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# Electricity: Overview and Issues for Congress

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SUMMARY

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# Electricity: Overview and Issues for Congress

Electricity is of perennial interest to Congress, especially the policy issues of reliability, security, affordability, and greenhouse gas emissions.

The electricity sector is made up of three distinct, but interrelated, systems for generating electricity and delivering it to consumers. The generation system consists of power plants that generate electricity. The transmission system generally consists of high-voltage transmission lines that move power across long distances. The distribution system makes final delivery of electricity to most homes and businesses. These systems are owned and operated by utilities with different ownership structures under different regulatory regimes across the country. Most aspects of electricity are regulated at the state or local level. The Federal Energy Regulatory Commission (FERC) primarily regulates electricity sales for resale in interstate commerce, rates for transmission service across state lines, and the reliability of many parts of the generation and transmission systems.

Market forces, such as capital costs and fuel costs, are key determinants of the *generation mix*, the share of different energy sources used to generate electricity. The U.S. generation mix has been changing since the mid-2000s, resulting in a decreased use of coal and an increased use of natural gas, wind, and solar energy. This change has been driven largely by price declines for natural gas, wind turbines, and solar panels, though federal and state electricity policies and environmental regulations have also affected the generation mix.

Multiple factors can potentially disrupt electricity supply, including weather events, cyberattacks, and physical attacks on electricity facilities. Aging infrastructure and the changing generation mix also pose potential reliability risks because of the operational challenges they present. FERC regulates reliability for much of the contiguous United States, though reliability for distribution systems (where most power outages occur) are largely outside of FERC's jurisdiction. The various threats to electric reliability and security can be prepared for, and responded to, in multiple ways. Congress might consider oversight activities related to current electric reliability and security conditions or the current regulatory framework in place to address risks. Improving reliability and security often comes at a cost to consumers. If Congress were to determine that additional reliability and security investments are needed within the electricity sector, Congress might consider how to allocate these costs among electricity consumers, utility shareholders (in the case of private utility companies), and the federal budget.

Residential electricity prices were relatively stable in the 2010s, in large part due to the changing generation mix. In the last several years, however, rate increases in many states have exceeded the pace of inflation due in part to relatively high natural gas prices in 2022 and increasing costs for maintaining transmission and distribution systems. While affordability affects all electricity consumers, low-income households may be more vulnerable than others. Several federal programs (e.g., the Low Income Home Energy Assistance Program) aim to address affordability by providing financial assistance to consumers. Also, federal incentives have historically existed for technologies that can lower electricity usage through efficiency upgrades, onsite solar generation, or other options. The 119th Congress reduced or eliminated some of these incentives via P.L. 119-21, the FY2025 budget reconciliation law. Congress might consider oversight of existing federal programs related to electricity affordability, energy efficiency, and other options to reduce electricity bills. Congress might also consider the appropriate role of the federal government in addressing electricity affordability concerns.

Greenhouse gas emissions associated with electricity generation have generally declined since the mid-2000s because of the changing generation mix. The 119th Congress has largely overturned laws from earlier years aimed at reducing greenhouse gas emissions. Likewise, the second Trump Administration has revoked many emissions reduction policies previously adopted by the Biden Administration. Emissions reductions likely would have costs and benefits. Costs include those associated with building new power plants, retiring existing power plants before the end of their useful life, and building any necessary infrastructure (e.g., transmission lines). Benefits include reduced negative impacts of climate change and improved public health through reduced co-pollutants. Indirect costs and benefits include changes in employment in the electricity sector and its supply chain (e.g., fossil fuel production, solar panel manufacturing).

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Electricity is central to modern life and is of perennial interest to Congress. This report provides an introduction to the electricity sector and discusses three key policy areas: electric reliability and security, electricity affordability, and greenhouse gas reduction.[1]

# Introduction to the Electricity Sector

## Generation Mix

Electricity sector participants generally aim to produce and deliver electricity at the lowest possible cost, though public policy goals and environmental regulations are also important factors. As a result, the mix of fuels used to produce electricity is strongly influenced by capital and fuel costs.

