# US Energy Production and Policy

**Introduction**

Virtually every economy runs on reliable, affordable energy. From factories to farms, from households to hospitals, fuel and electricity that arrive on a consistent and predictable schedule, and at stable prices, are a vital part of everyday life and essential to the American economy.

For most of its history the United States has been an energy-rich nation, producing most of the energy it consumed until the early 1950s.[1] And after two generations of energy dependence, it has again become a net energy exporter.[2] How that system is regulated, taxed, subsidized, and permitted—and which sources are allowed to expand—determines living costs, industrial competitiveness, and the country's capacity to lead the free world from a position of strength. Whether the United States keeps that advantage now hinges on how it meets the continuing surge in energy demand and whether Washington clears the way to build what is needed.

**Foundation and Abundance: From Self-Sufficiency to Record Output**

Abundant domestic fuel underwrote American industrialization. First coal, then oil and natural gas powered the factories, railroads, and wartime industries of the nineteenth and twentieth centuries. Through the early 1950s the United States produced most of the energy it used.[3] Commercial nuclear generation followed in 1958, when the first US commercial nuclear power plant began operating at Shippingport, Pennsylvania.[4] Yet consumption outpaced production in the postwar decades, and the United States became a sustained net energy importer.

The cost of that dependence became plain in 1973–1974, when Arab members of the Organization of the Petroleum Exporting Countries (OPEC) imposed an oil embargo on the United States in retaliation for American resupply of Israel during the Arab–Israeli War.[5] For decades afterward, energy security was framed as a problem of scarcity—of import quotas, strategic reserves, and vulnerability to foreign suppliers. Later advances in drilling and production technology reversed that picture. The United States became a net exporter of natural gas in 2017 for the first time since the late 1950s, and in 2019 total energy exports exceeded imports for the first time since 1952.[6] The country has remained a net total energy exporter since 2019.[7]

In 2025, US crude oil production averaged a record 13.6 million barrels per day, breaking the previous US and global production record.[8] Natural gas production also set a record, averaging 118.5 billion cubic feet per day.[9] Total primary energy production reached a new high of 107 quadrillion British thermal units (Btu)—the fourth consecutive annual record.[10] Energy exports reached a record 31 quadrillion Btu against imports of 21 quadrillion Btu, yielding a record 11 quadrillion Btu of net exports.[11]

Electricity generation reflects a diversified—though still fossil-heavy—mix. In 2025, utility-scale generation totaled about 4.43 trillion kilowatt-hours, with natural gas supplying about 41 percent, nuclear about 18 percent, coal about 17 percent, wind about 11 percent, and utility-scale solar about 7 percent.[12] Wind and utility-scale solar together reached a record 17 percent of US electricity; including small-scale solar lifts the combined share to about 19 percent.[13] Nuclear power, however, remains the largest source of firm, carbon-free capacity even as the fleet of nuclear reactors ages. As of March 2026, the United States had ninety-four operating commercial reactors at fifty-four plants in twenty-eight states, with an average reactor age of about forty-four years and combined net summer capacity of 98,441 megawatts.[14] The newest unit—Vogtle Unit 4 in Georgia—entered commercial operation in April 2024.

**Growing Demand for Electricity and Fuel**

From 2005 to 2019, US electricity demand grew just 0.1 percent a year, giving planners breathing room.[15] Since 2020, that era has ended. The Energy Information Administration (EIA) finds that electricity use, measured as net energy for load, accelerated about 1.7 percent annually from 2020 to 2025, with data centers a leading driver.[16] EIA forecasts US electricity generation rising from 4,430 billion kilowatt-hours in 2025 to 4,545 billion kWh in 2026 and 4,613 billion kWh in 2027.[17] Even before that climb, the United States generated more electricity in 2025 than the European Union, Japan, and South Korea combined—about 4,520 terawatt-hours against roughly 4,450.[18]

Official outlooks show how large the computing load could become. Lawrence Berkeley National Laboratory's 2025 update to its data-center energy report projects a reference case of 649 terawatt-hours of US data center electricity use by 2030—about 11.8 percent of total US electricity, within a scenario range of 9.5 to 15.3 percent.[19] Globally, the International Energy Agency (IEA) sees data center electricity consumption roughly doubling from 485 terawatt-hours in 2025 to 950 terawatt-hours in 2030.[20] EIA warns that if data center demand grows faster than expected, fossil generation could rise above its baseline because other capacity additions cannot keep pace.[21]

