

WORLD ENERGY MARKETS OBSERVATORY

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North America Retail

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U.S. electricity sales: There was a decline of retail electricity sales in 2020 due to the effects of COVID-19

Annual electricity sales overall have shown only modest changes from 2005 to 2020 as improved energy efficiency has largely offset the effects of population and GDP growth.

- Total electricity sales in 2020 fell around 3.9% below 2019 sales. With this decline, sales fell back to approximately the same level as in 2005.
- The largest drops in electricity retail sales in 2020 were in the March to May period, during widespread lockdowns at the beginning of the pandemic, and again in the September to November period of 2020.
- Compared to 2019, commercial electricity sales fell 6.3%, and industrial sales fell 8.3%.
- Conversely, with office buildings closed and millions of Americans directed to work from home, residential electricity sales rose 1.5% in 2020, with demand peaking in the spring and summer.

FIGURE 1

U.S. retail electricity sales by sector, 2005-2020



Source: US EIA 2021

Link: https://www.eia.gov/electricity/data/browser/#/topic/5?agg=0,1&geo=g&endsec=vg&linechart=ELEC.SALES.US-ALL.A=ELEC.SALES.US-RES.A=ELEC.SALES.US-COM.A=ELEC.SALES.US-IND.A&columnchart=ELEC.SALES.US-ALL. A=ELEC.SALES.US-RES.A=ELEC.SALES.US-IND.A&columnchart=ELEC.SALES.US-ALL.A&freq=A&start=2005&end=2020&ctype=linechart<ype=spin&rtype=s&pin=&rse=0&maptype=0 Link: http://www.bcse.org/factbook/#

Electricity Sales is expected to rebound in the coming years.

The EIA forecast expected residential electricity sales to grow by 2.4% in 2021 and by 1.6% in 2022. Commercial

sector retail electricity sales were expected to grow by 0.9% in 2021 and by 1.8% in 2022. Amid increased industrial production, industrial electricity sales were expected to rise by 1.2% in 2021 and by 1.1% in 2022.

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U.S. electricity prices: The U.S. annual average retail price of electricity was 10.66¢ per kWh, an increase of 1.1% over the 2019 price

In 2020, the U.S. annual average retail price of electricity was about 10.66¢ per kWh.

The annual average prices by major types of utility customers in 2020 were:

- Residential: 13.20¢ per kWh
- Commercial: 10.65¢ per kWh
- Industrial: 6.66¢ per kWh
- Transportation: 9.20¢ per kWh

Overall, nationwide average electricity prices edged up slightly from the 2019 rate, coming in at 10.66¢ per kWH. The increase can be attributed to rising cost of power production and power grid maintenance. However, this increase was not felt everywhere, as 23 states and the District of Columbia actually benefitted from a decrease in their average electricity prices during 2020. Only 26 states experienced rate increases in 2020.

FIGURE 2



U.S. Average Electricity Price, 2005-2020 (2020 cents per KWh)

Source: US EIA 2021

Link: https://www.eia.gov/electricity/data/browser/#/topic/7?agg=0,1&geo=g&endsec=vg&linechart=ELEC.PRICE.US-ALLA~ELEC.PRICE.US-RES.A~ELEC.PRICE.US-COM.A~ELEC.PRICE.US-IND.A&columnchart=ELEC.PRICE.US-ALL .A~ELEC.PRICE.US-RES.A~ELEC.PRICE.US-COM.A~ELEC.PRICE.US-IND.A&map=ELEC.PRICE.US-ALLA&freq=A&start=2005&end=2018&ctype=linechart<ype=s&maptype=0&rse=0&pin= U.S. electricity prices: In 2020, lower electricity rates were seen across four of the highest-priced jurisdictions (Alaska, Hawaii, Massachusetts, and New Hampshire), but the other highest priced states (Connecticut, Rhode Island, California, and Vermont) continued to watch their high electricity prices grow

In 2020, the annual average electricity price for all types of electric utility customers ranged from 27.67¢ per kWh in Hawaii to 7.46¢ per kWh in Oklahoma.

- Prices in Hawaii are high relative to other states mainly because the majority of its electricity is generated with petroleum fuels that have to be imported into the state.
- The eight states with electricity prices above 15¢ per kWh remained the same in 2020. Due to their geographic and electrical isolation, Alaska and Hawaii are perennial members of this club. **These states are unable to access the diversity of resources linked across the broad, interstate grid networks of the lower-48 states.**

• California, which experienced the highest year-overyear jump in its average electricity rate, ranked as the third highest electricity rate in the lower 48, at 18.15¢ per kWh.

FIGURE 3

U.S. average electricity price variations by state, 2020

 US - Average Electricity Retail Prices - Variations By State, 2020

 Variation Range, 2020

 US Cents 10.66 per KWh

 US Cents 10.66 per KWh

 Variation Range, 2020

 US Cents 10.66 per KWh

 Variation Range, 2020

 US Cents 10.66 per KWh

 Price Ranges (cents per KWh)

 2.00 to 9.00

 12.01 to 15.00

 12.01 to 15.00

Source: Global Energy Institute, 2020 Link: https://www.globalenergyinstitute.org/average-electricity-retail-prices-map# New York, New Jersey, and Maine remained in the second-highest pricing tier, ranging from 14.90¢ per kWh in the Empire State to the 13.59¢ per kWh charged to Mainers.

