



# MINNESOTA'S ELECTRIC COOPERATIVES

Laboratories of Utility Innovation

JANUARY 2017

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# Minnesota's Electric Cooperatives: Laboratories of Utility Innovation

## Why we undertook this project

Cooperative electric utilities (co-ops) are a key piece of the American energy landscape. They have an important history and continue to serve a foundational role in economic development in both rural and urban communities. Unlike investor-owned utilities that are overseen by state public utilities commissions, cooperatives are regulated by their boards of directors with little state regulatory oversight of their activities. Consequently, most people who aren't co-op members have little insight into the activities and operations of these utilities.

In this spirit, we thought it would be worthwhile to dig in and learn more about the issues and trends affecting Minnesota's cooperative electric utilities. We want to help inform policymakers, advocates, and interested persons about how best to work with cooperatives on public policy issues. We will focus on how cooperatives are adapting to a quickly changing energy landscape and how they are addressing state policy goals from which they have historically been exempt.

We approached this project by asking leaders at each cooperative utility the same set of questions: What does your system look like? What issues keep you awake at night? What excites and wakes you up in the morning? (See the full list of questions at the end of the introduction.)

We found stories that are at times similar and at other times unique to each utility. Even when dealing with similar issues, each is doing so in its own way and under different circumstances. The distribution cooperatives we interviewed vary in size from 6,500 members all the way up to 130,000 members. Some are entirely rural, others are entirely urban, and others have a mix of members. These cooperatives focus on what their members want in utility electric service, as well as (in some cases) additional services their members need. To cover all the bases, the utilities we spoke to have created a range of innovative and interesting programs, projects, and services.

Innovation, in fact, is the major theme arising from our conversations.

We discovered a culture that is extremely cost-conscious, and at the same time willing to take strategic risks in the best interest of the membership. If their innovative projects and programs have a defining characteristic, it is that they are all practical and offer clear current or prospective benefits to co-op members. Cooperative leaders shared new or emerging pursuits related to decarbonizing, the value of energy efficiency, solar community gardens, smart home projects, electric storage, smart grid and distribution management programs, electric vehicles, and a wide variety of programs, pilots, and projects that most people in the broader state audience don't know about. In all cases, they told us the reason they take on these projects is that their members have asked them to do it. And because each cooperative is relatively flexible and responsive to the needs of their individual membership, each is inevitably unique.

## Cooperative utility history and background

In the United States, cooperative electric utilities were established as the foundation of the rural electrification movement of the 1930s and 1940s. Electricity service had been available in major urban centers since the 1880s. By the 1920s, investor-owned or municipal utilities provided electricity to most cities of size.

Meanwhile, obstacles to electrifying rural America had been recognized for decades leading up to the '30s and '40s. By 1935, more than 80% of urban households had electricity while 90% of rural America did not. Despite multiple attempts to deliver electricity via the investor-owned utility model, investor-owned utilities found extending service to these rural economies to be too expensive and not profitable; nonprofit rural electric cooperatives were created to fill the gap. Integral to their shared history, rural America was electrified only *after* cooperatives were formed, and their electrification created decades of economic growth for these communities and continues to provide a foundation for our economy.

Part of President Roosevelt's New Deal, the Rural Electrification Act (REA) of 1935, loaned federal funds to electric cooperatives to string power and distribution lines in rural communities and to develop generation resources to serve these communities. Prior to the REA's passage, less than 10% of rural America was electrified. The passage of the REA and Minnesota's establishment of cooperatives led to real progress, and by 1960 our rural communities were almost entirely electrified.

From the beginning, cooperatives in Minnesota have organized around delivering power at the lowest cost to all members. There is no profit motive beyond ensuring that all costs are covered and that the books balance. And the co-op member-owners play a natural governance role to regulate rates, filling the role that state public utilities commissions play for investor-owned utilities.

Today, Minnesota is home to 44 distribution cooperative electric utilities and six generation and transmission cooperatives. These utilities serve more than 2 million Minnesotans and are responsible for delivering roughly 20% of the energy Minnesota consumes.

## Summary of interviews with Minnesota cooperative utilities

Interestingly, each interviewee began by emphasizing a similar point: "We exist to serve our members. Everything we do must be for their benefit." Our interviews confirmed for us that the all-important calculations of "member benefits" are quite difficult and time consuming. Often, our "what keeps you up at night?" question garnered a response of "making sure I'm being fair to all my members." The theme of "fairness" and "being reasonable" surfaced in all interviews. One question each manager and executive ponders is, "How do I deliver on the needs of one set of members while ensuring I'm being fair to all of my members?" Many spoke specifically of "a social contract" with their members that guides their thoughts and decision making.

Our interviews with cooperative leaders illustrate that cooperative utilities are not sitting still — they are open to the changes affecting the utility system and electric energy markets.

The trends they face are clear: demand for least-cost resources, need for reliable electric service, flat to slow load growth, member demand for cleaner utility generation, increasing

member demand for distributed generation, energy efficiency, and more control over customer bills drive each to adapt and evolve in ways that could not have been imagined during rural electrification 80 years ago.

Despite such surprises, the underlying cooperative business model continues to work well, providing members the services they want while keeping their communities vibrant and successful. In 1935, this meant electrifying rural communities; in 2016, it means keeping electric service reliable while also ensuring members have a cleaner supply mix, more choices, and greater control. The cooperative business model provides co-op members what they want at the lowest cost possible.

As evidence of this, there are some interesting numbers to keep in mind. Of the 10 utilities we interviewed, eight have developed solar community gardens or solar projects for their members. The development of solar community gardens has, in many cases, been accomplished by Great River Energy's allowance that members self-generate up to 5% of their own load. Furthermore, for the distribution utilities that utilize this, solar community gardens are over and above Minnesota's renewable energy standard.

The leaders we spoke with were open-minded about renewables and were especially excited by the price of wind energy. The utilities we spoke to support these actions strongly and expect more wind to be added to the system purely because it is inexpensive; Great River Energy and Dairyland have both recently announced large wind energy purchases.

Management at Great River Energy (GRE) is also interested in recent solar cost drops and related opportunities for self-generation by its members. It is worth stressing the significance of GRE's decision to invest in Coal Creek Station (its main coal-generation asset), to allow that facility to be operated with much greater ramping flexibility and enhance its ability to follow the region's bulk wind resources. (See the interview with GRE for more details.) Leaders shared how baseload will be used to supplement and enable more variable renewables. This enhanced flexibility optimizes their main coal asset for a world in which wind is the lowest-cost energy resource apart from energy efficiency, a huge shift in the way the utility and its members plan and operate their system. As GRE President and CEO David Saggau explained at CEE's Policy Forum in early 2017, this innovation at Coal Creek Station was planned and completed in recognition that "wind is the new baseload."

All these cooperatives have programs incentivizing load control, air source heat pumps, and energy conservation. All 10 have driven the wide-scale adoption of grid-facing electric water heaters and, because of this, Great River Energy can call on 165,000 distributed electric water heaters to shave load and act like a battery to effectively store wind energy at night.