The plants and wires to serve that load face a long line. The Berkeley Lab reports that 2,061 gigawatts of generation and storage capacity were actively seeking grid connection at the end of 2025—down 10 percent from 2024 amid more than 750 gigawatts of withdrawals but still far larger than the installed fleet.[22] Of the capacity that entered queues from 2000 through 2020, just 13 percent had come online by the end of 2025, while 75 percent had withdrawn, and the median time from interconnection request to commercial operation now exceeds five years. Demand for liquid fuels and gas is tightening as well: East Coast distillate inventories fell 32 percent below their five-year seasonal average in September 2026, and EIA expects US distillate stocks to remain below the 2021–2025 average through 2027.[23] Desire in a queue is not capacity on the grid, and a tank farm cannot be refilled by forecast.

**Prices People Feel: The Pump and the Meter**

For ordinary Americans, energy policy is measured at the pump and monthly utility bills. A family in California pays roughly $2.50 more per gallon of gasoline than a family in North Carolina,[24] and residential electricity costs about 30 percent more per kilowatt-hour than it did in 2020.[25] Those costs fall hardest on commuters, small businesses, and households on fixed incomes, and they ripple into the price of nearly everything that is grown, made, or shipped.

*Gasoline:* Record production has not delivered cheap gasoline in 2026. EIA's weekly survey put the US average price at $4.28 per gallon as of October 19, 2026, $1.27 higher than a year earlier.[26] AAA's daily survey on October 21 ranked California the most expensive state at $6.11, followed by Hawaii ($5.63), Nevada ($5.37), and Washington ($5.36); the cheapest states were North Carolina ($3.57), Georgia ($3.72), and Texas ($3.76).[27]

The reason: Americans pay a global price for gasoline, not a domestic one. Crude oil is the largest component of the retail price—about 51 percent in 2025, according to EIA—followed by distribution and marketing (about 18 percent), federal and state taxes (about 17 percent), and refining costs and profits (about 14 percent).[28] Crude is priced on a global market, so domestic output can soften but cannot cancel energy market shocks abroad.

The current spike began with the US–Iran conflict. After the February 28, 2026, US and Israeli strikes on Iran and the effective closure of the Strait of Hormuz, Brent crude, the global benchmark price, jumped from $72 a barrel to more than $100 by March 12 and ended the quarter at $118. That was its largest quarterly increase, adjusted for inflation, in data going back to 1988.[29] A second surge came in September. Attacks on oil infrastructure and tankers in the region, most notably on Saudi Arabia's

East-West pipeline, a crucial bypass around Hormuz that had been carrying more than 5 million barrels a day to the Red Sea, pushed Brent's monthly average to $114, $23 higher than in August, with a peak of $131 on September 15.[30]

Record tanker rates, rising insurance costs, and longer routes around conflict zones have added to deliverable crude costs.[31] Rising crack spreads—the margin between crude and wholesale fuel—have pushed gasoline and especially diesel fuel higher.[32] EIA expects Brent to average $105 per barrel in the fourth quarter of 2026 and gasoline to average just under $3.60 per gallon in 2027.[33]

California sits at the top of the national price ladder for reasons largely of its own making. The state's gasoline excise tax rose to 63.4 cents per gallon in July 2026,[34] on top of the 18.4-cent federal tax.[35] The California Energy Commission estimates that in January 2026 the Low Carbon Fuel Standard added about 17 cents per gallon and the cap-and-trade program about 25 cents.[36] California also requires a unique gasoline blend, known as CARBOB (California Reformulated Gasoline Blendstock for Oxygenate Blending), that only specially equipped refineries can make, and its market has little pipeline connection to the Gulf Coast refining hub.[37]

Into that isolated market came two refinery closures: Phillips 66's 139,000-barrel-per-day Los Angeles-area refinery and Valero's 145,000-barrel-per-day Benicia refinery, which together represent 17 percent of the state's refining capacity. EIA warned that their exit would increase price volatility and dependence on imports from Asia.[38]

