

BENEFITS OF TRANSPORTATION ELECTRIFICATION IN NORTH CAROLINA

North Carolina Transportation Electrification Roadmap

Key Takeaways:

A transition to transportation electrification would result in significant benefits to the climate, public health, electric vehicle (EV) owners, and utility customers. The state of North Carolina should consider adopting “core policies”, such as 1) California’s Advanced Clean Cars II (ACC II) rulemaking, 2) the Advanced Clean Trucks (ACT) rule, and 3) the NOx Omnibus rule. With certain policies implemented to further support the growth of EV adoption, cumulative benefits to the state of North Carolina could reach as high as \$150 billion in net societal benefits by 2050 from the electrification of light-duty vehicles (LDVs) and medium- and heavy-duty vehicles (M/HDVs).

Transportation Electrification: Enormous Emissions Reductions and Benefits for All Residents Of North Carolina

The Transportation sector is the largest source of greenhouse gas (GHG) emissions in North Carolina, and reducing these emissions is critical to human and environmental health. Executive Order No. 246 (EO 246), *North Carolina’s Transformation to a Clean, Equitable Economy*, sets a new GHG emissions reduction goal of net-zero emissions by 2050, increases the zero-emission vehicle (ZEV) registration target to 1.25 million vehicles and creates a new ZEV in-state sales target to be at least 50 percent by 2030. Transportation electrification is an important piece of the puzzle in reducing the state’s emissions.

This analysis found that North Carolina could see up to \$150 billion in cumulative net benefits from transportation electrification, including air quality benefits, utility customer savings, and EV owner savings.

This report includes a detailed analysis of four “core policies” to drive transportation electrification: 1) California’s Advanced Clean Cars II (ACC II) rulemaking, 2) the Advanced Clean Trucks (ACT) rule, 3) the NOx Omnibus rule, and 4) the Biden Administration’s 2030 electric vehicle (EV) sales target. It also explores how complementary policies, such as infrastructure development and vehicle financing, can help ensure that transportation electrification is implemented equitably and with the lowest cost and impact on consumers.

Background

North Carolina has ambitious electric vehicle and GHG emission reduction goals. It is critical to understand different pathways North Carolina can follow to meet those goals, such as implementing some or a combination of “core policies” establishing vehicle standards across the state.

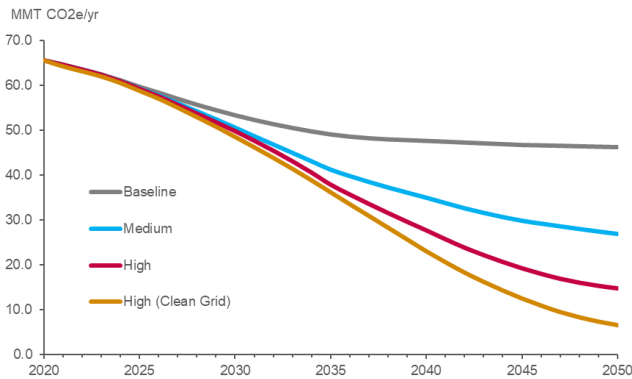
The report analyzed three modeled scenarios for both light-duty vehicles, as well as medium- and heavy-duty vehicles with increasing ambition, which were compared to a baseline to estimate the benefits of vehicle electrification to the state of North Carolina.

- The “**Medium Scenario**” assumed adopting the Biden Administration’s EV sales goal of 50% sales by 2030 for LDVs, and the ACT rule and NOx Omnibus rule for M/HDVs.
- The “**High Scenario**” modeled North Carolina adopting the ACC II regulation, ACT rule, and NOx Omnibus rule, but increased the ACT program to 100 percent M/HDV sales by 2040.
- The “**High (Clean Grid) Scenario**” modeled North Carolina adopting the same measures as the High Scenario but included a clean electric grid mix, which includes a 70 percent reduction in emissions from the electric grid from 2005 levels by 2030 (based on North Carolina’s HB951).