As for energy efficiency, all utilities we met with reported that they are either at or close to meeting their conservation goals and, more importantly, *are committed to efficiency because their members expect it*. It is interesting to note that only two of the utilities we spoke with have experienced recent kilowatt-hour sales growth, which effectively means that compliance with statewide efficiency goals has zeroed out the utilities' growth. It should be recognized that this societal success also comes with big challenges for utilities.

Minnesota's cooperatives have also been strong early adopters of advanced meters. Of the nine distribution cooperatives we interviewed, five have completed their adoption of advanced meters. Several of these utilities are also in the early stages of developing advanced distribution management systems to give them system-level load shaving, a virtual power plant, and efficiency capabilities built on the foundation of advanced meters. Three others plan to complete advanced meter rollouts by 2018, and Dakota Electric will likely complete its advanced meter roll out by 2022. Great River Energy already has approximately 40% of its system on advanced meters, and this number will only increase in the next couple of years. Minnesota's electric cooperatives are far ahead of their investor-owned and municipal brethren in this regard.

Another major interest of the cooperatives we interviewed is greater electrification of the economy. Perhaps more than any other class of utility or institutional actor, Great River Energy and the distribution cooperatives we spoke with have developed programs to strongly promote and support electric vehicles. It is worth noting that key elements of Great River Energy's "Revolt" electric vehicle program are being replicated by Xcel Energy.

Another very interesting theme in many conversations was the strong desire to have a real conversation about decarbonization. Several managers talked at length about keeping our collective eye on decarbonization rather than focusing on particular generation types. They emphasized driving relentlessly toward the system outcomes we want, as opposed to fixating on a limited list of tools or technologies that we use to get us there. Explained one, "Wind is low cost today but solar may beat it tomorrow, so don't pick winners." Furthermore, if carbon can be sequestered from coal and natural gas, those may remain viable options as well.

Lastly, we were very impressed that the spirit of innovation is not limited to technologies and programs. These cooperatives are thinking about the cooperative business model itself. And no better example of business model innovation can be found than with the cooperatives that purchased Alliant Energy's Southern Minnesota service territory and formed the Southern Minnesota Energy Cooperative, expanding the scope of their operations to achieve greater scale and cost benefits. Another example is that of Tri-County Electric Cooperative combining with Hawkeye REC to form MiEnergy Cooperative.

The remainder of this white paper shares information gained through each of our conversations. We provide a quick snapshot of each cooperative utility and then summarize responses to the questions we posed. We also organize each interview around themes that became evident in the conversation and are underscored for readers.

*Note: Although summarized in a conversational manor, the following pages are not meant to represent a verbatim transcript of our conversations.*

# Questions We Asked

## **What does your system look like?**

- Demographics
- Load: % residential vs. commercial and industrial
- Number of meters/customers served
- Growth
- Distributed generation
- Current utility resources
- Members' profiles and expectations

## **Which key challenges keep you up at night?**

- Workforce challenges
- Cyber-security
- Meeting changing demands of electric system
- Utility resource concerns
- Distributed generations and customer defections
- Policy uncertainty
- Other stuff

## **What excites and wakes you up in the morning?**

- Meeting changing customer needs
- Grid modernization
- Changing electric system
- Other

# CEE/Cooperative Utility Interviews

## Connexus Energy

On August 31, 2016, CEE traveled to Dakota, Minnesota, to speak with Connexus Energy. We met with Chief Executive Officer Greg Ridderbusch and Director of Member Services Don Haller.

### Fast facts

- Based in Ramsey, Minnesota
- Serves Twin Cities north metro from Coon Rapids to St. Cloud, and from Cambridge to Stillwater
- Largest distribution cooperative in Minnesota
- 130,000 Members — 110,000 residential and 20,000 commercial and industrial
- 65% residential and 35% commercial and industrial
- 1% annual growth
- Advanced meter rollout will be complete by 2018
- 43 DG (distributed generation) systems
- Several solar community gardens on site
- Largest distribution cooperative on Great River Energy's system (approximately 1/6 of system)
- Programs/innovative services:
  - Electric vehicle program
  - Dual fuel
  - Air source heat pump replacement for AC
  - AC saver switch
  - Ground source heat pump
  - Solar community gardens
  - Wellspring green pricing
  - Loans
  - CIP programs



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Energy policy/mandates.** We respond to what our members want. Our members want to see that their electric utility is green and we respond to that desire and, in the case of solar, we responded without a mandate. Great River Energy just locked in a 300MW power purchase agreement (PPA) for new wind. It's the lowest cost PPA in Great River Energy history. That is great as we want to add green, carbon-free energy without driving up member rates.

**Cooperative message.** Cooperatives exhibited early leadership on renewables, but lately we have lost the message. The greater public needs to know how much good stuff we do. We need to do better at communicating.

**Membership/fairness.** Our key challenge is addressing the range of members' wants and needs with cost fairness. It's a balancing act and a continuing challenge.



**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Solar.** We are figuring out how to develop solar so that it benefits all members. We need to understand and develop expertise to implement solar economically.

We are very proud of the fact that our wholesale energy provider (Great River Energy) is lowering its carbon footprint.

**Innovation/evolving electric system.** We are very interested in distributed generation, solar, wind, and other generation sources. These huge megatrends are shaping our industry and we need to be involved. We are excited about this transition. People can see our commitment to this and our members can be a part of it. Connexus has a “green your house” initiative. Our SolarWise program is designed for members who want to go beyond what Connexus is doing on its own. We also have an electric vehicle program and are rolling out advanced meters. We have grid-connected hot water heaters, ground source heat pumps, and air source heat pumps. These are all examples of our commitment to the future direction of energy.

**Innovation/solar.** We have a 5% self-supply option under our contract with Great River Energy. This is exciting because it allows us to directly procure up to 5% renewable energy. Here’s how this helps us out: right now solar is at parity or very close to parity compared to the energy we purchase from the bulk system at Great River Energy wholesale rates. As one Great River Energy owner, we can respond to member interests by having the flexibility to buy up to 5% without driving up member retail rates. This gives us the opportunity to build solar.

**Interesting comments**

**Renewables.** “We believe that the economics of wind in our region make it the best choice as more bulk renewable energy is added to GRE’s power supply. While also adding some solar, let’s not lose sight of the incredible economics of wind energy in today’s market.”

**Future.** “Connexus is embracing the future. It is a very interesting and fun time to be in this industry.”

**Electric grid.** “Distributed generation solar units have value for certain, but you can only access this value because of the electric grid.”

**Solar.** “Connexus is building solar and realizing its value, but scale matters.”

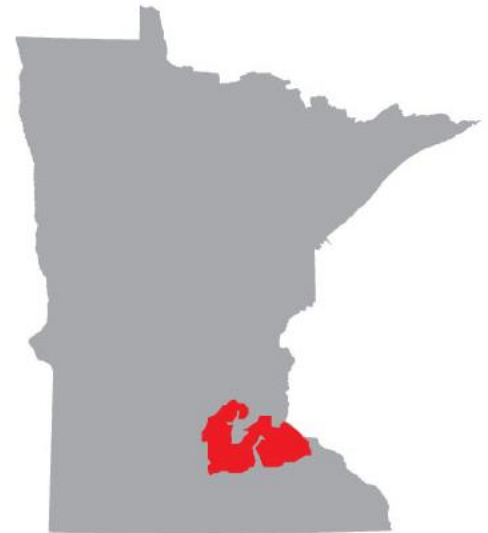
**Storage.** “Electric storage is valuable today and will be necessary tomorrow.”

