U.S. Energy-Related Carbon Dioxide Emissions, 2025

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Independent Statistics and Analysis
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Executive Summary

This report highlights notable trends in energy-related carbon dioxide (CO_2) emissions in the United States in 2025, based on preliminary data. The U.S. Energy Information Administration (EIA) has published this report on an annual basis since 2010, and has published monthly historical data and forecasts on energy-related CO_2 emissions since August 2009.

U.S. energy-related CO_2 emissions increased by 2%, or about 115 million metric tons (MMmt), in 2025. Emissions increased across all economic sectors, with the largest increase (in tonnage) in the electric power sector as a result of both higher electricity demand and a larger share of electricity generated from coal, relative to 2024 (Table 1). Colder winter weather relative to 2024 also led to an increase in emissions from the residential and commercial sectors for space heating.

Emissions increases in the industrial and transportation sectors were small, with energy efficiency gains and switches to less carbon-intensive fuels curbing growth. The following sections of the report provide more detail and insights into emissions changes for each sector.

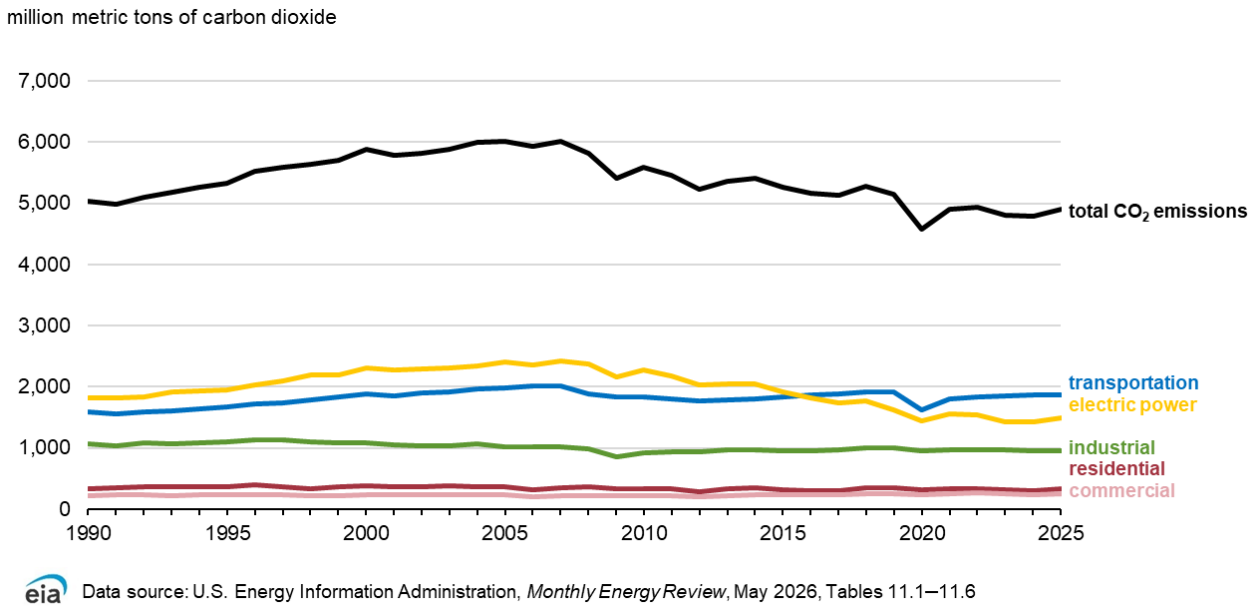
Table 1. Total U.S. energy-related carbon dioxide emissions by sector, 2021–2025

million metric tons of carbon dioxide

Sector	2021	2022	2023	2024	2025
Residential	325	340	313	304	331
Commercial	245	260	245	239	256
Industrial	977	964	964	955	960
Transportation	1,807	1,842	1,855	1,863	1,871
Electric power	1,553	1,539	1,422	1,427	1,485
Total	**4,906**	**4,945**	**4,799**	**4,789**	**4,904**

Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.1–11.6
Note: Totals may not equal sum of components due to independent rounding.