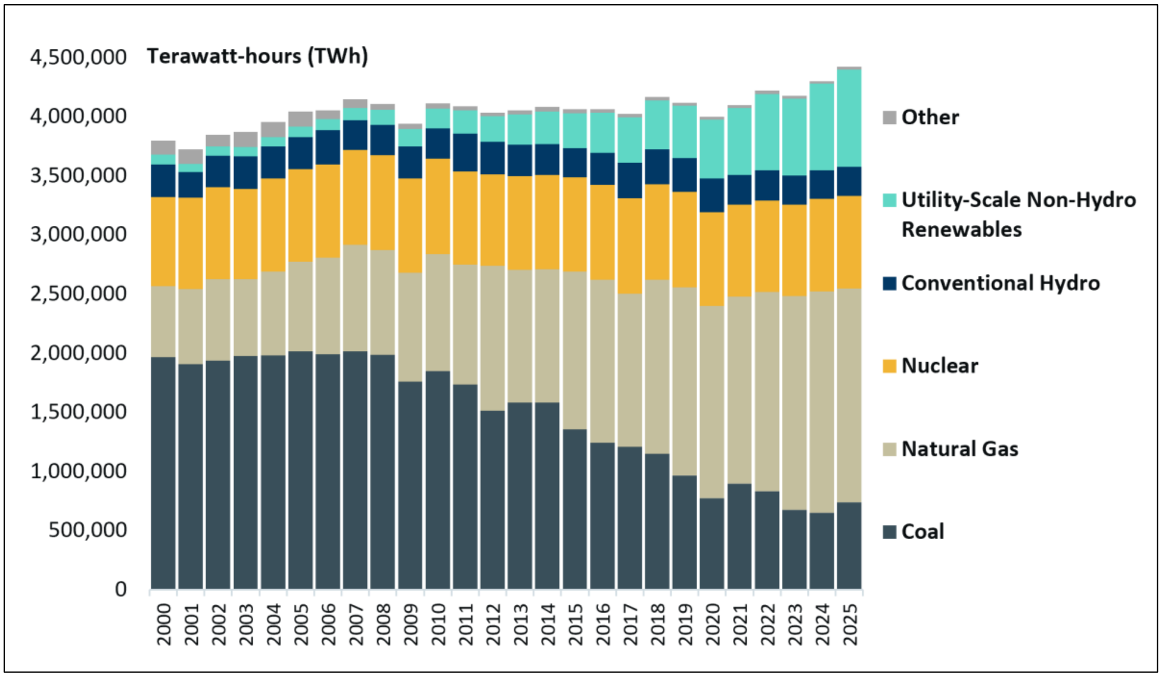
The *generation mix*, the share of different energy sources used to generate electricity, is changing. Much of this change dates to the mid-2000s when development of U.S. shale gas reserves lowered U.S. natural gas prices by half (or more).[2] Costs for wind turbines began falling at about the same time, due to technology innovation and increased global production. Largely as a result of these market changes, natural gas and wind grew in the U.S. electricity mix starting around 2010 (**Figure 1**). Prices for solar panels began declining a few years later for similar reasons as for wind turbines (i.e., technology innovation and increased global production capacity). The corresponding growth in generation from solar energy lagged growth in wind energy by a few years.

[1] A brief discussion of these policy areas is available in CRS In Focus IF12288, *Energy Transition: Affordability, Emissions, and Security*, by Brent D. Yacobucci, Corrie E. Clark, and Ashley J. Lawson.

[2] For a history of the U.S. natural gas industry, see CRS Report R45988, *U.S. Natural Gas: Becoming Dominant*, by Michael Ratner.

**Figure 1. U.S. Electricity Generation by Energy Source, 2000-2025**

Figure is interactive in HTML report version.




**Source:** U.S. Energy Information Administration (EIA), Monthly Energy Review, "Table 7.2a Electricity Net Generation: Total (All Sectors)" and "Table 10.6 Solar Electricity Net Generation," May 2026.

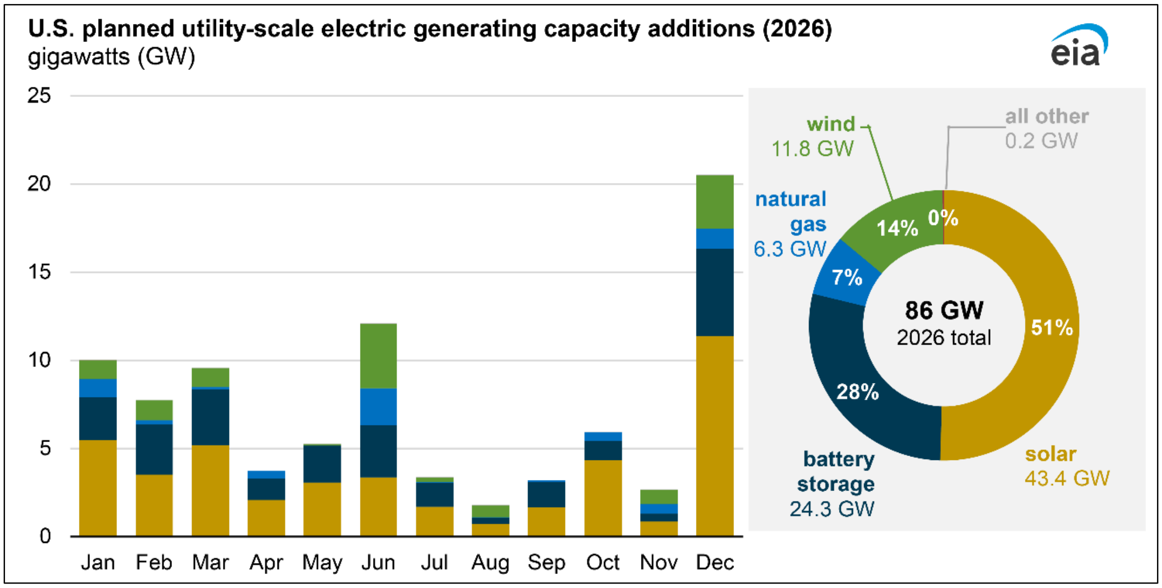
**Notes:** "Other" includes petroleum liquids, petroleum coke, pumped storage (which tends to be a negative value), blast furnace gas and other manufactured and waste gases derived from fossil fuels, non-biogenic municipal solid waste, batteries, hydrogen, purchased steam, sulfur, tire-derived fuel, and other miscellaneous energy sources. "Utility-Scale Non-Hydro Renewables" includes wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agricultural byproducts, other biomass, geothermal, solar thermal, solar photovoltaic, and wind. Beginning in 2014, EIA reported net generation from small-scale solar photovoltaic facilities that are also included in "Utility-Scale Non-Hydro Renewables."

