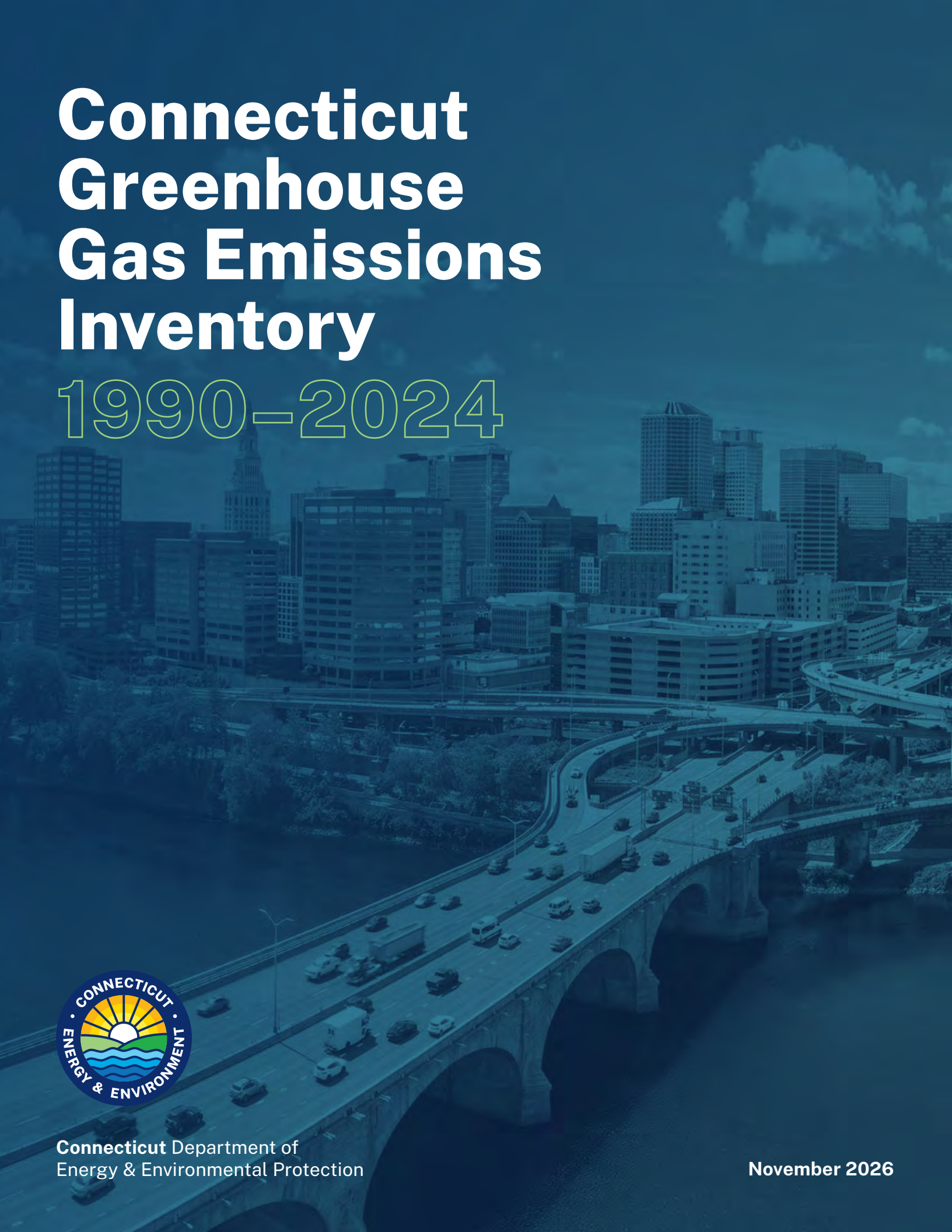
Connecticut Greenhouse Gas Emissions Inventory

1990–2024



Connecticut Department of
Energy & Environmental Protection

November 2026

Table of Contents

Figures 3
Abbreviations 3
Statutory Targets and Reporting Requirements 4
Summary of Findings 5
1990–2024 Emissions 7
Sector by Sector Review of Emissions 1990-2024 9
- Transportation 9
- Residential 11
- Electric Power 13
- Commercial Buildings 14
- Industrial Processes 15
- Wastewater and Solid Waste 16
- Agriculture 17
- Natural Gas Distribution System 18
- Natural and Working Lands 19

Appendices 20
- Appendix A: Electric Sector RECS 20
- Appendix B: Calculating Biogenic Emissions 21
- Appendix C: Generation vs Consumption based emissions from the Electric Power Sector over recent years in MMTCO2e 22

Figures

Figure 1: Connecticut's Economy-wide GHG Emissions
Figure 2: 1990-2023 GHG emissions by sectors
Figure 3: Percentage contribution of each economic sector to GHG emissions
Figure 4: Analysis of transportation sector GHG emissions
Figure 5: GHG Emissions in the residential sector
Figure 6: Statewide heating and cooling degree days
Figure 7: Commercial sector emissions

Abbreviations

Conservation and Load Management **(C&LM)**
Department of Energy and Environmental Protection **(DEEP)**
Electric Vehicle (**EV)**
Energy Information Administration **(EIA)**
Environmental Protection Agency **(EPA)**
Federal Highway Administration **(FHA)**
Greenhouse Gas **(GHG)**
Global Warming Solutions Act **(GWSA)**
Heating Degree Days **(HDD)**
Materials Innovation and Recycling **(MIRA)**
Megawatt hour **(MWh)**
Million Metric Ton of Carbon Dioxide equivalent **(MMTCO2e)**
Natural and Working Lands **(NWL)**
Renewable Portfolio Standards **(RPS)**
State Energy Data System **(SEDS)**
State Inventory Tool **(SIT)**
the United States Department of Agriculture **(USDA)**
Vehicle-Miles Traveled **(VMT)**



Statutory Targets and Reporting Requirements

For over two decades Connecticut has had statutory greenhouse gas (GHG) gross emissions reduction targets and the requirement to report on GHG emissions reduction progress. An Act Concerning Climate Change[1] in 2004 established state-wide emission reduction targets for 2020. The Global Warming Solutions Act (GWSA) of 2008[2] further refined and solidified targets and reporting requirements in state law, establishing state-wide emission reduction targets for 2050 using a 2001 baseline. The GWSA targets have been supplemented over time by legislation creating an interim target in 2018 for 2030,[3] an electric power sector target in 2022[4] for 2040, and, in 2025, adding an economy-wide interim target for 2040 and a net-zero target for 2050.[5] Connecticut's current GHG emissions targets are now:

- 10% below 1990 levels by January 1, 2020
- 45% below 2001 levels by January 1, 2030
- 65% below 2001 levels by January 1, 2040
- 0% from electricity supplied to electric customers in the state by January 1, 2040
- Net-zero by January 1, 2050, requires direct and indirect emissions of greenhouse gases to be at least 80% below 2001 levels by January 1, 2050.