Figure 1. U.S. energy-related carbon dioxide emissions by sector, 1990–2025



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.1–11.6

Key Findings

Growth in electricity demand and coal's share of electricity generation were the largest contributors to increases in CO_2 emissions

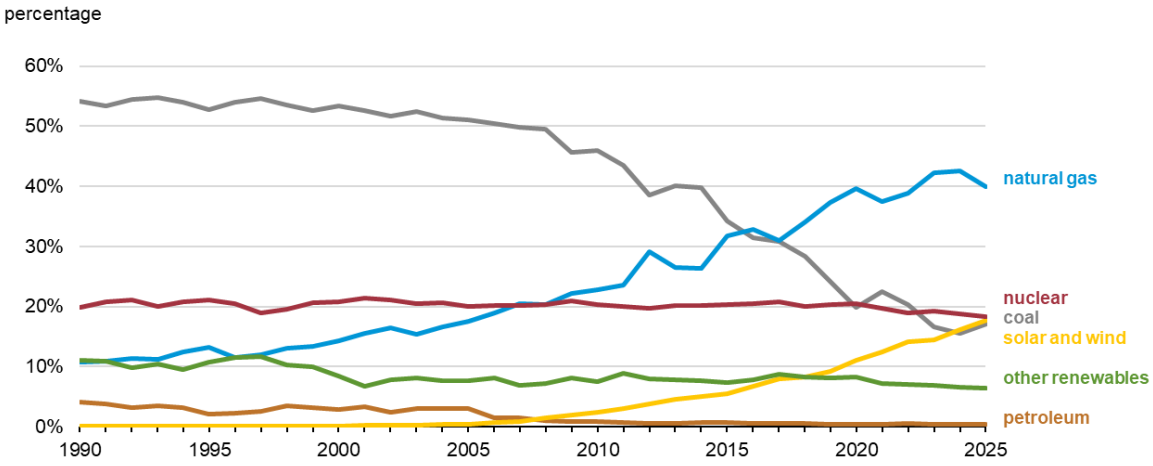
CO_2 emissions from the electric power sector rose by 4%, or 58 MMmt, in 2025, partly because of growth in overall electricity generation. Net generation in the electric power sector increased by 3%, or 119 terawatthours (TWh), in 2025, surpassing 2024's record annual generation. Hot summer weather, which led to increased demand for space cooling and record summer peak electricity demand, and growth in electricity demand from data centers and manufacturing facilities both contributed to increased generation.

Changes in the electricity generation mix also influenced sectoral CO_2 emissions, with both net growth in fossil fuel-fired generation and relative growth in coal-fired generation, which emits more CO_2 per kilowatthour than natural gas when combusted. Specifically:

- Coal-fired electricity generation increased by 13% (85 TWh), raising coal-related CO_2 emissions by 78 MMmt
- Natural gas-fired electricity generation decreased by 4% (64 TWh), lowering natural gas-related CO_2 emissions by 23 MMmt
- Wind generation increased by 3% (12 TWh) and solar generation rose by 34% (75 TWh), curbing increased emissions from electricity generation

Electricity generation from other sources was essentially flat compared with 2024.

Figure 2. Share of U.S. electric power sector generation by fuel source, 1990–2025