Solar generation has now overtaken other energy sources (including wind and natural gas) as the most common energy source for planned new power plants (**Figure 2**). Batteries are another important energy source, due, in part, to their ability to *balance* solar generation. Balancing helps reduce operational challenges that can be caused by the variable nature of solar energy.[3]

[3] For additional information on balancing, see CRS In Focus IF11257, *Variable Renewable Energy: An Introduction*, by Ashley J. Lawson, and CRS Report R45764, *Maintaining Electric Reliability with Wind and Solar Sources: Background and Issues for Congress*, by Ashley J. Lawson.

**Figure 2. Planned Utility-Scale Electric Generating Capacity Additions in 2026**

As of December 2025




**Source:** U.S. Energy Information Administration, "New U.S. Electric Generating Capacity Expected to Reach a New Record High in 2026," February 20, 2026, https://www.eia.gov/todayinenergy/detail.php?id=67205.

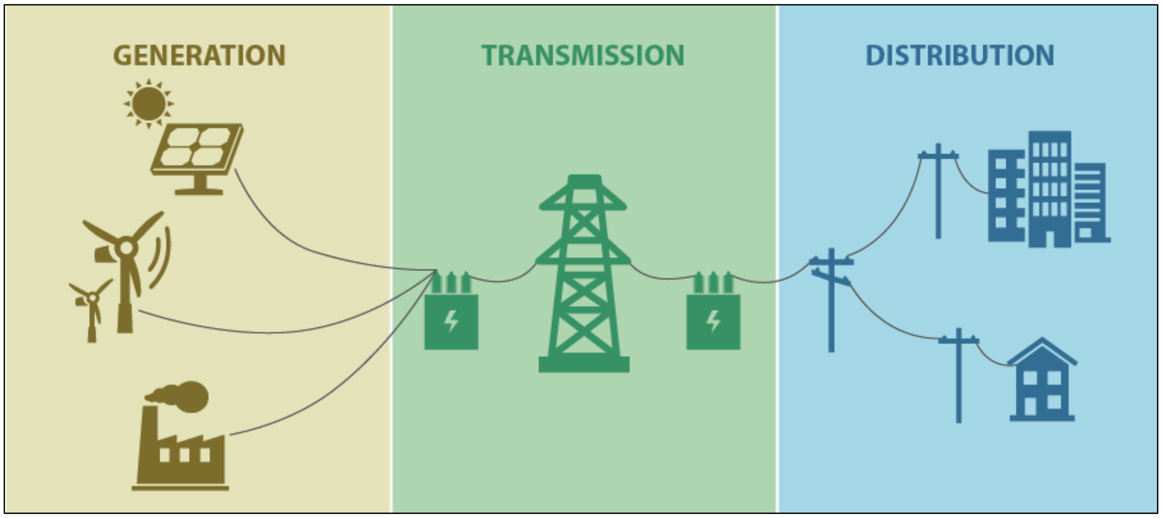
**Note:** Does not include additions with less than 1 megawatt capacity (e.g., rooftop solar panels).

## Ownership Structure and Regulation

The electricity system is made up of three distinct but interrelated systems (**Figure 3**). The generation system consists of power plants that generate electricity. The transmission system consists of high-voltage transmission lines and associated equipment that move power across long distances.[4] The distribution system makes final delivery of electricity to most homes and businesses (some businesses with high electricity demand, such as heavy industry facilities, buy power directly from the transmission system).

[4] For additional information about the transmission system, see CRS In Focus IF12253, *Introduction to Electricity Transmission*, by Ashley J. Lawson.

**Figure 3. Simplified Schematic of Electric Power Sector Systems**




**Source:** CRS, adapted from U.S.-Canada Power System Outage Task Force, *Final Report on the August 14, 2003, Blackout in the United States and Canada: Causes and Recommendations*, April 2004, p. 5, https://www.energy.gov/sites/prod/files/oeprod/DocumentsandMedia/BlackoutFinal-Web.pdf.

**Note:** Not all types of components in each system are shown.

Originally, the electricity system was made up of many vertically integrated utilities in charge of essentially all aspects of these three systems in their service territories, subject to state regulation. In 1935, Congress passed the Federal Power Act, limiting federal jurisdiction to "only those matters which are not subject to regulation by the States."[5] The Federal Power Act established areas of federal jurisdiction as "the transmission of electric energy in interstate commerce" and "the sale of electric energy at wholesale in interstate commerce." The Federal Energy Regulatory Commission (FERC) regulates these areas. Many aspects of electricity that are of interest to Members of Congress and their constituents—retail rates, the generation mix, siting of facilities, and others—are mostly outside of federal jurisdiction under current law.

Three main ownership models exist within the electricity industry.[6] A utility's ownership model affects how it is regulated:

- Investor-owned utilities (IOUs) are private companies that operate on a for-profit basis. State governments allow them to act as monopolies in their service territory, with no competition for electricity distribution. In return, IOUs are subject to regulation and oversight by state public utility commissions (PUCs). Such regulation includes setting the profits IOUs may earn.
- Publicly owned utilities (POUs, sometimes called *municipal utilities* or *munis*) are owned by local governments and operated on a not-for-profit basis. They are not generally regulated by PUCs. Instead, local governments typically regulate POUs and provide oversight.
- Electric co-operatives (co-ops, sometimes called *rural co-ops*) are member-owned organizations and operated on a not-for-profit basis. They are typically

[5] 16 U.S.C. §824(a). For a discussion of the jurisdictional boundaries established by the Federal Power Act, see CRS In Focus IF11411, *The Legal Framework of the Federal Power Act*, by Adam Vann, and CRS Legal Sidebar LSB11296, *Federalism and the Electricity Markets: Balancing National and Local Interests*, by Adam Vann.