The Connecticut Department of Energy and Environmental Protection (DEEP) is required to publish an inventory of GHG emissions sources and carbon sequestered annually by January 1st to track the state's progress towards these targets.[6]

[1] Public Act 04-252: **An Act Concerning Climate Change**
[2] Public Act No. 08-98: **An Act Concerning Connecticut Global Warming Solutions**
[3] Public Act No. 18-82: **An Act Concerning Climate Change Planning and Resiliency**
[4] Public Act No. 22-5: **An Act Concerning Climate Change Mitigation**
[5] Public Act No. 25-125: **An Act Concerning the Protection of the Environment and the Development of Renewable Energy Sources and Associated Job Sectors**
[6] Public Act No. 25-125: **An Act Concerning the Protection of the Environment and the Development of Renewable Energy Sources and Associated Job Sectors**

Summary of Findings

This inventory of emissions of GHGs updates previous inventories[7] to encompass anthropogenic emissions from the years 1990-2024 as well as an estimate of non-anthropogenic emissions and carbon sequestration through the state's natural and working lands.

For the year 2024, the most recent year for which data is available, GHG emissions fell to 34.7 million metric tons of carbon dioxide equivalent (MMTCO2e) or 28% below 2001 benchmark levels (Table 1). Between 2023 and 2024, emissions decreased by 0.5 MMTCO2e, or 1.3%, reversing the trend of increasing emissions since the 2020-2021 COVID-19-induced decline. While transportation sector emissions approached their 2019 pre-pandemic levels, total GHG emissions remained below 2019 levels primarily due to electric power sector emissions decreasing to approximately the same levels as they were in 2021. Continued emissions declines in the residential building sector and a decrease in commercial buildings sectors also offset the increase in transportation sector emissions. The state continues to meet the 2020 target of 10% below 1990 levels with emissions currently 22% below 1990.



Transportation sector emissions, the state's largest source of emissions (44% of total GHG emissions), increased by approximately one-half MMTCO2e between 2023 and 2024. While transportation emissions have decreased by nearly 13% from the 2001 benchmark, they remain virtually unchanged since 1990, the first year of data included in Connecticut's annual GHG inventories. Emissions levels for the transportation sector in 1990 are approximately 2.2 MMTCO2e lower (12.7%) than in 2001.



Buildings sector emissions for residential and commercial constitute the state's second largest source of emissions (32%). Residential emissions declined 3% over the previous year (or 0.2 MMTCO2e) and are 22% below the 2001 benchmark. Declines in the commercial building sector have resulted in a 5% decrease (or 0.2 MMTCO2e) from both 2023 and 2001 levels, as emissions in this sector were the same in both years.



Industrial processes sector emissions, the third largest source of emissions (11%), declined slightly (3%) from 2023, but have increased by 9% since 2001 levels.



Electric power sector consumption-based emissions, the fourth largest source of emissions (7%), returned to lower levels slightly above those experienced in 2022 following a rise in 2023 caused by planned service outages at the Millstone nuclear facility. Emissions in 2024 are 77% below the 2001 benchmark and 19.5% lower than 2023 (or 0.7 MMTCO2e).

[7] **CT Greenhouse Gas Inventory Reports**

Emissions from the agriculture and waste sectors and natural gas leakage remain relatively constant.

Connecticut's natural and working lands sequestered approximately net 4.8 MMTCO2e. Connecticut's inventory of non-biogenic GHG emissions relies heavily on calculations performed using the Environmental Protection Agency's (EPA) State Inventory Tool (SIT)[8] with data from the Energy Information Administration's (EIA) State Energy Data System (SEDS) as input. SEDS is based on a comprehensive inventory of energy consumption, production, and expenditures from fossil fuels and renewable sources at the state level spanning back to the 1960s and is derived from EIA surveys and statistical methods. Due to SEDS consistent treatment of data across decades, it is invaluable as a tool for compiling the inventory of GHG emissions.

Table 1: Emissions from each economic sector in Connecticut for select years

Sector Emissions (MMTCO2e)	1990	2001	2019	2022	2023	2024
Transportation	15.1	17.3	15.4	14.9	14.6	15.1
Residential	8.3	8.6	7.3	7.1	6.9	6.7
Commercial	3.8	4.3	4.2	4.3	4.3	4.1
Industrial	3.0	3.4	3.2	3.7	3.8	3.8
Electric Power (Consumption)	11.9	12.3	5.7	2.5	3.6	2.9
Waste	1.4	1.6	2.1	1.6	1.5	1.5
Agriculture	0.3	0.3	0.3	0.2	0.3	0.3
Natural Gas Leakage	0.8	0.5	0.2	0.2	0.2	0.2
Natural and Working Lands	-5.4	-5.1	-4.8	-4.6	-4.7	-4.8
Total Gross Emissions w/ Electric Consumption	**44.7**	**48.3**	**38.7**	**34.5**	**35.2**	**34.6**

GHG emissions would have to decline 22% from 2024 levels to meet the 2030 target of a 45% reduction from 2001 levels. This would require emissions to decline by an average of 1.3 MMTCO2e each year from 2024-2030.

[8] **Download the State Inventory and Projection Tool | US EPA**

1990–2024 Emissions

For the year 2024, the most recent year for which data is available, GHG emissions fell to 34.2 MMTCO2e or 29% below 2001 levels. Between 2023 and 2024, emissions decreased by 1 MMTCO2e, or 2.8% reversing the trend of increasing emissions since the 2020-2021 COVID-19-induced decline. GHG emissions must decline 23% from 2024 levels to meet the statutory 2030 target of a 45% reduction from 2001 levels. This would require emissions to decline by an average of 1.4 MMTCO2e or 3.9% each year from 2024-2030. If emissions declined at the same average rate that they have since 2004 of 0.6 MMTCO2e or 1.3% each year (Figure 1), then Connecticut's economy-wide emissions would be 37% below 2001 levels by 2030. In April 2026, DEEP published Connecticut's business-as-usual GHG emissions projections that showed emissions being reduced by at least 34% by 2030.[9]