*Electricity:* Electricity bills tell a similar story. The average US residential price rose from 13.15 cents per kilowatt-hour in 2020 to 17.30 cents in 2025,[39] and EIA forecasts 18.2 cents in 2026 and 18.7 cents in 2027.[40] Like gasoline, the state differences in electricity costs are stark: California residential customers paid about 33.6 cents per kilowatt-hour in July 2026, against a national residential average of about 18.3 cents that same month.[41] Berkeley Lab's analysis of recent retail-rate trends finds that national average prices have largely tracked inflation, but some states have risen much faster, and residential customers have faced larger increases than commercial and industrial ones.[42]

**Energy Efficiency Doesn't Mean Lower Costs**

Why haven't efficient light bulbs and appliances lowered bills? The per-kilowatt-hour rate is increasingly driven by the cost of the grid itself rather than the fuel burned to supply it. Investor-owned utilities' spending on distribution and transmission has climbed while generation costs have declined, with distribution capital spending up 35 percent—costs that utilities typically recover over many years with a regulated rate of return.[43] Aging infrastructure, supply-chain constraints, storm recovery, and wildfire mitigation have all added to those costs, with wildfire risk and liability insurance a major driver in California.[44] Because so many grid costs are fixed, shrinking sales can raise rates: States with the steepest price increases typically saw shrinking customer loads, partly from net-metered rooftop solar, which spreads fixed costs over fewer kilowatt-hours, while load growth tended to push prices down.[45] Less electricity sold means higher prices per unit, even with the same number of overall customers.

State renewables portfolio standards have also raised retail prices in many states, as their design intended.[46] Efficiency saves a household kilowatt-hours; it does not shrink the poles, wires, mandates, and returns embedded in the process.

**New Supply and How It Could Lower Prices**

The surest path to lower prices is more deliverable supply on calendars that match demand. Natural gas remains the fastest-moving firm option where turbines, pipelines, and permits are available. Gas capacity in interconnection queues jumped 86 percent in 2025 to 253 gigawatts, and the IEA notes that US data-center developers are pushing ahead with onsite gas generation precisely because

grid connections are slow.[47] Since natural gas prices are among the largest drivers of year-to-year changes in retail electricity prices, abundant domestic gas is also a direct lever on household bills.[48]

After decades of stagnation, the United States has prioritized nuclear power once again.[49] In May 2025, the Nuclear Regulatory Commission approved NuScale's US460 small modular reactor design—six 77-megawatt modules producing about 460 megawatts—ahead of schedule and under budget.[50] Under the Department of Energy's Reactor Pilot Program, launched in June 2025, four advanced test reactors reached criticality by July 4, 2026, exceeding the administration's goal of three; these were zero-power demonstrations intended to pave the way for reactors producing electricity from 2027 onward.[51] New large reactors remain capital-intensive and slow—Georgia's Vogtle Units 3 and 4 cost about $32 billion against an original budget of about $14 billion—and small modular designs must still prove their costs at commercial scale.[52]

More nuclear power could lower prices in three ways. First, it locks in cheap power once a plant is built. Because construction accounts for roughly 70 to 80 percent of a nuclear plant's lifetime cost, a reactor's operating costs are low and predictable,[53] and a fully depreciated plant produces electricity for about $30 to $38 per megawatt-hour, at or below the cost of new gas or utility-scale solar.[54] Extending the licenses of existing reactors keeps that low-cost power on the grid for another twenty years.[55]

Nuclear power also shields consumers from fuel shocks. Swings in natural gas prices rank among the largest factors behind year-to-year changes in retail electricity prices.[56] The cost of gas-fired power rises and falls with fuel prices, while a reactor's operating costs stay low and predictable.[57] More nuclear generation means bills that move less when gas spikes.

