



Governor Cooper's Executive Order No. 80

Electrify NC

Beneficial Electrification Summit

May 29, 2019

Sushma Masemore, P.E.



Executive Order 80

NC's Commitment to Address Climate Change and Transition to a Clean Energy Economy

- By 2025
 - Reduce NC greenhouse gas emissions 40%
 - Increase ZEVs to 80,000
 - Reduce energy consumption per sq.ft. in state buildings by 40% from 2002-2003 levels
- DEQ to develop a NC Clean Energy Plan – facilitate a modern electric grid, collaborate with stakeholders, and increase clean energy, energy efficiency, & clean transportation
- DOT to develop a NC ZEV Plan – increase number of registered ZEV, establish interstate and intrastate ZEV corridors, and increase ZEV infrastructure builtout.
- DOC to support clean energy businesses and develop clean energy workforce assessments

For additional directives to cabinet agencies, see

<https://governor.nc.gov/documents/executive-order-no-80-north-carolinas-commitment-address-climate-change-and-transition>

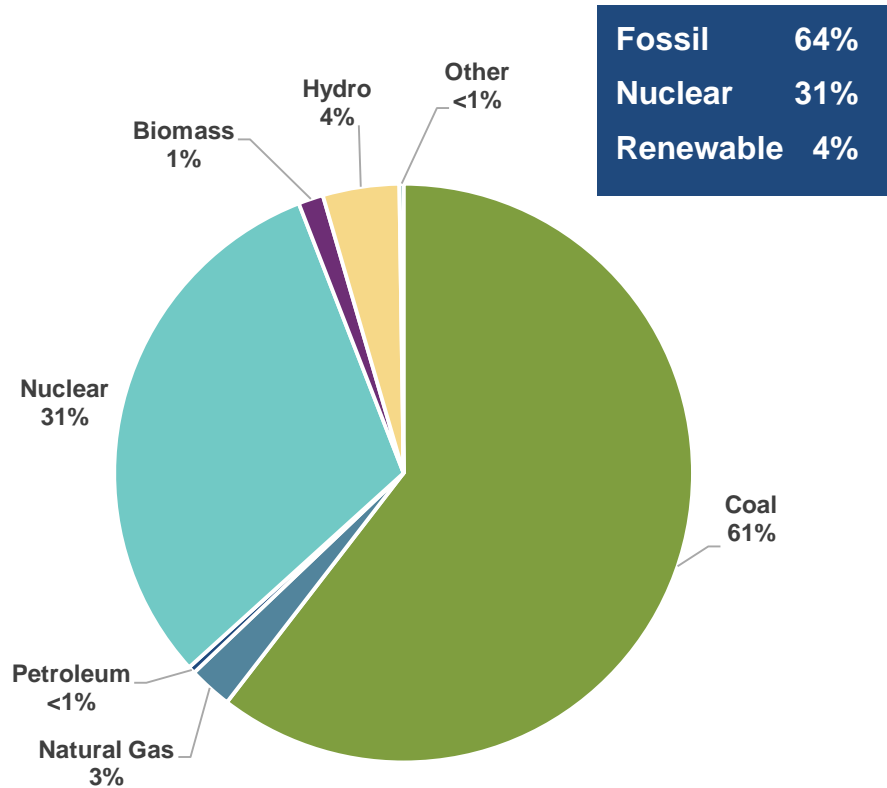


Electricity Sector Profile

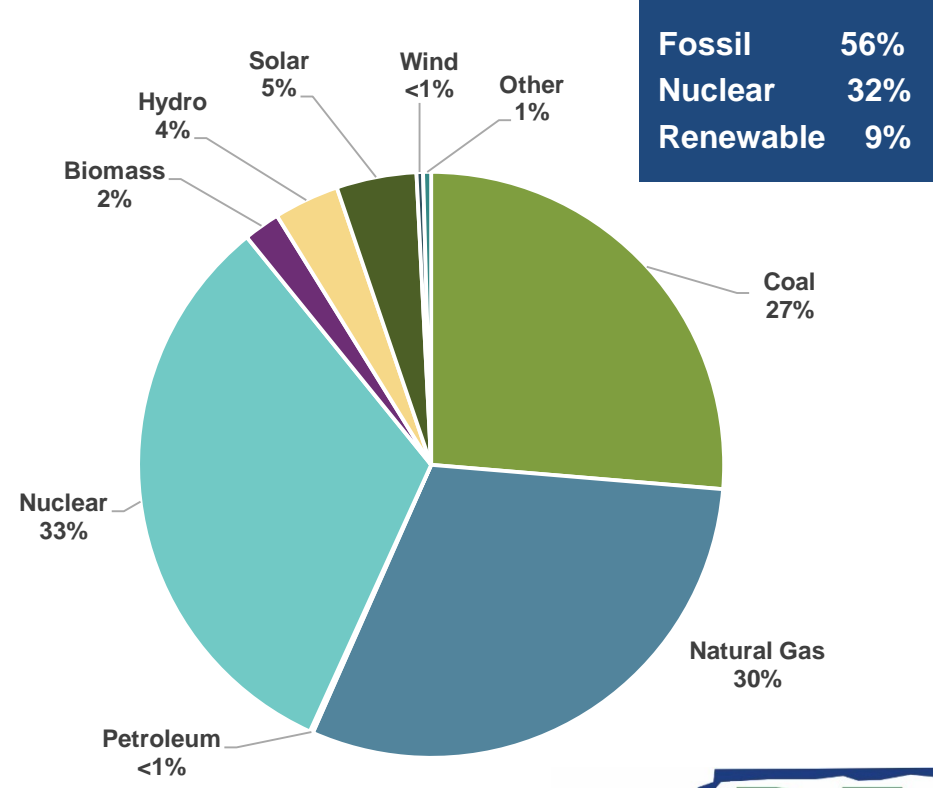


North Carolina Electricity Generation By Source Type (2005 & 2017)

