1.0 Executive Summary

1.1 Overview

This report presents North Carolina's greenhouse gas (GHG) inventory, a detailed accounting of historical activities and associated GHGs emitted or stored by key source categories from 1990 to 2018. In addition, the inventory projects North Carolina's GHG emissions from 2019 to 2030 based on forecasted changes in fuel use, population, historical trends, and other factors.

North Carolina uses the inventory to benchmark progress on GHG reductions against state goals and policies to determine which sectors offer opportunities for future reductions. According to the updated inventory, between 2005 and 2018, North Carolina reduced gross GHG emissions by 16% and net GHG emissions by 23%. By 2030, North Carolina is projected to see a 39% decrease in net GHG emissions as a result of current trends across all sectors and the reductions required in the electricity sector under Session Law (SL) 2021-165 (House Bill 951).

For this inventory and forecast, significant revisions were made to the transportation sector analysis due to newly available data and the use of an updated EPA-approved transportation model. The revised numbers in this inventory show that the transportation sector is responsible for approximately 17% more emissions in 2017 than in the previous inventory. This sector now accounts for 36% of the state's gross GHG emissions and is projected to decrease emissions at a much lower rate compared to the projected decrease in electricity generation emissions by 2030. However, the transportation projections do not include reductions expected as a result of policies enacted after 2020.

The inventory also recognizes North Carolina's tremendous potential to offset carbon emissions through its land and forest resources. Due to changes in guidance from the EPA on modeling Land Use, Land Use Change, and Forestry (LULUCF), the updated estimates show land use and forestry sequestered 26% of statewide gross GHG emissions in 2018, which represents more carbon sequestration than previously reported.

Overall, the projections in this inventory validate North Carolina's focus on reductions to GHG emissions from the electricity sector and highlight the opportunity for additional efforts in the transportation sector. The state is making progress on reducing emissions and is on track for continued reductions. The inventory will be updated as more data become available on a biennial schedule.

The methods used to prepare the North Carolina inventory are generally based on those used to prepare the "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018" (U.S.

Inventory), published annually by EPA.[1] The U.S. Inventory includes estimates of historical anthropogenic emissions of GHG sources and carbon sinks by source category, economic sector, and GHG pollutant type for the entire country starting from 1990.[2] It is calculated using methodologies consistent with those recommended in the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines).[3] The use of consistent methodologies ensures that GHG inventories prepared by states and other entities are comparable. In the report body, only select years are presented; however, estimated GHG emissions data for all analysis years, from 1990 to 2030, are summarized in Appendix A

The North Carolina historical and projected emissions inventory presented here estimates emissions of the six primary GHG pollutants listed below.[4] The pollutant specific estimates are reported as CO_2 equivalent emissions using currently used Global Warming Potential (GWP).

- carbon dioxide (CO_2)
- methane (CH_4)
- nitrous oxide (N_2O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF_6)

Table 1-1 summarizes the estimates of North Carolina's historical and projected GHG emissions and carbon sinks from 1990 through 2030.[5] Details about the table are listed below.

- Emissions are presented in million metric tons as CO_2e (MMT CO_2e).
- In keeping with IPCC guidelines, CO_2 emissions from combustion of biomass are included within the calculation of net carbon flux in the LULUCF sector (Appendix C provides a detailed discussion of the treatment of biomass CO_2 emissions).
- The inventory is presented as both gross emissions and net emissions (emissions minus carbon sinks) since targets for GHG emissions reductions are generally expressed as net emissions.
- The significant reduction in onroad vehicle emissions in 2020 reflects the estimated reduction in vehicle miles traveled resulting from the pandemic in that year.
- Emissions reductions are presented for a base year of 2005 as well as 2025 and 2030, which corresponds with the baseline and projection years specified by various Federal, multi-state, and North Carolina-specific GHG mitigation policies.

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[1] EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018," EPA 430-R-20-002, Washington, D.C., April 13, 2020, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018.

[2] Carbon sinks are natural or artificial reservoirs that accumulate and store a carbon-containing chemical compound (generally CO_2) for an extended period, such as the growth of newly planted trees in a sustainably managed forest.

[3] The Intergovernmental Panel on Climate Change, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, The National Greenhouse Gas Inventories Programme, Hayama, Kanagawa, Japan, 2006, https://www.ipcc-nggip.iges.or.jp/public/2006gl/.

