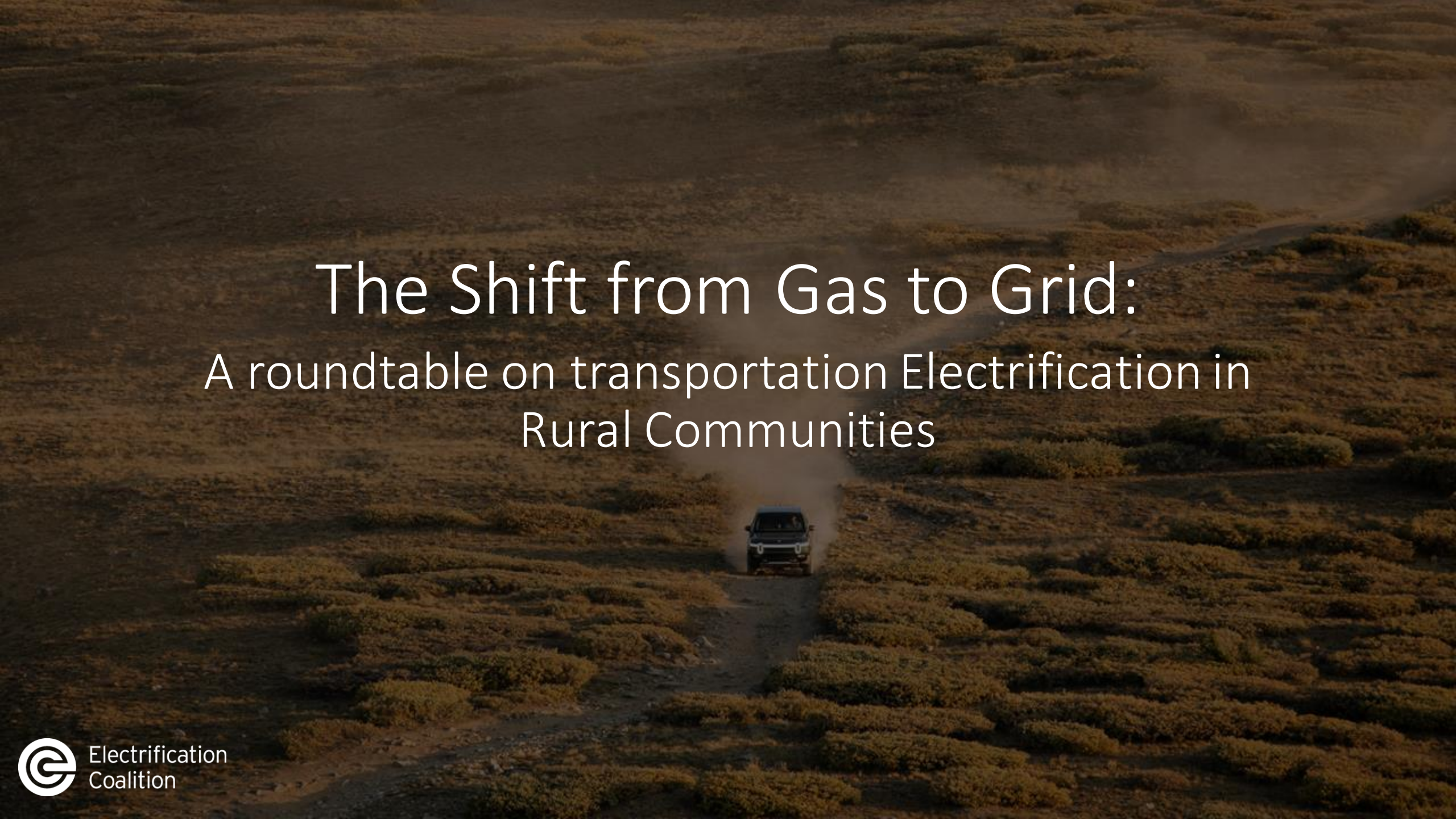
# The Shift from Gas to Grid:

## A roundtable on transportation Electrification in Rural Communities



Electrification Coalition


# Welcome Remarks

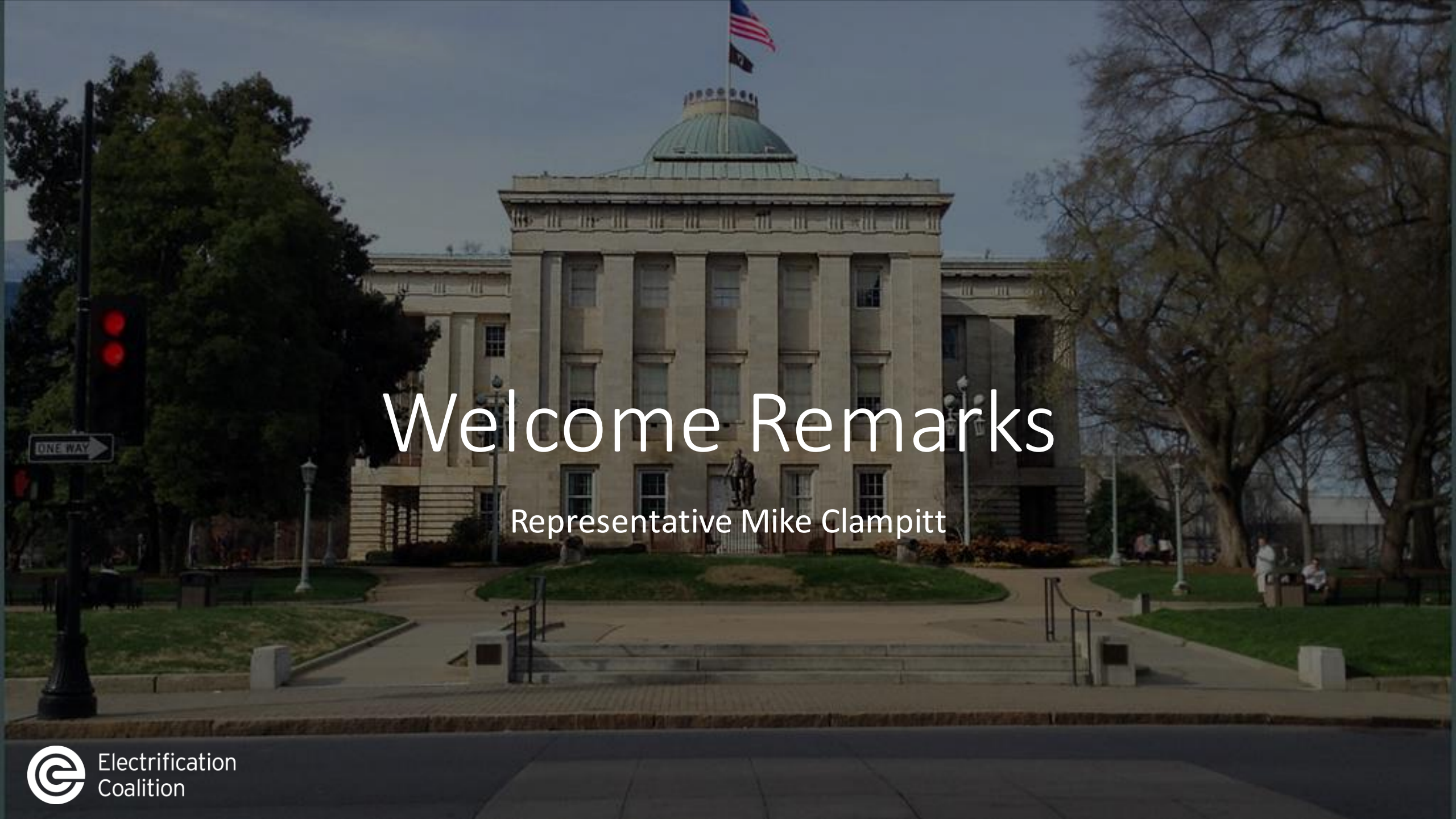
Anne Blair, Electrification Coalition Senior Policy Director


# About the Electrification Coalition

The **Electrification Coalition** is a nonpartisan, nonprofit organization dedicated to driving the policies and actions that will electrify all modes of transportation to protect economic and national security, public health, and American jobs.

