



Electrification 101

Building electrification refers to the transition from relying partially on gas combustion to using all electricity to power the appliances in your home. Getting rid of gas furnaces, water heaters, ranges, and other appliances and replacing them with electric alternatives makes buildings safer, more efficient, and more environmentally friendly, especially as more and more renewable power generation is added to the electrical grid.

Gas-powered appliances use either propane from a storage tank or, more commonly, gas from a utility hookup in your street to your home. The gas is ignited and burned directly by the appliance to create heat. This burning releases carbon dioxide, carbon monoxide, and other greenhouse gases.

Electric appliances are powered by electricity, which is generated either at a power plant and delivered through a wire that runs either overhead or underground from the street or from solar panels on your rooftop. After electricity reaches your home's electrical panel, it is dispersed to outlets where appliances can be plugged in. By electrifying appliances that were previously powered by gas, more electricity will likely be going to and through the home. Homes that have older electric panels with limited capacity may need an upgrade to accommodate the increased use of new appliances.

When a home has completely transitioned to using electric power, the gas service can be disconnected by the gas utility company. This is the end goal of building electrification, as it allows us to phase out the fossil-fuel gas system.

Where Does My Electricity Come From?

Electricity can be generated from solar panels, wind turbines, hydroelectric dams, nuclear reactors, fossil fuels, and more. Once generated, these particles travel across transmission power lines, which are like a freeway for electricity. Just like driving on the freeway, electricity particles need to exit in order to access local roads. These "off-ramps" are called substations, which are localized facilities that direct electric particles to specific areas. Next, electricity travels through distribution power lines (surface streets) to the service line to your home (a driveway), and eventually to your electric meter and panel (your door).

Like most electric grids, California's electrical system was built around centralized generation and distribution. That means power is generated at large facilities, often in remote areas, and distributed through transmission and distribution lines to your home. Historically, these generation facilities produced electricity by burning coal or natural gas, or through nuclear generation. In recent years, utilities have brought in more and more large-scale solar and wind farms to reduce pollution and the climate impacts of generating electricity.

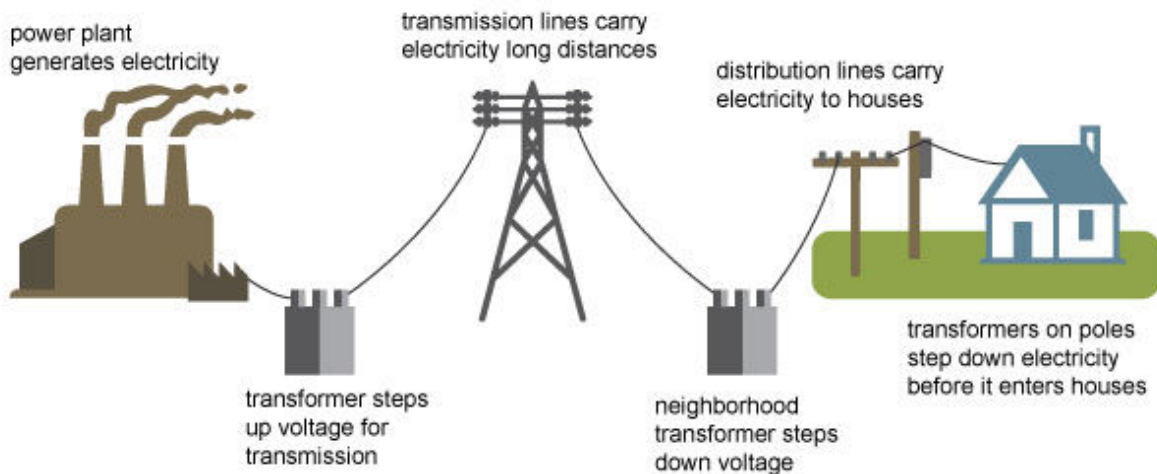


THE SWITCH IS ON

While bringing on more renewables solves some issues with our energy system, we also need to make it safer, easier and more efficient to get electricity where it's needed. Transporting energy through miles and miles of highly charged transmission and distribution lines can lead to wildfire risks and outages. That's why the state is also relying more on a wide variety of interconnected, decentralized sources of energy that generate electricity at or near where it will be used. These distributed energy resources include a variety of technologies, including rooftop solar panels and batteries. These resources generate and use power near the source, but are also connected to the larger electrical grid and supply excess power back to it. Distributed energy resources can even include demand response programs which “generate” energy for the grid by having customers reduce their consumption at key times.

Combining these resources across many households creates “virtual power plants” that can allow utilities to avoid building more dirty generation or large power lines. Being able to draw power from a variety of distributed sources or quickly have customers reduce demand to create a more flexible, resilient, and cleaner system is one of the key benefits of electrification.

Electricity generation, transmission, and distribution



Source: Adapted from National Energy Education Development Project (public domain)

What's In Your Electricity

The sources of electricity that power your home (also known as your energy mix) can vary widely. Historically, electricity mostly came from fossil fuels like coal, gas, and oil, but our current energy mix includes many renewable resources, including solar, wind, and geothermal. California's energy mix also includes nuclear power, hydroelectricity, and biofuels.



THE SWITCH IS ON

While every state has different rules when it comes to who is allowed to generate and deliver power on the electric grid, California lets people buy power from whoever offers it in their service area. However, this power is delivered by the utility company that owns the distribution infrastructure (wires, poles, and conduit) in that area. Most often, people buy their electricity from their utility company/agency or from their local Community Choice Aggregator (CCA).

Additional Resources

[Energy Explained: How electricity is delivered to consumers](#)

[Look up your energy mix](#)

[Today's real-time electricity outlook](#)

[Know Your Utility Poles](#)