

WASHINGTON DC: LOWEST IN CARBON EMISSIONS, HIGHEST IN INCREASED COSTS

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October 2026

Washington, D.C., has the lowest carbon emissions per capita of any state in the U.S., at less than 4 metric tons per person (See Fig. 1). That is the good news. The bad? Its rate of increase in the cost of energy is also the highest in the country at over [93% over the last 5 years.](#)

This drastic increase in cost is due to several factors, including inflation, increased wholesale prices from PJM, and, crucially, local green energy mandates. Ratepayers around the country are facing increasing prices from inflation. But Maryland and New Jersey, also in the PJM service area, faced just 50% increases in cost over the same period. By trying to squeeze out the relatively small amount of carbon in its electricity grid, DC has chosen a policy path to meet its ambitious net zero goals in the most expensive way. [Some estimates](#) put the city's implied cost of carbon, the price tag for abating a single metric ton of CO2 emissions, at \$750 to \$870. The next closest states are Massachusetts and New Jersey, both of which are at \$300 to \$400 per metric ton (Implied cost of carbon is the calculated financial cost per metric ton of greenhouse gas reduced by a specific policy or technology mandate).

It must be noted that carbon emissions are a global problem. The reality is that abating small amounts of carbon from the lowest-emitting state adds tremendous burdens on low-income residents while achieving no measurable impact on global climate change.

ENERGY PROFILE

Because it is entirely urban, D.C.'s population density — more than 11,000 inhabitants per square mile — is exceptionally high compared to any state, and more than 120 times the national average. Less than 10% of dwellings are single-family detached homes, the lowest among states and far below average (62%). More than half of dwellings are in apartment buildings with 10 units or more.

In consequence, the district's homes are much smaller (1,224 square feet on average) than across the country (1,845 square feet). Other things equal, smaller homes use less energy for power, lighting, heating, and especially cooling. The typical district home heats almost 30% less space (1,130 square feet) than nationally (1,596 square feet). More significantly, the average home cools 27% less space (955 square feet) than the national average (1,361 square feet).

Exceptionally high population density and urbanization have compelled the district to develop an extensive mass transit system. The proportion of commuters using public transport (27%) is seven times higher than average (4%). The district has more transit riders than most states with far higher populations. The proportion of people working from home (23%) is ten percentage points higher than the average (13%). Car use is well below average. The volume of driving per resident on the district's roads (5,064 vehicle-miles) is just half the countrywide average (9,640).

Energy consumption is low because there is virtually no manufacturing in the district. Manufacturing output is so low it is not reported separately to preserve confidentiality. By contrast, manufacturing contributes an average of 9% of output nationwide. Mostly as a result, the district's total energy consumption per person (200 million British thermal units per year) is lower than all but nine states and almost 28% below the average (278 million BTUs).

The district's energy system is also extraordinary because it relies so heavily on fuels and electricity imported from neighboring areas. The district consumes 75 times more energy than it produces. The district generates only 2% of its own electricity and imports 98% from adjoining areas. Most of this electricity is generated by a mix of nuclear and gas in neighboring Maryland, Virginia and Pennsylvania but does not show up in the district's own generation or emissions.

Fossil fuels still dominate the district's energy system, supplying 94% of consumption in 2024, though the share had declined slightly from 100% in 2005. Gas for heating and power generation was the largest source of primary energy, followed by oil for transport. There have been more profound changes in electricity generation. Fossil fuels accounted for just over half (53%) of the district's own utility-scale generation in 2024, down from 100% in 2005. Coal-fired generators and heating plants were once dominant but have been replaced by a combination of gas and biomass-firing. Solar has become increasingly important, much of it from small-scale installations mounted on rooftops. Small-scale solar accounted for three-fifths of all generation in the district in 2025.

The district emitted less than 3 million metric tons of carbon dioxide in 2024, far less than any state. Most emissions came from transport (41%), followed by commercial buildings (34%) and homes (24%). Most emissions came from gas (57%), with the rest from oil (43%). There is no coal combustion in the district following the conversion of the Capitol Power Plant to run on gas (though it can still run on coal as a backup fuel).