[6] Other organizations, such as federal power marketing administrations, irrigation districts, and the Tennessee Valley Authority, own and operate electricity infrastructure, but these are special circumstances.

located in rural areas and are not generally regulated by PUCs. Instead, co-op members or their elected boards typically regulate co-ops and provide oversight.

In 1978, Congress passed the Public Utility Regulatory Policies Act of 1978 (P.L. 95-617), creating a class of non-utility power producers—qualifying small power and cogeneration facilities—which introduced competition for electricity generation. Congress further promoted competition for electricity generation with the Energy Policy Act of 1992 (P.L. 102-486). As a result, in many parts of the United States, the electricity industry began to transition from vertically integrated local monopoly companies to a business model in which power generation is competitive. This transition is called *restructuring* or *deregulation*. However, even where companies compete for generation, the transmission and distribution functions remain primarily operated by utilities regulated by state or local regulators as described above.

In regions with restructured electricity industries, competitive markets largely set the wholesale price of electricity. These regions are shown in **Figure 4**. What consumers ultimately pay for electricity is based on auctions in regional transmission organization (RTO) or independent system operator (ISO) systems, wherein generators competitively bid to provide energy. Rates for wholesale transactions of RTOs and ISOs are under FERC's jurisdiction (except for ERCOT which manages wholesale transactions solely within the state of Texas). Wholesale electricity generation rates depend upon the market rules and structure of the RTO or ISO, and can have cost components for energy, capacity, ancillary services, operating reserves, and general system costs and regulatory fees.[7] The retail rate consumers pay is the sum of these generation costs plus transmission and distribution costs and any other costs approved by the utility regulator (e.g., costs associated with low-income bill assistance programs or environmental programs). While FERC is largely responsible for regulation of the interstate transmission system and wholesale power markets, regulation of the distribution function of the electric power business is still largely carried out by state or local authorities.

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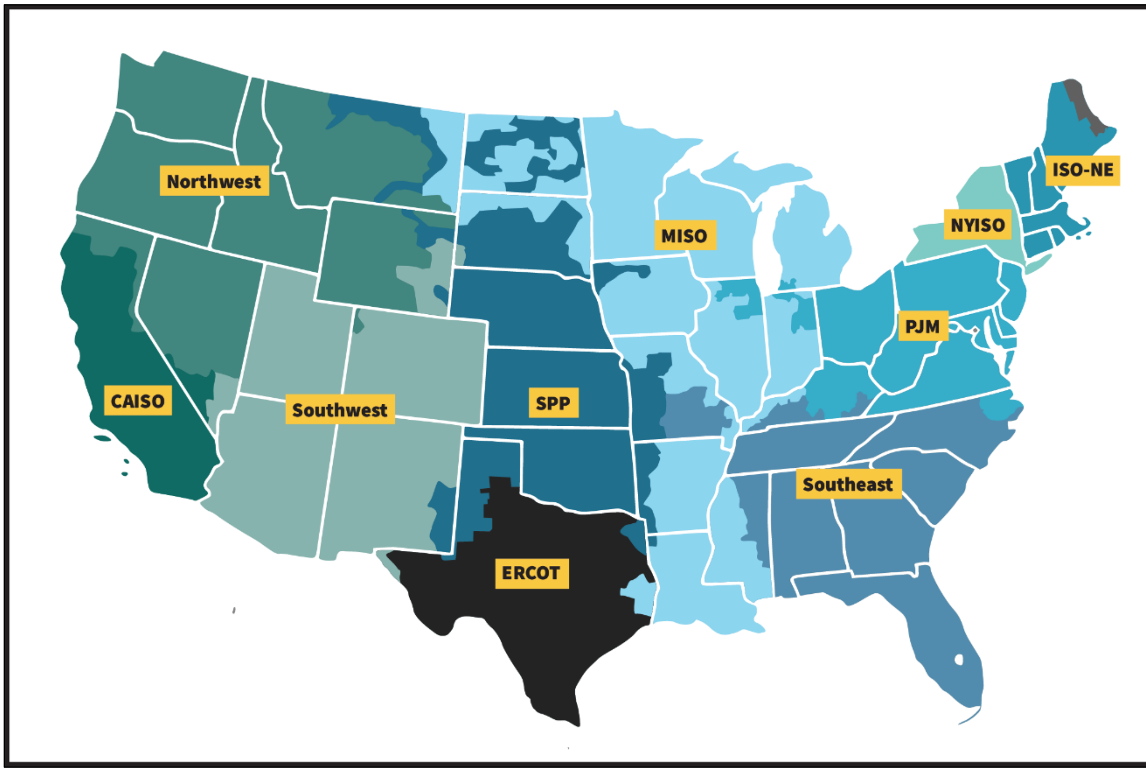
[7] *Ancillary services* are "services that ensure reliability and support the transmission of electricity from generation sites to customer loads. Such services may include load regulation, spinning reserve, non-spinning reserve, replacement reserve, and voltage support." U.S. Energy Information Administration (EIA), "Glossary." For further discussion of ancillary services, see the appendix in CRS Report R45764, *Maintaining Electric Reliability with Wind and Solar Sources: Background and Issues for Congress*, by Ashley J. Lawson.