Variations By State, 2020)) Variation Range, 2020 US Cents 7.46 to 27.67 per KWh

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In 2020, Oklahoma became the holder of the lowest average electricity price in the nation, swapping spots with Louisiana, the lowest average electricity price holder in 2019.

- The lowest average electricity rate in Oklahoma is due to the benefits of a diverse electricity generation portfolio.
- Natural gas powered the majority of Oklahoma's electric generation, smoothing out the variable nature of Oklahoma's robust wind resources.

Canadian electricity prices: In 2020, a low electricity rate was seen in Québec while a high electricity rate was seen in the Northwest Territories and Nunavut

The average residential cost of electricity in Canada is 17.9 ¢/kWh, which includes both fixed and variable costs and is based on an average monthly consumption of 1,000 kWh.

- If territories are excluded, the average electricity cost decreases to 13.8 ¢/kWh.
- Québec has the cheapest electricity prices in all of Canada (7.3 ¢/kWh).
 - The widespread use of hydroelectric dams in Québec contributes to the province having the cheapest electricity prices in all of Canada.

FIGURE 4



Canadian average total cost of electricity by province, based on monthly consumption of 1,000kWh, 2020

Source: Energy Hub.org, February 2021 Link: https://www.energyhub.org/electricity-prices/

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Electricity prices in the Northwest Territories and Nunavut are significantly higher than the rest of Canada. The Northwest Territories has the most expensive electricity prices (38.2 ¢/kWh).

- In much of northern Canada population density is low and communities are remote, which limits the viability of lower-cost energy infrastructure like natural gas pipelines and hydroelectric facilities.
- Geography poses a challenge for the broader use of renewables and as a result, northern Canada relies heavily on relatively expensive and carbon-intensive energy sources.
- The Northwest Territories generate most of its power and heat from diesel and fuel oil.
- Power generation facilities in Nunavut are almost all
 - diesel-fired and most homes are heated by fuel oil.

U.S. corporate procurement of clean energy: Corporate power purchase agreements declined in 2020 as companies tightened their budgets in response to COVID-19

Corporate power purchase agreements (PPAs) for clean energy totaled 12 GW in 2020. This is down from 14 GW in 2019 and the first drop in annual corporate PPA volumes since 2016.

- COVID-19 was the biggest factor in the drop. Few deals were announced in the first half of 2020, as companies tightened budgets and shifted priorities internally in response to the pandemic.
- There was a revival in the number of deals announced in the second half of 2020, which signaled that companies will be better prepared to carry on sustainability initiatives during future disruptions.
- Solar has become the dominant clean energy technology sought by corporations. This reflects growing expertise in power markets among buyers, who are trying to capture peak power pricing, in which solar tends to fare better than wind.
- Additionally, many wind projects in popular markets like ERCOT and SPP have seen their revenues erode as

more zero marginal cost clean energy is built, which depresses prices. This has prompted companies to seek solar contracts in these markets instead.

Amazon was by far the largest corporate buyer of clean energy in 2020 at 3.8GW

- The company announced 21 individual clean energy PPAs in the U.S., with most projects located in Virginia and Ohio. Verizon (1GW) and General Motors (797MW) were the next largest buyers.
- A slew of first-time buyers also entered the market in 2020, including Applied Materials, Henkel, and Nucor.

Total addressable market for corporate renewable PPA in U.S. is materially smaller than total C&I electricity demand. It is clear that there is still significant room for corporate renewables PPA penetration to increase due to the following factors:

- a vast and largely untapped U.S. C&I power demand pool
- an increased focus on the sustainability profiles of US corporations
- rapid growth in technology-sector power demand
- continued cost declines for wind and solar

Corporate Procurement of Clean Energy, 2020 (GW)

Renewable Capacity contracted by Corporations, 2014-2020



Source: BNEF ~ Sustainable Energy in America Factbook, 2021; Link: http://www.bcse.org/factbook/#

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U.S. sources of electric generation: There is a growth in the number of utilities offering green tariff programs in U.S.

U.S. companies announced 2.4GW of green tariffs in 2019 and just 1.5GW in 2020.

- The U.S. green tariff model, in which a regulated utility purchases clean energy on behalf of a corporate customer, has failed to grow after a record 2.6GW of clean energy was purchased through this mechanism in 2018. Companies announced 2.4GW of green tariffs in 2019 and just 1.5GW in 2020.
- Despite the slowdown, the number of utilities offering these programs continues to grow.
 - Some 20 regulated utilities in 20 states offered green tariff programs for corporate customers through 2020.
- Green tariffs are still popular with large, experienced buyers with operations in regulated markets.
 - Google, Facebook, and Toyota are some of the major companies to announce green tariff deals in 2020.

Green tariffs are desirable for more risk-averse companies as well. By serving as the offtaker and firming up intermittent renewable power with its existing energy portfolio, a utility offering a green tariff program can absolve their customers of things like weather, and operational risk. Throughout the country, the design of green tariffs vary.



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