## Dakota Electric

On August 30, 2016, CEE traveled to Farmington, Minnesota, to speak with Dakota Electric Association. We met with President and Chief Executive Officer Greg Miller and Vice President of Regulatory Services Doug Larson.

### Fast facts

- Based in Farmington, Minnesota
- Serves the southern two-thirds of Dakota County and portions of some surrounding counties
- 105,000 members (2nd-largest distribution cooperative in Minnesota)
- 95% residential and 5% commercial and industrial
- 50% of kilowatt-hour sales come from commercial and industrial
- Flat electric sales
- Only rate-regulated electric cooperative in Minnesota, something they chose voluntarily in 1981
- About 800/900 new members per year
- Analogue meters
- 80 DG systems under 40 kw
- Great River Energy member for wholesale energy
- Meets CIP goals every year
- Programs/innovative services:
  - Wholesale solar project in progress to serve all members under 5% self-generation clause
  - Electric vehicle rebate and special off-peak/time-of-use rates
  - Water heater off-peak program
  - Air source and geothermal heat pump programs
  - AC cycling program
  - CIP programs/energy efficiency rebates
  - Special rates for off-peak usage
  - Commercial and industrial and irrigation interruptible rates



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Rates/reliability/no load growth.** We have no new kilowatt hour sales. In fact, we sell less kilowatt hours today than in 2007, which reflects overall improvements in energy efficiency standards, participation in utility energy efficiency and conservation programs, and other factors. This means we must recover all of our increased and unavoidable costs from the same number of kilowatt hour sales. Maintaining reliability on our distribution system is a high priority.

**Membership/fairness.** We wrestle with how to give one member or group of members what they want or what their business needs while still protecting our other members. Striking the right balance is very important. We are not opposed to distributed generation or energy efficiency — it's what a lot of our members want, so how could we be? It's great and undeniably where things are moving towards. But how do we keep it fair for everyone? That's the question

we deal with daily. We can address revenue issues with rate design. We are a lot less concerned about simply collecting revenue than about *fairly* collecting revenue.

**Cyber-security.** Cyber issues definitely keep us up at night. We have policies and procedures in place to keep our members' personal information from getting out into the world. We put a lot of time and energy into getting our security policies right. We have specific training for our employees on cyber-security issues, and we recently did an internal reorganization to combine various IT functions into one department with a vice president reporting directly to the president/CEO. This is a big deal.

### **What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership.** Serving our members' needs! Dakota Electric exists to serve its members. It is not just a slogan, it is why we are here. We work with members on distributed generation and energy efficiency, we help participate in our demand response programs, we provide rebates for energy efficiency upgrades, and deliver energy audits and education for members.

**Membership/decarbonization.** We have several large customers and key accounts who are interested in being 100% renewable, and we are going to make this possible. We are exploring options within our wholesale power contract and regulated status to deliver this service.

**Innovation/smart grid.** We are actively planning advanced grid infrastructure and advanced meters. The reason we are a little behind some of the other cooperatives on advanced meters is that our service territory is dense enough that it is still cost effective to have on the ground walking meter readers. However the key benefit of advanced meters is that they provide a two-way view of what is happening on our system. This will create a lot of opportunities.

**Evolving electric system.** We absolutely want new electric load (we call it "good" load). This includes loads like electric vehicles, air source heat pumps, and off-peak water heaters. We offer great programs for these loads because our members want them. We are pushing the boundaries on this stuff by exploring a pilot program for grid-enabled water heaters. This is cutting edge stuff and it wakes us up in the morning because it's so exciting!

### **Interesting Comments**

**Rates.** "Lots of solutions to utility issues lie in rate design, but we are a lot less concerned about simply collecting revenue than about *fairly* collecting revenue."

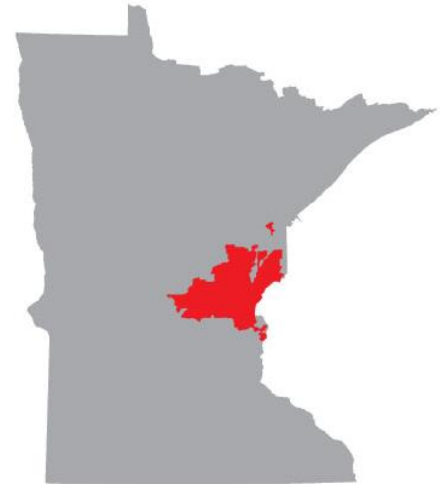
**Decarbonization.** "How do we as Dakota Electric get carbon out of the system cost effectively? This is the big question."

## East Central Energy

On August 30, 2016, CEE traveled to Braham, Minnesota, to speak with East Central Energy. We met with President and Chief Executive Officer Steve Shurts, Manager of Business Accounts and Energy Services Mark Nelson, and Energy Services Supervisor Justin Jahnz.

### Fast facts

- Based in Braham, Minnesota
- Services area from Lindstrom to St. Cloud, and east to Superior, Wisconsin.
- 59,000 members — 7,600 are commercial and industrial
- 35% sales come from commercial and industrial
- Flat electric sales, and commercial and industrial load growth
- Smart meter rollout will be complete by 2018
- 66 DG systems
- Power supplier owned solar on site
- Great River Energy member
- Meets CIP goals every year
- Average residential customer uses 986 kwh/month, less than the Minnesota co-op customer average of 1,200 kwh/month)
- Programs/innovative services
  - Electric water heater program/special rate 5.3 cents per kWh
  - Air source heat pump program
  - Cycled AC
  - Electric heat programs
  - Residential rebates
  - Dual fuel program
  - Green pricing for wind
  - CIP rebates
  - 0% 3-year financing for equipment purchases from the cooperative



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Rates/reliability/no load growth.** Having no new sales worries us because it means we must feed all our increased and unavoidable costs into the same number of kilowatt-hour sales. This raises rates and makes us worry about maintaining system reliability and distribution. We would like a little bit of growth because it helps us invest in the system and our members.

**Conservation issues.** The Conservation Improvement Program (CIP) worries us, and we spend a lot of money on conservation. It's not conservation itself or energy efficiency that troubles us, because our members want those things and our related programs are successful. What we are concerned about is that a large portion of our conservation rebates go towards LED lights. When lighting standards change in a couple years, this is going to make hitting our CIP goals much harder.

**Demographics/utility changes.** The demographics in our region are changing and so is our utility. We have a sizable number of low-income members. We also have a lot of seasonal

members with cabins in the area. And our rates are high. So it's a real challenge for economic development in our region and service territory.

On top of flat electric sales, East Central Energy itself is smaller than it was six years ago — we shrunk about 10%, from 180 staff to 160.

**Distributed generation challenges/size-to-load.** Size-to-load is an issue for us. A 39.9 kw system on a house is not good; that person's system makes money on the back of everyone else in the cooperative. This runs counter to our very existence as cooperatives because these folks are not paying their fair share. In fact, they are getting utility service for little or no cost. And often the person paying their bill for the infrastructure and distribution costs is a cooperative member on a fixed income who is below the poverty line and can't afford a solar array.

