2022 GHG Inventory Executive Summary

The 2022 Greenhouse Gas (GHG) Inventory Report presents the annually updated GHG emissions estimates and projections for the state of Delaware. The inventory includes GHG emission estimates from 1990 to 2022 as well as emission projections from 2023 to 2050 in a business-as-usual (BAU) scenario. This inventory is the primary tool from which state policy makers can track progress of emissions over time and determine whether Delaware is meeting long term emission reduction goals. The Delaware Climate Change Solutions Act of 2023[1] sets ambitious but attainable GHG emission reduction targets of 50.0% by 2030 and net-zero by 2050 from a 2005 baseline. The statute also stipulates that Department of Natural Resources and Environmental Control update its inventory on an annual basis to track progress towards these targets.

This inventory report estimates GHG emissions from various sources across economic sectors in Delaware. The data provided in this report were estimated using the United States Environmental Protection Agency (EPA) State Inventory Tool (SIT) and Projection Tool (PT).[2]

IPCC's Fifth Assessment Report Update

Delaware's previous inventory used global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4). For the 2020 inventory, Delaware updated its inventory using GWP values from the Fifth Assessment Report (AR5) to provide the most updated science and ensure that Delaware's inventory is comparable to the nationwide U.S Greenhouse Gas Inventory. Updating GWP values result in slight differences in emissions values. This is why total gross emissions in 2005, the baseline year from which Delaware's GHG reduction goals are set, has changed from 23.3 $MMTCO_2e$ under the previous methodology to 23.1 $MMTCO_2e$ in the current inventory. This update reflects Delaware's effort to use the most scientifically accurate data when evaluating emissions in Delaware sectors.

The emissions estimates in this inventory are represented in million metric tons of carbon dioxide equivalents ($MMTCO_2e$). In comparison to Delaware's 2005 baseline year emissions levels (23.1 $MMTCO_2e$), Delaware's gross total GHG emissions in 2022 were estimated at 17.3 $MMTCO_2e$, which represents a 25.4% decrease in emissions from the baseline year. This indicates that Delaware is making steady progress towards its emission goals.

[1] Delaware Climate Change Solutions Act of 2023, 99 (2023). https://legis.delaware.gov/BillDetail/130272

[2] Environmental Protection Agency. (n.d.). EPA. https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool

This inventory report also includes a BAU scenario with projections to 2050. This scenario is generated using the EPA PT and is intended to represent a future in which the state takes no further actions on climate change, current energy consumption trends continue, and Delaware's population and economy continue to grow. Under the BAU scenario, in the absence of state policy and program interventions called for in Delaware's Climate Action Plan,[3] total gross emissions are projected to increase to 20.3 $MMTCO_2e$ in 2030 and 22.1 $MMTCO_2e$ in 2050. This BAU scenario provides a useful baseline for comparison when assessing estimated emissions reductions for various energy policies and programs but should not be considered the "expected" future outcome for Delaware.

In 2022, emissions in many sectors decreased compared to 2005 levels, except for the commercial buildings, agriculture, and waste management sectors. Overall, the emissions decreased slightly in 2022 compared to 2021 as the effects of the coronavirus (COVID-19) pandemic diminished. The 2023 inventory is anticipated to offer a more precise assessment of Delaware's GHG emission reductions post-pandemic, enabling a clearer evaluation of progress towards emission reduction targets outlined in the Delaware Climate Solutions Act of 2023.

Key Findings

- In 2022, gross GHG emissions in Delaware were **17.3 $MMTCO_2e$,** a **25.4% decrease** from Delaware's 2005 baseline year.
- The emissions decreased slightly in 2022 compared to 2021 as **the effects of the coronavirus (COVID-19) pandemic diminished**.
- The sectors with the largest contribution to Delaware's GHG emissions remain the **transportation, electric power, and industrial sectors** accounting for almost 79.6% of all gross GHG emissions in 2022.

Baseline Year: 2005	Last Inventory: 2021	Current Inventory: 2022
23.1 $MMTCO_2e$	17.6 $MMTCO_2e$ 23.8% reduction from 2005 levels	17.3 $MMTCO_2e$ 25.4% reduction from 2005 levels

Figure *1* shows the breakdown of Delaware's GHG emissions (in $MMTCO_2e$) in 2022 by economic sector and end-use (where available) to provide a high-level overview of sources of GHG emissions. The economic sectors that were assessed are electric power,[4] transportation, industrial, residential and commercial buildings, agriculture, waste management, and land-use, land-use change, and forestry (LULUCF).