**2005
Electricity Generation**



**2017
Electricity Generation**



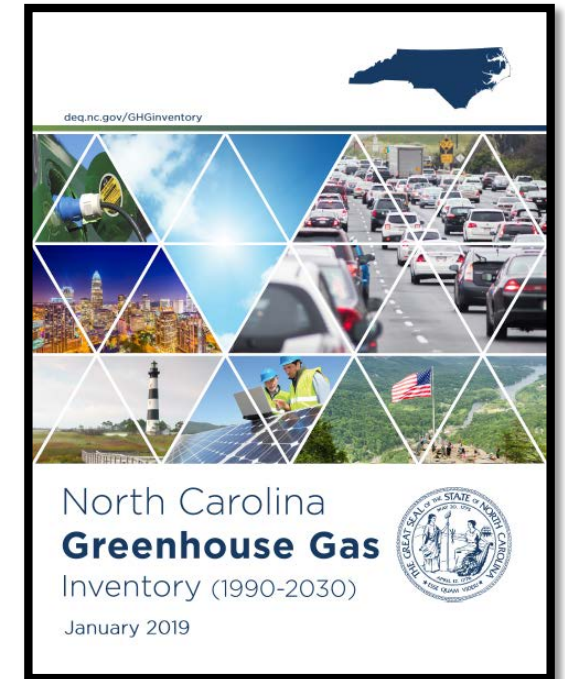
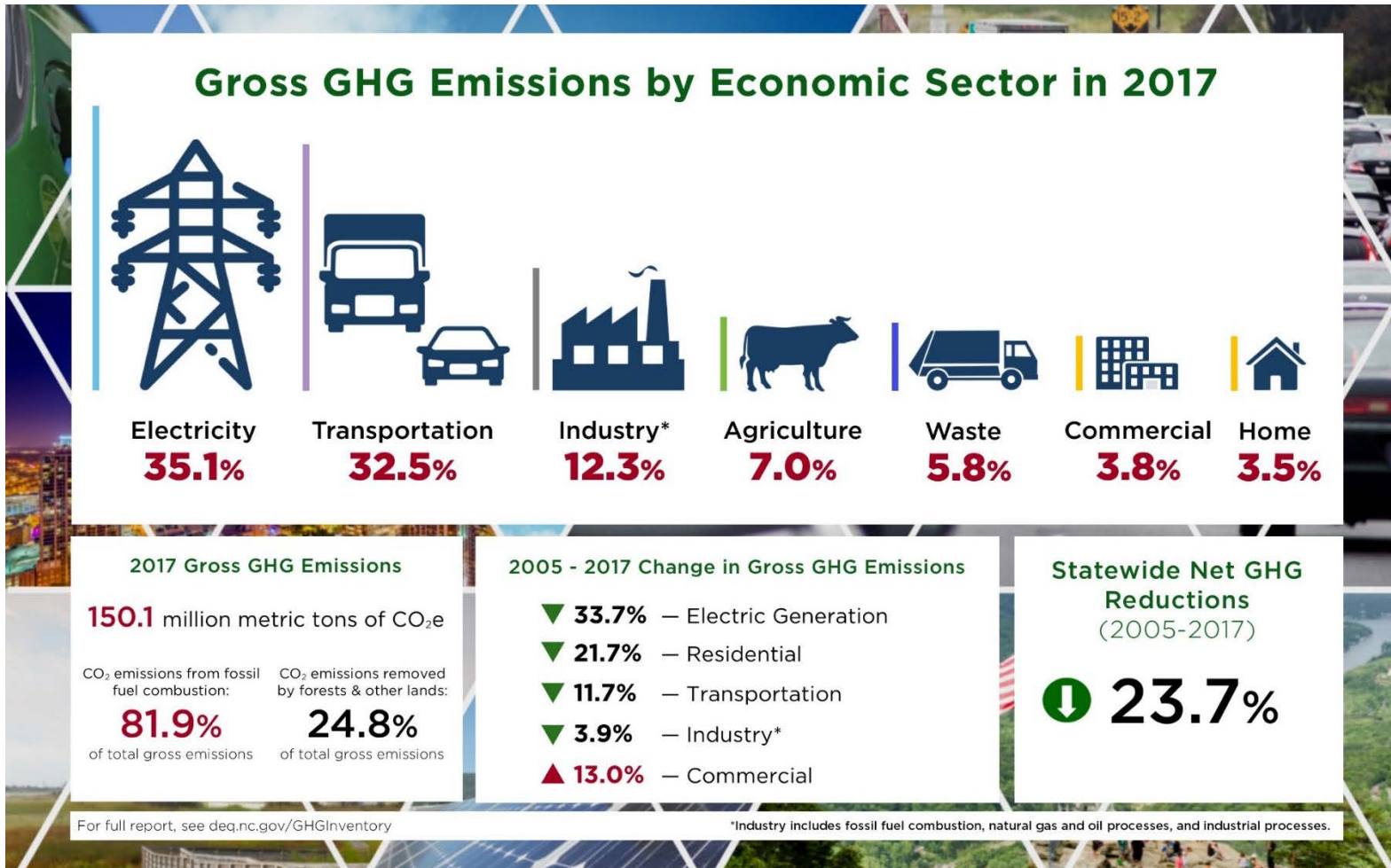
NC Imports about 10% of its electricity each year

Source: NC GHG Inventory, 2019



NC Greenhouse Gas (GHG) Emissions

Quick Facts: 2005 - 2017



Full Report

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

By 2025, current path reduces emissions by **31%**. Much of the reduction is a result of coal to gas switch, with help from REPS and H589. Need to get to 40% by 2025 for EO 80.