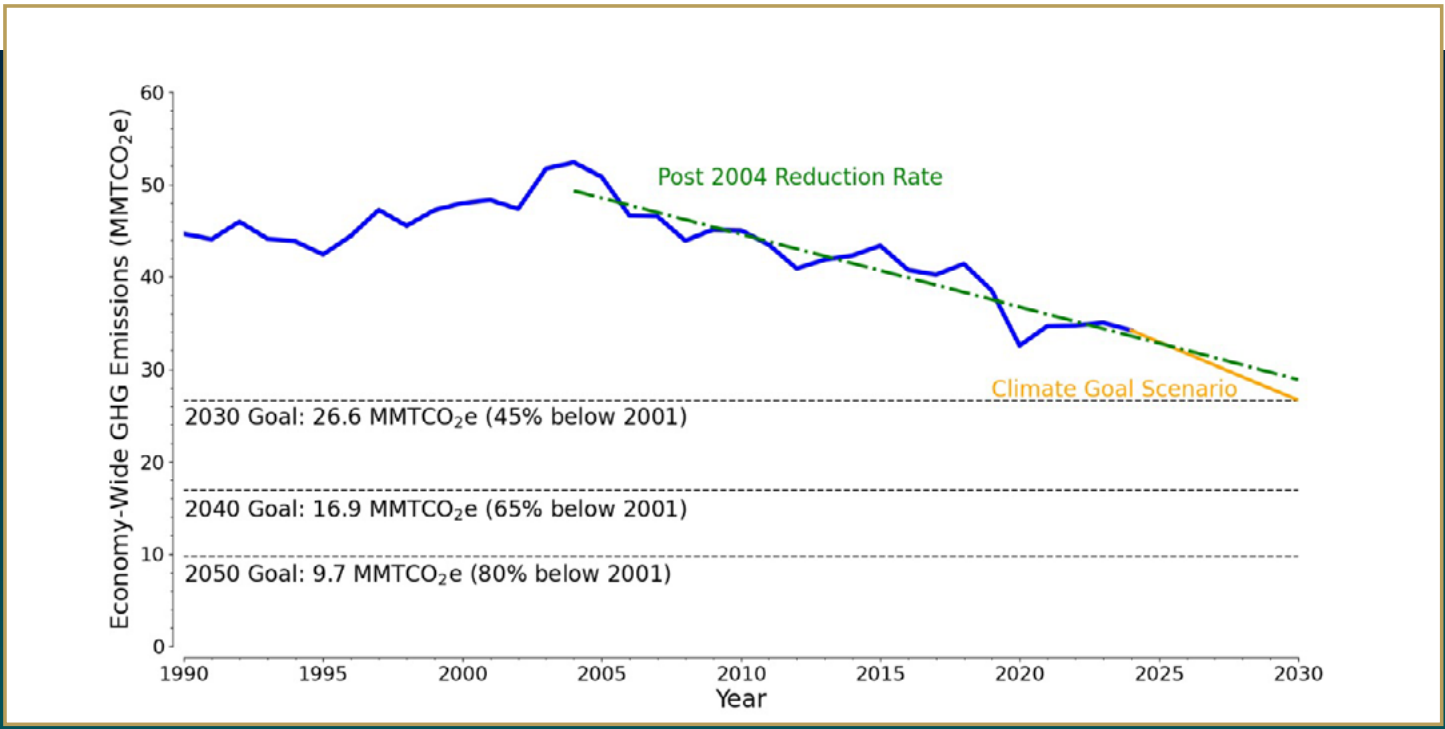


Figure 1: Connecticut's Economy-wide GHG Emissions for the years 1990-2024. Also shown in green is the average annual emissions decline curve since emissions peaked in 2004 along with the needed average decline between 2024 and 2030 to meet the state's climate goal.

Between 2023 and 2024, the transportation, residential, and commercial sectors are the biggest emitters, respectively. Residential and commercial sectors experienced a small decrease in emissions. After a modest decline in 2023, transportation sector emissions increased in 2024. Electric power sector emissions decreased to their 2022 levels. All other sectors remained the same. Natural and working lands had a small increase in carbon sequestration.

[9] **DEEP 2026 Climate Progress Report**

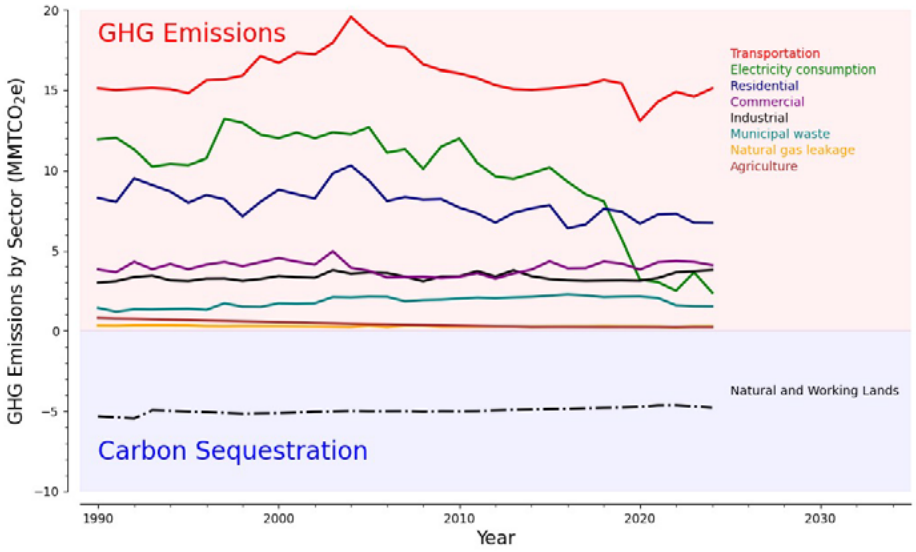
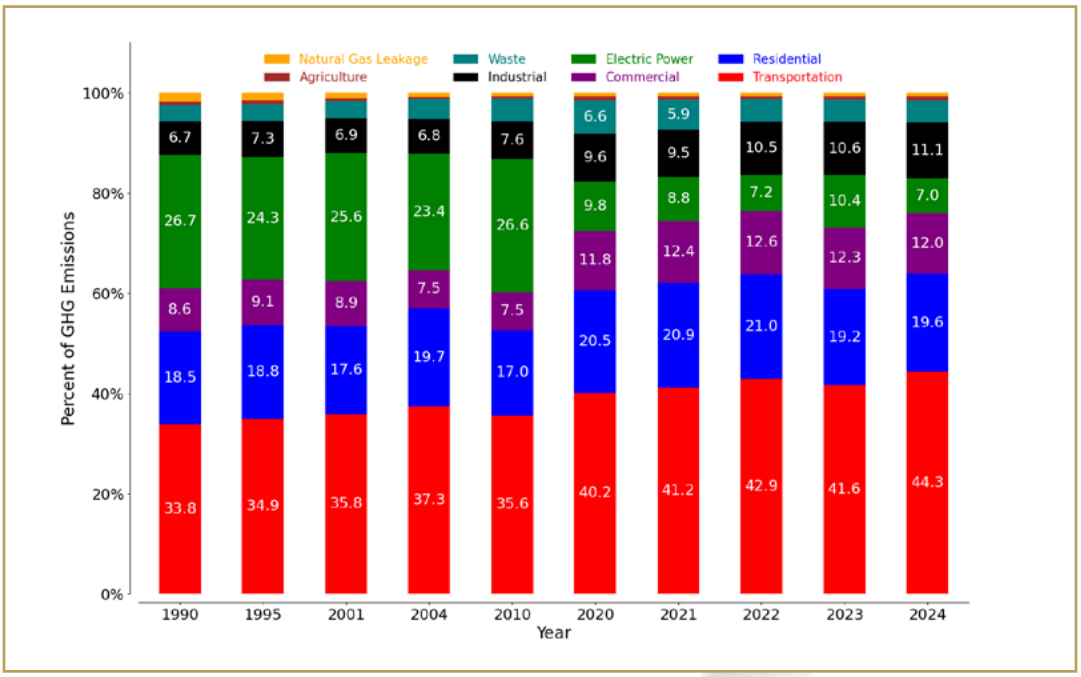


Figure 2: Breakdown of 1990-2024 GHG emissions across the economy. Transportation emissions are depicted in red, followed by residential emissions in dark blue. Commercial emissions are shown in purple, while industrial, electricity consumption, municipal waste, agriculture, and fugitive natural gas emissions are represented in black, green, light blue, brown, and orange, respectively. Net sequestration from Connecticut's forests and urban tree canopy are depicted as negative emissions.