[3] Delaware's Climate Action Plan - DNREC. (2025, October 11). DNREC. https://dnrec.delaware.gov/climate-plan/
[4] Including electricity consumption-based GHG emissions.

The largest source of GHG emissions in Delaware was the transportation sector, which represented 29.6% of the gross GHG emissions. When including electricity consumption-based (imported electricity) emissions, the electric power sector was the second largest contributor of GHG emissions, accounting for 27.2% of gross emissions. More than half of emissions from the electric sector were from imported electricity (15.5% of total emissions), with the rest generated in-state (11.7% of total emissions). The industrial sector was the third largest contributor of GHG emissions, accounting for 22.8% of gross emissions. The buildings sector accounted for a total of 13.0% of statewide GHG emissions, with 6.7% and 7.2% of total emissions from the residential and commercial sectors, respectively.

Finally, in 2022 the agriculture sector contributed 3.8% and the waste sector 3.6% of gross GHG emissions. The largest emission sectors are generally made up of one to two significant end-uses. For example, the majority of GHG emissions in the transportation sector are sources from on-road vehicles, such as passenger cars and heavy-duty vehicles. GHG emissions estimated in the industrial sector are primarily sourced from operations at the Delaware City refinery.

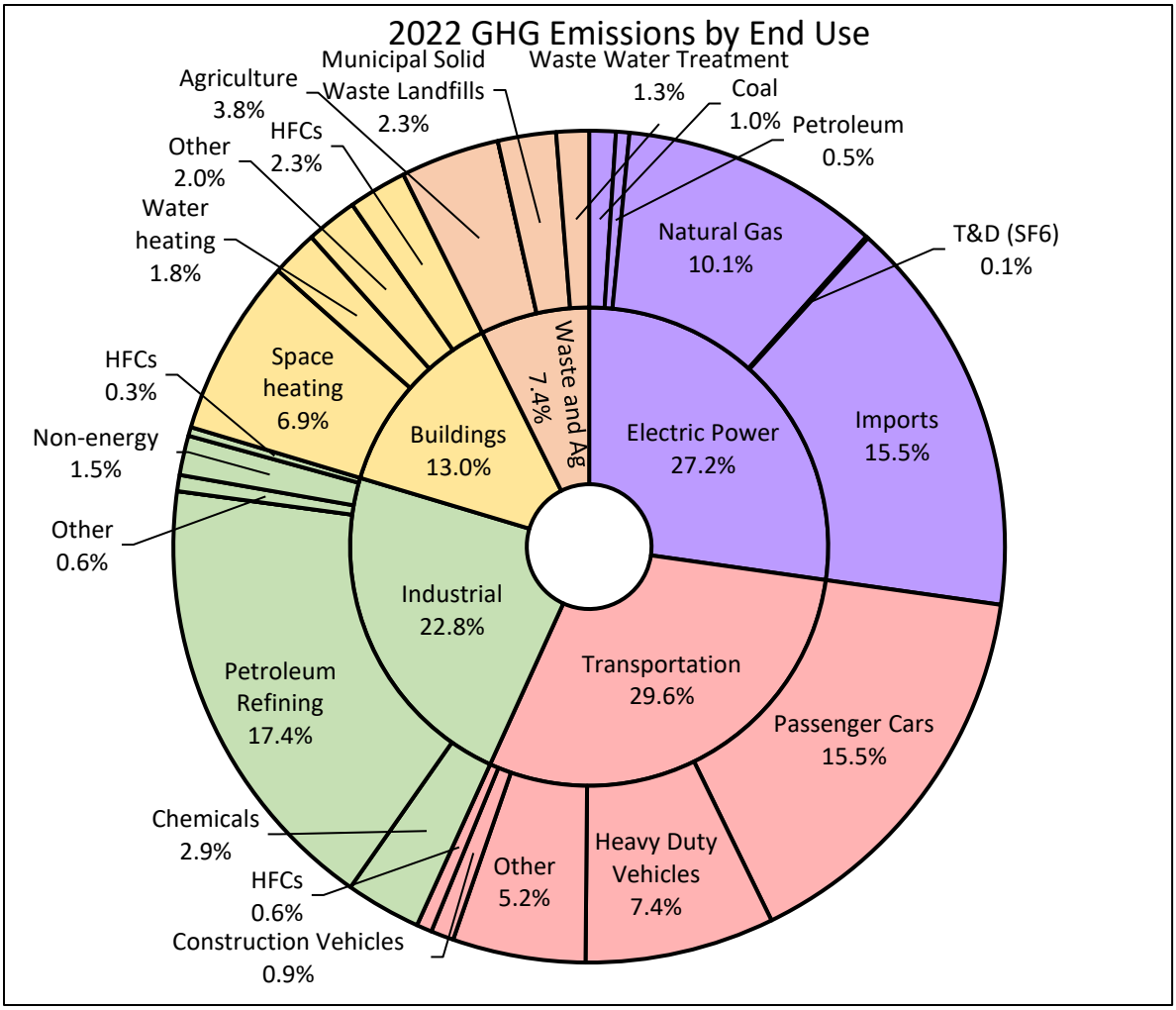

Figure 1: Gross GHG emissions in 2022 broken out by sector and end-use (% of $MMTCO_2e$)