**Figure 4. Regional Transmission Organizations and Independent System Operators**




**Source:** Federal Energy Regulatory Commission (FERC), "RTOs and ISOs," https://www.ferc.gov/power-sales-and-markets/rtos-and-isos.

**Notes:** FERC does not regulate the electricity industry in Alaska, Hawaii, or U.S. territories. CAISO = California Independent System Operator; SPP = Southwest Power Pool; ERCOT = Electric Reliability Council of Texas; MISO = Midcontinent Independent System Operator; PJM = PJM Interconnection; NYISO = New York Independent System Operator; ISO-NE = ISO New England. Regional transmission organizations and independent system operators do not operate electricity systems in the Northwest, Southwest, or Southeast.

# Electricity Reliability and Security

A stable supply of electricity is widely viewed as being critical to the economy, public health, and other aspects of modern life. Many kinds of events can potentially disrupt electricity supply, including weather events, cyberattacks, and physical attacks on electricity facilities. Vulnerabilities in the fuel supply networks for electric power plants (e.g., natural gas pipelines) also pose potential reliability risks. Further, aging infrastructure and the changing generation mix pose potential reliability risks because of the operational challenges they present. Recently, many utilities have announced anticipated electricity demand growth, marking a change from the relatively flat demand for electricity seen over the last 10 years or more.[8] Electricity supply shortages and associated reliability risks could increase if electricity demand growth outpaces new capacity additions.[9]

[8] See, for example, John D. Wilson et al., *Power Demand Forecasts Revised Up for Third Year Running, Led by Data Centers*, Grid Strategies, November 2025, https://gridstrategiesllc.com/wp-content/uploads/Grid-Strategies-National-Load-Growth-Report-2025.pdf.

[9] For further discussion of potential reliability risks, see, for example, North American Electric Reliability Corporation (continued...)

Congress directed FERC to regulate electric reliability, including cybersecurity considerations, in the Energy Policy Act of 2005 (P.L. 109-58). FERC's authority over reliability covers most of the generation and transmission systems in the contiguous United States. Alaska and Hawaii are exempt from federal reliability requirements.[10] FERC oversees electric reliability in coordination with the North American Electric Reliability Corporation (NERC). FERC's authority does not extend to ensuring sufficient electricity capacity is built (*resource adequacy*). State and local utility regulators have authority over resource adequacy.

Weather events can damage electricity facilities, especially transmission and distribution systems. Prominent events in recent years—hurricanes, wildfires, winter storms, and heat waves—have exposed various vulnerabilities in the electricity system. Numerous options exist to prevent outages from similar events in the future, but they often are more expensive than the status quo. The federal government has provided financial assistance to prepare for and recover from damaging weather events. For example, disaster assistance funds have sometimes supported electricity system rebuilding, and Congress provided over $10 billion for FY2022-FY2026 for financial assistance for grid reliability and resilience in the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58), also known as the Bipartisan Infrastructure Law.[11]

Physical or cyberattacks against electricity facilities can also disrupt electricity supply. For example, in December 2022, two separate physical attacks on the electricity system led to power outages for tens of thousands of customers in North Carolina and Washington.[12] Electricity infrastructure has also been the target of cyberattacks, but none that caused power outages.[13] The electricity system has numerous potential cyber vulnerabilities. The industry, its regulators, and federal agencies have taken a variety of actions to boost cybersecurity, but vulnerabilities remain.[14]

Congress and regulators have responded to reliability and security threats in recent years. For example, in February 2023, FERC approved reliability standards for extreme cold weather in response to Winter Storm Uri that caused widespread power outages in February 2021.[15] IIJA programs aimed to fund upgrades to electricity infrastructure that can improve reliability and resilience. NERC reviewed existing reliability standards related to physical security in response to attacks in late 2022 and identified areas for potential improvement, such as clarification of appropriate risk management activities related to physical security.[16]

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(NERC), *2025 Long-Term Reliability Assessment*, January 2026, https://www.nerc.com/globalassets/our-work/assessments/nerc_ltra_2025.pdf; and Department of Energy, *Evaluating the Reliability and Security of the United States Electric Grid*, July 2025, https://www.energy.gov/sites/default/files/2025-07/DOE%20Final%20EO%20Report%20%28FINAL%20JULY%207%29.pdf.

[10] 16 U.S.C. §824o(k).

[11] For a summary of energy programs established by P.L. 117-58, see CRS Report R47034, *Energy and Minerals Provisions in the Infrastructure Investment and Jobs Act (P.L. 117-58)*, coordinated by Brent D. Yacobucci.

[12] For additional discussion of physical attacks on the grid, see CRS Insight IN12074, *Electric Grid Physical Security: Recent Developments*, by Paul W. Parfomak.

[13] See, for example, NERC, *Lesson Learned: Risks Posed by Firewall Firmware Vulnerabilities*, September 5, 2019, https://www.nerc.com/pa/rrm/ea/Lessons%20Learned%20Document%20Library/20190901_Risks_Posed_by_Firewall_Firmware_Vulnerabilities.pdf.

[14] U.S. Government Accountability Office, "Securing the U.S. Electricity Grid from Cyberattacks," October 12, 2022, https://www.gao.gov/blog/securing-u.s.-electricity-grid-cyberattacks.

[15] FERC, Order Approving Extreme Cold Weather Reliability Standards EOP-011-3 and EOP-012-1 and Directing Modifications of Reliability Standard EOP-012-1, February 16, 2023, https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20230216-3062.