Figure 3: Relative contribution of each economic sector to Connecticut's total GHG emissions for selected years. Emissions peaked in 2004. Transportation emissions have historically constituted the largest proportion of emissions but in more recent years have taken up a larger fraction of statewide emissions as emissions decline in the Electric Power. Color scheme like Figure 2.



Sector by Sector Review of Emissions 1990-2024



Transportation

Transportation Sector Results

Transportation GHG emissions rose from 14.6 MMTCO2e in 2023 to 15.1 MMTCO2e in 2024 or a 3.4% increase. Transportation emissions had decreased from their 2022 levels in 2023. The change from 2022 to 2024 levels was an increase of 0.2 MMTCO2e or a 1.3% increase in emissions. The 2024 emissions are 2% below the pre-pandemic levels in 2019 of 15.4 MMTCO2e.

Transportation remains the highest source of emissions in Connecticut and releases more than twice as much CO2 as the next largest emitter. As seen in Figure 4, emissions in this sector have fallen compared to 2001 by approximately 13%. However, current emissions remain near 1990 levels, and, when averaged over the past ten years, transportation emissions only show a modest 1.6% decrease from 1990 levels.

Transportation Sector Analysis

Transportation emissions include the consumption of fossil fuels in personal vehicles, rail, aviation, buses, and vehicles used for transporting goods across the state. Gasoline sales are estimated in SEDS using data from the Federal Highway Administration (FHA) and can be found in the FHA's annual publication of Highway Statistics[10] in Table 8.4.2. Emissions from diesel fuel used in the transportation sector are estimated from FHA data on state-level tax receipts.

Vehicle-miles traveled (VMT) increased 2% between 2023-2024[11], partially explaining the growth of emissions. Gasoline accounts for 73% of the total emissions in the transportation sector, making it the largest source of emissions by fuel type.

Table 2 shows the number of active and new light duty (passenger) electric vehicle (EV) registrations[12] in Connecticut for the years 2020-2024. There were 16,176 additional EV registrations in 2024, bringing the total number of EVs on the road to 60,489, approximately four and half (4.5) times more EVs than were on the road in 2020. Electric vehicles constitute an increasing percentage of total passenger vehicles

[10] The U.S. DOT - Federal Highway Administration - Highway Statistics 2024 - User's Guide
[11] The U.S. DOT - Federal Highway Administration - Highway Statistics 2024 - Annual Vehicle-Miles Table
[12] Electric-Vehicle-Registration-Data | CT Open Data Portal

each year. In 2024, the percentage of total passenger vehicles on the road registered as EVs exceeded 2%, an increase of 0.72% from 2023. As of December 2024, the Connecticut Hydrogen and Electric Automobile Purchase Rebate Program (CHEAPR) approved 13,388 rebates since the start of the program in 2015, totaling over $31 million in awards to Connecticut residents.[13] Despite the growing percentage of passenger EVs on Connecticut roads, gasoline consumption within the transportation sector increased nearly 8% from 162 trillion British thermal units (TBtu) in 2023 to 175 TBtu in 2024.[14] This spike amounts to an increase from 359 gallons consumed per capita in 2023 to 381 gallons consumed per capita in 2024. This rate outpaces the growth in gasoline consumption in the neighboring states of Massachusetts, New Hampshire, and Rhode Island, which increased by 2-4%.

Table 2: Passenger EV registrations and concentration (in percent % total passenger vehicles) in Connecticut over the past five years.

Year	Cumulative Total Number of Passenger EV Registrations	EV Concentration (% Total Passenger Vehicles)
2020	13,800	0.63%
2021	21,377	0.96%
2022	30,186	1.33%
2023	44,313	1.97%
2024	60,489	2.69%

Source: **CT DEEP - 2025 EV Registration Factsheet**

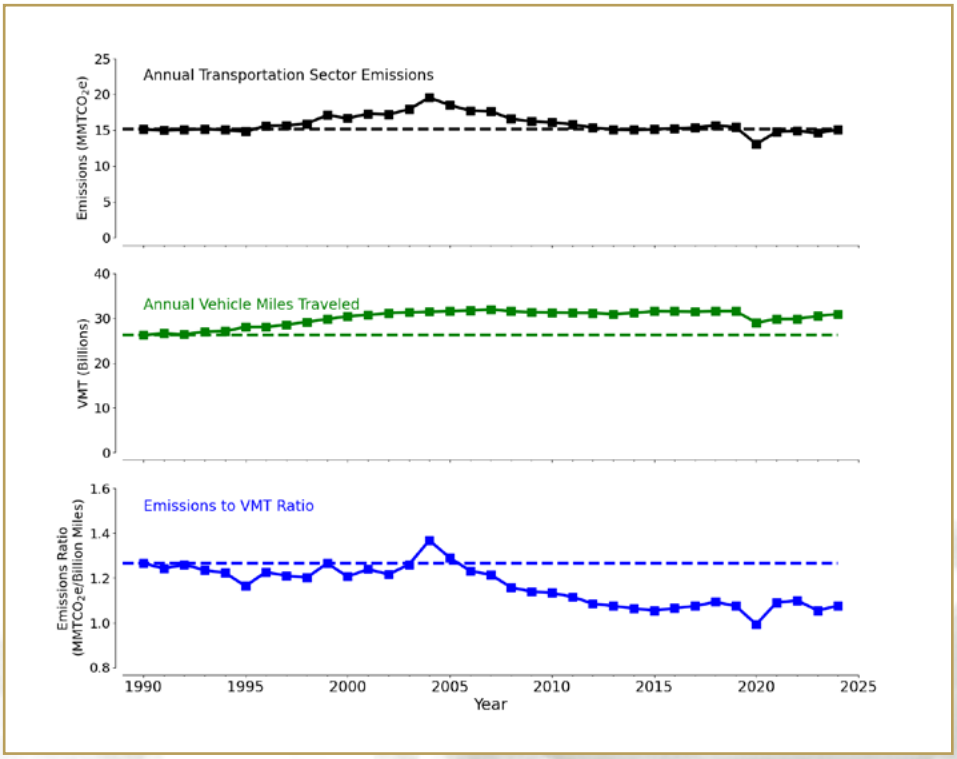


Figure 4: Left: Total transportation sector GHG emissions, 1990–2024. Middle: Annual vehicle miles traveled (VMT), 1990–2024. Bottom: Ratio of emissions to VMT. The dashed line represents 1990 values in all three panels.

Source: CT DOT, USDOT.