Emissions per person (less than 4 tons) were lower than any state — just one-quarter of the nationwide average (14 tons). Emissions were even more modest in relation to the district's very high output. Emissions per \$1 million (17 tons) were far lower than any state and just 8% of the national average (205 tons).

Since 2005, emissions have fallen rapidly as remaining coal-fired generation and steam plants have been converted to run on lower-emission gas and biofuels. Total emissions have declined more than twice as fast (2.6% per year) as the national average (1.2%). Emissions per person

(3.6% per year) and per unit of GDP (4.0% per year) have also fallen much faster than nationwide (1.9% and 3.1% respectively).

DC POLICIES

Solar

The District of Columbia's Renewable Portfolio Standard (RPS) is among the most aggressive mandates in the country, requiring 100% of retail electricity sales from renewable energy by 2032. Additionally, there is a strict solar carve-out requiring electric suppliers to procure a growing percentage of electricity from solar energy generated specifically within the DC borders, increasing to 15% by 2041. Failure to acquire the adequate number of Solar Renewable Energy Certificates (SRECs) results in steep statutory penalties in the form of a Solar Alternative Compliance Payment (SACP).

This statutory attempt to incentivize local solar development has driven an unprecedented surge in utility compliance costs. Between 2018 and 2025, total RPS compliance costs have risen from \$50.6 million to \$272.6 million.

By establishing rigid, statutory compliance schedules while relying heavily on out-of-state renewable build rates over which D.C. has no regulatory control, the District has exposed its power market to severe credit price volatility.

The financial mechanics of the solar carve-out create severe economic equity distortions across D.C. neighborhoods. High SREC prices (\$350-\$455/MWh) allow property owners who can afford upfront solar installations or financing to generate \$2,200 to \$3,200 annually in passive SREC income in addition to their net-metering bill credits. Over half of DC households are low-income residents or renters who lack the means or property rights to install solar and therefore receive none of these financial subsidies. Those residents are saddled with higher monthly electric bills to fund the compliance penalties and grid infrastructure upgrades that support privately owned solar arrays.

Natural gas

Under DC's 2022 climate legislation, all new commercial and residential construction as well as major renovation projects are mandated to meet net-zero emissions standards. This requirement effectively establishes a ban on natural gas equipment and appliances in new developments, forcing space heating, water heating, and cooking systems to be fully electrified. While framed as a critical step toward building sector decarbonization, this mandatory transition creates profound operational, financial, and grid-reliability challenges.

The fundamental flaw in this approach is that it forces massive energy demand onto the electrical grid at the exact time regional power supplies are tightening and capacity costs are

skyrocketing. Pushing these loads entirely onto the electric infrastructure amplifies peak demand, necessitating expensive distribution system upgrades that add to the bills ratepayers shoulder.

DC residents who can least afford to shoulder the cost burden of these climate initiatives are paying a steep cost. Low-income renters in Wards 7 and 8, who already experience energy burdens triple those of wealthier Ward 3 residents, face rising electricity prices driven by grid electrification without receiving adequate support. Ultimately, banning natural gas appliances imposes significant financial costs and political friction on residents while accomplishing no measurable reduction in global climate trajectories.

POLICY RECOMMENDATIONS

Replace rigid technology-specific mandates with market-based standards. This applies to both the RPS and the net-zero building standard. DC's carbon abatement cost is wildly outside of what other states are paying, even in the most expensive markets.

Invest in efficiency programs and public transportation. Leaning into the structural advantages that DC has — urban efficiency and heavy use of public transportation — will be a more pragmatic approach than the current path of pushing against DC's lack of electric generation and reliance on PJM capacity.

Revisit the underlying rationale for DC's net-zero goals. DC is the lowest per capita emitting "state" in the country. At the same time, it has the highest cost for abating carbon, more than twice that of the next most costly states. Ratepayers in the poorest parts of DC are facing energy poverty, forced to make choices between buying food and medicine or paying a utility bill. All of this should be considered in the context of what the goal of carbon emission reduction is. On the global scale, where climate change occurs, DC's incremental and expensive emissions abatement from these policies has no measurable effect. Is there a point where cost prompts the question, "are we good enough for now?"

