


# RELIABLE, RESPONSIVE ENERGY DELIVERY

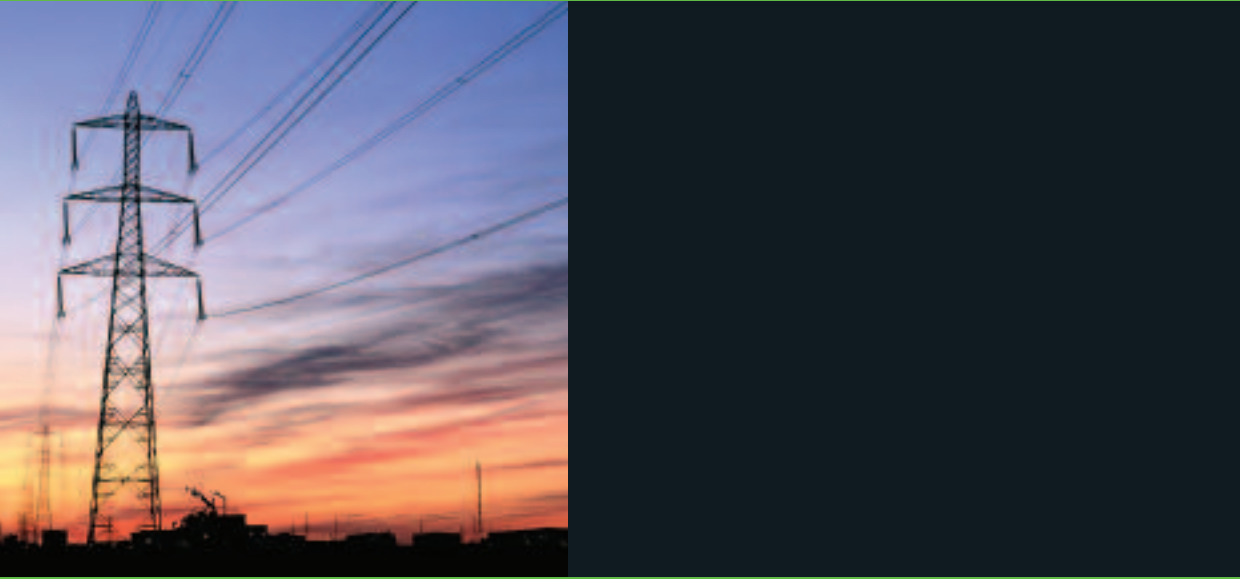
*Our transmission system*



**GREAT RIVER  
ENERGY**<sup>®</sup>

A Touchstone Energy<sup>®</sup> Cooperative 

# A delivery system that's both reliable and responsive



Every time you plug in your toaster, television or other electrical device, you're tapping into the electrical grid—or, more specifically, into the network of distribution power lines owned by your local electric co-op. Your co-op gets its power by plugging into Great River Energy's transmission system, a network of high-voltage lines that connect generation facilities, such as power plants and wind farms, to your co-op's distribution network.

It takes a broad network of transmission lines, including more than 4,500 miles owned by Great River Energy, to deliver electricity from generation facilities to our 28 member cooperatives, and providing that electricity is a unique process. Power can't be boxed and shipped to customers, nor can it be easily stored. It must be delivered instantly at the precise moment a customer needs it.

In order to carry out its mission as a dependable wholesale energy provider, it's vital that Great River Energy has an effective and efficient way to transport energy to our customer-owners. Electricity is carried from generation facilities to substations using our own transmission facilities and those of other utilities, with whom Great River Energy has long-standing agreements. Along with those utilities, Great River Energy jointly plans, builds, operates and maintains transmission facilities to ensure that the most efficient and cost-effective lines are available to provide reliable service at a reasonable rate for members.



**GREAT RIVER  
ENERGY**<sup>®</sup>  
A Touchstone Energy<sup>®</sup> Cooperative 

# Staying connected to our members

Extensive work and planning goes into the construction and maintenance of the transmission system to ensure members have reliable power at affordable rates for their homes and businesses. In close coordination with its 28 member co-ops, Great River Energy engineers carry out short- and long-term assessments to ensure the transmission system will serve members' needs for years to come. Engineers then design the most efficient and reliable new facilities to meet future needs. The Great River Energy transmission system undergoes regular upgrades to make sure energy is transmitted efficiently and remains affordable.



Electricity begins its journey at generation facilities before it is transported over long distances via high-voltage transmission lines. It enters each co-op's distribution area at an efficient voltage that will reliably serve its customers' needs. Voltages are then stepped down at the distribution substations located throughout the Great River Energy service area.



