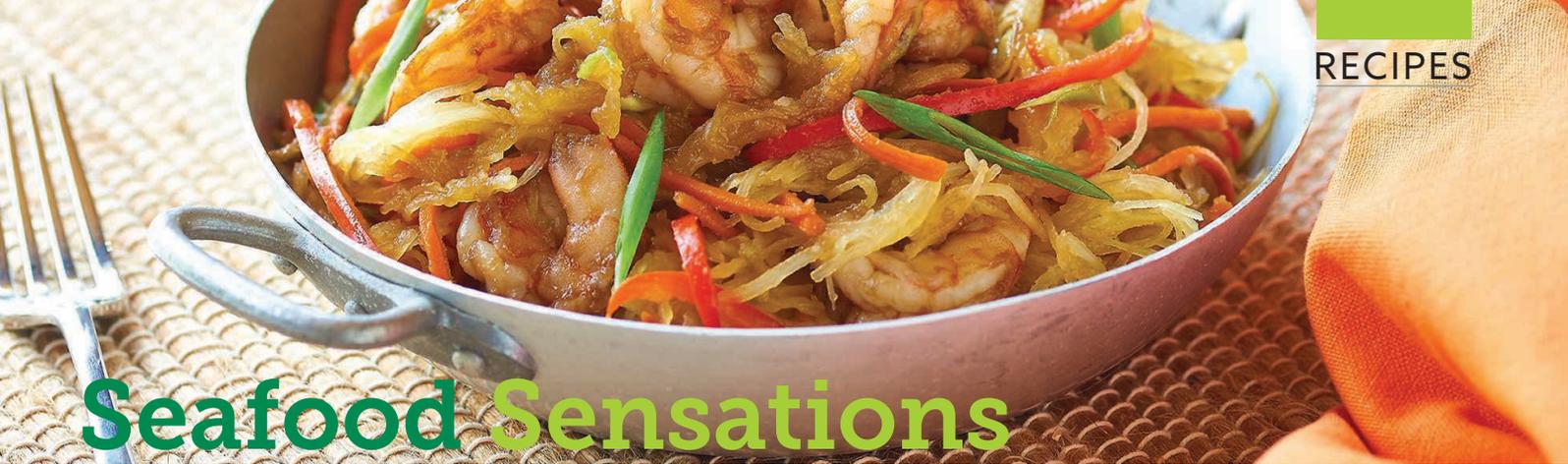


"Don't touch power lines."

Christopher Barranco, 5 years old

Christopher is the son of David and Catherine Barranco, Brandon, S.D. They are members of Sioux Valley Energy, Colman.

Kids, send your drawing with an electrical safety tip to your local electric cooperative (address found on Page 3). If your poster is published, you'll receive a prize. All entries must include your name, age, mailing address and the names of your parents. Colored drawings are encouraged.



Seafood Sensations

Seafood Quiche

1 (6 oz.) can crab, salmon or tuna, drained	1 cup milk
1 cup shredded Cheddar cheese	1/2 tsp. salt
Onions	Pepper to taste
4 eggs	Fresh chives, optional
	Paprika

Spray a 10-inch pie plate with vegetable cooking spray. Combine seafood, cheese and onions. Press into bottom and up sides of pie plate. Beat eggs, milk, salt and pepper; pour over all. Sprinkle with paprika, if desired. Bake at 350°F. for about 30 minutes or until eggs are set. Let set a few minutes before cutting.

Elaine Rowett, Sturgis

Broiled Salmon with Lemon

1 T. extra-virgin olive oil	4 (6 oz.) center-cut salmon fillets (about 1-inch thick)
1 tsp. grated lemon rind plus 1 T. fresh juice (from 1 lemon)	1/4 tsp. kosher salt
1 tsp. Worcestershire sauce	1/4 tsp. black pepper

Combine oil, rind, juice and Worcestershire sauce in a shallow dish. Place fillets, skin side up, in dish. Let stand 15 minutes. Preheat broiler with oven rack 6 inches from heat. Place fillets, skin side down, on a foil-lined baking sheet. Sprinkle with salt and pepper. Broil to desired degree of doneness, 8 to 10 minutes. Remove fillets from foil using a metal spatula.

Tina Haug, Pierre

Freeze Ahead Crab Appetizers

1 jar Old English cheese spread	1/2 tsp. seasoned salt
1/2 c. soft butter	1 T. mayonnaise
1/4 tsp. garlic salt/powder	1 (7 oz.) can crab meat
	6 English muffins, separated

Mix first 5 ingredients together well; stir in crab. Spread on each half muffin. Cut each half muffin into 6 wedges. Place in ziplock bag and freeze. When ready to serve, don't thaw. Bake at 400°F. for 10 minutes.