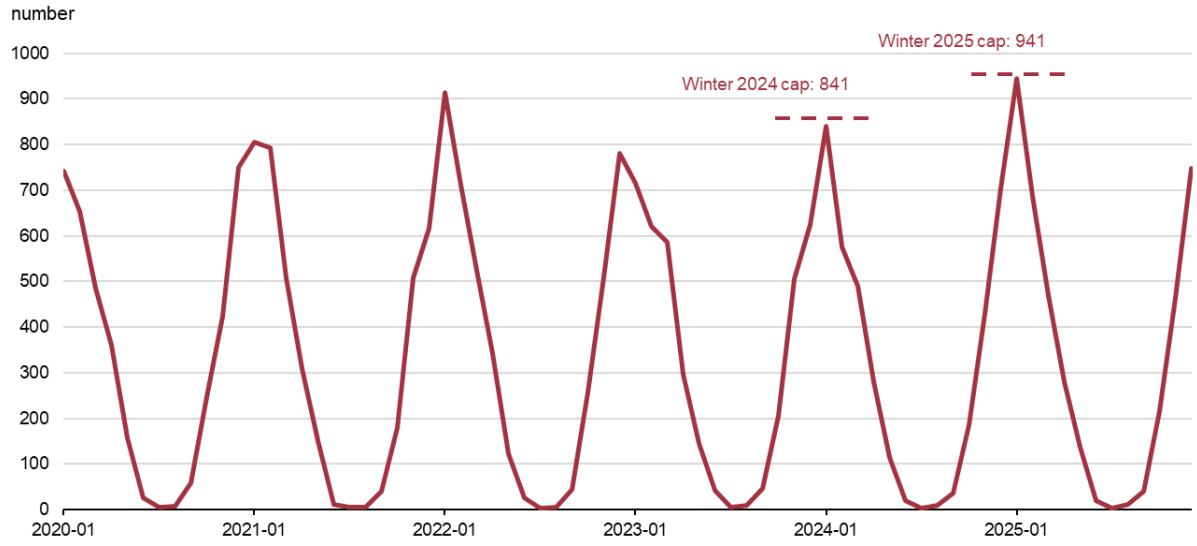


Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Table 7.2a, Electricity Net Generation Total (All Sectors), and Table 10.6, Solar Electricity Net Generation
Note: Solar and wind excludes small-scale solar generation

Colder winter weather led to higher residential and commercial natural gas use and CO_2 emissions

CO_2 emissions increased in 2025 from rising consumption of natural gas, propane, and distillate fuel oil—key fuels used in space heating –in both the residential and commercial sectors. Increases in CO_2 were primarily a result of colder winter weather relative to 2024. U.S. population-weighted heating degree days (HDDs), increased by 9% relative to last year, with a peak winter HDD reaching 12% higher than the 2024 winter season.

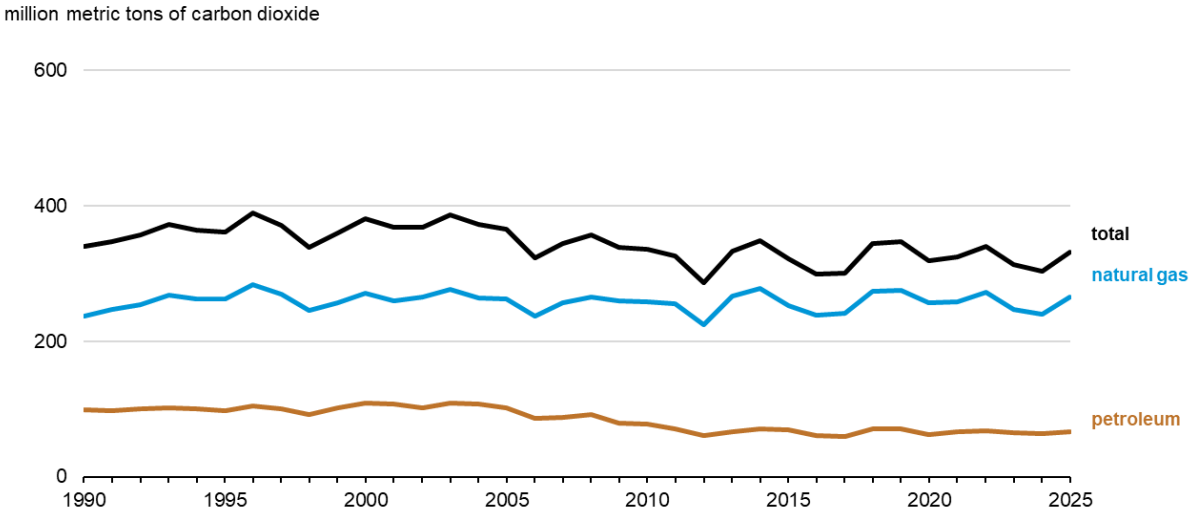
Figure 3. U.S. monthly average heating degree days, 2020–2025