Electrification Coalition

SAFE

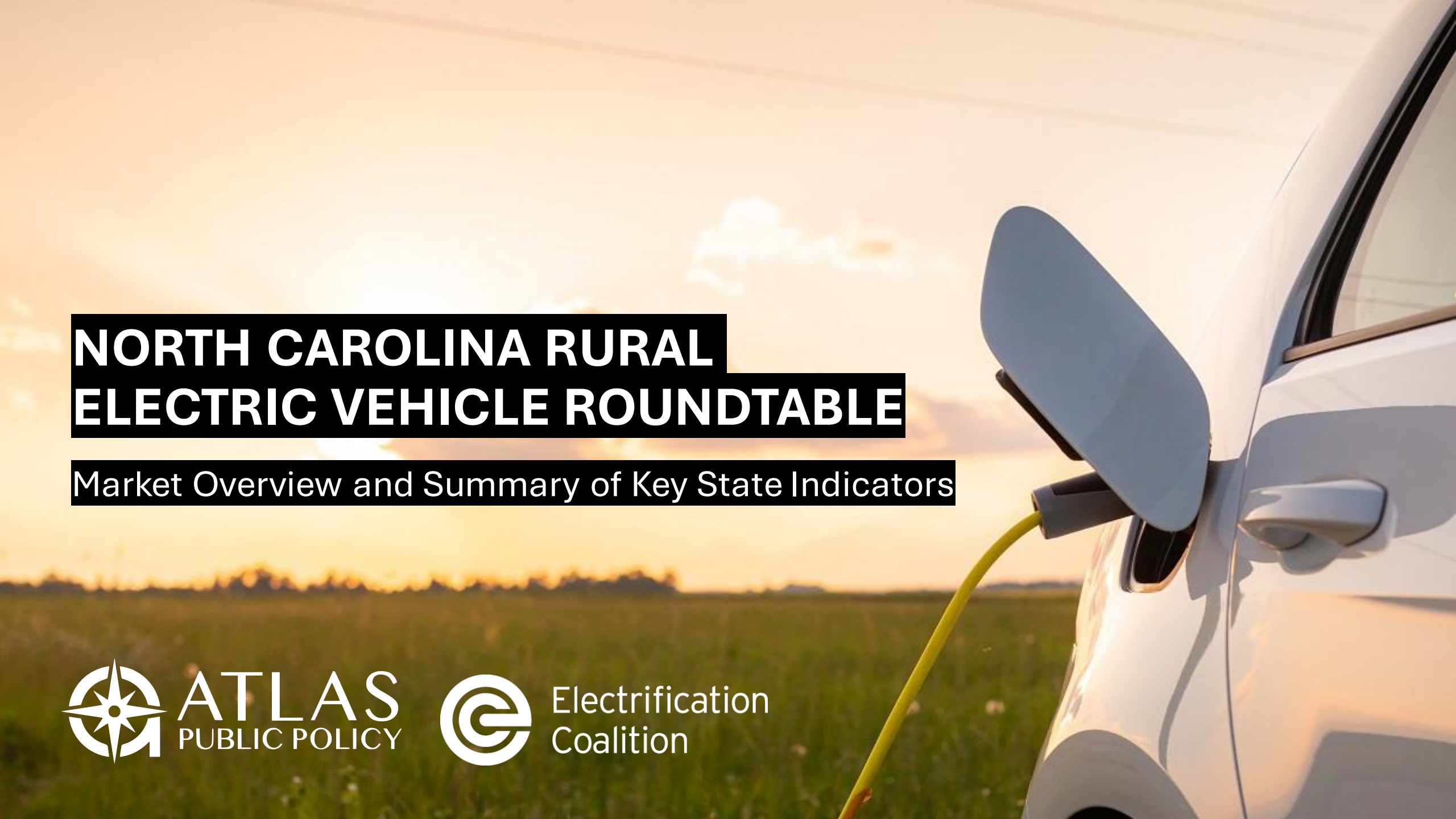



# Welcome Remarks

Representative Mike Clampitt

Electrification Coalition


Heather Hildebrandt
Statewide Initiatives Supervisor



# NORTH CAROLINA RURAL ELECTRIC VEHICLE ROUNDTABLE

## Market Overview and Summary of Key State Indicators

ATLAS PUBLIC POLICY

Electrification Coalition

# OVERVIEW

**Overview**
EV Market
Manufacturing
Federal Funding
State Funding

Electrification Coalition

# BENEFITS OF RURAL ELECTRIFICATION

## Cost Savings

- Rural households spend an average of **20 percent** of their household expenditures on transportation, compared to **16 percent** for urban (FHWA)

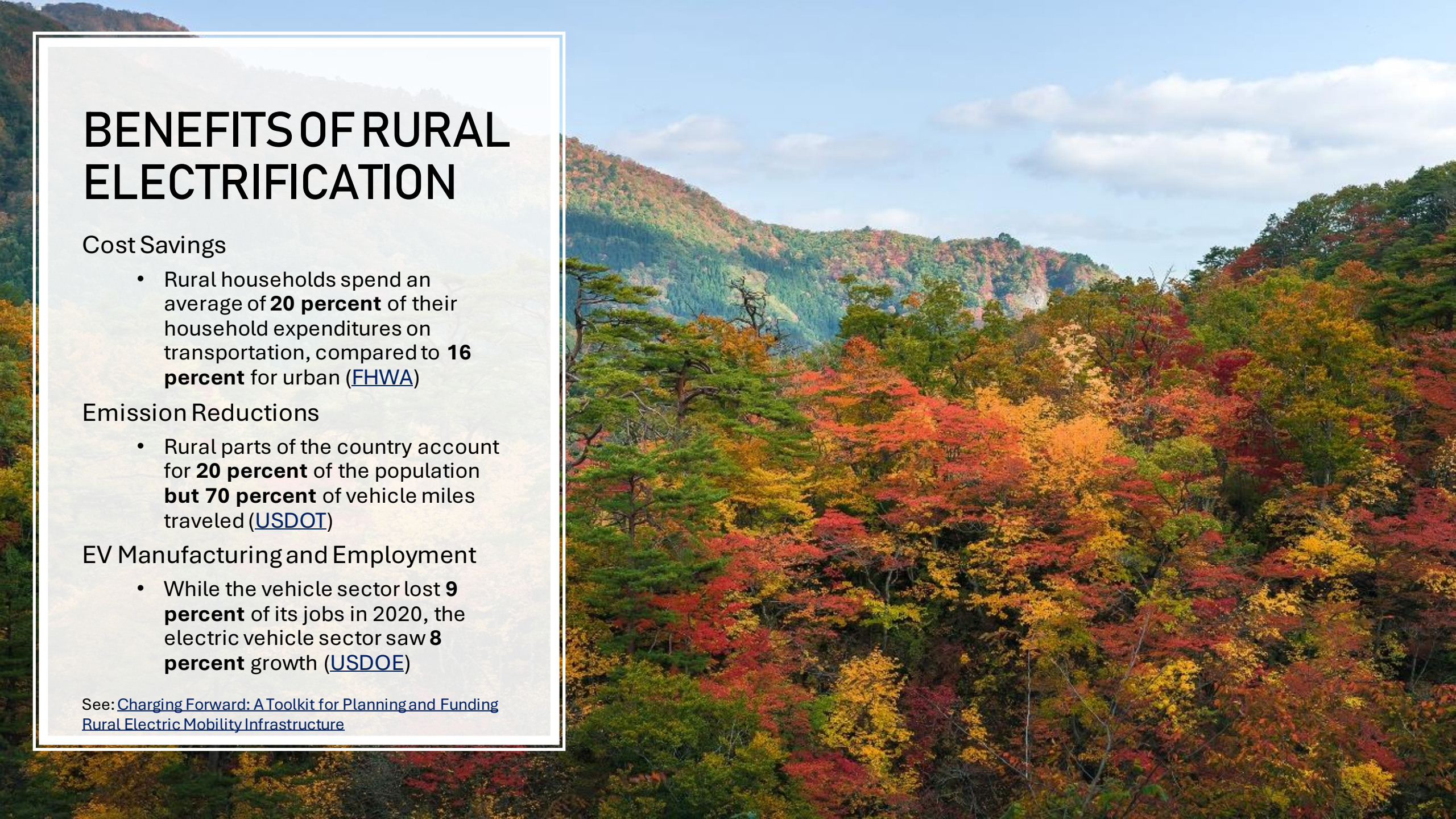
## Emission Reductions

- Rural parts of the country account for **20 percent** of the population **but 70 percent** of vehicle miles traveled (USDOT)

