



**GREAT
RIVER
ENERGY™**

Grid modernization initiative

12300 Elm Creek Boulevard • Maple Grove, Minnesota 55369-4718 • 763-445-5000 • greatriverenergy.com

Background

Interest in new power generation sources, energy efficiency, distributed energy resources and a constant stream of new technologies that make life easier continue to reshape the electric utility industry. As costs for residential and utility-scale solar energy, wind energy, energy storage, LED lights and other technologies steadily decrease, the industry continues to move from the centralized power system of yesterday to a system where energy resources are more distributed and intermittent. Consumers accustomed to using smart devices to easily interact with people and service providers in every area of their lives now want options and the same ease of interaction from their electric cooperative. Electric cooperatives are working with stakeholders around the country to bring the electric grid to a place where it can meet members' needs, take advantage of advanced technologies and meet public policy goals such as those related to renewable energy and energy efficiency.

Our position

Great River Energy and its member-owner cooperatives are excited about the opportunities our changing industry provides. We continue to find innovative solutions and lead the pursuit of technologies and resources that will allow us to better use the grid and serve our member cooperatives in new ways. While the rapid pace of change poses challenges, they are challenges Great River Energy and its member cooperatives are well positioned to meet – we have been laying the groundwork for years. In our future, we see a transformed energy system that we helped shape, and it is cleaner, more resilient and more reliable than it ever has been before.

Shaping our future together

Our cooperative business model enables us to work in the best interest of our member cooperatives. Together, Great River Energy and its member cooperatives are transforming our electric system and developing a shared vision of the future through an effort we call our grid modernization initiative. Our unique grid modernization initiative has been recognized around the country by thought leaders and other cooperatives as a powerful method for finding the best path forward.

Technology advancements

Great River Energy and its member cooperatives are well into updating critical systems and implementing new technologies for metering, telecommunications, demand response management, advanced distribution management and meter data management. The two-way flow of information and data enabled by these technologies can allow members to do things that are otherwise not possible, such as monitor their energy bill daily, or sell excess power into the electric system from solar panels on their home. To prevent obsolescence in the grid's infrastructure, now is the time to invest in systems that offer advanced capabilities that will make our electric grid more agile and responsive, and create more options for serving member-consumers in new ways.

Leadership and innovation

For years Great River Energy and its member cooperatives have been driving major industry initiatives, demonstrating new technologies and educating stakeholders through pilot projects. A few examples:

Solar pilot projects: In 2014 and 2015, Great River Energy launched a significant pilot project, installing 20-kilowatt solar installations at its headquarters and at 19 member cooperative sites to evaluate solar energy's performance, maintenance requirements and impact on the grid. Several Great River Energy member cooperatives have installed community solar gardens for their member-consumers.

Electric vehicle program: Recognizing growing momentum for the electrification of Minnesota's economy, Great River Energy and its member cooperatives developed Revolt™, a program that offers renewable energy credits for the expected life of an electric vehicle at no additional cost. Several of our member cooperatives offer special EV rates and rebates for the installation of special chargers.

Community Storage Initiative: Great River Energy was a founding member of the Community Storage Initiative, a group of utility sector businesses and nonprofit organizations focused on wide-scale implementation of energy storage technologies. Great River Energy and its member cooperatives have long offered community storage programs, such as our electric thermal storage water heating program.

Demand response management system: Great River Energy and its member cooperatives can reduce demand for electricity during periods of higher market prices by strategically suspending service to certain loads, helping minimize electricity purchases during the most expensive periods. Great River Energy replaced its outdated demand response management system with a more advanced version, which allows for fine-tuning of demand response to meet our member cooperatives' needs.

Meter data management pilot projects: Great River Energy and two member cooperatives conducted a meter data management pilot project that uncovered a wide variety of business applications, including monitoring line losses, monitoring transformer losses, identifying power theft and analyzing energy data.

Data analytics pilot projects: Great River Energy and its member cooperatives have researched and tested new data analytics capabilities to identify distribution line losses, assess cycled air conditioning programs and enable timelier financial ratio comparisons.

CapX2020: Great River Energy was a founder and leader of CapX2020, the largest electric grid expansion in the Upper Midwest in decades. CapX2020 improved the reliability of the region's grid, opened new pathways for renewable energy and developed a collaborative business model that others can emulate. Now under a new name, Grid North Partners, the utilities are studying the transmission needs of the year 2050 and the integration of more carbon-free generation on the transmission system.

Conservation voltage reduction pilot projects: Great River Energy and its member cooperatives have tested uses for conservation voltage reduction to decrease energy use, lessen peak loads and reduce demand charges while continuing to serve their member-consumers within established voltage parameters.

Irrigation pilot project: Great River Energy is using advanced metering infrastructure data and its demand response management system to learn how much electric load can be controlled during spring and fall and how much controlling irrigation contributes to load management efforts separate from other load control programs.

Grid security and compliance: Great River Energy works with utilities, government agencies and others to address the rising risk of cyber attacks. We participate in industry organizations and work with the North American Electric Reliability Corporation and the U.S. Department of Energy to ensure compliance with reliability standards and preparedness against natural disasters, vandalism and other threats.