Findings

The analysis found significant climate and health benefits, with the greatest amount of benefits resulting from the most ambitious “High (Clean Grid) Scenario.”

Estimated On-Road Vehicle Related GHG Emissions



The “High (Clean Grid) Scenario” would result in 90 percent GHG emissions reductions compared to the baseline from 2020 to 2050. This translates to a cumulative reduction of 507.2 million metric tons (MMT) of CO2e and \$39.2 billion in monetized benefits (2020\$).

Cumulative Estimated Reductions in Health Outcomes Under Modeled Scenarios

Policy Scenario*	Cumulative Reduced Incidents				Monetized Value (2020\$ bil)
	Mortality	Hospital**	Asthma-Related Emer. Room	Restricted Activity Days***	
Medium	773	493	277	463,271	\$9.0
High	1,007	640	359	603,369	\$11.8
High (Clean Grid)	1,070	679	379	636,083	\$12.5

* Compared to the Baseline Scenario

**Hospital visits include respiratory-related hospitalizations, asthma-related hospitalizations, hospitalizations related to chronic lung disease, and cardiovascular-related hospitalizations

***Restricted activity days are days where activity is limited, but not severely restricted, for example missing work

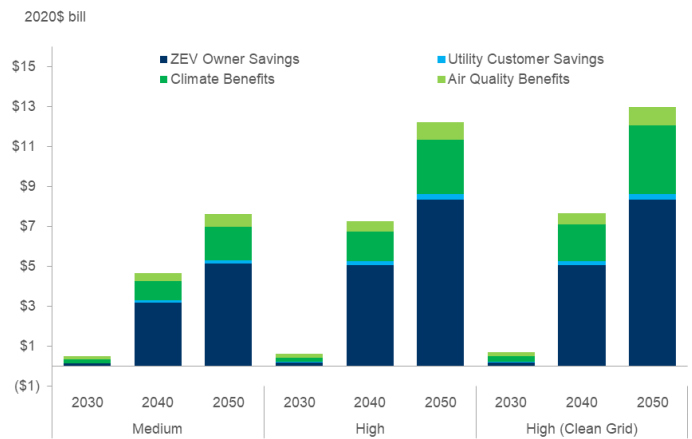
The “High (Clean Grid) Scenario” has the highest reductions of nitrogen oxides (NOx) and fine particulate matter (PM) emissions. Emissions for NOx and PM are expected to fall 31 percent and 43 percent respectively by 2050, compared to the Baseline.

Overall net societal benefits, which include air quality benefits, climate benefits, utility customer savings, and EV owner savings will yield annual benefits of \$7.5 billion, \$12.0 billion, and \$12.8 billion for Scenarios “Medium” to “High (Clean Grid),” respectively. The cumulative benefits between 2021 and 2050 amount to \$91 billion, \$142 billion, and \$150 billion for Scenarios “Medium” to “High (Clean Grid),” respectively.

A large portion of the net societal benefits result from EV owner savings, about 70 percent. These EV owner savings come from:

- **Savings in fuel costs:** over the lifetime of a vehicle, a LDV owner could save approximately \$4,000 in net fuel savings and an electric M/HDV owner could save almost \$20,000 in fuel
- **Savings in maintenance costs:** over the lifetime of a vehicle, a LDV owner could save \$2,000 worth and an electric M/HDV owner could save almost \$14,000 due to reduced vehicle maintenance
- **Purchase price:** certain LDVs will become cheaper than traditional vehicles as soon as 2026 and will create additional savings for EV owners.

Net Societal Benefits from Modeled Scenarios



Conclusion

All scenarios considered have significant benefits to the state of North Carolina. The “High (Clean Grid) Scenario” is modeled to result in the greatest net benefit to the state. North Carolina should consider adopting ACCII, ACT, and the NOx Omnibus Rule, which are all included under the “High (Clean Grid) Scenario” along with a decarbonized electric grid from North Carolina’s HB951.

The full report is available at [ERM.com](https://www.erm.com)