## EV Manufacturing and Employment

- While the vehicle sector lost **9 percent** of its jobs in 2020, the electric vehicle sector saw **8 percent** growth (USDOE)

See: Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure



# CHALLENGES TO RURAL ELECTRIFICATION

## Up-Front Costs

- While EVs have a lower total cost of ownership, higher upfront costs present a barrier especially for low-income drivers (see fueleconomy.gov)

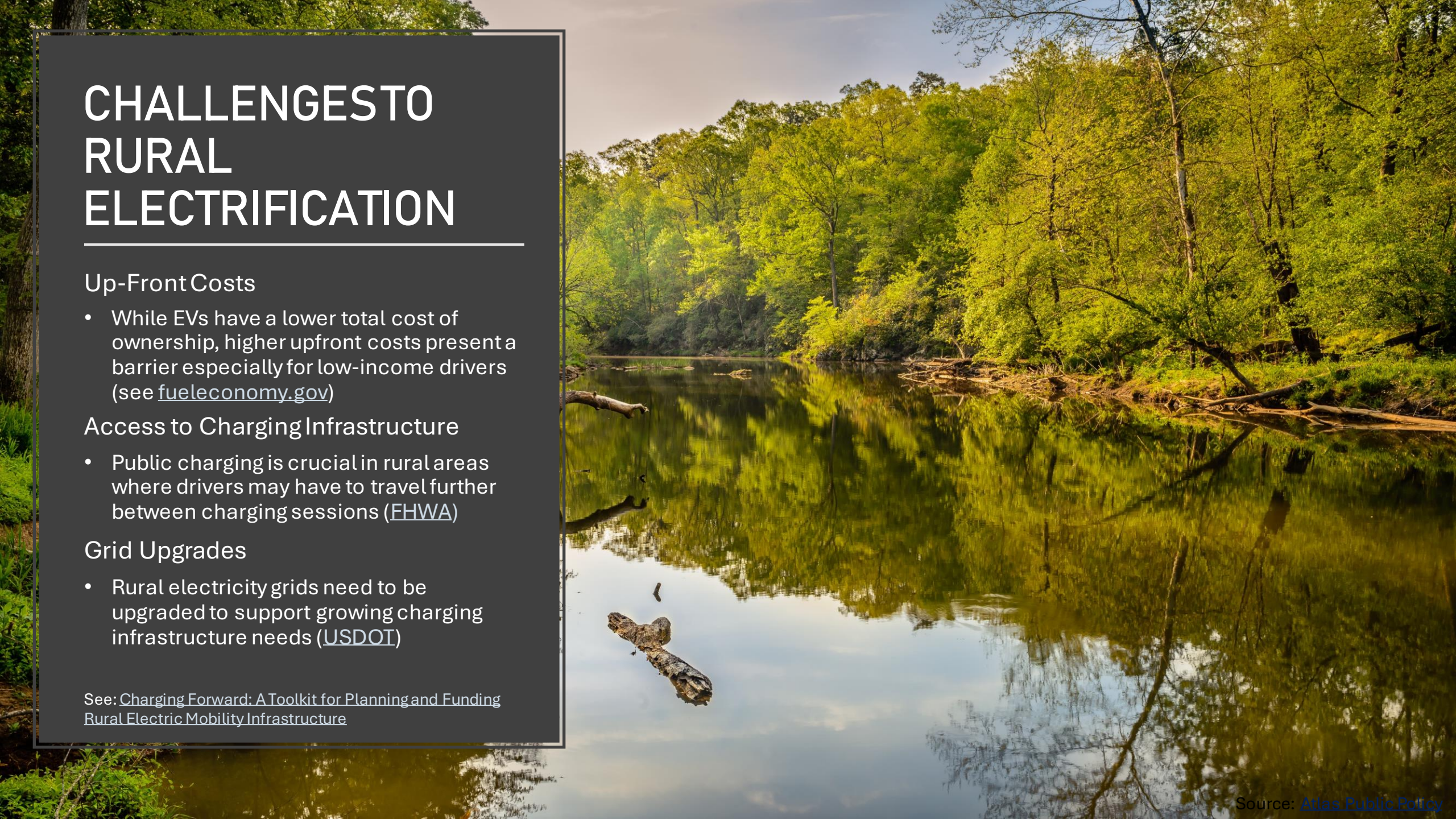
## Access to Charging Infrastructure

- Public charging is crucial in rural areas where drivers may have to travel further between charging sessions (FHWA)

## Grid Upgrades

- Rural electricity grids need to be upgraded to support growing charging infrastructure needs (USDOT)