CONCLUSION

Instead of working backward from a goal of net-zero by an arbitrary date, policymakers should assess the cost and benefit of climate policies. These policies should not be undertaken for their own sake. In that assessment, the effect on low-income residents should carry great weight. The benefit side of the equation should explicitly acknowledge what effect on global climate change these policies have. Increasingly expensive policies aimed at minimal additional carbon abatement should be viewed skeptically. DC residents deserve that rigorous skepticism and thoughtful assessment.

APPENDIX: DISTRICT OF COLUMBIA ENERGY CONSUMPTION AND EMISSIONS

The District of Columbia's energy consumption per person is well below average and per unit of output is the lowest in the country, according to data from the U.S. Energy Information Administration.¹ Nearly all electricity is imported from neighboring states where it is generated by a mix of nuclear, gas, and coal. Generation inside the district is dominated by gas and biomass, which have replaced coal, but the share from rooftop solar is growing very rapidly. Emissions in the district are the lowest in the country. Energy prices are high, but until recently spending has been lower than average because the district uses so little energy. However, residential electricity prices are rising rapidly as a result of capacity problems on the PJM Interconnection stemming from the rapid growth in data centers across the border in northern Virginia.

The District of Columbia has a temperate climate overall, but summer heat can exceed 100 degrees Fahrenheit and nearby rivers and bays impart high humidity. Between 2015 and 2024, the district experienced an average of 1,811 cooling days, almost 19% above the national average (1,522). Most homes have some form of air conditioning (93%), in the majority of cases a central unit (68%), and both are slightly above the nationwide average. Winters are slightly milder than across the country as a whole. The average number of heating degree days (3,569) was 11% below the national average (4,001). Nearly all homes are heated with either utility gas (56%) or electricity (41%).

The district has more than 700,000 people living in an area of only 61 square miles. Population density is exceptionally high (more than 11,000 inhabitants per square mile), far higher than any state, and more than 120 times the national average (94). The district is wholly urban. At the time of the last Census in 2020, the entire population was classified as urban compared with 80% across the country as a whole. Less than 10% of dwellings are single-family detached homes, the lowest in the country and far below average (62%). More than half of dwellings are in apartment buildings with 10 units or more.²

In consequence, the district's homes are much smaller (1,224 square feet on average) than across the country (1,845 square feet). All else equal, smaller homes use less energy for power, lighting, heating, and especially cooling. The typical district home heats almost 30% less space (1,130 square feet) than the national average (1,596 square feet). More significantly, the average home cools 27% less space (955 square feet) than nationwide (1,361 square feet).³

Exceptionally high population density and urbanization have compelled the district to develop an extensive mass transit system. The proportion of commuters using public transport (27%) is seven

¹ Unless stated otherwise, all the data and rankings in this profile are taken from the most recent online edition of the State Energy Data System (SEDS) published by the U.S. Energy Information Administration and cover energy consumption and emissions through 2024. Emissions are restricted to carbon dioxide (CO₂) from combustion of fossil fuels, excluding fugitive methane, other greenhouse gases, and emissions from land use, land-use change and forestry.

² *American Community Survey* (U.S. Census Bureau, 2026).

³ *Residential Energy Consumption Survey* (U.S. Energy Information Administration, 2026).

times higher than average (4%). The district has more transit riders than most states with far higher populations.⁴ The proportion of people working from home (23%) is ten percentage points higher than the average (13%). Car use is well below average. The volume of driving per resident on the district's roads (5,064 vehicle-miles) is just half the countrywide average (9,640).

District residents have the highest incomes in the country. The workforce is highly educated, with two-thirds (65%) having at least a bachelor's degree compared with less than 37% nationwide. More than one-third of the workforce has an advanced degree. The largest sources of employment are in professional, scientific and management (25%); public administration (18%); education, health and social assistance (18%); and other services (10%). The proportion of jobs in public administration is more than three times higher than in the country as a whole (5%). Very few residents work in manufacturing compared with about one in ten across the country. Wages and salaries are high. Median household income (\$110,000) is about one-third above the national average.⁵

The district is effectively a "city-state" specializing in public administration and other service activities. It has a relatively low resident population with many workers commuting in from neighboring areas. Measured output per person is exceptionally high because much of it is attributable to workers who reside elsewhere. Reported in 2017 dollars, gross domestic product per person (\$210,000) was three times higher than the national average (\$68,700) in 2024.