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Table 1.11, Heating Degree-Days by Census Division

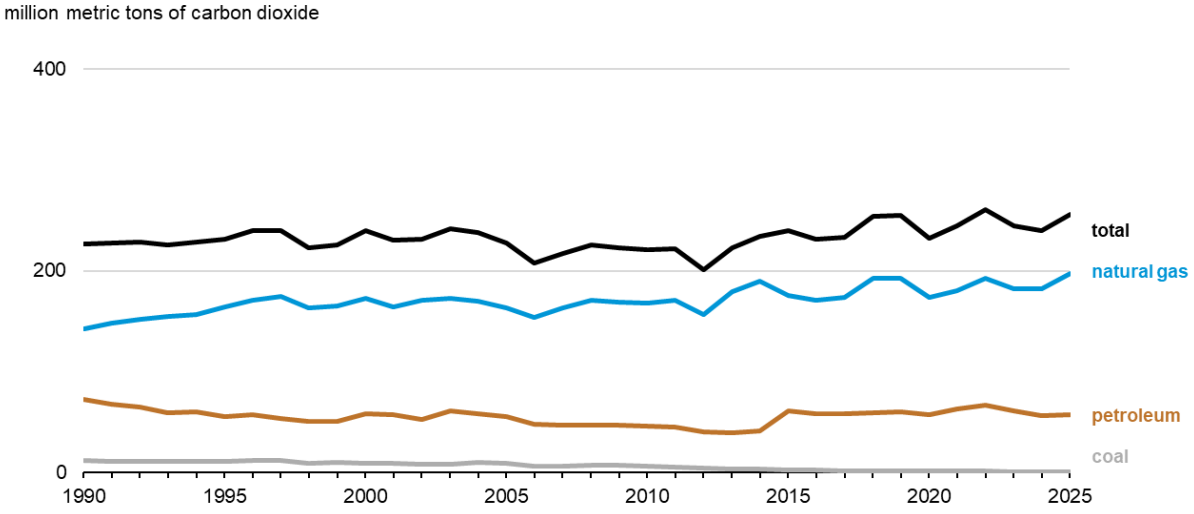
Direct energy use CO_2 emissions in the residential and commercial sectors increased by 9% (27 MMmt) and 7% (17 MMmt) relative to 2024, respectively.

Figure 4. U.S. residential sector direct carbon dioxide emissions by fuel source, 1990–2025



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.2, Carbon Dioxide Emissions from Energy Consumption: Residential Sector
Note: Total represents only direct emissions from the residential sector and does not include emissions associated with the use of utility-scale electric power. Petroleum includes distillate fuel oil, kerosene, and propane.

Figure 5. U.S. commercial sector direct carbon dioxide emissions by fuel source, 1990–2025