GHG emission estimates and projection trends by economic sector from 1990 through 2050 are shown in Figure 2. Projections exclude any federal and state policy interventions. It is important to note that this projection is just one prediction to review when considering the future of GHG emissions in Delaware.

The greatest total increase in GHG emissions from 2005 to 2050 is a 1.7 $MMTCO_2e$ increase in the electricity consumption sector. This rise in emissions is primarily attributed to population growth and the resulting increased demand for electricity. It is important to note that these projections do not account for Delaware specific or federal policies aimed at reducing emissions. Delaware has two significant policies - the RPS and the Regional Greenhouse Gas Initiative - that will drive the decrease in emissions associated with increasing demand.

Emissions from the transportation sector are also projected to increase from 2005 through 2050, reaching 5.7 $MMTCO_2e$ in 2050 as population and economic activities continue to grow. From 2005 through 2050, agricultural sector and waste management emissions increase 16.5% and 80.3% respectively, although these are smaller contributing sectors to overall emissions. Industrial emissions increase 16.7% between 2005 and 2050 to a total of 5.1 $MMTCO_2e$ in 2050. Additional, in-depth methodology and data sources for each sector are provided in the relevant section in the 2022 GHG Inventory Report.

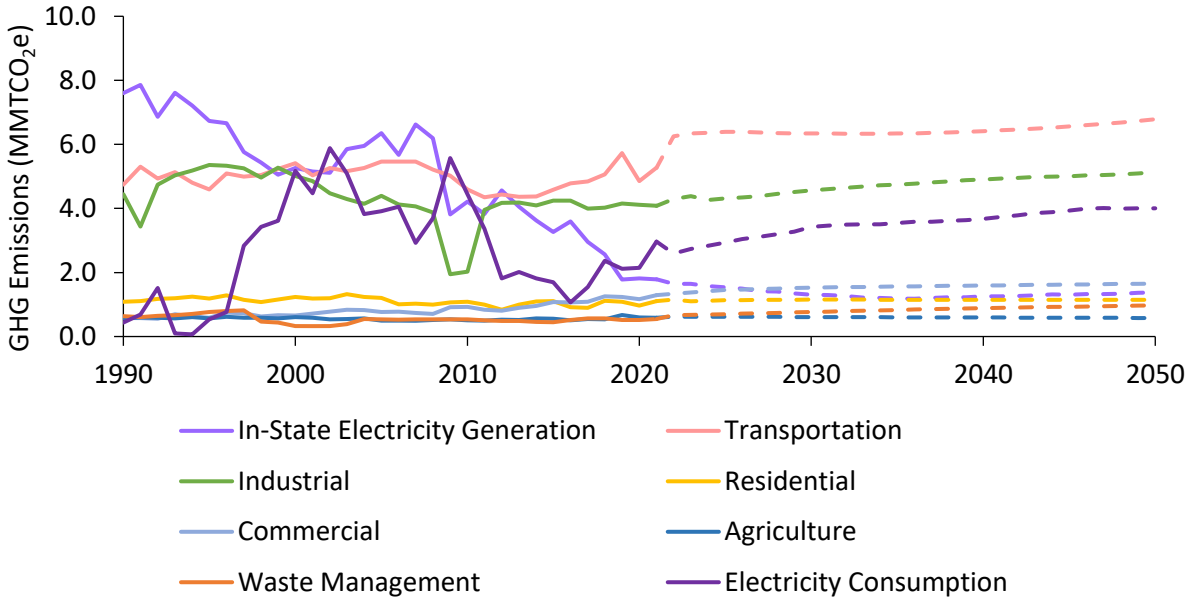

Figure 2: Gross GHG emission and projection trends by economic sector from 1990 to 2050