### **What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership.** Serving our members and being a vital part of this community is why we do what we do.

**New opportunities and innovation.** We want to grow load in a way that is VALUABLE and mutually beneficial. It's not about installing inefficient stuff. We want electric vehicles, we want hot water storage for wind, we want air source heat pumps. Our goal is to get rid of air conditioning and replace it all with heat pumps. That is a big deal for the environment and for our business. We want to flatten demand throughout the day and year.

Distributed generation is a huge opportunity for us and it is GREAT stuff! It is the future of the industry, our members want it, and we want to deliver it for them. But we need to find a fixed cost recovery mechanism that is not punitive and also addresses system needs.

We are also rolling out smart meters, or "AMi" (for advanced metering infrastructure). The project started in early 2016 and will be complete by 2018. The key benefit of smart meters will be to give us a two-way view of everything that is happening on our system. AMi will also allow us to be more creative in helping our members control their bills and their energy use and get more value out of their membership. We will be able to do time-of-use rates, pre-pay options, and a bunch of stuff we have not even thought of yet.

### **Interesting comments**

**Conservation.** "I want to sell fewer and fewer kilowatt hours to each and every member."

**Equity.** "The biggest place in my heart is for our members who are on a fixed income."

**Environmentalists.** "To environmentalists — let's talk about this not like there are winners and losers, but like we are all stakeholders in this system."

**Social compact.** "The cooperative is based on there being a social compact with our members. This is a good thing. We are operating under that social compact. In the 1970s, Coal Creek was built and we were required by federal law to utilize coal for that facility. Coal Creek is not paid off and until it is we have to operate under that social compact."

**Equity.** "There is a human toll to closing coal facilities. We need to appreciate this human toll and work to deal with it."

## Freeborn-Mower Cooperative Services

On October 12, 2016, CEE traveled to Albert Lea, Minnesota, to speak with Freeborn-Mower Cooperative Services (FMCS). We met with President and Chief Executive Office Jim Krueger and Director of Energy Services Mike Murtaugh.

### Fast facts

- Based in Albert Lea, Minnesota
- Serves large portions of South Central Minnesota including Albert Lea and Freeborn and Mower Counties (except Austin and Waltham)
- 21,000 members
- 15,000 new members/meters from the Southern Minnesota Energy Cooperative (SMEC) acquisition of Alliant Energy's service territory
- 80% residential and 20% commercial and industrial
- Half of kilowatt-hour sales come from commercial and industrial customers
- Flat electric sales
- AMi throughout legacy distribution territory (prior to SMEC) and for about 4,000 new members
- 40 DG systems
- Co-owner of solar power plant in Oronoco, Minnesota
- Dairyland Power Electric Cooperative member
- Four times larger in 2016 compared to 2015
- Programs/innovative services
  - SmartHub phone app
  - Evergreen program/green pricing
  - Home energy audits and rebates
  - Interruptible thermal storage programs (air source heat pumps/ground source heat pumps/electric heat)
  - Water heater load control program



### Interview answers and questions

#### **What are your key challenges? What keeps you up at night?**

**Innovation/utility.** The biggest issue we are currently dealing with is integrating Alliant Energy's service territory and assets into our system. For some perspective, we grew from 6,000 members in 2015 to 21,000 in 2016, and our utility grew from 30 to 65 employees. We now serve the City of Albert Lea and have some new large commercial and industrial customers. These are all good things and we really appreciate the opportunity to have them all as new members, but growing quickly can be challenging. However, it is worth it. We view the purchase of the Alliant service territory as a huge opportunity that will allow us to better serve our members in the long run.

**Energy policy/mandates.** We do not have a problem with renewables or efficiency. Wind energy is cheap and we will keep investing in wind. Going forward lots of wind, solar, and efficiency will be added to the system. However, the problem from our perspective as to why mandates are really difficult for us is that we do not need any new generation. We do not have

any growth on our system so if we are required to build new generation it is going to cost us twice, even if the new stuff is inexpensive. That is the crux of the problem for us.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership/innovative programs.** Some of our most exciting work is the programs we are delivering for our members. We have great efficiency and load control programs, and there are many opportunities in the recently acquired SMEC service territory. This is important to us because it will help to flatten out our system load profile. For example, we are pushing air source and ground source heat pumps because these systems give our members all the comforts of an air conditioner and furnace with the added benefit of flattening out our yearly load profile, which makes for a more efficient system. We have worked with contractors in the region to better understand the benefits of heat pumps.

**Innovation/empowering members.** We are helping our members take better control of their electricity usage with our smart phone app, SmartHub, which allows them to pay their bill, check their energy use, and better understand how they use electricity.

**Innovation/solar.** We decided to work on a solar project with two other Dairyland cooperatives. The project is located just north of Rochester in Oronoco. We did this project for two reasons: we wanted to work in collaboration with neighboring cooperatives since we learn more and have better outcomes working together, and we wanted to pilot a solar project to get some real on the ground numbers and values for our area. This technology is coming and we want to figure out how to use it.

**AMi/rate design.** We are rolling out advanced meters (AMi) throughout our service territory. The Minnesota Public Utilities Commission limits how much we can affect rates for our new members, but we are excited about having all our members on AMi. In addition to the help advanced meters provide on the system side, we will also be able to do a lot of innovative rate designs for members. For example, if rates increase we will be able to give people the option to opt into new rates as a way to impact their behavior and decrease their bills even with increased rates. Rate design will give our members better control in a way our current meters and system cannot.

**Conservation.** CIP (Conservation Improvement Program) is one of the ways we engage with our members. The SMEC acquisition should help us achieve our conservation goal. Prior to SMEC we were struggling to hit the 1% savings goal because we had such a high percentage of residential load. The SMEC acquisition helped us engage with some new large commercial and industrial customers so we have a better chance of meeting conservation goals. But there are some issues with how CIP is structured. The three-year rolling average is a problem and we would like to be able to get savings for more than just one year. That said, we do want to do more on efficiency — our members want it.

**Interesting comments**

**Decarbonization.** “This is all about carbon dioxide. We need to have a serious conversation about carbon.”

**Renewables.** “Renewables have a place in our energy economy; however, they cannot entirely replace base load plants today.”

**Coal.** “Coal will continue to be part of our base load power supply in the future. It has been a reliable source of electricity for our members. People also need to remember that in the '70s when we built our coal plants we were required to build them as coal generators. These power plants are not finished being paid off yet.”

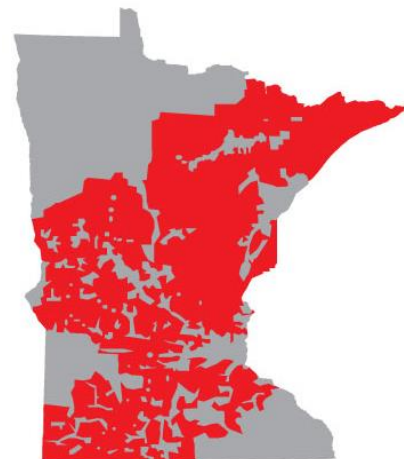


## Great River Energy

On October 10, 2016, CEE traveled to Elk River, Minnesota, to speak with Great River Energy. We met with President and Chief Executive Officer David Saggau, Vice President and General Counsel Eric Olsen, Vice President and Chief Market Officer Jon Brekke, and Director of Governmental Affairs Stacey Fujii.