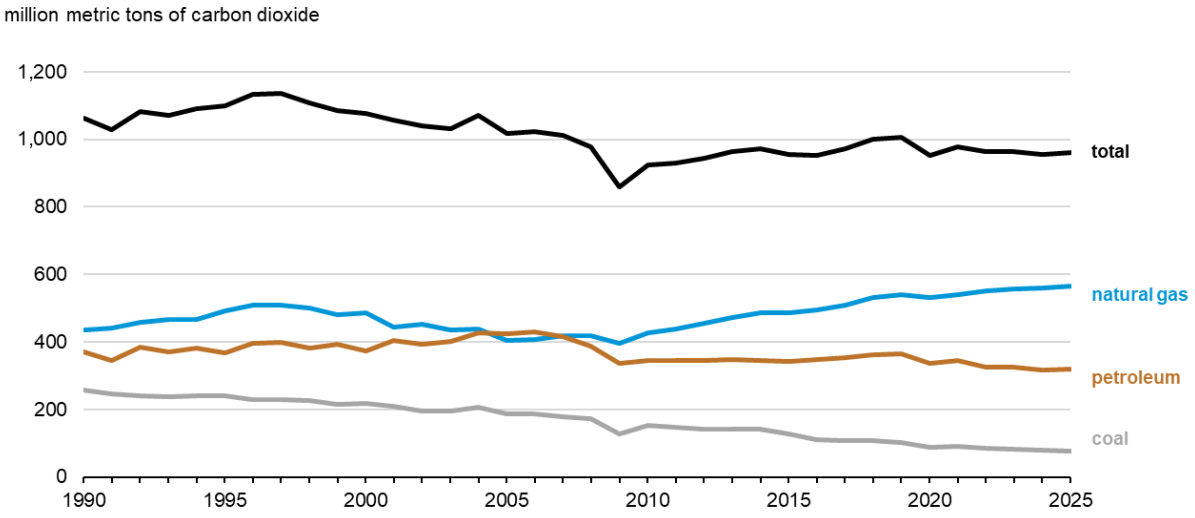


Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.3, Carbon Dioxide Emissions from Energy Consumption: Commercial Sector
Note: Total represents only direct emissions from the commercial sector and does not include emissions associated with the use of utility-scale electric power. Petroleum includes distillate fuel oil, kerosene, propane, motor gasoline, petroleum coke, and residual fuel oil.

Total industrial CO_2 emissions remained mostly unchanged as decreases in coal-related emissions balanced increases from natural gas

CO_2 emissions from the U.S. industrial sector increased by less than 1% (5 MMmt) in 2025. Despite an increase in industrial output in 2025, emissions from the sector remained relatively unchanged because of changes in fuels used. Specifically, coal use in the industrial sector, for both power and manufacturing, continued to decrease through 2025. However, as coal use in industry has decreased, natural gas use has continued to increase and is expected to reach records in 2026 and 2027. As a result of these fuel changes, industrial coal-related emissions fell by 4% (3 MMmt) in 2025 while natural gas-related emissions rose by 1% (6 MMmt). The residual increase in total emissions was a result of modest increases in consumption of various petroleum products.

Figure 6. U.S. industrial sector direct carbon dioxide emissions by fuel source, 1990–2025



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.4, Carbon Dioxide Emissions from Energy Consumption: Industrial Sector
Note: Total represents only direct emissions from the industrial sector and does not include emissions associated with the use of utility-scale electric power.

Transportation sector CO_2 emissions remained flat as decreases from motor gasoline emissions offset increases from distillate fuel oil

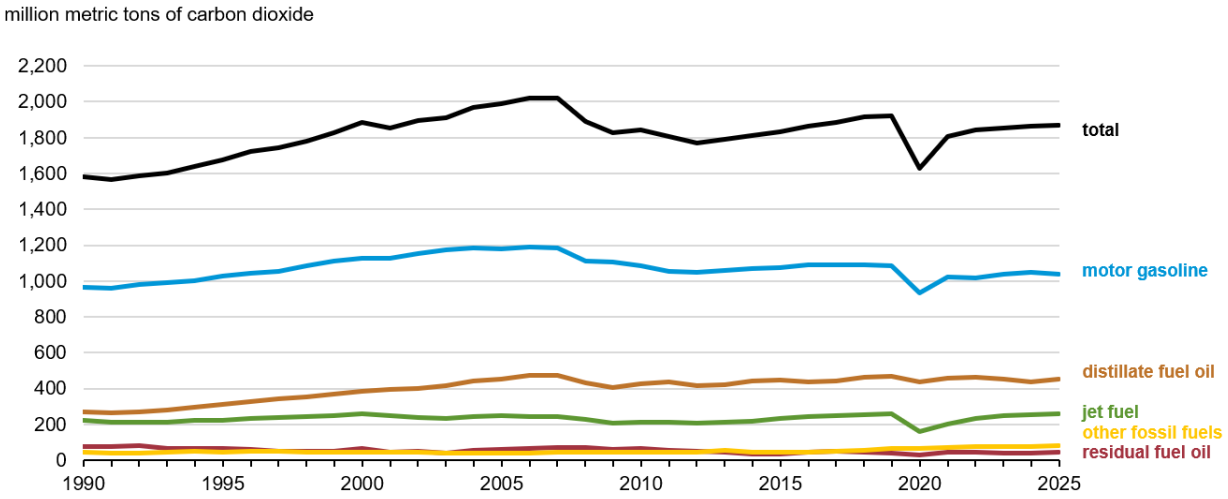
U.S. transportation sector emissions remained effectively unchanged in 2025 as emissions changes in the two most-used fuels, motor gasoline and distillate fuel oil, offset each other. CO_2 emissions from motor gasoline fell by 1% (12 MMmt), but CO_2 emissions from distillate fuel oil increased by 3% (12 MMmt). Smaller emissions increases from other fuels, such as jet fuel as use has gradually returned to near pre-pandemic levels, did not meaningfully affect overall sectoral emissions changes. Total transportation sector emissions rose by less than 1% relative to 2024.