[4] These six compounds are being reported under the U.S. GHG reporting program. For information on each compound, see https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

[5] The data for all years are presented in Appendix A.

- An estimate of the impact associated with the 2030 goal to reduce CO_2 emissions by 70% from 2005 levels as specified in State Law (SL) 2021-165 on statewide emissions for the electric power generation sector and total statewide gross and net emissions is provided in the last column of Table 1-1.

Table 1-1: North Carolina GHG Emissions Inventory by Source Sector (MMT CO2e)

	Historical					Projected			
	1990	2005	2012	2017	2018	2020	2025	2030	2030 with SL 2021-165
Electricity Generation and Use	54.55	80.15	65.61	51.29	52.32	46.83	41.08	34.35	
Electric Power Generation	46.28	73.27	55.95	46.64	47.56	42.48	36.80	30.12	23.91
Imported Electricity[a]	8.27	6.88	9.65	4.65	4.76	4.35	4.28	4.23	
Residential/Commercial/Industrial Combustion[b]	26.76	26.00	18.74	19.83	21.28	19.65	21.38	21.96	
Industrial	17.58	14.20	10.10	10.18	10.43	9.74	10.59	11.18	
Commercial	3.79	5.06	4.17	5.06	5.22	4.82	5.42	5.48	
Residential	5.39	6.75	4.47	4.60	5.64	5.09	5.37	5.30	
Transportation	40.40	59.36	56.91	57.18	57.31	49.71	52.42	49.09	
Gasoline & Diesel Highway	35.23	51.79	51.01	51.82	51.68	44.35	46.49	42.88	
Non-Highway	5.17	7.51	5.78	5.18	5.46	5.16	5.72	5.96	
Alternative Fuel Vehicles	0.00	0.05	0.12	0.17	0.18	0.20	0.22	0.25	
Agriculture	7.06	10.65	10.56	10.53	10.52	10.51	10.47	10.44	
Manure Management	2.59	6.02	5.63	6.05	6.06	6.06	6.09	6.11	
Agricultural Soil Management	2.87	2.74	3.18	2.84	2.83	2.82	2.78	2.75	
Enteric Fermentation	1.60	1.89	1.74	1.64	1.63	1.63	1.60	1.58	
Burning of Agricultural Crop Waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Waste Management	6.39	8.52	9.09	8.77	8.94	9.29	10.17	11.07	
Municipal Solid Waste	5.47	7.23	7.52	7.09	7.23	7.52	8.26	9.00	
Wastewater	0.92	1.29	1.57	1.68	1.71	1.77	1.92	2.06	
Industrial Processes	1.04	3.83	5.39	7.18	7.73	8.84	11.31	12.73	
Natural Gas and Oil Systems	0.86	1.17	1.28	1.35	1.37	1.40	1.47	1.55	
Gross Emissions	137.04	189.68	167.56	156.13	159.48	146.23	148.31	141.18	134.97
Net Carbon Sinks – LULUCF[c]	-42.17	-37.29	-40.15	-41.58	-42.13	-42.13	-42.13	-42.13	
Net Emissions	94.88	152.39	127.41	114.56	117.35	104.10	106.18	99.05	92.84
Percent Reduction in Net Emissions from 2005					**23%**		**30%**	**35%**	**39%**

Note: Totals may not equal exact sum of subtotals shown in this table due to independent rounding.

[a] Includes estimates of emissions from Imported Electricity that are generated outside North Carolina.

[b] Represents emissions associated with on-site fuel combustion activities in the Residential, Commercial, and Industrial sectors.

[c] Land Use, Land Use Change, and Forestry.

1.2 Key Findings

Based on the estimated emissions in Table 1-1, North Carolina's gross GHG emissions in 2018 were 159 MMT CO_2e and are projected to decrease by 11% to 141 MMT CO_2e by 2030.[6] Accounting for

[6] 2018 is the last year of historical GHG emissions data; 2012 and 2017 are also displayed in Table 1-1 to demonstrate recent emission trends.

carbon sinks, North Carolina's net GHG emissions in 2018 are estimated at 117 MMT CO_2e and are projected to decrease by 16% to 99 MMT CO_2e by 2030. North Carolina's projected net post-2005 GHG reductions in 2025 and 2030 are 30% and 39%, respectively. The 2025 net GHG emission reduction projection does not consider SL 2021-165 in this report. There is not enough information to project year-over-year emissions decreases leading up to the 70% CO_2 reductions by 2030 requirement. More information will be established in the North Carolina Utilities Commission (NCUC) Carbon Plan.