Ginny Jensen, Volga

Spaghetti Squash Shrimp Lo Mein

1 spaghetti squash, (about 2-1/2 lbs.)	2 tsp. vegetable oil, divided
1/4 cup reduced sodium soy sauce	1-1/2 cups matchstick carrots
2 T. honey	1 medium red bell pepper, thinly sliced
2 tsp. McCormick® Garlic Powder, divided	1 lb. shrimp, peeled and deveined
1-1/4 tsp. McCormick® Ginger, Ground, divided	1/4 cup thinly sliced green onions

Cut spaghetti squash crosswise into 1-inch thick rings. Remove seeds. Place rings on microwavable plate. Pour 1/4 cup water in the plate. Cover with plastic wrap. Microwave on HIGH 7 minutes or until tender. Let stand in microwave 10 minutes. Carefully remove from microwave. Peel the skin off the squash, then shred the flesh, using fingers or a fork, into long thin strands. Place squash noodles in large bowl. Discard the skin. (Should yield about 5 cups of squash noodles.) Meanwhile, mix soy sauce, honey, 1-1/2 tsp. of the garlic powder and 1 tsp. of the ginger in small bowl until well blended. Set aside. Heat 1 T. of the oil in large skillet on medium-high heat. Add carrots and pepper; stir-fry 3 minutes. Add shrimp and sauce mixture; stir-fry 2 minutes or just until shrimp turn pink. Remove shrimp mixture from skillet. Heat remaining 1 T. oil in skillet on medium-high heat. Add squash noodles, remaining 1/2 tsp. garlic powder and 1/4 tsp. ginger; cook and stir gently 1 minute to heat through. Return shrimp mixture to skillet; toss gently with squash noodles. Remove from heat. Sprinkle with green onions. Makes 7 (1 cup) servings

Nutritional Information Per Serving: Calories 165, Total Fat 5g, Saturated Fat 1g, Sodium 479mg, Cholesterol 96mg, Carbohydrates 18g, Protein 12g, Dietary Fiber 3g,

Pictured, Cooperative Connections

Please send your favorite appetizer, beverage and casserole recipes to your local electric cooperative (address found on Page 3).

Each recipe printed will be entered into a drawing for a prize in June 2018.

All entries must include your name, mailing address, telephone number and cooperative name.

Aim for Quality

when managing a renovation contractor



Pat Keegan

Collaborative Efficiency

When you review the work, it may be helpful to take photos or to bring in an energy auditor.

This column was co-written by Pat Keegan and Brad Thiessen of Collaborative Efficiency. For more information on thermostats, please visit: www.collaborativeefficiency.com/energytips.

Footnotes & Sources

¹https://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_solutions

²https://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_solutions

³https://www.energystar.gov/index.cfm?c=hvac_install.hvac_install_index

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<https://www.angieslist.com/articles/11-tips-hiring-home-improvement-contractor.htm>

<https://www.consumerreports.org/cro/news/2008/01/how-to-hire-a-contractor/index.htm>

https://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_solutions

<https://www.forbes.com/sites/houzz/2016/05/27/a-beginners-guide-to-managing-a-remodel/#2058e5f4ae2c>

Dear Pat: We followed your advice last month and hired a contractor we think will give us an energy efficient renovation. How do we manage the job to make sure the project turns out right? – Bridget and Neil

Dear Bridget and Neil: Last month, I offered tips on how to hire a good contractor, but it's smart to realize that after the hiring is complete, contractors need to be managed.

First, you should decide who will be the main contact with your contractor. Clear communication is critical because a renovation that includes energy efficiency improvements comes with extra challenges. A single point of contact will help avoid confusion, conflicts and cost overruns.

Before the work starts, have a discussion with your contractor about quality. You want the contractor to know you'll be carefully overseeing the work and that there may be others involved in this oversight, such as building inspectors, your electric cooperative or an independent energy auditor. You can discuss the standards of a professional, high-quality job. And you can agree on the points at which the contractor will pause so you or someone you designate can review the work. At a minimum, an inspection should take place before you make an interim payment.

Here are a few examples of interim review points:

The building envelope should be properly sealed before insulation is installed because air leaks increase energy use and reduce comfort.¹

Replacement windows should be properly flashed and sealed before siding and trim are installed, which prevents moisture problems and air leaks.²

Some insulation measures can be inspected before they are sealed up behind walls or ceilings.

Almost all efficiency measures require some kind of final inspection. For example, infrared thermometers can show voids in blown insulation, and fiberglass batts can be visually inspected to ensure there are no air gaps and the batts are not compressed.

HVAC measures require special attention. Nearly half of all HVAC systems are not installed correctly,³ which often causes uneven temperature distribution throughout the home, along with higher energy bills. ENERGYSTAR® has a special program to ensure quality HVAC installation. Forced air systems typically have poorly balanced supply and return air delivery that can often be improved. Air flow can be measured at each register, and a duct blaster test can identify and quantify duct leakage.

When you review the work, it may be helpful to take photos or to bring in an energy auditor. Be sure to have these inspections outlined in the contract and discussed beforehand so the contractor is comfortable.

It will be tempting to add “just one more thing” along the way, and the contractor may agree a change is simple and possible within the timeframes. Contractors and customers often miscommunicate about change orders and end up disagreeing about a additional costs when the project is completed. Before you make any changes, be sure to get a written cost quote. If it's significant, you can then weigh the cost against the benefit of the change.

It's a good idea to maintain good records as the project progresses. These records could be helpful for building inspectors or to qualify for rebates or tax credits.

When the renovation is complete, it may be tempting to sign the check, shake hands and breathe a sigh of relief that it's all over. Depending on the size and complexity of the project, it may be worth the extra step of having a final audit by a licensed energy auditor.

My neighbors were saved from a home renovation disaster when an energy audit discovered the energy efficiency contractor had failed to produce the promised efficiencies. The contractor had to perform thousands of dollars' worth of improvements to fulfill the contract before my neighbors made the final payment.