Energy consumption

Energy consumption is low because there is virtually no manufacturing in the district. Manufacturing output is so low it is not reported separately to preserve confidentiality. By contrast, manufacturing contributes an average of 9% of output nationwide. Mostly as a result, the district's energy consumption per person (200 million British thermal units per year) is lower than all but nine states and almost 28% below the average (278 million BTUs).

Energy consumption is low in relation to the district's output because so much of the output is attributable to workers who live elsewhere. Consumption per \$1 million of output (0.95 billion BTU) was far lower than any state and less than one-quarter of the national average (4.05 billion). Consumption per unit of output has also fallen much faster (3.5% per year) than in the rest of the country (2.2%) since 2005. The district's apparent energy efficiency advantage has therefore been growing.

The district's energy system is also extraordinary because it relies so heavily on fuels and electricity imported from neighboring areas. The district consumes 75 times more energy than it produces. The district generates only 2% of its own electricity and imports 98% from adjoining areas. Most of this electricity is generated by a mix of nuclear and gas in neighboring Maryland, Virginia, and Pennsylvania but does not show up in the district's own generation or emissions.

⁴ *National Transit Database* (Federal Transit Administration, 2026).

⁵ *Maryland State Profile* (U.S. Census Bureau, 2026).

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Energy-related emissions

The district emitted less than 3 million metric tons of carbon dioxide in 2024, far less than any state. Most emissions came from transport (41%) followed by commercial buildings (34%) and homes (24%). Most emissions came from gas (57%) with the rest from oil (43%). There is no coal combustion in the district following the conversion of the Capitol Power Plant to run on gas (though it can still run on coal as a backup fuel).

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Prices and expenditure

Energy prices are among the highest in the country. District residents and businesses pay an average of more than \$32 per million British thermal units for electricity, gas and liquid fuels. Prices are the third-highest in the country (after Hawaii and California) and almost 44% higher than the national average (\$23). But because the district uses so little energy, total spending is well below average, especially in relation to the district's high incomes and output. Combined spending on electricity, gas and fuels per person (\$3,746) was the fifth-lowest in the country and 16% below the national average (\$4,440) in 2024. Only residents of Maryland, Colorado, New York and Florida spent less. Energy spending accounts for a small share of GDP (1.4%), by far the lowest in the country, and just over one-quarter of the average (5.2%).

⁶ *State Energy Data System – District of Columbia Profile* (U.S. Energy Information Administration, 2026).

In 2024, residential electricity prices (17.7 cents per kilowatt-hour) were in line with nearby Maryland and Pennsylvania and slightly above the national average (16.5 cents per kWh). But district residents used almost 20% less electricity (3,538 kWh per person) than the national average (4,361kWh). As a result, total spending (\$626) was moderately below average (\$720).

Gas consumption by all sectors fell to 39 million BTU per person in 2024 from 60 million in 2025. Gas consumption is among the lowest in the country (only Vermont and Hawaii use less) and less than 40% of the national average (101 million BTU). Residential gas prices have always been a couple of dollars per thousand cubic feet above the national average. Residential prices were just over \$16 per thousand cubic feet compared with a nationwide average of under \$15 in 2024. The district's prices are in the second-highest quartile of the distribution but prices have been broadly stable after adjusting for inflation for a decade.

Recent developments in electricity prices (2019-2026)

In recent years, the district has experienced some of the fastest increases in electricity prices even as electricity consumption has fallen. Between 2019 and 2024, residential prices increased at an average annual rate of 2.4% compared with a nationwide increase of 0.9% after adjusting for inflation. Prices climbed even as district-wide consumption by all sectors fell by 1.7% per year compared with growth of 0.9% per year nationally. Residential prices climbed faster than anywhere else in the country except California.

Part of the reason is the rapid growth in rooftop solar. Growing self-generation from rooftop panels is putting upward pressure on residential rates as the fixed costs of central generation as well as transmission and distribution have to be spread across a smaller number of kilowatt-hours sold. Higher rates are therefore not necessarily the same as higher bills. But there is an increasing burden on households who do not have access to rooftop solar.