See: Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure



Source: Atlas Public Policy

# EV MARKET

Overview

**EV Market**

Manufacturing

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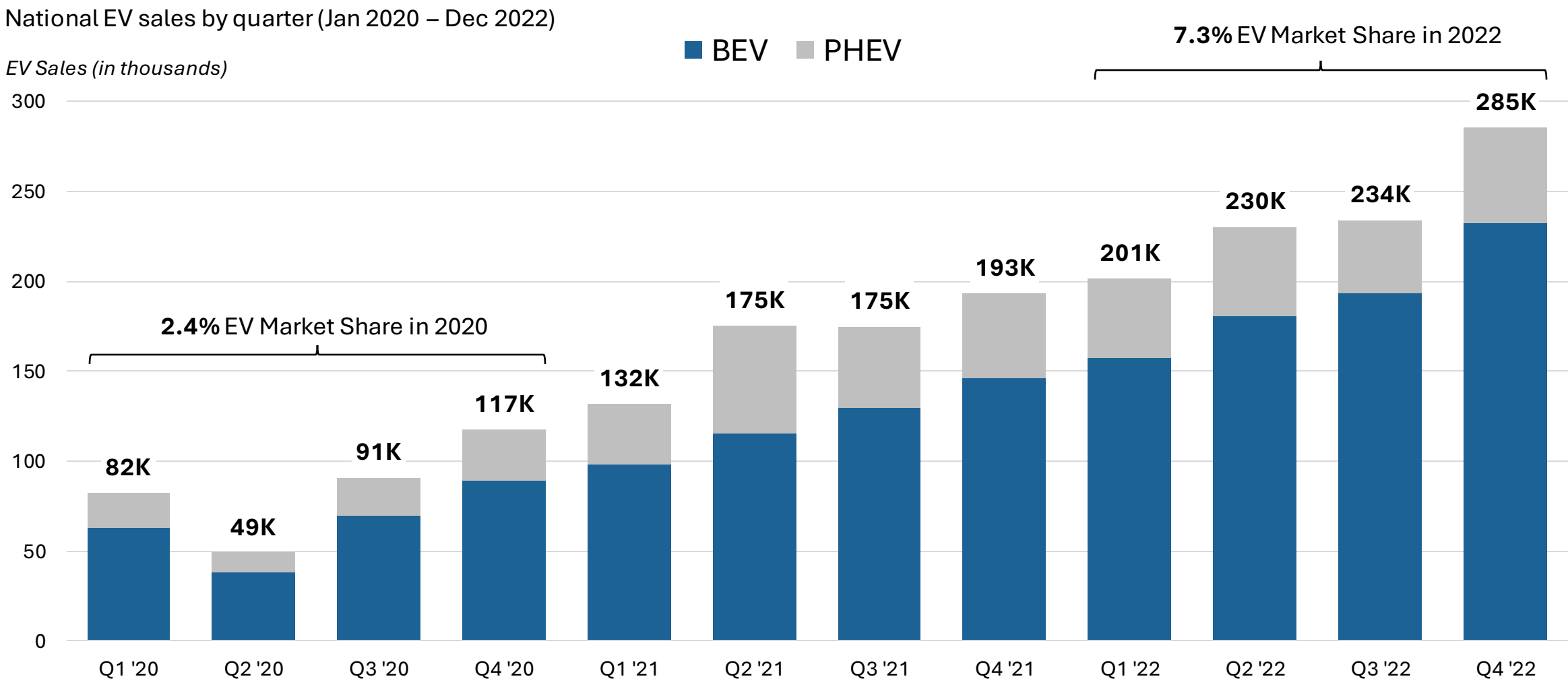
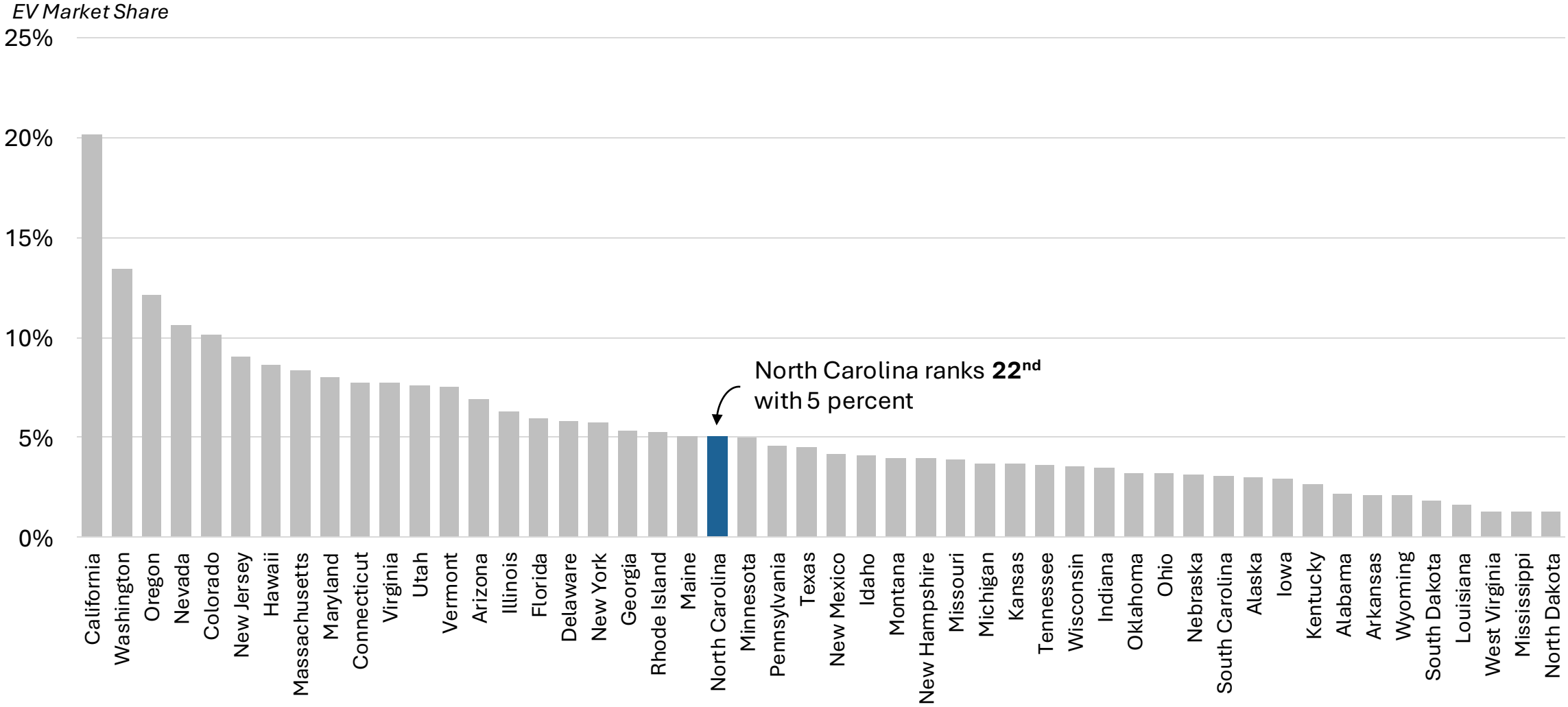
Electrification Coalition