Once you confirm that the work is 100 percent complete, you can write a check for the final payment, then sit back and enjoy your revitalized, more energy-efficient home!

Lignite Education Seminar: Energy, Economics and Environment

The Lignite Energy Council and Basin Electric Power Cooperative are sponsoring the 33rd annual Lignite Education Seminar, titled Energy, Economics and Environment, being held June 11-14, 2018, at Bismarck State College's National Energy Center of Excellence in Bismarck, N.D.

The seminar provides instruction on these topics and more: history, geology, land reclamation, environmental protection, and economics of the lignite industry; the need for more workers, energy conservation, and transmission. Besides the classroom instruction and the tours, teachers will take home handouts, videos, coal samples, and activities that can be used in the classroom.

Learn about the lignite coal industry and the important role it plays in providing electricity to the Midwest!

- 2 FREE PROFESSIONAL DEVELOPMENT CREDITS
- TOUR A LIGNITE COAL MINE AND POWER PLANT
- RECEIVE TEACHING MATERIALS FOR THE CLASSROOM

2018 LIGNITE EDUCATION SEMINAR
JUNE 11-14
BISMARCK STATE COLLEGE

www.lignite.com/teachers

Lignite Energy Council

Teachers who attend and complete a lesson plan can choose from one of three North Dakota institutions from which to receive two professional graduate credits: University of North Dakota, North Dakota State University and Minot State University.

School administrators and teachers from all subjects and grade levels (K-12) are encouraged to apply to the program before April 13. Should applications outnumber available spots, preference will be given to earth science, social studies, math teachers and career counselors. The cost of the seminar and associated travel will be paid by Basin Electric for Iowa, Minnesota, Montana, South Dakota and Wyoming teachers within our member service territory.

Find more information and register on the Lignite Energy Council's website: <http://www.lignite.com/teachers>. For further questions, please contact Kay LaCoe, Lignite Energy Council, at kay.lacoe@lignite.com, or 1-800-932-7117.

Teachers who are selected to attend the seminar will be required to send a \$60 deposit to the Lignite Energy Council that will be held and returned at registration on June 11. Deposits should not be sent until a confirmation to attend has been received.

MTI Power Program Honored

Mitchell Technical Institute has been named a winner of the Siemens-Aspen Community College STEM Award by the Aspen Institute College Excellence Program and the Siemens Foundation. MTI's Power Line Construction and Maintenance program will receive an award of \$50,000 and is among eight exceptional community college programs recognized for providing outstanding preparation for high-demand jobs. <http://ow.ly/Y6NI30ifXFP>

MITCHELL TECHNICAL INSTITUTE

PROGRAM:
Power Line Construction & Maintenance

\$52,842
Earnings five years after leaving the institution

2018 WINNER
COMMUNITY COLLEGE STEM AWARD

THE ASPEN INSTITUTE | SIEMENS Foundation

Missouri Electric Co-op CEO Named RUS Administrator

Ken Johnson, general manager of Co-Mo Electric Cooperative, has been appointed as USDA Rural Utilities Service (RUS) Administrator.



Ken Johnson

"We are excited and thrilled that Ken has been selected to lead the RUS program. Electric cooperatives have a storied history of working with RUS to power the rural American economy," said NRECA CEO Jim Matheson. "The ongoing collaboration between RUS and electric co-ops remains essential to the success of rural communities across the nation as co-ops invest in infrastructure upgrades to modernize the grid and meet consumer expectations. Ken is exceptionally qualified to serve in this role and we look forward to working with him in his new capacity."

"Ken Johnson is one of the top co-op managers I have ever worked with in my 40-year career," said Barry Hart, executive vice president and CEO of the Association of Missouri Electric Cooperatives. "He has never forgotten that he works for the co-op members at the end of the line. When the members of Co-Mo Electric Cooperative told the co-op they wanted access to high-speed Internet services, Ken worked with his staff and found a way to deliver what the members wanted. Because of Ken's leadership, Co-Mo's members today enjoy internet with speeds of up to 1 Gigabit and access to the latest technology."

USDA's Rural Utilities Service (RUS) administers programs that provide infrastructure or infrastructure improvements to rural communities.

The National Rural Electric Cooperative Association is the national service organization that represents the nation's more than 900 not-for-profit, consumer-owned electric cooperatives.



Solar energy generates about 1 percent of the nation's electricity.

WHERE RENEWABLE ENERGY GETS ITS POWER

Here are the basics of a small but fast-growing source of your electricity.

Paul Wesslund

NRECA Contributing Writer

Solar energy and wind power may not seem like a big deal. Unless you're talking about the future. Or maybe even the present.

For all today's talk about renewable energy, it still makes up a pretty small portion of the energy sources that generate our electricity. But it's coming on fast, and it's picking up speed.

Here's your crash course in how wind, the sun and water generate electricity.

Solar energy

Solar energy generates only about 1 percent of the nation's electricity, but that's a stunning increase from just five years ago, when the number was too small to report for the U.S. Department of Energy. Solar growth will continue as costs fall, technology improves and people figure out better ways to use solar energy.

There are lots of ways to use energy from the sun. You can hang your washed clothes outside to dry, and you can open curtains to warm your home on a sunny day. More ambitious projects use the sun to warm pipes full of water that is pumped around a building for heat.