The district is part of the Pennsylvania-New Jersey-Maryland (PJM) Interconnection, which is also responsible for coordinating transmission and reliability for 67 million customers across all or part of 13 states in the Mid-Atlantic and Midwest. PJM hosts the largest concentration of data centers in the country just across the border in northern Virginia. Data center loads have been growing faster than PJM has added generation and transmission, causing an increasingly acute shortage of capacity on the transmission network at peak times.

PJM's wholesale electricity prices have been surging as the region struggles with capacity shortages. Wholesale electricity prices increased by 47% in 2025 and are forecast to increase by another 27% in 2026.⁷ Rising wholesale rates are filtering through into escalating tariffs for residential customers. Residential prices climbed by 24% in 2025 and another 23% in the first five months of 2026 compared with a year earlier.

⁷ *Short-Term Energy Outlook* (U.S. Energy Information Administration, 7 July 2026).

ABOUT THE AUTHORS

Neel Brown

Neel is Managing Director at PPI where he helped build the Energy and Climate Solutions Initiative, which is widely respected and relied on by Members of Congress, Senators, and their staff for pragmatic proposals and solutions.

Neel is deeply engaged in PPI's international efforts, frequently engaging with policymakers and think tanks in Europe on energy issues and other policy and political topics.

Before joining PPI, Neel was the President of Legis Media, an advocacy communications firm that he founded in 2004. He has extensive experience in advocacy advertising, grassroots organization, and coalition building. He spent over seven years working on Capitol Hill and political campaigns.

