North Carolina Greenhouse Gas Emissions Inventory

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North Carolina Greenhouse Gas (GHG) Emissions Inventory

- Purpose
  - Starting Point for Planning
  - Executive Order (EO) 80
- Comprehensive/Economy-Wide
- Identifies Key Sectors/Potential for Reductions
- GHG Pollutants
  - Carbon Dioxide (CO_2)
  - Methane (CH_4)
  - Nitrous Oxide (N_2O)
  - Sulfur Hexafluoride (SF_6)
  - Perfluorocarbons (PFCs)
  - Hydrofluorocarbons (HFCs)

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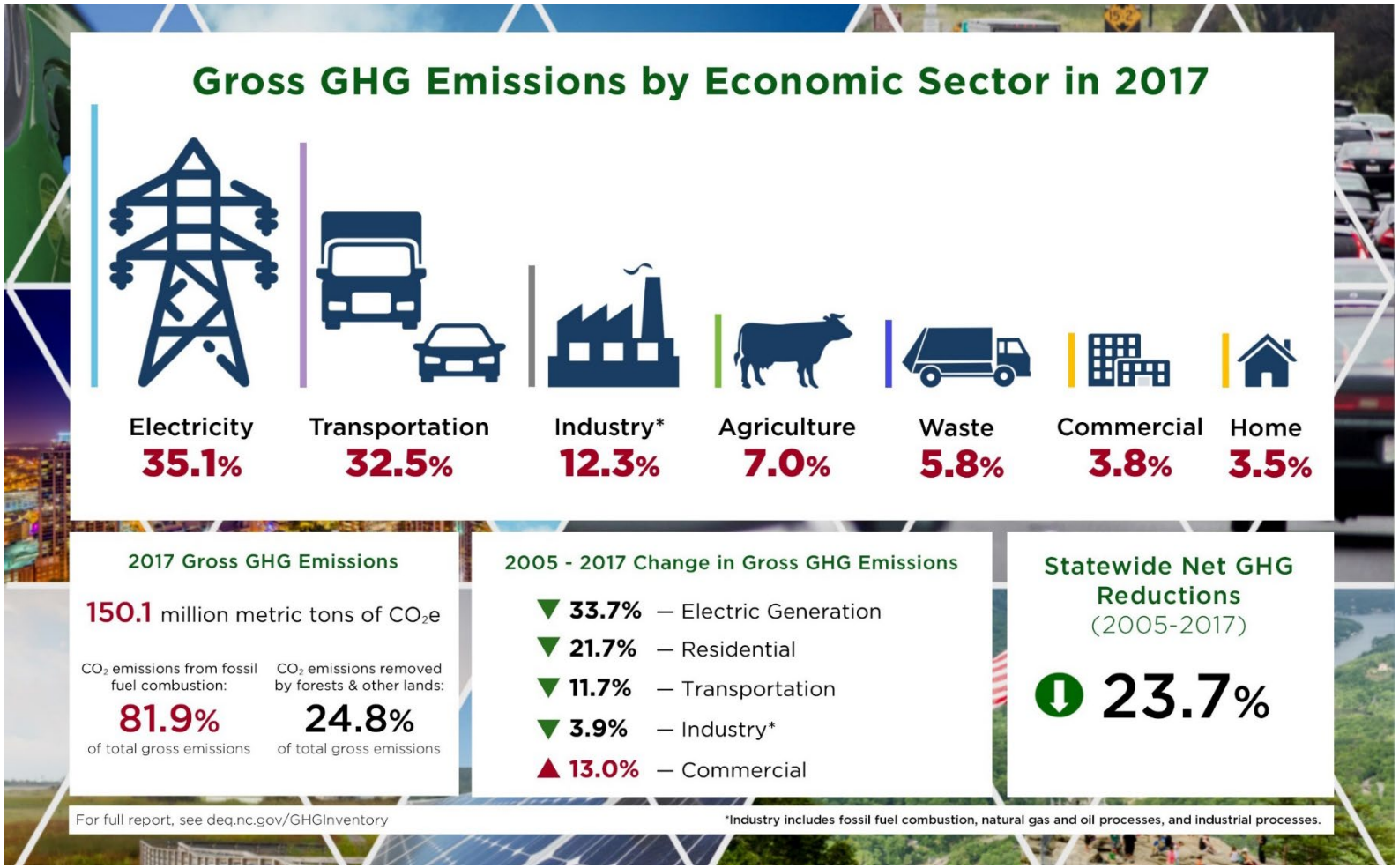
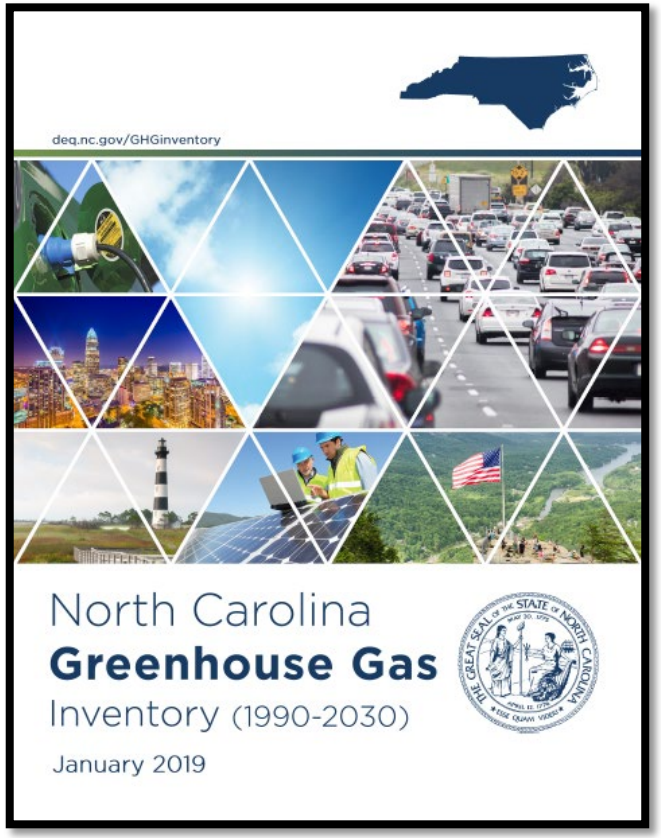
GHG Inventory Overview