But what most people mean when they talk about solar energy is photovoltaic electricity. When certain materials get hit by sunlight, their atoms spit out an electron, and electricity is just

DID YOU KNOW?

Approximately 15 percent of the nation's electricity is generated from renewable energy sources, like hydro, wind and solar power. That percentage may seem low, but renewable energy generation is gaining momentum and continues to play an important role in reducing greenhouse gas emissions.



6.5%
generated by
hydropower.



5.6%
generated by
wind.



0.9%
generated by
solar.

*Additional sources, like geothermal and biomass, contribute to the 15 percent of renewable energy generation.

Source: Energy Information Administration

a stream of electrons. Over the decades, scientists and engineers experimented with solar-sensitive materials to make them into lighter, longer-lasting and more affordable wafers called photovoltaic cells, which are combined and integrated into solar photovoltaic modules. One of their first uses was space travel, and continued improvements are allowing solar to become a more down-to-earth kind of energy.

One of those improvements is cost. Solar panel prices dropped 85 percent in the past seven years with improvements in materials and larger-scale production methods.

Another technological advance is about to give the industry an

extra boost, says Dale Bradshaw, a technical consultant with the National Rural Electric Cooperative Association (NRECA). He says solar panels can now track the sun as it moves across the sky rather than sitting fixed in place, raising their productivity by collecting more sunlight throughout the day. This year, the U.S. Department of Energy's Energy Information Administration reported that half the large solar installations in the country already use some kind of sun-tracking technology.

It's also worth knowing that the solar industry is maturing with different forms of ownership: utility, industrial, commercial and residential scale, and community solar installations.

Utility scale is what you might expect – large banks of solar panels owned and operated by an electric utility or other large organization, producing many megawatts of solar energy. Industrial and commercial solar installations can range from kilowatts up to multi-megawatts and be placed on rooftops, over parking lots or on land near industrial and commercial enterprises. Industrial and commercial installations are beginning to increase as the price for solar continues to drop. Residential solar installations are also being installed primarily on rooftops, especially in the southwestern United States.

NRECA's Bradshaw says community solar can ease the higher expense of self-owned rooftop solar. With community solar, a utility builds a large solar installation and sells shares in the project to customers interested in an investment in renewable energy. That style of ownership and development is especially suited to consumer-owned electric co-ops, and many are offering solar shares to their members.

“Co-ops are doing a great job of building community-scale solar,” says Bradshaw. “They're going full blast on that.”

Bradshaw also notes that community solar allows a homeowner to avoid both maintenance of their own system, and the hassle of sorting out different offers from rooftop solar vendors.

Wind power

Wind power has increased significantly as costs continue to decrease. Wind power generates nearly 6 percent of the nation's electricity, and it is growing at a pretty good clip, with an increase of about 35 percent during the past four years.

In a way, wind generates electricity the same way as coal, natural gas and nuclear – by spinning a turbine that creates an electricity-producing magnetic field. The huge difference is that the turbine is turned by enormous propeller-like blades designed to catch the wind.

It's the size of those blades, and the height of the turbine towers (as much as 300 feet in the air) that makes the difference, says NRECA's Bradshaw.

“Wind is a really useful renewable, but it has to be utility scale,” he says.

A tall utility-scale tower can capture as much as 50 percent of the wind, but there's not a practical, personal alternative to compare with rooftop solar. A rural residential customer or a rural commercial customer with a 50 to 100-foot tower will probably generate electricity only about 25 percent of the time. “It's really

not cost-effective for small-scale home use when compared to utility scale wind turbines,” says Bradshaw.

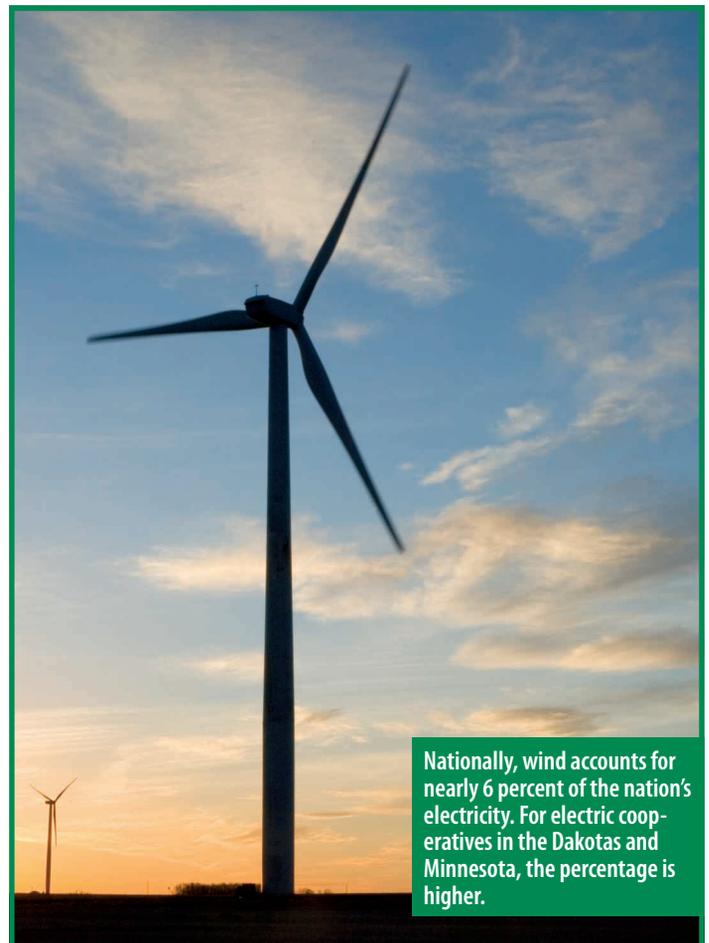
Hydroelectric power

Another way to turn an electricity-generating turbine is to store water behind a dam then harness its power as it flows from the reservoir to the river below.