# U.S. EV MARKET SHARE HAS TRIPLED SINCE 2020

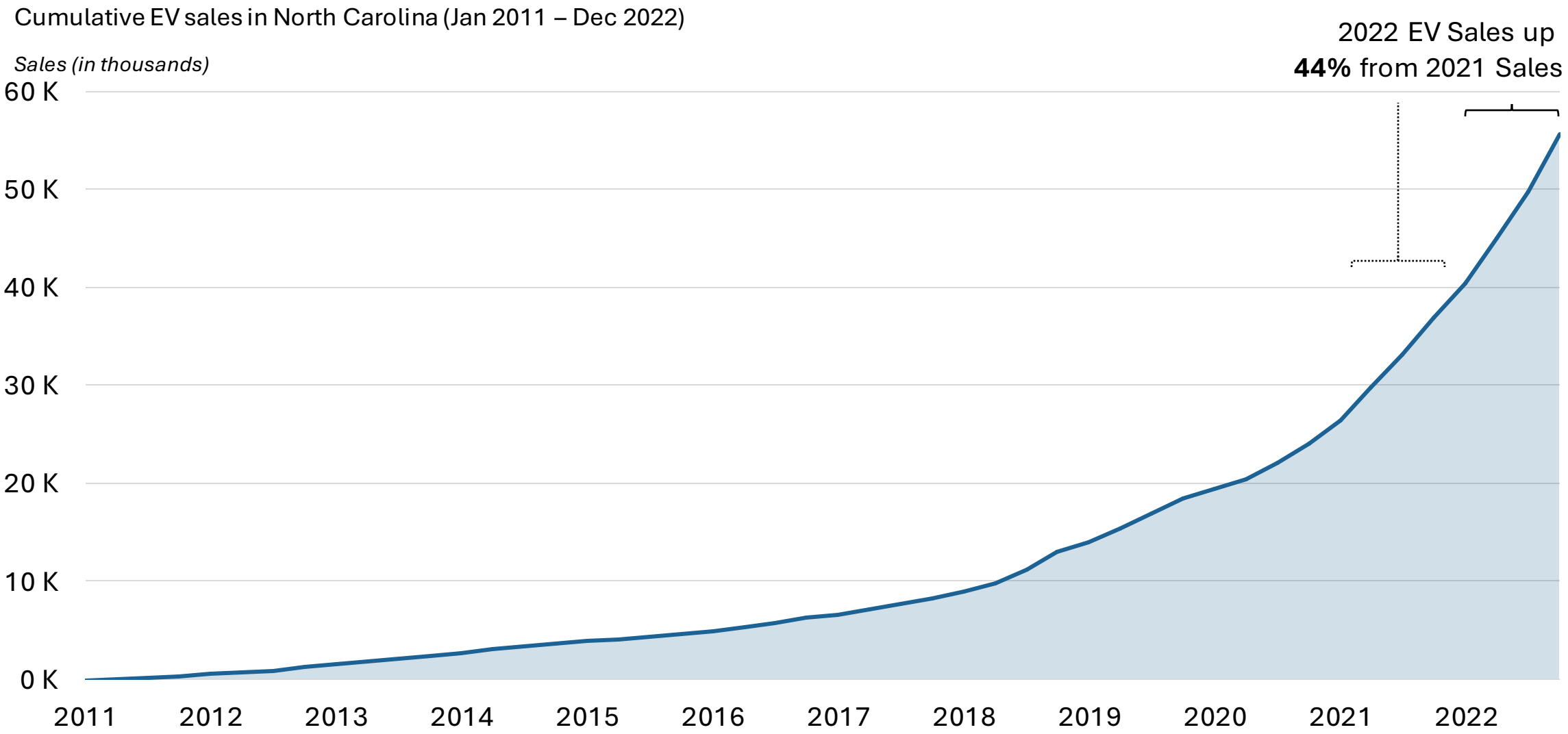


# NORTH CAROLINA MIDDLE OF THE PACK IN EV MARKET SHARE

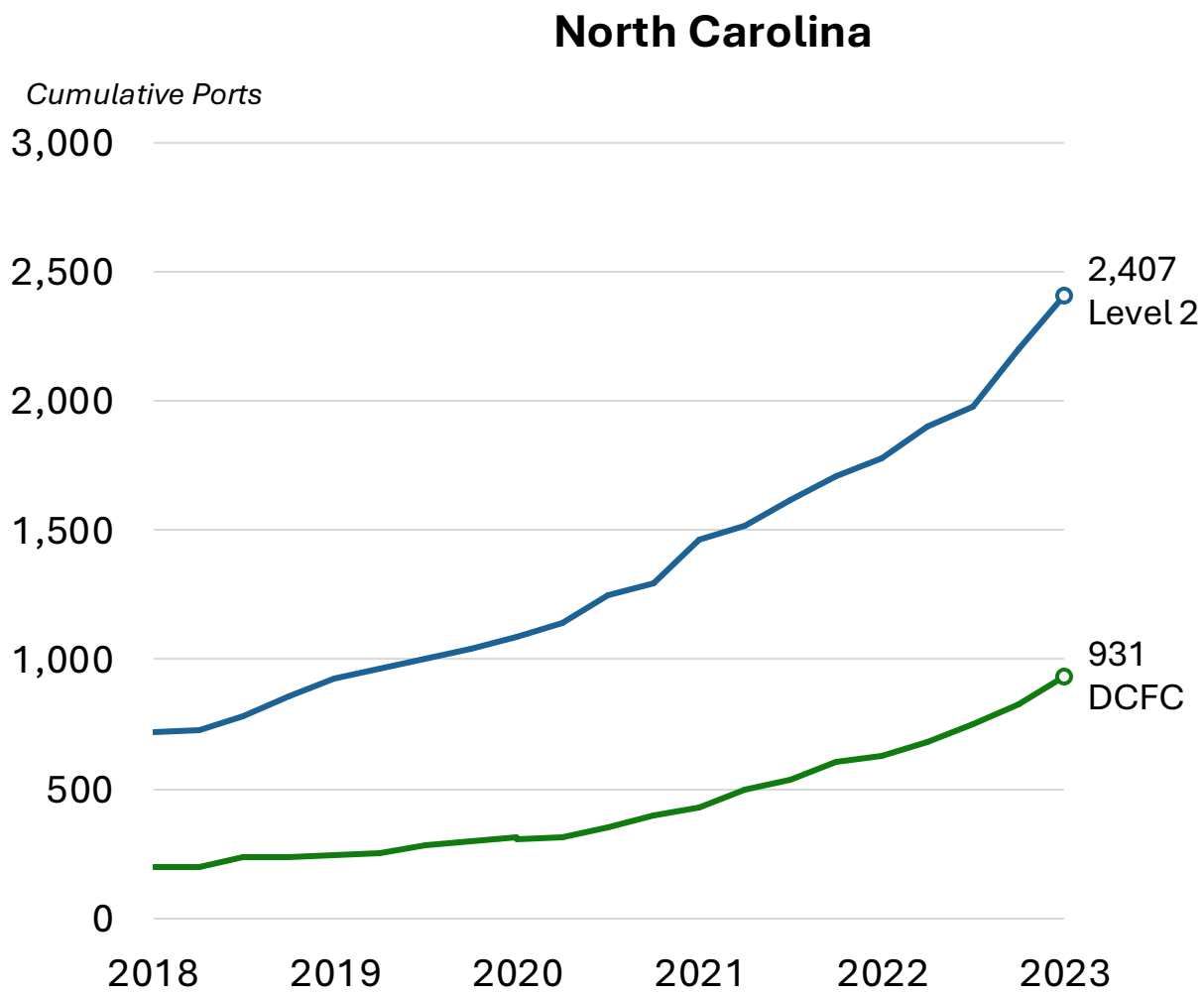
2022 EV Market Share by State