Avoided Generation & Emissions from NC REPS

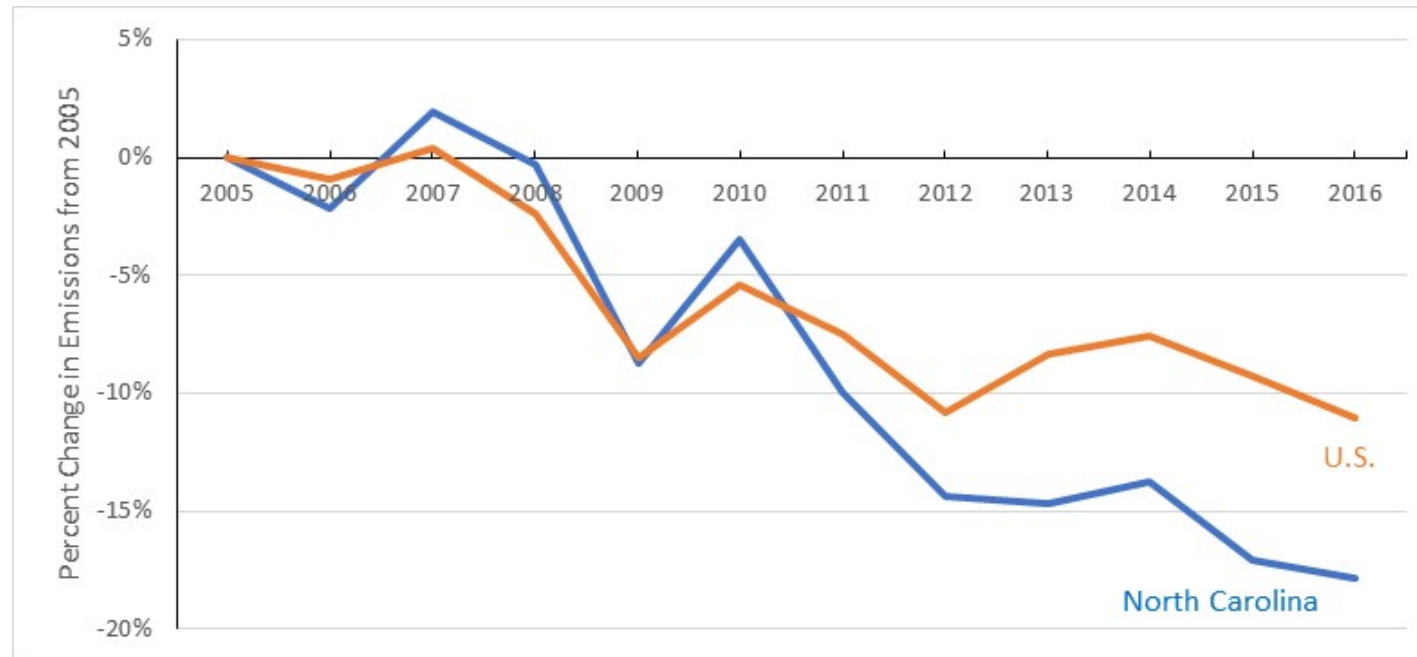
Parameter	2009	2011	2013	2015	2017	with HB 589*
RE Net Generation (MWh)	5,230,196	4,061,146	7,283,230	6,787,674	10,970,000	15,500,000
EE Avoided Generation (MWh)	80,008	1,134,040	2,119,916	6,218,251	4,797,944	4,797,944
Avoided GHGs (MMT CO ₂ e)	2.80	2.80	4.53	5.83	5.79	7.47

10% of Electricity Sector GHG

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



Comparison of NC GHG Emissions with National Trends (% Relative to 2005)



North Carolina's GHG Emissions

million metric tons carbon dioxide equivalent (MMTCO₂e)

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%

Opportunities for Efficient Energy Conversion?

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



GHG Emissions from Total Energy Use by the Residential, Commercial and Industrial (RCI) Sector (MMT CO₂e)

	2005	2017	Changes from 2005-2017
Industrial Total Energy Use	36.34	20.14	-45%
Fuel Combustion	17.72	9.93	-44%
Electricity Use	18.62	10.21	-45%
Commercial Total Energy Use	32.37	25.07	-23%
Fuel Combustion	5.06	5.72	13%
Electricity Use	27.31	19.36	-29%
Residential Total Energy Use	40.19	28.31	-30%
Fuel Combustion	6.75	5.28	-22%
Electricity Use	33.44	23.03	-31%
Total RCI Fuel Combustion	29.52	20.92	-29%
Total RCI Electricity Use	79.37	52.60	-34%
Total Energy Use	108.89	73.52	-32%

Opportunities for Efficient Energy Conversion?

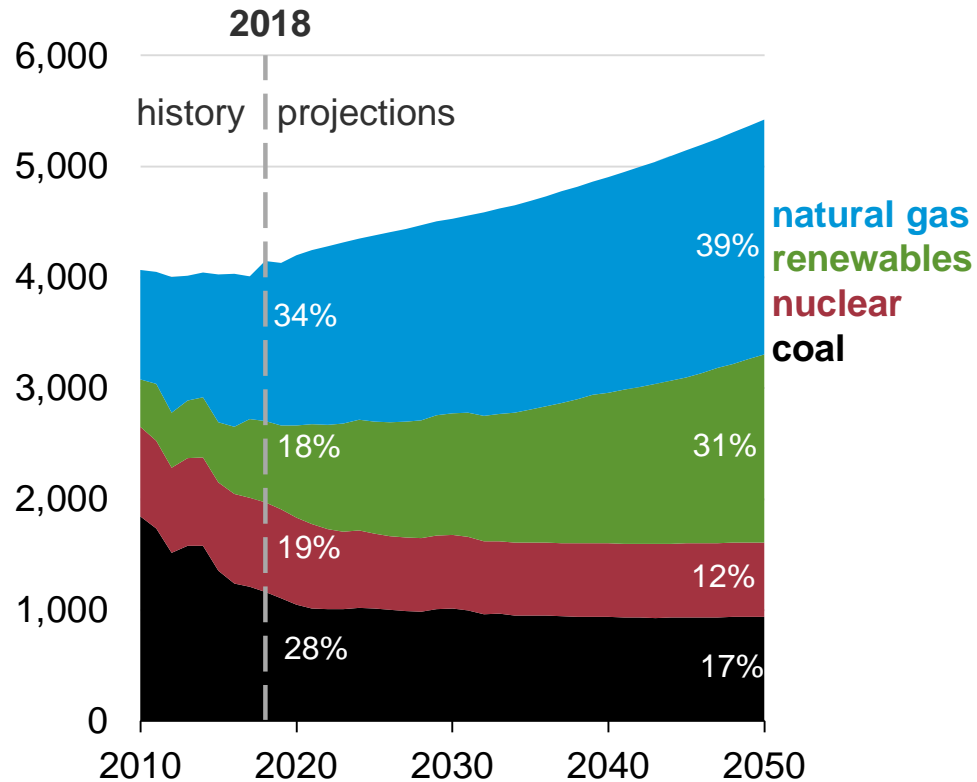




Electricity generation from *natural gas and renewables increases*, and the shares of *nuclear and coal* generation decrease—

