



Residential electric service

Reliability and power quality at CenterPoint Energy





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Our business is reliability

At CenterPoint Energy, we understand that our customers demand both reliable and high-quality electric service. Dependable electricity is essential to the comfort and safety of our residential customers. As a result, CenterPoint Energy strives to make reliable power delivery a top priority.

Signs of a possible reliability or power quality issue

Are you experiencing problems with your home's appliances or equipment, or have you noticed any of these occurrences?

- Upon coming home, you see your digital clocks flashing.
- The ground-fault circuit – interrupter (GFCI) receptacle keeps tripping for no apparent reason.
- You have experienced frequent failures of electronic equipment, which you suspect to be caused by “power surges.”
- Light bulbs, including LEDs in your home, require replacement more often than what you consider normal.
- Every time your air conditioner turns on, the lights flicker.

Events like these are possibly the result of either reliability or power quality related issues. These concerns may be caused by conditions originating from the utility system, from within your home, or even from the affected equipment itself.

In order to determine the most appropriate solutions to your reliability and power quality problems, it's important to understand how electricity is delivered from the utility system to your home.

How CenterPoint Energy delivers electricity

CenterPoint Energy delivers electricity to over 2.4 million customers across a 5,000 square mile service area which requires an extensive network of transmission and distribution facilities. How extensive? CenterPoint Energy's 28,702 miles of overhead distribution poles and wires is enough to completely circle the earth. Add to that almost 24,000 miles of underground distribution lines and over 3,700 miles of transmission lines.

The electricity delivered to your home travels through the following process as illustrated in Figure 1:

1. Electricity is generated at a centralized plant. (CenterPoint Energy does not generate electricity.)
2. Electricity travels over long distances via high voltage transmission lines.
3. From the transmission system, electricity travels to distribution substations.
4. From these substations, distribution lines, operating at a lower voltage, deliver electricity throughout cities and neighborhoods.
5. Electricity then travels from the distribution lines through a service transformer located close to your home and finally to your meter at the proper voltage for your lights and appliances.