Below are key findings from both the GHG emissions inventory and from the analysis of the data used to develop the emissions for each source sector. Additional detail is provided in Section 2.0 Trends in Greenhouse Gas Emissions. Unless otherwise stated, emission reductions are generally expressed as the percent change in gross GHG emissions from the baseline year of 2005.

- **North Carolina's Gross and Net Emissions**
  - Between 2005 and 2018, North Carolina reduced gross GHG emissions by 16% and net GHG emissions by 23%.
  - During this same time period, North Carolina's population and real Gross State Product (GSP) grew by 19% and 24%, respectively.
  - By 2025, net GHG emissions are projected to decrease by 30% relative to 2005 baseline emissions.
  - By 2030, net GHG emissions are forecast to decrease by 39% relative to the 2005 baseline.
  - The 2025 and 2030 projections do not include all reductions expected as a result of policies enacted after 2020.
- **GHG Compounds**
  - Carbon dioxide emissions currently account for approximately 82% of total GHG emissions.
  - The primary source of CO_2 emissions is fossil fuel combustion.
  - GHG emissions from fossil fuel combustion have decreased by 21% between 2005 and 2018. This is due to both a shift in fuel use, from coal to natural gas, and increased energy efficiency.
  - Methane emissions currently account for approximately 11% of total GHG emissions.
  - The primary sources of methane are Waste Management and Agriculture.
  - Emissions from Waste Management and Agriculture have not changed significantly since 2005, even with a growing population and economy.
- **Electricity Generation and Use Sector**
  - While previously the largest contributor to GHG emissions, Electricity Generation and Use is now the second largest emissions sector and represents 33% of all GHG emissions.
  - GHG emissions from the Electricity Generation and Use sector in 2018 decreased by 34% since 2005
  - North Carolina's electricity generation has undergone a transformation since 2009, including:

1) retirement of over 3,000 megawatts (MW) of coal fired power plants, which is 27% of the NC coal fleet.
2) increased use of natural gas combined cycle (NGCC) plants.
3) North Carolina legislation to promote renewable energy (RE).

- Solar, hydroelectric and wind power represented 10% of North Carolina's electricity generation in 2018.
- Avoided GHG emissions due to RE power are estimated at 5.26 MMT CO_2e for 2018.
- Emissions from imported electricity have decreased by 31% since 2005.
- If the carbon reduction goal outlined in SL 2021-165 is achieved by 2030 as required, the Electricity Generation sector will see a 67% overall decrease in gross GHG emissions compared to 2005 levels.

➢ **Transportation**

- Transportation sector emissions are significantly higher than estimated in the previous inventory, reflecting the impact of the new onroad vehicle emissions estimation methodology that utilizes EPA's state-of-the-science emissions modeling system.
- The Transportation sector is the largest emissions sector and represents about 36% of all GHG emissions.
- Emissions from the Transportation sector decreased by an estimated 3% from 2005 to 2018.
- Onroad light-duty gasoline vehicles represent 72% of total Transportation sector GHG emissions in 2018, while onroad medium/heavy-duty diesel vehicles are the next largest contributor (16%).
- While not captured in this inventory, national projections for gasoline and diesel vehicle emissions under the 2020 Corporate Average Fuel Economy (CAFE) and GHG standards suggest a notable decrease in GHG emissions.
- EPA estimates that 2021 promulgated light-duty vehicle GHG standards will achieve an additional national 6% reduction in CO_2, 5% reduction in CH_4, and 5% reduction in N_2O emissions in 2030 relative to the existing light-duty vehicle standards.[7]

➢ **Residential, Commercial, and Industrial**

- RCI emissions represent 13% of all GHG emissions.
- Residential sector emissions from total energy use have decreased by 25% between 2005 and 2018, while North Carolina's population grew by 19% over that time.
- GHG emissions from fuel combustion in the Commercial sector have increased by 3% due to shifts in the economy.
- Industrial fuel combustion emissions have decreased by 27% since 2005.

[7] EPA, "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards, Final Rule," 86 FR 74434, December 20, 2021.

- GHG emissions from Industrial Processes have doubled since 2005, mainly due to increased emissions of HFCs and PFCs resulting from their use as substitutes for ozone-depleting substances (ODS).