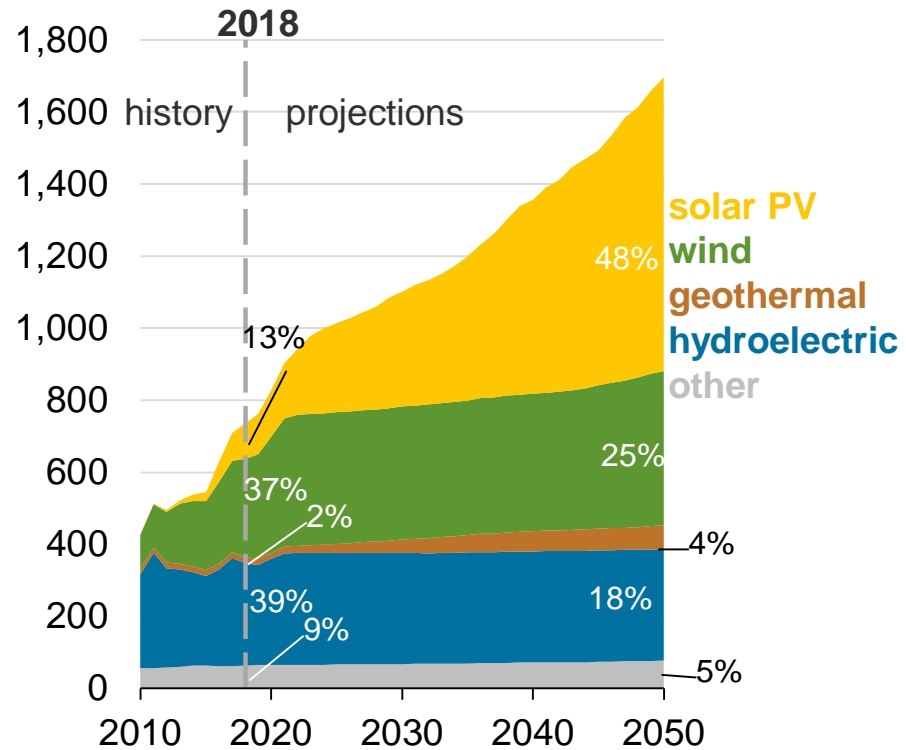
**Electricity generation from selected fuels
(Reference case)**