Quick Facts: 2005 - 2017





Full Report

https://files.nc.gov/ncdeq/climate-change/ghg-inventory/GHG-Inventory-Report-FINAL.pdf

North Carolina's GHG Emissions

million metric tons carbon dioxide equivalent ($MMTCO_2e$)

Sector	2005	2017	2025
Electricity Use	79.37	52.60	40.59
Transportation	55.19	48.72	41.00
Residential/Commercial/Industrial Combustion*	26.02	20.92	23.26
Agriculture	10.65	10.53	10.47
Waste Management	8.52	8.77	10.17
Industrial Processes	3.83	7.18	11.31
Natural Gas and Oil Systems	1.17	1.35	1.47
Gross Emissions	**184.74**	**150.08**	**138.28**
Net Carbon Sinks - LULUCF**	-32.66	-34.03	-34.03
Net Emissions	**152.08**	**116.06**	**104.25**
Estimated Reduction in Net Emissions from 2005		23.7%	31.4%

Note: Totals may not equal exact sum of subtotals shown in this table due to independent rounding.
* Emissions associated with on-site fuel combustion activities in the Residential, Commercial, and Industrial sectors.
** Land Use, Land Use Changes and Forestry

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North Carolina's Ranking Nationally

	Ranking
Total Energy Production (trillion Btu)	29th
Total Net Electricity Generation (thousand MWh)	6th
Total Carbon Dioxide Emissions (million metric tons)	14th
Total Energy Consumed per Capita (million Btu)	38th
Total Energy Expenditures per Capita, ($)	45th
Average Retail Price of Electricity to Residential Sector, January 2018 (cents/kWh)	42nd