Specialists disagree on whether to count hydroelectric power as renewable energy. On the one hand, it doesn't create greenhouse gas or other chemical pollutants by burning fossil fuel. On the other hand, large-scale hydro typically calls for building a permanent dam across a river valley and flooding the area behind it. Another option is to put hydroelectric generators directly in rapidly flowing rivers to capture power, but this is a significantly more expensive option than using hydroelectric power from water stored behind a permanent dam. Then there's the question of whether you consider flowing water renewable, or something that can be used up.

Hydroelectric power generates nearly 7 percent of the electricity in the United States. Although that number changes a bit during times of drought or heavy rain, the amount of electricity produced by hydro power has been relatively stable during the past several years.

Paul Wesslund writes on cooperative issues for the National Rural Electric Cooperative Association, the Arlington, Va.-based service arm of the nation's 900-plus consumer-owned, not-for-profit electric cooperatives.



Nationally, wind accounts for nearly 6 percent of the nation's electricity. For electric cooperatives in the Dakotas and Minnesota, the percentage is higher.



SDREA Board President Don Heeren of Southeastern Electric Cooperative in Marion, S.D., delivers his address at the SDREA annual meeting.

Creating Connections, Building Success TOGETHER

Highlights of 2018 SDREA Annual Meeting

SDREA hosted its annual meeting in Pierre on Jan. 11-12, with more than 300 co-op leaders attending the event.

“The connections made between our cooperatives gives us a strong network when it comes to safety, communications and in the legislative arena,” said SDREA Board President Don Heeren, during his comments at the start of the meeting. “One of SDREA’s principal responsibilities is to represent its members before Congress and the South Dakota state legislature on issues of importance to our members and our industry in general.”

“Creating connections that foster understanding is one of the tasks of your statewide board of directors,” Heeren continued at the end of his remarks. “We hail from the length and the width of the state, representing the state’s smallest cooperatives and the largest, the most rural and the most urban and everything in between.”



Delbert Bushong, left, receives the Legacy of Leadership Award from SDREA board president Don Heeren.

Participants listened to presentations from guest speakers Jim Matheson, National Rural Electric Cooperative Association CEO; Ted Case, author of *Poles, Wires and War*; Sheldon Petersen, National Rural Utilities Cooperative Finance Corporation CEO; and Phil Irwin, Federated Rural Electric Insurance Exchange president



NRECA CEO Jim Matheson spoke to participants of the SDREA annual meeting.

and CEO. Break-out sessions provided attendees updates on legislative and safety issues as well as workplace dynamics brought on by millennials.

Delbert Bushong, former Dakota Energy director, received this year's Legacy of Leadership award. This is the fifth time the award has been bestowed since its creation in 2014 and Bushong is the ninth recipient. The award was launched to highlight the wealth of talent and leadership we benefit from within our ranks and to recognize individuals whose talents, dedication and commitment to their co-op, their communities and the larger co-op family stand out among many. Delbert was president of the Ree Electric board, was the first president of Dakota Energy Cooperative's board, a position he held for 14 years, and represented Dakota Energy on the SDREA board of directors.

Co-ops Honored for Safety

The intent of the enhanced Rural Electric Safety Achievement Program is "to establish a foundation for continuous improvement that emphasizes leadership engagement towards improving safety results."

Two fundamental guiding principles which are essential to achieving safety excellence:

- Safety must be embraced as a core value where the actions and decisions of the cooperative reflect a fundamental and unwavering commitment to safety at all levels of the cooperative.
- Cooperative leaders and employees take ownership of the systems and processes that create a safe working environment.



Seven cooperatives completed their three-year enhanced assessment process in 2017 and were recognized for their efforts to improve safety:

New Participants:

- Lake Region Electric Association, Webster – New Participant
- Northern Electric Cooperative, Bath – New Participant
- Oahe Electric Cooperative, Blunt – New Participant

Previous Participants

- Clay-Union Electric Corporation, Vermillion
- FEM Electric Association, Ipswich
- Southeastern Electric Cooperative, Marion
- West River Electric Association, Wall

Directors, Employees Recognized

More than 50 directors and employees of South Dakota electric cooperatives were recognized for achieving years of service milestones in 2017.

25 years:

Craig Douthit and Bart McLellan, Butte Electric; Morris Reber, Dakota Energy; Rhonda Tuscherer, FEM Electric; Sharon Longwood, Grand, Troy Kwasniewski, H-D Electric; Dane Claussen and Anna Haynes, Lacreek Electric; Kent Larson and Royce Walker, Moreau-Grand Electric; Kim Hansen and Jim Kuyper, Sioux Valley Energy; Caralee Miller and John Ostraat, Southeastern Electric; and Lane Butler, West River Electric.