### Fast facts

- Headquartered in Maple Grove, Minnesota
- Minnesota's largest generation and transmission cooperative electric utility
- Minnesota's second largest electric utility on a kilowatt-hour sales basis
- Provides wholesale electric service to 28 member distribution cooperatives
- Member cooperatives distribute electricity to approximately 665,000 member consumers in Minnesota (about 1.7 million people)
- Flat load growth
- 35% to 40% of GRE's system has advanced meters — will be 50% when Connexus completes rollout
- 5% renewable self-supply option offered to member-owners in addition to RES requirements — most use for solar community gardens
- Low load factor at 64% — GRE is actively looking to flatten its load profile to improve its system efficiency
- Owns three coal-fired power plants in North Dakota (Stanton Station will retire on May 1, 2017)
- Owns power plants in Minnesota, including four natural gas-fired peaking plants and a refuse derived fuel-fired plant
- Has long-term power purchase agreements with several wind farms in Minnesota, Iowa, and North Dakota



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Rates/reliability/no load growth.** From our perspective, keeping costs reasonable and low is the imperative. Our members are extremely cognizant about costs and keeping costs low is vital to cooperative communities. In a one billion dollar annual budget, our members scrutinize every line item. And since our members are hawkish on costs, we have to be as well.

**Third-party disrupters.** We are very concerned about third-party aggregators and disrupters. Companies that do not have to worry about serving all members could take away our ability to be innovative and deliver cost-effective load control and other programs to our members.

**Cyber-security.** Cyber-security is a big issue. David Saggau is one of 30 utility CEOs working to address this issue as a part of a national cyber-security board. It takes a lot of our time, and we are very concerned about hardening our system and getting people trained to deal with these issues.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Co-ops leadership/innovation.** We are trying to be innovative and enable innovation in our members. As the company our members formed to be their wholesale power provider, GRE has scale and that helps our members. We are working on great stuff for our members, such as our Revolt electric vehicle program, load control programs, and our efficiency programs. All of this is done to help our members better deliver programs to their member-owners and help their communities thrive.

**Innovation/electric vehicles.** One of the things we are interested in is the opportunity to grow good load. Our Revolt program is about electrifying the economy through electric vehicles. We are working hard to get other utilities to adopt Revolt, and Xcel Energy is emulating the program for their electric vehicle offering, so our ability to innovate helps other utilities as well.

As a part of our electric vehicle efforts we are also interested in an electric school bus pilot. School buses are actually the largest transportation system in the country, and we want school buses to run on electricity instead of diesel. They are huge loads, run very predictable routes, and operate during specific hours. Not only could this project be very helpful moving electric school buses along, it could also be an important step to electrify garbage hauling and incentivize local Minnesota manufacturing.

**Innovation/load control.** We are very interested in making our system more efficient. That is why we want to flatten our load curve and do more load control. Our off-peak water heaters have been an extremely successful program — there are more than 160,000 deployed by our members. It is a huge asset to us and to our members as we can now control 13% of our peak. We have also developed a software platform to control water heaters and air conditioners. We could use this as a virtual power plant, but the value in the MISO market is not there yet. However, we are skating to where the puck is going.

Nobody should install an air-conditioning unit on our system. It should all be air source heat pumps. They are more efficient and create new load while flattening out the demand curve. We help contractors better understand heat pumps and they are now offering them to customers in a way they never would have 10 years ago.

**Innovation/baseload.** We are innovating by doing a number of new things with our power plants. First, we have accelerated the depreciation on Coal Creek Station. The facility will now be fully depreciated in 2028. To our knowledge, we are the only utility in the country to voluntarily take this step. Secondly, we have invested in technology to help Coal Creek operate in a way that was unintended 40 years ago when it was first constructed. Coal Creek can now ramp up to follow the wind resources in this region. In our view, baseload supplements and enables renewables, and this will be the dynamic going forward. We are learning to operate our fossil generators in a way to optimize wind and solar. This is a totally new way to look at renewables and traditional generators, and we have invested in Coal Creek Station to create more space on the system for variable resources. Through the aggregated efforts of its members, we can currently control up to 13% of its peak capacity (or approximately 300 megawatts).

### **Interesting comments**

**Energy sources.** “We are agnostic on fuel but zealots on costs!”

**Energy policy/mandates.** “We have 1.7 million Minnesotans on our system. State Policy should be reflected on our system and it is. Look at GRE and look at our members. The exemption we got from the solar mandate has worked. We have exceeded what we would have done just by letting the market work and by responding to our members. The vast majority of our members are using their 5% self-generation option to build solar gardens and solar facilities in their service territory.”

**Decarbonization.** “We need to keep our focus on decarbonization.”

## Lake Region Electric Cooperative

On August 30, 2016, CEE traveled to Pelican Rapids, Minnesota, to speak with Lake Region Electric Cooperative (LREC). We met with Chief Executive Officer Tim Thompson, Chief Financial Officer Lloyd Nelson, and Vice President of Energy Services Dan Husted.

### Fast facts

- Based in Pelican Rapids, Minnesota
- Serves West Central Minnesota
- 27,000 members, approximately 350 new accounts per year
- 25% of members are seasonal
- Flat electric sales
- 100% advanced meters
- Approximately 40 DG systems
- Two community solar on site and fully subscribed
- Great River Energy member
- Programs/innovative services:
  - Off-peak space and water heating
  - Air source heat pump
  - Geothermal
  - Community solar
  - EV program with reduced rates for off-peak charging and EV charging station rebate
  - CIP programs
  - MyMeter program



### Interview questions and answers

#### **What are your key challenges, what keeps you up at night?**

**Rates/reliability/no load growth.** We need to keep the electric grid reliable and strong. We have a \$20 million work plan over three years for reinvestment in the system. We have nearly 1,000 poles that need to be replaced each year, and we need to balance all of this with costs as well as with wind, solar, storage, and efficiency. Losing members is also a big concern to us. We are seeing members go off the grid if our rates are too high.

**Misunderstanding.** The criticism we receive from the environmental community bothers us. They do not see all the successful programs we are delivering or our positive impact on our community.

**Third-party disrupters/social compact.** It concerns us greatly to see third parties come between us and our members. A cooperative is about sharing so that we all have electric service. It is not about skimming the most profitable stuff and letting the community shoulder the burden.

**Energy policy/mandate.** We worry a lot about maintaining our autonomy and sovereignty. It's how we meet our members' needs.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership.** We have developed great programs to serve our members and meet their needs, and we are very proud of this. We try really hard to go beyond a traditional utility and serve our community as trusted energy professionals. That is why we install geothermal loops, solar, and standby generation for our members and offer LED lights to our members through our online store.

**Innovation/utility.** We are very innovative around solar. We recently decided to become our own solar general contractor. We will go out and install solar for our members. We are serious about building this service, expertise, and capability, and we want to help other cooperatives deliver it for their members.