https://www.eia.gov/state/rankings/?sid= #/series/31

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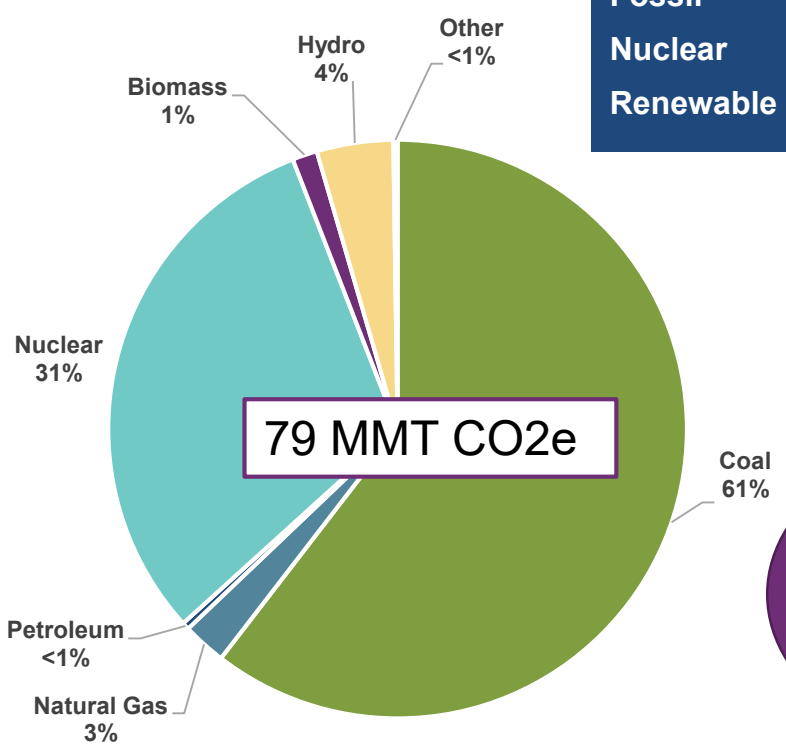
North Carolina Electricity Generation By Source Type (2005 & 2017)