30 years:

Floyd Burbach, Bon Homme Yankton Electric; Cris Miller, Butte Electric; Geoffrey Byrd and Alan Spader, Central Electric; Darrell Scott, Cherry-Todd Electric; Alan Gauer, Clay-Union Electric; Tammy Popham, Codington-Clark Electric; Bonnie Sander, Grand Electric; Dean O'Neill, Lacreek Electric; Tim McIntyre, Lake Region Electric; Duane "Cap" Pearman, Moreau-Grand Electric; Kenny Swanson, Northern Electric; LeRoy Littau and Rich Rahn, Rosebud Electric; Todd Eliason, Rushmore Electric; Bruce Halverson, Southeastern Electric; and Byron Frank, Ross Johnson and Joel Stephens, West River Electric.

35 years:

Monty Harer, Cam Wal; Doug Engbrecht, East River; Melvin Cummings, Lacreek; Darvin Dickhaut and Marty Newman, Northern; and Marvyn Moor, West Central.

40 years:

Robert Ulmer, Bon Homme Yankton Electric; Curtis Guindon, Central Electric; Julie Labrie, Dakota Energy; Jim Iversen and Val Manthey, East River Electric; Michael Bowers, Rushmore Electric; Doug Bartling and Bob Schrag, Southeastern Electric; and Steve Reed, West Central Electric.

45 years:

Richard Luke, Southeastern Electric.

Robots and Sensors

Electric co-ops use innovative technologies for real-time feedback on the health of the grid.

Thomas Kirk

NRECA Associate Analyst

Today, electric cooperatives may choose from a wide array of technologies that give them near real-time feedback on the health of the grid.

Electric grids are immense machines that span counties, and often entire states, bringing power to many homes and businesses. So how do the electric companies know what's happening on their lines? How much power is being delivered? What equipment needs to be replaced? These are important questions that electric cooperatives spend a lot of time and money to answer.

For many years, electric co-ops relied entirely on in-person inspections to determine asset conditions and calls from members to discover power outages. During and after storms, this could mean lengthy recovery times as supervisors evaluated the available information and decided where to send line crews, who then searched for damaged lines in order to make repairs and restore electric service. Even normal operations required personnel to be sent into the field constantly to perform manual inspections. Today, electric co-ops may choose from a wide array of technologies that give them near real-time feedback on the health of the grid. Monitoring and automation tech-



Electric cooperatives maintain 2.5 million miles of power lines across the United States. In South Dakota alone, electric cooperatives have more than 65,000 miles of distribution power lines.

nologies are becoming more affordable and gaining more functionality leading to greater use in the field.

Two of the most common technologies in this space are Supervisory Control and Data Acquisition (SCADA) and

Automated Meter Infrastructure (AMI). SCADA systems have greatly evolved since their original development in the 1920s. Modern systems take advantage of communication, monitoring and automation technologies to give utilities a



Electric cooperatives are exploring a host of innovative technologies, such as smart meters and special sensors placed on power lines for niche applications, including fault location, power theft detection and asset management.

real-time picture of how substations are performing and make changes as needed. At the end of the line, AMI, also known as smart meters, report back to the utility how much energy consumers use, often on a 15-minute basis. Utilities can “ping” these meters to determine if they’re still receiving power during storms or other types of outages.

Beyond AMI and SCADA, utilities are exploring a host of other sensor technologies for niche applications including fault location, power theft detection and asset management. These applications are being enabled by a new wave of inexpensive sensors that cost one-tenth of what they did a decade ago. When a fault occurs on a transmission line (the large power lines that carry power from plants to substations), they create transient waves on the lines. By placing special sensors on transmission lines and measuring the time that a wave reaches two of these sensors, the location of a fault can be accurately and quickly determined. This lets the utility know exactly where to send repair crews.

Across the whole U.S. electric industry, roughly \$6 billion worth of electricity is stolen annually, which leads to higher prices for everyone. Traditionally, one of the best tools for identifying power theft

For members, these technologies provide three primary benefits: increased reliability, reduced outage times and lower prices.

is visual inspection of meters for signs of tampering, but with AMI systems, utility personnel aren’t visiting meters in-person as often. Load-monitoring sensors – often called current transformers (CTs) or current sensors – can be placed on distri-

bution power lines to help catch significant losses along a line, from theft or for other reasons. Data gathered by CTs can be reconciled with meter readings to investigate discrepancies between the electricity passed through the line and the electricity measured by the meters. CT devices are also valuable for diagnosing excessive line loss due to other problems, such as conductor damage or aging transformers.

For members, these technologies provide three primary benefits: increased reliability, reduced outage times and lower prices as the utility manages employee time and resources more efficiently. As sensors continue to improve and drop in price, expect to see more real-time grid monitoring.

Thomas Kirk is an associate analyst of distributed energy resources for the Arlington, Va.-based National Rural Electric Cooperative Association’s Business & Technology Strategies (BTS) division.



Dakota Gasification Company's Great Plains Synfuels Plant is located near Beulah, N.D., and is adjacent to Basin Electric's Antelope Valley Station.

VALUE OF AN ASSET

Why Basin Electric will continue to operate Dakota Gasification Company

Tracie Bettenhausen

Basin Electric Senior Editor

Here is a high-level look at why the decision to continue to operate Dakota Gas makes sense for Basin Electric's members.

Spend a bit of time thinking about your hardest business decision.

Was it always clear it was the right thing to do? What about the moments you questioned yourself, or outside forces made the decision seem foolish? Did you stick it out? Has it paid off?