**Innovation/solar.** We focus on building west-facing solar facilities because they can be more valuable to the system than southern-facing systems. We are also currently working to build a rate around a south-facing array that will work better than net metering. Both of our solar community gardens are fully subscribed. We are utilizing our 5% generation cap under our Great River Energy contract to make these programs work.

**Interesting comments**

**Distributed generation.** “We are not opposed to DG or solar, we are getting into the market ourselves.”

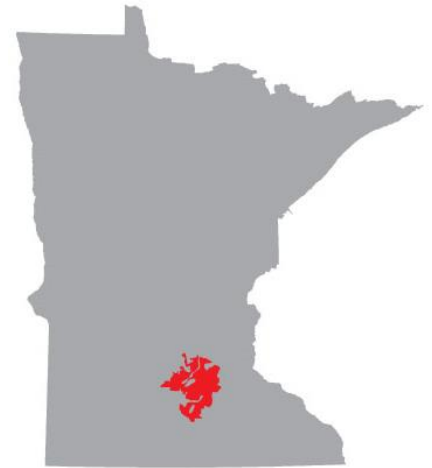
**Decarbonization.** “The market is decarbonizing. It’s happening.”

## Minnesota Valley Electric Cooperative

On September 2, 2016, CEE traveled to Jordan, Minnesota, to speak with Minnesota Valley Electric Cooperative (MVEC) General Manager Ryan Hentges.

### Fast facts

- Headquartered in Jordan, Minnesota
- Serves Twin Cities southwest metro
- 40,000 members (1,200 commercial and industrial)
- 70% residential and 30% commercial and industrial load
- Rural and suburban membership
- Diverse economic membership
- 1% annual growth
- 100% advanced meters
- 20 DG systems
- Wholesale power supply from Great River Energy, Basin Energy, and Alliant Energy (12% MVEC power supply is up for grabs)
- Large average account use at 1100 kwh/month
- 45% of members participate in off-peak programs
- Programs/innovative services
  - Energy Wise load control programs offer 10%-50% reduced energy rates
  - EV half-price rates
  - Air/ground source heat pumps
  - Wi-fi thermostat program
  - CIP offerings
  - SmartHub online account system



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Wholesale power costs.** Wholesale power prices are our single largest operating expense, at about 70% of our budget. If wholesale power costs increase, our members feel it right away. This is why we have created a diverse supply for ourselves.

**Third-party disrupters/social compact.** I'm concerned about people, groups, and companies that want to be a part of our system but are not in it for the long haul. For example, a very large technology company came to us with a bunch of recommendations. Then, two weeks before the launch, they called to say they were dropping support and getting out of the market. That is frustrating. We have been here for 70 years and plan to be around for another 70.

As for the third parties trying to disaggregate us, folks tend to forget the social value of a utility. A utility is about a community working together. Third parties do not have this motivation. However, utilities must do their part to continue to evolve and move forward.

**Conservation.** The Conservation Improvement Program and energy efficiency are very important to us. There are continued opportunities on the commercial and industrial side. That said, we are worried about the residential side. It's about to get much harder with the new lighting standards, and we will not be able to meet harder goals with residential customers.

**Workforce.** Workforce issues and retirements are huge concerns. Forty percent of our workforce is retiring in the next five years. This is a huge deal.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Wholesale power costs.** Our diverse supplier mix allows us to do interesting things and keep costs low for our members. It's both scary and fun.

**Conservation/energy efficiency.** We need to focus on efficiency and better understand usage to determine how we will generate cleaner energy to meet demand. Also, maybe CIP (Conservation Improvement Program) needs to allow for different kinds of residential programs with things like "Beat the Peak," education programs, etc.

**Membership/decarbonization.** We are currently working with members interested in moving to carbon-free generation.

**Membership/renewables.** Wind prices are so low and we want more wind energy. Look at how inexpensive it is. Our members want renewables and they want least cost and that means wind. We are not convinced our members want solar for solar's sake.

**Innovation/electric vehicles.** Electric vehicles are becoming a bigger deal and we are expecting a lot of interest between 2020 and 2025. We want to promote this trend so we have a special electric vehicle rate and are evaluating partnering with a local dealer to promote electric vehicles.

**Innovation/smart grid.** Our entire system is advanced meters. We have been doing this for a while and are collaborating with (energy industry tech innovator) OATI to go to the next level. We are building a demand response management system to pull together all distribution resources and allow us to dispatch them as a system resource. This will be the virtual power plant that we can use when needed. Down the road we may be able to offer this into the market and do ancillary services. We are building a platform to take us to the "prices to devices" world we hear so much about. It's very exciting!

**Interesting comments**

**Mandates/innovation.** "A problem with mandates for cooperative utilities is that they reduce the amount of resources we can allocate to being innovative. Wholesale power costs are such a huge part of our budget."

**Innovation/utility business model.** "MVEC is absolutely moving to become a services company."

**Distributed generation issues/sized-to-load.** "As for distributed generation, if our members want it, we want to try to find ways to provide it. We need it to be sized to load, though, because other members have to pay for oversized systems."

**Renewables.** "Renewables and distributed generation do not keep me up at night."

**Innovation.** "We believe in failing quickly and learning from our mistakes."

**Future.** "MVEC is way past advanced meters."

## Nobles Cooperative Electric

On November 19, 2016, CEE traveled to Worthington, Minnesota, to speak with Nobles Cooperative Electric (NCE) General Manager Adam Tromblay.

### Fast facts

- Headquartered in Worthington, Minnesota, with satellite office in Slayton, Minnesota
- Serves southwestern Minnesota, including Nobles County and Murray County
- 6,700 members (5,000 legacy members and 1,700 new members from SMEC/Alliant Energy acquisition)
- 54% residential and 46% large/small commercial
- 20% of load comes from local soybean processor
- Flat electric sales
- 100% advanced meters throughout entire service territory
- Acquired approximately 1,700 new members from SMEC/Alliant Energy acquisition including the cities of Fulda, Ellsworth, Avoca, Wilmont, Lismore, and Dovray
- 13 DG wind/solar systems
- About 34% larger in 2016 than 2015
- Less than 3 members per mile of line
- 60% of legacy members have grid-connected hot water heater
- Offers Internet service to members
- Programs/innovative services
  - Hot water heater
  - Dual Fuel program
  - Generator back up program
  - Cycled AC program
  - Emergency response phone system WellSpring (wind and solar)
  - Conservation incentives and rebates
  - Safety and conservation demonstrations



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Membership.** The cooperative business model is designed to serve our members' needs, and this cooperative is critical to the economic health of this community.

**Reliability/outages.** NCE acquired Alliant Energy's service territory in southwestern Minnesota. Their system is different than ours, and we are doing a lot of work to integrate it into our system and approach. We worry that when we have outages or events that it reflects poorly on us. We are working extremely hard to get this service territory completely rolled into ours.

**Distributed generation challenges/fairness.** We do not have a problem with distributed generation (DG). Some of our members want it, but most are not interested. We want to help those who are interested, but it has to be fair. The problem is that the net-metering policy that supports small scale solar and wind is not sustainable. As DG increases on our system, we are going to struggle to make it work. Right now, we have a service charge of \$15, but it actually costs us \$50 to serve each member. We eat the difference because, as a cooperative, that is



what we do for the good of the order. However, as members switch to DG and get paid more for their systems than what the energy is worth, the service fee will become much more of an issue.

