



## 2020 GHG Inventory Executive Summary

The 2020 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 2020 as well as emission projections from 2021 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<sup>1</sup> sets ambitious but attainable greenhouse gas emission reduction targets of 50% by 2030 and net-zero by 2050 from a 2005 baseline. The law also stipulates that DNREC 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).

The emissions estimates in this inventory are represented in million metric tons of carbon dioxide equivalents (MMTCO<sub>2e</sub>). In comparison to Delaware's 2005 baseline year emissions levels (23.1 MMTCO<sub>2e</sub>), Delaware's gross total GHG emissions in 2020 were estimated at 16.2 MMTCO<sub>2e</sub>, which represents a 30% decrease in emissions from the baseline year. This indicates that Delaware is making steady progress towards its emission goals.

This inventory report also includes a "business-as-usual" (BAU) scenario extending out 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, total gross emissions are projected to increase to 19.7 MMTCO<sub>2e</sub> in 2030 and 21.6 MMTCO<sub>2e</sub> in 2050. This BAU scenario provides a useful

### ***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<sub>2e</sub> under the previous methodology to 23.1 MMTCO<sub>2e</sub> in the current inventory. This update reflects Delaware's effort to use the most scientifically accurate data when evaluating emissions in Delaware sectors.

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

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 2020, most sectors experienced a decrease in emissions compared to 2005 emissions levels, except for emissions in the commercial buildings and agricultural sectors. Some decreases in emissions observed in the short-term in the electric power and transportation sector were likely influenced by less economic and transportation activity during the coronavirus (COVID-19) pandemic. The 2021 and 2022 inventories will provide a more accurate assessment of emissions reductions post COVID-19 from which to assess progress toward Delaware's emission reduction targets.

### Key Findings

- In 2020, gross GHG emissions in Delaware were **16.2 MMTCO<sub>2</sub>e**, a **30% decrease** from Delaware's 2005 baseline year.
- The decline in emissions from 2019 to 2020 was largely due to **the impacts that the COVID-19 pandemic** had on travel and economic activities.
- The sectors with the largest contribution to Delaware's GHG emissions remain the **transportation, industrial, and electric power sectors** accounting for almost 80% of all gross GHG emissions in 2020.

