



**Delaware Climate Pollution Reduction Plan  
Submitted to U.S. EPA in partial fulfillment of  
Assistance Agreement 95316201**

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## Disclaimer and Acknowledgements

This Climate Pollution Reduction Plan (CPRP or “Plan”) was developed by the Delaware Department of Natural Resources and Environmental Control (DNREC) to meet deliverable requirements for the planning phase of the U.S. Environmental Protection Agency (EPA) Climate Pollution Reduction Grants (CPRG) program.

The purpose of this document is to meet the first planning deliverable requirement for the U.S. EPA’s CPRG program. The document includes information required as outlined in the March 2023 document: “Climate Pollution Reduction Grants Program: Formula Grants for Planning Program, Guidance for States, Municipalities, and Air Pollution Control Agencies.” Within that guidance document EPA specified tools or approaches to use. DNREC followed this guidance, but also presents state-specific supplemental or additional information where available.

This plan reiterates the state’s priority actions to reduce greenhouse gas (GHG) emissions as outlined in its 2021 Climate Action Plan. This document does not supersede or serve as a replacement for the 2021 Climate Action Plan but instead will enable the state and eligible entities within it to apply for CPRG implementation grant funding through the EPA.

This project has been funded wholly or in part by the United States EPA under assistance agreement 95316201. The contents of this document do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this document.

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## Acronyms

ACEEE	American Council for an Energy Efficient Economy
ACS	American Community Survey
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BAU	Business-as-usual
CAP	Delaware's statewide Climate Action Plan
CARB	California Air Resources Board
CCAP	Comprehensive Climate Action Plan, a required deliverable of the EPA CPRG program
CIG	Capital Investment Grants
CPRG	EPA Climate Pollution Reduction Grant
CPRP	Climate Pollution Reduction Plan
DAQ	DNREC Division of Air Quality
DART	Delaware Authority for Regional Transit
DE	Delaware
DEC	Delaware Electric Cooperative
DeIDOT	Delaware's Department of Transportation
DERA	Diesel Emissions Reduction Act
DNREC	Delaware Department of Natural Resources and Environmental Control
DOE	U.S. Department of Energy
DSWA	Delaware Solid Waste Authority
DVRPC	Delaware Valley Regional Planning Commission
EEAC	Energy Efficiency Advisory Council
EEIF	Energy Efficiency Investment Fund
EERS	Energy Efficiency Resource Standards
EIA	U.S. Energy Information Administration
EJ	Environmental Justice
EM&V	Evaluation, Measurement, & Verification
EPA	U.S. Environmental Protection Agency
EPD	Environmental Product Declaration
EV	Electric Vehicle
FHWA	U.S. Federal Highway Administration

GAP	University of Delaware Local Government Grant Assistance Program
GEAC	Governor's Energy Advisory Council
GEF	Green Energy Fund
GHG	Greenhouse Gas
GRRP	Green and Resilient Retrofit Program
GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HFC	Hydrofluorocarbon
HOMES	Home Efficiency Rebates Program
HUD	Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IECC	International Energy Conservation Code
IJA	Infrastructure Investment and Jobs Act
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
IRC	International Residential Code
IRS	Internal Revenue Service
LCFS	Low-Carbon Fuel Standard
LEA	Local Education Agencies
LEV	Low-Emission Vehicle
LIDAC	Low Income, Disadvantaged Communities
LMI	Low- to Moderate-Income
LULUCF	Land use, Land-use change, and Forestry
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MW	Megawatts
NEI	National Emissions Inventory
NEVI	National Electric Vehicle Infrastructure
NOAA	U.S. National Oceanic and Atmospheric Administration
PACE	Powering Affordable Clean Energy Program
PCAP	Priority Climate Action Plan, a required deliverable of the EPA CPRG program (see: CPRP)
PFC	Perfluorocarbon

PJM	Pennsylvania-New Jersey-Maryland Interconnection, Delaware’s Regional Transmission Organization
PT	U.S. EPA Projection Tool
PUT	Public Utility Tax
PV	Photovoltaic
RAISE	Rebuilding American Infrastructure and Sustainability and Equity
RASCL	Resilient and Sustainable Communities League
REC	Renewable Energy Credit
REPSA	Renewable Energy Portfolio Standards Act
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standard
SCM	Supplementary Cementing Materials
SEU	Sustainable Energy Utility
SFRP	State Funding Readiness Project
SLOW	Special Initiative on Offshore Wind
SIP	State Implementation Plan
SIT	State Inventory Tool
SREC	Solar Renewable Energy Certificates
T&D	Transmission and Distribution, of electricity
TCI	Transportation and Climate Initiative
TEDI	Tree for Every Delawarean Initiative
U.S.	United States
USDA	United States Department of Agriculture
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VW	Volkswagen
WAP	Weatherization Assistance Program
WiST	Wilmington and Surrounding Townships
WWTP	Wastewater Treatment Plant
ZEV	Zero Emissions Vehicle



# 1 Introduction

The Inflation Reduction Act (IRA), signed into law on August 16, 2022, directs federal funding to reduce carbon emissions, lower healthcare costs, fund the IRS, and improve taxpayer compliance. The IRA contains provisions that directly or indirectly address issues related to climate change, including reduction of greenhouse gas (GHG) emissions and promotion of adaptation and resilience to climate change impacts.

The U.S. EPA CPRG program, authorized under Section 60114 of the IRA, provides \$5 billion in grants to states, local governments, tribes, and territories to develop and implement plans for reducing GHG emissions and other harmful air pollution.

The CPRG program consists of a planning and implementation phase:

- The planning phase provides \$250 million in noncompetitive planning grants for state and local agencies to develop phased plans for reducing greenhouse gas emissions
- The implementation phase provides \$4.6 billion for competitive implementation grants to eligible applicants to implement GHG reduction measures identified in a plan developed under a CPRG Planning grant.<sup>1</sup>

The Delaware DNREC is the designated lead for CPRG planning deliverables for the state of Delaware. Along with DNREC, the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD metropolitan statistical area (MSA) in Delaware also received a CPRG planning grant. DNREC coordinated closely with the Delaware Valley Regional Planning Commission (DVRPC), the lead organization responsible for the MSA's CPRG plans, to align emission reduction measures where practicable and jointly engage with stakeholders across Northern Delaware

This document is a grant deliverable for the CPRG Program and serves as the state level "Priority Climate Action Plan" as required by the grant. The document includes information

## Definitions

- **GHG:** The air pollutants carbon dioxide, hydrofluorocarbons, methane, nitrous oxide, perfluorocarbons, and sulfur hexafluoride.
- **GHG Inventory:** A list of emission sources and sinks, and the associated emissions quantified using standard methods.
- **GHG Reduction Measure:** Policies, programs, actions, or projects that reduce GHG emissions or enhance carbon removal. Measures that enhance "carbon removal" are those that increase the removal of carbon dioxide from the atmosphere through, for example, the uptake of carbon and storage in soils, vegetation, and forests.
- **Benefits:** Improvements in air quality/reduction in harmful air pollutants.
- **Co-Benefits:** Positive effects beyond the stated goal of a GHG reduction measure (e.g., improved public health outcomes, economic benefits, increased climate resilience).
- **Low Income Disadvantaged Community (LIDACs):** Communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens.

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<sup>1</sup> US EPA. "Climate Pollution Reduction Grants." January 18, 2023. <https://www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants>.

required as outlined in the March 2023 EPA document: “Climate Pollution Reduction Grants Program: Formula Grants for Planning Program, Guidance for States, Municipalities, and Air Pollution Control Agencies.” Within this guidance document EPA specified tools or approaches to use. DNREC followed this guidance, but also presents state-specific supplemental or additional information where available. This plan includes the activities and actions already identified and prioritized through the development of the 2021 CAP as well as additional information and analysis about these actions as required by EPA.

This document does not supersede or serve as a replacement or update for the 2021 Climate Action Plan and the Delaware Climate Action Plan 2023 Implementation Report. The completion and delivery of this report to EPA enables the state and eligible entities within the state to apply for CPRG grant funding through the EPA for implementation of emission reduction measures described within the report.

## 1.1 Climate Pollution Reduction Plan Purpose, Scope, and Overview

Starting in 2019, Delaware undertook a multi-year comprehensive climate planning process to develop its first comprehensive Climate Action Plan that included:

- Stakeholder and community engagement in all Delaware counties and with key industrial sectors and technical experts in the state.<sup>2</sup>
- Development, prioritization, and analysis of strategies and actions to reduce GHG emissions and adapt to the impacts of climate change.<sup>3</sup>
- Selection of key priority strategies and actions for emission reduction and adaptation for inclusion in the state’s Climate Action Plan.
- Implementation of certain strategies and continued public outreach and engagement about climate change and the role of the Climate Action Plan.

This transparent process and robust engagement resulted in the state’s 2021 Climate Action Plan (CAP), which has subsequently guided the state’s efforts to minimize GHG emissions and maximize resilience to climate change impacts. Activities and actions that were spurred from the 2021 CAP are still ongoing and continue to be a high priority for the state to address climate change.

This Climate Pollution Reduction Plan was developed based upon EPA grant guidelines and requirements. It consolidates the information and analysis presented in the 2021 CAP and identifies policy or progress updates since the CAP’s completion, where available. This Climate Pollution Reduction Plan includes the information outlined in Table 1 below. In this table, the

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<sup>2</sup> DNREC. “Public Participation,” 2024. <https://dnrec.delaware.gov/climate-plan/public-participation/>.

<sup>3</sup> DNREC. “Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis Report.” August 31, 2020. <https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/DNREC%20Technical%20Report.pdf>.

location of each piece or type of information required for this Climate Pollution Reduction Plan is also identified.

*Table 1. Location of CPRG requirements in Delaware’s Climate Pollution Reduction Plan*

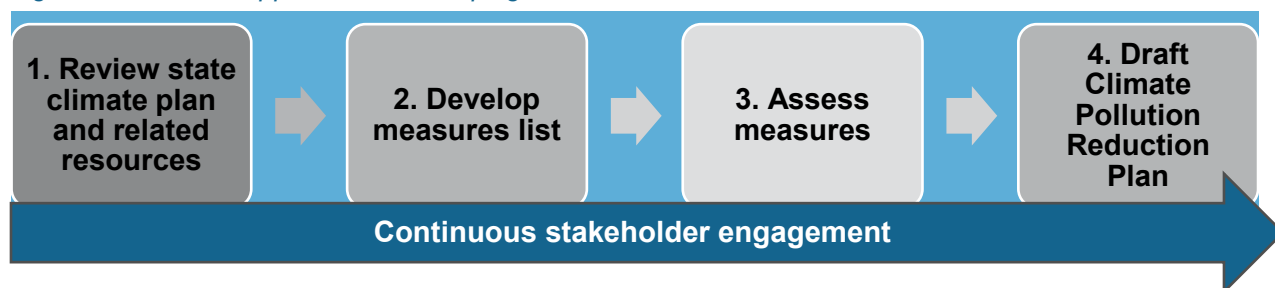
<b>Climate Pollution Reduction Plan Requirement</b>	<b>Requirement Notes and Document Location</b>
<b>GHG Inventory</b>	<ul style="list-style-type: none"> <li>• Section 2.1 and Appendix A</li> </ul>
<b>GHG Emissions Projections</b>	<ul style="list-style-type: none"> <li>• Section 2.1 and Appendix A</li> </ul>
<b>GHG Reduction Targets</b>	<ul style="list-style-type: none"> <li>• Section 2.3</li> </ul>
<b>Priority Quantified GHG Reduction Measures</b>	<ul style="list-style-type: none"> <li>• Section 4.1 includes: an estimate of the quantifiable GHG emissions reductions; key implementing agency(ies); a review of the statutory or regulatory authority to implement the measure; implementation schedule and milestones; expected geographic coverage; identification of relevant funding sources; a qualitative discussion of the benefits for LIDACs; and metrics for tracking progress - see also Appendices D and E</li> </ul>
<b>Benefits Analysis</b>	<ul style="list-style-type: none"> <li>• Section 4.2, will be expanded in Delaware’s upcoming CPRG Program deliverables</li> </ul>
<b>Review of Authority to Implement</b>	<ul style="list-style-type: none"> <li>• Sections 2.4 and 4.1 information by measure</li> </ul>
<b>Low Income Disadvantaged Communities (LIDAC) Benefits Analysis</b>	<ul style="list-style-type: none"> <li>• Specific climate impacts or risks to which LIDACs are vulnerable – Section 3.2</li> <li>• LIDACs that will be affected by the GHG reduction measures in the Climate Pollution Reduction Plan and Appendix C</li> <li>• Census block group ID for affected LIDACs and Climate Pollution Reduction Plan measures – Section 3.1 and Appendix C</li> <li>• Qualitative discussion of the expected benefits to LIDACs associated with Climate Pollution Reduction Plan GHG reduction measures – measure-specific information in Section 4.1</li> <li>• Overview of planned and/or ongoing engagement with representatives and residents of LIDACs to inform Climate Pollution Reduction Plan and development and implementation of upcoming CPRG deliverables – and Appendix B</li> </ul>
<b>Intersection with Other Funding Availability</b>	<ul style="list-style-type: none"> <li>• Section 4.1 information by measure and Appendix D</li> </ul>
<b>Workforce Planning Analysis</b>	<ul style="list-style-type: none"> <li>• Encouraged element for this Plan, it will be addressed in Delaware’s upcoming CPRG Program deliverables</li> </ul>

## 1.2 Approach to Climate Pollution Reduction Plan Development

As described above, Delaware has an existing Climate Action Plan, published in 2021. State law requires an update to that plan in 2025. The EPA CPRG funds and deliverables support DNREC’s efforts to update the state’s Climate Action Plan.

The approach to developing this document was built upon the foundation set by the 2021 Climate Action Plan and centered on the on the strategies and actions previously prioritized for inclusion in 2021 CAP. DNREC followed the approach outlined in Figure 1 to develop the Climate Pollution Reduction Plan.

Figure 1. DNREC's approach to developing the Climate Pollution Reduction Plan



**Step 1.** As a first step in the development of this Climate Pollution Reduction Plan, DNREC reviewed the 2021 CAP,<sup>4</sup> accompanying documentation, existing legislation (e.g., the Delaware Climate Change Solutions Act of 2023), and progress implementing the 2021 CAP.<sup>5</sup> These materials represent already identified priorities for reducing GHG emissions in Delaware.

During this review DNREC identified and collated existing policies, goals, and actions and categorized them by sector, in line with the sectors within Delaware's GHG Inventory. DNREC then consolidated them into an initial measure list. The specific consolidation process included the following steps:

1. Categorize existing and planned policies, goals, and actions by sectors.
2. Group policies, goals, and actions into similar topics and with similar needs/audiences/approaches for implementation.
3. Review groups and develop overall measures.

**Steps 2 and 3.** After compiling the consolidated list of measures DNREC collected information for each measure using existing analyses and resources and incorporating feedback from stakeholders to complete this Climate Pollution Reduction Plan. Where required information to include in the Climate Pollution Reduction Plan was not available, DNREC worked internally and with stakeholders to develop it. Along with the references cited and overview of analysis approaches within this Climate Pollution Reduction Plan, Appendix E provides further technical methodological approaches and information.

**Step 4.** Using information developed in Steps 1 through 3 and gathered from stakeholders, DNREC prepared this Climate Pollution Reduction Plan.

### 1.2.1 Continuous Stakeholder Engagement

Throughout the development of this Climate Pollution Reduction Plan, and during the development of the 2021 CAP (the basis for this Climate Pollution Reduction Plan), DNREC engaged with stakeholders to seek feedback on priorities and discuss key implementation

<sup>4</sup> DNREC. "Delaware's Climate Action Plan." November 2021.

<https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/Delaware-Climate-Action-Plan-2021.pdf>.

<sup>5</sup> DNREC and ICF. "Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis Report." August 31, 2020. <https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/DNREC%20Technical%20Report.pdf>.

information. DNREC engaged with stakeholders across state, local, and regional governments, as well as the public, non-profit, and private sectors in various ways, including one-on-one and small group meetings with individuals and organizations and energy-focused workshops conducted both online and in person. A list of meetings and engagements DNREC had specifically for the Climate Pollution Reduction Plan and CPRG are in Appendix B.

### **Interagency Government Coordination**

DNREC coordinated with interagency departments such as the Delaware Department of Transportation (DelDOT) as well as DVRPC and local government organizations to gather critical input throughout the development of this Climate Pollution Reduction Plan.

Intergovernmental Coordination is facilitated by the state's Energy Office and Climate and Sustainability Office (CPRG lead) being co-located physically and administratively within one DNREC division. This helps conversations happen seamlessly and organically and is one of the reasons that Delaware can move policies forward quickly and efficiently. DNREC is leading a Delaware CAP mitigation team, an interagency coordination group that includes participation from DelDOT, the DNREC Division of Air Quality (DAQ), and DNREC Division of Waste and Hazardous Substances among others, that collaborates to implement the CAP and related activities.

### **Stakeholder, Community Organization, LIDAC, and Public Engagement**

The development of this Climate Pollution Reduction Plan built upon the comprehensive stakeholder engagement conducted to support the 2021 CAP by holding smaller group conversations and individualized meetings to get additional feedback and continue developing a stakeholder network to engage in the upcoming phases of the CPRG grant process.

For the 2021 CAP DNREC conducted two rounds of technical expert input. The first round, a “technical advisory workshop” held in March 2020, sought stakeholder feedback on the viability of possible actions that could help Delaware meet its 2025 emissions reduction goal. The feedback provided by the stakeholders in this workshop informed the 2021 CAP modeled mitigation strategies. DNREC followed this up with sector-specific “technical expert conversations” in September 2020 to review the results of the 2021 CAP technical analysis and to generate input on opportunities and barriers for implementing strategies.

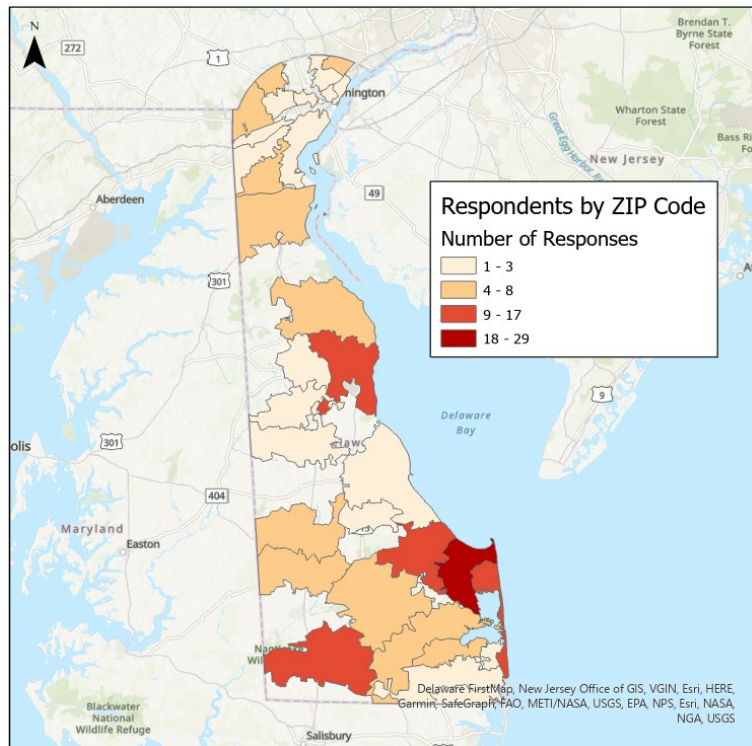
During the development of the 2021 CAP, DNREC also hosted two rounds of public workshops. The purpose of the first round, held in March 2020, was to brainstorm ideas for climate action. Input gathered from this round informed the emissions reduction strategies modeled and the questions DNREC asked during its state agency interviews. The second round, held in September and October 2020, focused on reviewing strategies being considered for the 2021 CAP. Input gathered helped DNREC gauge public support for implementation actions.



Additionally, as a part of the U.S. Climate Alliance's State Funding Readiness Project (SFRP), Delaware conducted a Stakeholder Mapping Analysis Report in 2023. This report covered previous stakeholder engagement efforts for the 2021 CAP, along with other climate and energy-related state initiatives. The report identified stakeholder groups and points of contact with whom DNREC has previously worked, analyzed potential engagement gaps or areas of overlap between engagement efforts across programs, and developed a list of recommended actions. The stakeholder tracker and dashboard developed for this project was used as a planning tool to shape Climate Pollution Reduction Plan engagement and will continue to be utilized for engagement to develop Delaware's upcoming CPRG Program deliverables.

The Governor's Energy Advisory Council (GEAC) recently completed a series of public workshops seeking input on the upcoming State Energy Plan. While the GEAC planning process is separate from the Climate Pollution Reduction Plan, the two share a close overlap in topics covered including renewable energy, energy efficiency, building electrification, clean transportation, and energy equity. The public workshops included a series of surveys that attendees could fill out (see Figure 2), allowing participants to identify priorities for state action, express concerns about perceived or potential disbenefits,

*Figure 2. GEAC survey respondents by self-reported ZIP code*



and assess awareness of existing programs. Because the State Energy Plan overlaps considerably with Climate Pollution Reduction Plan measures, feedback from participants will be considered when applicable in Climate Pollution Reduction Plan development. While privacy concerns prevented DNREC from collecting address data, and thus an exact proportion of participants from LIDAC Census block groups cannot be calculated, ZIP codes for survey participants can be seen in Figure 2 and shows a strong cross-section of respondents across all three Delaware counties. Responsibility for the Delaware CAP, CPRG, and Delaware's Energy Plan sits with the DNREC Division of Climate, Coastal, and Energy. CPRG grant leads played a key role in the planning and implementation of the GEAC workshops, ensuring that climate change information was incorporated throughout.

The development of the additional CPRG deliverables will continue to build on these stakeholder engagement processes and include the development of a comprehensive



engagement plan that includes public workshops in each county and several technical workshops.

### **Planned Engagements with Delaware’s LIDACs and Tribes**

Collaborations and partnerships with communities can help build equity into climate action. Early and continued engagement — especially when considering new or updated programs or policies — is essential, as residents can speak first-hand to community-specific climatic and economic impacts. Particular attention should be paid to communities that may be disproportionately impacted by climate change or climate action. It should be noted that productive partnerships with communities are only possible if trust is established. This trust can be built over time, in part, by openly working with communities to evaluate whether climate actions have the intended effects once implemented. Such a process can ensure that action is carried out in a way that provides benefits to both communities and the state as a whole.

Delaware is committed to equity and environmental justice in all aspects of climate action. The 2021 CAP, which set the stage for current engagement efforts, included an extensive and thorough public engagement process. Public workshops in all three Delaware counties were held in early March 2020, with a second round of virtual workshops held online in September and October 2020. While initially adopted due to the pandemic, this “hybrid” option has rapidly become the norm for engagement, offering better accessibility to those who may struggle with transportation or mobility issues attending an in-person meeting, as well as those who may struggle with reliable broadband access. Additionally, DNREC solicited public comments via an online comment form. Summary reports from all 2021 CAP engagement can be found online at <https://dnrec.delaware.gov/climate-plan/public-participation/>.

LIDAC communities are disproportionately vulnerable to the harmful effects of climate change (see Section 3.2). In recognition of this, DNREC’s prior LIDAC-specific outreach and engagement efforts have primarily focused on climate resilience and reducing local impacts in vulnerable communities, rather than on greenhouse gas emissions reduction measures which are a statewide (and indeed nationwide) responsibility. One example of such resilience-based engagement was the South Wilmington Wetlands Park,<sup>6</sup> which completed construction in August 2022. The park is a 17-acre functioning wetland, providing valuable green space for residents and habitat for native species, as well as natural stormwater management to reduce flooding in the neighboring Southbridge community of Wilmington. The project included extensive input from Southbridge residents throughout the decade-long planning and construction process. Another recent resilience effort was the Wilmington and Surrounding Townships (WiST) Urban Heat Watch project,<sup>7</sup> a community-science-based urban heat mapping initiative that utilized exclusively local volunteers for data gathering. While these projects do not directly relate to emissions reduction, they establish a pattern of strong relationships with

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<sup>6</sup> <https://www.wilmingtonde.gov/government/city-departments/public-works/south-wilmington-wetlands-park>

<sup>7</sup> <https://sites.udel.edu/climatechangehub/events-oldversion/wist-heat-watch-2023/>

communities that DNREC can leverage to open the conversation around CPRG program planning.

Building on efforts to engage with LIDACs for the 2021 CAP and for the development of the Climate Pollution Reduction Plan, DNREC will expand on previous engagement efforts to continue stakeholder outreach for the development of Delaware's upcoming CPRG Program deliverables. Since 2022, DNREC has hosted over 20 engagements and meetings covering a range of topics included within the CAP and focused on in this Climate Pollution Reduction Plan to continue to educate and gather feedback to inform program development. Several of these meetings have been open to the public to provide educational resources and present information from the 2021 CAP. DNREC has also led coordinated stakeholder meetings with Delaware youth organizations, environmental conservation agencies, and other non-profit advocacy groups. Another key stakeholder group is the Lenape Tribe of Delaware, which provides input into developing inclusive climate change adaptation strategies. DNREC is also continuously engaging with municipal governments and other state agencies to share resources and strategize for funding opportunities. DNREC will continue to engage with these key stakeholders and look for additional opportunities for public outreach with LIDACs.

DNREC's engagement efforts for climate planning, particularly in the development of the Climate Pollution Reduction Plan, have involved a diverse group of stakeholders. These include:

- Sierra Club Delaware Chapter
- The Nature Conservancy in Delaware
- Partnership for the Delaware Estuary
- Delaware Center for the Inland Bays
- Resilient and Sustainable Communities League (RASCL)
- Clean Cities Coalition
- NAACP Delaware State Conference
- Delaware Concerned Residents for Environmental Justice
- Delaware Interfaith Power and Light
- Plastic Free Delaware
- Claymont Community Coalition
- Sussex Health and Environmental Network
- Lenape Tribe of Delaware

Each of these groups has contributed valuable insights and perspectives to the climate planning process, enriching the development of strategies within the Climate Pollution Reduction Plan. DNREC's collaboration with these stakeholders ensures that the Climate Pollution Reduction Plan reflects the needs and priorities of diverse communities across Delaware.

