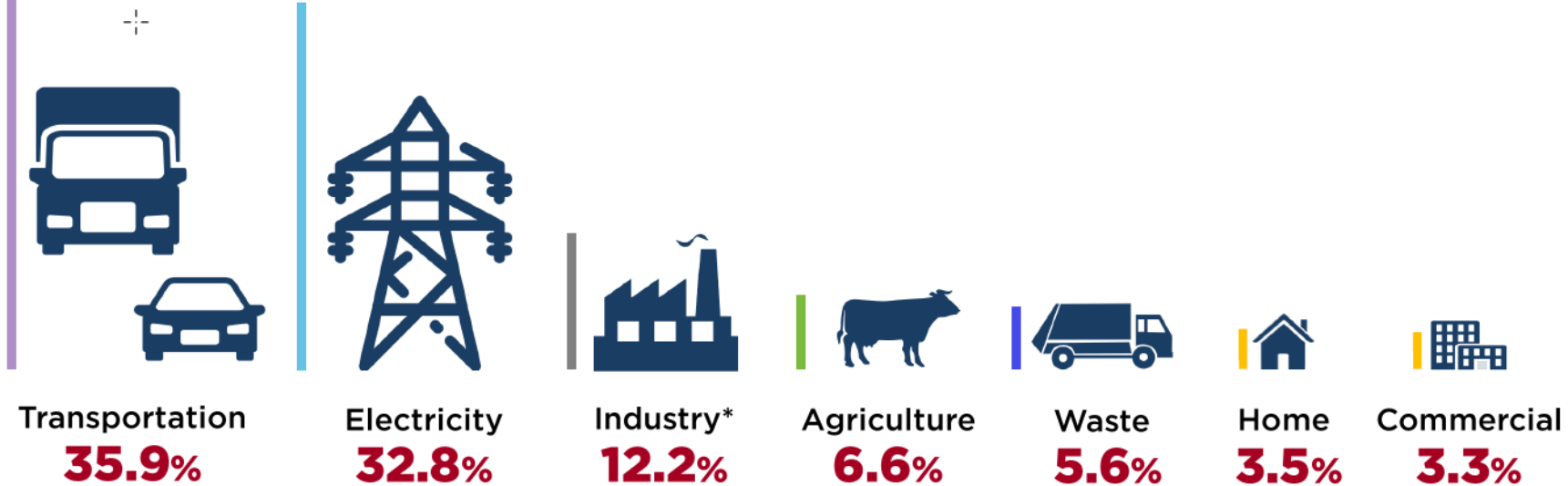


NC Greenhouse Gas Emissions Inventory

- Pollutants: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆)
- 2022 Update to statewide GHG emissions inventory
- Years covered: 1990-2018
- Projections for 2019 to 2030
 - Based on forecasted changes to fuel use, population, historical trends
- Used to benchmark progress on GHG reductions against state goals and policies to determine which sectors offer opportunities for future reductions

NC Greenhouse Gas Emissions Inventory

Gross GHG Emissions by Economic Sector in 2018



2018 Gross GHG Emissions

159.5 million metric tons of CO₂e

CO₂ emissions from fossil fuel combustion:

81.3%

of total gross emissions

CO₂ emissions removed by forests & other lands:

26.4%

of total gross emissions

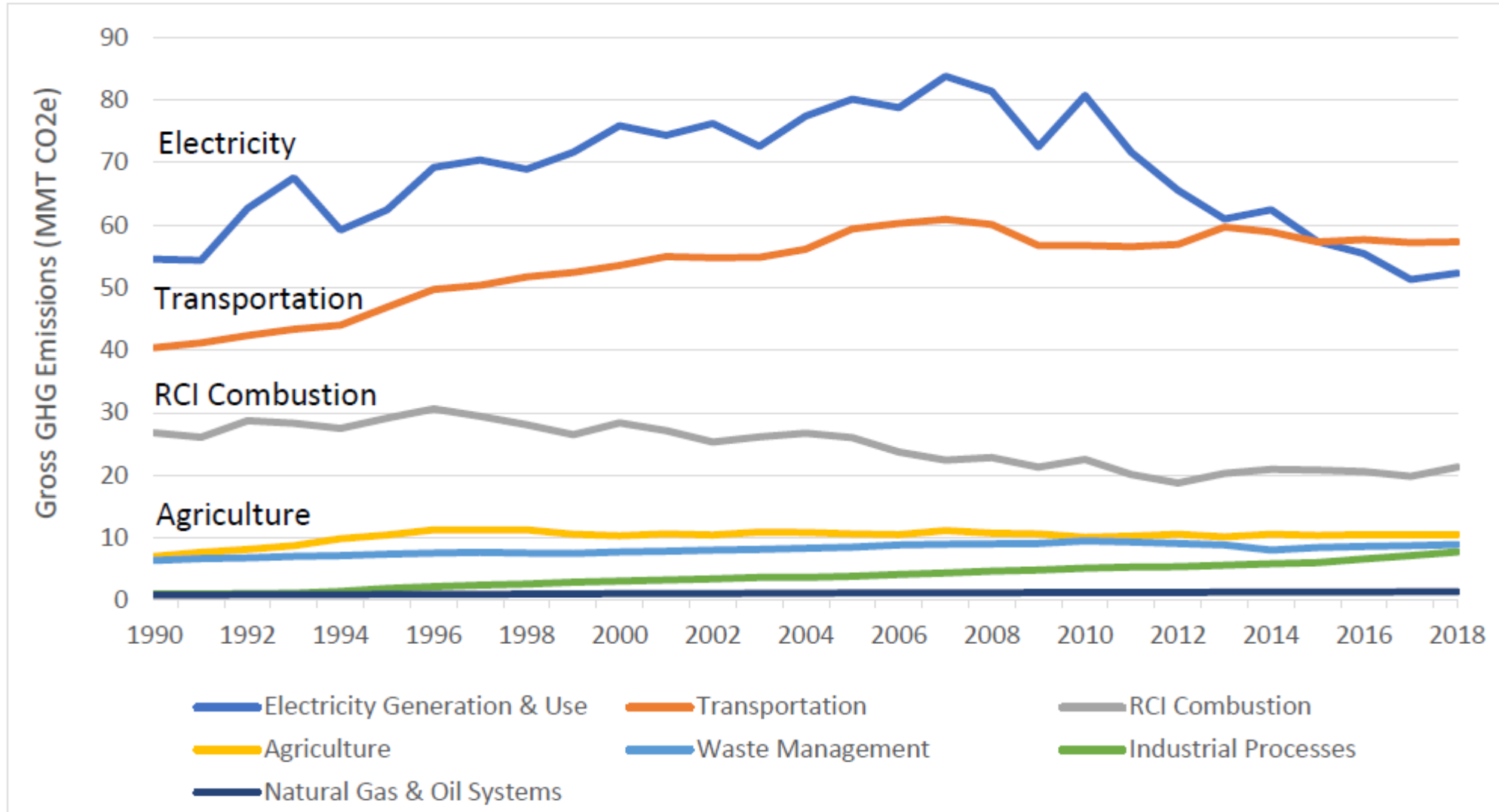
2005 - 2018 Change in Gross GHG Emissions

- ▼ **34.7%** — Electric Generation
- ▼ **16.5%** — Residential
- ▼ **3.5%** — Transportation
- ▲ **1.7%** — Industry*
- ▲ **3.3%** — Commercial