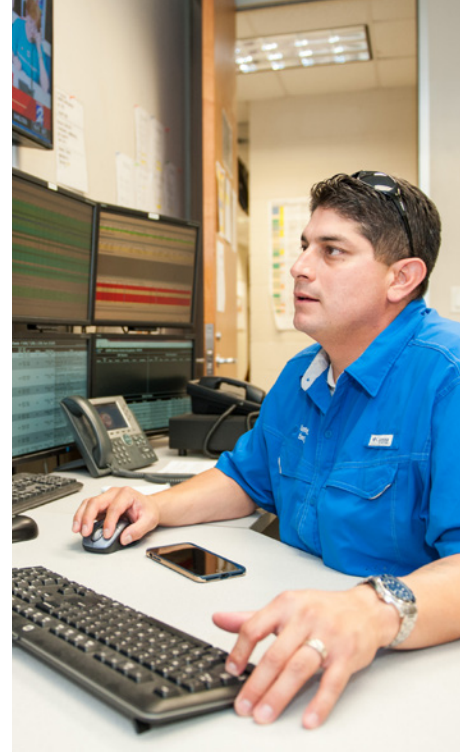
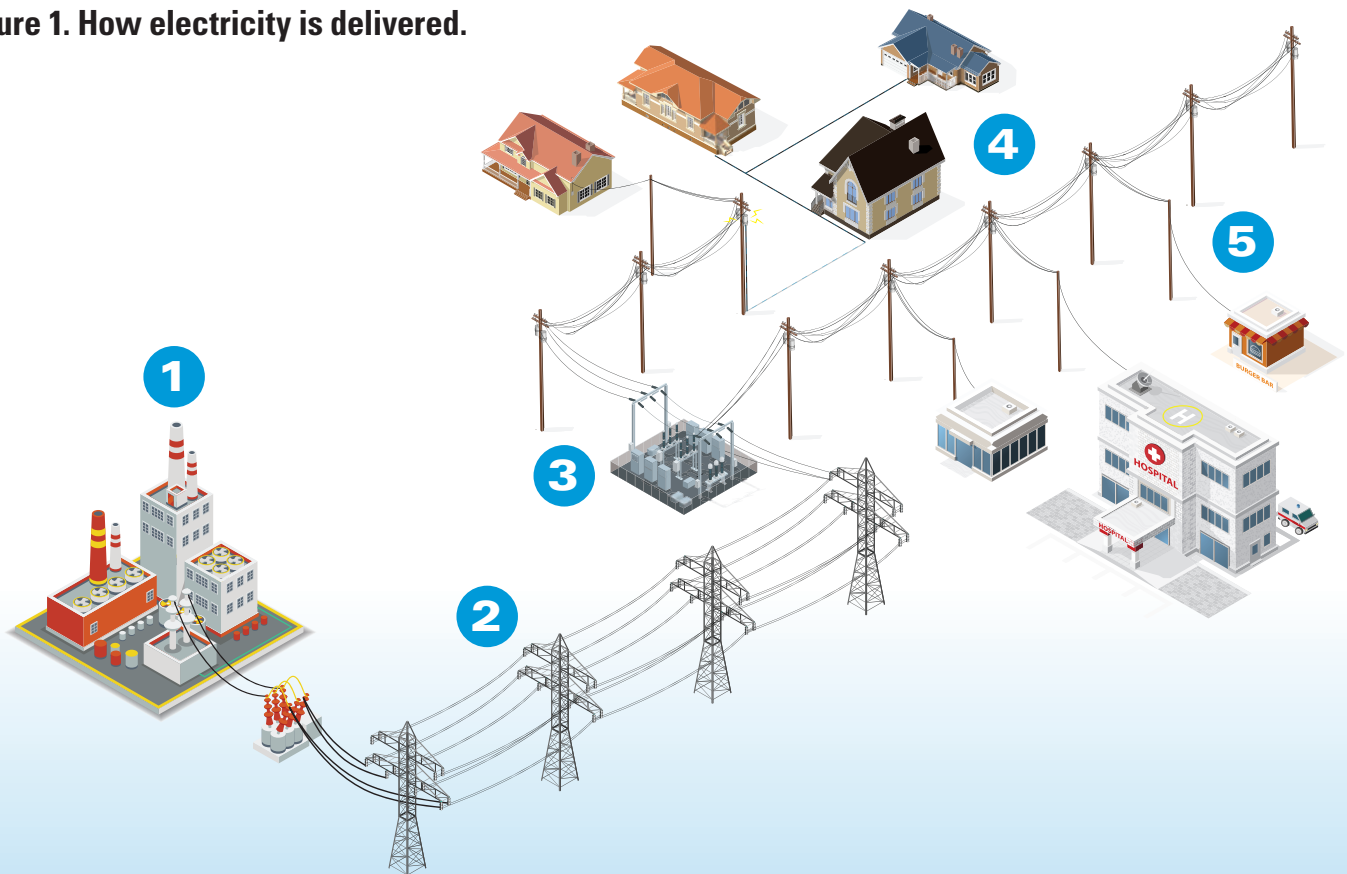
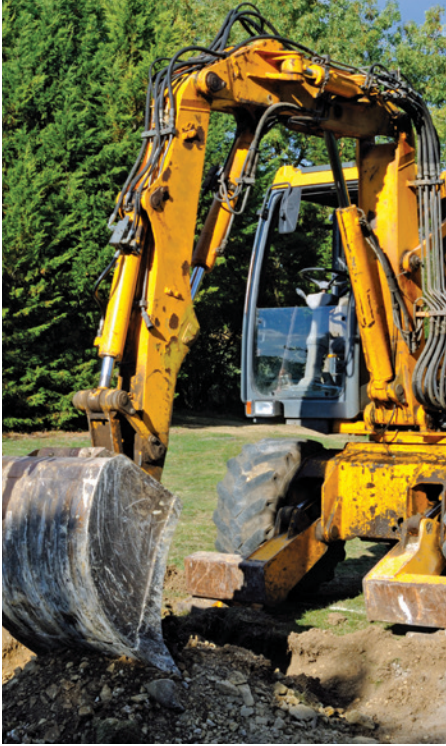


Figure 1. How electricity is delivered.