After electricity reaches distribution substations, the distribution lines carry reduced, but sufficient, voltages to the homes, farms and businesses of co-op customers.



Reliability is a critical feature of the transmission grid. To deliver dependable service, technicians, equipment and maintenance materials are strategically located at service centers throughout the Great River Energy service territory. Crews at these locations are able to respond swiftly to outages, and continually monitor and enhance the system.

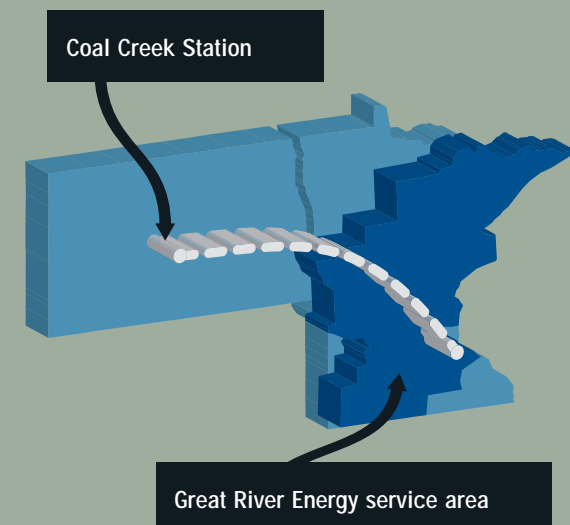


By maintaining an efficient network of transmission lines over long distances, Great River Energy can continue to offer reliable service at affordable rates to our members.

## HVDC: the electricity superhighway

Nearly all transmission lines transport alternating current (AC) electricity, which is the same type of current that goes into your home. However, a unique feature of Great River Energy's transmission system is a high-voltage direct current (HVDC) line.

To transport electricity from Great River Energy's largest generation facility, Coal Creek Station in Underwood, N.D., designers determined that it would be more efficient and reliable to transmit energy over a HVDC transmission line, then convert it to AC for transmission within Minnesota. Great River Energy's HVDC transmission system has reliably delivered electrical power to rural and suburban areas of Minnesota since it was energized in 1978.



## Keeping the energy flowing



Operators in the Great River Energy control center in Elk River, Minn., remotely control the transmission system using a highly reliable communications network. The control room performs critical functions needed to ensure smooth daily operations and facilitate responses during storms and heavy load situations.

Great River Energy's operators are in continuous contact with operators at power plants, converter stations and other utilities throughout the region. Through their coordinated efforts, our operators make sure energy reaches all members and that the transmission system works as effectively as possible.

## Making sure the power goes where it's needed

Great River Energy is a member of the Midwest Independent Transmission System Operator (MISO), an independent, nonprofit organization that supports the constant availability of electricity in 15 U.S. states and Manitoba, Canada.

MISO oversees more than 94,000 miles of interconnected high-voltage power lines and ensures the reliable

transmission of more than 100,000 megawatts of energy in the Midwest, including to Great River Energy's 28 member co-ops.

MISO also administers one of the world's largest energy markets, which Great River Energy can access to provide the most economical and reliable energy to our members.

## CapX2020: delivering electricity you can rely on

To keep up with the long-term electric growth in the Great River Energy service area and in the region, an expansion of the regional high-voltage grid is necessary. CapX2020 is the first wide-area upgrade of Minnesota's electric transmission infrastructure in more than 25 years and will ensure continued reliable service into the future.

Planning studies show that customer demand for electricity will increase by 4,000 to 6,000 megawatts by 2020—more than the present system has the capacity to deliver. New transmission lines proposed by CapX2020 will be built in phases designed to meet this growth, as well as to tap into vast wind energy resources in Minnesota and the Dakotas.



The first group of CapX2020 projects is made up of four proposed transmission lines:

- A 230-mile, 345-kilovolt (kV) line between the Brookings, S.D., area and the southeast Twin Cities.
- A 250-mile, 345-kV line between Fargo, N.D., and Monticello, Minn.
- A 150-mile, 345-kV line between the southeast Twin Cities and Rochester, Minn., continuing to La Crosse, Wis.
- A 68-mile, 230-kV line between Bemidji and Grand Rapids in north central Minnesota.

Great River Energy is one of 11 utilities proposing the CapX2020 transmission upgrade.



**GREAT RIVER  
ENERGY®**

A Touchstone Energy® Cooperative 

12300 Elm Creek Boulevard  
Maple Grove, MN 55369

[www.GreatRiverEnergy.com](http://www.GreatRiverEnergy.com)



*Printed on recycled paper  
with soy-based ink*