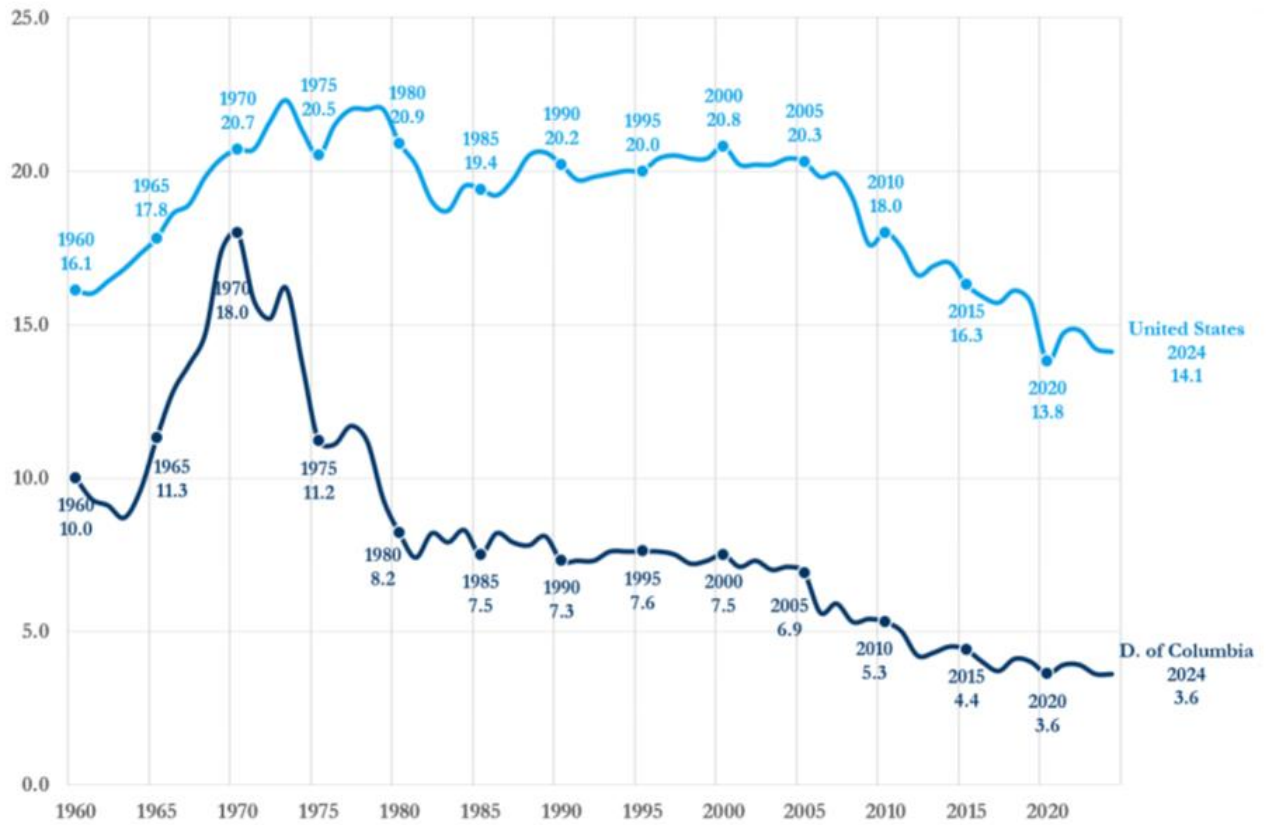
John Kemp

Founder and Director of JKempEnergy.com, John is an internationally recognized expert on energy markets and systems, including technology, industry structure and risk management.

He curates a daily digest of "Best in Energy" news and research from all sources sent via email to more than 15,000 energy market professionals with readership over 13,000 per week.

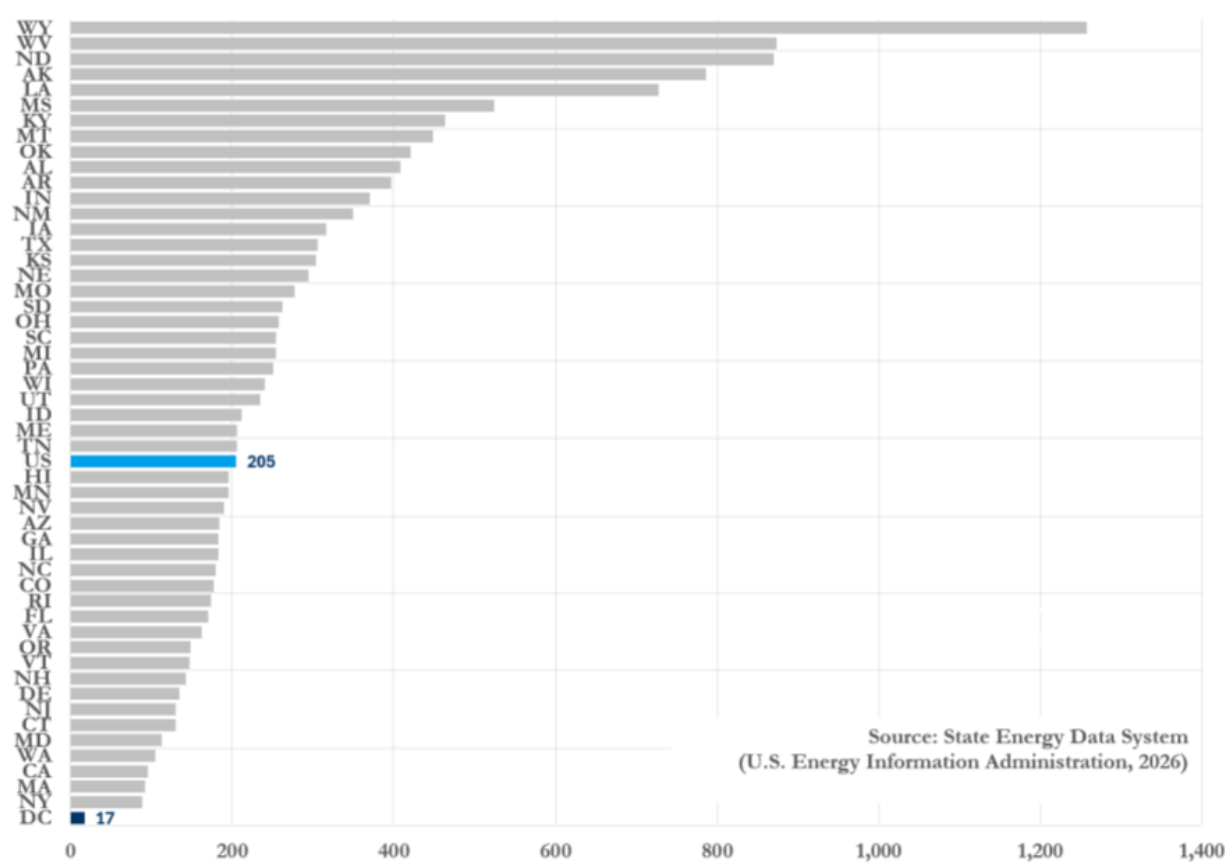
He also publishes a newsletter three times a week analyzing major developments across most sources (oil, gas, coal, renewables and electricity) and regions (North America, Europe, China, India, Southeast Asia and Latin America).