[13] **CHEAPR - Program Statistics**
[14] **Table F15: Motor gasoline consumption estimates, 2024. HTML and/or Excel version of this table.**



Residential

Residential Sector Results

Residential emissions decreased from 6.9 MMTCO2e in 2023 to 6.7 MMTCO2e in 2024, or 2.9%, which falls within the trend of decreasing emissions since 2021. Since 2021, there has been a 6.4% decline in emissions in this sector, equaling almost 0.45 MMTCO2e.

Residential Sector Analysis

The data required to determine residential emissions partially relies upon data included in the EIA Fuel Oil and Kerosene Sales Report to determine sales of distillate fuel as heating oil. In 2020, this sales report was suspended, and from 2021-present, SEDS has since relied upon a linear regression model weighted using the state's population and the year's statewide heating degree days to estimate heating oil sales in the residential and commercial sectors.[15] Heating degree days (HDD) are defined as the difference between a day's average temperature and 65° Fahrenheit. This method allows DEEP to track the number of days that require heating demand during cold days. Furthermore, estimates of biodiesel present in heating oil sold are provided based on state blending mandates.

Residential emissions account for fossil fuel combustion used for home heating, water heating, and, to a much smaller degree, cooking. In 2024, over 75% of homes in Connecticut burned fossil fuels to heat their homes, including 35% using heating oil and 41% using natural gas or liquid propane. Electric heat is used in 20% of homes[16] with the remainder heating with wood or other fuels. While the share of homes dependent on electricity for heating increased from 19% to 20% between 2023-2024, this increase in electrification alone is not enough to explain the reductions in this sector.

Additionally, although the state's weatherization and energy efficiency measures like the Home Energy Solutions program offered through Energize CT[17] contribute to reductions in residential sector emissions, there has been a significant decrease in rebate claims since 2023. In 2024, 13,200 home heat pump rebates were claimed through the state's Conservation and Load Management (C&LM) program, a 42% cut from the previous year. This decrease in home heat pump rebates may or may not reflect the rate of heat pump adoption in Connecticut. In 2024, a federal tax credit of up to $2,000 for the installation of heat pumps was also available,[18] although CT DEEP does not have data on how many individuals took advantage of this tax credit.

[15] See SEDS complete technical notes **U.S. Energy Information Administration - EIA - Independent Statistics and Analysis**
[16] **American Community Survey 1-Year Data (2005-2024) | CT Data.org Blog**
[17] **Home Energy Solutions Assessment | Connecticut Homeowners**
[18] **Now Is A Great Time to Take Advantage of Cost-Saving Clean Energy Tax Credits and Incentives**

Heating and Cooling Demand and Climate Change

As average winter temperatures continue to increase, the reduction in the number of heating degree days (HDD) could lead to an overall decrease in GHG emissions from this source, if residential buildings need to heat less and burn less heating oil or natural gas. In 2024, Connecticut registered the second warmest average temperature for the winter in 2024.[19] In 2024, the number of HDD was consistent with this long-term trend with the number of HDD remaining below the forty-year average with 19% fewer heating degree days than average and a 44% increase in cooling degree days[20] (Figure 6). However, 2024 had slightly more HDD than 2023, making it difficult to attribute the decrease in GHG emissions from 2023 to 2024 to residential buildings using less heat. More HDD should lead to more heating and more GHG emissions. Measuring statewide heating and cooling degree days can be difficult, however, because average temperatures fluctuate throughout the state. For instance, in 2024, Hartford County had fewer HDD than other counties. While average temperatures across the state continue to rise, consistent with climate change, it is important to note that there continues to be year to year and local variability in HDD.

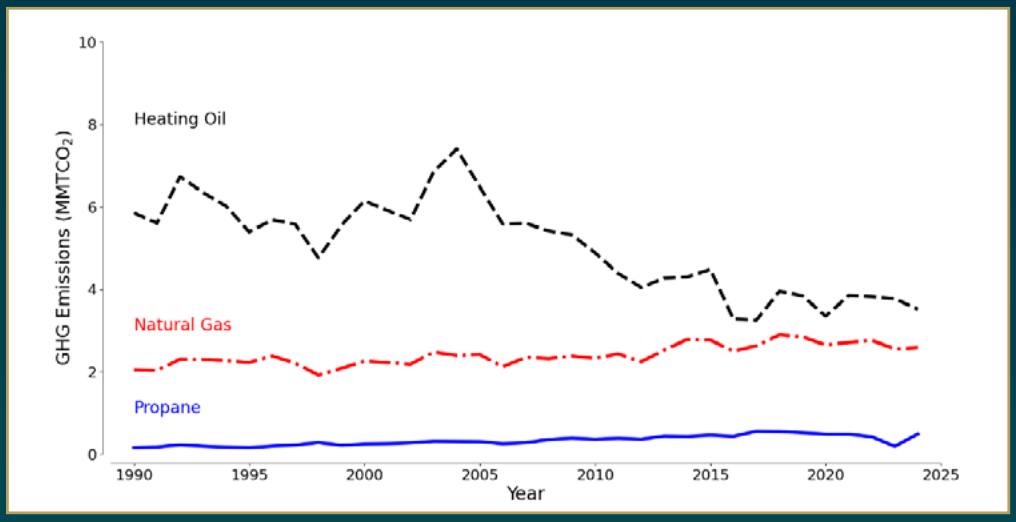
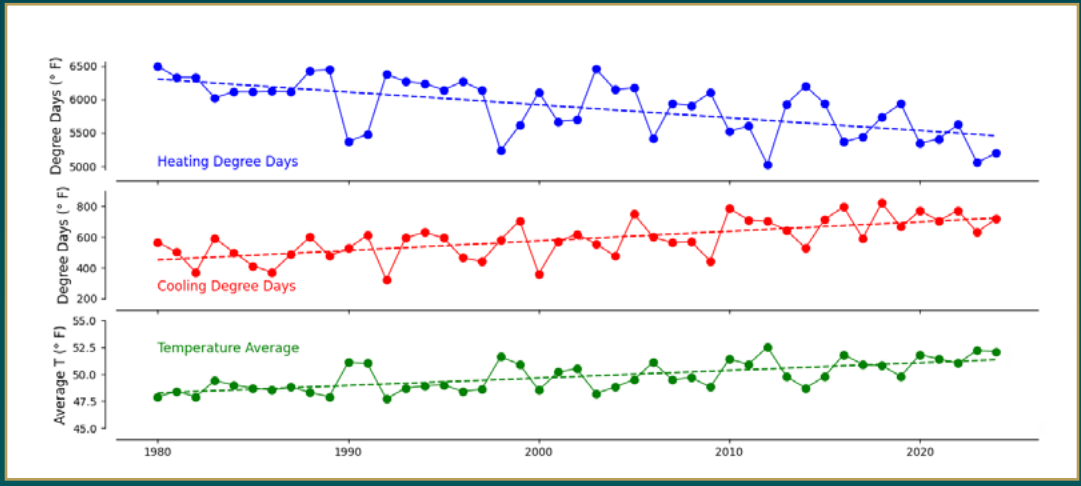


Figure 5: Left: Total transportation sector GHG emissions, 1990–2024. Middle: Annual vehicle miles traveled (VMT), 1990–2024. Bottom: Ratio of emissions to VMT. The dashed line represents 1990 values in all three panels. Source: CT DOT, USDOT.

