Department of Energy

INFOGRAPHIC: Understanding the Grid

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UNDERSTANDING THE GRID

How does electricity get from a power plant to your home? The basic functions of your home or business are powered by energy sources that may be hundreds of miles away. Here's how that energy gets from the source to the electrical outlets in your home or office.

GENERATION
Electricity is created at a power plant.

TRANSMISSION
It is then converted to a very high voltage to be transmitted to your neighborhood.

DISTRIBUTION
The electricity is then doled out to homes, businesses and other facilities.

END USE
Electricity is used to power machinery, light homes, prepare food and run transportation.
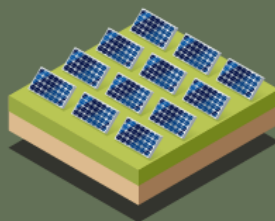
GENERATION

Electricity starts at a generator, which can be powered by burning fossil fuels, collecting wind, solar or water energy, or from nuclear reactions.
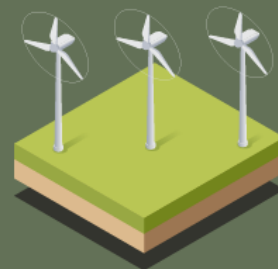
Hydroelectric dams   *Power plants*   *Solar panels*   *Wind turbines*

TRANSMISSION & DISTRIBUTION

After it's generated, the power needs to travel from the power plant to homes, businesses and other facilities. This process is called transmission.
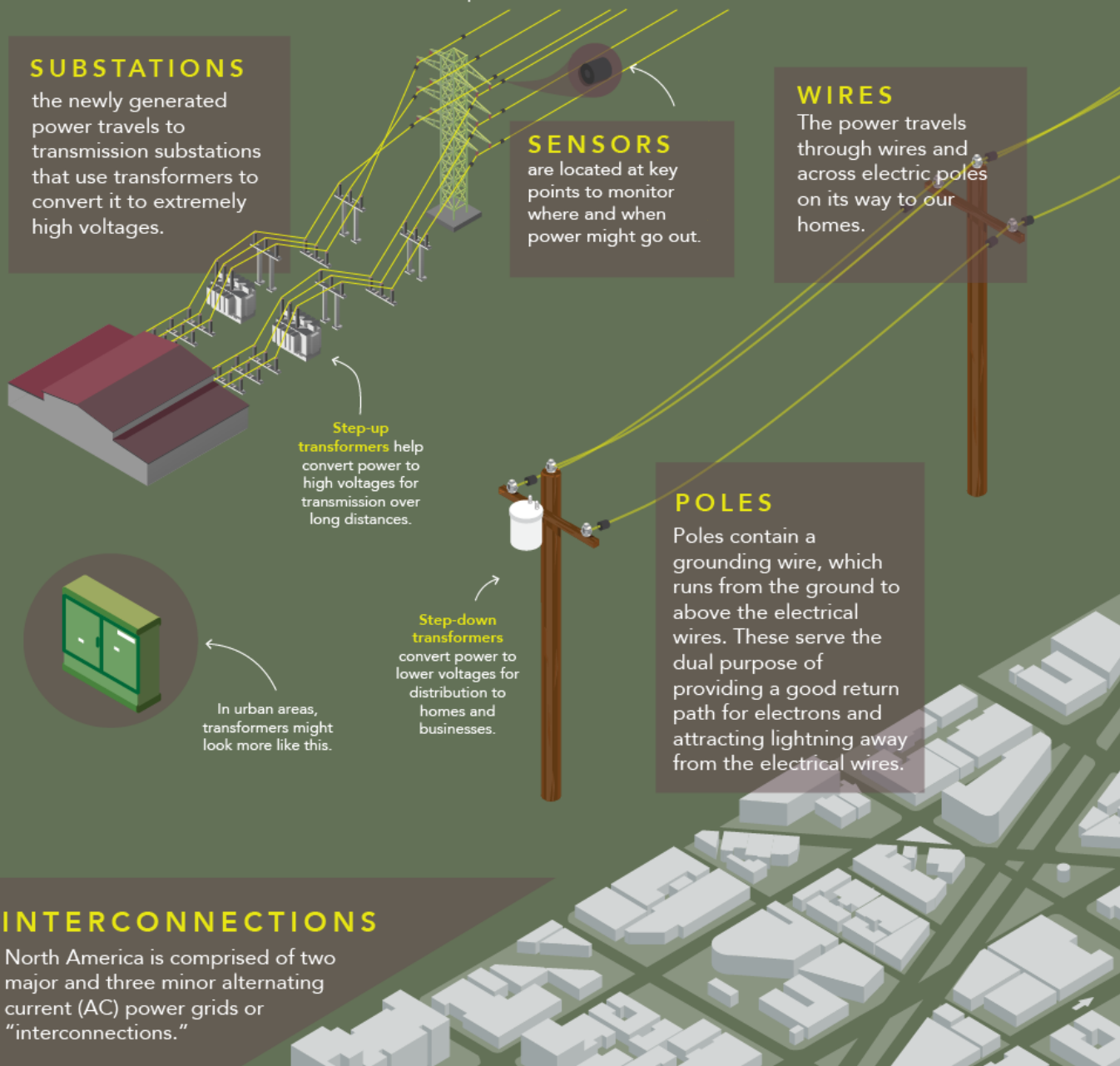
SUBSTATIONS
the newly generated power travels to transmission substations that use transformers to convert it to extremely high voltages.