## 2 Delaware's Climate Context

### 2.1 GHG Inventory and Projections

Delaware's GHG inventory provides a comprehensive historical and current assessment of the state's GHG emissions. The most recent GHG inventory was prepared in 2023 for the years 1990 through 2020. Emissions estimates in this inventory are represented in million metric tons of carbon dioxide equivalents (MMT<sub>CO<sub>2</sub>e</sub>). In comparison to Delaware's 2005 baseline year emissions levels (23.1 MMT<sub>CO<sub>2</sub>e</sub>), Delaware's gross total GHG emissions in 2020 were estimated at 16.2 MMT<sub>CO<sub>2</sub>e</sub>, which represents a 30% decrease in emissions from the baseline year.

Along with the inventory DNREC prepared a "business-as-usual" (BAU) scenario extending out to 2050. This scenario 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 CAP, total gross emissions are projected to increase to 19.7 MMT<sub>CO<sub>2</sub>e</sub> in 2030 and 21.6 MMT<sub>CO<sub>2</sub>e</sub> 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.

#### Methodology

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 EPA State Inventory Tool (SIT) and Projection Tool (PT). EPA's SIT is a Microsoft Excel®-based tool designed to help states develop GHG emissions inventories. The SIT consists of sector-specific estimation modules to calculate GHG emissions. The default data within the SIT are gathered by federal agencies and other sources covering fossil fuels, electricity consumption, agriculture, forestry, waste management, and industry. The SIT is designed to use methods and sectors consistent with those used in the U.S. GHG Inventory. The EPA disaggregates the National GHG inventory across the 50 states for all sectors.

Where data was unavailable within the SIT, additional state-specific data sources were used and are highlighted within the sector-specific methodology sections. State-specific assumptions were made where SIT estimates were unavailable including the following adjustments:

#### Global Warming Potentials

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 use 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 23.29 to 23.14 MMT<sub>CO<sub>2</sub>e</sub>. This update reflects Delaware's effort to use the most scientifically accurate data when evaluating emissions in Delaware sectors.

- To avoid double counting in the electric power sector, Delaware EIA electricity from in-state generation data were used to subtract electricity generated in-state from total electricity consumption data from the SIT module.
- The SIT does not include default data for industrial wastewater estimates. For 2019 and 2020, industrial wastewater estimates were used from EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks by State.<sup>8</sup>
- For reporting years 2019 and 2020, lime tonnage data was provided by the Delaware Department of Agriculture. To calculate the total amount of agricultural limestone applied to the soil for each year, data from the U.S. Geological Survey was used to determine the ratio of total agricultural limestone to total agriculture specific limestone.<sup>9</sup> These ratios were multiplied by the lime tonnage data provided by the Delaware Department of Agriculture and entered as activity data in the SIT Agricultural module

Projections were developed using the EPA's PT, which allows users to create a simple forecast of emissions through 2050 based on historical emissions imported from the SIT modules. These projections do not include state-specific policies (e.g., renewable portfolio standard or zero-emission vehicle (ZEV) regulations) and are meant to provide additional context when reviewing emissions inventory results. State-specific assumptions were made where PT estimates were unavailable including the following adjustments:

- Hydrofluorocarbon (HFC) emissions were disaggregated using United States Climate Alliance (USCA)/California Air Resources Board (CARB) projected HFC estimates following the same methodology described in the Inventory to separate emissions between the residential, commercial, transportation, and industrial sectors.
- Default oil refinery emissions for DE in the PT included incorrect activity data that over-estimate the state's oil production in 2021 and subsequent projected years. As a result, 2020 emissions were held constant.
- The PT does not include projections for the land use, land-use change, and forestry (LULUCF) sector. To develop projections, 2020 emissions were held constant.

Further methodology discussion can be found in Appendix A.

## Results

The 2020 GHG inventory estimates GHG emissions from various sources across economic sectors in Delaware. The economic sectors that were assessed are electric power (including electricity consumption-based GHG emissions), transportation, industrial, residential, and commercial buildings, agriculture, waste management, and LULUCF. Sector-specific

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<sup>8</sup> EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks by State for 1990-2021. Available online at: <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>

<sup>9</sup> US Geological Survey Mineral Yearbook for Crushed Stone. Table 10 ("Limestone and Dolomite Sold or Used by Producers in the United States in 2019/2020, by use"). Available online at: <https://www.usgs.gov/centers/national-minerals-information-center/crushed-stone-statistics-and-information#myb>

methodologies and activity data, such as fossil fuel combustion, were used to estimate GHG emissions from each of the sectors.

In 2020, Delaware's gross total GHG emissions were estimated at 16.2 MMTCO<sub>2</sub>e, which represents approximately 0.3% of national gross GHG emissions (U.S. gross total was 6,026.0 MMTCO<sub>2</sub>e in 2020).<sup>10</sup> This is a 7.6% decrease from 2018 emissions and 6.5% decrease from 2019 (2018 and 2019 gross emissions were 17.5 MMTCO<sub>2</sub>e and 17.3 MMTCO<sub>2</sub>e, respectively). The 2020 emissions decrease was largely due to a sharp drop in transportation sector emissions due to the COVID-19 pandemic.

Figure 3 shows the breakdown of Delaware's GHG emissions (in MMTCO<sub>2</sub>e) in 2020 by economic sector and end use (where available) to provide a high-level overview of sources of GHG emissions. Tabulated results for emissions by sector and gas can be found in Table 2. Methodologies and data sources for each end-use estimate displayed in Figure 3 are provided in the relevant sector section. Key takeaways from this figure include:

- The largest source of GHG emissions in Delaware was the transportation sector, which represented 30.0% of the gross 2020 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% of total emissions from the residential sector and 7.2% of total emissions from the commercial sector.
- Finally, in 2020 the agriculture sector contributed 3.7% and the waste sector 3.2% of gross GHG emissions.

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<sup>10</sup> EPA: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021; available: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021>

Figure 3. Gross GHG emissions in 2020 broken out by sector and end use (percent of MMTCO<sub>2</sub>e)

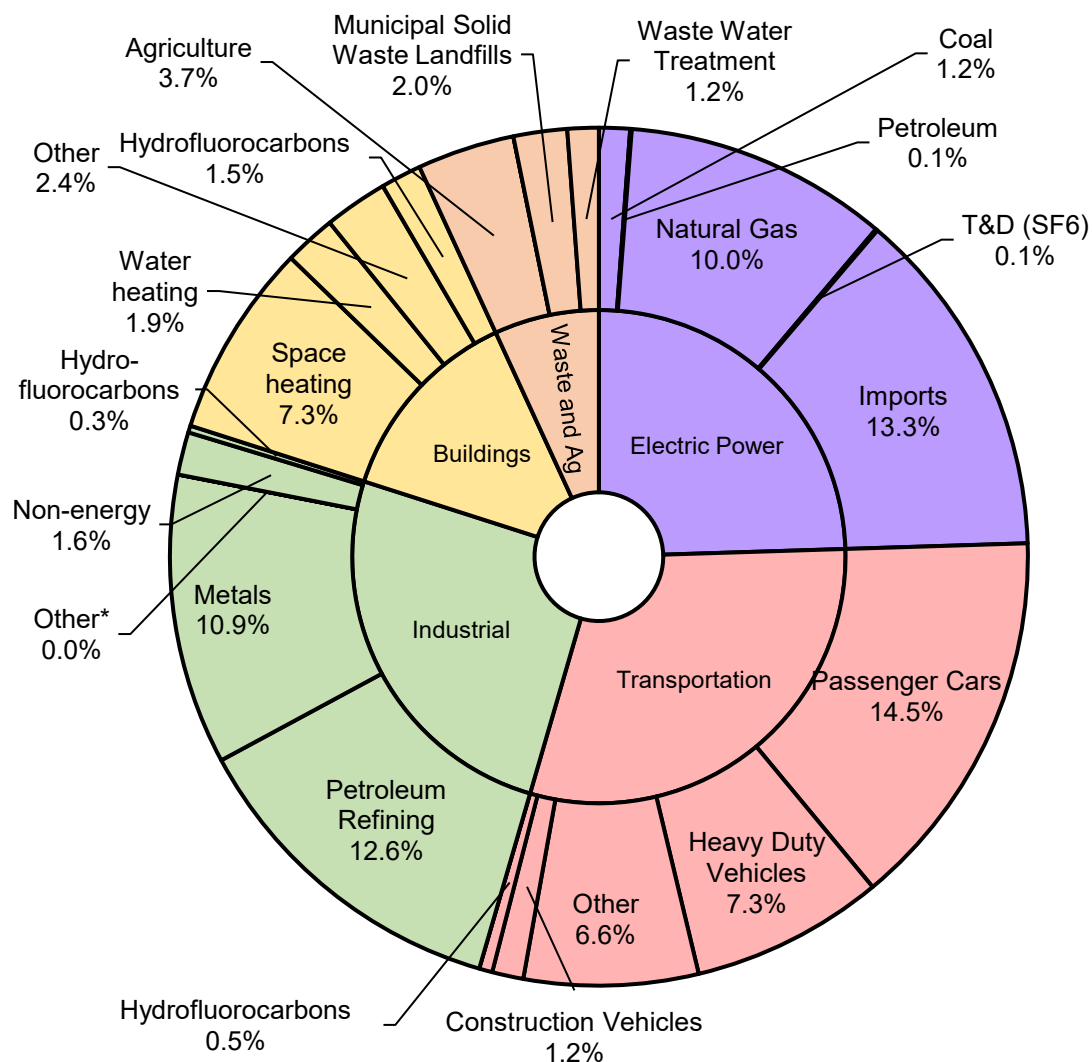


Table 2. Summary table of Delaware GHG emissions estimates and BAU projections (MMTCO<sub>2</sub>e)

	1990	2005	2019	2020	2030	2050
<b>In-State Electricity Generation</b>	<b>7.60</b>	<b>6.35</b>	<b>1.78</b>	<b>1.82</b>	<b>1.30</b>	<b>1.38</b>
CO <sub>2</sub> from fossil fuel combustion (FFC)	7.49	6.29	1.76	1.80	1.29	1.37
N <sub>2</sub> O from FFC	0.03	0.02	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SF <sub>6</sub> from transmission and distribution (T&D)	0.08	0.04	0.01	0.01	<0.01	<0.01
<b>Electricity Consumption</b>	<b>0.43</b>	<b>3.91</b>	<b>2.11</b>	<b>2.14</b>	<b>3.42</b>	<b>4.00</b>
CO <sub>2</sub> from FFC	0.43	3.90	2.11	2.14	3.41	4.00
N <sub>2</sub> O from FFC	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01



	1990	2005	2019	2020	2030	2050
<b>Transportation</b>	<b>4.74</b>	<b>5.46</b>	<b>5.73</b>	<b>4.85</b>	<b>6.34</b>	<b>6.78</b>
CO <sub>2</sub> from FFC	4.53	5.15	5.58	4.72	6.16	6.65
N <sub>2</sub> O from FFC	0.18	0.15	0.05	0.04	0.07	0.07
CH <sub>4</sub> from FFC	0.03	0.02	<0.01	<0.01	<0.01	<0.01
HFCs	<0.01	0.15	0.09	0.08	0.11	0.06
<b>Industrial</b>	<b>4.44</b>	<b>4.40</b>	<b>4.15</b>	<b>4.11</b>	<b>4.56</b>	<b>5.13</b>
CO <sub>2</sub> from FFC	4.04	3.93	3.84	3.80	4.13	4.71
N <sub>2</sub> O from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CO <sub>2</sub> from industrial processes (IP)	0.20	0.17	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from IP	0.19	0.24	0.25	0.25	0.34	0.34
HFC/PFC/NF <sub>3</sub>	<0.01	0.03	0.04	0.04	0.08	0.06
<b>Residential</b>	<b>1.08</b>	<b>1.21</b>	<b>1.08</b>	<b>0.97</b>	<b>1.15</b>	<b>1.14</b>
CO <sub>2</sub> from FFC	1.07	1.19	0.99	0.87	0.90	0.84
N <sub>2</sub> O from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from FFC	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HFCs	<0.01	<0.01	0.08	0.09	0.25	0.30
<b>Commercial</b>	<b>0.58</b>	<b>0.77</b>	<b>1.24</b>	<b>1.17</b>	<b>1.53</b>	<b>1.65</b>
CO <sub>2</sub> from FFC	0.58	0.73	1.08	1.00	1.14	1.26
N <sub>2</sub> O from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CH <sub>4</sub> from FFC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HFCs	<0.01	0.04	0.15	0.16	0.38	0.39
<b>Agricultural</b>	<b>0.57</b>	<b>0.50</b>	<b>0.67</b>	<b>0.59</b>	<b>0.61</b>	<b>0.58</b>
Enteric Fermentation	0.07	0.06	0.04	0.03	0.03	0.03
Manure Management	0.17	0.17	0.19	0.17	0.20	0.22
Agricultural Soil Management	0.32	0.27	0.43	0.38	0.37	0.31
Agricultural Residue Burning	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Liming and Urea	<0.01	<0.01	<0.01	0.01	<0.01	0.01
<b>Waste Management</b>	<b>0.64</b>	<b>0.54</b>	<b>0.52</b>	<b>0.52</b>	<b>0.77</b>	<b>0.97</b>
Wastewater Treatment	0.12	0.16	0.20	0.19	0.23	0.29
Landfill Activities	0.37	0.38	0.32	0.33	0.54	0.68
Waste Incineration	0.15	NO	NO	NO	NO	NO
<b>LULUCF</b>	<b>0.09</b>	<b>-1.05</b>	<b>-0.81</b>	<b>-0.80</b>	<b>-0.81</b>	<b>-0.80</b>
<b>Gross GHG Emissions</b>	<b>20.08</b>	<b>23.14</b>	<b>17.28</b>	<b>16.16</b>	<b>19.68</b>	<b>21.64</b>
<b>Net GHG Emissions</b>	<b>20.17</b>	<b>22.08</b>	<b>16.47</b>	<b>15.36</b>	<b>18.88</b>	<b>20.84</b>

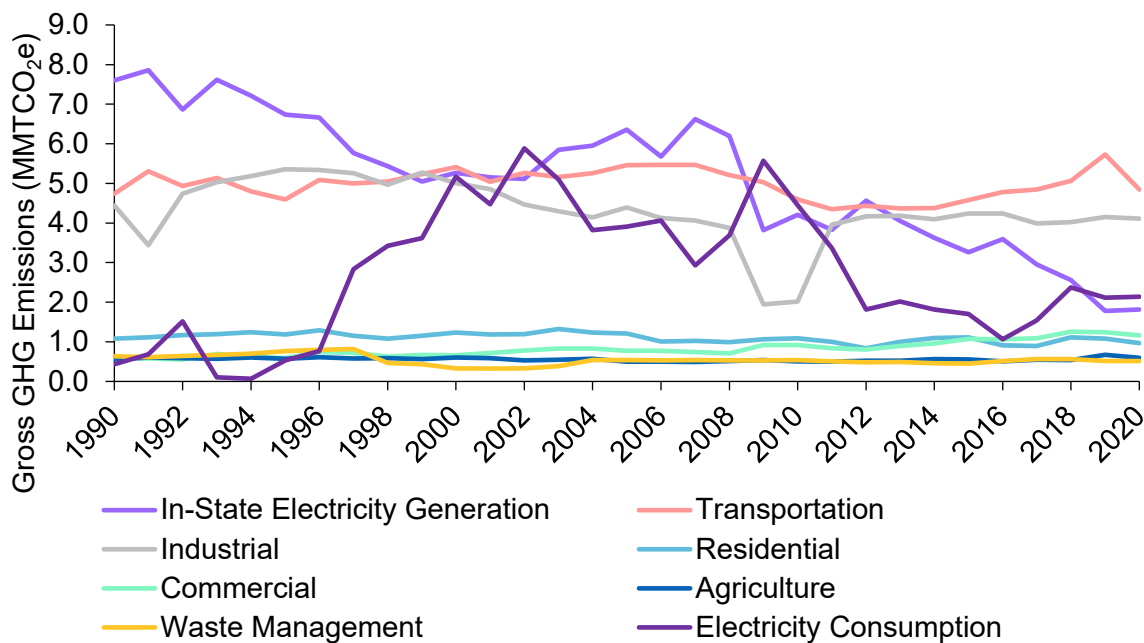
\*Net GHG emissions are greater than gross because the LULUCF sector was estimated to be a source of emissions in 1990.

Projections are per Delaware 2020 inventory methodology and assumptions.

NO = Not Occurring

Sector-specific trends in GHG emissions are shown in Figure 4. This figure reports emissions from in-state electricity generation and electricity consumption (imported electricity) separately. Emissions from both sources of electricity combined decreased between 2005 and 2020 by 61.4%, influenced by factors such as decreased demand for electricity from the industrial sector since 2003, fuel shifting from coal to natural gas for power generation, and emission reductions associated with Delaware’s renewable energy portfolio standards (RPS). Transportation sector GHG emissions decreased by 7.3% between 2005 and 2018 followed by a peak in 2019 due to a change in jet fuel consumption estimates. There was a sharp decline in GHG emissions from the transportation sector between 2019 and 2020, due to reduced travel during the COVID-19 pandemic. The industrial sector dropped significantly in 2009, caused by the economic recession and the Delaware City refinery shutting down operations. Emissions from the industrial sector returned to their pre-2009 levels shortly after refinery operations resumed in 2011. The agriculture and waste management sectors changed by 19.3% and 4.1% respectively between 2005 and 2020 but are smaller contributors to overall emissions. The use of HFCs increased significantly between 2005 and 2020 in the residential and commercial sectors, contributing to a total increase in the combined building sector emissions of 0.2 MMTCO<sub>2</sub>e. The driving force for GHG emissions across all economic sectors was energy consumption. Energy-related activities – specifically, fossil fuel combustion – were the largest source of GHG emissions in 2020 as they represented 89.1% of gross GHG emissions in Delaware (including emissions associated with energy consumption).

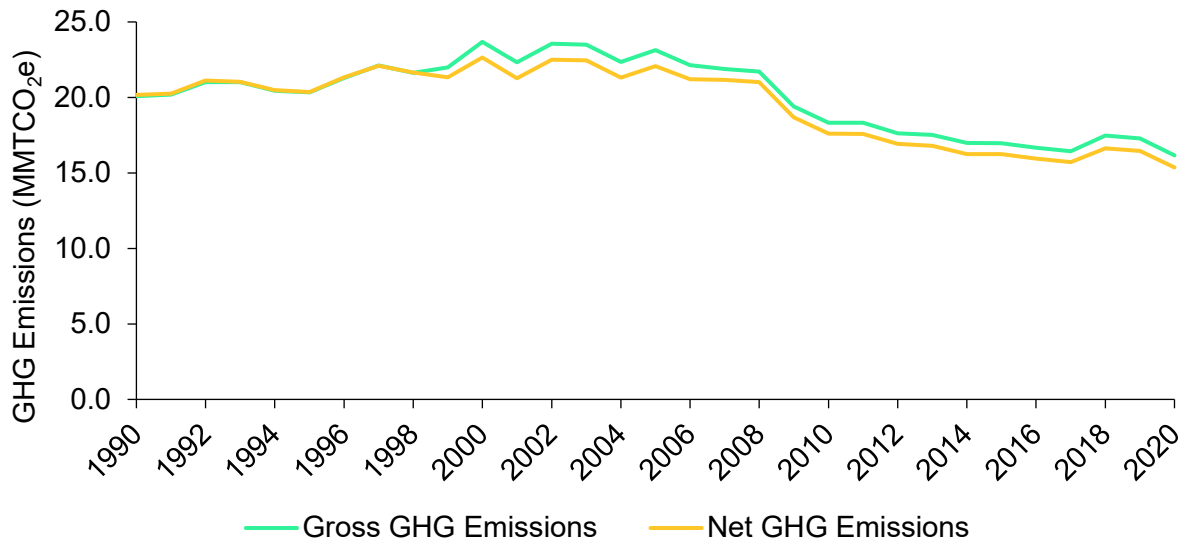
Figure 4. Gross GHG emission trends by economic sector from 1990 to 2020



Net GHG emissions are calculated by including the LULUCF sector in totals. The LULUCF sector can act as a sink for CO<sub>2</sub> emissions (i.e., remove CO<sub>2</sub> emissions from the atmosphere

through capture by the land sector). In this analysis, the LULUCF sector was a source of emissions between 1990 and 1998 (excluding 1997), as shown in Figure 5. In 2020, the total net GHG emissions were 15.4 MMTCO<sub>2</sub>e, with a reduction in emissions by the LULUCF sector of 0.8 MMTCO<sub>2</sub>e, or 4.9% of the total gross GHG emissions.

Figure 5. Comparison of gross and net GHG emissions from 1990 to 2020

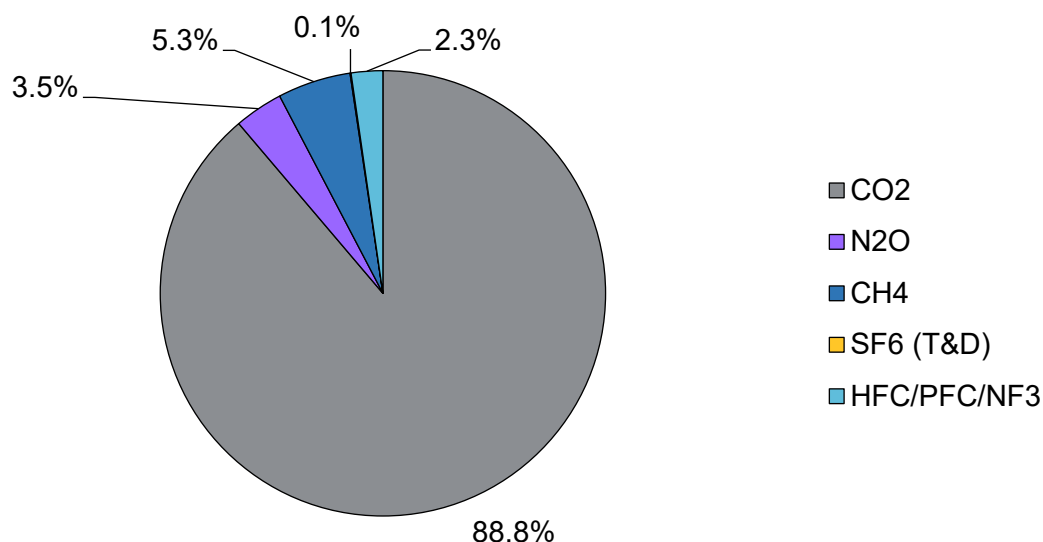


The 2020 GHG inventory estimated emissions for the following GHGs, per the Greenhouse Gas Protocol: carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), HFCs, perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).<sup>11</sup>

Figure 6 presents the gross GHG emissions by gas in 2020. GHGs trap heat in the atmosphere at varying rates over a specific time-period (usually 100 years) compared with CO<sub>2</sub>. The IPCC assigns a GWP to each greenhouse gas that measures its potency compared with CO<sub>2</sub> (which has a GWP of 1). For example, CH<sub>4</sub> has twenty-eight times the GWP of CO<sub>2</sub>. In Delaware, CO<sub>2</sub> emissions accounted for the greatest fraction of emissions, 88.8% of the total, followed by methane, 5.3%, and nitrous oxide, 3.5%. The combined contribution of the fluorinated gases (HFCs, PFCs, and NF<sub>3</sub>) was 2.3% of total 2020 GHG emissions in Delaware. Sulfur hexafluoride emissions associated with the T&D of electricity were less than 1% of total emissions.

<sup>11</sup> Greenhouse Gas Protocol, February 2013, Required Greenhouse Gases in Inventories. [https://ghgprotocol.org/sites/default/files/2022-12/Required%20gases%20and%20GWP%20values\\_0.pdf](https://ghgprotocol.org/sites/default/files/2022-12/Required%20gases%20and%20GWP%20values_0.pdf)

Figure 6. Gross GHG emissions by gas type in 2020 (percent of CO<sub>2</sub>e)

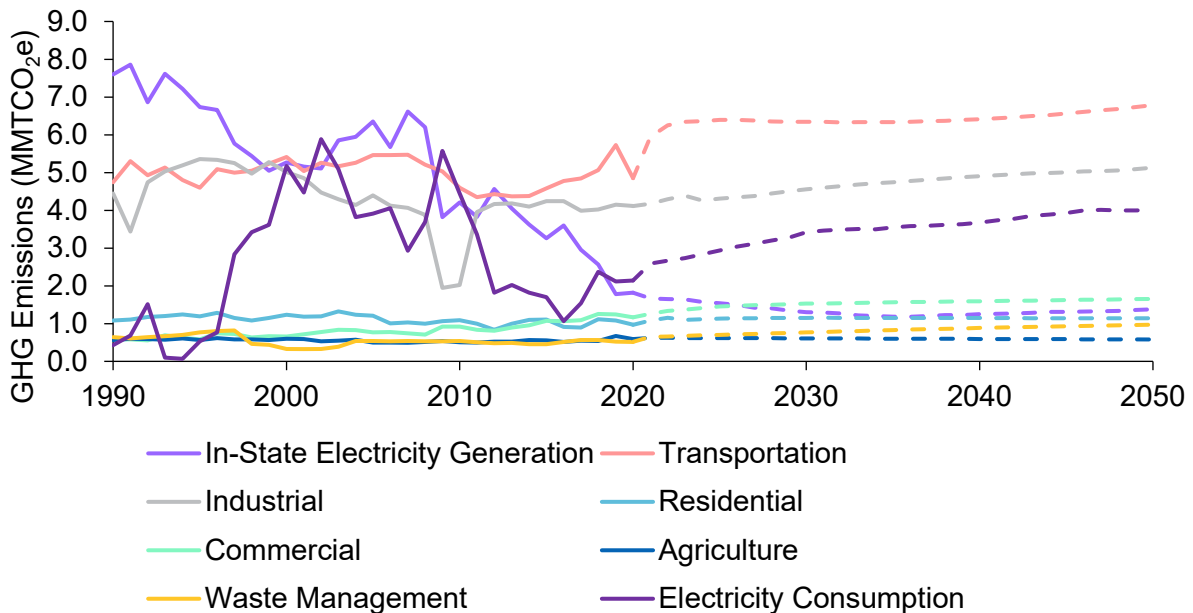


GHG emissions in Delaware are projected to increase from 2021 to 2050 under a BAU scenario (see Table 2). In this scenario, projections are calculated assuming that no state or local policy interventions are made to impact future emissions. These projections were developed using EPA's PT and project future emissions from historic data either based on linear interpolation or the projected growth in population. The PT does not consider any federal or state emissions policies or plans – a key difference between the PT results and the 2018 Delaware GHG Inventory. Updated projections will be included in the state CAP. These projections are provided for comparison with the 2020 inventory estimates. Total gross GHG emissions are projected to increase from 18.0 MMTCO<sub>2</sub>e in 2021 to 19.7 MMTCO<sub>2</sub>e in 2030 and 21.6 MMTCO<sub>2</sub>e in 2050. It is important to note that this projection is just one prediction to review when considering the future of GHG emissions in Delaware. The uncertainty associated with these projections increases as the projection period is extended.