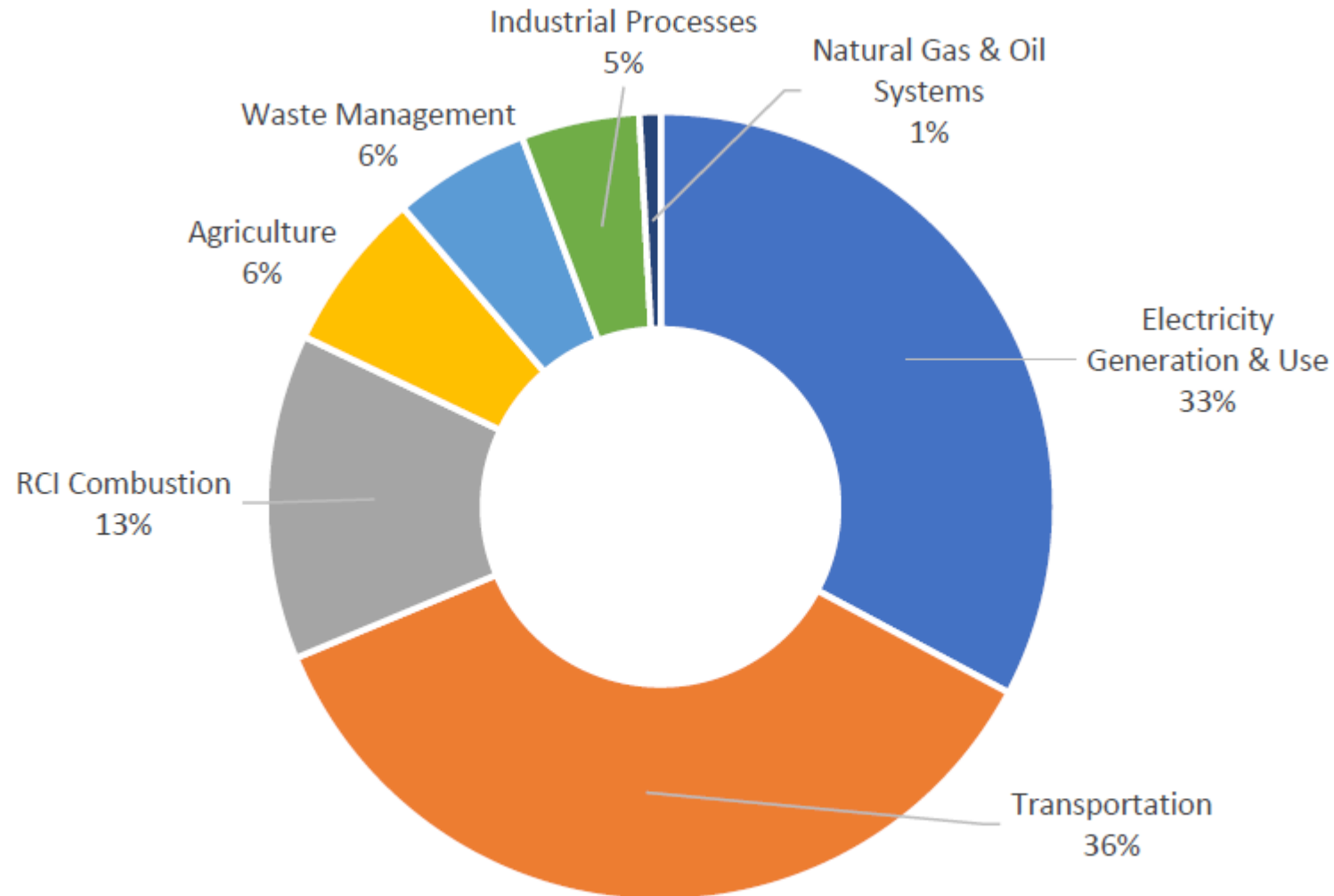
Statewide Net GHG Reductions (2005-2018)