Figure 6: Right: Heating degree days statewide 1980-2024. Middle: Cooling degree days 1980-2024. Bottom: Average temperature 1980-2024. Source: NOAA National Center for Environmental Information[21]



[19] **2024 Second Warmest Year in Connecticut History – The Hartford Times**
[20] **The Climate Challenge**
[21] **NCEI Climate at a Glance**



Electric Power

Electric Power Sector (Consumption) Results

Electric power sector emissions from electricity consumed by Connecticut decreased by about 19.5% from the previous year, emitting 2.9 MMTCO2e, which is about the same level recorded for 2021. Compared to the 2001 baseline, Electric power sector emissions have fallen by 77%.

Electric Power Sector Analysis

Electric power sector emissions are estimated based on the electricity consumed in Connecticut, using data provided by the U.S. EIA and ISO-NE. The emissions associated with this consumption are based on Connecticut RECs and environmental attributes and the residual ISO-NE electricity GHG emission factors.

The calculation method consists of the following steps. First, the quantity of electricity consumption attributable to RECs or other Environmental Attributes that are purchased to comply with the Renewable Portfolio Standards (RPS) and retired in Connecticut is deducted from the state's total electricity consumption. Emissions associated with this portion of electricity consumption are calculated using the standard emissions factor provided by EPA. In 2024, 78% of Connecticut's electric load can be accounted for through either RPS resources or through Millstone environmental attributes.

For the remaining portion of Connecticut's electricity consumption, GHG emissions are estimated by using an emissions factor derived from the ISO-NE residual electricity mix. This residual mix represents the total ISO-NE electricity generation after accounting for RECs retired in New England states other than Connecticut.

The RPS mandates that an increasing percentage of the state's electric energy supply is to be met by power plants producing energy from renewable resources which are grouped into three distinct classes:

- Class I sources are renewables like wind and solar but also include various emitting resources like biomass and landfill methane gas.[22]
- Class II consists of electricity generated from trash that is incinerated (trash-to-energy).
- Class III renewables are energy derived from combined heat and power systems.

In past years, DEEP has presented the consumption-based approach to electric sector emissions alongside the same calculation based solely on electric power generation. These approaches provide different values for total emissions because Connecticut is a net-exporter of electricity to the regional

[22] Effective October 1, 2025, PA 25-173 removed these biofuels from the Class I renewable energy definition.

electric grid, which means that Connecticut generates electricity within its borders that is not consumed by Connecticut's residents. The GHG emissions from Connecticut's exported electricity are included in the electric power sector GHG inventories of the states that use that electricity if the state uses a consumption-based approach. Using a consumption-based electric power sector inventory avoids double counting electric power sector GHG emissions for the region and properly credits Connecticut for the clean energy the state has procured for its residents, including through the contract with Millstone nuclear power. This comparison of methods along with ISO-NE wide GHG emissions for this sector are provided in Appendix C. Further detailed in Appendix C.

The high emissions in 2023 were heavily influenced by the capacity production of Millstone, which was interrupted twice in 2023 for scheduled maintenance. The continuous running of Millstone throughout 2024 allowed for more baseline non-fossil fuel-free power and therefore fewer emissions, despite an increase in electricity consumption. Total electricity consumption rose from 26.8 Megawatt hours (MWh) in 2023 to 27.2 MWh in 2024 yet remained below the 2022 consumption level of 28.4 MWh.



Commercial Buildings

Commercial Buildings Sector Results

Emissions in this sector decreased from 4.3 MMTCO2e in 2023 to 4.1 MMTCO2e in 2024, a 4.6% drop. Compared to the 2001 baseline, emissions in this sector have decreased by 4.7%.

Commercial Buildings Sector Analysis

Commercial buildings are another sector that has experienced significant reductions since the previous year. This recent shift interrupts the trend of increasing emissions in this sector observed since 2021. Commercial buildings accounted for 11.7% of total emissions between 2023 and 2024. As with the residential sector, with the suspension of the Fuel Oil and Kerosene Sales Report,[23] heating oil sales in this sector are estimated through regression modeling with heavy emphasis on state population statistics, biofuel blending statutes, and the observed temperature data throughout the heating season.

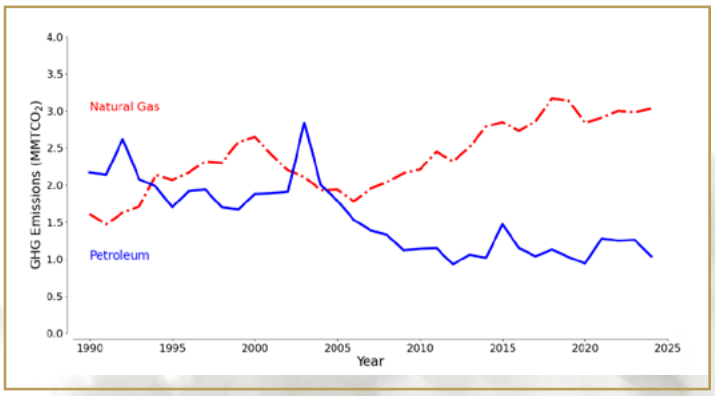


Figure 7: Commercial sector emissions by fuel type. Petroleum distillate is depicted in blue while natural gas is shown in red.

[23] Fuel Oil and Kerosene Sales - Energy Information Administration



Industrial Processes

Industrial Processes Sector Results

In 2024, emissions in the industrial processes (IP) sector from the combustion of fossil fuels make up 1.6 MMTCO2e, or 4.5% of economy-wide emissions. Remaining IP emissions are approximately 2.2 MMTCO2e, or 6% of total emissions. Since 2001, emissions from industrial processes have increased by about 9%.

Industrial Processes Sector Analysis

Industrial processes emissions result from the combustion of fossil fuels and from the use of carbon containing raw materials in industrial processes. Fugitive emissions of refrigerants also contribute to emissions. Industrial process emissions for direct fossil fuel combustion are calculated from the remaining petroleum product sales after transportation use, residential and commercial use, and natural gas delivered for industrial use (including use in agriculture, fisheries, and chemical processes) have been accounted for. Furthermore, while SIT allows for the calculation of emissions due to heavy industrial processes like chemical manufacturing, cement production, etc., these processes occur outside of Connecticut and do not contribute to the statewide inventory. A small percentage of emissions from the consumption of limestone and dolomite, iron and steel production, soda ash, and urea consumption are apportioned to Connecticut based on a nationwide dataset that is scaled by population. With reliable 2024 data not yet available, interpolation has been employed to estimate consumption from previous years' data.

Nearly 70% of Connecticut's additional industrial processes emissions are estimated from the use of ozone depleting substance substitutes. This estimate is also obtained through apportioning national emissions data to individual states based on population and regional emissions. Estimates for 2024 were obtained via interpolation.