# NORTH CAROLINA EV MARKET GROWING RAPIDLY

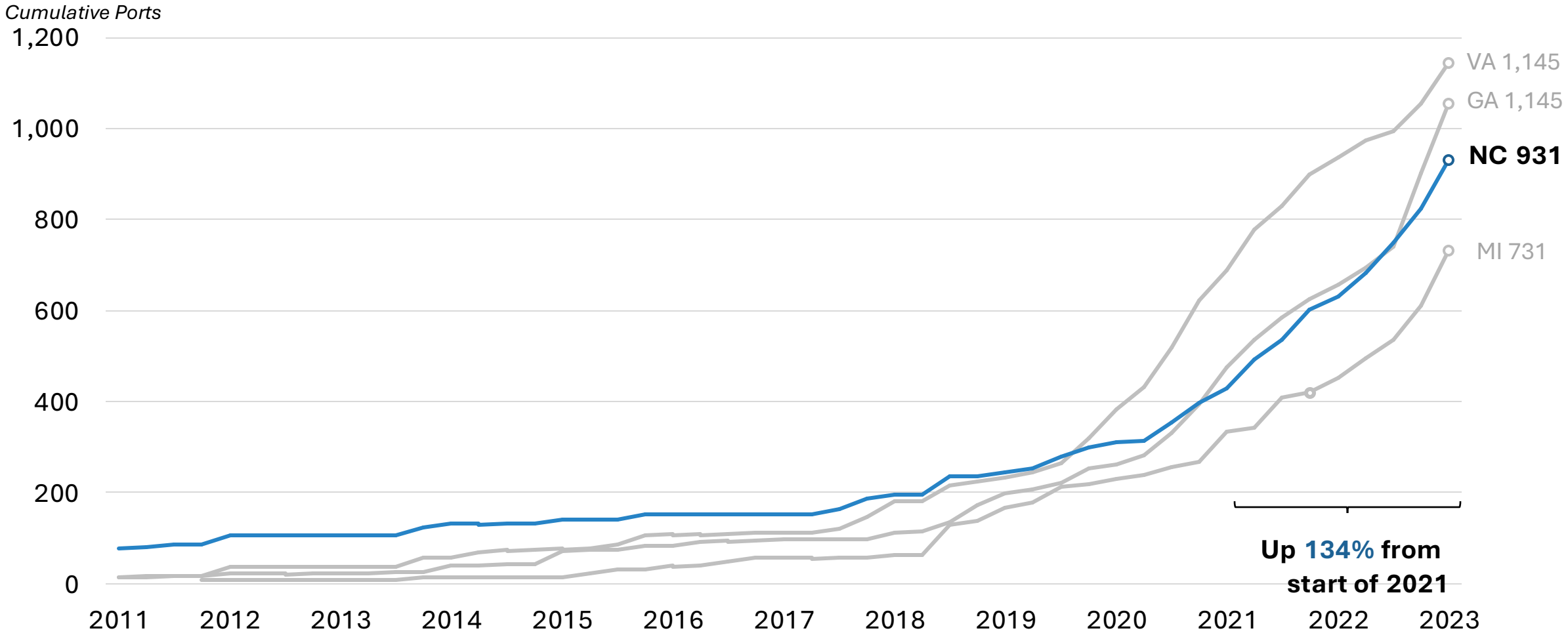


# NORTH CAROLINA PUBLIC CHARGING NETWORK EXPERIENCING STEADY GROWTH



# NORTH CAROLINA DCFC INSTALLATIONS TRAIL SIMILAR-POPULATION STATES

North Carolina DCFC stations compared to similar-population states (Jan 2011 – Dec 2022)