SENSORS
are located at key points to monitor where and when power might go out.

WIRES
The power travels through wires and across electric poles on its way to our homes.

Step-up transformers help convert power to high voltages for transmission over long distances.

Step-down transformers convert power to lower voltages for distribution to homes and businesses.

In urban areas, transformers might look more like this.

POLES
Poles contain a grounding wire, which runs from the ground to above the electrical wires. These serve the dual purpose of providing a good return path for electrons and attracting lightning away from the electrical wires.
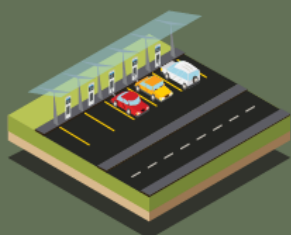
INTERCONNECTIONS
North America is comprised of two major and three minor alternating current (AC) power grids or "interconnections."

END USE

Once distributed, **electricity is used to keep food cold, rooms lit and computers charged.**

**ELECTRIC
VEHICLES**

HOMES

**COMMERCIAL
AREAS**

**INDUSTRIAL
AREAS**

Did you know? In 2012, the average American home used more electricity for space cooling than lighting, refrigeration or heating.

GRID INNOVATIONS

The grid is currently undergoing a major evolution with new technologies enabling shorter power outages, clean energy and energy efficiency options and providing a platform for innovative consumer services and products.

MICROGRIDS

Microgrids help distribute power, but can also disconnect from the larger grid and function as an electrical island in case there's a disruption on the grid.

ENERGY STORAGE

Energy storage technology helps integrate renewable energy into our power grid by managing the electricity supply: storing excess energy and distributing it as needed.

SMART METERS

Smart meters enable two-way communication between consumers and utility companies. This allows utilities to immediately know when your power is out enabling

Our #GridWeek infographic shows how electricity is generated, transmitted and distributed for use in our homes. | Graphic by Sarah Gerrity, Energy Department.

It's #GridWeek on Energy.gov. We're highlighting our efforts to maintain a reliable, resilient and secure electric grid across the country, and what that means for you. We'll be hosting a Twitter chat on How the Grid Works on Thursday November 20 at 2 PM EDT. Send us your questions on Twitter, Facebook and Google+ using #GridWeek.

Ever since Thomas Edison and Nikola Tesla battled it out during the War of the Currents in the late 19th century, electricity has been a central part of life in America. We are constantly connected to the power grid, which keeps our food refrigerated, our homes heated, our computers running and our rooms lit. Power lines, transmission stations and power plants have become a part of the landscape -- to the point that we hardly notice them.

But have you ever really thought about the complex system that generates electricity, carries it across miles of transmission lines and then delivers it to your home?

As you can see in the infographic above, our power grid is a network of power plants, substations, transformers, wires, sensors and poles that carry electricity sometimes

hundreds of miles to be distributed to our homes, schools and offices.

Parts of this network are more than a century old -- 70 percent of the grid's transmission lines and power transformers are over 25 years old, and the average age of power plants is over 30 years old. Today, our electricity needs are more sophisticated and the strain on the grid is higher than ever.

That's why our experts are working to strengthen and update the grid with new technologies that help prevent outages, provide for cybersecurity and enable real-time data sharing, among other innovations.

Our electrical grid has served us well for more than 100 years, and we are working to ensure it continues for many years to come.

How can I participate?
Send us your questions about how the grid works using #GridWeek on Facebook, Twitter and Google+.
Join the #GridWeek Twitter chat on Thursday, November 20 at 2PM EST, when our experts will answer your questions live.

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