Figure 1: District of Columbia energy-related CO₂ emissions per capita, 1960-2024
metric tons per capita



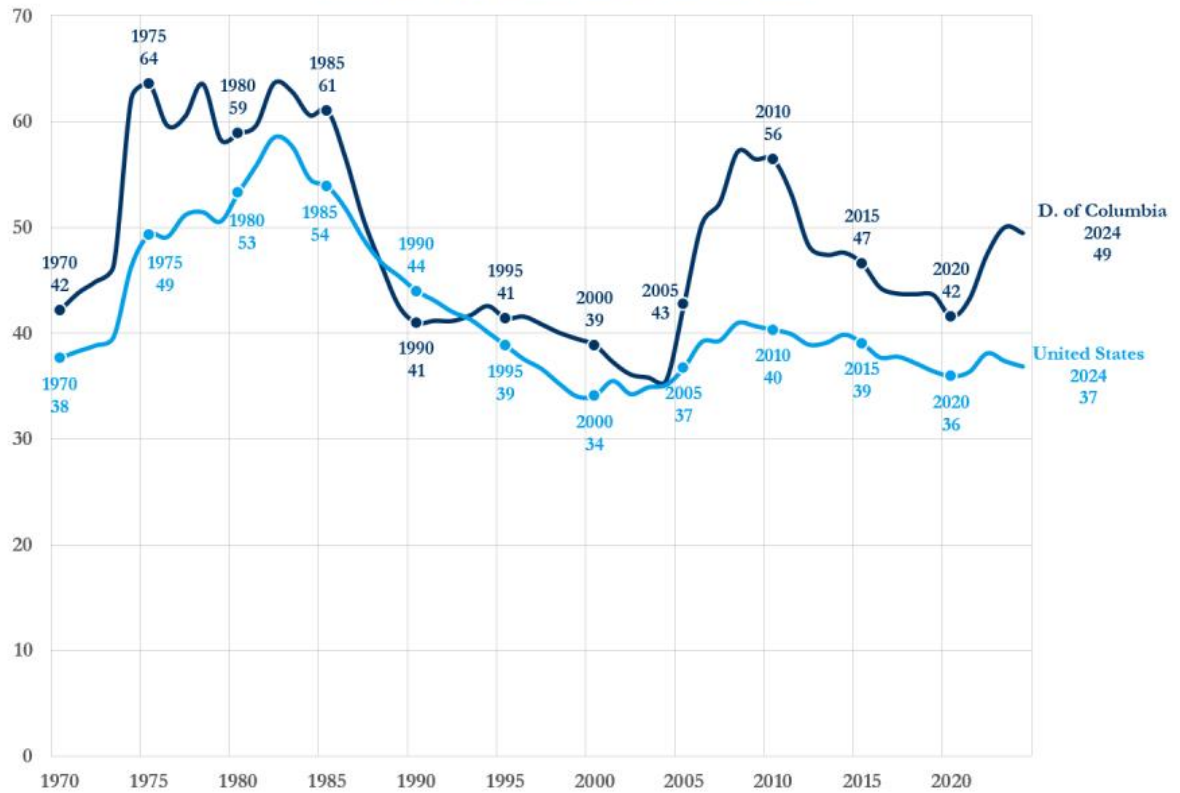
Source: State Energy Data System (U.S. Energy Information Administration, 2026)

Figure 2: State-level energy-related carbon dioxide emissions in 2024
metric tons per U.S.\$(2017) 1 million



Source: State Energy Data System
(U.S. Energy Information Administration, 2026)

Figure 3: District of Columbia electricity prices, 1970-2024
U.S.\$ (2024) per million British thermal units



Source: State Energy Data System (U.S. Energy Information Administration, 2026)

Figure 4: U.S. electricity prices charged to residential users (including taxes)
compound annual growth rate between 2019 and 2024, percent, adjusted for inflation