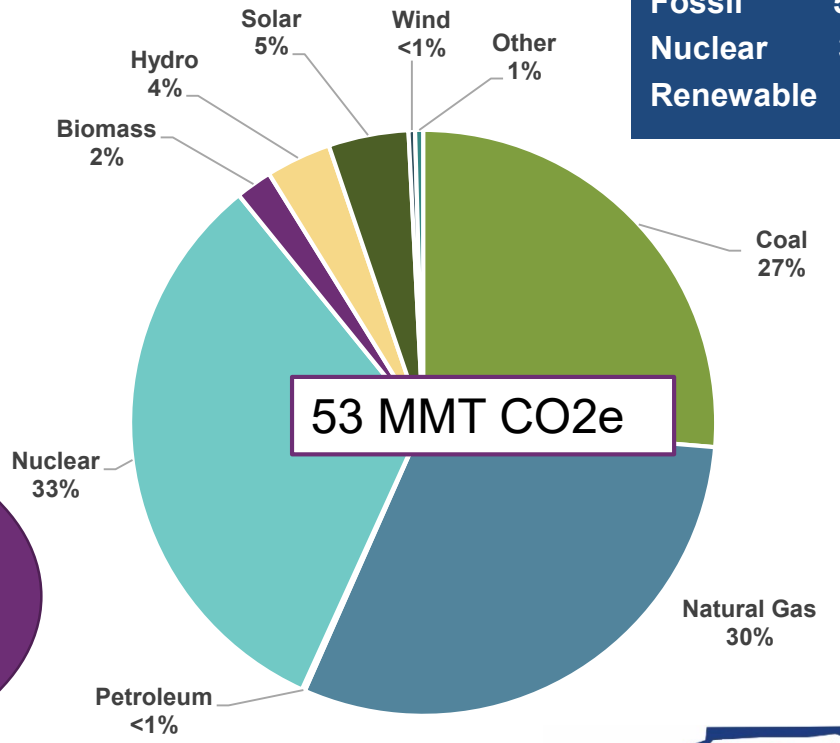
2005 Electricity Generation

Fossil	64%
Nuclear	31%
Renewable	4%



2017 Electricity Generation

Fossil	56%
Nuclear	32%
Renewable	9%



NC Reductions

34% GHG

90% SO2

37% NOx

NC Imports about 10% of its electricity each year

Source: NC GHG Inventory, 2019

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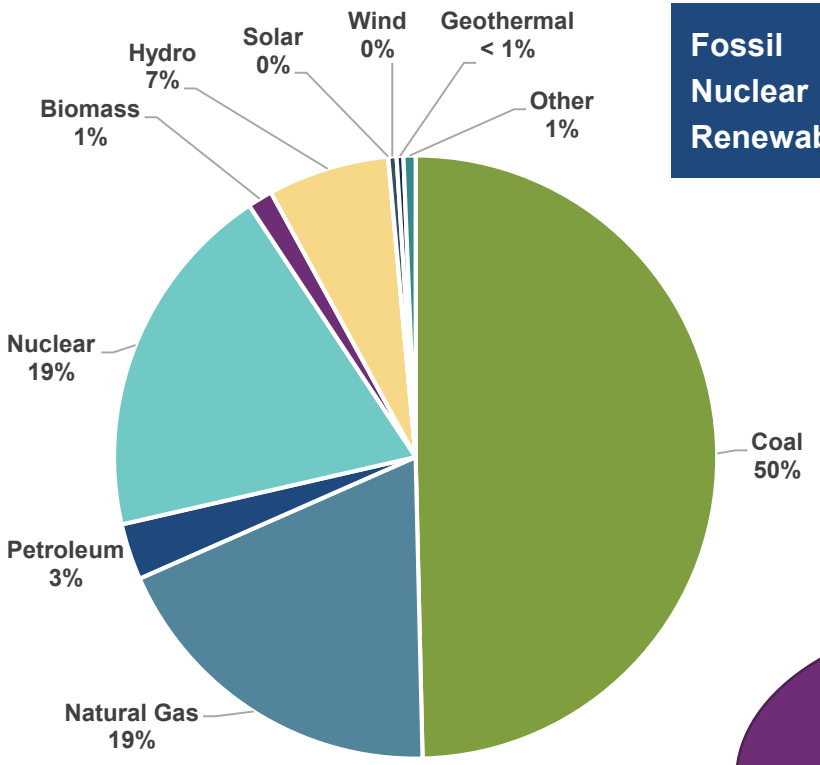
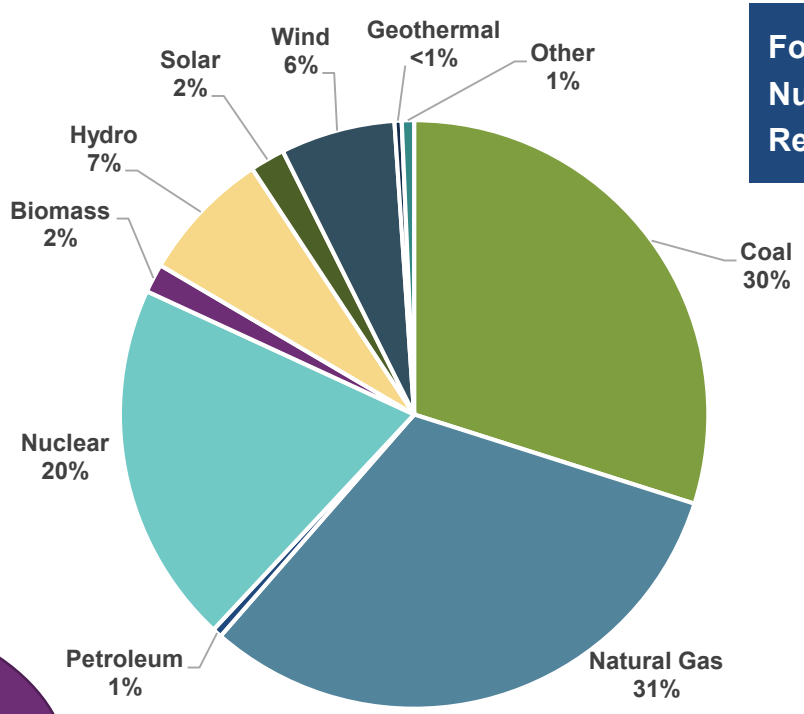
U.S. Electricity Generation By Source Type (2005 & 2017)

U.S. 2005 Electricity Generation



Fossil	71%
Nuclear	19%
Renewable	7%

U.S. 2017 Electricity Generation



Fossil	62%
Nuclear	20%
Renewable	16%

US Reductions

23% GHG

80% SO2

60% NOx

Source: EIA Electricity Data Browser

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Avoided Emissions from NC REPS

Parameter	2009	2011	2013	2015	2017	with HB 589*
RE Net Generation (MWh)	5,230,196	4,061,146	7,283,230	6,787,674	10,970,000	15,500,000
EE Avoided Generation (MWh)	80,008	1,134,040	2,119,916	6,218,251	4,797,944	4,797,944
Avoided GHGs (MMT CO2e)	2.80	2.80	4.53	5.83	5.79	7.47
Avoided NOx (tons)	1,931	2,189	3,924	4,474	4,399	5,670
Avoided SO2 (tons)	5,231	4,953	4,902	4,474	3,508	4,522

10% of Electricity Sector GHG

* Estimate of generation and avoided emissions resulting from full implementation of HB 589