[16] NERC, *Evaluation of the Physical Security Reliability Standard and Physical Security Attacks to the Bulk-Power* (continued...)

Congress could consider options related to electric reliability and security. Options include

- continued monitoring of electric reliability and security, and oversight as necessary;
- evaluating the effectiveness of the current regulatory framework;
- providing additional financial assistance to grid infrastructure owners to prepare for, withstand, or recover from power outages;
- assessing emerging or increasing threats to electricity reliability (e.g., the changing generation mix, malicious actors within the country and overseas, changing weather and climate conditions); and
- identifying electricity customers most vulnerable to power outages and potential policy options to support them.

## Additional Resources

CRS Insight IN12074, *Electric Grid Physical Security: Recent Developments*, by Paul W. Parfomak

CRS Report R45764, *Maintaining Electric Reliability with Wind and Solar Sources: Background and Issues for Congress*, by Ashley J. Lawson

CRS Report R48127, *Natural Gas Reliability: Issues for Congress*, by Paul W. Parfomak, Ashley J. Lawson, and Michael Ratner

CRS Insight IN11242, *Power Generation and Electric Reliability in the U.S. Virgin Islands*, by Corrie E. Clark

CRS Insight IN12048, *Electric Power Transformers: Supply Issues*, by Paul W. Parfomak

CRS In Focus IF12061, *Critical Infrastructure Security and Resilience: Countering Russian and Other Nation-State Cyber Threats*, by Brian E. Humphreys

CRS Report R47339, *Ensuring Electricity Infrastructure Resilience Against Deliberate Electromagnetic Threats*, by Brian E. Humphreys

# Electricity Affordability

High electricity prices can limit some households' ability to use the amount of electricity they would like and can reduce businesses' profitability. Electricity prices are influenced by the cost of producing electricity and the cost of delivering electricity to customers (i.e., the power lines and their operation). On an inflation-adjusted basis, residential electricity prices were mostly stable or falling for many years after 2010 (**Figure 5**), driven largely by increasing use of low-cost natural gas.

More recently, this trend has changed. Inflation-adjusted national average residential electricity prices in 2025 were 3% higher than in 2019.[17] Nominal (not adjusted for inflation) residential electricity prices grew at a higher rate—29% on average nationwide between 2019 and 2025.

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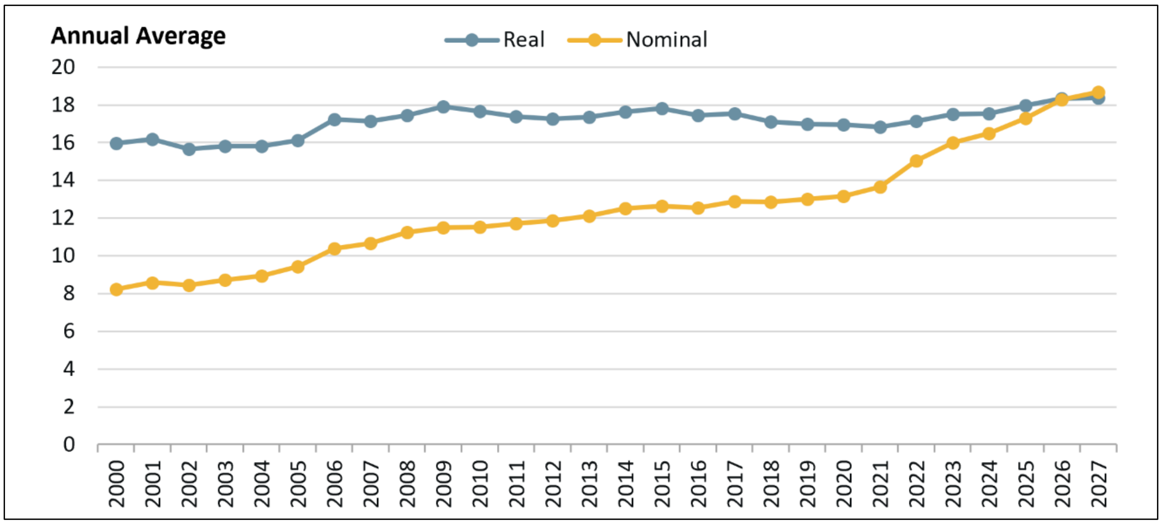
*System*, April 14, 2023, https://www.nerc.com/FilingsOrders/us/NERC%20Filings%20to%20FERC%20DL/NERC%20Report%20on%20CIP-014-3.pdf.

[17] Ryan Wiser et al., *Retail Electricity Price Trends and Drivers: Data Update—2026 Edition*, Lawrence Berkeley National Laboratory, April 2026, p. 7, https://eta-publications.lbl.gov/sites/default/files/2026-03/retail_price_trends_2026_edition.pdf.

Retail electricity price changes have not been uniform across the country, reflecting differences in local utility expenses and other local factors. Twenty-nine states saw inflation-adjusted electricity prices decline between 2019 and 2025.[18] Two factors explain many of the retail electricity price changes across the country over this time period: (1) changes in natural gas prices (natural gas is a common fuel for power plants, as shown in **Figure 1**); and (2) growing utility expenses for maintaining their transmission and distribution systems. In some states, environmental policies or other state-specific factors were also influential.[19]

**Figure 5. Average Annual U.S. Residential Retail Electricity Prices, 2000-2027 (cents per kilowatt-hour)**

Figure is interactive in HTML report version.