#### Baseline Year: 2005

23.1 MMTCO<sub>2</sub>e

#### Last Inventory: 2018

16.9 MMTCO<sub>2</sub>e  
27% reduction from 2005  
levels

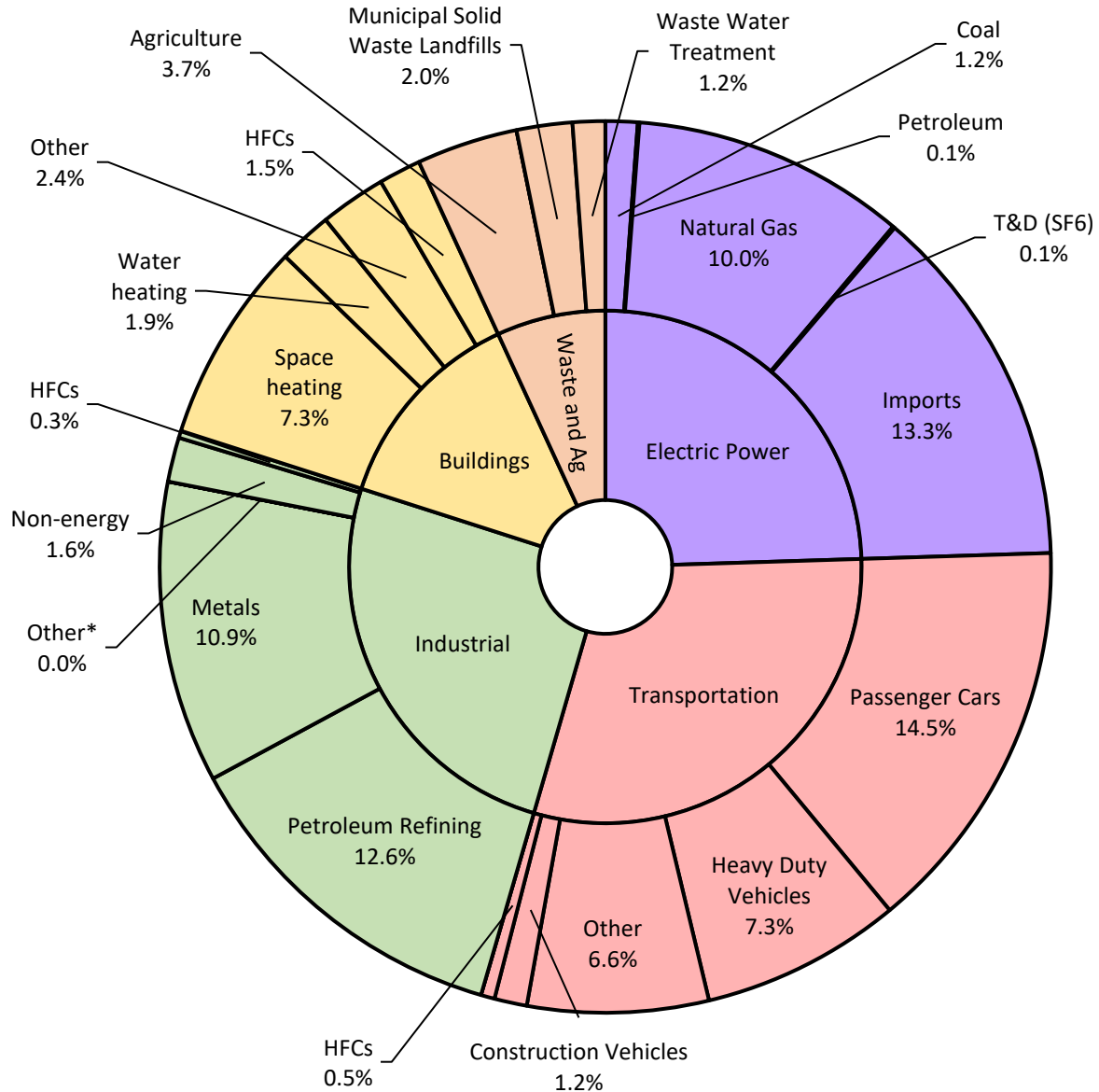
#### Current Inventory: 2020

16.2 MMTCO<sub>2</sub>e  
30% reduction from 2005  
levels

Figure 1 shows the breakdown of GHG emissions (in MMTCO<sub>2</sub>e) in 2020 by economic sector, as well as end uses (where available) to provide a high-level overview of sources of GHG emissions. The economic sectors that were assessed are electric power,<sup>3</sup> transportation, industrial, residential and commercial buildings, agriculture, waste management, and land-use, land-use change, and forestry (LULUCF). The largest source of GHG emissions in Delaware in 2020 was the transportation sector, which represented 30% of the gross GHG emissions. The industrial sector was the second largest contributor of GHG emissions, accounting for 25.4% of gross emissions. When including electricity consumption-based (imported electricity) emissions, the electric power sector was the third largest contributor of GHG emissions, accounting for 24.5% of gross emissions. Roughly half of emissions from the electric sector were generated in-state (11.2% of total emissions) with the other half from imported electricity (13.3% of total). The buildings sector accounted for a total of 13.2% of statewide GHG emissions, with 6.0% and 7.2% of total emissions from the residential and commercial sectors, respectively. Finally, in 2020 the agriculture sector contributed 3.7% and the waste sector 3.2% of gross GHG emissions.

<sup>3</sup> Including electricity consumption-based GHG emissions.