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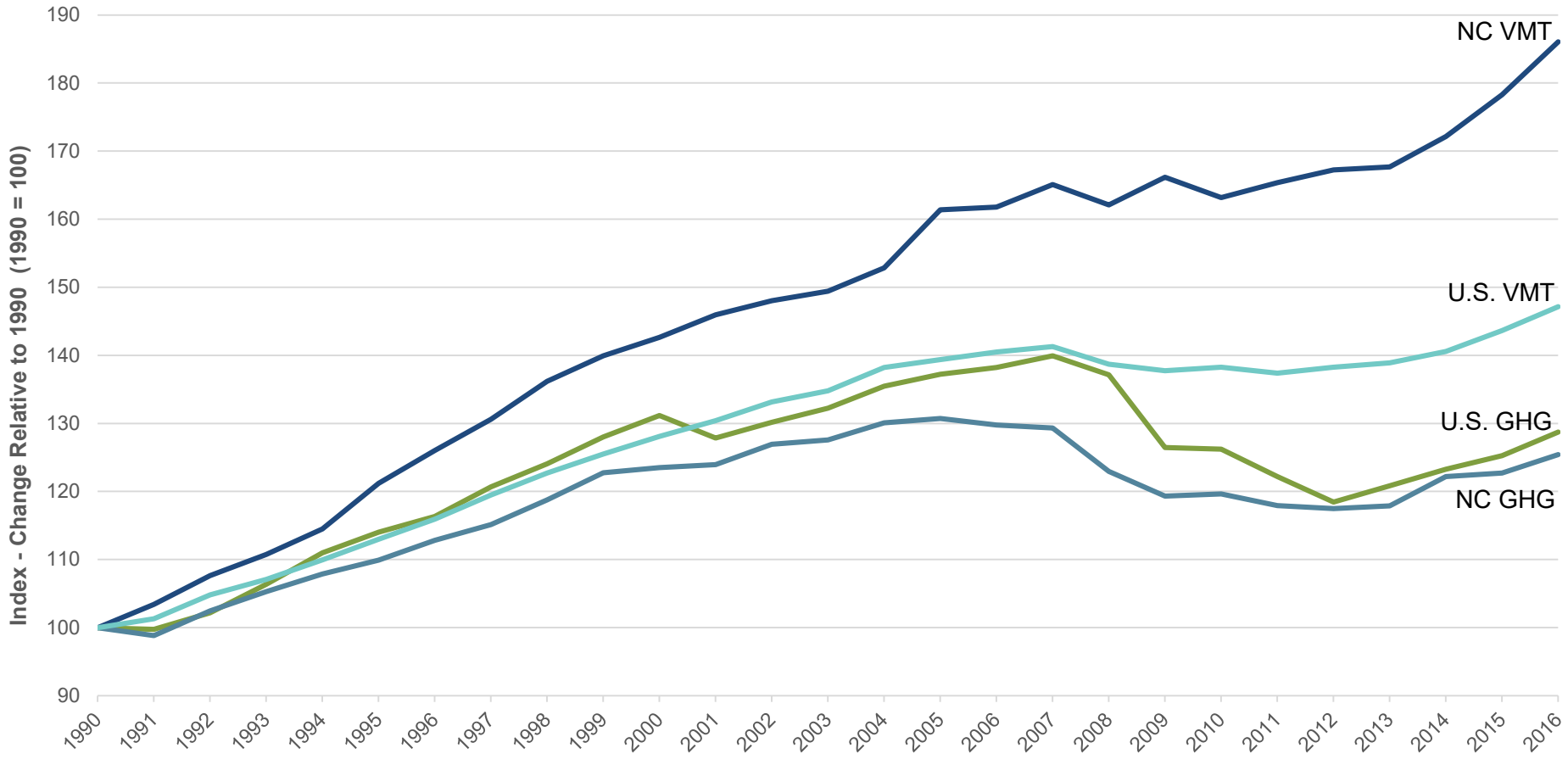
U.S. and NC Gasoline/Diesel Vehicle Activity & Emissions