↓ **23.0%**

NC Gross GHG Emissions Trends by Source Sector, 1990-2018



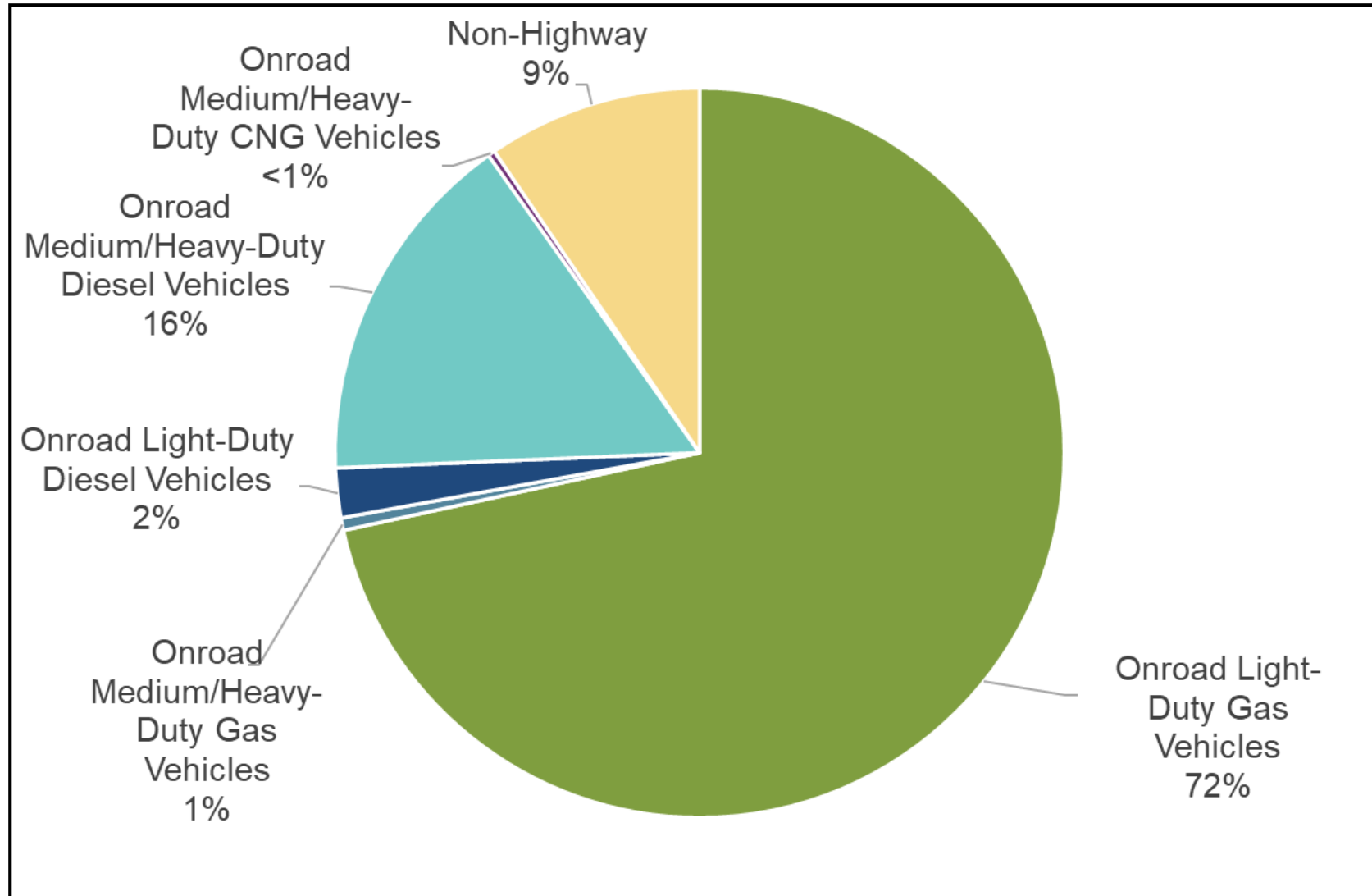
Percentage of NC 2018 GHG Emissions by Source Sector



2018 NC Gross Emissions: 159.48 MMT CO₂e

North Carolina Greenhouse Gas
Emissions Inventory January 2022

Distribution of 2018 NC Transportation GHG Emissions



NC GHG Inventory-Key Take Aways

- Between 2005 and 2018, North Carolina reduced gross GHG emissions by 16% and net GHG emissions by 23%, while North Carolina's population and real Gross State Product grew by 19% and 24%, respectively.
- By 2030, net GHG emissions are forecast to decrease by 39% relative to 2005 baseline emissions, with the inclusion of the electricity sector reductions mandated by House Bill 951.
- The inventory's emission projections do not include all reductions expected as a result of policies enacted after 2020.
- The Transportation sector 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.
- Forests, natural lands, and agricultural lands sequestered an estimated 26% of the state's gross GHG emissions in 2018.

NC'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 CO₂ 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 CO₂e 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 CO₂, 5% reduction in CH₄, and 5% reduction in N₂O emissions in 2030 relative to the existing light-duty vehicle standards.

Residential, Commercial, 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.
- 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).