**Source:** U.S. Energy Information Administration (EIA), Short Term Energy Outlook, July 2026.

**Notes:** Real prices are adjusted for inflation by EIA using the Consumer Price Index for July 2026. Nominal prices are not adjusted for inflation. Rates for 2026 and 2027 are forecast/estimated by EIA.

Affordability is not only affected by electricity rates. Customer consumption matters as well. A customer with a high rate might have a low bill if they do not use much electricity. Likewise, a customer with a low rate might have a high bill if they use a lot of electricity. Customers can experience large increases in their bills when their consumption patterns change. For example, hot summers can cause people to increase their use of air conditioners, leading to higher electricity bills.

One source of data for household electricity expenditures is the Residential Energy Consumption Survey (RECS) conducted by the U.S. Energy Information Administration (EIA).[20] Every four

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[18] Ryan Wiser et al., *Retail Electricity Price Trends and Drivers: Data Update—2026 Edition*, Lawrence Berkeley National Laboratory, April 2026, p. 12, https://eta-publications.lbl.gov/sites/default/files/2026-03/retail_price_trends_2026_edition.pdf.

[19] Ryan Wiser et al., *Retail Electricity Price Trends and Drivers: Data Update—2026 Edition*, Lawrence Berkeley National Laboratory, April 2026, pp. 19-42, https://eta-publications.lbl.gov/sites/default/files/2026-03/retail_price_trends_2026_edition.pdf.

[20] Background information about the Residential Energy Consumption Survey (RECS) is at https://www.eia.gov/consumption/residential/about.php. Recently, RECS has been conducted every four or five years, but that time interval has changed since EIA first conducted RECS in 1978. Data for 2020 electricity expenditures are from Table CE2.6, (continued...)

years or so, EIA collects nationally representative information about residential energy consumption and expenditures. The most recent RECS survey year for which data are available is 2020. For that year, EIA found that, on average, households spent $1,380 for electricity. Expenditures vary by climate, household size, housing characteristics, and other factors. Household income is one factor of continual interest to Congress related to energy expenditures, because of observations that lower-income households spend a higher share of their income on energy.[21] RECS data for expenditures by household income level are shown in **Table 1**.

**Table 1. Average Annual Household Electricity Expenditures, 2020**

| Household Income | Electricity Expenditures |
|---|---|
| Less than $5,000 | $1,188 |
| $5,000 to $9,999 | $1,056 |
| $10,000 to $19,999 | $1,089 |
| $20,000 to $39,999 | $1,209 |
| $40,000 to $59,999 | $1,285 |
| $60,000 to $99,999 | $1,404 |
| $100,000 to $149,999 | $1,552 |
| $150,000 or more | $1,830 |
| U.S. overall | $1,380 |

**Source:** U.S. Energy Information Administration, Residential Energy Consumption Survey (RECS) 2020, Table CE2.6, "Annual Household Expenditures in the United States—Totals and Averages 2020."

**Note:** The most recent year for which RECS data are available is 2020.

Households that do not pay their electricity bills may be disconnected for nonpayment. Utilities reported 13.4 million residential electricity disconnections in 2024, the most recent (and only) year for which comprehensive data about disconnections has been collected.[22] For context, utilities reported serving 143.0 million residential electricity customers that year. The rate of disconnections remains uncertain because some customers may have been disconnected multiple times that year.

In the early part of the COVID-19 pandemic, many utilities and utility regulators banned most disconnections, providing some relief for households facing affordability challenges. By the end of 2021, nearly all pandemic-related disconnection moratoria had expired, and anecdotal evidence suggests that the pace of disconnections in 2022 met or exceeded pre-pandemic levels.

Congress has responded to some affordability concerns in recent years. For example, annual and supplemental appropriations to the Low Income Home Energy Assistance Program (LIHEAP) provide direct financial assistance to eligible electricity customers. Additionally, electricity

"Annual Household Fuel Expenditures—Totals and Averages, 2020," https://www.eia.gov/consumption/residential/data/2020/c&e/pdf/ce2.6.pdf. RECS is conducted on multiyear cycles. The RECS 2024 cycle is currently underway, so 2020 is the most recent year for which data are available.

[21] See, for example, a research series conducted by the American Council for an Energy-Efficient Economy (ACEEE), available at https://www.aceee.org/policy-brief/2024/09/data-update-city-energy-burdens. Researchers at ACEEE reported energy burdens based on their analysis of data from the U.S. Census Bureau's American Housing Survey (AHS). The ACEEE analysis was conducted in 2016, 2018, 2020, and 2024 based on AHS data releases.

[22] EIA, *2024 Residential Utility Disconnections Report*, April 2026, https://www.eia.gov/analysis/requests/residential/utility/pdf/Residential%20Utility%20Disconnections%20Report%20-%20April%202026.pdf.

affordability has been a topic of debate in the context of energy policy and permitting reform in the 119th Congress.[23]

Congress could consider additional options related to electricity affordability. Options include

- monitoring federal data collection related to affordability;
- providing additional support for energy efficiency improvements or distributed electricity generation (e.g., rooftop solar panels, community solar) as ways of reducing customers' electricity bills;
- evaluating the effectiveness of federal assistance options for consumers (e.g., LIHEAP);
- identifying and promoting best practices aimed at affordability;
- providing financial assistance to utilities to reduce potential rate increases; and
- debating the appropriate role of the federal government in addressing electricity affordability.