Figure 3 shows the gross GHG emission estimates and projections in Delaware from 1990 to 2050. The state of Delaware has a GHG emissions reduction target of 50.0% reduction below its 2005 baseline emission levels by 2030 and net-zero emissions by 2050 in alignment with the Delaware Climate Change Solutions Act of 2023. Net-zero emissions means that any emissions

produced by 2050 will be appropriately offset through carbon sinks or sequestration methods. Gross GHG emissions in Delaware were estimated at 23.1 $MMTCO_2e$ in 2005 and 17.3 $MMTCO_2e$ in 2022. In the absence of any policies, the total gross emissions in 2050 are projected to increase 22.1 $MMTCO_2e$.

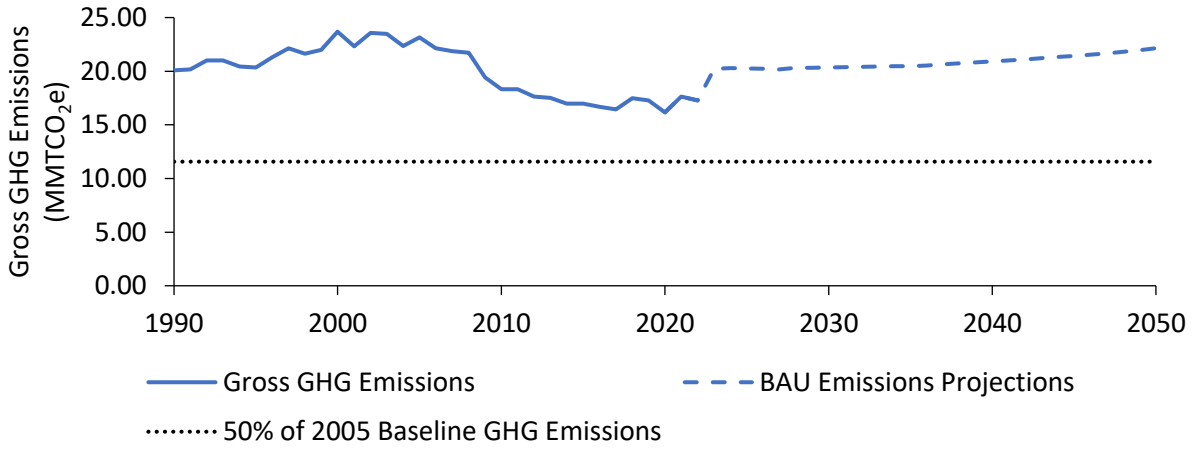

Figure 3: Baseline GHG emission estimates and projections from 1990 to 2050

Overall, gross GHG emissions in 2022 in Delaware decreased 2.07% from 2021 and 25.4% from Delaware's 2005 baseline year. Like past reports, the three largest emitting sectors in Delaware are the transportation, electric power (including consumption-based emissions), and industrial sectors. Although Delaware has made progress towards its emissions reduction goals, it is important to note that much of the emissions reduction in 2022 resulted from the stabilization of economic activity following the post-COVID period. Further policy intervention will be needed to continue to have meaningful mitigation of GHG emissions in the state.

It is important to continue to reduce GHG emissions by implementing the policies and programs outlined in Delaware's Climate Action Plan to protect Delaware from potential harmful impacts of climate change. A detailed analysis of emission reduction strategies is presented in the 2025 update to Delaware's Climate Action Plan.[5] This analysis models emissions and provides further detail on the policies and programs necessary to reduce GHG emissions projected in the BAU scenarios described in this report. Reducing emissions in the transportation, electric power, and industrial sectors will have a meaningful impact on emissions in Delaware and will help meet state goals to reduce emissions by 50.0% from the 2005 baseline by 2030 and to reach net-zero emissions by 2050.

[5] Delaware's Climate Action Plan - DNREC. (2025, October 11). DNREC. https://dnrec.delaware.gov/climate-plan/