billion kilowatthours



**Renewable electricity generation, including
end-use (Reference case)**

billion kilowatthours

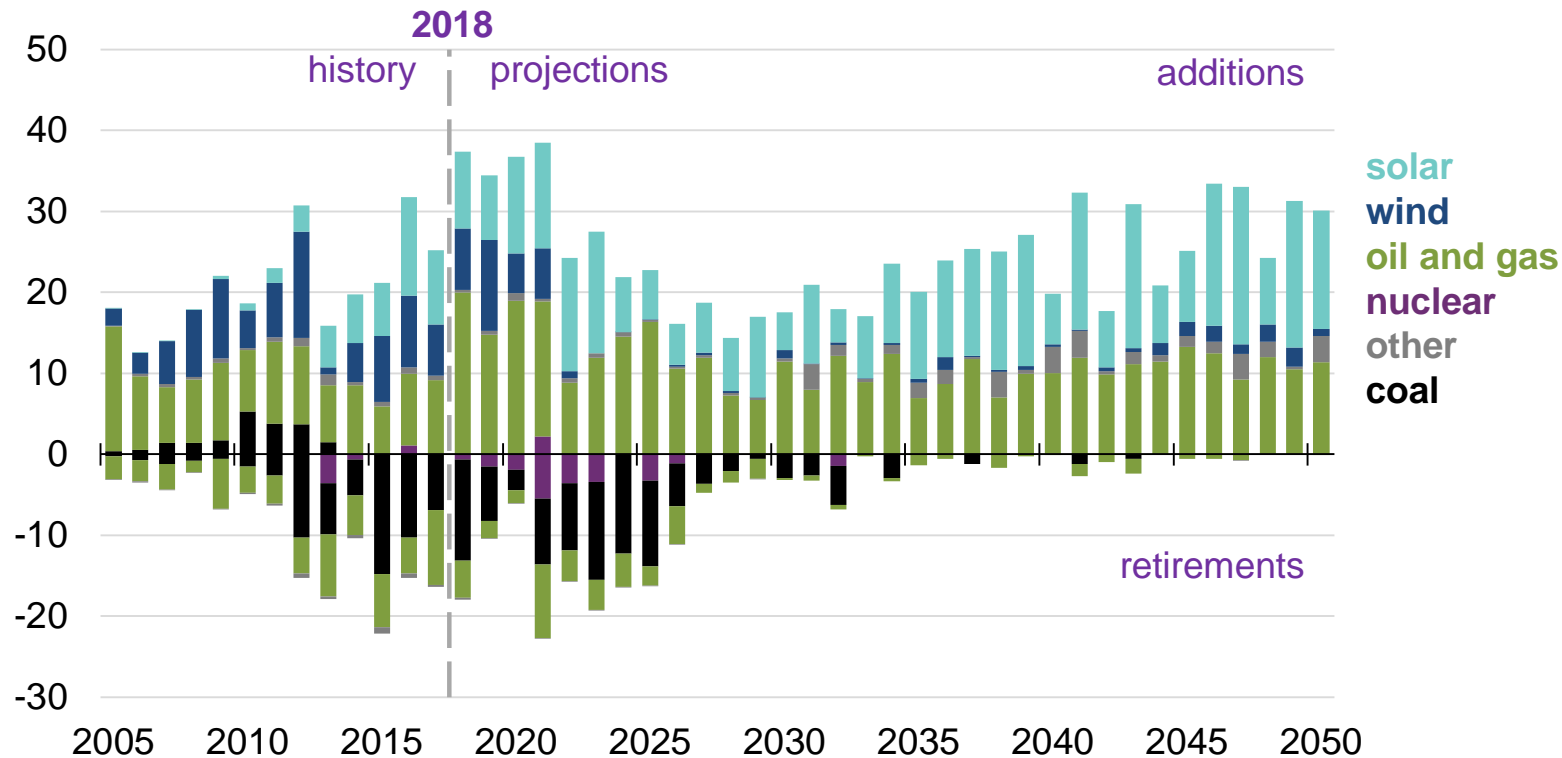


AEO 2019
www.eia.gov/aeo



Expected new generating capacity will be met by *renewables* and *natural gas*—

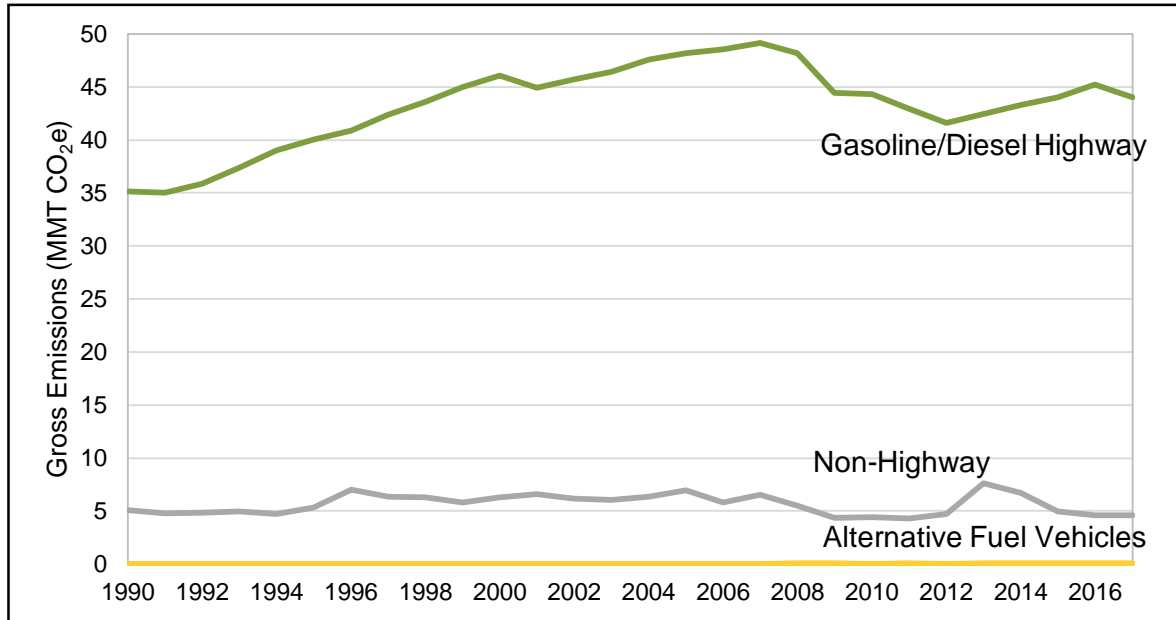
Annual electricity generating capacity additions and retirements (Reference case)
gigawatts



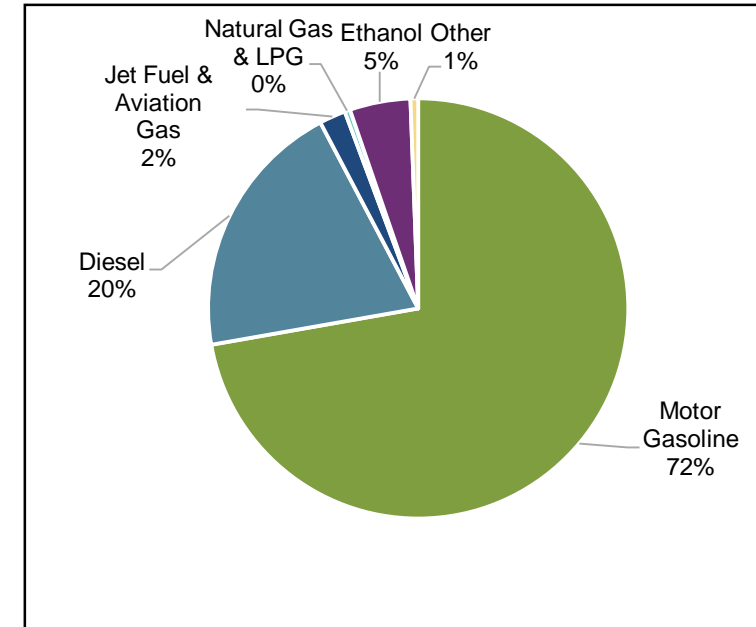
Transportation Sector Profile



NC's Transportation Fuels



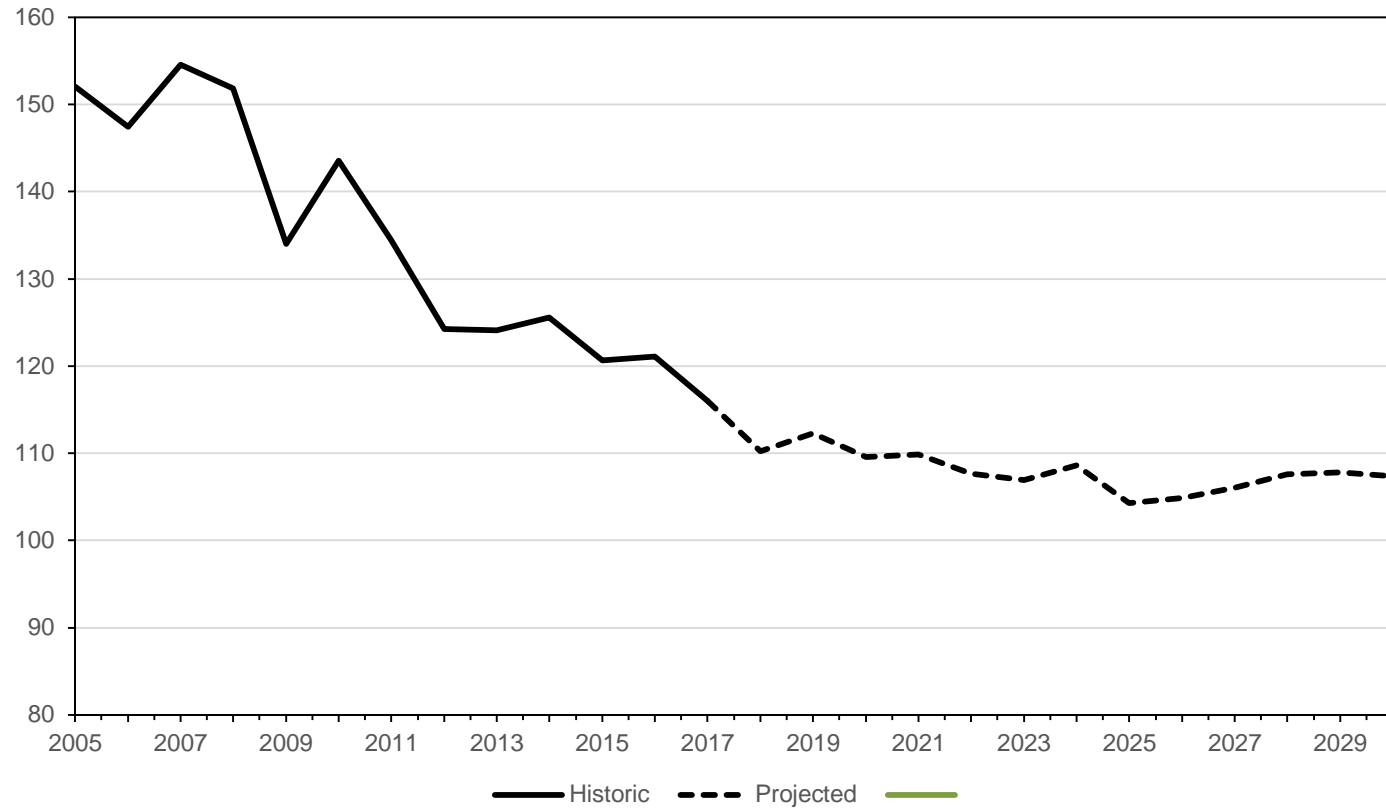
Transportation Sector GHG Trends in North Carolina, 1990-2017