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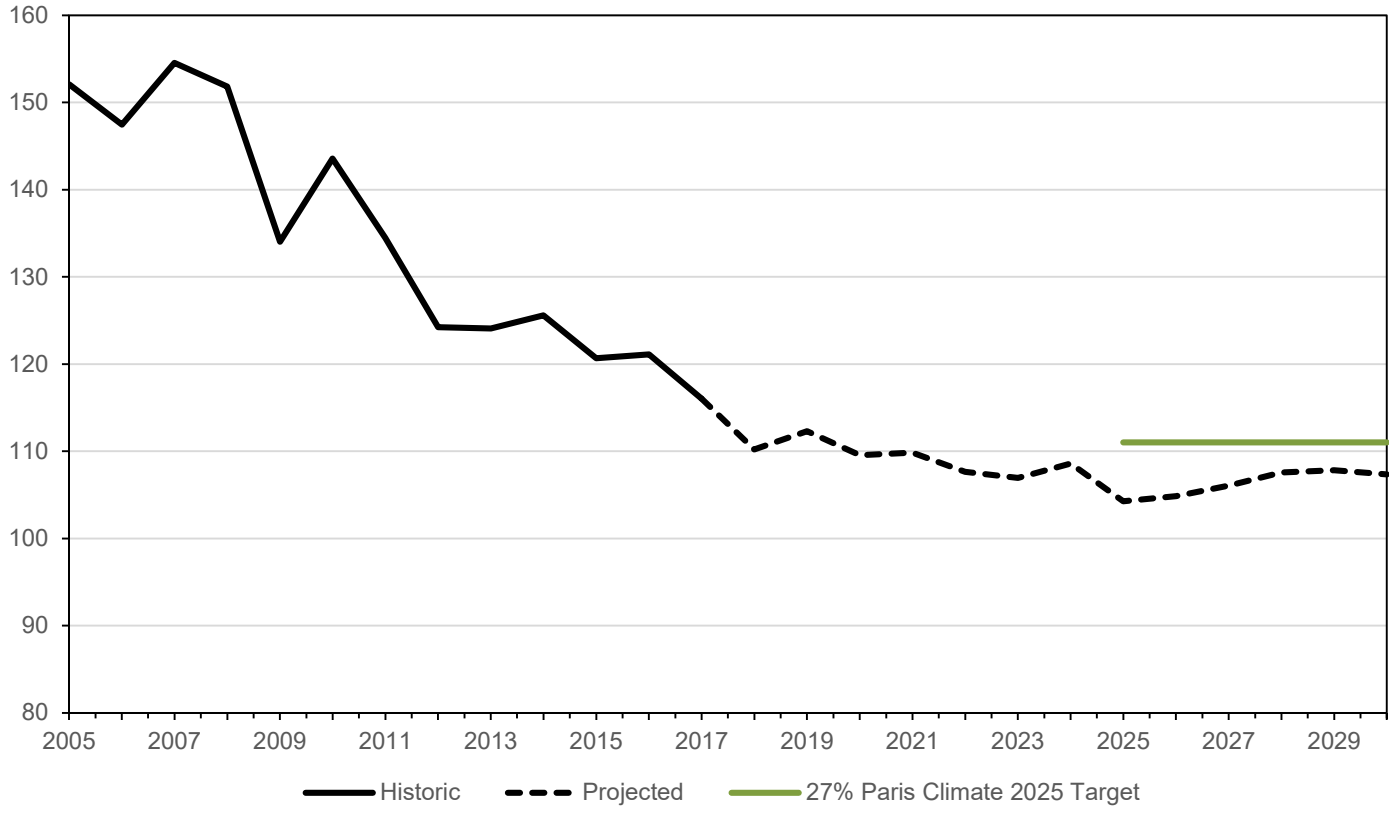
Net GHG Emissions Trends in North Carolina, 2005-2030



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Land Use, Land Use Changes, and Forests

Forest Stocks and Area	1990	1995	2000	2005	2010	2015	2017	Percent Change 1990-2017
Total Forest Area (Million Acres)	18.51	18.58	18.64	18.71	18.78	18.84	18.87	**2%**
Aboveground Biomass	365.3	392.0	417.1	442.7	469.9	498.6	510.1	
Belowground Biomass	72.7	78.4	83.7	89.1	94.8	100.7	103.1	
Dead Wood	65.3	65.6	65.9	66.2	66.5	66.8	66.9	
Litter	45.9	44.9	44.0	43.1	42.3	41.6	41.3	
Soil Organic Carbon	723.3	722.5	721.8	721.2	720.7	720.4	720.3	
Total Forest Carbon Stocks (MMT Carbon)	**1,272.5**	**1,303.4**	**1,332.5**	**1,362.2**	**1,394.2**	**1,428.2**	**1,441.8**	**13%**
Forest Carbon Flux (MMT CO2e)	-35.3	-35.1	-34.1	-35.2	-37.3	-37.9	-37.8	7%
Net Sources & Sinks (MMT CO2e)*	-35.64	-35.24	-34.33	-32.66	-35.30	-34.16	**-34.03**	

*Includes forest carbon, landfilled biomass, agricultural soil carbon, liming and fertilization, and fires

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