

February 2024

## THE WHEAT BELT CONNECTION

# Beginner's Guide

## The Electric Grid

By: Maura Giles



Electricity plays an essential role in everyday life. It powers our homes, offices, hospitals and schools. We depend on it to keep us warm in the winter (and cool in the summer), charge our phones and binge our favorite TV

shows. If the power goes out, even briefly, our lives can be disrupted.

The system that delivers your electricity is often described as the most complex machine in the world, and it's known as the electric grid.

What makes it so complex? We all use different amounts of electricity throughout the day, so the supply and demand for electricity is constantly changing. For example, we typically use more electricity in the mornings when we're starting our day, and in the evenings when we're cooking dinner and using appliances. Severe weather and other factors also impact how much electricity we need.

The challenge for electric providers is to plan for, produce and purchase enough electricity so it's available exactly when we need it. Too much or too little electricity in one place can cause problems. So, to make sure the whole system stays balanced, the electric grid must adjust in real time to changes and unforeseen events.

At its core, the electric grid is a network of power lines, transformers, substations and other infrastructure that span the entire country. But it's not just a singular system. It's

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Editor - Kelli Chaon

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# Reliable Power For Today.....and Tomorrow



**LACEY GULBRANSON**  
General Manager/CEO

Ring in a new year sparks a sense of renewed hope and optimism about the future. As the general manager of Wheat Belt Public Power District, for me, it's a time to reflect on where we are and where we're going. At the heart of this reflection, I think about ways we can better serve you, our customers.

Our team at Wheat Belt PPD is always looking ahead, exploring ways to innovate and utilize new technologies to improve our services. As our nation increasingly relies on electricity to power the economy, keeping the lights on has never been more important. We're committed to delivering electricity safely, reliably, and efficiently.

So how are we working to ensure reliable and affordable power while adapting to a changing energy landscape and our community's evolving needs?

One critical component of reliable power is the mix of energy resources used to generate the electricity that keeps the lights on across our service territory. You may not realize it, but Wheat Belt PPD doesn't generate electricity. Instead, we purchase it from our energy provider, Tri-State Generation and Transmission and from there, we distribute it to homes

and businesses throughout our communities. Our energy resource mix is made up of 45% coal, 34% renewable and 7% natural gas/oil and 14% contracts (generation purchased from various other third-party sources).

We're increasingly using more electricity generated from renewable energy sources, but we still depend on a diverse energy mix to ensure reliable power that's available to our members whenever they need it.

In addition to managing a reliable energy mix, Wheat Belt PPD is using technology to enhance our local grid, limit service disruptions and improve outage response times.

Advanced metering technology, also known as AMI, enables two-way communication between the district and consumer's meter. In the event of a power outage, AMI helps pinpoint the exact location of the outage and can even analyze damaged or tampered meters. AMI helps Wheat Belt PPD save money with real-time data, and ultimately improves power reliability for our entire community.

Proactive tree trimming is another way we limit service disruptions. Scheduled trimming keeps power lines clear from overgrown limbs that are likely to fall. As technological advancements become more accessible, we anticipate using advanced mapping and line patrol analytics to better maintain the environment while providing more reliable service.

One of the best methods for improving our services to you is monitoring trends and leading practices from other rural electric organizations in Nebraska and across the country. Learning from other public power districts and co-ops is one of the many benefits of the cooperative business model because for us, it's about cooperation, not competition. As we turn our focus to 2024, Wheat Belt PPD will continue working to provide the reliable, affordable electricity you expect and deserve—for today and tomorrow.

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divided into three major interconnected grids: the Eastern Interconnection, the Western Interconnection and the Electric Reliability Council of Texas. These grids operate independently but are linked to allow electricity to be transferred between regions when backup support is required.

Within the three regions, seven balancing authorities known as independent system operators (ISOs) or regional transmission organizations (RTOs) monitor the grid, signaling to power plants when more electricity is needed to maintain a balanced electrical flow. ISOs and RTOs are like traffic controllers for electricity.

### **The journey of electricity begins at power plants.**

Power plants can be thought of as factories that make electricity using various energy sources, like natural gas, solar, wind and nuclear energy. Across the U.S., more than 11,000 power plants deliver electricity to the grid.

Wheat Belt Public Power receives power from our generation and transmission (G&T) co-op, Tri-State Generation and Transmission. We work closely with Tri-State to provide electricity at the lowest cost possible. Being part of a G&T benefits customers like you by placing ownership and control in the hands of your public power district, prioritizing affordability and reliability, supporting local economic development and fostering a sense of community.

### **To get the electricity from power plants to you, we need a transportation system.**

High-voltage transmission lines act as the highways for electricity, transporting power over long distances. These lines are supported by massive towers and travel through vast landscapes, connecting power plants to electric substations.

Substations are like pit stops along the highway, where the voltage of electricity is adjusted. They play a crucial role in managing power flow and ensuring that electricity is safe for use in homes and businesses.

Once the electricity is reduced to the proper voltage, it travels through distribution power lines, like the ones you typically see on the side of the road. Distribution lines carry electricity from substations to homes, schools and businesses. Distribution transformers, which look like metal buckets on the tops of power poles or large green boxes on the ground, further reduce the voltage to levels suitable for household appliances and electronic devices.

After traveling through transformers, electricity reaches you—to power everyday life.

We're proud to be your local, trusted energy provider. From the time it's created to the time it's used, electricity travels great distances to be available at the flip of a switch. That's what makes the electric grid our nation's most complex machine—and one of our nation's greatest achievements.

## **HOW ELECTRICITY GETS TO YOU**



### **step 1**

#### **Generation**

Electricity is generated from various sources.



### **step 2**

#### **Step-Up Transformer**

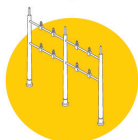
Voltage is increased to push the electricity over long distances.



### **step 3**

#### **Transmission Power Lines**

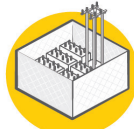
Lines carry electricity over long distances.



### **step 4**

#### **Transmission Substation**

Voltage is lowered so electricity can travel across the local system.



### **step 5**

#### **Distribution Substation**

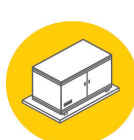
Voltage is lowered further for safe distribution.



### **step 6**

#### **Distribution Power Lines**

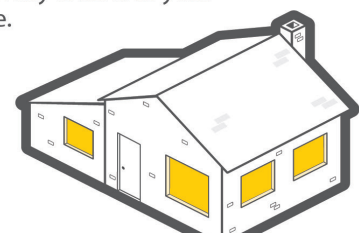
Electricity travels across these lines in your community.



### **step 7**

#### **Final Stop**

A transformer reduces voltage a final time, and electricity is sent to your home.



## ENERGY EFFICIENCY TIP OF THE MONTH

Area rugs are an easy, cost-effective solution to cold floors. Adding area rugs to hard-surface flooring can add warmth to any room and keep your feet cozy on cold winter days.

Choose rugs made from wool or other natural fibers and plush or high-pile textures for the most insulation. Place rugs in areas where you need additional warmth, like the foot of a bed or under a coffee table. Area rugs can enhance the aesthetic of your home and keep you cozier.



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## Our Mission

Deliver electricity safely, reliably and efficiently.