2016 Fossil Fuel Use in the Transportation Sector



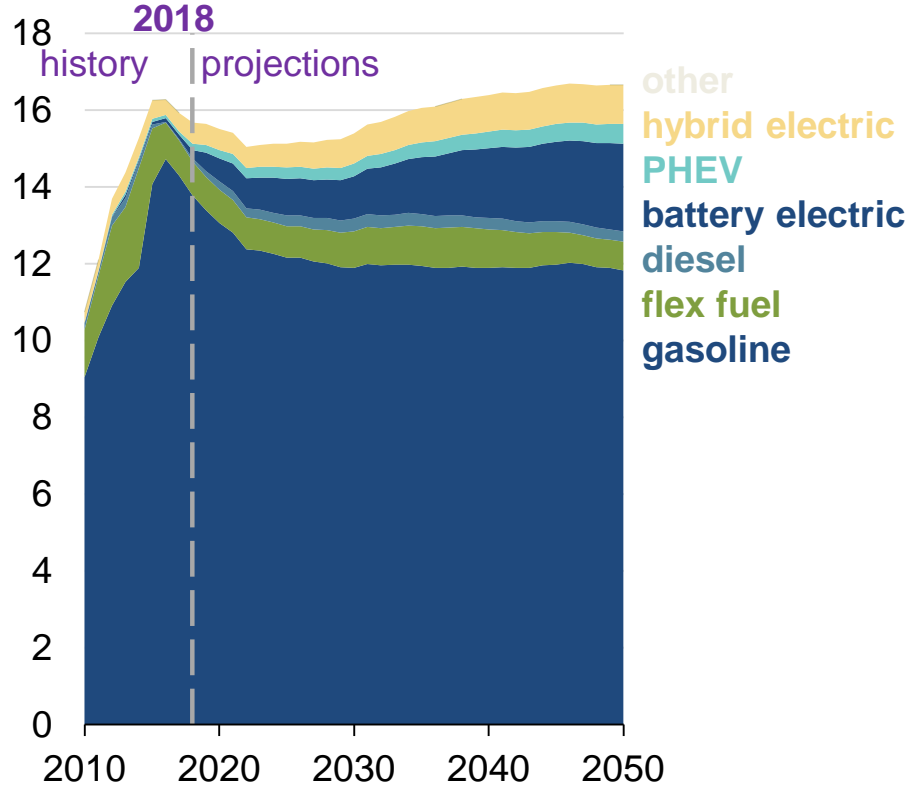
NC's GHG Emissions Trends, 2005-2030



Alternative and electric vehicles gain market share in the Reference case—

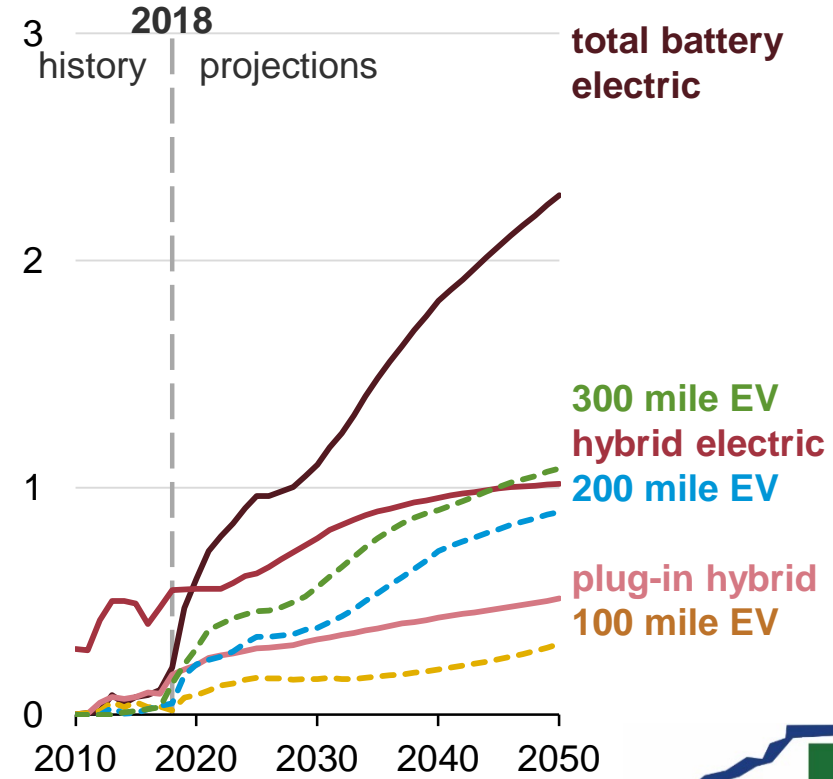
Light-duty vehicle sales by fuel type (Reference case)