The nature of the business surrounding Dakota Gasification Company's Great Plains Synfuels Plant is based on commodity prices. The price of oil and natural gas, the prices that crops are selling for, the price of fertilizer and, though less so, the price of other products like carbon dioxide.

When commodity prices were higher, profits meant Basin Electric was able to return a lot of money to its members. The Great Plains Synfuels Plant has served as a \$1.4 billion benefit to its members since 1988, and continues to provide benefits.

However, the most recent 10-year financial forecast shows losses every year.

Basin Electric directors and senior staff have decided the cooperative needs to hang steady with Dakota Gasification Company while maintaining its focus on strategic cost management and continuing to look at other options.

The decision was explained to Basin Electric members during a Members Strategic Direction Meeting in November.

"We wanted to be able to have an open dialogue with our

members, where they could ask specific questions we just can't answer in an open meeting," says Paul Sukut, Basin Electric CEO and general manager. "We were pleased with how that meeting turned out. It was very well attended, and we took as much time as everyone needed to get questions answered. There is still work to do on this, but I know by going to our cooperative roots, using the business model's best attributes of transparency and democracy, we are making the best decisions we can."

Here is a high-level look at why this decision makes sense for Basin Electric's members.

History of the purchase

Basin Electric bought the Great Plains Synfuels Plant from the U.S. Department of Energy (DOE) as a way to salvage the synergies that had been built between the Synfuels Plant and Antelope Valley Station. The DOE had acquired the plant after the original owners failed.

"At the time the DOE announced its intent to close the plant, Basin Electric was under a great deal of financial stress," says Mark Foss, Basin Electric senior vice president and general counsel. "The load growth the cooperative had forecasted was not materializing, and Basin Electric had about 2,000 megawatts (MW) of generation. Our peak loads were only at 1,000 MW."

Basin Electric formed two subsidiaries to make the deal: Dakota Coal Company paid \$69 million for the coal rights, Dakota Gas paid \$16 million for the natural gas pipeline that reaches to the Northern Border Pipeline, and Basin Electric paid \$0. As part of the deal, Basin Electric agreed to forgo production tax credits and go through with a profit-sharing agreement for 15 years.

Basin Electric had interest in keeping the plant operating for several reasons, including those related to member rates. The Synfuels Plant used about 90 MW of electricity when operating at full load. If the plant had closed down at that time, Basin Electric would have had to increase rates by 14 percent, Foss says.

From 1988-2014, Dakota Gas invested \$845 million into the plant in capital improvements, all funded with self-generated cash, including the proceeds from a legal settlement concerning the gas pipeline, according to Foss.

Bottom line impacts

While the decision to buy the Synfuels Plant paid off initially, the benefits proved themselves year after year when commodity prices were high.

Of the \$1.4 billion in benefit Dakota Gas has had to Basin Electric since 1988, \$300 million has been through dividends and bill credits paid to members, and \$1.1 billion is in synergies in operations between the various facilities, according to Susan Sorensen, Basin Electric vice president and treasurer.

Sorensen explains that the shared coal supply keeps costs down for other Basin Electric facilities. If the Synfuels Plant would be shut down, the cost of mining coal would need to be absorbed by other users. A shutdown of the Synfuels Plant would increase coal prices for Leland Olds Station and Antelope Valley Station, coal-based power plants near Stanton, N.D., and Beulah, N.D., respectively.

Also, because the Synfuels Plant shares water and rail services with Antelope Valley Station, those benefits would be shifted over to the power plant.

“Dakota Gas currently pays about 30 percent of the overhead costs at Basin Electric Headquarters,” Sorensen says. “That percentage that is already netted down when considering some costs, like a haul road or computer mainframe, cannot be reduced by selling the asset.”

The Synfuels Plant uses a large amount of electricity, which supports Basin Electric’s margins. Also, the Freedom Mine, which supplies coal to the North Dakota facilities, is a large electricity consumer of Roughrider Electric Cooperative, a Basin Electric Class C member.

Rates and projects

The urea production facility at the Synfuels Plant has had financial challenges for some of the membership. The budget increased over the course of construction due to increases in quantity of materials and costs of labor required to build the facility. The project was further challenged by the quality and timeliness of engineering, and

ultimately, staff released the general contractor for sustained poor performance. Once those issues were resolved, the project has consistently met its targets and is set to go into production by the end of January 2018.

Despite those struggles, recent rate increases can’t be attributed to the construction project’s budget.

“Basin Electric’s average member rate went up through 2016 due to several factors,” says Dave Raatz, senior vice president of Resource Planning. “Member growth was increasing across the entire membership, and we were building infrastructure to support that. Especially in the Bakken oil region of western North Dakota and eastern Montana, the growth meant Basin Electric was building generation and transmission to support the reliability of the transmission system.”

The plant will produce 360,000 tons of urea each year. According to Ken Rutter, Basin Electric senior vice president of Marketing and Asset Management, there is 2.2 million tons of demand each year within a 200-mile radius of the plant.

Backing up the decision

While these factors may be enough on their own for Basin Electric to keep the Synfuels Plant operating, staff knows more action needs to be taken.

Through September 2017, Dakota Gas employees have been able to find ways to reduce expenses by \$24.5 million.