GHG emission estimates and projections by sector from 1990 through 2050 are shown in Figure 7. Projections exclude any federal and state policy interventions. The greatest percent increase in GHG emissions from 2005 to 2050 was a 114.5% increase in the commercial sector, driven in large part by the increase in HFCs. Although 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 by 2.3%. GHG 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, making industrial emissions the second largest sector in 2050.

Figure 7. Gross GHG emission and projection trends by economic sector from 1990 to 2050



## 2.2 Delaware's Criteria Air Pollutants Emissions Inventory

EPA's National Emissions Inventory (NEI) provides a detailed estimate of emissions of criteria air pollutants. Figure 8 and Figure 9 below show emissions of criteria air pollutants, carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrous oxide (NO<sub>x</sub>) from the NEI from 2002-2022. In Delaware, CO, SO<sub>2</sub>, and NO<sub>x</sub> are the most prevalent pollutants, primarily due to the state's industrial and transportation activities. The burning of fossil fuels for power and industrial production (soda ash, HFC/PFC, natural gas, and oil production) result in NO<sub>x</sub> emissions.

Figure 8. Delaware criteria air pollutants emissions over time from the NEI without CO, NO<sub>x</sub>, and SO<sub>2</sub>.

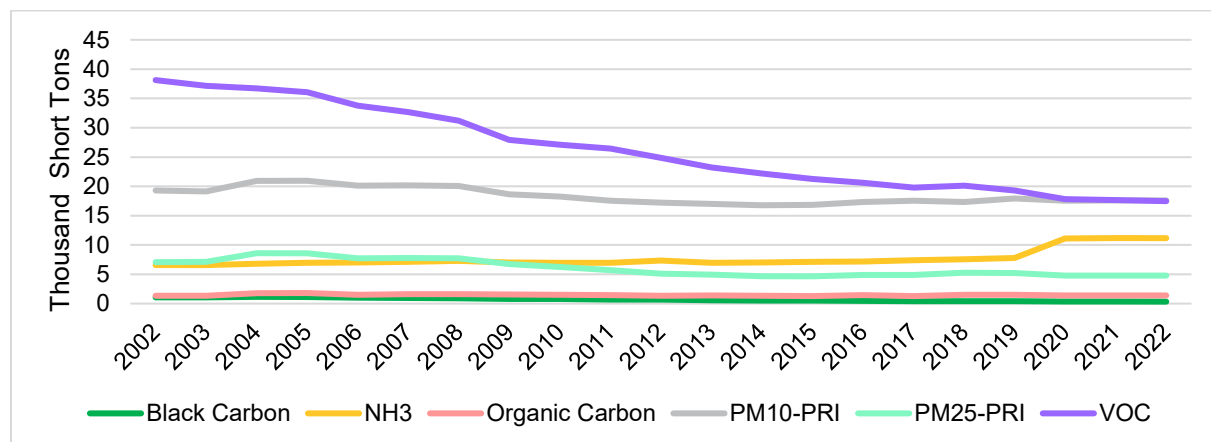
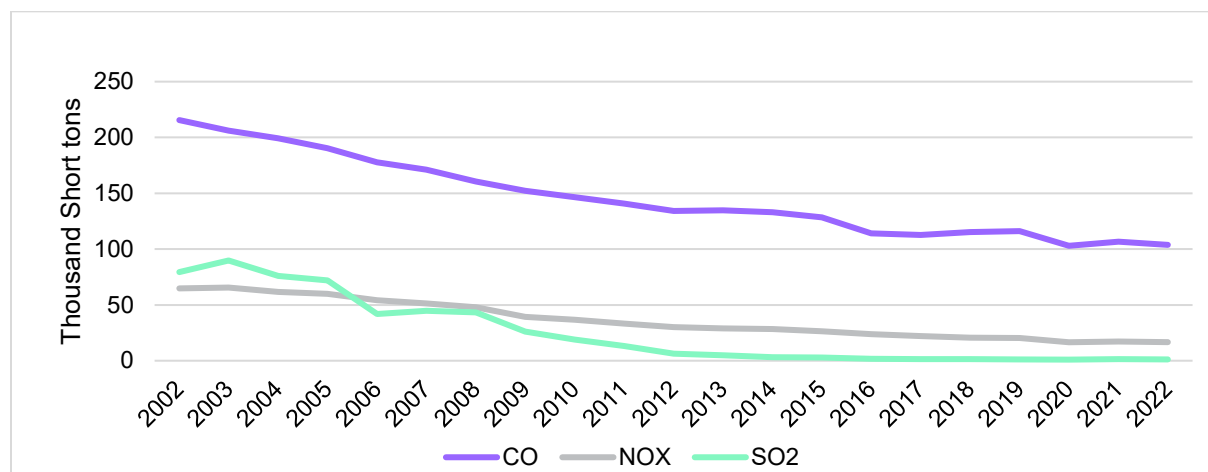


Figure 9. Delaware criteria air pollutants emissions over time from the NEI with CO, NO<sub>x</sub>, and SO<sub>2</sub>.



As seen in Figure 8 and Figure 9, from 2002 to 2022, there has been a decline in multiple air pollutants in Delaware.

- Volatile Organic Compounds (VOCs) have seen a significant decrease of 38,100.0 tons in 2002 to 17,500.0 tons in 2022 due to advancements in industrial processes, emission control technologies, and the adoption of cleaner production methods across various sectors. In 2013, Delaware submitted a State Implementation Plan (SIP) to EPA which highlighted state-approved regulations embedded in the SIP, targeting stationary, mobile, and area sources of VOCs. The SIP-approved regulations specifically addressed emissions reduction from stationary sources such as power plants, industrial boilers, and peaking units.<sup>12</sup>
- The reduction of 111,800.0 tons in CO levels from 2002 to 2022 can be attributed to stricter vehicle emission standards, improved fuel quality, and enhanced transportation infrastructure.
- Decreased NO<sub>x</sub> and SO<sub>2</sub> emissions are a result of regulations on power plants and industrial facilities and programs that address these emissions. Power generation fuel switching and reduced generation have also contributed to these decreases.
- Black carbon, organic carbon, and particulate matter less than 10 microns (PM<sub>10</sub>) levels have remained consistent from 2002 to 2022.
- Ammonia (NH<sub>3</sub>) experienced a sharp increase in 2019 due to an increase in fertilizer use<sup>13</sup> and particulate matter less than 2.5 microns (PM<sub>2.5</sub>), levels showed a relatively small decrease.

<sup>12</sup> EPA. "Air Plan Approval; Delaware; SIP for Interstate Transport for the 2008 Ozone Standard." 2018. <https://www.federalregister.gov/documents/2018/03/23/2018-05868/air-plan-approval-delaware-state-implementation-plan-for-interstate-transport-for-the-2008-ozone>

<sup>13</sup> DNREC. "Delaware 2019 Toxics Release Inventory Report." December 2020. <https://documents.dnrec.delaware.gov/dwhs/tri/2019-TRI-Report.pdf>



## 2.3 GHG Reduction Targets

Delaware enacted a law in 2023 establishing economy-wide greenhouse gas reduction targets. This law, the Climate Change Solutions Act of 2023<sup>14</sup>, established a target of reducing net emissions by 50% by 2030 and to net zero by 2050, both from a 2005 baseline year. The Act is described in more detail in the section below.

## 2.4 Existing Climate Goals, Plans, Policies, and Programs in Delaware

Delaware has existing statutory authority to implement a wide variety of emission reduction strategies in all key economic sectors and has implemented programs, policies and permitting programs for emissions for decades. A more comprehensive list of emissions reduction programs and policy can be found in section 2.1 of the 2021 Delaware Climate Action Plan.

Over the last 20 years, Delaware has taken executive, legislative, and regulatory action to increase energy efficiency, promote renewable energy, and decrease emissions from vehicles and industrial sources. The cornerstone statutory authorities for reducing emissions described below.

In 2003, the Delaware Energy Act (29 *Del. C.* §8051-§8064)<sup>15</sup> became a foundational piece of legislation for energy policy, and thus climate policy in the state. The Delaware Energy Act establishes a state energy office to coordinate energy planning for the state and established the GEAC. It also established a green bank, Delaware's Sustainable Energy Utility which operates under the trade name Energize Delaware. The Delaware Energy Act also grants DNREC regulatory authority to promulgate regulations that are necessary to implement the Delaware Energy Act (29 *Del. C.* §8058)<sup>16</sup>. The Delaware Code (16 *Del. C.* §8001 - §8006) was updated in 2023 to require newly constructed single-family and multi-family residential dwellings to include certain electric vehicle charging infrastructure. The update also provides county and municipal government enforcement authority for the new electric vehicle charging infrastructure requirements.

Delaware's RPS are established by the Renewable Energy Portfolio Standards Act (REPSA) (26 *Del. C.* §351-§364)<sup>17</sup>, first adopted in 2005. This Act is a policy aimed at promoting the use of renewable energy in the state's electricity supply. It sets a target for the minimum percentage of electricity sales that must come from eligible renewable energy sources including solar, wind, biomass, and other clean energy technologies. The Act was most recently amended<sup>18</sup> in 2021, requiring at least 40% of Delaware's electricity retail sales to come from renewable sources by

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<sup>14</sup> Delaware General Assembly, An Act to Amend Titles 7 and 29 of the Delaware Code Relating to Climate Change (2023). <https://legis.delaware.gov/BillDetail/130272>.

<sup>15</sup> Delaware General Assembly. The Delaware Energy Act, Title 29, Chapter 80, §8051-§8064 (2005). <https://delcode.delaware.gov/title29/c080/sc02/index.html>.

<sup>16</sup> Delaware General Assembly. The Delaware Energy Act, Title 29, Chapter 80, §8058 (2005). <https://delcode.delaware.gov/title29/c080/sc02/index.html>.

<sup>17</sup> Delaware General Assembly. Renewable Energy Portfolio Standards, Title 26, Chapter 1, §351-§364 (2005). <https://delcode.delaware.gov/title26/c001/sc03a/index.html>.

<sup>18</sup> Delaware General Assembly, An Act to Amend Title 26 of the Delaware Code Relating to Renewable Energy Portfolio (2021). <https://legis.delaware.gov/BillDetail?LegislationId=48278>.

2035 with a 10% solar carveout. The Renewable Energy Taskforce is established under REPSA to provide recommendations of renewable energy trading mechanisms and other structures to support the growth of renewable energy in Delaware. The Taskforce is directed by REPSA to promote a market for renewable energy at all scales. The Public Service Commission is charged with managing RPS compliance requirements, establishing reporting mechanisms for electric utilities, and developing rules and procedures to implement the RPS.

Delaware code (7 *Del. C.* §6043-§6047)<sup>19</sup> authorizes DNREC to implement and participate in the Regional Greenhouse Gas Initiative (RGGI) and to implement and manage an auction program to sell CO<sub>2</sub> allowances into a market-based trading program consistent with the RGGI Memorandum of Understanding. Delaware's portion of the RGGI program is established in Delaware regulations as the CO<sub>2</sub> Budget Trading Program (7 *Del. Admin. Code* §1147)<sup>20</sup>. Delaware and other participating states have developed the emission budget trading programs based on a model rule to reduce CO<sub>2</sub> emissions from fossil-fuel fired power plants. Funds raised through the initiative are returned to participating states to invest in energy efficiency, renewable energy, and other consumer benefit programs.

Delaware's renewable energy efficiency resource standards are established by the Energy Efficiency Resource Standards Act (26 *Del. C.* §1500-§1507)<sup>21</sup> of 2009. The Act established that all electric distribution companies, rural electric cooperative, or municipal electric companies serving energy customers in Delaware must achieve a minimum percentage of energy savings.

Building off the progress achieved through the Energy Efficiency Resource Standards (EERS), the Delaware Energy Act was amended (29 *Del. C.* §8059(h)) in 2014 to create the Energy Efficiency Advisory Council and enable expansion of cost-effective energy efficiency programs in Delaware by establishing energy savings targets and allowing energy providers to offer programs to their customers. The updates also directed DNREC to promulgate regulations governing evaluation, measurement, and verification (EM&V) to define the procedures and standards that will be used to demonstrate, document, and report compliance with the energy savings targets. DNREC's Division of Air Quality has adopted regulations prohibiting high global warming potential pollutants. The Clean Air Act Title V Operating Permit Program (7 *Del. C.* §6095-§6099)<sup>22</sup>, authorizes DNREC to assess annual fees onto eligible entities that emit high proportions of hazardous air pollutants. These fees will be assessed for each calendar year 2024, 2025, and 2026. The required fees are scaled to each entity based on the emissions of each air contaminant, NO<sub>x</sub>; PM<sub>10</sub>; SO<sub>2</sub>; VOC, in whole tons and in the aggregate, excluding CO

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<sup>19</sup> Delaware General Assembly. Regional Greenhouse Gas Initiative and CO<sub>2</sub> Emission Trading Program, Title 7, Chapter 60, §6043-§6047. <https://delcode.delaware.gov/title7/c060/sc02a/index.html>.

<sup>20</sup> Division of Air Quality. "1147 CO<sub>2</sub> Budget Trading Program." State of Delaware, December 11, 2018. <https://regulations.delaware.gov/AdminCode/title7/1000/1100/1147.shtml>.

<sup>21</sup> Delaware General Assembly. Energy Efficiency Resource Standards, Title 26, Chapter 15, §1500-§1507 (2009). <https://delcode.delaware.gov/title26/c015/index.html>.

<sup>22</sup> Delaware General Assembly. Clean Air Act Title V Operating Permit Program, Title 7, Chapter 60, §6095-§6099. <https://delcode.delaware.gov/title7/c060/sc08/index.html>.

and PM<sub>2.5</sub>, as listed in the 2020 Delaware Point Source Emission Inventory of Estimated Actual Regulated Air Contaminants.

Delaware's Motor Vehicle Emissions Code (7 *Del. C.* §6701-§6709)<sup>23</sup>, authorizes DNREC to formulate and amend codes, rules and regulations establishing standards and requirements for the control of air contaminants from motor vehicles. 7 *Del. C.* §6702 also authorizes DNREC to assess fines to motor vehicle operators that emit smoke and other air contaminants in excess of standards, rules, or regulations adopted by DNREC.

In December 2023, Delaware adopted the Advanced Clean Cars II (AC II) emission standards, a package of regulations including the Low Emission Vehicle Program (LEV) criteria and greenhouse gas regulations and the ZEV regulation and will implement these tailpipe emission standards through 2032. The requirements for ZEVs will gradually increase through 2032. The regulations require automakers to deliver an increasing number of ZEVs for sale in Delaware. Zero-emission options, including battery-electric, plug-in hybrid electric, and fuel cell electric vehicles, will be more accessible across the state. Under the finalized regulation, starting with model year 2027, 43% of new cars and trucks sent to Delaware for sale will be ZEVs. The percentage will increase to 82% in 2032. The regulations will expire in model year 2033.<sup>24</sup> This is similar to regulations in some other states. The adoption of these standards was enabled in large part by a decade of education and financial incentives aimed at reducing barriers to electric vehicle adoption.

In 2021, Delaware's first CAP was published, outlining strategies that will help Delaware meet its short-term emission reduction goals. The plan also integrated emission reduction strategies with resiliency actions. The plan was developed after months of community outreach and coordination with the public to ensure the plan reflects the needs and priorities of vulnerable communities, those most affected by climate change.

The Delaware Planning Act (29 *Del. C.* §9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

In 2023, Delaware enacted the Climate Change Solution Act of 2023<sup>25</sup>, establishing a greenhouse gas emission reduction target of net-50% by 2030 and net-zero by 2050 – in alignment with the federal goal. The Act (7 *Del. C.* §10000-§10006) provides broad statutory authority to support implementation of emission reduction measures (including those outlined in this Climate Pollution Reduction Plan) and directs DNREC to update the CAP every five years, provide a Climate Action Plan Implementation Report every two years, and establish an “all-of government” strategy for state agencies to achieve emission targets. The Act also instructs state

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<sup>23</sup> Delaware General Assembly. Motor Vehicle Emissions, Title 7, Chapter 67, §6701-§6709. <https://delcode.delaware.gov/title7/c067/index.html>.

<sup>24</sup> DNREC. “DNREC Finalizes Clean Car Regulations.” State of Delaware News, November 29, 2023. <https://news.delaware.gov/2023/11/29/dnrec-finalizes-clean-car-regulations/>.

<sup>25</sup> Delaware General Assembly, An Act to Amend Titles 7 and 29 of the Delaware Code Relating to Climate Change (2023). <https://legis.delaware.gov/BillDetail/130272>.

agencies to incorporate climate change into agency operations, decision making, and rulemaking.

Also in 2023, a suite of other energy-related bills was enacted that call for measures such as solar-ready commercial building construction and advancing offshore wind procurement and transmission planning.

Delaware has been taking action to decarbonize its electric and transportation sectors since the early 2000's, with the goal of reducing in-state emissions to lessen the impacts of climate change and improve the health of Delawareans. The CPRG program will facilitate state efforts to update and refine the CAP for 2025, improve greenhouse gas accounting and modeling, and move the needle in sectors where more progress is needed.

The first Climate Action Plan Implementation Report was released in December 2023.<sup>26</sup> Highlights from the report include:

- Delaware's Green Energy Fund deploying over 500 solar projects in 2022
- The introduction of a new Low- to Moderate-Income (LMI) Solar Pilot Program, making solar more affordable and accessible
- Energize Delaware launching six new programs, including electric vehicle (EV) grants for local governments and solar grants for schools and libraries
- Codifying the Clean Vehicle Rebate Program into state law, to incentivize adoption of EVs
- The State of Delaware providing \$1.4 million in funding to build DC-Fast Charging stations throughout the state, strengthening EV charging infrastructure
- Utilizing \$100 million from Bipartisan Infrastructure Law funding to expand broadband access in underserved communities, reducing transportation emissions by making telework and virtual healthcare options more accessible
- Finalizing regulations to adopt California's Advanced Clean Car II program in Delaware
- Placing over 1,200 acres into Agricultural Conservation Easements to protect natural and working lands
- Planting over 180,000 trees as part of Delaware's Tree for Every Delawarean initiative

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<sup>26</sup> DNREC. "2023 Implementation Report: Delaware's Climate Action Plan." December 2023. [documents.dnrec.delaware.gov/energy/climate/plan/2023-CAP-Implementation-Report.pdf](https://documents.dnrec.delaware.gov/energy/climate/plan/2023-CAP-Implementation-Report.pdf).

### 3 Delaware LIDACs

Not all communities feel the effects of climate change equally. To ensure equitable outcomes and environmental justice for all, it is vitally important to identify, understand, and communicate transparently with communities who stand to be most immediately affected by climate change impacts. This can begin by analyzing environmental, Census, and other geographic data to identify those communities most at risk, while also engaging residents on the ground. Authentic community engagement is necessary to leverage local knowledge of impacts and to better understand the obstacles and issues these communities face. It is also important to understand how climate action, such as transitioning to low-carbon energy, could impact existing jobs or alter job opportunities.

Intentional engagement, partnerships, and planning with LIDACs is essential to provide meaningful benefits to LIDACs in Delaware.<sup>27</sup> Failure in program design and mechanisms may lead to significant challenges within LIDACs, such as:<sup>28</sup>

- Experiencing inequitable access to sustainable and efficient energy systems due to unavailability or unaffordability resulting in a greater energy burden, characterized by more expensive energy services
- Facing rising energy prices attributed to a shift to renewables and increased costs associated with technology transitions

Finally, climate change-related engagement should focus on communities most at risk of climate change impacts and those most immediately affected by climate action. Targeted outreach can help disseminate climate change information and provide communities with a way to provide the state with input and insight for decision making. The benefits of Delaware's priority GHG emissions reduction measures for LIDACs are discussed in individual measures, as presented in Section 4 of this document.

#### 3.1 Identification of Delaware LIDACs

There are numerous environmental justice and equity analysis tools available at both the state and federal level, with varying definitions, indices, and intended modes of use. While federal guidelines often require use of one tool over others, identification of low-income and disadvantaged communities and gaining an initial assessment of potential environmental and

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<sup>27</sup> The EPA defines a disadvantaged community in the following manner: 1) if it is disadvantaged according to the Climate and Economic Justice Screening Tool (CEJST); 2) if the census block is at or above the 90th percentile for any of EJScreen's Supplemental Indexes compared to the nation or state; 3) any geographic area within Tribal lands and indigenous areas as included in EJScreen.

U.S. EPA Office of Air and Radiation. "Climate Pollution Reduction Grants Program: Technical Reference Document for States, Municipalities and Air Pollution Control Agencies. Benefits Analyses: Low-Income and Disadvantaged Communities," April 27, 2023. [https://www.epa.gov/system/files/documents/2023-05/LIDAC%20Technical%20Guidance%20-%20Final\\_2.pdf](https://www.epa.gov/system/files/documents/2023-05/LIDAC%20Technical%20Guidance%20-%20Final_2.pdf).

<sup>28</sup> World Resources Institute. "Achieving Social Equity in Climate Action: Untapped Opportunities and Building Blocks for Leaving No One Behind." 2021. <https://www.wri.org/research/achieving-social-equity-climate-action>.

economic stressors can be greatly enhanced by using several available tools in conjunction, especially those that utilize more regional or localized datasets.

Delaware has existing state-level tools to identify low-income and disadvantaged communities. Because of Delaware's relatively small size and small community size, use of state level tools often provides a more accurate picture of geographic areas of need. State policy encourages use of the Equity Analysis Tool, developed by DelDOT, and the EJ Area Viewer, developed by DNREC. Both of these state tools incorporate federal data sets used in the EPA EJScreen (described below) tool but couple them with more granular geographic data. The use of these state level tools is particularly useful for identifying smaller or isolated low-income and disadvantaged communities in more rural areas.

The state-level Equity Analysis Tool categorizes neighborhoods based on specific poverty and minority percentage criteria<sup>29</sup> effectively identifying areas with varying degrees of environmental justice concerns.<sup>30</sup> Using this tool, DNREC identified 104 moderate and 61 significant Environmental Justice Neighborhood Groups statewide. Of the 165 neighborhood groups identified, New Castle County contains 70 moderate and 53 significant groups, Kent County contains 16 moderate and 3 significant groups, and Sussex County contains 18 moderate and 5 significant groups.

As required by EPA's CPRG guidelines, DNREC also utilized the EPA environmental justice screening tool EJScreen to identify Census Block Groups that the EPA designates as disadvantaged in the state. Using a federal tool in this manner ensures consistent methodology across state boundaries. Using the EJScreen Tool, DNREC identified 189 Census Block Groups as disadvantaged out of 706 total (27%). Of the 189 Census Block Groups identified as disadvantaged using EJScreen, 124 are in New Castle County, 28 are in Kent County, and 37 are in Sussex County. A full listing of the Census Block IDs that are identified as LIDACs by EJScreen in Delaware is included in Appendix C.

### **3.2 Climate Risks to Delaware's LIDACs**

The most prevalent climate risks within Delaware are sea level rise, rising temperatures, and changes in precipitation patterns. In 2021, Delaware conducted a climate vulnerability assessment as part of its CAP. Since 1900, Delaware has experienced over one foot of sea level rise. By midcentury, sea levels are projected to rise another 9 to 23 inches, and up to 5 feet by 2100.

Average temperatures have also increased and are projected to continue rising; since 1895, Delaware's average temperature has risen 2.0°F. Projections indicate average temperatures may be 2.5-4.5°F warmer by midcentury and 3.5-8.0°F by 2100 (compared to the average for

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<sup>29</sup> WILMAPCO. "2019 Transportation Justice Plan." September 2019. [http://www.wilmapco.org/EJ/WILMAPCO\\_2019\\_TJ\\_Plan.pdf](http://www.wilmapco.org/EJ/WILMAPCO_2019_TJ_Plan.pdf).

<sup>30</sup> WILMAPCO. "2019 Transportation Justice Plan." September 2019. [http://www.wilmapco.org/EJ/WILMAPCO\\_2019\\_TJ\\_Plan.pdf](http://www.wilmapco.org/EJ/WILMAPCO_2019_TJ_Plan.pdf).



the 1981-2010 period). Furthermore, the number of days above 95.0°F is projected to increase from an average of 5 days to more than 10 days over the next 2 decades.

Climate change is causing increased variability in precipitation. Annual average precipitation in the state is projected to increase 10% by 2100. The number of very wet days – defined as periods with over 2 inches of rainfall in 24 hours – is expected to increase as well.