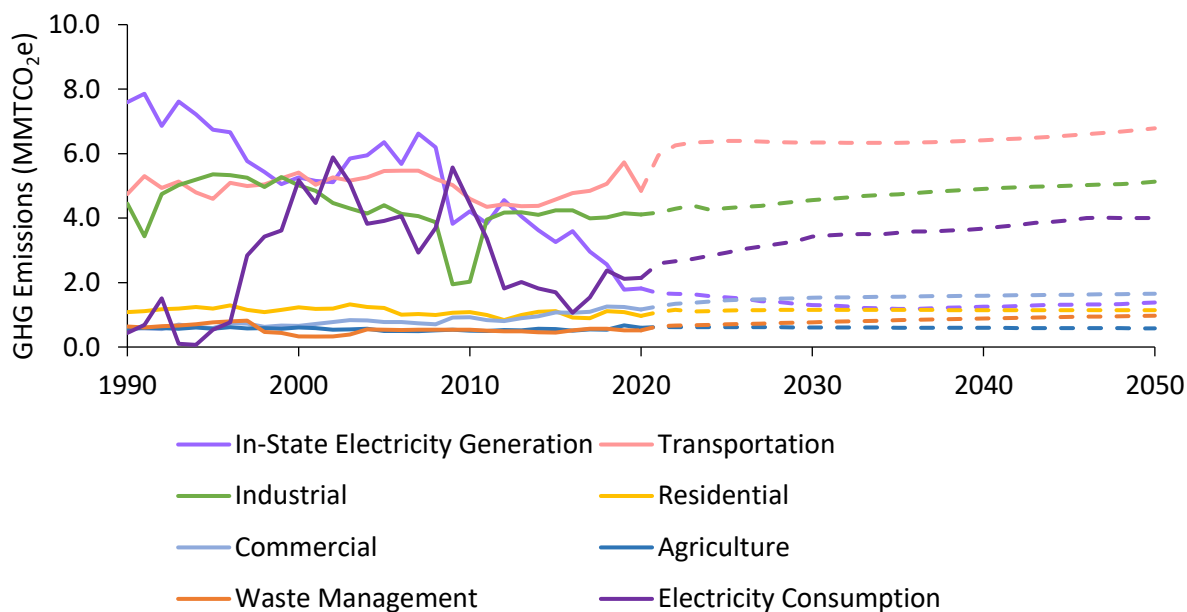
The largest emission sectors are generally made up of one to two significant end uses. For example, the majority of GHG emissions in the transportation sector are sources from on-road vehicles, such as passenger cars and heavy-duty vehicles. Greenhouse gas emissions estimated in the industrial sector are primarily sourced from operations at the refinery.



**Figure 1. Gross GHG emissions in 2020 broken out by sector and end-use (% of MMTCO<sub>2</sub>e)**

GHG emission estimates and projections by sector from 1990 through 2050 are shown in Figure 2. Gross GHG emission and projection trends by economic sector from 1990 to 2050. Projections exclude any federal and state policy interventions. The greatest percent increase in GHG emissions from 2005 to 2050 a 114.5% increase in the commercial sector, driven in large part by the increase in HFCs. The combined electric power sector emissions are projected to decrease by 47.6% between 2005 and 2050, or 4.88 MMTCO<sub>2</sub>e. Consumption-based emissions within this sector are projected to increase 2.3%.

Greenhouse gas emissions from in-state electricity generation show a declining trend from 2005 through 2030 and then generally remain flat through 2050. Projected emissions from in-state electricity generation fall below those in the commercial sector. The greatest total increase in GHG emissions from 2005 to 2050 is a 1.32 MMTCO<sub>2</sub>e increase in the transportation sector. Overall, transportation emissions are projected to increase gradually through 2050 following a sharp increase after a drop in 2020 due to the effects of the COVID-19 pandemic. 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 5.13 MMTCO<sub>2</sub>e in 2050.