millions of vehicles

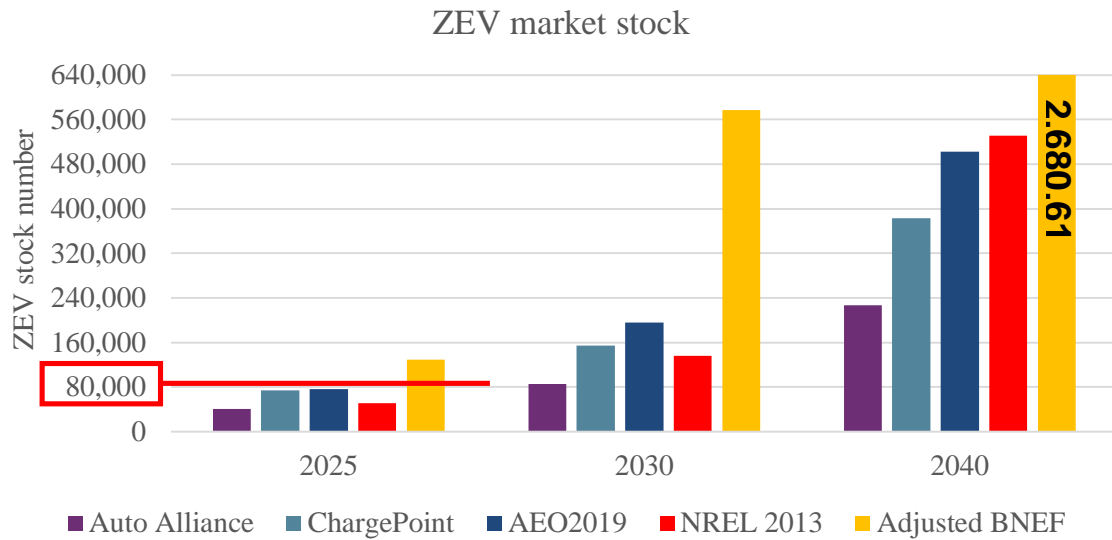


New vehicle sales of battery powered vehicles (Reference case)

millions of vehicles



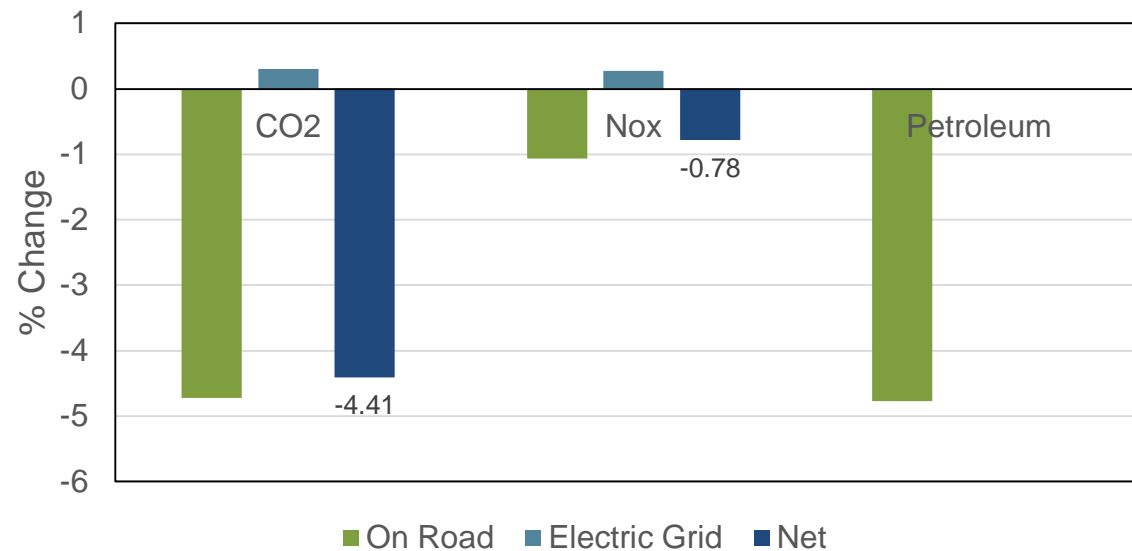
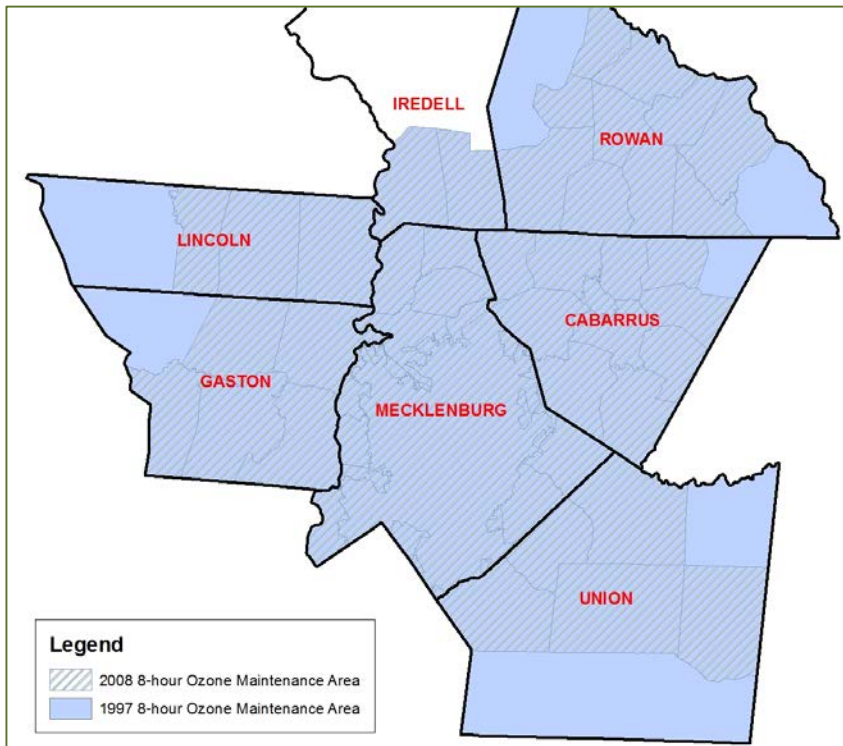
Predictions of total ZEV in North Carolina Light Duty Vehicle (LDV) fleet