2023 was a year of unprecedented climate change driven disasters in the U.S. and in Delaware. In 2023, the U.S. experienced 28 weather and wildfire disasters that had an economic cost of more than one billion dollars each, the most ever recorded. In 2023, Delaware experienced its largest tornado ever, an EF-3 rated tornado which caused a path of damage 14.0 miles long in Bridgeville and Ellendale. Also in 2023, Delaware and its neighboring states experienced several of the worst air quality days on record due to wildfire smoke from Canada. Nine of the top ten hottest summers recorded in Delaware have occurred in the past twenty years<sup>31</sup>. Globally speaking, July 2023 was the hottest month ever recorded in 173 years of NOAA record-keeping<sup>32</sup>. These events, along with extreme precipitation and chronic sunny day flooding in coastal areas, will become increasingly frequent unless rapid progress is made to reduce the emissions that cause climate change.

The State of Delaware recognizes that frontline communities – many of which are low-income, minority neighborhoods that are disproportionately exposed to hazardous industrial pollution – are the most impacted by climate change. Rising temperatures in urban areas and an increased frequency of extreme weather events more deeply affect communities with less social and economic capital. For example, several flood events in the past two years have left residents in LIDAC communities displaced and/or have ruined vehicles parked on low-lying streets. High heat days put families without access to air conditioning and outdoor workers at risk of heatstroke. DNREC will prioritize and continue to engage LIDACs to address all considerations discussed in this section through the comprehensive stakeholder engagement process that will be deployed for Delaware’s upcoming CPRG Program deliverables.

## 4 Priority GHG Reduction Measures

### 4.1 Measures

Delaware’s CPRP GHG Reduction Measures are derived from the 2021 Delaware Climate Action Plan and incorporate feedback from CPRG-focused engagement efforts. Activities and actions that were initiated because of the 2021 CAP are still ongoing and continue to be a high priority for the state to address climate change. Delaware’s CPRP consolidates the information and analysis presented in the 2021 CAP and identifies policy or progress updates since the CAP’s completion, where available. Table 3 provides a summary of the measures, relevant

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<sup>31</sup> NOAA National Centers for Environmental Information. “Climate at a Glance Statewide Time Series.”

<https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/statewide/time-series/>

<sup>32</sup> NASA. “NASA Clocks July 2023 as Hottest Month on Record Ever Since 1880.” 2023. <https://www.nasa.gov/news-release/nasa-clocks-july-2023-as-hottest-month-on-record-ever-since-1880/>

GHG inventory sectors, and links each Climate Pollution Reduction Plan measure to GHG reduction strategies detailed in Delaware’s 2021 CAP.

*Table 3. Delaware Climate Pollution Reduction Plan measures summary*

<b>Climate Pollution Reduction Plan Measure</b>	<b>2021 CAP Strategies</b>	<b>Sector(s)</b>
<b>1. Support deployment of and access to renewable energy systems and the decarbonization of Delaware’s electricity.</b>	<ul style="list-style-type: none"> <li>• Increase the number of on-site renewable energy systems in residential and commercial buildings.</li> <li>• Address equity challenges in access to renewable energy.</li> <li>• Increase commitment to renewable energy in state agency operations.</li> <li>• Strengthen Delaware’s Renewable Energy Portfolio (RPS) standards.</li> <li>• Ensure that Delaware is prepared for offshore wind energy opportunities.</li> </ul>	Residential and Commercial Buildings, Electricity
<b>2. Increase building energy efficiency and reduce energy consumption.</b>	<ul style="list-style-type: none"> <li>• Strengthen building energy codes.</li> <li>• Expand energy efficiency programs for residential and commercial buildings.</li> <li>• Expand energy efficiency opportunities for low- and moderate-income residents and small businesses.</li> <li>• Reduce emissions from hydrofluorocarbons.</li> </ul>	Residential and Commercial Buildings
<b>3. Support the long-term transition to building electrification.</b>	<ul style="list-style-type: none"> <li>• Support the long-term transition to building electrification.</li> </ul>	Residential and Commercial Buildings
<b>4. Provide assistance and support for industrial decarbonization.</b>	<ul style="list-style-type: none"> <li>• Improve industrial energy efficiency.</li> <li>• Reduce emissions from hydrofluorocarbons.</li> <li>• Increase the number of on-site renewable energy systems in industrial buildings.</li> </ul>	Industry, Waste Management
<b>5. Reduce methane emissions across Delaware.</b>	<ul style="list-style-type: none"> <li>• Reduce methane emissions through expanded methane capture.</li> <li>• Reduce methane leakage from natural gas T&amp;D pipelines.</li> <li>• Increase renewable natural gas production and incentivize markets for its use as a fuel.</li> <li>• Reduce methane emissions by diverting waste from landfills through increased recycling and waste diversion.</li> </ul>	Industry, Agriculture, Waste Management
<b>6. Reduce vehicle miles traveled.</b>	<ul style="list-style-type: none"> <li>• Reduce vehicle miles traveled.</li> </ul>	Transportation
<b>7. Improve the efficiency of freight delivery.</b>	<ul style="list-style-type: none"> <li>• Improve the efficiency of freight delivery.</li> </ul>	Transportation
<b>8. Advance deployment of zero emission vehicles and ZEV fueling infrastructure.</b>	<ul style="list-style-type: none"> <li>• Strengthen consumer adoption of electric vehicles.</li> <li>• Capitalize on the transition to ZEVs to stimulate innovation and provide jobs.</li> <li>• Expand charging infrastructure for electric and plug-in hybrid electric vehicles.</li> <li>• Improve accessibility of low-carbon transportation options for all Delawareans.</li> <li>• Ensure electric and plug-in hybrid electric vehicles contribute to grid stability.</li> <li>• Promote increased vehicle fuel efficiency and ZEV Program.</li> </ul>	Transportation
<b>9. Maintain natural and working lands to sequester carbon</b>	<ul style="list-style-type: none"> <li>• Support best management practices on agricultural lands that provide greenhouse gas emissions co-benefits.</li> <li>• Support conservation and restoration of forest lands.</li> <li>• Support local communities’ enhancement of urban greenspaces.</li> </ul>	Agriculture, Land Use/Forestry

Climate Pollution Reduction Plan Measure	2021 CAP Strategies	Sector(s)
<b>10. Lead by example in State and Municipal Operations and Procurement</b>	<ul style="list-style-type: none"> <li>Lead by example in state government operations to reduce transportation emissions (expanded upon in this Climate Pollution Reduction Plan).</li> </ul>	Transportation, Waste Management, Industry, Electricity

The following section describes each measure in more detail. Each measure has a description, quantified GHG reductions, key implementing agencies, implementation activities and milestones, a description of the authority to implement, the geographic coverage of the measure, relevant funding sources, LIDAC benefits, and metrics for tracking progress. All the GHG reduction quantifications are cumulative and are based on modeling built from the 2021 CAP except for Measure 9. The methodology for quantifying reductions from all measures is described in Appendix E.

### Measure 1. Support deployment of and access to renewable energy systems and the decarbonization of Delaware’s electricity.

This measure focuses on increasing opportunities for all Delaware residents and stakeholders to access, install, and benefit from renewable energy solutions. Delaware has existing incentive programs that help homeowners and businesses install renewable energy systems such as solar panels, solar water heating, and geothermal systems.<sup>33</sup> Delaware's RPS established by the REPSA requires utilities to source an increasing percentage of electricity from renewable sources, with a mandate of 25% by 2025 and 40% by 2035, with at least 10% coming from solar energy.<sup>34</sup>

Decarbonization: Long-term strategies to reduce carbon dioxide emissions by phasing out the use of carbon-emitting processes and technologies. This is primarily accomplished by eliminating the combustion of fossil fuels as an energy source, with the end goal of a carbon-free global economy.

Solar Renewable Energy Certificates (SRECs) generated from on-site renewable energy systems at residences and businesses can be purchased by Delaware electric suppliers to meet the RPS requirements. The RPS has driven the growth of solar sited in Delaware from 2 megawatts (MW) at the end of 2008 to 207 MW at the end of 2022. Additionally, Delaware has been researching the feasibility of offshore wind projects since 2017 and has since passed significant legislation and published several reports to further the advancement for procuring offshore wind power. The strategic value of offshore wind for Delaware is underscored by the fact that there are not many other options available for delivering sufficient renewable energy at the scale that will be needed to meet the state’s renewable energy goals, which in turn will be crucial to meeting Delaware’s climate goals.

<sup>33</sup> DNREC. “Renewable Energy Assistance.” <https://dnrec.delaware.gov/climate-coastal-energy/renewable/assistance/>  
<sup>34</sup> DNREC. “Renewable Energy Portfolio Standards.” <https://dnrec.delaware.gov/climate-coastal-energy/renewable/portfolio-standards/>

Low-income households spend a higher percentage of their total income on energy costs than higher income households. They also face numerous barriers in accessing clean and renewable energy programs that could reduce this high-cost burden. This measure seeks to expand opportunities to provide renewable energy to LIDAC residents and communities, while ensuring energy affordability. For example, opportunities exist to build on the work of the GEAC’s Environmental Justice and Energy Equity workgroup. The workgroup proposed suggestions to be included in the State Energy Plan which is currently being updated. These recommendations advocated for the development of policies and programs that will ensure equitable access to the benefits of renewable energy resources regardless of income, tenure (owner vs. renter), or location (multi-family vs. single-family, and utility service territory).<sup>35</sup>

This measure builds on existing programs and considers new and expanded opportunities for deployment of on-site renewable resources at residential and commercial sites in addition to decarbonizing the Delaware electric grid through the investment in offshore wind, solar, and other renewable energy sources, to meet the State’s ambitious RPS.

### Quantified GHG Reductions

*Table 4. Near- and long-term cumulative emission reductions for Measure 1*

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
<b>Support deployment of and access to renewable energy systems and the decarbonization of Delaware’s electricity.</b>	1.05	39.01

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Administers financial incentive programs for residential and commercial renewable energy deployments; works with partners to improve policies related to renewable energy; works with neighboring states and PJM Interconnection to study the transmission impacts of offshore wind development and report back to the Governor and the General Assembly on a process for procuring offshore wind power; administers the Renewable Energy Taskforce; develops the State Energy Plan.
- **Delaware Public Service Commission:** Ensures safe, reliable, and reasonably priced cable, electric, natural gas, wastewater, water and telecommunications services for Delaware consumers. Implements, and certifies compliance with, the Renewable Energy

<sup>35</sup> DNREC. “Governor’s Energy Advisory Council.” <https://dnrec.delaware.gov/climate-coastal-energy/energy-office/advisory-council/>

Portfolio Standard Act, certifies eligible renewable energy credit (REC) generators, and establishes the tracking system for RECs and SRECs.

- **Energize Delaware:** Administers financial incentive programs for renewable energy for a variety of end-users and operates Delmarva Power's annual SREC procurement program.
- **State and local government agencies, businesses, institutions, residents, and other organizations and agencies:** Make choices to install and deploy on-site renewable energy systems.

### Implementation Activities and Milestones

Delaware has made significant progress to enact laws and develop program offerings and incentives to support the deployment of on-site renewable energy at homes, businesses, and institutions. In 2023, in support of continued growth of on-site or distributed solar across the state, Delaware Code (16 *Del. C.* §7604) was amended to require most new, large commercial buildings in Delaware to be solar-ready. Delaware also continued to build the foundation needed to improve access to renewable energy and accelerate Delaware RPS implementation by amending the Delaware Energy Act (29 *Del. C.* §8056), directing DNREC to conduct an offshore wind transmission and procurement analysis which will inform future decision making on offshore wind projects that will bring additional utility-scale renewable energy capacity to Delaware.

Delaware's Green Energy Fund (GEF) supports transitions to clean energy in the residential and commercial sectors by offering grants to reduce the cost of purchasing clean energy equipment for residences and businesses. The GEF funds qualifying renewable energy projects installed in Delaware including solar photovoltaic (PV) systems, solar water heating systems, small wind turbines, and geothermal heat pumps. In 2022, the GEF deployed funds to over 500 projects that added just under 6.0 MW of solar capacity. As of October 2023, the program received over 1,000 new requests for funding during the 2023 calendar year, a 29% increase compared to recent years and distributed funding to 300 completed projects during the same period, adding 3.2 MW in solar capacity. The GEF LMI Solar Pilot Program provides cost-free rooftop solar installation for qualified low-income homes in Delaware. Qualifying moderate-income households pay less than one-third of the total cost for rooftop solar installation. As of October 2023, the program added 170 kW of photovoltaic solar to underserved communities throughout the state.

Energize Delaware has programs including a low-interest Residential Solar Loan program to lower the barrier to installing solar systems and a Solar RECs program to incentivize renewable energy among residents. For businesses, Energize Delaware has a Low-Interest Commercial Loan Program to finance renewable energy initiatives, a no-cost Business Technical Assistance program that can be used for solar installations, and a Solar Renewable Energy Credits program.

DNREC's Renewable Energy Taskforce examines the current state of Delaware's renewable energy market, develops recommendations for renewable energy credit trading mechanisms and financial incentives, and finds ways to support the growth of renewable energy resources in Delaware.

Delaware's RPS established by the REPSA requires utilities to source an increasing percentage of electricity from renewable sources, with a mandate of 25% by 2025 and 40% by 2035, with at least 10% coming from solar energy.<sup>36</sup> One of the key paths for Delaware to achieve its RPS is through the development of offshore wind. Delaware has made significant progress in accelerating the procurement of offshore wind energy since initially establishing the Delaware Offshore Wind Working Group in 2017. The Offshore Wind Working Group held a series of formal meetings and public comment workshops in 2017 and 2018 to develop a Report to the Governor<sup>37</sup>, which was delivered in June 2018. In February 2022, the Special Initiative on Offshore Wind (SLOW) at the University of Delaware completed the *Offshore Wind Procurement Options for Delaware*<sup>38</sup>, report at the request of DNREC Secretary Shawn Garvin. The purpose of the report was to conduct analyses of market conditions and options for developing offshore wind to serve Delaware.

Furthermore, the Delaware Energy Act (29 Del. C. § 8051 and § 8056), as updated in 2023, authorizes DNREC to work with PJM Interconnection and neighboring states on offshore wind transmission planning and tasked DNREC with studying and providing recommendations to the Governor and the General Assembly on a process for procuring offshore wind power by December 31, 2023. DNREC published the required report, *Proposed Offshore Wind Procurement Strategy for Delaware*<sup>39</sup>, on December 29, 2023. This report proposes an offshore wind procurement program for Delaware that builds on the broad recommendations of the Offshore Wind Working Group, incorporates the market intelligence and technical analysis found in the SLOW report, is based on the centrality of renewable energy in the CAP (codified in Delaware's Climate Change Solutions Act), and covers the topics enumerated in the Delaware Energy Act (29 Del. C. § 8051, § 8056). At the end of 2023, Governor John Carney announced the start of formal negotiations between Delaware and offshore wind developer "US Wind" regarding its two planned offshore wind projects, MarWin and Momentum Wind, with an outline of potential agreements for a lease of state land, energy credits to reduce electricity costs, and funding for workforce and environmental projects. These two projects are located in federal waters off the coast of Maryland, but Delaware is conducting negotiations over a lease at 3Rs

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<sup>36</sup> DNREC. "Renewable Energy Portfolio Standards." <https://dnrec.delaware.gov/climate-coastal-energy/renewable/portfolio-standards/>

<sup>37</sup> DNREC Division of Coastal, Climate, and Energy and Synapse Energy Economics. "Offshore Wind Working Group Report to the Governor," June 29, 2019. <https://documents.dnrec.delaware.gov/energy/offshore-wind/Offshore%20Wind%20Working%20Group%20Report%20June%2029%202018.pdf>.

<sup>38</sup> Willet Kempton, Lilian E. Peterson, Amy Bosteels, and Kris Ohleth. "Offshore Wind Procurement Options for Delaware Report to the State of Delaware by the Special Initiative on Offshore Wind at the University of Delaware," February 27, 2022. <https://documents.dnrec.delaware.gov/energy/offshore-wind/SLOW-report.pdf>

<sup>39</sup> DNREC Division of Climate, Coastal and Energy, Synapse Energy Economics, and Zooid Energy. "Proposed Offshore Wind Procurement Strategy for Delaware," December 29, 2023. <https://documents.dnrec.delaware.gov/energy/offshore-wind/Proposed-Offshore-Wind-Procurement-Strategy-20231229.pdf>.



Beach in Delaware Seashore State Park for an underground cable landing to deliver power from the turbines to the regional electrical grid.<sup>40</sup> Table 5 overviews the key actions that have been identified to date to implement Measure 1.

*Table 5. Climate Pollution Reduction Plan Measure 1 key actions*

<b>Actions</b>	<b>Status</b>	<b>Timing</b>
Address equity challenges in access to renewable energy.	In Progress	Near term <sup>a</sup>
Ensure adequate transmission infrastructure is in place to accommodate the growing use of renewable energy through coordination with the Public Service Commission, utilities and the regional transmission organization, PJM Interconnection.	In Progress	Near term
Conduct a market analysis to determine the needs for expanding the current state incentive programs to achieve on-site renewable energy goals of 25% of residential homes and 15% of commercial spaces having renewable energy systems by 2050.	In Progress	Near term
Conduct planning to assess how to integrate utility-scale and distributed renewable energy.	In Progress	Near term
Assess opportunities for solar panels/fields in areas other than rooftops, including landfills, carports, and other applications. Following this assessment, develop an initiative for implementation (e.g., a solar canopy electric vehicle charging program).	In Progress	Near term
Conduct analyses to ensure efficient implementation of renewable energy programs (e.g., a gap analysis to project funding needs to promote distributed solar energy for residential, commercial, and industrial users or an analysis to determine the optimal balance between utility-scale and distributed energy and how to use emerging microgrid and storage technologies to integrate distributed energy into the grid in a way that supports and promotes grid stability).	In Progress	Near term
Collaborate with the Public Service Commission and other stakeholders to consider a graduated rate structure (e.g., a lower rate for electricity for income qualified ratepayers).	In Progress	Near term
Support expansion of on-site renewable energy systems, including in LIDACs through efforts including community solar projects, targeted incentive programs, and leveraging the Solar for All grant program.	In Progress	Near term
Support and facilitate the process for procuring offshore wind power	In Progress	Near term

<sup>a</sup> *Near term indicates within the coming five to six years (i.e., pre-2030). Actual timing to implement actions will depend on available staffing, funding, and other resources.*

<sup>40</sup> Office of the Governor. "Delaware to Negotiate with US Wind Over Benefits for State." Delaware News, December 19, 2023. <https://news.delaware.gov/2023/12/19/delaware-to-negotiate-with-us-wind-over-benefits-for-state/>.

## **Authority to Implement**

The implementing agency has the existing authority necessary to implement this measure.

Delaware's Climate Change Solutions Act (7 *Del. C.* §10000) provides broad statutory authority to support implementation of Delaware's Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state's framework for achieving the GHG emissions reduction targets. The Act further ensures coordination between the CAP and State Energy Plan.

The Delaware Planning Act (29 *Del. C.* §9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

The Delaware Energy Act (29 *Del. C.* §8051-8064) establishes the State Energy Office and a variety of task forces, planning documents, and programs that support deployment of and access to renewable energy systems including the GEAC, Sustainable Energy Utility (SEU), GEF, Delaware's Voluntary Clean Energy Financing Program, and State Energy Plan. The Delaware Energy Act also grants DNREC regulatory authority to promulgate regulations that are necessary to implement the Delaware Energy Act (29 *Del. C.* §8058). The Delaware Energy Act (29 *Del. C.* § 8051, § 8056), additionally authorizes DNREC to work with PJM Interconnection and neighboring states on offshore wind transmission planning efforts. The Act enables DNREC, the SEU, and Delaware electric and gas utilities to offer programs and initiatives that will support implementation of this measure.

Delaware has additional authority to implement through the REPSA (26 *Del. C.* §§ 351-364) which establishes the state's RPS. This Act is a policy aimed at promoting the use of renewable energy in the state's electricity generation. It sets a target for the minimum percentage of electricity sales that must come from eligible renewable energy sources including solar, wind, biomass, and other clean energy technologies. Delaware's RPS is designed to encourage the development and use of renewable energy to reduce greenhouse gas emissions, enhance energy security, and promote economic development in the renewable energy sector. The Renewable Energy Taskforce is established under REPSA to provide recommendations of renewable energy trading mechanisms and other structures to support the growth of renewable energy in Delaware. The Taskforce is directed by REPSA to promote a market for renewable energy at all scales, and RPS compliance requirements and reporting mechanisms for electric utilities.

## **Geographic Coverage**

The actions within this measure include the entire state.

## Example Relevant Funding Sources

Existing state funds through the Green Energy Fund are being used to support this measure. Federal opportunities include:

- EPA CPRG Implementation Grants
- U.S. Department of Energy's (DOE) Energy Efficiency Community Block Grants
- EPA Greenhouse Gas Reduction Fund:
- EPA Solar for All
- EPA National Clean Investment Fund and Clean Communities Investment Accelerator
- U.S. Department of Housing and Urban Development (HUD) Green and Resilient Retrofit Program (GRRP)

See Appendix D for additional information on funding opportunities.

## LIDAC Benefits

Some of the main barriers to installing and using on-site renewable energy are cost and preexisting building condition. However, these barriers can be overcome using different program designs and mechanisms, opening the door for residents and businesses within LIDACs to benefit from renewable distributed energy systems. Benefits for any LIDAC within Delaware may include:<sup>41</sup>

- Reduced monthly energy costs (dependent on renter/owner responsibilities).
- Improved air quality, and therefore health benefits, resulting from potential reductions in power generation from fossil resources, such as power plants located in Wilmington.
- Reduced risk of blackouts and increased reliability, which can also result in more consistent access to services provided in commercial properties with on-site solar.
- Potential for new or higher paying job opportunities through training programs targeted at LIDAC residents and businesses.

## Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Number of projects installed
- Number of projects installed in LIDACs
- Amount of distributed renewable capacity installed
- Amount of distributed solar capacity installed in LIDACs

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<sup>41</sup> EPA. "Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy, A Guide for State and Local Governments." 2018. <https://www.epa.gov/statelocalenergy/quantifying-multiple-benefits-energy-efficiency-and-renewable-energy-guide-state>

## Measure 2. Increase building energy efficiency and reduce energy consumption.

This measure focuses on identifying and implementing actions that will work to decrease energy consumption in Delaware’s building sector through energy efficiency. Delaware currently supports energy efficiency and conservation programs that help reduce energy use in homes, public buildings, non-profits, and businesses, the state is also focused on developing initiatives to support energy efficiency measures in commercial and industrial buildings.

### Quantified GHG Reductions

Table 6. Near-term and long-term cumulative emission reductions for Measure 2

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Increase building energy efficiency and reduce energy consumption.	3.10	26.50

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Administers the WAP, Energy Efficiency Investment Fund (EEIF), adopts building energy conservation codes, and implements programs using federal and state funding for energy efficiency programs.
- **Energize Delaware:** Administers programs that increase building energy efficiency and reduce consumption using the state’s RGGI proceeds as the primary funding source.
- **Utilities:** Several utilities already support energy efficiency and fuel-switching initiatives, and opportunities for other partnerships are possible.
- **Building owners, residents, and developers:** Make decisions about building upgrades, retrofits, and construction.
- **Local governments:** Enforces energy conservation codes; may implement energy efficiency projects for municipal buildings.
- **Contractors:** Understand available technology options and are trained to install and maintain those options.

### Implementation Activities and Milestones

Delaware is making strides to increase building energy efficiency and reduce energy consumption, key actions include strengthening building codes and legislation and expanding energy efficiency programs. These efforts are supported by the GEAC Energy Efficiency and Electrification working group that was established to explore needs and opportunities for current energy efficiency programs, transportation electrification, electric vehicles, building

electrification, and reliability. A 2019 update of the Delaware Energy Efficiency Potential Study found that cost-effective savings continue to be possible with investments in energy efficiency for both electricity and natural gas in Delaware. Energy audits are provided by Energize Delaware participating contractors and energy advisors.

Energy efficiency programs in Delaware are currently implemented by DNREC as well as Delaware's SEU. Efficiency programs are also run by some of the state's energy utilities including Delmarva Power, Delaware Municipal Electric Corporation (DEMEC), and Delaware Electric Corporation (DEC). The SEU is a non-profit organization that was created in 2007 through legislative action to foster a sustainable energy future in Delaware. The SEU serves as a resource to residents and businesses by offering numerous programs, resources, and information through its Energize Delaware initiative.

DNREC adopted the 2018 International Energy Conservation Code (IECC) and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2016 in 2020 and is in the process of evaluating the 2021 IECC and ASHRAE 90.1-2019, for possible adoption in 2024. Delaware is also focused on improving industrial energy efficiency. In 2023 the Delaware Code relating to the EEIF was updated to raise the eligible proportion of the project cost covered by the program to 60%, without changing the maximum funding, enabling DNREC to support more businesses in reducing operating costs and environmental impact by implementing energy efficiency improvements in new or existing commercial buildings.

Energize Delaware launched several new programs between 2022 and 2023 supporting building energy efficiency and reducing energy consumption, including the energy saving Performance Contracting Program for schools, universities, municipalities, hospitals, and other nonprofits and privately held institutions and the Small Business Program offering qualifying small businesses a no-cost energy assessment and incentives for eligible energy efficiency upgrades. Five other programs were expanded by offering higher incentives and broadening eligibility: Home Performance with ENERGY STAR®, Affordable Multifamily Housing, Faith Efficiencies, Non-Profit Energy Assessment Program, and Pathways to Green Schools programs.

DNREC has also continued to administer Weatherization Assistance Program (WAP) funds to serve low-income households and applied for the Bipartisan Infrastructure Law (BIL) WAP enhancements to deliver more program funding and benefits to Delaware residents. In addition, DNREC will administer the IRA Home Energy Rebates beginning in 2024. DNREC continues to partner with Energize Delaware on the state's Pre-Weatherization Program in order to reduce deferrals from the state WAP by addressing structural and health & safety issues in eligible homes. Table 7 overviews the key actions that have been identified to date to implement Measure 2.