Wastewater and Solid Waste

Wastewater and Solid Waste Sector Resuts

Landfills and the combustion of solid waste released approximately 1.2 MMTCO2e into the atmosphere while an additional .3 MMTCO2e were a result of wastewater treatment. The total 1.5 MMTCO2e of wastewater and solid waste emissions are roughly equivalent to previous years.

Wastewater and Solid Waste Sector Analysis

Some emissions in the wastewater and solid waste sector result from methane released during the treatment of wastewater and the off gassing of landfilled solid waste. While Connecticut no longer landfills solid waste in state, emissions from previously landfilled waste still occur. Another source of emissions in this sector is the combustion of non-organic materials in the waste stream. Solid waste emissions have decreased over the past decade due to the end of in-state landfilling and the closure of the Materials Innovations and Recycling Authority (MIRA) facility in Hartford in 2022. Waste that is transported out of state for landfilling or incineration is not reflected in the GHG inventory for this sector. Only emissions from landfilling and incineration activities that occur within the state's jurisdiction are accounted for in the waste and wastewater treatment sector. Scope III waste emissions, or emissions from the trucks used to haul waste out of state, are captured in the transportation sector. These changes only impact GHG emissions counted toward GWSA because trash that is landfilled or incinerated outside the state's jurisdiction does not count toward the state's emission targets. Connecticut disposes of 2.2 million tons of solid waste per year, 40% of which are organic materials. DEEP's Comprehensive Materials Management Strategy charts a course for increasing solid waste diversion as well as addressing reduced in-state solid waste disposal capacity with the goal of achieving greater source reduction and returning Connecticut to self-sufficiency in waste disposal.[24]

[24] **Comprehensive Materials Management Strategy**



Agriculture

Agriculture Sector Results

In 2024, Connecticut's agricultural sector emissions changed negligibly from 2023 and emitted 0.26 MMTCO2e. Compared to the 2001 baseline, emissions from this sector have also not changed appreciably.

Agriculture Sector Analysis

Agriculture emissions are made up of three main categories:

1. Methane that is generated mainly via enteric fermentation of organic material in the digestive tracts of farm animals;
2. Methane emitted from manure management practices; and
3. Emissions associated with soil run-off.

Animal population data are sourced from the National Agriculture Statistics Service maintained by the U.S. Census of Agriculture. This dataset contains the results of annual surveys conducted by the United States Department of Agriculture (USDA[25]) as well as a twice decadal census of livestock. Animal counts for some livestock including milk cows, beef cows, steers, bulls, etc. are derived from survey data while other animal counts including chickens, horses, goats, and swine come from the agricultural census most recently performed in 2022 and 2017. To determine animal counts for 2024, census results are linearly interpolated from the most recent census values.

The combustion of agricultural residue, soil amendments, and cultivation of crops contribute a minor amount to agricultural emissions. These emissions are small enough that they are difficult to measure and do not have a significant impact on total agricultural emissions. Most of Connecticut's agriculture sector emissions come from enteric fermentation. Therefore, the amount of GHGs emitted from the agricultural sector is heavily dependent on the number of cattle being raised in the state. Overall, agricultural emissions only make up 0.5% of total economy-wide emissions. Therefore, even large increases or decreases in emissions within this sector are unlikely to impact state-wide emissions levels.

[25] **USDA - National Agricultural Statistics Service - Census of Agriculture**



Natural Gas Distribution System

Natural Gas Distribution System Results

In-state emissions from natural gas escaping from the distribution system remain a small portion of the state's economy-wide emissions. DEEP estimates that in 2024, this system emitted approximately 0.2 MMTCO2e, a decrease of about 0.3 MMTCO2e from 2001, or 60%.

Natural Gas Distribution System Analysis

Most direct natural gas emissions occur during the extraction process. Because Connecticut imports its natural gas supply, estimates of emissions for this inventory only capture the emissions released by methane leaks in the natural gas distribution system once these systems enter Connecticut.

Calculations for the natural gas distribution system use emission factors developed by a Washington State University study that measured methane emissions from thirteen urban natural gas distribution systems across the United States.[26] This study is supplemented by emission factors developed from the Pipeline and Hazardous Materials Safety Administration[27] which considers the length of distribution pipeline in the state and pipeline's construction material to calculate fugitive methane emissions.

Despite Connecticut's efforts to replace older cast iron infrastructure with newer PVC lines, natural gas emissions continue to increase with expanding infrastructure. Most of the methane emissions from natural gas systems are not captured in the inventory because up to half of these emissions occur during the extraction process outside the state's jurisdiction.

[26] Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States | Environmental Science & Technology
[27] Pipeline and Hazardous Materials Safety Administration



Natural and Working Lands

Natural and Working Lands Results

Natural and working lands contain sources of GHG emissions in the form of decomposition of organic matter as well as sources of sequestration primarily in the forms of carbon uptake in living biomass and organic material incorporation into soils. In 2024, Connecticut's natural forests removed a net 2.96 MMTCO2e, or roughly 9% of the State's GHG emissions. Additionally, carbon flux from Connecticut's urban tree canopies resulted in an additional 1.8 MMTCO2e of carbon sequestration for a total of 4.8 MMTCO2e net carbon sequestration from this sector, offsetting approximately 14% of GHG emissions for the year.

Natural and Working Lands Analysis

In July 2025, with the passage of Public Act 25-125, the state adopted a new net-zero by 2050 target and required DEEP to report on carbon sequestration in the state's GHG inventory. DEEP is currently tracking carbon sequestered from its natural and working lands (NWL) to meet this requirement. Connecticut defines NWL as forests and woodlands, urban tree canopies, grasslands, wetlands and urban green spaces. NWLs provide a carbon sink, absorbing carbon from the atmosphere and storing it long-term as biomass. These lands can also act as a source of carbon due to biomass decay or combustion from wildfires or controlled burns.

Connecticut's largest carbon sink is forestland, which accounts for 60% of the state's total land cover. Forest carbon is held in trees, leaf litter, and organic matter in soil. The carbon sequestration provided by forests is calculated using the Land Use, Land Use Change, and Forestry module within the SIT. This module calculates the carbon flux through several categories of land use including remaining forest land, land that has been converted to forest, forest land converted to other uses, urban tree canopy, and landfilled organic material. These calculations rely on data collected for the Forest Inventory Analysis (FIA) program conducted by the US Forest Service. Modeling methods described in Westfall et al. (2024) consider geographic region and forest species type to determine the carbon flux through these lands. Carbon flux through urban tree canopies is determined through a combination of analyzing satellite imagery and U.S. Census data to determine the fraction of urbanized land that is covered in tree canopy. This fraction is then multiplied by a carbon sequestration factor as described in Nowalk et al (2013).