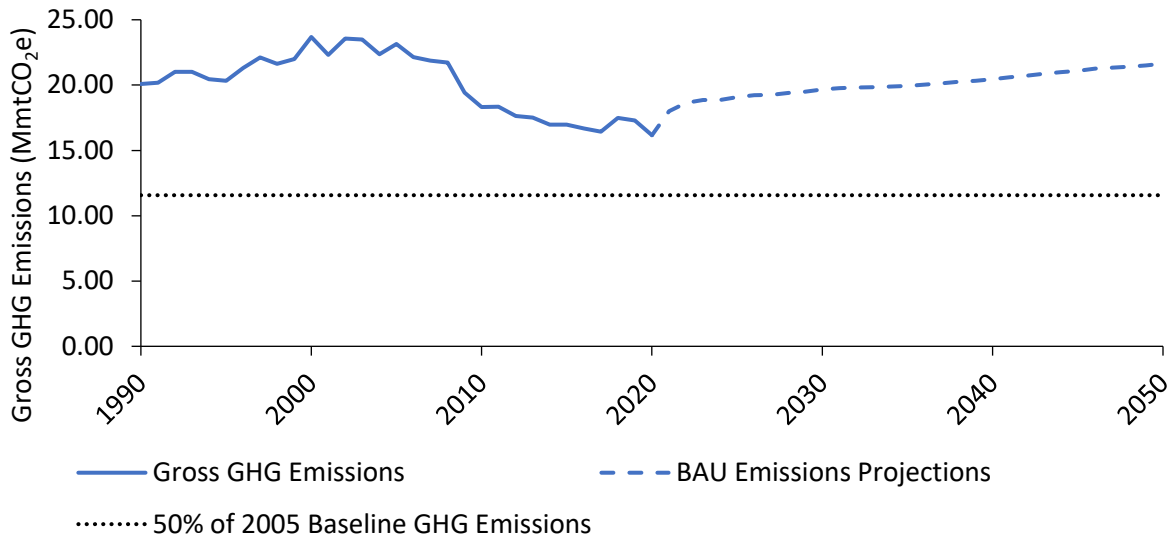


**Figure 2. Gross GHG emission and projection trends by economic sector from 1990 to 2050**

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<sub>2</sub>e in 2005 and 16.2 MMTCO<sub>2</sub>e in 2020. In the absence of any policies, the total gross emissions in 2050 are predicted to increase 21.6 MMTCO<sub>2</sub>e.

Overall, gross GHG emissions in 2020 in Delaware decreased 7.6% from 2018 and 30.1% from Delaware’s 2005 baseline year. Like past reports, the three largest emitting sectors in Delaware are transportation, industrial, and electric power (including consumption-based emissions). The 2020 GHG Inventory includes the same sources and sinks as in the 2018 Inventory, with updates to the GWPs and SIT modules used and additional sector specific updates mentioned in 2020 GHG Inventory Report.

Although Delaware has made progress toward its emissions reduction goals, decreases in emissions from 2019-2020 were largely due to the impacts of the COVID-19 pandemic on travel and economic activities, and are likely to return to pre-pandemic levels in 2021. Further policy may be needed to continue to have meaningful mitigation of GHG emissions in the state.



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

The industrial sector had a sharp decline in 2009 which was primarily caused by the economic recession and the Delaware City refinery shutting down operations. However, emissions from the industrial sector returned to their pre-2009 levels shortly after and are expected to continue increasing in the future. The electric power sector has shown significant declines from shifts to lower-emitting combustion fuels and zero-emitting sources of power. Emissions from electric power generated in-state are projected to decrease while emissions from electric power imported into Delaware are expected to increase in the future. Additional, in-depth methodology and data sources for each sector are provided in the relevant sector section in the 2020 GHG Inventory Report.

As Delaware is already experiencing harmful impacts from the effects of climate change, it is critical to continue to reduce GHG emissions by implementing the policies and programs outlined in Delaware’s Climate Action Plan. A detailed analysis of emission reduction strategies will be completed for the 2025 update to Delaware’s Climate Action Plan. This analysis will model emissions and further detail the policies and programs necessary to reduce the GHG emissions illustrated in the BAU scenarios in this report. Reducing emissions in the transportation, industrial, and electric power sectors will have a meaningful impact on emissions in Delaware and will help meet state goals to reduce emissions by 50% from the 2005 baseline by 2030 and to reach net-zero emissions by 2050.