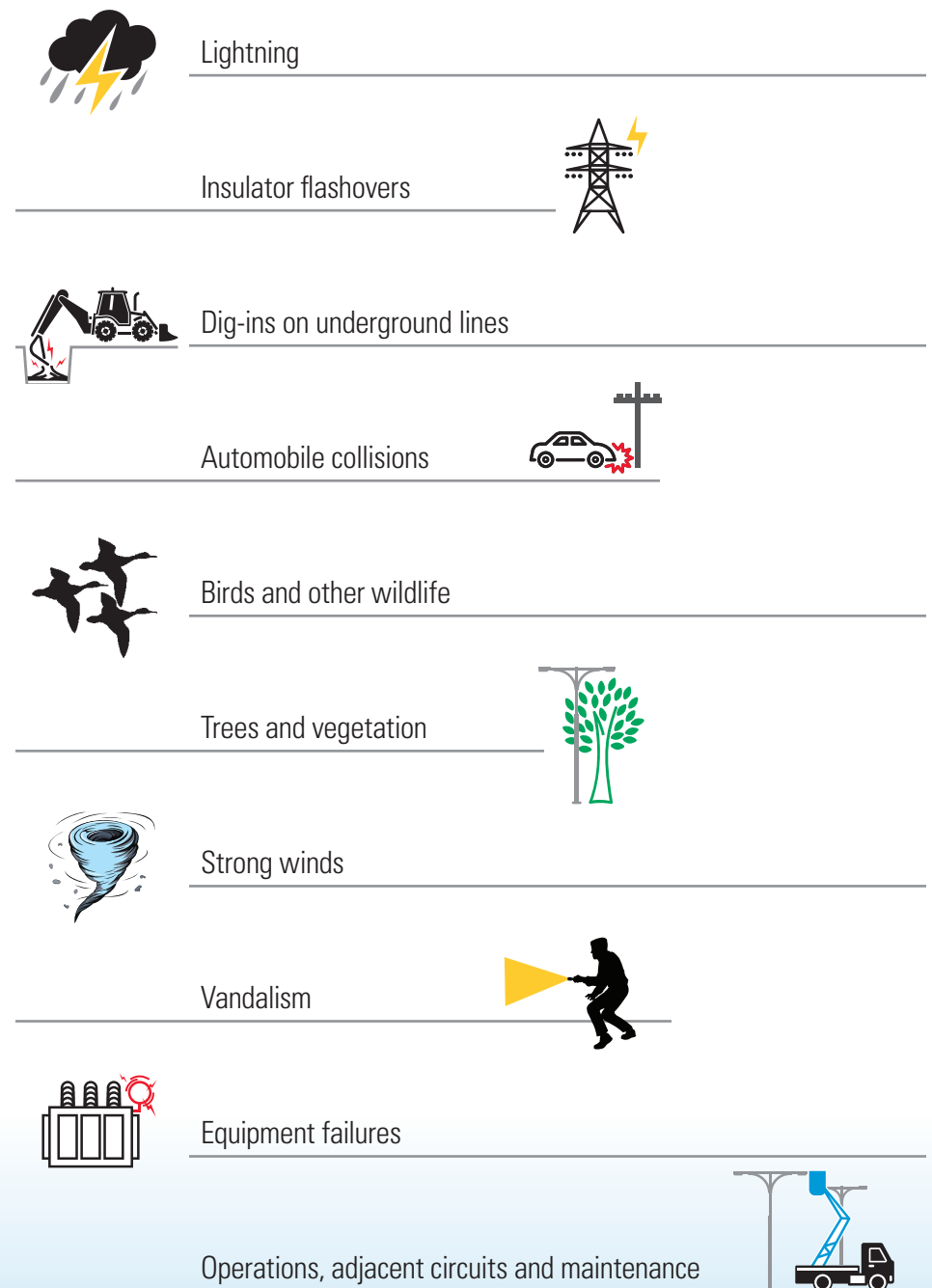




What causes reliability issues?