**Energy policy/mandates.** NCE is a locally owned member cooperative that is democratically controlled by an elected board of directors. Because of the way we are structured, we do not need the state to tell us what to do. We are going to do the right thing and we don't need to be made to do it.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Innovation/smart meters.** Our system is 100% smart meters and we are utilizing the many benefits these meters bring to us. For example, because of a snowstorm right now, we are having a major outage event at several places throughout our service territory. Five years ago, I would have had to cancel this interview with you because we would be running around trying to figure out where all of the individual lines are down and whose houses were out, etc. On top of this, we would be getting hundreds of phone calls because people would be calling in to let us know their power was out. Those days are gone, because now with smart meters we know exactly what is happening on the system at the same time our member sees the lights go out. This means we can send linemen into an area immediately and get everything back up and running much faster. Plus members are not calling in anymore since they know that we are on the way. Soon we will be adding a text-based service to update members during these events. This is what is possible from our side with smart meters.

**Membership.** As a cooperative electric, we are here to serve our members and to deliver reliable electric power. We have great programs and the tools to help our members reduce their bills. This is exciting and important work. We know that if we are successful in doing this it makes *our community* healthy and successful. We want to help our members be more efficient, but it is a challenge. We need help spreading the word about available programs and grants, and with finding qualified residential energy auditors to help evaluate homes in our area.

**Building a new cooperative.** There has been a lot of change at NCE in the last couple of years. Right now we have 25 people working here, 12 of whom are new. We are creating a new member-focused business model that serves our community in a deep and fundamental way. Building that is the most fun part of this job!

**Interesting comments**

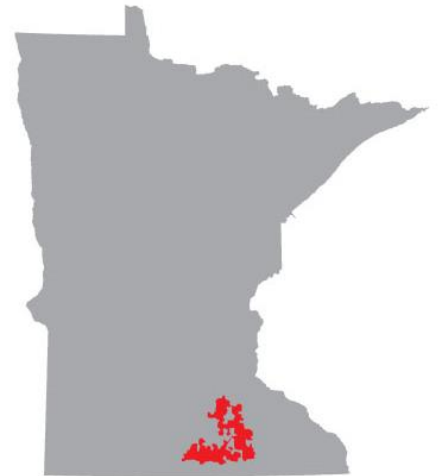
**Co-op business model.** "The nonprofit cooperative is the best business model ever created. It aligns everything for the best possible service."

## Steele-Waseca Cooperative Electric

On August 29, 2016, CEE traveled to Owatonna, Minnesota, to speak with Steele-Waseca Cooperative Electric General Manager Syd Briggs.

### Fast facts

- Based in Owatonna, Minnesota
- Serves south central Minnesota
- 90% residential and 10% commercial and industrial
- 63% sales come from commercial and industrial customers
- Flat electric sales
- 100% advanced meters
- Highest DG percentage of any Minnesota cooperative — about .4% of load historically, now .34% with Alliant acquisition
- Solar community garden on site
- Great River Energy member
- Programs/innovative services
  - Sunna Project (community solar)
  - Wellspring
  - EV Rebate
  - CIP Rebates
  - Dual fuel program
  - Water heater program
  - Load management rates for customers with load greater than 50 kw



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Rates/reliability/no load growth.** While average for a cooperative of our size, our rates are higher than neighboring utilities because of our low density (just over five meters per mile) and low growth. This puts a lot of pressure on our members and on us to maintain the system. Fortunately, we just acquired about 1,500 meters from Alliant Energy, which will help counter the lack of organic growth from within our existing territory.

**Fairness.** I'm also very concerned about distributed generation costs for non-participating members and the fairness of some members paying for other members' choices. Minnesota's current distributed generation/net-metering policy incentivizes the wrong objective — we need to be incentivizing distributed generation/solar or small wind systems that meet members' needs *and* have a system benefit. The problem with our current policy is that it incentivizes individuals to focus on the retail rate payment.

**Distributed generation challenges/size-to-load.** We are starting to see several 39.9 kw systems, many of which are localized in a particular area, and we already see the impacts of all 39.9 kw systems feeding into a substation. The problem is that distributed generation customers rely on substation infrastructure and, since they are reimbursed at retail rates, they no longer pay for it. So we will be forced to upgrade a substation for people who no longer pay into the system — how is that fair? The result is that my fixed-income members pay for the upgrades.

With current net-metering policy, folks who are putting up large systems that aren't sized to their load are focused more on making a profit than on saving the environment. It's a bad policy.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership.** Delivering great programs for our members. There is so much opportunity to serve our members' needs. We offer great programs! I was at a "smart energy" conference recently and the Nest guy said to me, "You guys are doing the innovative stuff we've been talking about for years." Yes, we are! We combined off-peak water heaters with our solar community garden program, and separate from that, we also offer a water heater program that uses off-peak energy. We also have a utility controlled dual-fuel heating program, interruptible load programs, and all sorts of other offerings.

**Innovation/distributed generation.** We are developing distributed generation. We are not going backward. I want to be a part of delivering distributed generation and energy efficiency to our members because *they* want it. I have the most distributed generation on a percentage basis (.34% of retail sales) of any cooperative in Minnesota. Clearly my members want it — and if they want it, I want it — even though they both reduce a part of our revenue structure.

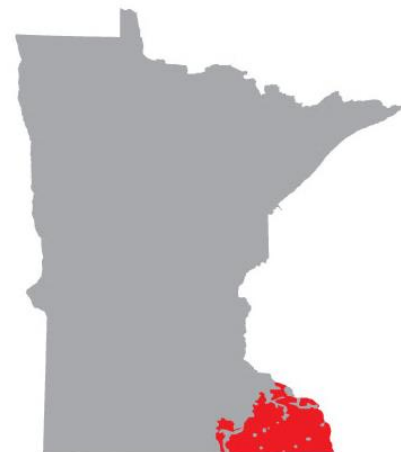
The solution is in the rate structure itself, to cover the cost of maintaining reliable energy. So we will need to restructure rates and receive reimbursement through either the energy, capacity, or monthly charge. It's really simple. Steele-Waseca understands that there is a huge benefit to distributed generation, especially regarding outages and cyber-security issues.

## Tri-County Electric Cooperative

On August 26, 2016, CEE traveled to Rushford, Minnesota, to speak with Tri-County Electric Cooperative. We met with President and Chief Executive Officer Brian Krambeer, Vice President of Marketing and External Relations Ted Kjos, and Dairyland Power Electric Cooperative Director of Government Affairs for Kenric Scheevel.