➢ **Land Use, Land Use Change, and Forestry**

- LULUCF sector carbon sequestration is greater than estimated in the previous inventory, which reflects larger estimates of North Carolina forest carbon stocks (as estimated by the U.S. Forest Service (USFS)) and the incorporation of estimates for additional LULUCF sector subcategories (e.g., Urban Trees).
- Forests, natural lands, and agricultural lands sequestered an estimated 42 MMT of CO_2 or 26% of total gross GHG emissions in 2018.
- Carbon storage in wood products and landfills is estimated to be a significant carbon sink in North Carolina (31% of the total 2018 sink).

1.3 North Carolina Climate Initiatives

1.3.1 State Executive Orders (EOs)

Governor Roy Cooper issued three EOs that set goals for North Carolinians to address climate impacts by mitigating GHG emissions and improving carbon sequestration. On October 29, 2018, the Governor signed EO-80 (North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy) that established the following goals for 2025 in the State:[8]

- Reduce statewide greenhouse gas emissions to 40% below 2005 levels;
- Increase the number of registered, zero-emission vehicles ("ZEVs"; individually, "ZEV") to at least 80,000; and
- Reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels.

June 9, 2021, Governor Cooper issued EO-218 (Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind) promoting the development offshore wind power in North Carolina. The EO establishes the following goals for the State:[9]

- Develop 2.8 gigawatts (GW) of offshore wind energy resources off the North Carolina coast by 2030 and 8.0 GW by 2040.

[8] State of North Carolina, Governor Roy Cooper, Executive Order No. 80, "North Carolina's Commitment To Address Climate Change And Transition To A Clean Energy Economy," October 29, 2018, https://governor.nc.gov/media/967/open.

[9] State of North Carolina, Governor Roy Cooper, Executive Order No. 218, "Advancing North Carolina's Economic and Clean Energy Future with Offshore Wind" June 9, 2021, https://files.nc.gov/governor/documents/files/EO218-Advancing-NCs-Economic-Clean-Energy-Future-with-Offshore-Wind.pdf.

January 7, 2022, Governor Cooper signed EO-246 (North Carolina's Transformation to A Clean, Equitable Economy) that establishes the following additional GHG emission reduction goals for the State:[10]

- Reduce statewide GHG emissions to at least 50 percent below 2005 levels by 2030 and achieve net-zero emissions as soon as possible, no later than 2050; and
- Increase the total number of registered ZEVs to at least 1,250,000 by 2030 and increase the sale of ZEVs so that 50 percent of in-state sales of new vehicles are zero-emission by 2030.

This and the previous GHG emissions inventory and forecast reports have been prepared to understand the sector-level baseline emissions to support development of GHG mitigation and carbon sequestration measures needed to achieve these goals.

1.3.2 Carbon Plan for North Carolina

On October 13, 2021, Governor Cooper signed bipartisan legislation SL 2021-165 (House Bill 951) that authorizes the NCUC to:

- Take all reasonable steps to achieve a 70% reduction in CO_2 emissions emitted in the State from electric public utilities from 2005 levels by the year 2030, and carbon neutrality by the year 2050,[11]
- Authorize performance-based regulation of electric public utilities,
- Proceed with rulemaking on securitization of certain costs and other matters, and
- Allow potential modification of certain existing power purchase agreements with eligible small power producers.

Part I, Section 1.(1) of SL 2021-165 requires the NCUC to "Develop a plan, no later than December 31, 2022, with the electric public utilities, including stakeholder input, for the utilities to achieve the authorized reduction goals, which may, at a minimum, consider power generation, transmission and distribution, grid modernization, storage, energy efficiency measures, demand-side management, and the latest technological breakthroughs to achieve the least cost path consistent with this section to achieve compliance with the authorized carbon reduction goals (the "Carbon Plan"). The Carbon Plan shall be reviewed every two years and may be adjusted as necessary in the determination of the Commission and the electric public utilities." The electric public utilities affected by SL 2021-165 include Duke Energy Progress and Duke Energy Carolinas.[12]

This inventory report presents total GHG emissions associated with electricity generation by all entities (i.e., investor-owned utilities, independent power producers, municipalities, and electric cooperatives) in North Carolina, and all GHG pollutants combined. The Carbon Plan will only address CO_2 emissions from the State's investor-owned utilities (i.e., Duke Energy Progress and Duke Energy Carolinas). This report provides an initial estimate of the impact associated with the

[10] State of North Carolina, Governor Roy Cooper, Executive Order No. 246, "North Carolina's Transformation To A Clean, Equitable Economy," January 7, 2022, https://governor.nc.gov/media/2907/open.
[11] SL 2021-165 allows 5% of the 2050 CO_2 reductions to be met with offsets.
[12] For purposes of Part I, Section 1.(1) of SL 2021-165, "electric public utility" means any electric public utility as defined in G.S. 62-3(23) serving at least 150,000 North Carolina retail jurisdictional customers as of January 1, 2021.