Table 7. Climate Pollution Reduction Plan Measure 2 key actions

Actions	Status	Timing
Establish in-state training infrastructure for code inspectors, contractors and building designers, including certification training, continuing education, and code transition assistance during code adoption cycles.	In Progress	Near term
Establish statewide energy code compliance improvement goals of 10% annual improvement above current baseline.	In Progress	Near term
Increase code compliance and enforcement. Fully implement existing code requiring residential new construction to be net-zero energy-capable by 2025 and commercial new construction by 2030.	In Progress	Near term
Conduct an energy code compliance benchmarking field study to determine a baseline of Delaware’s current code compliance rates, followed by biannual code compliance studies to track improvements.	In Progress	Near term
Provide technical support for municipalities to adopt more stringent local stretch codes with the development of policy tool kits and training resources and provide technical support for the most recent IECC or ASHRAE Standards to be adopted by municipalities.	In Progress	Near term
Expand energy efficiency programs for residential and commercial buildings, including expanding energy efficiency opportunities and program access in LMI communities.	In Progress	Near term
Expand weatherization programs to reach more homes and buildings for retrofits, accomplishing increased efficiency.	In Progress	Near term
Develop a “cool roof” program to promote the use of vegetation or reflective materials that absorb less heat or reflect more sunlight than standard roofs.	In progress	Near term
Strengthen programs to increase energy efficiency in affordable and multi-family housing and expand existing energy efficiency programs to better support minority-, women- and veteran-owned businesses.	In progress	Near term
Identify linkages and gaps between state programs, tax credits, Hope for HOMES, and DOE Building Codes to fill gaps, develop additional programs, and add funds to existing programs.	In Progress	Near term
Integrate energy efficiency measures into local level sustainability plans and support municipalities and localities in the adoption of ordinances for efficient new construction.	In Progress	Near term
Work with state agencies and educational institutions to promote worker training in energy efficiency technologies, installation, and maintenance.	Not started	Near term
Assess feasibility and benefits of adoption of legislation to institute stronger appliance energy efficiency standards.	Not started	Longer term



## **Authority to Implement**

The implementing agency has the existing authority necessary to implement this measure.

Delaware's Climate Change Solutions Act (7 *Del. C.* §10000) provides broad statutory authority to support implementation of Delaware's Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state's framework for achieving the GHG emissions reduction targets. The Act further ensures coordination between the CAP and State Energy Plan.

The Delaware Energy Act (29 *Del. C.* §8051-8064) establishes the State Energy Office and a variety of task forces, planning documents, initiatives, and programs that Delaware uses to increase building energy efficiency and reduce energy consumption, including the GEAC, the SEU, GEF, EEIF, Delaware's Voluntary Clean Energy Financing Program, and State Energy Plan. The Delaware Energy Act also grants DNREC regulatory authority to promulgate regulations that are necessary to implement the Delaware Energy Act (29 *Del. C.* §8058). The Act enables DNREC, the SEU, and Delaware electric and gas utilities to offer programs and initiatives that will support implementation of this measure.

The Delaware Planning Act (29 *Del. C.* §9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

## **Geographic Coverage**

The actions within this measure cover the entire state.

## **Example Relevant Funding Sources**

State funds from RGGI and the Public Utility Tax are the two key funding sources for many of the programs highlighted above. Federal funding opportunities that could support this measure include:

- EPA CPRG Implementation Grants
- DOE Technical Assistance for the Adoption of Building Energy Codes
- DOE Home Efficiency Rebates and Home Electrification and Appliance Rebates
- DOE Weatherization Assistance and Weatherization Deferral Repair Programs
- EPA National Clean Investment Fund and the Clean Communities Investment Accelerator
- DOE Energy Efficiency Revolving Loan Fund
- DOE Energy Efficiency and Conservation Block Grant (EECBG)
- HUD GRRP

- Federal tax credits: Such as the Energy Efficient Home Improvement Credit.<sup>42</sup>

See Appendix D for additional information on funding opportunities.

## LIDAC Benefits

Benefits for any LIDAC within Delaware may include:<sup>43,44</sup>

- Reduced monthly energy costs (dependent on renter/owner responsibilities).
- Improved air quality, and therefore health benefits, resulting from potential reductions in power generation from fossil resources, such as power plants located in Wilmington.
- Improved health, safety, and comfort, especially for elderly residents, residents with disabilities, and children.
- Potential for new or higher paying job opportunities through training programs targeted.

Renters can face challenges in securing funding or financing options to make energy-efficient upgrades.<sup>45</sup> They can also have limited control over efficiency upgrade choices. Housing conditions can be a barrier for upgrades, including moisture and mold issues, roof damage, overall structural problems, knob and tube wiring, and other severe structural deficiencies.

## Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Number of EEIF-funded projects and cumulative energy savings for each project
- GHG emissions saved
- Number of projects in LIDAC communities

## Measure 3. Support the long-term transition to building electrification.

This measure focuses on identifying opportunities for effectively advancing building electrification considering factors such as energy consumption patterns, economic feasibility, and technology availability. It also focuses on deploying and acting on electrification opportunities.

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<sup>42</sup> IRS. "Home Energy Tax Credits." IRS, 2024. <https://www.irs.gov/credits-deductions/home-energy-tax-credits>.

<sup>43</sup> EPA. "Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy, A Guide for State and Local Governments." 2018. <https://www.epa.gov/statelocalenergy/quantifying-multiple-benefits-energy-efficiency-and-renewable-energy-guide-state>

<sup>44</sup> Oak Ridge National Laboratory. "Addressing Non-Energy Impacts of Weatherization." 2021.

<sup>45</sup> American Council for an Energy Efficient Economy (ACEEE). "Energy Equity for Renters Fact Sheet." March 2023. <https://www.aceee.org/sites/default/files/pdfs/EE%20Renters%20English%20-%20Encrypt.pdf>

## Quantified GHG Reductions

Table 8. Near- and long-term cumulative emission reductions for Measure 3

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Support the long-term transition to building electrification.	1.20	6.08

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Provides guidance on adopting and implementing smart energy choices through energy conservation and efficiency measures.
- **Energize Delaware:** Administers programs that increase building energy efficiency and reduce consumption. Many of these same programs incentivize electrification with rebates.
- **Utilities:** Several utilities already support energy efficiency and fuel-switching initiatives, and opportunities for other partnerships are possible.
- **Building owners, residents, and developers:** Make decisions about building upgrades, retrofits, and construction.
- **Contractors:** Understand available technology options and are trained to install and maintain those options.

### Implementation Activities and Milestones

Delaware has taken several additional steps since the release of the state’s first comprehensive CAP in 2021 to support the long-term transition to building electrification. The GEAC established an Energy Efficiency and Electrification working group to explore building electrification, current energy efficiency programs, transportation electrification, electric vehicles, reliability, and other topics to ensure that Delaware’s energy grid is prepared for increased load from the transition to building and transportation sector electrification, along with electric home heating and electric vehicles. The State Energy Plan, which is under development and expected in summer 2024, will provide specific recommendations and pathways for building electrification.

In 2020, Delaware adopted the 2018 IECC and the ASHRAE 90.1 2016 Energy Standard for Buildings Except Low Rise Residential Buildings.

Delaware’s Code for Energy Conservation (16 Del. C. §7602) requires residential and commercial new construction buildings to be net-zero energy-capable by 2025 and 2030, respectively. In 2022, Energize Delaware’s ZeMod Program and Beracah Homes won the U.S. DOE’s Zero Energy Home’s Housing Innovation Award. These zero-energy modular homes use highly efficient heat-pump technology, ENERGY STAR® rated appliances, and lighting coupled

with rooftop solar that produces as much energy as the home uses, resulting in no electric or fuel costs for the homeowner.

Table 9 overviews the key actions needed to implement Measure 3.

*Table 9. Climate Pollution Reduction Plan Measure 3 key actions*

Actions	Status	Timing
Fully implement existing code requiring residential new construction to be net-zero energy-capable by 2025 — and for commercial new construction to meet the same requirements by 2030.	In progress	Near term
Update 16 <i>Del. C.</i> §7602(c) to include reporting and enforcement mechanisms, clarify the existing definition of net-zero energy home/building and establish an incentive program to promote the construction of net-zero energy homes and commercial buildings.	In progress	Near term
Develop and implement incentive programs, in addition to the Cool Switch Low Impact Refrigerant Program, to accelerate the transition from the use of hydrofluorocarbons by alleviating the up-front costs of new equipment using alternative refrigerants.	In progress	Near term
Conduct an analysis of opportunities and barriers for the transition to building electrification and take steps to implement the analysis.	Not started	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware’s Climate Change Solutions Act (7 *Del. C.* §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state’s framework for achieving the GHG emissions reduction targets.

The Delaware Energy Act (29 *Del. C.* §8051-8064) establishes the State Energy Office and a variety of task forces, planning documents, initiatives, and programs that Delaware uses to increase building energy efficiency and reduce energy consumption, including the GEAC, the SEU, GEF, Delaware’s Voluntary Clean Energy Financing Program, and State Energy Plan. The Delaware Energy Act also grants DNREC regulatory authority to promulgate regulations that are necessary to implement the Delaware Energy Act (29 *Del. C.* §8058). The Act enables DNREC, the SEU, and Delaware electric and gas utilities to offer programs and initiatives that will support implementation of this measure.

DNREC derives authority to implement statewide energy conservation codes from Delaware’s Code for Energy Conservation (16 *Del. C.* §7602) which directs the Department to review for adoption the most recent version of the IECC and ASHRAE Standard 90.1 for adoption on a triennial basis. State law directs DNREC to promulgate regulations to adopt updates to the

energy code. Compliance with Delaware's energy code regulation (*7 Del. Admin. C. §2101*) is mandatory statewide, with exception for agricultural structures as determined by the local governments. The energy codes are enforced on the local level by code officials within each county or municipality.

Delaware's Code for Energy Conservation (*16 Del. C. §7602(c)*) requires all new residential buildings constructed after December 31, 2025, and all new commercial buildings constructed after December 31, 2030 to be net zero energy-capable. To be qualified as net-zero energy-capable, the building must be energy efficient enough that the building would consume zero energy if the building owner chooses to install on-site renewable energy generation. To support this requirement, DNREC is directed by Delaware Code (*16 Del. C. §7602(c)*) to consult with the Green Building Council of the Home Builders Association of Delaware to establish programs to promote the construction of zero net energy homes.

Amendments to the Delaware Code (*29 Del. C. §8030*) and Delaware Commodity Tax Code (*30 Del. C. §5502(f)*) established the EEIF, which promotes the use of energy-efficient technologies by eligible non-residential entities. The law directs DNREC to manage the EEIF, which receives \$5,000,000 in Public Utility Tax receipts each fiscal year. Delaware Code (*29 Del. C. §8030(b)*) instructs DNREC to support implementation of projects that reduce the use of gas, electricity, or other sources through the issuance of competitive grants, low-interest loans, or other financing support from EEIF.

In 2019, DNREC received directives from the Governor and Delaware Legislature to propose regulations on the use and manufacturing of HFCs as part of the state's efforts to confront climate change. In accordance with the directives, the DNREC Division of Air Quality developed and promulgated a new regulation to phase out HFCs in Delaware: "Prohibitions of Use of Certain Hydrofluorocarbons in Specific End-Uses" (*7 Del. Admin. C. §1151*). The regulation establishes the prohibitions and requirements for the use and manufacture of HFCs in Delaware according to their specific end usage, which include air-conditioning and refrigeration equipment, aerosol propellants, and foam end-users. The regulation became effective in March 2021, and includes effective dates for prohibition for different HFC end-uses, ranging from September 2021 to January 2024.

The Delaware Planning Act (*29 Del. C. §9101-9103*) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

### **Geographic Coverage**

The actions within this measure include the entire state.

## Example Relevant Funding Sources

Existing state programs for energy efficiency and electrification are funded primarily through the Public Utility Tax and RGGI. Federal funding opportunities that could support this measure include:

- EPA CPRG Implementation Grants
- DOE Home Electrification and Appliance Rebates
- DOE Weatherization Assistance and Weatherization Deferral Repair Programs
- EPA Greenhouse Gas Reduction Fund
- HUD GRRP

See Appendix D for additional information on funding opportunities.

## LIDAC Benefits

Benefits for any LIDAC within Delaware may include:<sup>46</sup>

- Improved air quality, and therefore health benefits, resulting from potential reductions in power generation from fossil resources, such as power plants located in Wilmington.
- Improved indoor air quality through the reduction of fossil fuels in the home.
- Potential for new or higher paying job opportunities through training programs targeted at LIDAC residents and businesses.

Renters can face challenges in securing funding or financing options to make appliance upgrades.<sup>47</sup> They can also have limited control over efficiency upgrade choices and may have poor pre-existing building conditions.

## Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Number of installed pieces of electric equipment through programs
- Number of installed pieces of electric equipment through programs in LIDACs
- Number or monetary value of incentives or rebates used to support deployment
- Survey data from the public regarding electric equipment swap-outs in homes and businesses

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<sup>46</sup> EPA. "Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy, A Guide for State and Local Governments." 2018.

<sup>47</sup> American Council for an Energy Efficient Economy (ACEEE). "Energy Equity for Renters Fact Sheet." March 2023. <https://www.aceee.org/sites/default/files/pdfs/EE%20Renters%20English%20-%20Encrypt.pdf>



## Measure 4. Provide assistance and support for industrial decarbonization.

This measure focuses on facilitating emission reductions in industrial operations, with a focus on energy efficiency for energy intensive industries and resulting transition of these emissions and energy intensive sectors to lower emissions operations.

### Quantified GHG Reductions

Table 10. Near- and long-term cumulative emission reductions for Measure 4

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Provide assistance and support for industrial decarbonization.	1.64	10.80

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state's natural resources. Oversees the administration of the EEIF, which issues grants to perform energy assessments, make energy improvements, and to implement custom improvements for new or existing industrial buildings.
- **Energize Delaware:** Administers programs that increase energy efficiency and reduce energy consumption.
- **Industry and trade groups:** Industry and trade groups may implement electricity and gas efficiency, electrification, or process improvement projects, share best practices, and build and disseminate resources for companies and other industrial bodies to become more efficient and decarbonized. Partnering with industry and trade groups enables efficiency and decarbonization planning that is tailored to sub-sectors with unique needs.
- **Municipalities:** In addition to implementing energy building codes, municipal governments operate wastewater treatment facilities and wastewater transmission systems.
- **Utilities:** Provide crucial support for efficiency programs and provide energy to support industrial operations.

### Implementation Activities and Milestones

Delaware's Energy Efficiency Investment Fund provides financial incentives to commercial and industrial facilities to reduce their energy use. There are currently gaps in eligibility of industrial entities for EEIF grants. The EEIF Program is available to all non-residential, commercial, and industrial buildings in Delaware. However, EEIF is funded by the Delaware Public Utility Tax (PUT) which is paid by certain non-residential consumers on their electric and/or natural gas utility bills. Currently, customers who do not pay the PUT are not eligible. Implementing projects that support industrial decarbonization of municipal operations such as drinking water, stormwater, and wastewater treatment are examples of energy intensive industrial processes

that have historically been ineligible for state funding targeted toward renewable energy, energy efficiency, and beneficial electrification.

DNREC also supports the industrial sector with reducing emissions from HFCs through the Cool Switch Low Impact Refrigerant Program, which provides incentives for replacing existing refrigerants with low-GWP refrigerants or installing new systems that use low GWP refrigerants.

Further, the state amended Delaware Code relating to County Building Code requirements (16 *Del.C.* §7604) in 2023, to require that most new large commercial buildings in Delaware are constructed with a solar-ready zone on the roof. At least 40% of a commercial building’s roof area must be reserved as a solar-ready zone and the solar-ready section of the roof must be designed to accommodate future installation of solar energy infrastructure, including (solar photovoltaic or solar thermal systems).

**Wastewater Treatment Plants**

There are 21 publicly owned wastewater treatment plants (WWTPs) that provide centralized collection and treatment to Delaware's 1 million residents. WWTPs are significant contributors to the state's overall GHG emissions, particularly in the form of methane, but also due to the large energy requirements for the treatment process. Implementing Measures 4 and 5 can drastically reduce the GHG emissions associated with WWTPs. Implementing energy efficiency measures and expanding renewable energy production at WWTPs, an element of industrial-style energy efficiency, presents a significant opportunity to reduce energy demand in the state and achieve substantial GHG reduction. WWTPs can increase energy efficiency by adding variable frequency drives to aeration blowers, lift pumps, and return activated sludge pumps to reduce energy use by giving more control over the speed of the equipment to adapt to different process flow needs. In addition, WWTPs can increase renewable energy production and reduce methane emissions through the capture of biogas from the anaerobic digestion process to create renewable natural gas, which reduce the amount of natural gas imported from gas distribution lines and the need for biogas flaring.

Table 11 overviews the key actions that have been identified to date to implement for Measure 4.

*Table 11. Climate Pollution Reduction Plan Measure 4 key actions*

Actions	Status	Timing
Maintain existing funding from the Public Utility Tax to support the EEIF.	In progress	Near term
Improve industrial energy efficiency by expanding energy efficiency incentive programs to promote more frequent energy efficiency upgrades targeting the ten highest energy users in Delaware and the highest energy users for municipal operations, including wastewater treatment plants.	In progress	Near term
Build on existing incentive programs to reduce energy consumption in the industrial sector by 1.5% annually.	In progress	Near term
Provide additional outreach, education, technical support to industrial facilities to assist in identifying opportunities to reach independent corporate goals.	In progress	Near term

Actions	Status	Timing
Support installation of renewable energy on-site at industrial facilities, including energy storage and grid integration to facilitate peak demand reduction. Expand existing state incentive programs to achieve an on-site renewable energy goal of 15% of industrial sites having renewable energy systems by 2050.	In progress	Near term
Improve industrial lighting systems, buildings energy efficiency, motor systems including air compressors, blowers, dryers, and pumps, materials handling equipment, process improvements, and operational reviews and improvements.	In progress	Near term
Expand of the use of low GWP refrigerants in the industrial sector by implementing DNREC's Cool Switch Program, Delaware's HFC Regulation (7 Del. Admin. C. §1151) or Federal American Innovation and Manufacturing (AIM) Act and implementing programs that manage HFCs and other high-GWP materials throughout the product lifecycle.	In progress	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware's Climate Change Solutions Act (7 Del. C. §10000) provides broad statutory authority to support implementation of Delaware's Climate Pollution Reduction Plan. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state's framework for achieving the GHG emissions reduction targets. The Act further ensures coordination between the CAP and State Energy Plan.

Amendments to the Delaware Code (29 Del. C. §8030) and Delaware Commodity Tax Code (30 Del. C. §5502(f)) established the EEIF, which promotes the use of energy-efficient technologies by eligible non-residential entities. The law directs DNREC to manage the EEIF, which receives \$5,000,000 in PUT receipts each fiscal year. Delaware Code (29 Del. C. §8030(b)) instructs DNREC to support implementation of projects that reduce the use of gas, electricity, or other sources through the issuance of competitive grants, low-interest loans, or other financing support from the Fund. However, entities that do not pay PUT are not eligible, including municipalities and non-profit organizations.

The 2014 amendments to the Delaware Energy Act (29 Del. C. Chapter 8059(h)) established the Delaware Energy Efficiency Advisory Council (EEAC), a collaborative panel of representatives that develops program recommendations to increase energy efficiency, reduce energy usage, promote emission-reducing fuel switching, and lower consumer energy costs. Key provisions of this section of the Delaware Energy Act authorize the EEAC to define statewide energy savings and demand reduction targets, enables Delaware electric and gas utilities to offer cost-effective programs to achieve the targets, and directs the EEAC to review and recommend program portfolios comprised of energy efficiency, energy reduction, and

emission-reducing fuel-switching programs that are developed and proposed by Delaware electric and gas utilities.

DNREC obtains its authority to regulate and reduce air pollution and air contaminants from legislation passed by the Delaware General Assembly. The following statutes in the Delaware Code establish DNREC's broad authority to regulate air pollution emitted in Delaware: 7 *Del. C.* §§6002, 6003, 6010 (a)(c). The statutes provide authorities to develop, promulgate, and implement programs, projects, rules, regulations, and plans to regulate and reduce air pollution and air contaminants.

In 2019, DNREC received directives from the Governor and Delaware Legislature to propose regulations on the use and manufacturing of HFCs as part of the state's efforts to confront climate change. In accordance with the directives, the DNREC Division of Air Quality developed and promulgated a new regulation to phase out HFCs in Delaware: "Prohibitions of Use of Certain Hydrofluorocarbons in Specific End-Uses" (7 *Del. Admin. C.* §1151). The regulation establishes the prohibitions and requirements for the use and manufacture of HFCs in Delaware according to their specific end usage, which include air-conditioning and refrigeration equipment, aerosol propellants, and foam end-users. The regulation became effective in March 2021, and includes effective dates for prohibition for different HFC end-uses, ranging from September 2021 to January 2024.

The Delaware Planning Act (29 *Del. C.* §9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

### **Geographic Coverage**

The actions within this measure include the entire state but are particularly focused on areas of industrial and wastewater treatment activities.

### **Example Relevant Funding Sources**

Existing state funds through the PUT and RGGI could be used to support this measure. Federal programs that may be utilized include:

- EPA Clean Water State Revolving Fund (CWSRF)
- EPA CPRG Implementation Grants
- DOE Industrial Efficiency and Decarbonization Funding Opportunity.

See Appendix D for additional information on funding opportunities.

### **LIDAC Benefits**

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from potential reductions in industrial pollution emissions. It can also lead to reductions in new asthma cases and reductions in hospital admissions and emergency department visits. This is particularly true for fence line communities that live near and around major industrial and similar sources of emissions, which are often LIDACs. A recent American Council for an Energy Efficient Economy (ACEEE) study notes that children living near industrial sites have a much higher likelihood of being diagnosed with asthma.
- Potential for new or higher paying job opportunities through training programs targeted at LIDAC residents and businesses.

### Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Industrial sector GHG emissions
- Number of pieces of equipment upgraded

### Measure 5. Reduce methane emissions across Delaware.

This measure focuses on assessing opportunities for reducing methane emissions in the state and facilitating these reductions, including through the reduction of methane from landfills through methane capture and waste diversion and leak reductions from utility gas lines. The measure also includes opportunities to capture and beneficially use methane (e.g., from WWTPs) for renewable gas production.

### Quantified GHG Reductions

*Table 12. Near- and long-term cumulative emission reductions for Measure 5*

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
<b>Reduce methane emissions across Delaware.</b>	2.66	16.17

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Lead agency for air quality regulations, waste and hazardous substances regulations, and activities such as permitting waste generators, industrial and biogas facilities.
- **Delaware Solid Waste Authority (DSWA):** Responsible for developing, adopting, and implementing the Statewide Waste Management Plan for Delaware Collects and utilizes the energy capacity of the landfill gas at all three active landfill facilities – Cherry Island Landfill in New Castle County, Sandtown Landfill in Kent County, and Jones Crossroads

Landfill in Sussex County. Across Delaware, DSWA partners with companies that operate a total of 15 beneficial use engines and 3 boilers to generate electricity.

- **Municipal Governments:** In addition to enforcing building energy conservation codes, municipal governments operate wastewater treatment facilities and wastewater transmission systems.
- **Private industry partners and energy and water utilities:** Serve as partners to help facilitate and deploy solutions. Make business decisions to support methane reductions.

### Implementation Activities and Milestones

Methane is a product of decomposition from landfills and wastewater treatment and is a primary component of natural gas. Leaks in natural gas pipelines and equipment contribute to Delaware's statewide emissions. Delaware is reducing methane output by increasing recycling and waste diversion, reducing methane leakage from natural gas lines, increasing renewable gas production, incentivizing markets, and expanding methane capture.

In 2021, DNREC unveiled Recyclopedia, an online search tool to find out how and where to properly dispose of recyclables to encourage recycling. In addition, DNREC will receive a \$500,000 grant to increase waste diversion throughout the state, but there remains a considerable amount of effort needed to promote a behavioral shift toward a low-waste culture.

Delaware is also taking steps toward increasing natural gas production and incentivizing markets for its use as a fuel. Delaware state and county agencies are considering a renewable biogas project that would process organic waste and transform it into stable compost to replace chemical fertilizers. The byproduct will be injected into natural gas pipelines for use by the utility's Sussex County customers.

Delaware is exploring funding sources and gaps to reduce process emissions from wastewater treatment facilities throughout the state. Improving methane-reducing technologies, system controls, monitoring, and expanding capture is key to reducing methane, carbon dioxide, and traces of other 'contaminant' gases such as nitrous oxide from wastewater treatment operations. Wastewater treatment facilities can upgrade parts of their treatment processes such as aerobic, anaerobic digestion, and flaring to capture and harvest biogas as a fuel source in combined heat and power gas engines or upgraded to natural gas-quality biomethane for on or offsite use. Furthermore, the nutrient-rich digestate, a byproduct of this process, can also be dried and transported offsite for used as fertilizer which further reduces waste in the treatment process. Such process improvements reduce methane leakage, produce biogas for reuse, and can even reduce operating costs when paired with energy efficiency enhancements (Measure 4) to process blowers, pumps, and motors.

Finally, DWSA collects and utilizes the energy capacity of the landfill gas at three active landfill facilities in New Castle County, Kent County, and Sussex County. Across the state, DWSA partners with companies to generate up to 16.0 MW of electricity and heat for local businesses



and homes. This use of landfill gas to generate energy diverts the use of fossil fuel energy sources including coal, natural gas, and oil.

In addition, utilities are currently required to conduct annual inspections of natural gas distribution lines to identify and repair gas leaks. However, increasing the frequency of these inspections leads to quicker repairs, reducing fuel losses, and increasing efficiency in natural gas infrastructure. Many of these leaks will likely be addressed through the implementation of the proposed EPA rule to reduce methane as initiated through IRA<sup>48</sup> (Methane Emission Reduction Program (MERP)).

Table 13 overviews the key actions to implement that have been identified to date for Measure 5.