Lastly, nuclear power lowers the cost of the whole system. A reactor runs around the clock, filling the hours when wind and solar fall off and when power is most expensive. In a California case study, the Department of Energy estimates that a clean grid built with nuclear power could cost about 37 percent less than one built on renewables and storage alone.[58] The obstacle is the upfront price. New reactors today cost $141 to $220 per megawatt-hour[59] but DOE projects that the next units of a proven design could come in below $100 with federal incentives and closer to $60 with further cost reductions.[60]

Geothermal and transmission could widen the options. The United States has only 2.7 gigawatts of conventional geothermal capacity, but the US Geological Survey estimates 135 gigawatts of potential from enhanced geothermal systems in the Great Basin alone. EIA identifies Fervo Energy's Cape Station in Utah, scheduled to come online in June 2026, as the country's first large-scale commercial enhanced-geothermal plant.[61] Transmission is the connective tissue for all of it: FERC's Order No. 2023 required cluster studies, stricter readiness requirements, and firm study deadlines after 68 percent of interconnection studies completed in 2022 were issued late.[62] Berkeley Lab cautions that it remains too early to judge the reforms' full effect.[63]

**Energy as Statecraft**

Domestic abundance has rewritten America's external position. The United States was the world's largest liquefied natural gas (LNG) exporter in 2024, and its LNG exports surged from 0.5 billion cubic feet per day in 2016 to 15.0 billion in 2025.[64] In 2024, Europe (including Turkey) took 53 percent of US LNG exports, while Asia's share rose to 33 percent.[65] Those cargoes gave Europe a way out of dependence on Russian gas. As Russian pipeline deliveries fell 89 percent below their 2021 level in 2023, Europe turned primarily to LNG, and the United States supplied almost half of it.[66]

Energy has always been a weapon in the hands of those who control supply. The 1973 OPEC embargo showed what a supplier cartel could do to an import-dependent America.[67] The 2026 attacks on Middle Eastern oil infrastructure show that disruptions abroad still reach every US gas station.[68]

The newer pressure point is critical minerals. The IEA reports that the average market share of the top three refining nations for key energy minerals rose from about 82 percent in 2020 to 86 percent in 2024, with China supplying most of the growth in cobalt, graphite, and rare earths. In December 2024, China restricted exports of gallium, germanium, and antimony to the United States, followed in early 2025 by restrictions on additional minerals and seven heavy rare earth elements.[69] An America that produces its own fuel but imports the materials for its grid and batteries has traded one vulnerability for another.

**Energy Reforms: What Is Being Done and What Might Work**

Washington has moved on several fronts since 2025. On January 20, 2025, President Trump declared a national energy emergency, directing agencies to speed the leasing, production, transportation, refining, and generation of domestic energy.[70] A May 2025 executive order set the goal of bringing three advanced nuclear test reactors to criticality by July 4, 2026, which DOE exceeded.[71]

In response to the 2026 oil shock, the Department of Energy offered on September 29 to exchange up to 40 million barrels of crude oil from the Strategic Petroleum Reserve, the final tranche of a 172-million-barrel US commitment to a coordinated International Energy Agency release.[72] The G7 announced additional measures on October 2.[73]

Permitting reform remains the largest unfinished task. The House passed the SPEED Act (H.R. 4776), which would narrow the scope of National Environmental Policy Act (NEPA) review and limit judicial challenges, by a vote of 221 to 196 in December 2025; it awaits a Senate vote.[74] On September 30, 2026, Senate committee leaders introduced the Bipartisan American Affordability and Jobs Act (S. 5653), a comprehensive permitting bill that has been referred to the Energy and Natural Resources Committee.[75]

States have acted too, if sometimes at cross-purposes. California enacted a 2024 law that empowers regulators to set minimum fuel inventories for refiners—shortly before Phillips 66 announced it would close its Los Angeles refinery.[76]

Permitting deadlines and narrower review windows would shorten the five-year path from interconnection request to operation. Cost discipline on transmission and distribution spending along with rate designs that do not shift fixed costs onto households would address the main drivers of rising energy bills. Fuel policies that recognize California's isolation—rather than deepening it with layered taxes, unique blends, and a shrinking refinery base—would narrow the gap between its pump prices and the nation's. And a supply strategy that pairs near-term gas with long-lead nuclear, geothermal, and new transmission would meet rising load without betting the grid on any one technology.

**Conclusion**

For the nation, energy is both an economic foundation and an instrument of power. Record production, net-exporter status, and LNG cargoes to allies give the United States leverage it lacked in 1973—but only if rising demand is met by new supply and if the minerals and materials of the modern grid are not held hostage abroad. The lesson of the past half century is that energy scarcity can be determined as much by policy as it can by geology. Free people and free markets built American energy abundance; preserving it requires policy prescriptions that let them keep building that abundance.

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