2030 CO_2 emission reduction target incremental to the 2030 baseline emissions. Appendix D provides an initial estimate of 2005 baseline CO_2 emissions associated with facilities subject to SL 2021-165. In 2005, emissions associated with the affected facilities are estimated at 68.39 MMT CO_2. To achieve the 70% reduction target, CO_2 emissions associated with these facilities would need to reduce to 20.52 MMT CO_2.

Once the Carbon Plan is approved by the NCUC, information will be available to better understand the generation technology and fuel mix that will need to be implemented to achieve the SL 2021-165 targets which may affect the emission estimates. In addition, any demand-side management measures that are included in the plan may also impact emission projections for the RCI Combustion sectors.

1.4 2019 Inventory Report Revisions

This report revises the previous North Carolina GHG inventory report that was released in 2019. Because of the resources that are required to develop a comprehensive GHG emissions inventory, this report includes revised emission estimates for a subset of the complete list of GHG source categories. For the following source categories, this revised inventory replaces the previous estimates with estimates based on the most recent information available:

- Electricity Generation and Use;
- Transportation;
- Residential, Commercial, and Industrial (RCI) Fuel Combustion; and
- Land Use, Land Use Change, and Forestry (LULUCF).

These "priority" source categories were selected for updating because they are the largest contributors to net 2017 emissions in the comprehensive inventory released in 2019. For these priority source categories, the North Carolina Division of Air Quality (DAQ) utilized a set of emissions estimation improvements relative to the previous inventory, which result in the Transportation and LULUCF sectors exhibiting significantly higher emission/sink estimates than the previous inventory. For the Transportation sector, the DAQ is now using EPA's state-of-the-science emissions modeling system to estimate onroad vehicle emissions.[13] For the LULUCF sector, improvements include incorporating newly released EPA estimates that reflect larger estimates of North Carolina forest carbon stocks (as estimated by the USFS) and EPA estimates for additional LULUCF sector subcategories (e.g., Urban Trees).

1.5 Emission Sources Included in the Inventory

North Carolina's GHG emissions inventory covers all major GHG sources and carbon sink categories that are included in the national inventory prepared by EPA and are representative of activities occurring in our State. This includes emissions from Combustion Processes, Industrial

[13] EPA, "MOVES3: Latest Version of Motor Vehicle Emission Simulator," available from https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves, accessed September 2021.

Processes, and Waste Management activities.[14] It also includes fugitive emissions from Natural Gas Transmission and Distribution systems, Agriculture Operations, and from Land Use activities such as fertilization and forest fires. Lastly, the emissions inventory includes estimates of the indirect emissions associated with Imported Electricity consumed in North Carolina but generated outside the State. North Carolina's GHG inventory does not include coal, oil, and gas production, cement manufacture, lime manufacture, ammonia production, nitric acid production, adipic acid production, magnesium production, and the production of the refrigerant chlorodifluoromethane (HCFC-22) because these activities do not occur in the State.

The LULUCF sector is the net sum of all CH_4 and N_2O emissions to the atmosphere from activities on natural and working lands plus the net change in the carbon stocks for each year. Changes in the growth, decay, storage, and use of the carbon-based stocks on North Carolina's natural and working lands, often referred to as carbon flux, are estimated in the LULUCF sector.[15] For all years, North Carolina's forestry management practices result in a net sequestration of carbon and are reported as a carbon sink. (See Section 2.9.)

Gross CH_4 and N_2O emissions from biomass combustion are included in the inventory within the relevant consumption sector (e.g., Residential/Commercial/Industrial combustion). However, CO_2 emissions from the combustion of biomass must be treated differently than fossil fuel sources in the inventory. This is because the release of carbon from biomass combustion is accounted for in the LULUCF sector per the IPCC Inventory Guidelines. Therefore, including biomass combustion CO_2 emissions elsewhere (i.e., within each applicable combustion sector) would result in double-counting emissions. For these reasons, biomass combustion emissions are included within the net emissions reported for the LULUCF sector. For transparency, Appendix C presents gross CO_2 emissions from biomass combustion in North Carolina and provides additional discussion on the treatment of CO_2 emissions from biomass combustion.