*Table 13. Climate Pollution Reduction Plan Measure 5 key actions*

Actions	Status	Timing
Assess and implement strategies for improving collection efficiencies of sources of methane (e.g., landfill gas, wastewater treatment). Also assess strategies for improving refinement of captured gas for increased use in applications such as energy generation projects and production of renewable natural gas as a vehicle fuel source.	In progress	Near term
Assess opportunities to convert captured landfill gas into renewable natural gas to be used as on-site power generation, fuel for heavy-duty vehicles and other applications. As part of this, an effort should be undertaken to ensure adequate emissions control technology for renewable natural gas-fired engines, as the exhaust may contain higher levels of air toxics emissions, such as formaldehyde.	In progress	Near term
Assess opportunities to support anaerobic digestion projects to process wastewater and agricultural waste into a usable renewable natural gas product.	In progress	Near term
Encourage the use of renewable natural gas as a fuel for trash collection trucks by working with landfill operators to offer lower disposal rates for trash trucks that are fueled by renewable natural gas.	In progress	Near term
Encourage utilities to become partner programs of the U.S. Environmental Protection Agency’s Natural Gas STAR Program to implement methane-reducing technologies and document voluntary emissions reduction activities for natural gas transmission and distribution pipelines.	In progress	Near term
Increase the development and use of biogas from and at wastewater treatment and biosolids facilities.	In progress	Near term

<sup>48</sup> US EPA. “Biden-Harris Administration Announces Proposed Rule to Reduce Wasteful Methane Emissions from the Oil and Gas Sector to Drive Innovation and Protect Communities.” News Release, January 12, 2024. <https://www.epa.gov/newsreleases/biden-harris-administration-announces-proposed-rule-reduce-wasteful-methane-emissions>.

Actions	Status	Timing
Develop and incentivize projects for renewable natural gas fueling stations for vehicles to generate demand for new heavy-duty vehicles that use renewable natural gas as a fuel source.	Not Started	Near term
Improve waste stream characterization methodology to calculate recycling rates and identify components of the waste stream for downstream specialty compost manufacture. Address past challenges of composting projects by applying lessons learned, engaging with stakeholders and the public on siting projects, addressing equity concerns, ensuring quality control and more.	Not Started	Near term
Develop education and outreach programs and implement a disposal system to efficiently separate waste types prior to collection; build upon disposal system to develop a pay-as-you-throw variable rate system for trash collection and disposal.	Not Started	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

The Delaware Solid Waste Authority Act (7 *Del. C.* §6400) established the Delaware Solid Waste Authority and directed it to develop, adopt and implement a statewide waste management plan for Delaware. Prior to the establishment of DSWA, a disjointed public and private collection and disposal system existed throughout Delaware. Delaware had no significant public recycling programs and minimal private recycling companies.

Delaware’s Climate Change Solutions Act (7 *Del. C.* §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state’s framework for achieving the GHG emissions reduction targets.

The Delaware Planning Act (29 *Del. C.* §§9101-9103) establishes the state’s Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

DNREC obtains its authority to regulate and reduce air pollution and air contaminants from legislation passed by the Delaware General Assembly. The following statutes in the Delaware Code establish DNREC’s broad authority to regulate air pollution emitted in Delaware: 7 *Del. C.* §§6002, 6003, 6010 (a)(c). The statutes provide authorities to develop, promulgate, and implement programs, projects, rules, regulations, and plans to regulate and reduce air pollution and air contaminants.

In addition to renewable energy resources like solar and wind projects, Delaware’s REPSA (26 *Del. C.* §§351-364) defines sustainable biomass, anaerobic digestion, and landfill gas as eligible

energy resources and enables Delaware energy providers to obtain electricity for RPS compliance from such sources.

### **Geographic Coverage**

The actions within this measure include the entire state, although there may be areas better suited to host relevant projects such as methane capture from landfills, wastewater treatment plants, agriculture, and other generators.

### **Example Relevant Funding Sources**

Existing state funds through the Delaware Water Pollution Control Revolving Fund could be used to finance this measure. Federal programs that may be accessed include:

- EPA CPRG Implementation Grants
- EPA MERP
- EPA Community Change Grants
- EPA Solid Waste Infrastructure for Recycling Grant Program

See Appendix D for additional information on funding opportunities.

### **LIDAC Benefits**

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from potential reductions in landfill emissions. This can also lead to lower overall healthcare costs, impacted days of work and other economic benefits.
- Potential for new or higher paying job opportunities through training programs targeted at LIDAC residents and businesses.

### **Metrics for Tracking Progress**

Metrics to track progress for this measure may include:

- Number of projects or pilots to capture or reuse methane
- Number of composting/organics diversion programs implemented
- Tons of organic waste diverted through organics collection programs
- Amount or volume of biofuel produced in state

## **Measure 6. Reduce vehicle miles traveled.**

This measure focuses on existing efforts to promote a variety of actions that would lead to a reduction in vehicle miles traveled by providing more opportunities to live close to work and school, offer nonmotorized ways to commute and recreate, and promote more efficient transportation systems.

## Quantified GHG Reductions

Table 14. Near- and long-term cumulative emission reductions for Measure 6

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Reduce vehicle miles traveled.	0.59	5.10

See Appendix E for information on quantification methods.

## Key Implementing Agency(ies) and Partners

- **DeIDOT:** Responsible for ensuring travelers in Delaware have access and choices and the environmental impact of the state's transportation system is minimized, among other responsibilities.
- **DART:** Delaware's public transit agency offering bus service and transit access across the state. DART also runs the Delaware Commute Solutions program which provides free assistance to businesses and others to promote clean and alternative commutes.
- **Office of State Planning Coordination:** Responsible for implementing the state's Land Use Act and ensuring that local land-use decisions are consistent with state policies and funding priorities.
- **Metropolitan Planning Organizations:** Responsible for maintaining the Long-Range Transportation Plan and air quality conformity for urban areas. There are three MPOs operating within Delaware.
- **Non-profit and NGO partners:** Such as Delaware Greenways, which maintains and supports the development of trails and trail connections that offer bicycle and pedestrian travel options.
- **County and municipal governments:** Responsible for the land use and community design decisions and infrastructure investments that can either contribute to walkable and healthy communities or perpetuate auto-centric communities. Required to prepare a Comprehensive Development Plan every ten years.
- **Private sector partners:** Private sector partners, such as landowners, developers, and businesses play a key role in development decisions and design that affect the viability of using alternatives to driving. Private rail companies (e.g., Amtrak) are also essential players in connecting Delaware. Business and healthcare providers can also implement telecommuting and telehealth policies that help manage travel demand.

## Implementation Activities and Milestones

Delaware is building infrastructure to make biking and walking a safe and convenient alternative to cars. In 2023, Delaware received two U.S. Department of Transportation RAISE grants to support interconnecting bike paths and trails. \$23.0 million was awarded to the New Castle County Government for a shared-use path connecting Newport to the Jack A. Markell Trail in Wilmington. \$21.0 million was awarded to DeIDOT for the final phase of a shared-use path

connecting Georgetown to Lewes. In 2022, Delaware was ranked as the ninth most bicycle friendly state by the League of American Bicyclists.<sup>49</sup>

Delaware is also increasing access to telecommuting to reduce VMT. The state is using more than \$100 million in federal funds from the Bipartisan Infrastructure Bill to bring Internet to All Delawareans, with a focus on deploying high speed broadband to underserved households. Expansion of broadband access statewide helps all families access remote work opportunities and virtual healthcare options.

Table 15 overviews the key actions to implement that have been identified to date for Measure 6.

*Table 15. Climate Pollution Reduction Plan Measure 6 key actions*

Actions	Status	Timing
Accelerate and enhance existing efforts to create “Complete Communities,” which promote healthy lifestyles, economic growth, and sustainability through integrated approaches to transportation, land use and community design.	In Progress	Near term
Build on existing incentives and partnerships for businesses to encourage employees to use alternative modes of transportation (including telecommuting) for commuting to/from work.	In Progress	Near term
Partner with counties and municipalities to evaluate methods to incorporate the greenhouse gas emissions consequences of land use decisions into comprehensive development plans and master plans.	In Progress	Near term
Help to improve the Project Prioritization Criteria for the state’s Capital Transportation Program to incorporate greenhouse gas emissions and develop a standard method for quantifying emissions impacts.	In Progress	Near term
Designate funding and incentives to expand broadband internet access to help facilitate telecommuting (and other benefits) in areas that lack adequate broadband coverage.	In Progress	Near term
Conduct research to determine whether increased use of ride-share services such as Uber and Lyft will affect vehicle miles traveled, congestion and emissions.	Not Started	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware’s Climate Change Solutions Act (7 Del. C. §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets,

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<sup>49</sup>Bicycle Friendly State<sup>SM</sup> Ranking. The League of American Bicyclists, <https://bikeleague.org/bfa/states/ranking/>.

directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state's framework for achieving the GHG emissions reduction targets.

29 *Del. C.* §§8401-8422 establishes the state Department of Transportation and authorizes it to create regulations, collect revenues, comprehensively plan for transportation, and build and maintain transportation infrastructure. The Delaware Complete Community Enterprise District Act (2 *Del. C.* §§ 2101-2106) encourages transportation solutions that are not automobile-based and establishes special districts for multi-modal investments and policies.

DNREC has broad statutory authority (7 *Del. C.* §6703) to formulate, promulgate, amend, and repeal codes, rules, and regulations establishing standards and requirements for the control of air contaminants from motor vehicles.

The Delaware Planning Act (29 *Del. C.* §§9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

### **Geographic Coverage**

The actions within this measure include the entire state.

### **Example Relevant Funding Sources**

Federal resources may include:

- EPA CPRG Implementation Grants
- Federal Highway Administration (FHWA) Carbon Reduction Program (CRP)
- U.S. DOT Active Transportation Infrastructure Investment Program (ATIIP)
- FHWA Surface Transportation Block Grant Program (STBG)
- FTA Grants for Buses and Bus Facilities Program
- FTA Capital Investment Grants (CIG) Program
- U.S. DOT Rebuilding American Infrastructure and Sustainability and Equity (RAISE) grant program

See Appendix D for additional information on funding opportunities.

### **LIDAC Benefits**

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from fewer trips per day, particularly in urbanized areas.
- Increased safety for pedestrians and bicyclists.
- Improved access to services and amenities.
- Reduced noise pollution due to less vehicle traffic.

- Increased access to transportation alternatives.
- More reliable and resilient transport services.
- Reduced transportation expenses with more mass transit and shared mobility.
- Greater solidarity and social inclusion, including in sharing, local, and circular economies.
- Greater access to social and cultural activities with greater mobility and better energy.

Risks that may exist for LIDACs for this measure include:

- Potential displacement of homes or community resources due to infrastructure expansion projects, which in turn contributes to a risk of losing social networks and cultural heritage.
- Potential for increased access to multi-modal transportation or remote work to drive up real estate prices or rent, resulting in gentrification of LIDAC communities.

### **Metrics for Tracking Progress**

Metrics to track progress for this measure may include:

- Changes in statewide vehicle miles traveled
- Miles of new separate bike lanes and shared-use paths
- Public transit ridership rates
- Number of days the Air Quality Index indicates unhealthy levels of air pollutants

### **Measure 7. Improve the efficiency of freight delivery.**

This measure seeks to reduce emissions from the medium- and heavy-duty vehicles we rely on for freight delivery. In 2020, heavy-duty vehicles were responsible for approximately 24% of transportation related emissions.<sup>50</sup> A variety of actions can be taken to reduce these emissions, but this measure primarily focuses on optimizing freight routes for maximum efficiency and transitioning from diesel and gasoline powered vehicles to zero emissions electric or hydrogen fueled vehicles. Foundational to the transition to zero-emissions medium and heavy-duty vehicles is establishing a convenient and affordable network of charging and fueling infrastructure for these vehicles. Delaware's small size, location and connectivity to regional ports and interstates means that a coordinated, multi-state approach would benefit the deployment of convenient zero-emissions fueling infrastructure.

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<sup>50</sup> See Appendix A. Delaware's GHG Inventory and BAU Projections Methodology



## Quantified GHG Reductions

Table 16. Near- and long-term cumulative emission reductions for Measure 7

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Improve the efficiency of freight delivery.	0.32	3.57

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DeIDOT:** Responsible for ensuring travelers in Delaware have access and choices and the environmental impact of the state's transportation system is minimized, among other responsibilities. Responsible for completing the state's freight plan and building EV charging networks.
- **DNREC:** Ensures the wise management, conservation, and enhancement of the state's natural resources. Directs the Delaware Clean Cities Coalition and manages the state's consumer and business incentives for electric and alternative fuel vehicles, including medium and heavy-duty vehicles.
- **Metropolitan Planning Organizations:** Responsible for maintaining the Long-Range Transportation Plan and air quality conformity for urban areas. There are three MPOs operating within Delaware.
- **University of Delaware Institute for Public Administration:** Coordinates the development of the statewide Freight Plan<sup>51</sup> under contract to DeIDOT and provides technical assistance to local governments for comprehensive planning.
- **Private sector partners:** Private sector partners, such carriers and freight companies, play a key role in implementing solutions regarding freight efficiency, including route optimization, and fuel economy of the vehicle purchased. They are essential players in Delaware's economy.

### Implementation Activities and Milestones

Table 17 overviews the key actions to implement that have been identified to date for Measure 7.

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<sup>51</sup> Delaware Department of Transportation. "Delaware Freight Plan 2022." Delaware Department of Transportation, 2022. <https://deldot.gov/Business/freight/>.

Table 17. Climate Pollution Reduction Plan Measure 7 key actions

Actions	Status	Timing
Improve marketing of existing and underused incentive programs for fuel switching, such as Delaware’s Clean Transportation Incentive Program, the Volkswagen Environmental Mitigation Trust, and the Diesel Emissions Reduction Act to accelerate the transition of medium and heavy-duty vehicles to emission free technology.	In Progress	Near term
Develop incentives and technical assistance to enable a network of alternative fuel infrastructure for medium- and heavy-duty vehicles with a focus on zero-emission technologies.	Not Started	Near term
Adopt the California Advanced Clean Trucks Program addressing technology and emission standards for medium- and heavy-duty vehicles for model years 2024 to 2035.	Not Started	Long term
Develop incentives to support freight businesses in adopting best practices for route optimization, last mile solutions and mode switching.	Not Started	Long term
Collaborate and partner with federal and state agencies, alongside with private sector (representing majority of freight operations) to comprehensively implement efficiency-driven solutions over time, through freight planning and investments.	Not Started	Long term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware’s Climate Change Solutions Act (7 Del. C. §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state’s framework for achieving the GHG emissions reduction targets.

DNREC holds broad statutory authority (7 Del. C. §6703) to formulate, promulgate, amend, and repeal codes, rules, and regulations establishing standards and requirements for the control of air contaminants from motor vehicles.

Delaware Code (29 Del. C. §§8401-8422) establishes Delaware’s Department of Transportation and authorizes it to create regulations, collect revenues, comprehensively plan for transportation, and build and maintain transportation infrastructure.

The Delaware Planning Act (29 Del. C. §§9101-9103) establishes the state’s Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

## Geographic Coverage

The actions within this measure include the entire state.

## LIDAC Benefits

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from a reduction in heavy-duty vehicle miles traveled overall, routing heavy-duty trucks away from residential neighborhoods and conversion to cleaner fuel technologies. This can also lead to lower overall healthcare costs, impacted days of work and other economic benefits. This is particularly true for adjacent highway communities.
- Reduced noise pollution.

## Example Relevant Funding Sources

Funds from the U.S. EPA Diesel Emission Reduction Act grants program and VW Mitigation Trust are currently used to incentive vehicle conversion to alternative fuels, but there are no federal funding sources specific to building a network of charging or fueling infrastructure for medium- and heavy-duty vehicles. Federal funding opportunities that could support this measure include:

- FWHA Carbon Reduction Program
- EPA CPRG Implementation Grants

See Appendix D for additional information on funding opportunities.

## Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Number of heavy-duty vehicles converted to clean fuel alternatives
- Number of heavy-duty vehicle alternative fueling infrastructure sites
- Air quality improvements

## Measure 8. Advance deployment of zero-emission vehicles and ZEV fueling infrastructure.

This measure focuses on accelerating the widespread adoption of EVs by implementing a comprehensive framework of incentives and assistance programs, making EV ownership more accessible, increasing the availability and convenience of charging stations, and appealing to consumers. This measure includes activities focused on the state's vehicle electrification priorities, including centering equity and environmental justice, establishing a robust EV charging network, and promoting the deployment of fast and reliable EV charging stations across the state.

## Quantified GHG Reductions

Table 18. Near- and long-term cumulative emission reductions for Measure 8

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
Advance deployment of zero-emission vehicles and ZEV fueling infrastructure.	1.59	16.80

See Appendix E for information on quantification methods.

### Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Sets vehicle emission standards, implements consumer and business incentive programs for electric vehicles and charging stations, coordinates EV planning and policy development, and directs the Delaware Clean Cities Coalition, among other related activities.
- **Delaware SEU (Energize Delaware):** Provides consumer and business incentives for energy efficiency, including programs for municipal deployment of EV technologies.
- **Delaware Office of Management and Budget Fleet Services:** Responsible for ordering and maintaining vehicles used in state operations.
- **DeIDOT:** Responsible for ensuring travelers in Delaware have access and choices and the environmental impact of the state's transportation system is minimized, among other responsibilities. Deploys federal and state funds to develop a network of public EV chargers statewide.
- **Counties, school districts, and municipal governments:** Manage and maintain fleets of vehicles for municipal and district operations. Several individual entities have already formulated plans to electrify their own fleets of vehicles and equipment.
- **Utilities:** Provide electric service to consumers. Several utilities already offer EV charging station rebates, and opportunities for other partnerships are possible.
- **Companies and consumers:** Take advantage of incentives, federal tax credits, and buy/use EV and alternative fuel vehicles.

### Implementation Activities and Milestones

Delaware has made significant progress in advancing EVs and other alternative fuel vehicles through education, financial incentive programs, policy development and regulations. In 2013, the Delaware Division of Air Quality established the Delaware LEV which incorporates the requirements of the California LEV program and applies to all passenger cars, light-duty trucks, medium-duty passenger vehicles, and medium-duty vehicles subject to the California LEV program and delivered for sale in Delaware with a model year of 2014 or later. These are stricter than the federal standard for vehicle emissions and seek to ensure that conventional

vehicles sold in Delaware use the best technology available and provide consumers with the most fuel-efficient options.

In December 2023, Delaware adopted the AC II emission standards, a package of regulations including the LEV criteria and greenhouse gas regulations and the ZEV regulation and will implement these tailpipe emission standards through 2032. The requirements for ZEVs will gradually increase through 2032. The regulations require automakers to deliver an increasing number of ZEVs for sale in Delaware. Zero-emission options, including battery-electric, plug-in hybrid electric, and fuel cell electric vehicles, will be more accessible across the state. Under the finalized regulation, starting with model year 2027, 43% of new cars and trucks sent to Delaware for sale will be ZEVs. The percentage will increase to 82% in 2032. The regulations will expire in model year 2033.<sup>52</sup> This is similar to regulations in some other states. The adoption of these standards was enabled in large part by a decade of education and financial incentives aimed at reducing barriers to electric vehicle adoption.

The Delaware Clean Transportation Incentive Program, implemented since 2015, makes EVs more affordable for Delaware families and businesses and can be coupled with available federal tax incentives. This program also includes rebates for Level 2 EV chargers for public, multi-family residences and workplace deployment. In 2023, the program was expanded to provide higher incentive levels for multi-family dwellings, particularly those in LIDAC communities. Delaware also enacted a law in 2023 requiring that all new residential construction include provision for EV charging.

DelDOT and DNREC have worked together for two years to develop and implement strategies for EV charging and especially for DC-Fast Charging. These agencies work seamlessly together to develop plans, including the National Electric Vehicle Infrastructure Plan (NEVI) and a state-level EV Charging Infrastructure strategy. Grant proposals from the state's first NEVI Procurement are under review and construction on NEVI funded DC-Fast chargers should commence in late 2024. To foster innovation and job creation, a working group was established to explore workforce development opportunities related to EVs. Students at Delcastle Technical High School installed the state's first high school-led EV charging stations.

Delaware's electric utilities also offer specialized programs for EV drivers, such as the Delaware Electric Cooperative's "Beat the Peak" program and Delmarva Power's Electric Vehicle Program, contributing to a comprehensive and accessible clean transportation ecosystem. Table 19 overviews the key actions that have been identified to date to implement Measure 8.

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<sup>52</sup> DNREC. "DNREC Finalizes Clean Car Regulations." State of Delaware News, November 29, 2023. <https://news.delaware.gov/2023/11/29/dnrec-finalizes-clean-car-regulations/>.

Table 19. Climate Pollution Reduction Plan Measure 8 key actions

Actions	Status	Timing
Adopt California's Zero Emissions Vehicle portion of the Climate Action Advanced Clean Cars Program to require light-duty vehicle manufacturers to make available specific quantities of ZEVs for sale in Delaware.	Complete	
Continue offering electric and plug-in hybrid electric vehicle rebates through Delaware's Clean Transportation Incentive Program to encourage the purchase or lease of these types of vehicles. Modify incentive levels over time to respond to market trends and emerging technologies.	In progress	Near term
Develop audience-specific marketing campaigns and education to highlight the benefits of electric vehicles, particularly for dealerships, businesses, local governments, and low-income communities.	In Progress	Near term
Assess opportunities for indirect incentives for electric vehicle drivers, such as discounted parking rates and registration fees.	Not Started	Near term
Partner with technical and vocational schools to provide ZEV maintenance and repair training programs inclusive of light-, medium- and heavy-duty vehicles.	Not Started	Near term
Review existing state economic development funding to ensure that small businesses conducting research and manufacturing for batteries, hydrogen, charging, and other components are eligible for funding.	Not Started	Near term
Continue offering vehicle charging station rebates through Delaware's Clean Transportation Incentive Program to defray initial costs of installing stations.	In Progress	Near term
Expand Delaware's Clean Transportation Incentive Program to include incentives for used electric and plug-in hybrid electric vehicles and/or increased rebate amounts for low and moderate-income car buyers.	In Progress	Near term
Support access to ZEV mobility for populations with limited access to personal vehicles (including low-income households, students, and seniors), through local car-sharing programs and strategic deployment of charging stations.	In Progress	Near term
Partner with state agencies to develop charging station accessibility requirements to meet compliance with the Americans with Disability Act.	Complete	Near term
Facilitate installation of charging stations for electric and plug-in hybrid electric vehicles in multi-family dwelling units through partnership with electric utility providers and pilot projects.	Not started	Near term
Partner with universities and colleges, or others to expand the deployment of vehicle-to-grid technology.	Not started	Near term

Actions	Status	Timing
Develop a statewide EV charging plan and facilitate deployment of charging stations through maximizing federal funding, leveraging private capital and further promote EV adoption.	In Progress	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware’s Climate Change Solutions Act (7 Del. C. §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state’s framework for achieving the GHG emissions reduction targets.

The Delaware Planning Act (29 Del. C. §§9101-9103) establishes the state’s Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

DelDOT has broad authority for transportation planning, transportation infrastructure, and establishing fees. Delaware Code (29 Del. C. §§8401-8422) establishes Delaware’s Department of Transportation and authorizes it to create regulations, collect revenues, comprehensively plan for transportation, and build and maintain transportation infrastructure.

DNREC holds broad statutory authority (7 Del. C. §6703) to formulate, promulgate, amend, and repeal codes, rules, and regulations establishing standards and requirements for the control of air contaminants from motor vehicles.

The Delaware Energy Act was amended in 2021 and 2023 to include provisions and requirements for EV incentive programs, electric school buses, and state-owned EV charging stations (29 Del. C. §§ 8062-8024). It directs DNREC to administer an EV rebate program and establishes goals for electric school bus purchases. It also allows the state to charge a fee for use of state-owned charging stations.

A law was enacted in 2023 (16 Del. C. §§ 8062-8024) that requires that newly constructed single-family and multi-family residential dwellings include certain EV charging infrastructure and provides county and municipal government enforcement of the EV charging infrastructure requirements of this Act.

### Geographic Coverage

The actions within this measure include the entire state.



## Example Relevant Funding Sources

Existing state programs for electric vehicles and infrastructure are primarily funded through revenues from the RGGI and the VW Environmental Mitigation Trust. In addition, Delaware is a recipient of funding from the FHWA NEVI Formula Program. Existing funding is not adequate to meet existing and anticipated future needs. Additional federal funding sources include:

- U.S. FHWA Carbon Reduction Program
- U.S. FHWA Charging and Fueling Infrastructure Grant Program
- EPA CPRG Implementation Grants

See Appendix D for additional information on funding opportunities.

## LIDAC Benefits

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from potential reductions in vehicular emissions can also lead to reductions in new asthma cases and reductions in hospital admissions and emergency department visits;
- Reduced noise pollution;
- Improved access to services and amenities;
- Increased access to transportation alternatives; and
- Potential for good paying jobs in the growing EV industry.

Barriers for low-income customers to access EVs still exist but the state is working to overcome these barriers. Challenges in accessing EVs include lack of charging infrastructure, especially in multi-family dwellings or in urban areas and lack of available quality used or lower cost new EVs.

## Metrics for Tracking Progress

Metrics to track progress for this measure may include:

- Number of registered electric vehicles
- Proportion of state and other fleets that are low or zero emissions vehicles
- Number of public chargers installed
- Number of chargers convenient to LIDAC areas

## Measure 9. Maintain natural and working lands to sequester carbon.

This measure focuses on maximizing the benefit of natural and working lands for carbon sequestration and storage through conservation and enhancement. Conservation strategies focus on protecting carbon that is already stored in natural and working lands by preventing land-use changes. This defensive approach prevents the release of stored carbon.

Enhancement strategies seek to increase the carbon sequestration and storage of natural and working lands through management and restoration actions.

## Quantified GHG Reductions

Table 20. Near- and long-term cumulative carbon sequestration for Measure 9

Climate Pollution Reduction Plan Measure	Sequestration (MMTCO <sub>2</sub> e), 2025-2030	Sequestration (MMTCO <sub>2</sub> e), 2025-2050
Maintain natural and working lands to sequester carbon.	0.44	1.96

See Appendix E for information on quantification methods.

## Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Manages and protects the state’s soil, water, and coastlines. Owns and manages tens of thousands of acres of land as parks, estuary reserves, nature preserves, and fish and wildlife areas. Implements conservation easements for private lands and manages a comprehensive suite of incentives and education programs aimed at improving land conservation and restoration.
- **Delaware Department of Agriculture:** Provides services and support to sustain and promote the viability of food, fiber, and agricultural industries in Delaware. This includes technical assistance to farmers and landowners for conservation practices and implementation of forestry practices.
- **University of Delaware Cooperative Extension:** Works with individuals, farmers, and horticulturalists to promote environmental stewardship in the state. Uses research to develop management practices to adapt to climate change.
- **Conservation Districts:** Delaware’s three county conservation districts are involved in numerous programs and activities that help landowners become better stewards of their land, including the state’s cost-share program.
- **Non-profits and NGO:** Such as Delaware Nature Society, the Nature Conservancy, Delaware Wild Lands, and others who support the natural and working lands in Delaware.
- **Landowners:** Make decisions about land use and easements.

## Implementation Activities and Milestones

Delaware has made significant progress in its efforts to increase natural and working lands. The state has prioritized supporting best management practices on agricultural lands, conservation and restoration of forest lands, local communities’ enhancement of urban greenspaces, and improved methods for measuring and tracking carbon sequestration.

The Delaware Department of Agriculture has been actively supporting best management practices on agricultural lands. In 2022, they placed 1,211.0 acres into Agricultural Conservation Easements, and there are plans to secure almost double that acreage in 2023. Additionally, DNREC has initiated a pilot riparian forest buffer cost-share program in Chesapeake Bay, with the aim of eventually offering it statewide. One full-time staff member is now dedicated to implementing riparian buffers and other best management practices in Chesapeake Bay.

The state is also committed to the conservation and restoration of forest lands. Governor John Carney launched the Tree for Every Delawarean Initiative (TEDI) in 2021. TEDI provides technical support and funding for tree planting projects, with an annual competitive grant program. The initiative received an additional \$500,000 in funding from the Delaware General Assembly in 2023, enhancing program implementation and stakeholder interest. The DNREC Division of Fish and Wildlife, along with the Division of Parks and Recreation, purchased 541.7 acres of forested lands in 2022 and 2023, including 19.1 acres in conservation easements. The Delaware Forest Service also launched the Forest Investment Fund in spring 2023.

In terms of supporting local communities' enhancement of urban greenspaces, the Delaware Forest Service's Urban and Community Forestry Program provides annual grants for tree planting projects in urban areas. In 2022, they planted 3,193 trees, and in 2023, 116 trees were planted.

To improve methods for measuring and tracking carbon sequestration, DNREC has convened a team of natural lands experts to explore emerging technologies for carbon accounting. They plan to continue working with partners to find the most suitable tool for application in Delaware.

Table 21 overviews the key actions that have been identified to date to implement for Measure 9.

*Table 21. Climate Pollution Reduction Plan Measure 9 key actions*

Actions	Status	Timing
Improve methods for measuring and tracking carbon sequestration.	In progress	Near term
Increase statewide implementation of winter cover crops with a goal of reaching 224,000 acres annually by 2025 through continued state funding for cost-share programs and partnership with conservation districts.	In progress	Near term
Increase use of grassed buffers from just over 9,000 acres statewide in 2018 to slightly more than 13,000 acres by 2025 through best management practices to reduce nutrient runoff, such as planting cover crops like the clover and vetch shown here, also provide the co-benefit of storing carbon.	In progress	Near term

Actions	Status	Timing
Increase use of forest buffers adjacent to croplands by 171 acres with a goal of reaching a total of 1,000 acres by 2025 in the Inland Bays and Chesapeake watersheds.	In progress	Near term
Increase tree planting in agricultural lands with a goal of 671 acres of trees planted by 2025.	In progress	Near term
Permanently protect 2,500 acres of forest areas by 2028 and 1,000 acres of headwater forests by 2025, through conservation easements or fee acquisition.	In progress	Near term
Increase urban tree planting throughout the state by 371 acres by 2025.	In progress	Near term
Establish 5 miles of urban riparian buffers along impaired waterways and isolated wetlands by 2025.	In progress	Near term
Plan and implement Governor Carney's TEDI through coordination with state and local governments, homeowner associations and non-profit partners.	In progress	Near term
Develop and test technologies for conservation practices.	In progress	Long-term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware's Climate Change Solutions Act (7 *Del. C.* §10000) provides broad statutory authority to support implementation of Delaware's Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state's framework for achieving the GHG emissions reduction targets.

The Delaware Agricultural Lands Preservation Act (3 *Del. C.* §900) establishes a fund and provisions for preservation of farmland and forestland through fee simple acquisition and easements. The Act also directs the Department of Agriculture to promulgate regulations governing farmland preservation programs.

The Delaware Planning Act (29 *Del. C.* §§9101-9103) establishes the state's Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

### Geographic Coverage

The actions within this measure include the entire state.

## Example Relevant Funding Sources

State funding for the Agricultural Lands Preservation Program, Open Space Program and Tree for Every Delawareans, among others, provide a consistent source of funding for long-term planning for restoration and preservation. In addition to these state funds, additional federal funds include:

- EPA CPRG Implementation Grants
- USDA Forest Service Urban and Community Forestry Grants
- USDA Agricultural Conservation Easement Program
- USDA Wetland Reserve Easements
- USDA Conservation Reserve Enhancement Program

See Appendix D for additional information on funding opportunities.

## LIDAC Benefits

Benefits for any LIDAC within Delaware may include:

- Increased resilience to climate change from reduction of urban heat island effect
- Improved access to outdoor recreational amenities
- New green space and/or community beautification
- Improved livelihoods for farming, fishing, and forest communities with natural resources that are protected and sustainably managed
- Job opportunities in restoration and green infrastructure

## Metric for Tracking Progress

Metrics to track progress for this measure may include:

- Acres of land preserved through fee simple or conservation easement
- Acres of grassed buffer and winter cover crops
- Changes in land type (wetland, forest, etc.) by area
- Numbers of trees planted/area of tree canopy covered

## Measure 10. Lead by example in state agency and municipal operations and procurement processes.

This measure focuses on deploying projects and programs for Delaware state government and local governments in the state to lead by example through actions to reduce operational GHG emissions. This includes actions to increase renewable energy deployments for state and local government facilities, procure renewable energy, reduce emissions from state owned vehicles, collaborate with other states to facilitate the production of lower carbon products, procure products with lower emissions, and target high emitting sectors of municipal operations like wastewater treatment. Ample opportunities exist to work with other states and local

governments to lead by example in addressing GHG emissions and providing co-benefits. As one example, shared practices in programs and procurement can help accelerate low embodied carbon materials markets, especially important for products like concrete and cement. As another example, the state can partner with municipalities to accelerate actions that will maximize municipal emission reductions in the short term from industrial processes used to treat wastewater.

## Quantified GHG Reductions

*Table 22. Near- and long-term cumulative emission reductions for an example action in Measure 10*

Climate Pollution Reduction Plan Measure	GHG reductions (MMTCO <sub>2</sub> e), 2025-2030	GHG reductions (MMTCO <sub>2</sub> e), 2025-2050
<b>Lead by Example – State Fleet Electrification</b>	0.01	0.12

Due to current timing and limitations in data availability, reductions from other state and all local government buildings and operations, along with Scope 3 GHG emissions could not be estimated as a part of Delaware’s Climate Pollution Reduction Plan but will be assessed for Delaware’s next CPRG program deliverables and/or in relevant CPRG implementation grant applications. See Appendix E for information on quantification methods.

## Key Implementing Agency(ies) and Partners

- **DNREC:** Ensures the wise management, conservation, and enhancement of the state’s natural resources. Administers and deploys federal and state funds and works with regional and local partners to improve policies related to climate action and sustainability.
- **DeIDOT:** Responsible for ensuring travelers in Delaware have access and choices and the environmental impact of the state’s transportation system is minimized, among other responsibilities. Makes transportation infrastructure decisions related to upgrades, procurement of materials, etc.
- **Delaware Office of Management and Budget Fleet Services:** Responsible for ordering and maintaining vehicles used in state operations and establishing procurement rules and procedures.
- **Counties, school districts, and municipal governments:** Manage and maintain fleets of vehicles for municipal and district operations. Several individual entities have already formulated plans to electrify their own fleets of vehicles and equipment.

## Implementation Activities and Milestones

The state is on track to convert 20% of its state-owned light-duty vehicle fleet to electric by 2025. As a component of this effort, a team from four state agencies worked together to complete engineering designs to install charging stations for fleet vehicles at five locations statewide. Construction will commence in 2024.

Significant work is already occurring at the municipal level and can be accelerated. For example, the City of Wilmington conducts an annual greenhouse gas emission inventory of its operations and identified wastewater treatment processes as the largest source of operational emissions. The City of Newark has completed a comprehensive sustainability plan and set goals for renewable energy use, among other goals.

Table 23 overviews the key actions identified to date to implement for Measure 10.

*Table 23. Climate Pollution Reduction Plan Measure 10 key actions*

Actions	Status	Timing
Increase the state’s electricity procurement to 100% renewable by 2025.	In Progress	Near term
Electrify of the state’s vehicle fleet. State agencies will increase the number of ZEVs in light-duty fleets to at least 20% of the fleet by 2025	In Progress	Near term
Lead by example by increasing on-site renewable energy systems at state and municipal facilities.	In Progress	Near term
Partner with municipal governments to support operational GHG emissions mitigation projects, especially from high emission sources like wastewater treatment facilities.	Not Started	Near term
Increase the procurement of products and services by state agencies that have lower greenhouse gas emissions, including working collaboratively with other states to facilitate the production and procurement of low embodied carbon materials	Not Started	Near term

### Authority to Implement

The implementing agency has the existing authority necessary to implement this measure.

Delaware’s Climate Change Solutions Act (7 Del. C. §10000) provides broad statutory authority to support implementation of Delaware’s Climate Pollution Reduction Plan Measures. The Act sets medium- and long-term, economy-wide greenhouse gas emissions reduction targets, directs state agencies to incorporate climate change into agency operations, decision making, and rulemaking, and establishes a process for completing regular updates to the Delaware CAP to be used as the state’s framework for achieving the GHG emissions reduction targets. The Act further ensures coordination between the CAP and State Energy Plan. It also directs state agencies to procure products with lower greenhouse gas emissions.

The Delaware Planning Act (29 Del. C. §9101-9103) establishes the state’s Office of State Planning Coordination and requires county and municipal governments to draft comprehensive development plans that are consistent with state policies and goals.

The Delaware Energy Act (29 Del. C. §8051-8064) establishes the State Energy Office and a variety of task forces, planning documents, initiatives, and programs that Delaware uses to



increase building energy efficiency and reduce energy consumption, including the GEAC, the SEU, GEF, Delaware's Voluntary Clean Energy Financing Program, and State Energy Plan.

### **Geographic Coverage**

The actions within this measure include the entire state.

### **Example Relevant Funding Sources**

In addition to state and local government funds to support this measure, examples of other funding opportunities include:

- U.S. DOT Initiative for Novel Cement Development
- EPA CPRG Implementation Grants
- U.S. EPA Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products grant program
- U.S. Department of Transportation Low Carbon Materials grant program
- General Services Administration (GSA) Low Embodied Carbon program

See Appendix D for additional information on funding opportunities.

### **LIDAC Benefits**

Benefits for any LIDAC within Delaware may include:

- Improved air quality, and therefore health benefits, resulting from potential reductions in air pollutants can lead to reductions in new asthma cases and reductions in hospital admissions and emergency department visits.
- Improved air quality, and therefore health benefits, resulting from potential reductions in power generation from fossil resources.
- New and high-quality jobs.

### **Metrics for Tracking Progress**

Metrics to track progress for this measure may include:

- Percentage of the state vehicle fleet that is electrified
- Energy use intensity of government-owned buildings
- Emission reductions in municipal operations
- Number of kilowatts of installed renewable energy on government buildings
- Number of procurement commitments (for low carbon materials)

## **4.2 Measures Benefits and Co-Benefits Analysis**

As reflected in the information above for each measure, implementation of the Climate Pollution Reduction Plan will contribute to achieving local, state, and national climate objectives while

reducing co-pollutants, such as criteria air pollutants and hazardous air pollutants, that adversely affect Delaware and its environment.

Decreasing fossil fuel (i.e., coal, natural gas, petroleum, propane) use in buildings, vehicles, and electric power generation, in addition to more clean and efficient industrial practices, will lower emissions and generate environmental, public health, and socioeconomic advantages. In the short term, the reduction of co-pollutants will enhance both indoor and outdoor air quality, diminishing hazardous air pollutants, toxins, and other harmful substances. The immediate alleviation of these pollutants can positively impact the physical and economic well-being of communities. The pollutants reduced by measures in Delaware's Climate Pollution Reduction Plan include carbon monoxide, sulfur dioxide, VOCs, particulate matter (e.g., PM<sub>2.5</sub>), heavy metals, black carbon, and other hazardous air pollutants (HAPs) and air toxics. In the next phase of planning DNREC will complete a more comprehensive, quantitative analysis of air pollutant and co-pollutant benefits for GHG reduction measures.

### **Public Health Benefits**

Reducing GHG and co-pollutant emissions has and will continue to have profound implications for the public health of Delawareans. The combustion of fossil fuels contributes to outdoor and indoor air pollution which, in turn, poses significant health risks. In the United States, roughly 87% of people's lives are spent indoors, so indoor exposure to combustion pollutants, such as natural gas for cooktops or heating, has the potential for substantial health effects.<sup>53</sup> In instances of long-term exposure, these health effects can include premature mortality, adverse birth outcomes, cognitive decline, and gastrointestinal inflammatory disease. Short-term exposure can lead to asthma and respiratory symptoms.<sup>54</sup>

Furthermore, the adverse health impacts extend to climate impacts such as extreme heat events. Nearly two-thirds of the U.S. population resides in areas susceptible to health risks related to extreme heat,<sup>55</sup> including heat-related illnesses and cardiovascular conditions. Heat is the number one weather-related killer in the United States, surpassing flooding and storms.<sup>56</sup> Despite this, heat-related deaths and hospitalizations have been historically under-reported, as heat-exacerbated conditions such as respiratory and cardiac events are not always recorded as heat-linked. Reducing GHG emissions as rapidly as possible is critical to protecting Delawareans, especially outdoor workers and those living in urban areas.

In addition, many of the measures outlined in this Climate Pollution Reduction Plan, especially those that contribute to restoration and preservation of natural and working lands, smart growth and expansion of multi-modal transportation provide opportunities for improved physical and

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<sup>53</sup> U.S. EPA. 1989. Report to Congress on indoor air quality: Volume 2. EPA/400/1-89/001C. Washington, DC. <https://www.epa.gov/report-environment/indoor-air-quality>.

<sup>54</sup> Health Effects Institute. 2020. *Health Effects Institute Annual Report 2020: Valuing Science Informing Decisions*. <https://www.healtheffects.org/system/files/hei-annual-report-2020.pdf>.

<sup>55</sup> <https://www.nrdc.org/resources/climate-change-and-health-extreme-heat#/map>

<sup>56</sup> <https://www.epa.gov/climate-indicators/climate-change-indicators-heat-related-deaths>

mental well-being for Delawareans through increased opportunities for biking, walking and other outdoor activities.

### **Socioeconomic Benefits**

The implementation of the priority GHG reduction measures in Delaware's Climate Pollution Reduction Plan can bring significant socioeconomic advantages especially among LIDACs. One major shift will be an increased number of high-quality energy-related jobs to the state as it builds renewable energy infrastructure. The development of clean energy technologies, such as solar installations and EV charging infrastructure, necessitates skilled individuals proficient in installing and maintaining such hardware. Offering clean energy job training, especially within environmental justice communities, both supports resilient and clean infrastructure and generates economic opportunities. Of the fastest-growing occupations as reported by the Bureau of Labor Statistics, wind- and solar-related jobs are in the top 20 nationwide<sup>57</sup>.

In 2022, Delaware commissioned an Economic Analysis of the Impacts of Climate Change report<sup>58</sup>, which found that cumulative potential impacts of climate change across the transportation, public health, public safety, agriculture, and natural resources sectors totaled well over \$1 billion annually in a high-emissions scenario. Many of these costly impacts can be avoided or mitigated through emissions reduction.

Clean energy can be developed to improve grid resilience (e.g., through battery storage), reducing the risk of blackouts and promoting energy independence. Consequently, these investments mitigate the economic and physical impact of extreme weather events.

GHG emissions contribute to more frequent and severe extreme weather events, resulting in substantial financial costs and economic impacts. Long-term reduction of GHG emissions can mitigate these events, such as extreme precipitation and storms, while preventing associated costs like increased insurance premiums, expenses for repairing structural damage, and losses in crops and natural resources. The reduction of extreme weather events also alleviates costs related to medical bills and premature deaths. In 2023 alone, the U.S. faced 28 extreme weather and climate events costing over \$1 billion, making the reduction of these costs crucial for individual, community, and overall economic well-being.

Electrifying and decarbonizing energy end-use sectors and enhancing efficiency through properly designed measure implementation can offer financial relief to individuals and businesses, especially for low-income and disadvantaged residents. Energy efficiency retrofits will lower overall household energy use, therefore lowering energy bills. This reduction in energy

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<sup>57</sup> U.S. Bureau of Labor Statistics. Fastest Growing Occupations between. 2023. <https://www.bls.gov/ooh/fastest-growing.htm>

<sup>58</sup> Industrial Economics, Incorporated. An Economic Analysis of the Impact of Climate Change in the State of Delaware. 2022. <https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/Economic-Analysis-of-the-Impacts-of-Climate-Change-in-the-State-of-Delaware.pdf>

cost burden eases financial stress for households and businesses, allowing resources to be redirected to better individual economic situations and stimulate the economy.

Additionally, the Climate Pollution Reduction Plan measures promote and require public education, community engagement, and social inclusion. Actions to implement measures, such as enhancing multi-modal transit options, fosters social capital, encourages community engagement, and contributes to the overall socioeconomic well-being within Delaware.

## 5 Moving Forward

### 5.1 Implementing the Delaware Climate Pollution Reduction Plan and CPRG Implementation Grants

As outlined in the 2021 CAP, how climate action is implemented can be just as critical as what is implemented. DNREC applies three principles in implementing climate action:

- **Principle 1:** Ensure climate action is ambitious yet adaptable.
- **Principle 2:** Ensure climate action accounts for all costs and benefits.
- **Principle 3:** Ensure climate action is engaged, empowering, and equitable.

Further, as outlined in the 2021 CAP, the measures outlined in both this Climate Pollution Reduction Plan and the 2021 CAP require resources, technical capability, data, and partnerships to move forward. Climate action implementation will also require the participation of a variety of players, including state agencies, the state legislature, non-profit partners, businesses, and residents. In some cases, strategies can be accomplished by one entity; in most other cases, implementation of strategies will require coordinated efforts or benefit from a multi-state approach.

The measures outlined in this plan focus on steps that can be taken primarily by state agencies, local governments, and other partners. Cooperation across state agencies and leadership within those agencies — coupled with stakeholder partnerships — will help facilitate and motivate the transition from climate planning to climate action. This can be assisted by a framework for accountability and transparency. The GHG inventory, emission reduction targets, and example progress metrics outlined in Delaware’s Climate Pollution Reduction Plan are all tools to support implementing such a framework.

To support implementation of this Climate Pollution Reduction Plan, DNREC, other executive branch-level agencies, offices, and departments in Delaware, as well as the municipalities and tribes in Delaware are eligible to participate in the general competition for CPRG implementation grants. DNREC is intending to seek implementation funding to support implementation of one or more measures in this Delaware Climate Pollution Reduction Plan. For more information about the implementation grant applications and competition see: <https://www.epa.gov/inflation-reduction-act/about-cprg-implementation-grants>.

The significant rebate and grant opportunities from the IRA and the Infrastructure Investment and Jobs Act (IIJA), including CPRG implementation funding, will help to support Delaware's actions to reduce GHG emissions and provide benefits to communities across the state. Despite these funding sources, gaps in funding needs for climate action in Delaware still exist. As Delaware continues to implement the specific activities identified for each measure, key state and local agencies and partners that are administrators of formula funding or eligible applicants for competitive grant programs will continue to evaluate funding opportunities that are applicable for Delaware's climate actions.

Funding gaps are not the only barrier facing the state in implementing climate solutions and rapidly reducing greenhouse gas emissions. Consumer demand for new technologies including electric vehicles, heat pumps, and induction stoves does not yet match state and federal ambition. In addition, the workforce to build, install, and repair these new technologies also must be rapidly expanded. CPRG funding, coupled with other state initiatives, will help the state build the capacity to address these barriers and facilitate the rapid deployment of carbon reduction strategies.

## **5.2 Other CPRG Planning Grant Deliverables and Intersection with Other State Climate Actions**

In addition to Climate Pollution Reduction Plan implementation, as the lead organization for CPRG planning grant program deliverables, DNREC is responsible for developing the next major CPRG deliverable by mid-2025 which will look at a broader range of climate action options. This upcoming CPRG deliverable will serve to inform the emission reduction component of the state's larger CAP, which is scheduled to be completed in late 2025. The state CAP will include key statistics about the impact of climate change on the state, updated emission reduction measures, and strategies for climate change adaptation, specifically focusing on ways the state can prepare for sea level rise, increasing heavy precipitation events, and increasing temperatures. DNREC utilized the planning process for this Climate Pollution Reduction Plan to initiate conversations with key stakeholders, in some cases engaging with LIDAC community leaders that have not previously been engaged in statewide climate planning activities. DNREC will build upon these conversations throughout the development of future CPRG deliverables and Delaware's 2025 CAP. DNREC will continue to meaningfully engage with stakeholders, including other state agencies, industry, community organizations, LIDACs, local governments, the public, and more. Stakeholder input will be essential to update Delaware's 2021 CAP and provide clear paths to implement actions to reduce GHG emissions.

The next major CPRG Program deliverable identifying potential emission reductions strategies is due to EPA in mid-2025 and will include the following:

- An updated GHG inventory for the state using the most up-to-date and available data
- BAU GHG emissions projections and an economy-wide GHG emissions reduction scenario
- GHG reduction targets for Delaware (short- and long-term)

- A comprehensive list of GHG reduction measures that address economy-wide emissions. Building on the Climate Pollution Reduction Plan this will include the following for each measure:
  - Quantified estimates of GHG reduction and costs
  - Key implementing agency or agencies
  - Implementation schedule and milestones
  - Expected geographic location if applicable
  - Quantified estimates of co-pollutant reductions (e.g., PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, VOCs, air toxics)
  - A more robust or quantified analysis of benefits for LIDACs
  - A review of the statutory or regulatory authority to implement the measure (and a schedule and milestones for key entities to obtain it if not existing)
  - Identification of funding sources that have been secured for implementation
  - Metrics for tracking progress
- A workforce planning analysis
- The Delaware Climate Solutions Act requires DNREC to produce an implementation report every two years. Implementation reports will be produced in 2025 and 2027. A CPRG Status Report is also due to EPA in 2027. To the extent feasible these reports will be consolidated. The CPRG Status Report will include, at minimum: the implementation status of the quantified GHG reduction measures from the Delaware Climate Pollution Reduction Plans.
- Relevant updated analyses or projections supporting CPRG program implementation.
- Next steps and future budget or staffing needs to continue with Climate Pollution Reduction Plan implementation.

CPRG deliverables will be incorporated to the extent possible into other state activities that are related, but not funded through CPRG. These include annual public meetings as required by the state Climate Change Solutions Act, establishment of state agency climate officers, and the development of the State Energy Plan.

## Appendix A. Delaware's GHG Inventory and BAU Projections

### Methodology

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 EPA SIT and PT.

EPA's SIT is a Microsoft Excel®-based tool designed to help states develop GHG emissions inventories. The SIT consists of sector-specific estimation modules to calculate GHG emissions. The default data within the SIT are gathered by federal agencies and other sources covering fossil fuels, electricity consumption, agriculture, forestry, waste management, and industry. The SIT is designed to use methods and sectors consistent with those used in the U.S. GHG Inventory. The EPA disaggregates the National GHG inventory across the 50 states for all sectors.

Where data was unavailable within the SIT, additional state-specific data sources were used and are highlighted within the sector-specific methodology sections. State-specific assumptions were made where SIT estimates were unavailable including the following adjustments:

- Subtracting electricity generated in-state from total electricity consumption, before developing emissions estimate so as to avoid double counting.
- The SIT does not include default data for industrial wastewater estimates. For 2019 and 2020, industrial wastewater estimates were used from EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks by State.<sup>59</sup>
- For reporting years 2019 and 2020, lime tonnage data was provided by the Delaware Department of Agriculture. To calculate the total amount of agricultural limestone applied to the soil for each year, data from the U.S. Geological Survey was used to determine the ratio of total agricultural limestone to total agriculture specific limestone.<sup>60</sup> These ratios were multiplied by the lime tonnage data provided by the Delaware Department of Agriculture and entered as activity data in the SIT Agricultural module.

Projections were developed using the EPA's PT, which allows users to create a simple forecast of emissions through 2050 based on historical emissions imported from the SIT modules. These projections do not include state-specific policies (e.g., RPS or ZEV regulations) and are meant to provide additional context when reviewing emissions inventory results. State-specific assumptions were made where PT estimates were unavailable including the following adjustments:

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<sup>59</sup> EPA. "U.S. Inventory of U.S. Greenhouse Gas Emissions and Sinks by State for 1990-2021." 2023.

<https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>

<sup>60</sup> US Geological Survey Mineral Yearbook for Crushed Stone. Table 10 ("Limestone and Dolomite Sold or Used by Producers in the United States in 2019/2020, by use." <https://www.usgs.gov/centers/national-minerals-information-center/crushed-stone-statistics-and-information#myb>)



- HFC emissions were disaggregated using USCA/CARB projected HFC estimates following the same methodology described in the Inventory to separate emissions between the residential, commercial, transportation, and industrial sectors.
- Refinery emissions for DE in the PT accidentally includes the activity data for the CO instead. As a result, 2020 DE emissions were held constant.
- The PT does not include projections for the LULUCF sector. To develop projections, 2020 emissions were held constant.