Decreases in motor gasoline CO_2 emissions were most closely associated with improvements in vehicle fuel economy, some of which can be attributed to changing trends in vehicle powertrains. Most of these

fuel economy improvements can be attributed to continued efficiency improvements in conventional light-duty vehicles. To a lesser extent, increases in electric vehicles and hybrid electric vehicles in the U.S. light-duty fleet also contribute to fuel economy improvements. Emissions reductions from improvements in light-duty vehicle fuel economy outpaced emissions growth from steadily rising on-road vehicle travel, resulting in an overall reduction in motor gasoline emissions.

Increases in CO_2 emissions from distillate fuel oil, mostly from increased vehicle travel and on-road diesel consumption, offset emissions decreases from motor gasoline. Diesel is a more common fuel in larger heavy-freight vehicles, for which there are fewer electric and hybrid options. As a result, demand for freight movement grows faster than fuel economy improvements, leading to a net increase in distillate emissions.

Figure 7. U.S. transportation sector carbon dioxide emissions by fuel source, 1990–2025



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, May 2026, Tables 11.5, Carbon Dioxide Emissions from Energy Consumption: Transportation Sector
Note: Total represents only direct emissions from the transportation sector and does not include emissions associated with the use of electric power.

Background and Data

We based our analysis of U.S. energy-related CO_2 emissions in this report on data published in our *Monthly Energy Review* (MER). This initial analysis is based on preliminary 2025 data published in the May 2026 edition of the MER. These values are subject to change as final data are published from underlying sources, according to source data revision policies and publication schedules. Although these results are still preliminary, we expect only minor revisions to these estimates. If major revisions to 2025 CO_2 emissions estimates do occur, then this report will be revised accordingly. Supplemental analysis, figures from past reports, and a discussion of the methodology and terminology used in this report are available in the Appendix.

Emissions values and analysis presented in this report pertain only to U.S. CO_2 emissions associated with fossil-fuel combustion and non-combustion applications of energy products (for example, as industrial

feedstocks). We do not include estimates of CO_2 emissions outside this scope or other greenhouse gas emissions burned or released in production, extraction, or distribution of energy products. Our approach may result in discrepancies between our emissions estimates and those of other organizations, including other U.S. government agencies.

In addition to historical estimates, we also offer short-term forecasts and long-term projections of U.S. energy-related CO_2 emissions in several other data products. You can find a short-term forecast of U.S. energy-related CO_2 emissions and key drivers in our monthly *Short-Term Energy Outlook* (STEO), which includes monthly forecasts by fuel source currently through the end of 2027 and the latest estimates of the effects of recent events on energy markets and energy-related CO_2 emissions. We publish long-term U.S. emissions projections in our *Annual Energy Outlook*, which provides annual projections of energy-related CO_2 emissions by fuel source, sector, and end use through 2050.

EIA has published this report on an annual basis since 2010. The STEO has included a forecast for energy-related CO_2 emissions since August 2009. The MER has also included historical data for energy-related CO_2 emissions on a monthly basis since August 2009.