NATIONAL PROPANE GAS ASSOCIATION

FAQ: Cost of Electricity

Background

Given that states across the country are pursuing various building and transportation electrification initiatives, it's important to understand grid electricity's cost premium, and how it compares to propane. First, remember that we can't directly compare the price of one kilowatt-hour (kWh) of retail electricity to one gallon of propane because they represent different amounts of energy. To account for this, we can convert both energy sources to British thermal units (Btu). You can review the Btu contents of various energy sources on EIA's website here.

- 1 kWh of electricity = 3,412 Btu
- 1 gallon of propane = 91,452 Btu

One gallon of propane has the same energy content as 26.8 kWh of electricity. For example, if a residential customer is paying $0.12 per kWh, then it cost them $3.21 to achieve the energy equivalence of one gallon of propane. As long as that customer is able to purchase propane for less than $3.21 per gallon, propane will be a cheaper alternative.

- In 2021, the average U.S. residential electric customer used 10,632 kWh of electricity annually, or 886 kWh per month.

According to the Department of Energy's 2023 Representative Average Unit Costs of Energy:

- 1 million Btu of electricity = $46.19
    - 1 million Btu of electricity = 293.08 kWh
- 1 million Btu of propane = $32.62
    - 1 million Btu of propane = 10.93 gallons

Electricity Prices

Generally speaking, electricity prices increase when demand increases. And on the flipside, prices are lowest when overall demand in the weakest. Electric companies charge different prices for different customers classes. Typically, residential rates are the most expensive, followed by commercial rates, and industrial rates are the cheapest. And yes, some states also have specific rates for the transportation sector. These types of rates will grow in popularity as EV adoption becomes more widespread.

2021 retail electricity prices (national averages)

- Residential = $13.66 cents per kWh
- Commercial = $11.22 cents per kWh
- Industrial = $7.18 cents per kWh

On a state basis, Washington has the cheapest residential electric rates in the country at 10.11 cents per kWh; Hawaii is the most expensive at 33.49 cents. Per Census Division, the East South Central Region has the cheapest residential rates at 11.74 cents per kWh; the Pacific Noncontiguous Region is most expensive at 28.85 cents.

- You can review retail electricity rates by states and regions on EIA's website here.

2011 retail electricity prices (national averages)

- Residential = $11.72 cents per kWh
- Commercial = $10.23 cents per kWh
- Industrial = $6.82 cents per kWh

Unsurprisingly, average electricity prices have incased over the last decade.

- Residential = Increased $1.94 cents per kWh between 2011-2021
- Commercial = Increased $0.99 cents per kWh between 2011-2021
- Industrial = Increased $0.36 cents per kWh between 2011-2021

For comparison, in October 2011 a gallon of propane cost $2.63 a gallon (national average). In October 2021, a decade later, a gallon of propane cost $2.66.

Electricity Providers

The market price of electricity varies depending not only on where you live, but also what type of entity provides the power. Across the country, utility-scale electricity is provided to customers by:

- Investor-owned utilities (EEI has additional information)
- Community-owned utilities (APPA has additional information)
- Electric cooperatives (NRECA has additional information)

It's worth noting that since many of our residential customers live in rural, sparsely populated areas, they are disproportionately more likely to be served by an electric cooperative, compared to the national average.

Impact of Electrification

Economy-wide electrification will certainly impact retail electricity prices. Even with efficient electrical equipment, disallowing other energy sources to participate in the residential and commercial markets will drastically increase the aggregate electric load. This will require additional investments in generation, distribution, and transmission infrastructure to produce more electrons and ensure their movement across the system. Utilities will also have to cope with new shapes and variables in the overall electric load. All of this requires resources and money. In terms of absolute dollars, different publications use different figures, but most agree it will cost many trillions of dollars.