Data source	ZEV in LDV (% of vehicle fleet)			Projected North Carolina ZEV Fleet		
	2025	2030	2040	2025	2030	2040
Auto Alliance 2018	0.5	1.1	2.7	40,600	85,500	226,000
ChargePoint 2018	1.0	1.9	4.5	74,400	155,000	383,000
AEO 2019	1.0	2.4	5.9	76,800	196,000	502,000
NREL 2013	0.7	1.7	6.3	50,600	136,000	532,000
Half of BNEF 2018	1.1	4.3	16.0	82,300	342,000	1,360,000



DEQ Air Quality Study for Charlotte Ozone Maintenance Area

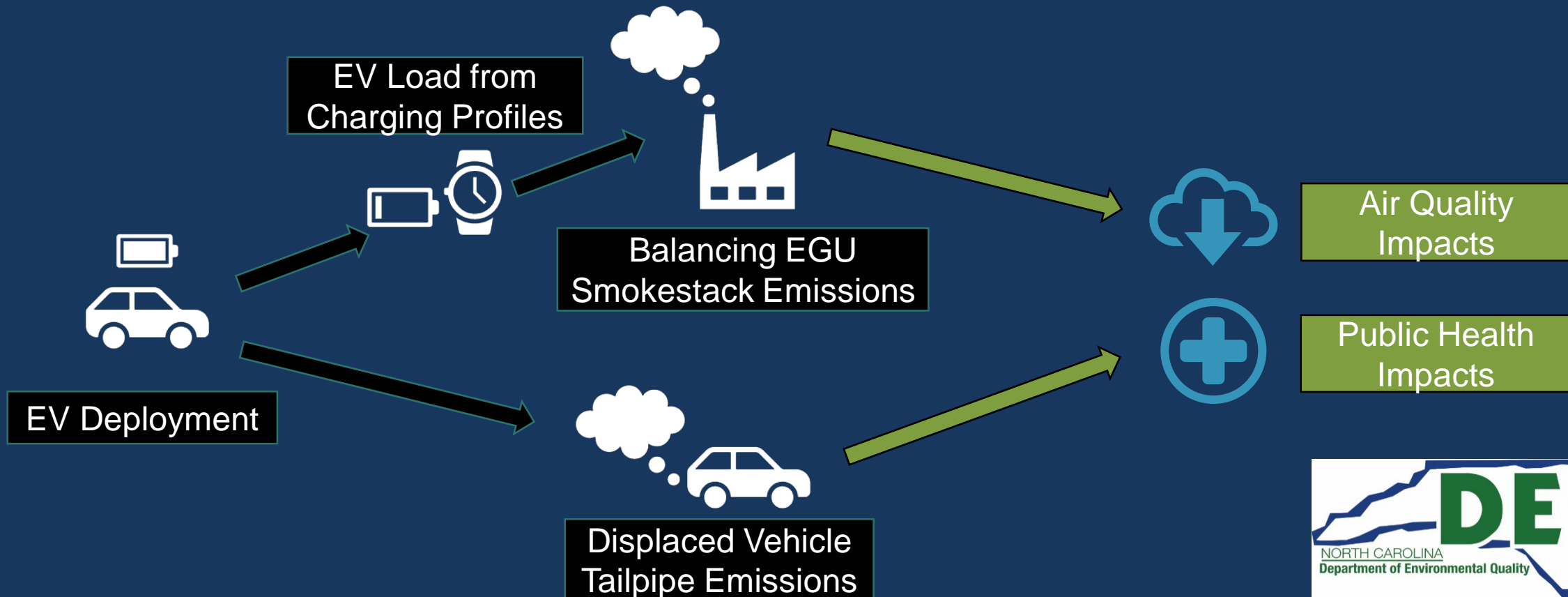


Estimated Reductions Statewide

96,451 EVs
 162 tons NOx
 1.7 million metric tons CO₂e

DEQ / EPA Modeling

- 2025 and 2030 future years



Volkswagen Settlement

- **EV Charging Infrastructure Programs**

- **DC Fast Charging Infrastructure Program - \$3,451,712 available in Phase 1**

- Projects will be funded in priority areas along selected interstates and pending interstates across the state where no EV charging infrastructure exists within 50 miles.
- Approximately 15-16 sites for Phase 1
- A competitive proposal application and approval process.
- Applicants that use Renewable Energy Certificates are eligible for up to ten additional bonus points on application. Points are based on the percentage of Renewable Energy used to power the charging station for five years.

- **Level 2 Charging Infrastructure Rebate Program - \$1,1501,571 available in Phase 1**

- First come-first serve program until funds have been reserved in the form of a voucher.
- A maximum rebate amount will be set per charging port based on the project type and accessibility to the general public
- NCDEQ will only issue a maximum amount in rebate vouchers to any one applicant at any time. This amount will be detailed in the RFP.
- Workplace and multi-unit dwelling will be eligible to apply for rebate vouchers.
- Projects initiated prior to a rebate application approval are not eligible for funding. Project initiation activities that may disqualify a rebate application include ordering equipment, hiring a contractor or vendor to complete the project.



Volkswagen Settlement

Additional EV Related Activities

- DEQ and DOT funding a project with M.J. Bradley & Associates LLC (MJB&A) to assist with development of an Electric Vehicle Infrastructure Location Identification Tool and Visualization Map.
- Tool evaluates existing plug-in EV charging network and utilizes local commercial and demographic data to identify possible suitable locations for future EV infrastructure development across 9,000 miles of primary travel corridors in other states.
- Project will add 2,300 miles of North Carolina interstates and highways for staff to utilize for EV infrastructure project evaluation for both agencies.
- To be completed by mid-June 2019.

<https://deq.nc.gov/about/divisions/air-quality/motor-vehicles-and-air-quality/volkswagen-settlement>



Thank you.

Questions?

Sushma Masemore, P.E.
Deputy Assistant Secretary for Environment &
State Energy Director
919-707-8700
Sushma.Masemore@ncdenr.gov

Department of Environmental Quality