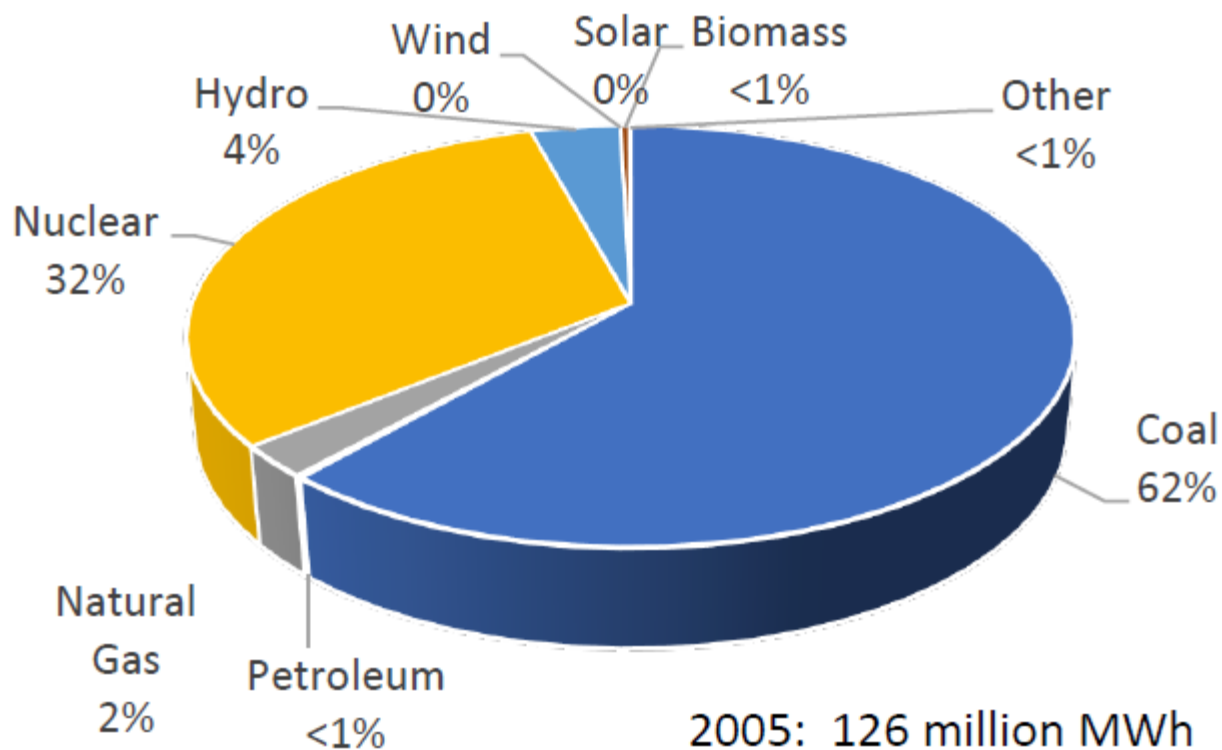
Land Use, Land Use Change, and Forestry

- 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 CO₂ 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).

Table 2-4: Comparison of Gross GHG Emissions for North Carolina and U.S., 2005-2018

Region	2005 GHG Emissions (MMT CO₂e)	2018 GHG Emissions (MMT CO₂e)	Percent Reduction 2005 to 2018	North Carolina Percentage of U.S. GHG Emissions in 2018
North Carolina	190	159	16%	2.4%
U.S.	7,392	6,677	10%	