## Appendix B. Recent Delaware Stakeholder and Public Climate Engagements

Table 24. Recent Delaware Stakeholder and Public Climate Engagements

Date	Meeting Description	Stakeholder(s)
September 2022	EV Webinar Series discussing technologies, interconnection, and funding opportunities	Local Government Staff
October 2022	EV Workshops on adopting California Advance Clean Cars III Regulation	Multiple/general public
October 2022	Delaware's American Planning Association Conference with presentation of Delaware CAP	Multiple/general public
December 2022	Dover Kent MPO Annual Meeting with presentation of Delaware CAP	Multiple/general public
December 2022	DNREC coordinated with MSA to assist with planning grant awarded to DVRPC	DVRPC
January 2023	Presentation on Solar for Libraries and other CAP strategies for Libraries Construction Leadership	Delaware State Libraries
February 2023	Workshop for the graduates of Delaware's Climate Leadership Academy and convening of state and local government and private sector individuals who completed training in climate science and preparing the workforce to address actions in Delaware's Climate Action Plan	Graduates of Delaware's Climate Leadership Academy, state/local government, and private sector individuals
March 2023	Delaware Youth Environmental Summit presentation on Delaware's Climate Action Plan	Delaware Youth Environmental Summit, Delaware schools
March 2023	Meeting with technical stakeholders regarding updating Delaware's downscaled climate scenarios	Technical stakeholders
April 2023	Delaware Association of Nonprofit Advancement Annual Impact Conference, presentation on Delaware's Climate Action Plan	Delaware Association of Nonprofit Advancement, multiple/general public
August 2023	Held interviews with key cabinet staff on the Delaware Climate Leadership Academy, training needs, and best opportunities for engaging participants	Delaware Climate Leadership Academy

Date	Meeting Description	Stakeholder(s)
<b>October 2023</b>	Delaware Coast Day event in Lewes, hosted by University of Delaware, speaking with members of the public on Delaware's CAP	University of Delaware, general public
<b>October 2023</b>	Partnered with Delaware Association of Non-profit Advancement to present a webinar on the CAP and non-profits' role in climate action.	Delaware Association of Non-profit Advancement, Multiple/general public
<b>October 2023</b>	Inclusive and Creative Climate Education Workshop at the University of Delaware	University of Delaware Climate Hub, K-12 educators, Delaware museums
<b>November 2023</b>	Public workshops with Energize Delaware to gather input on the update to the State Energy Plan	Energize Delaware, general public
<b>November 2023</b>	Governors Energy Advisory Council Public Workshops in Dover, Wilmington, and Georgetown	General Public
<b>November 2023</b>	Engagement with City of Newark staff on funding opportunities	City of Newark
<b>November 2023</b>	Engagement with City of Wilmington staff on funding opportunities	City of Wilmington
<b>November 2023</b>	Engagement with University of Delaware faculty and staff on funding opportunities	University of Delaware GAP Program
<b>November 2023</b>	Engagement with internal state government stakeholders on funding opportunities	CAP Mitigation Team (DNREC Climate, Energy DAQ, Waste, DelDOT)
<b>December 2023</b>	Engagement with internal state government stakeholders on funding opportunities	CAP Adaptation Team (DNREC Climate, Coastal)
<b>December 2023</b>	Engagement with New Castle County staff on funding opportunities	New Castle County
<b>December 2023</b>	Engagement with the Delaware Estuary Program staff on funding opportunities	Delaware Estuary Program

Date	Meeting Description	Stakeholder(s)
<b>December 2023</b>	Engagement with Clean Cities Coalition stakeholders on funding opportunities	Clean Cities Coalition
<b>January 2024</b>	Workshop on inclusive climate change adaptation with the Lenape Indian Tribe of Delaware	University of Delaware, Lenape Tribe of Delaware
<b>January 2024</b>	Meeting with Delaware Sierra Club Leadership on CPRG Planning Grant, Implementation Application ideas, and Delaware CAP, and Sierra Club input on engagement and outreach strategies	Delaware Sierra Club
<b>January 2024</b>	RASCL Summit	Partners for the Delaware Estuary, Center for the Inland Bays, other non-profit advocacy groups, local governments, University of Delaware, and more
<b>January 2024</b>	Institute for Public Engagement Annual Retreat	University of Delaware Institute for Public Administration
<b>January 2024</b>	Engagement with Plastic Free Delaware stakeholders on funding opportunities	Plastic Free Delaware
<b>February 2024</b>	Engagement with community leaders on LIDAC outreach	NAACP, Interfaith Power and Light, Sussex Health Environmental Network, Claymont Coalition for Environmental Justice, and more
<b>Spring 2024 - upcoming</b>	Public engagement session on the 2023 Implementation Report of the Delaware CAP	General public
<b>Spring 2024 - upcoming</b>	Public Engagement Survey	General public

## Appendix C. Identification of LIDACs in Delaware

Table 25. Identification of LIDACs in Delaware

County	Census Block Group ID	County	Census Block Group ID
Kent County	100010405011	New Castle County	100030006012
Kent County	100010405021	New Castle County	100030006013
Kent County	100010405022	New Castle County	100030006021
Kent County	100010407001	New Castle County	100030006022
Kent County	100010407002	New Castle County	100030006023
Kent County	100010407003	New Castle County	100030009001
Kent County	100010409001	New Castle County	100030009002
Kent County	100010409002	New Castle County	100030009003
Kent County	100010410001	New Castle County	100030011003
Kent County	100010410002	New Castle County	100030014002
Kent County	100010410003	New Castle County	100030015002
Kent County	100010411012	New Castle County	100030016001
Kent County	100010412003	New Castle County	100030016002
Kent County	100010413001	New Castle County	100030016003
Kent County	100010413002	New Castle County	100030019021
Kent County	100010414001	New Castle County	100030019022
Kent County	100010414002	New Castle County	100030021001
Kent County	100010415001	New Castle County	100030021002
Kent County	100010415002	New Castle County	100030022001
Kent County	100010416001	New Castle County	100030022002
Kent County	100010417013	New Castle County	100030022003
Kent County	100010425001	New Castle County	100030023001
Kent County	100010425002	New Castle County	100030023002
Kent County	100010425003	New Castle County	100030023003
Kent County	100010430002	New Castle County	100030024001
Kent County	100010433001	New Castle County	100030024002
Kent County	100010433002	New Castle County	100030024003
Kent County	100010433003	New Castle County	100030024004
New Castle County	100030002004	New Castle County	100030025001
New Castle County	100030003001	New Castle County	100030025002
New Castle County	100030003002	New Castle County	100030025003
New Castle County	100030003003	New Castle County	100030026001
New Castle County	100030004001	New Castle County	100030026002
New Castle County	100030004002	New Castle County	100030026003
New Castle County	100030004003	New Castle County	100030026004
New Castle County	100030005001	New Castle County	100030027001
New Castle County	100030005002	New Castle County	100030027002
New Castle County	100030005003	New Castle County	100030028001
New Castle County	100030005004	New Castle County	100030028002
New Castle County	100030006011	New Castle County	100030029001

County	Census Block Group ID
New Castle County	100030029002
New Castle County	100030029003
New Castle County	100030029004
New Castle County	100030030021
New Castle County	100030030022
New Castle County	100030101051
New Castle County	100030101063
New Castle County	100030103002
New Castle County	100030107031
New Castle County	100030107042
New Castle County	100030112033
New Castle County	100030122002
New Castle County	100030122004
New Castle County	100030123001
New Castle County	100030123002
New Castle County	100030124003
New Castle County	100030125001
New Castle County	100030125002
New Castle County	100030125003
New Castle County	100030126001
New Castle County	100030127001
New Castle County	100030127002
New Castle County	100030127003
New Castle County	100030127005
New Castle County	100030129001
New Castle County	100030129002
New Castle County	100030129003
New Castle County	100030132002
New Castle County	100030132003
New Castle County	100030134003
New Castle County	100030136141
New Castle County	100030136142
New Castle County	100030136153
New Castle County	100030139012
New Castle County	100030140002
New Castle County	100030141001
New Castle County	100030141002
New Castle County	100030141003
New Castle County	100030145011
New Castle County	100030145021
New Castle County	100030145022
New Castle County	100030147032
New Castle County	100030147034

County	Census Block Group ID
New Castle County	100030148081
New Castle County	100030149031
New Castle County	100030149035
New Castle County	100030149062
New Castle County	100030149063
New Castle County	100030149073
New Castle County	100030149081
New Castle County	100030149082
New Castle County	100030149092
New Castle County	100030150005
New Castle County	100030152001
New Castle County	100030152002
New Castle County	100030152003
New Castle County	100030152004
New Castle County	100030152005
New Castle County	100030154001
New Castle County	100030154002
New Castle County	100030155021
New Castle County	100030155022
New Castle County	100030156001
New Castle County	100030156002
New Castle County	100030158021
New Castle County	100030158022
New Castle County	100030159001
New Castle County	100030159002
New Castle County	100030159003
New Castle County	100030160001
New Castle County	100030160002
New Castle County	100030163061
Sussex County	100050501042
Sussex County	100050501043
Sussex County	100050502001
Sussex County	100050502002
Sussex County	100050502003
Sussex County	100050503043
Sussex County	100050504052
Sussex County	100050504062
Sussex County	100050504064
Sussex County	100050504072
Sussex County	100050504083
Sussex County	100050505013
Sussex County	100050505031
Sussex County	100050505032

County	Census Block Group ID
Sussex County	100050505033
Sussex County	100050505051
Sussex County	100050505061
Sussex County	100050506031
Sussex County	100050506032
Sussex County	100050506041
Sussex County	100050506042
Sussex County	100050506043
Sussex County	100050507011
Sussex County	100050507012
Sussex County	100050507031
Sussex County	100050507032
Sussex County	100050507081
Sussex County	100050507101
Sussex County	100050507112
Sussex County	100050510122
Sussex County	100050510171
Sussex County	100050511033
Sussex County	100050513082
Sussex County	100050514001
Sussex County	100050514003
Sussex County	100050518011
Sussex County	100050518023



## Appendix D. State and Federal Climate Funding Opportunities

This appendix presents a summary of state and federal climate funding opportunities to support Climate Pollution Reduction Plan measure implementation. This list is intended to be educational and informative, not exhaustive. All the funds listed may already be available, may be in the process of becoming available, or may not yet be available to and within Delaware for a number of reasons. While significant financial opportunities exist, gaps in funding needs for climate action in Delaware still remain. As Delaware continues to implement the specific activities identified for each measure, key state and local agencies and partners that are administrators of formula funding or eligible applicants for competitive grant programs will continue to evaluate funding opportunities that are applicable for Delaware’s climate actions.

*Table 26. State and Federal Climate Funding Opportunities*

Program/Grant Name	Funding Source	Description of Funding Opportunity
<b>Regional Greenhouse Gas Initiative</b>	Emission Budget Trading Program	Delaware’s portion of the RGGI program is established in Delaware regulations as the CO <sub>2</sub> Budget Trading Program (7 DE Admin. Code 1147). Delaware and other participating states have developed the emission budget trading programs based on a model rule to reduce CO <sub>2</sub> emissions from fossil-fuel fired power plants.  Funds raised through the initiative are returned to participating states to invest in energy efficiency, renewable energy, and other consumer benefit programs.
<b>Energy Efficiency Investment Fund</b>	State – Public Utility Tax	Provides grants to support non-residential facilities replace aging and inefficient equipment and systems with energy-efficient alternatives. Funding is available to all non-residential, commercial, industrial, local government, governmental, and non-profit entities in the State of Delaware that pay the PUT. Grant project types include energy assessment grants, prescriptive improvement grants, custom improvements grants, combined heat, and power grants.
<b>Energize Delaware</b>	State – Utility Surcharge	Provides technical assistance, financial incentives, and educational resources to help residents and businesses reduce energy consumption and transition to cleaner sources of energy. Offerings include home energy assessments, rebates for energy-efficient appliances and equipment, and grants for renewable energy projects.
<b>Green Energy Program</b>	State – Utility Surcharge	Provides grants for qualifying renewable energy systems installed in Delaware

<b>Program/Grant Name</b>	<b>Funding Source</b>	<b>Description of Funding Opportunity</b>
<b>State Energy Program</b>	Federal – Formula	Provides funding and technical assistance to enhance energy security, advance state-led energy initiatives, and increase energy affordability. Eligible uses for this funding include energy conservation measures, renewable energy measures, and programs to increase deployment of clean energy technologies in buildings, industry, and transportation. Delaware’s formula allocation is approximately \$400,000 annually.
<b>Energy Efficiency Revolving Loan Fund Capitalization Grant Program</b>	Federal – Formula	Provides capitalization grants to states to establish a revolving loan fund under which the state shall provide loans and grants for energy efficiency audits, upgrades, and retrofits to increase energy efficiency and improve the comfort of buildings. Delaware’s allocation of this IIJA program was \$729,270.
<b>Weatherization Assistance Program</b>	Federal – Formula	Provides funds to reduce energy costs for low-income households by increasing the energy efficiency of their homes in addition to health and safety measures. Eligible uses for this funding include Improvement of heating and cooling of dwellings by the installation of weatherization materials such as attic insulation, caulking, weather-stripping, furnace efficiency modifications, certain mechanical measures to heating and cooling systems, and replacement furnaces, boilers, and air-conditioners. Delaware’s Fiscal Year 2023 total allocation of Weatherization Assistance funds is \$833,863.
<b>Energy Efficiency and Conservation Block Grant</b>	Federal – Formula	Activities must be for a financial incentive program, such as a rebate, loan, energy savings performance contracts, or other financing program for the purpose of improving energy efficiency; and limited to resident, non-profits, government entities, or businesses within the jurisdiction of the eligible entity. Funds available until expended.
<b>Home Energy Performance-Based, Whole-House Rebate Program</b>	Federal – Rebates Administered by States	Uses money provided to states to incentivize whole-house energy-saving retrofits for homeowners. Delaware may receive up to \$30 million for program implementation.
<b>High Efficiency Electric Home Rebate Program</b>	Federal – Rebates Administered by States	Provides point-of-sale consumer discounts on the purchase of high-efficiency electric home appliances, specifically targeted to low-income households. Delaware may receive up to \$29 million for program implementation.
<b>Delaware Clean Vehicle Rebate Program</b>	State	Provides incentives via cash rebates for residents and businesses to buy or lease new battery electric or plug-in hybrid vehicles.
<b>Electric Vehicle Charging Equipment Rebates</b>	State	Rebates to reduce the cost of EV charging stations that can be installed at multi-family dwellings, workplaces, outside businesses and in other public places.

<b>Program/Grant Name</b>	<b>Funding Source</b>	<b>Description of Funding Opportunity</b>
<b>VW Mitigation Funds</b>	State – VW Environmental Mitigation Trust	Delaware has developed a phased VW Mitigation Plan that focuses on medium- and heavy-duty road and limited off-road emission reduction projects. Delaware has been allocated approximately \$9.6 million from the Environmental Mitigation Trust.
<b>National Electric Vehicle Infrastructure Program</b>	Federal – Formula	Provides dedicated funding to states to strategically deploy EV charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability. Delaware’s NEVI Plan was approved and the Department of Transportation is administering the state’s \$175 million in funding.
<b>Carbon Reduction Program</b>	Federal – Formula	Provides funds for projects designed to reduce transportation emissions, defined as CO2 emissions from on-road highway sources. Eligible activities under this program include projects to establish or operate a traffic monitoring, management, and control facility or program, eligible public transportation projects, eligible transportation alternatives projects. Delaware’s total allocation for the five-year program period is \$27,098,325.
<b>Cool Switch Low Impact Refrigerant Program</b>	State	Offers participants grants for replacing existing refrigerants with low GWP refrigerants or installing new systems that use low GWP refrigerants. Incentives for all pathways will be paid at a rate of \$25 per ton of avoided CO2 equivalent emissions up to specified limits for a retrofit or new system. Delaware non-residential consumers that use at least 50 lbs of refrigerant are eligible to participate.
<b>Recycling Grants and Low Interest Loan Program</b>	State – Currently Suspended	Was funded through fees established in the Universal Recycling Law – fee sunset on December 1, 2014. A final grant cycle was executed during FY 2020 that depleted the fund balance. Unless a new funding source is identified, this program will be suspended after Cycle 9 is complete.
<b>Assistance for Latest and Zero Building Energy Code Adoption</b>	Federal – Formula	Provides funding for state activities regarding the adoption, implementation, training, enforcement, and measurement of compliance rates of specified building energy codes. Funding can be used to adopt the latest versions of the building code (IECC and IRC) as long as adoption of such code includes an eligible energy code. Delaware’s total initial allocation is \$4,081,710.
<b>Solid Waste Infrastructure for Recycling Grant Program</b>	Federal – Competitive	Provides funding to support state and local waste management infrastructure and recycling programs. DNREC applied for and received a grant to support activities in the state including conducting reusable bag research, analyzing the use of recycled glass as an alternative to sand, updating Recyclopeda, improve data collection, and create a map of food waste generation.

<b>Program/Grant Name</b>	<b>Funding Source</b>	<b>Description of Funding Opportunity</b>
<b>Clean School Bus Program</b>	Federal – Competitive	Provides \$5 billion over five years (FY 2022-2026) to replace existing school buses with zero-emission and low-emission models.
<b>Green and Resilient Retrofit Program</b>	Federal – Competitive	Provides funding for direct loans and grants to fund projects that improve energy or water efficiency, enhance indoor air quality or sustainability, implement the use of zero-emission electricity generation, low-emission building materials or processes, energy storage, or building electrification strategies, or address climate resilience, of eligible HUD-assisted multi-family properties.
<b>Renew America’s Schools Program</b>	Federal – Competitive	Provides funding to support the implementation of energy infrastructure improvements in schools, with a focus on local education agencies (LEAs) that qualify as rural and/or high poverty. Eligible projects include a range of energy improvements, including new heating, ventilation, and air conditioning (HVAC).
<b>Zero-Emission Technologies Grant Program</b>	Federal – Competitive	Provides funding for competitive grants to mobilize financing and leverage private capital for clean energy and climate projects that reduce greenhouse gas emissions, with an emphasis on projects that benefit low-income and disadvantaged communities.
<b>Clean Diesel Grant Program/Diesel Emissions Reduction Act</b>	Federal – Competitive	Provides funding assistance to accelerate the upgrade, retrofit, and turnover of legacy diesel fleet vehicles. Delaware has previously received DERA funding to replace diesel vehicles in the state.
<b>Powering Affordable Clean Energy</b>	Federal – Competitive	PACE program funding enables loan forgiveness (USDA Rural Development Rural Utilities Service) of up to 60% for renewable energy projects that use wind, solar, hydropower, geothermal, or biomass, in addition to renewable energy storage projects.
<b>Greenhouse Gas Reduction Fund</b>	Federal – Competitive	Provides funding through three grant programs: National Clean Investment Fund, Clean Communities Investment Accelerator, and Solar for All with the goal to support projects that reduce emissions and air pollutants and mobilize financing and private capital to stimulate deployment of such projects.
<b>Rural Energy for America Program</b>	Federal – Competitive	Provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements.
<b>Rural Energy for America Program</b>	Federal – Competitive	Provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements.

Program/Grant Name	Funding Source	Description of Funding Opportunity
<b>Urban and Community Forestry Grants</b>	Federal – Competitive	Provides funding to increase tree cover in urban, suburban, and rural communities nationwide. Delaware Forest Service Urban and Community Forestry received \$500,000 in program year 2023 to deliver assistance to disadvantaged communities through community / municipality tree planning, urban forestry training and workforce development, and community-based outreach, education, and greening.
<b>Surface Transportation Block Grant Program</b>	Federal – Formula	Provides flexible funding that may be used by states and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.
<b>Technical Assistance for the Adoption of Building Energy Codes</b>	Federal – Formula and Competitive	The IRA provides \$1 billion for states and local governments with the authority to adopt traditional building energy codes and innovative building energy codes, such as building performance standards, to lead the way in decarbonizing the new and existing residential and commercial buildings. Delaware is eligible for \$4,081,710.24 through the formula grant.

## Appendix E. Approaches for Quantifying GHG Reductions from Climate Pollution Reduction Plan Measures

This appendix outlines the approaches used to model GHG emission reductions for the Climate Pollution Reduction Plan measures. Climate Pollution Reduction Plan measure GHG reductions are developed based on the modeling conducted for the 2021 CAP and detailed in the report *Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis*<sup>61</sup>. DNREC did not conduct new, additional modeling for this Climate Pollution Reduction Plan except for estimating carbon sinks in the future for the natural and working lands measure. Emission reductions are presented in CO<sub>2</sub> equivalents based on the Intergovernmental Panel on Climate Change Fourth Assessment Report 100-year Global Warming Potentials. These values will be updated to align with the Fifth Assessment Report during a new modeling effort to be conducted as a part of Delaware's CPRG deliverables.

Given each CPRG Climate Pollution Reduction Plan measure is linked directly to the modeled GHG reduction strategies included in the 2021 CAP, DNREC was able to use these estimates to quantify potential GHG reductions for each Climate Pollution Reduction Plan measure (tied to the 2018 GHG inventory, linkages to the new 2020 GHG inventory will occur for upcoming CPRG deliverables). For the 2021 CAP DNREC quantified annual GHG reductions based on potential strategy implementation as compared to a BAU scenario (note the BAU presented in this Climate Pollution Reduction Plan has been updated since the 2021 CAP; DNREC will update the BAU scenario used for the GHG reduction analysis during a new modeling effort to be conducted as a part of future CPRG deliverables). Using these annual reductions, DNREC was able to aggregate GHG emissions over time to estimate cumulative potential GHG reductions for 2025-2030 and 2025-2050 for each Climate Pollution Reduction Plan measure as indicated is needed per CPRG requirements and guidance. More specifically, DNREC:

- Collected annual GHG emissions reduction estimates for each strategy outlined in the 2021 CAP.
- Where there was a one-to-one alignment of a 2021 CAP strategy to a Climate Pollution Reduction Plan measure, DNREC summed the annual reductions from each year in the time periods 2025-2030 and 2025-2050 to arrive at cumulative reductions (see.
- Where multiple 2021 CAP strategies aligned to a Climate Pollution Reduction Plan measure, DNREC summed the annual reductions from each year for each strategy aligned with that measure in the time periods 2025-2030 and 2025-2050 to arrive at cumulative reductions.
- Of note, is that the carbon intensity of the electric grid used to quantify GHG emissions from electricity used is based on an assumption that any electricity generated in state is

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<sup>61</sup> DNREC and ICF. "Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis Report." August 31, 2020. <https://documents.dnrec.delaware.gov/energy/Documents/Climate/Plan/DNREC%20Technical%20Report.pdf>.

used in state and then remaining power needed to meet demand is imported. The analysis is based on the assumption that Delaware’s Renewable Portfolio Standard is 40% by 2035, in line with updated policy passed in 2021<sup>62</sup>, and 100% by 2050, in line with many aspirational targets across the country and world<sup>63</sup>.

*Table 27. Alignment of 2021 CAP Modeled Strategies and Climate Pollution Reduction Plan Measures*

Climate Pollution Reduction Plan Measure	2021 CAP Technical Report Modeled Strategies
<b>1. Support deployment of and access to renewable energy systems and the decarbonization of Delaware’s electricity.</b>	• GRID-1, DG-1
<b>2. Increase building energy efficiency and reduce energy consumption.</b>	• EE-1, EE-2, EE-4, HIGH-GWP-1
<b>3. Support the long-term transition to building electrification.</b>	• EE-3
<b>4. Provide assistance and support for industrial decarbonization.</b>	• DG-2, EE-5, HIGH-GWP-2
<b>5. Reduce methane emissions across Delaware.</b>	• NG-1, WASTE-1, WASTE-2
<b>6. Reduce vehicle miles traveled.</b>	• TPORT-2
<b>7. Improve the efficiency of freight delivery.</b>	• TPORT-7
<b>8. Advance deployment of Zero-Emission Vehicles and ZEV Fueling Infrastructure.</b>	• TPORT-1, TPORT-3, TPORT-4, TPORT-6
<b>9. Maintain natural and working lands to sequester carbon.</b>	• NA
<b>10. Lead by example in state agency and municipal operations and procurement processes.</b>	• TPORT-5

Explicit assumptions, data sources, and methods used to quantify GHG emission reductions for the 2021 CAP strategies are detailed in the report *Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis*.

Aligned with the 2021 Natural and Working Lands Report, DNREC utilized the USDA-NRCS’s COMET-Planner tool to estimate per acre annual carbon sequestration from practices on agricultural land. Supplementary carbon sequestration rates were sourced from tools such as the EPA SIT and iTree for practices not modeled by COMET-Planner.

<sup>62</sup> 26 Del. C. §354. Renewable energy portfolio standards, eligible energy resources and industrial exemption. <https://delcode.delaware.gov/title26/c001/sc03a/index.html>.

<sup>63</sup> National Conference of State Legislatures, “State Renewable Portfolio Standards and Goals.” August 13, 2021. <https://www.ncsl.org/energy/state-renewable-portfolio-standards-and-goals>.



For most practices in this analysis, DNREC quantified annual GHG reductions based on the targeted increase in acres adopting the sequestration practice. For the cover crop adoption, however, a BAU number of acres applying cover crops was estimated using data from DNREC's Phase III Watershed Implementation Plan (WIP)<sup>64</sup>. DNREC assumed a linear phase-in of all practices from 2020-2025 to estimate annual carbon sequestration and emissions reductions. Using these annual reductions, DNREC was then able to aggregate GHG emissions over time to estimate cumulative potential GHG reductions for 2025-2030 and 2025-2050 for each agriculture and working lands measure.

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<sup>64</sup> DNREC. "Delaware's Chesapeake Bay Watershed Implementation Plan Phase III," August 2019. <https://documents.dnrec.delaware.gov/swc/district/Documents/CB%20WIP/DE%20Phase%20III%20WIP%2008232019%20with%20appendices.pdf>.