## Additional Resources

CRS Report RL31865, *LIHEAP: Program and Funding*, by Libby Perl

CRS Report R47417, *Electric Utility Disconnections*, by Ashley J. Lawson and Claire Mills

CRS Report R48646, *Data Centers and Their Energy Consumption: Frequently Asked Questions*, by Martin C. Offutt, Ling Zhu, and Ashley J. Lawson

# Greenhouse Gas Reduction

The change in generation mix illustrated in **Figure 1** has contributed to a decline in greenhouse gas emissions from the electricity sector. In 2005 (approximately the peak year for U.S. greenhouse gas emissions from the electricity sector), emissions were 2,457.4 million metric tons of carbon dioxide equivalent (Mt $CO_2e$).[24] Observers estimate emissions in 2025 were 1,514 Mt $CO_2e$.[25] Reducing electricity sector emissions to zero was a policy priority for the Biden Administration; the Trump Administration does not support this goal.[26]

Reducing greenhouse gas emissions in the electricity sector likely would have costs and benefits. Costs include those associated with building new power plants, retiring existing power plants

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[23] See, for example, U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Energy, *AI and the Grid: Meeting Growing Power Demand While Protecting Ratepayers*, hearings, 119th Cong., 2nd sess., April 29, 2026; U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Energy, *Wires, Rates, and States: Permitting Transmission for Reliable and Affordable Power*, hearings, 119th Cong., 2nd sess., May 13, 2026.

[24] Estimates of electricity sector greenhouse gas emissions include emissions from generation, transmission, and distribution of electricity. The sector emits several greenhouse gases monitored by the U.S. Environmental Protection Agency (EPA), but carbon dioxide from fossil fuel combustion makes up approximately 97% of total sector greenhouse gas emissions. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022*, April 11, 2024, Table 2-11, "Electric Power-Related Greenhouse Gas Emissions (MMT $CO_2$ Eq.)."

[25] Rhodium Group, *Preliminary U.S. Greenhouse Gas Emissions Estimates for 2025*, January 13, 2026, Figure 2, https://rhg.com/research/us-greenhouse-gas-emissions-2025/.

[26] See, for example, Section 4 of Executive Order 14154, "Unleashing American Energy," revoking a Biden Administration executive order ("Tackling the Climate Crisis at Home and Abroad") that had articulated a goal of a "carbon pollution-free electricity sector no later than 2035." Executive Order 14154 of January 20, 2025, "Unleashing American Energy," 90 *Federal Register* 8353, January 29, 2025, https://www.federalregister.gov/documents/2025/01/29/2025-01956/unleashing-american-energy.

before the end of their useful life, and building any necessary infrastructure (e.g., transmission lines). Benefits include reduced negative impacts of climate change and improved public health through reduced co-pollutants. Indirect costs and benefits include changes in employment in the electricity sector and its supply chain (e.g., fossil fuel production, solar panel manufacturing). Costs and benefits of reducing greenhouse gas emissions in the electricity sector remain a topic of active debate and research.

As discussed in the section "Ownership Structure and Regulation," states have the most authority over deciding what energy sources should be used to generate electricity. A number of states have adopted policies requiring zero-emissions electricity by 2050 or earlier. Additionally, some utilities have adopted voluntary goals.[27]

The 117th Congress passed two laws aimed, in part, at reducing greenhouse gas emissions in the electricity sector and other sectors of the economy: IIJA and P.L. 117-169, commonly known as the Inflation Reduction Act (IRA). Both laws aimed to promote the use of many low- and zero-emissions technologies across the economy. The 119th Congress scaled back many of these provisions through passage of P.L. 119-21, the FY2025 budget reconciliation law.

Congress could consider options related to greenhouse gas reduction in the electricity sector. Options include

- conducting oversight on agency implementation of policies that affect greenhouse gas emissions;
- evaluating the appropriateness of federal incentives for deploying zero-emissions electricity sources;
- considering federal requirements to reduce greenhouse gas emissions from the electricity sector;
- monitoring developments related to state greenhouse gas reduction policies (e.g., renewable portfolio standards) and voluntary utility goals; and
- identifying an appropriate greenhouse gas reduction goal (if any) for the United States, and the role of the electricity sector in achieving any economy-wide goal.

## Additional Resources

CRS Report R47034, *Energy and Minerals Provisions in the Infrastructure Investment and Jobs Act (P.L. 117-58)*, coordinated by Brent D. Yacobucci

CRS Report R47262, *Inflation Reduction Act of 2022 (IRA): Provisions Related to Climate Change*, coordinated by Jane A. Leggett and Jonathan L. Ramseur

CRS Report R45913, *Electricity Portfolio Standards: Background, Design Elements, and Policy Considerations*, by Ashley J. Lawson

CRS Report R46947, *U.S. Climate Change Policy*, coordinated by Richard K. Lattanzio

CRS Report R47561, *Greenhouse Gas Emissions in the U.S. Electricity Sector: Background, Policies, and Projections*, by Jonathan L. Ramseur

[27] For a list of states and utilities with 100% zero-emissions electricity policies, see the Smart Electric Power Alliance's Utility Carbon Reduction Tracker at https://sepapower.org/utility-transformation-challenge/utility-carbon-reduction-tracker/.

CRS Insight IN12624, *IRA Tax Credit Repeal in the FY2025 Reconciliation Law: Part 1*, by Nicholas E. Buffie

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