[28] **USDA Forest Service**
[29] **Carbon storage and sequestration by trees in urban and community areas of the United States - ScienceDirect**

Appendices

Appendix A: Electric Sector RECS

Table 3: Electric Sector RECS and Emissions by fuel type

Class I	RECS (MWh)	Emissions (lb CO2)
Biogas	3,085	4,574,723
Biomass	472,920	1,101,079,362
Digester gas	18,346	27,205,145
Fuel cell	906,116	724,892,800
Hydroelectric/ Hydropower	566,097	
Landfill gas	483,886	717,550,897
Natural Gas	128,604	102,883,200
Solar Photovoltaic	1,620,484	
Wind	1,425,746	
Wood	528,449	2,163,050,097
Class II	**RECS (MWh)**	**Emissions (lb CO2)**
Trash-to-energy	676,393	1,134,998,580
Class III	**RECS (MWh)**	**Emissions (lb CO2)**
Natural Gas	1,107,532	979,550,696

Table 4: RPS Emissions and RECS for 2024

	Emissions (lb CO2)	RECS (MWh)	EF (lb/MWh)
Class I	4,841,236,224	6,153,733	786.72
Class II	1,134,998,580	676,393	1,678.02
Class III	979,550,696	1,107,532	884.44

Table 5: Emission types in CT RPS profile

Emission Type	$MMTCO_2$
Biogenic Emissions	2.19
Non-Biogenic Emissions	0.97

In addition to the above calculations, DEEP also notes that Connecticut's electricity consumption was 27.21 million MWh in 2024 with an effective emission factor of 236 lb/MWh CO2e. Non-biogenic RECS are mostly comprised of solar, wind, and hydropower.

Appendix B: Calculating Biogenic Emissions

Beginning with the inventory released in 2021, DEEP began tabulating biogenic emissions separately from fossil sources within the report in accordance with international standards. This standard requires biogenic sources to be reported. In Connecticut, this shift was evident mainly because:

1. The state's RPS treats many biofuels such as wood and biodiesel as Class I renewable resources. This International Standard also treats biofuels as favorably as non-carbon emitting energy sources such as nuclear power or solar photovoltaics. While the biomass share of the state's electricity profile is being phased down in anticipation of a transition to less carbon-intensive renewable sources, carbon emissions still occur when these fuels are combusted. The carbon released into the atmosphere in this matter was removed relatively recently – over the years or decades – while fossil fuel-embodied carbon has been sequestered for millions of years.
2. Most of the gasoline consumed in the state is a ten percent ethanol blend.
3. Connecticut has a biodiesel blending mandate for all home heating oil in Connecticut. The minimum Biodiesel blending percentage was 5% in July 2022 and increased to 10% in July 2025. These percentages are incorporated into estimates of fossil diesel fuel that was consumed in 2024.
4. Electricity generated from biogenic fuels, and, hence, not counted toward GWSA emission targets, emitted 2.2 MMTCO2e in 2024. Emissions from burning ethanol in gasoline in the transportation sector as well as the industrial and commercial sectors released and additional 0.9 MMTCO2e in 2024. In 2024, biodiesel in the transportation sector is estimated to contribute another 0.1 MMTCO2e of gross emissions while biodiesel blended with heating oil in the commercial and residential sectors increases gross emissions approximately 0.3 MMTCO2e. Furthermore, consumption of wood products in the residential buildings sector contributed 0.8 MMTCO2e emissions for that sector while wood products in the commercial and industrial sectors added 0.1 and 0.4 MMTCO2e respectively.

Appendix C: Generation vs Consumption based emissions from the Electric Power Sector over recent years in MMTCO2e

Consumption-based accounting for the electric power sector was first applied in the 2013 inventory analysis, although it had hybrid elements. In prior GHG inventories, emissions from the electric power sector had been based entirely on direct emissions from generation of electricity by power plants operating within state boundaries.

In a March 2016 report,[30] the Governor's Council on Climate Change (GC3) recommended that DEEP employ a complete consumption-based methodology for calculating the electricity sector's contribution to the GHG inventory toward the GWSA goals. In 2021, DEEP conducted a public engagement process to solicit stakeholder input on a proposed consumption-based accounting methodology for the electric power sector. The proposed methodology was more consistent with the nature of the regional grid, international standards and approaches adopted by peer states, particularly in its treatment of biogenic emissions as carbon-neutral for purposes of assessing compliance with GWSA goals. That process included a public meeting held on October 26, 2021,[31] and public written comments.[32] The proposed change was implemented for the 1990-2021 inventory report.[33] Nevertheless, DEEP continued presenting the generation-based accounting methodology to provide the public with additional transparency and information, despite the fact that these results are not included in the assessment of progress toward meeting the GWSA targets.

In the table below, DEEP provides a comparison of emissions associated with the electric power sector based on both consumption and generation accounting methodologies. Electricity sector emissions for ISO New England (including imports) are also included for comparison as well as a consumption-based calculation that assumes Connecticut only consumes electricity generating in state while ignoring any environmental attributes the state owns from any renewable or low-carbon sources. While emissions from generation of electricity within Connecticut for export to other parts of New England have increased in recent years, emissions from New England as a whole are on a downward trajectory. Generation-based emissions are sourced from data published by the Energy Information Administration and ISO New England, while the consumption-based approach is described in the main body of this report.

The table also compares the emissions that would be associated with Connecticut electricity consumption if the state consumed all the in-state clean electricity generation instead of selling RECs and Environmental Attributes associated to the clean generation to other states. The numbers show than in this scenario the emissions profile would be even cleaner than the profile considered toward the GWSA Climate Goals mainly due to the Environmental Attributes associated to Millstone's nuclear energy generation that are owned by the state. Currently, a small portion of these attributes are sold to Massachusetts, who also account for their electricity emissions based on consumption.

[30] **GC3 Exploratory Report: A Report on the Governor's Council on Climate Change**
[31] The Public Meeting Presentation is available at **10.26.2021 Public Meeting Presentation** and the recording is available at **10.20.2021 Public Meeting Recording**.
[32] Public written comments are available at **CT Greenhouse Gas Inventory Reports**.
[33] CT DEEP. **1990-2021 Connecticut Greenhouse Gas Emissions Inventory**

Table 6: Emissions in Million Metric Tons CO2 from Electricity consumption and generation in CT in 2024 Source; EIA State Electricity Profiles, ISO New England Annual Air Emissions Report, Iso New England Annual Generation and Load Data for ISO NE and the Six New England States[34]

Year	CT Consumption-Based Emissions (toward the GWSA Climate Goals)	Consumption-Based emissions considering all clean electricity generated in CT as consumed by CT	CT Generation-Based Emissions[35]	ISO New England Generation-Based Emissions[36]
2018	8.1	8.1	9.6	32.6
2019	5.7	5.7	9.5	29.8
2020	3.2	3.2	10.1	30.1
2021	3.0	2.9	10.9	31.3
2022	2.5	2.3	10.8	30.9
2023	3.7	3.3	10.6	30.1
2024	2.9	2.1	11.0	30.2

[34] ISO-NE Energy Generation data
[35] Connecticut Electricity Profile 2024 - U.S. Energy Information Administration (EIA)
[36] ISO-NE Environmental and Emissions Reports


CONNECTICUT
ENERGY & ENVIRONMENT
portal.ct.gov/DEEP