Once the urea production facility is operating, the Synfuels Plant will need 160 MW of electricity, and is expected to run at a 93-percent capacity factor, according to Dave Sauer, Dakota Gas senior vice president and chief operating officer.

A creative tactic would change the way the power contract between Dakota Gas and Basin Electric is written. Currently, the Synfuels Plant pays a higher-than-market rate. Having the plant pay market rates wouldn’t impact Basin Electric. Also, a plant write-down is being considered, which wouldn’t affect operation of the plant.

Employees of Dakota Gas and Basin Electric continue to search for ways to reduce costs and operate the plant more efficiently. Normal staff attrition has helped reduce the workforce as employees leave due to retirement and other opportunities.

On the Basin Electric side, directors are looking at a revenue deferral plan, which would allow for financial flexibility for future instances like what is happening today. Staff is working to optimize the generation fleet, focus on market exposure, and work on a coal asset strategy.

Urea Plant Starts Up

North Dakota’s first urea fertilizer production facility, located at Dakota Gasification Company’s Great Plains Synfuels Plant near Beulah, N.D., is successfully making product and was declared commercial Feb. 1.

Urea is a dry, granular fertilizer commonly used in agricultural applications, and has the highest nitrogen content of all solid fertilizers. The facility produced urea for the first time Jan. 19. Employees are currently working toward the goal of producing up to 1,100 tons of product per day.

“I want to thank the employees of Dakota Gasification Company and Basin Electric for working safely and efficiently to achieve this major milestone,” said Paul Sukut, Basin Electric CEO and general manager. “Hard work and innovation are hallmarks of America’s Heartland, and I’m proud that the completion of this project carries on that tradition.

The plant has the ability to shift a portion of the urea production to produce diesel exhaust fluid, used to reduce emissions of nitrogen oxides from diesel engines. Additionally, the new facility has the capability of producing liquefied carbon dioxide, which is expected to be used in the oil production industry. The products bring the Synfuels Plants total product count to 13.

Construction on the project started in July 2014.

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March 3-6

2018 Summit League Basketball Championship, Sioux Falls, SD, 605-367-7288

March 9-10

Holiday Arts Spring Craft Show, Masonic Temple, Mitchell, SD, 605-359-2049

March 10

Farm and Home Show, 10 a.m. to 5 p.m., Auditorium, Gregory, SD, 605-830-9778

March 10-11

2018 Gun Show, American Legion Hall, Saturday 9 a.m. to 5 p.m., Sunday 9 a.m. to 3 p.m. MST, Philip, SD, 605-859-2280 or 605-441-8466

March 15-17

South Dakota High School State B Boys Basketball Tournament, Barnett Center, Aberdeen, SD

March 15-17

South Dakota High School State A Boys Basketball Tournament, Rushmore Plaza Civic Center, Rapid City, SD

March 15-17

South Dakota High School State AA Boys Basketball Tournament, Premier Center, Sioux Falls, SD

March 16-17, 23-24

60th Annual Schmeckfest, Freeman, SD, 605-925-4237

March 17

Annual Ag Day at the Washington Pavilion, Sioux Falls, SD, 605-367-6000

March 24

Spring Craft Fair/Flea Market, American Legion Hall, Wagner, SD, 605-384-3543



February 24: Annual Outhouse Races and Chili Cook-off Contest, Nemo, SD, 605-578-2708

Photo courtesy: travelist.com

March 24

Milltones Spring Show, 7 p.m., High School Theatre, Milbank, SD

April 5

McCrossan's Wildest Banquet Auction in the Midwest featuring A Night Out with the PBR, 5:30 p.m., Arena, Sioux Falls, SD, Tickets: \$75 each, 605-339-1203, www.mccrossan.org

April 6

SPURS Spring Dance, Dakota Events Center, Aberdeen, SD, Tickets available at the Hitch 'N Post or by calling 605-226-1099

April 6-7

Forks, Corks and Kegs Food, Wine and Beer Festival, Deadwood, SD, 605-578-1876

April 6-8

Professional Bull Riders Built Ford Tough Series, Sioux Falls, SD, 605-367-7288

April 7-8

Hats Off to the Artists Art Show, Faulkton, SD, 605-598-4160

April 25-29

Black Hills Film Festival, Hill City, SD, 605-574-9454

April 28-29

Bike Show, Ramkota Convention Center, Aberdeen, SD, 605-290-0908

May 10

Chris Young, Don Barnett Arena, Rushmore Plaza Civic Center, Rapid City, SD, 605-394-4115

May 13

1880 Train Mother's Day Express, Hill City, SD, 605-574-2222

May 18

Turkey Races, Huron, SD, 605-352-0000

May 18-19

Sioux Empire Film Festival, Sioux Falls, SD, 605-367-6000

May 18-20

State Parks Open House and Free Fishing Weekend, Pierre, SD, 605-773-3391

May 18-20

Tesla Road Trip Rally, Custer, SD, 605-673-2244

July 7

Hedahls Auto Value Car Show, Hav-A-Rest Campground, Redfield, SD, 605-380-9985

July 10-15

4th Annual 3 Wheeler Rally, Deadwood, SD, 605-717-7174, www.d3wr.com

To have your event listed on this page, send complete information, including date, event, place and contact to your local electric cooperative. Include your name, address and daytime telephone number. Information must be submitted at least eight weeks prior to your event. Please call ahead to confirm date, time and location of event.