2005 NC Sources of Electric Power



2018 NC Sources of Electric Power

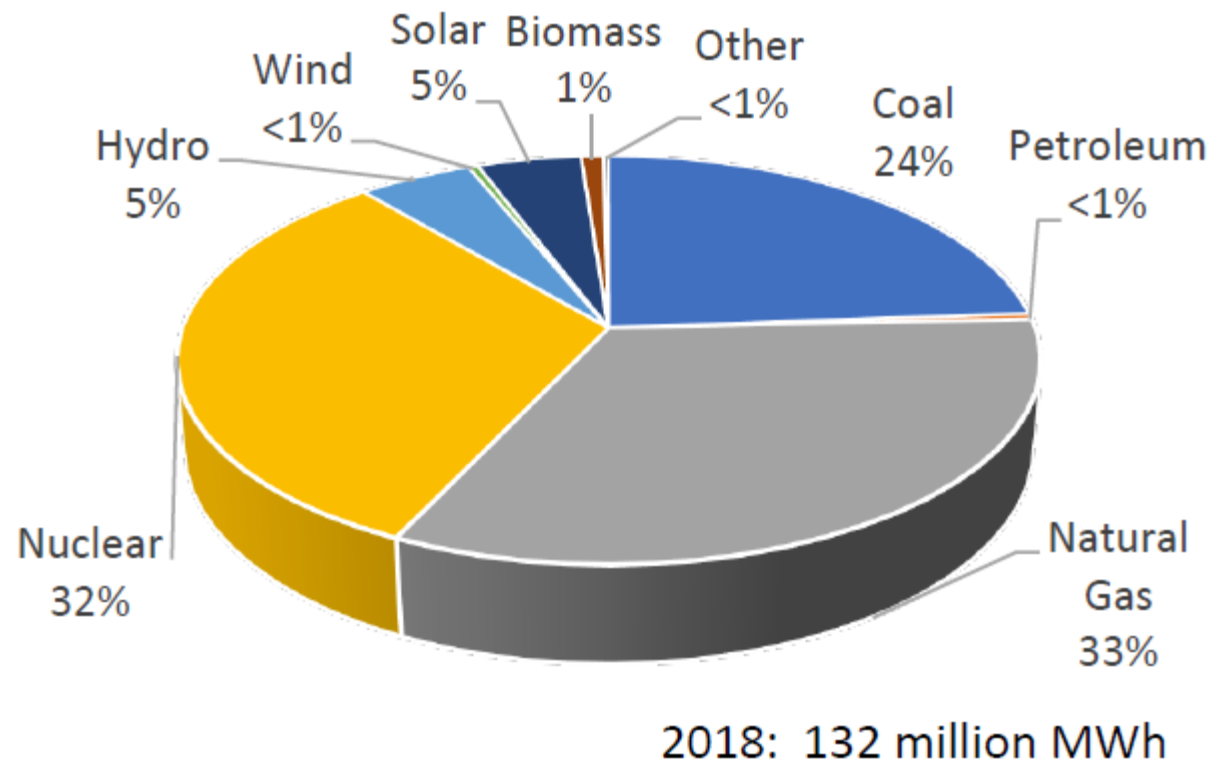


Figure 2-10: Changes in North Carolina Sources of Electricity Generation, 2005-2018

State Executive Orders

- EO-80 (October 29, 2018)
 - 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.
- EO-218 (June 9, 2021)
 - Develop 2.8 gigawatts (GW) of offshore wind energy resources off the North Carolina coast by 2030 and 8.0 GW by 2040.
- EO-246 (June 7, 2022)
 - 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.

Carbon Plan for NC

- 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 CO2 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.
- NCUC required to develop a plan with electric public utilities including stakeholder input by December 31, 2022
 - “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").”
 - Plan will be reviewed every 2 years and adjusted as necessary per the commission and electric public utilities (Duke Energy Progress and Duke Energy Carolinas)

NC Clean Transportation Plan and Bipartisan Infrastructure Law (BIL)

- Clean Transportation Plan required by EO-246
 - ZEV plan 2.0
 - M/HD ZEV Plan
 - Fleet Transition Plan
 - Vehicle Miles Traveled
 - Clean Transportation Infrastructure
- Bipartisan Infrastructure Law (BIL)
 - \$7.5 billion in funding to build out a national network of EV charging and alt fuel infrastructure
 - NC to receive \$109 million over five years
 - \$2.5 billion in competitive grant funding
 - \$3.9 billion in new investment to modernize transit
 - \$250 million for reduction of truck emissions at ports
 - \$5 billion for Clean School Bus program

More Information

NC Greenhouse Gas Emissions Inventory:

[https://deq.nc.gov/energy-climate/climate-change/greenhouse-gas-inventory\](https://deq.nc.gov/energy-climate/climate-change/greenhouse-gas-inventory)

Climate Change & Clean Transportation and the NC DOT Clean Transportation Plan:

<https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/default.aspx>

NC DEQ Climate Change:

<https://deq.nc.gov/energy-climate/climate-change>