### Fast facts

- Based in Rushford, Minnesota
- Serves southeastern Minnesota and parts of Iowa
- 15,000 members
- Currently merging with Hawkeye Cooperative in Iowa; combined utility will have 22,000 members
- 97% residential and 3% commercial and industrial
- Flat electric sales
- 100% smart meters
- 61 DG solar/wind systems
- Solar community garden on site
- Dairyland Power Electric Cooperative member
- Programs/innovative services
  - Renewable Rays Community Solar Garden
  - Evergreen renewable energy
  - Straightforward DG interconnection information/webpage
  - My Meter energy portal/energy tracker
  - CIP rebates
  - Smart meters
  - Special rates
  - Dual fuel
  - Electric thermal storage maintenance
  - Air source and ground source heat pump rebates
  - Water heater load management program
  - Security and medical alert systems



### Interview questions and answers

#### **What are your key challenges? What keeps you up at night?**

**Rates/reliability/no load growth.** The current rate structure is very concerning because Tri-County has not had any electric sales growth since the 2008 recession. This makes paying for aging infrastructure difficult. There are simply no new kilowatt hours to spread out increased costs so rates must increase. Additionally, we are losing rural residential members. Since 2008, the cooperative has seen a reduction of about 5% in residential members.

**Membership/fairness.** We spend a tremendous amount of time balancing what our members want with pricing and reliability. We conduct extensive member surveys and interviews to better understand members' wants and needs. And if we get our outreach wrong or are not inclusive, we hear about it immediately.

**Energy policy.** We worry a lot about "revolution" in the energy world. We are evolving and doing so quite quickly. We view this evolution as good for our cooperative and good for our members. But some energy advocates are pushing "revolution" and this worries us a lot. For

one, this creates a lot of turbulence in our community, and turbulence means people are less accepting. We think that having an evolutionary mindset towards energy technology is going to create a lot more acceptance in the long run.

**Social compact.** We want environmentalists to know all the good things we are doing and that our current power plants were built in the 1970s when they were required to be built with coal. I don't think people appreciated that. We didn't have a choice and now we still need to pay them off. One thing about a cooperative utility is that at the end of the day it's about the "social compact." A social compact was set up in the 1970s with our members to build and operate these facilities, at least until they are paid off. We have no load growth and the wholesale power costs attributed to these power plants is 70% of our budget. So in this context a 50% renewable energy standard will hurt us, and it is energy we do not need.

**Workforce.** We are very concerned about workforce issues. It is hard to get people to move to rural communities with the necessary technical and technology skills, and we need to keep our benefits and pay attractive. The system is evolving and fast, and we must compete. This is hard to do. Our wholesale power provider (Dairyland Power Electric Cooperative) is staring at this issue in a huge way right now with 50% of their senior staff over 55 years old.

**Cyber-security.** We are very concerned about cyber-security issues. We just hired a dedicated IT person. We've seen people already poking around on our system but they haven't been able to do anything. It's a big concern for us and we are addressing it.

**Distributed generation challenges/size-to-load.** The net-metering policy does not work. Here's the problem: we are seeing several systems right under the 40 kw net-metering threshold. These systems are not sized to the load they are serving and were placed on the system purely to make money. Because we pay these members the retail rate, these systems make money on the backs of all the other members. However, we are not opposed to distributed generation. Our members want it and we want to help them get it. It just needs be fair to all members. Net-metering gets in the way of the benefits that distributed generation systems can bring to the system. The policy gets in the way of us working with our members because it incentivizes the retail rate and nothing else. We could be using these systems to help shave peak load and provide other benefits that all members could share, if we worked together.

**What exciting projects is your cooperative working on? What wakes you up in the morning?**

**Membership.** We are excited to serve our members and make sure they have affordable electricity so they can be successful. It is about our community. This is why we work at a cooperative.

**Evolving electric system.** There are huge opportunities that we see every day serving our members. We are actively working on micro-grid and smart grid issues. We need to understand how we are going to operate on our system in this new fast-paced and evolving world. We are looking at all sorts of new stuff, studying it, and trying to figure out how it all works. No day is the same. We see a future in electric vehicles, battery storage, distributed generation, and advanced metering, and we are embracing it 100%. All of our 22,000 combined members (with Hawkeye Cooperative in Iowa) are on smart meters. There has never been a more exciting time

in this industry. We are figuring out the capabilities of smart meters and the distributed generation systems we currently have online. By 2018 we will be able to do some really cool stuff and we want to work with folks to do it together.

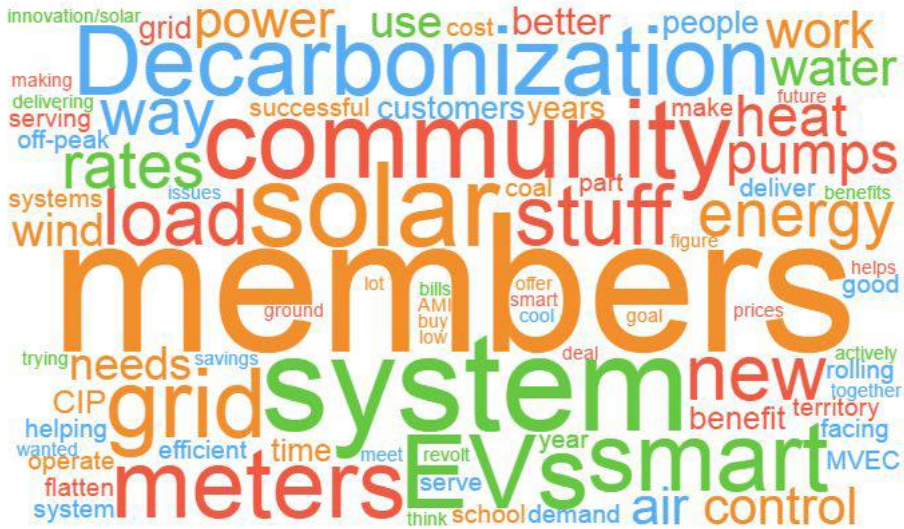
**Innovation/evolving electric system.** We are leading the way on innovation. We have adopted smart meters for all our members. We spend four times the Conservation Improvement Program (CIP) requirement to keep our members happy. We hit our budget every year and exceed our goals. And we are bringing more renewables online. Dairyland is about to buy 150 MW of new wind. And because it is extremely inexpensive, we will buy more of it when we need it.

Summary Word Clouds

What are your key challenges? What keeps you up at night?



What exciting projects is your cooperative working on? What wakes you up in the morning?



These word clouds were completed from raw interview notes based on the two key big questions we asked: what are your key challenges and what exciting stuff are you working on? They aggregate words from our interview notes based on their frequency of use, creating a new context that shows the challenges and opportunities for Minnesota's cooperative utilities.

It is not a coincidence that the number one word in both clouds is "member," as member-owners are key to cooperative electric utilities. All the co-op leaders we spoke with used the term "member" as opposed to "customer" when referring to the individuals and businesses they serve. Member implies ownership and an ongoing relationship, whereas customer can be turned away or not "cooperated" with. Cooperatives must listen to their members, and members ultimately call the shots. Eighty years ago, members drove cooperatives to undertake one of the most complicated infrastructure buildouts in history with the electrification of rural America. Today, these members demand least-cost, reliable electricity, as well as clean energy, energy efficiency services, and more control over their utility bills — these word clouds reflect just that.



## Minnesota municipal utility white paper

Minnesota has over 120 municipal utilities ranging in size from 50 to approximately 9,000 meters. We will soon be interviewing municipal utilities to better understand the issues they face and how they are dealing with the changing electric system. We will release a white paper later this year.