Most power outages and disturbances can be attributed to factors often beyond the control of the utility. CenterPoint Energy's electric distribution system is exposed to weather and other environmental influences, as well as normal equipment wear and tear, all of which can create both power quality and reliability disturbances. Common sources of disturbances include the following as illustrated in Figure 2:

Figure 2. Common sources of disturbances



Understanding how reliability is measured

CenterPoint Energy maintains statistics of interruption frequencies and durations for each distribution circuit and for the electric system as a whole. While there is some variation from year to year, the average figures that customers may experience are as follows:

Duration of sustained interruptions = 126 minutes per year
Number of sustained interruptions = 2 per year

CenterPoint Energy also maintains statistics of momentary interruptions frequencies for each distribution circuit and for the system as a whole. While there is some variation from year to year, the average figure that customers may experience is as follows:

Number of momentary interruptions = 9 per year

Besides momentary interruptions, instantaneous voltage sags are the most common type of utility-related power quality event that adversely affects our customers. While CenterPoint Energy does not keep statistics on voltage sags, it did participate in a national power quality survey that accurately reflects what typical customers can experience:

Number of sags below 90% of nominal voltage = 70 per year

Of these 70 sags, 23 will dip below 70% of nominal voltage, which is generally considered the threshold for causing motors and other sensitive equipment to drop off-line. The duration of these voltage sags varies however customers may see sags lasting between 16- 54 milliseconds.

Customers may experience over-voltages, also known as voltage swells, as a result of lightning strikes on nearby facilities. The magnitude of these voltage swells will vary based off the intensity of the lightning strike. The frequency of these swells is dependent upon weather activity.





What is CenterPoint Energy's responsibility regarding reliability and power quality?

As a regulated utility, CenterPoint Energy's role and responsibilities for service delivery can be found in its approved Tariff for Electric Service on file with the Texas Public Utility Commission. CenterPoint Energy must make reasonable provisions to ensure a steady and continuous delivery of electricity within defined service voltage and harmonic levels. CenterPoint Energy is also responsible for restoring power as quickly as possible in the event of a service interruption. However, given the impacts of weather and other factors on distribution facilities, there is no guarantee against the possibility of voltage fluctuations or service interruptions.

What are the customer's responsibilities?

Per CenterPoint Energy's Tariff, it's the responsibility of customers with concerns about sensitive equipment in their homes that could be affected by power quality issues to install protective equipment in their homes. Protective equipment to enhance electric service is readily available in the power quality market. Examples of these devices are as follows:

- **Uninterruptible Power Supply (UPS):** Provides backup power when the primary source is not available. It also provides protection from power surges.
- **Surge protector:** Provides protection against overvoltage, also known as voltage swells.
- **Standby generator:** Provides backup power when the primary source is not available.

CenterPoint Energy recommends customers contact a power quality consultant or electrician to determine the appropriate equipment needed.





How to determine if you have a power quality or reliability issue

Below is a guide to help determine the root cause of your power quality or reliability issue.

- 1. Start a log.** Keep track of the date and time when the issue occurs and a description of what happened. Does the issue occur throughout the entire home, in specific rooms, or just to a particular piece of equipment? Did any protective equipment such as breakers, GFCI, AFCI, or fuses operate? Are any of your neighbors experiencing similar issues?
- 2. Verify equipment is working properly.** If you are having issues with a particular piece of equipment, contact the manufacturer to see if they can identify the problem.
- 3. Contact an electrician.** Schedule an electrician to check the following:
 - Electrical receptacles are wired properly and that the line, neutral and ground conductors have been connected to the proper terminals.
 - Verify equipment is set to function within CenterPoint Energy's 5% maximum and minimum voltage limits. For example, at 120 volts, the minimum voltage is 114 volts and the maximum is 126 volts.
 - Verify earth grounding electrode and connections are clean and tight.
 - Verify there is only one neutral-to-ground bond at the main service panel and that the neutral is not bonded to the grounds at any downstream panels or receptacles. The only exception to this rule is that each separately derived system may have one additional neutral-to-ground bond.
- 4. Contact CenterPoint Energy.** If you have completed the above steps and the problem has still not been resolved, contact CenterPoint Energy. The log sheet you began in step one is now your critical means of communicating the nature of your problems to CenterPoint Energy.

CenterPoint Energy's commitment to improving reliability and power quality

Reliable electricity is critical to the daily life of residents of Houston and the surrounding communities CenterPoint Energy serves. With more than 130 years of energy delivery service, our employees are always there to maintain the reliability and power quality of the electrical delivery system as well as quickly restore power after outages.

As your trusted energy advisor, we're here to help with more information about your electric service in general or to discuss reliability and power quality in more detail.

Please contact customer service at 713-207-2222 or visit CenterPointEnergy.com/OutageCenter.

CenterPoint Energy. Always There.





Always There.®