1.6 GHG Emissions Estimation Methods

For the Transportation sector, the latest version of EPA's Motor Vehicle Emissions Simulator Model (MOVES3) was used to calculate historic and projected GHG emissions. For all other sectors, both historical and projected GHG emissions are calculated primarily using the State Inventory and Projection Tool (SIT), a spreadsheet-based tool developed by EPA to assist state agencies in preparing state-level GHG inventories and projections.[16] The SIT automates and adapts the estimation procedures used by EPA to prepare the national GHG inventory for use in preparing state-level GHG inventories

The SIT includes default data supplied by EPA for North Carolina and other states. The default data are generally publicly available information from various federal agencies such as the U.S.

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[14] Combustion processes include burning of coal, natural gas, fuel oil, biomass, and other fuels for electricity generation, process heat, space, and water heating, and onroad and non-road transportation, and other combustion processes in the State.

[15] Natural and working lands include public and private forests, cropland, grassland, wetlands, and "settlement" lands, where settlement refers to both urban and rural communities.

[16] EPA, "State Inventory and Projection Tool," https://www.epa.gov/statelocalenergy/download-state-inventory-and-projection-tool, accessed November 2020.

Department of Energy (DOE), U.S. Department of Agriculture (USDA), Federal Highway Administration (FHWA), U.S. Geological Survey (USGS), U.S. Census Bureau, and EPA. These data are frequently used by state and local agencies to develop air pollutant emissions inventories. A limited number of source categories contained in the SIT utilize data obtained from third party vendors (e.g., fertilizer application). Where default data were unavailable or considered inferior relative to other information sources, data obtained from state agencies are used in the SIT to provide more accurate emissions estimates for North Carolina. The data sources used to estimate emissions are documented in Section 3.0 of this report. A discussion of the uncertainty associated with the default data available in the SIT is located in each SIT module under the tab labeled "Uncertainty."

1.7 Reference Case Projection

The projection of the GHG inventory includes all sectors that were estimated for the historical inventory. The projection represents a single reference case for future GHG emissions. No future year scenarios are included in the projections since potential scenarios have not been identified at this time. This reference case "baseline" projection can be used to evaluate the impact of future scenarios with policies, programs, or rules that increase or decrease emissions.

The baseline projection does not include recently adopted and future federal and State GHG mitigation and carbon sequestration measures. At the federal level, examples include 1) GHG emission standards for passenger cars and light-duty trucks for 2023 through 2026 recently adopted by EPA, 2) proposed CAFE standards for light-duty vehicles, and 3) phasedown of HFCs.[17,18,19] At the State level, examples include 1) control of CO_2 emissions from power plants (see Section 1.6); 2) increase in the use of RE, energy efficiency, and storage; 3) increase in the use of electric vehicles; 4) livestock manure management; and 5) sequestration of carbon by natural and working lands. Voluntary emission reduction measures taken by the private sector and local and state government will also be captured in the future as the consumption of fossil fuels changes based on demand. Future inventories will incorporate any final regulatory changes.

1.8 Structure of the Report

The remainder of this report is divided into two sections. The first section is an analysis of the key GHG-emitting sectors and a discussion of the trends in North Carolina's GHG sources and sinks. The second section discusses the methodologies and data sets used to prepare the estimates, including key assumptions and limitations. Appendix A provides a tabulated summary of each year of GHG emissions from 1990 to 2030. Appendix B provides a brief overview of GWPs, and Appendix C discusses the treatment of CO_2 emissions from biomass combustion. Appendix D of

[17] EPA, "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards, Final Rule," 86 FR 74434, December 20, 2021.
[18] "Corporate Average Fuel Economy Standards for Model Years 2024–2026 Passenger Cars and Light Trucks, Proposed Rule" 86 FR 49602, September 3, 2021.
[19] "Reducing HFCs, AIM Act," background information available from https://www.epa.gov/climate-hfcs-reduction/aim-act, accessed January 2022.

this report provides an initial estimate of 2005 baseline CO_2 emissions associated with facilities subject to SL 2021-165 (House Bill 951).