*Similar population states represent a sample of the closest states to North Carolina in total population*

# MANUFACTURING

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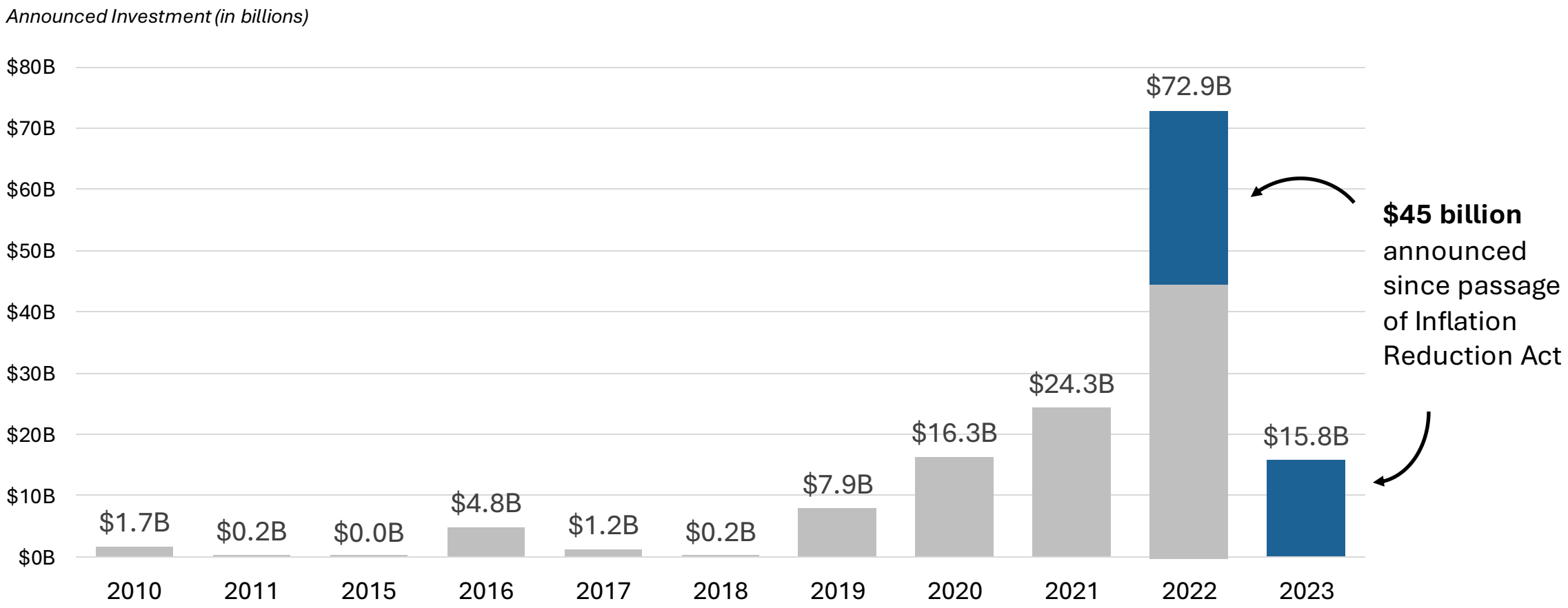
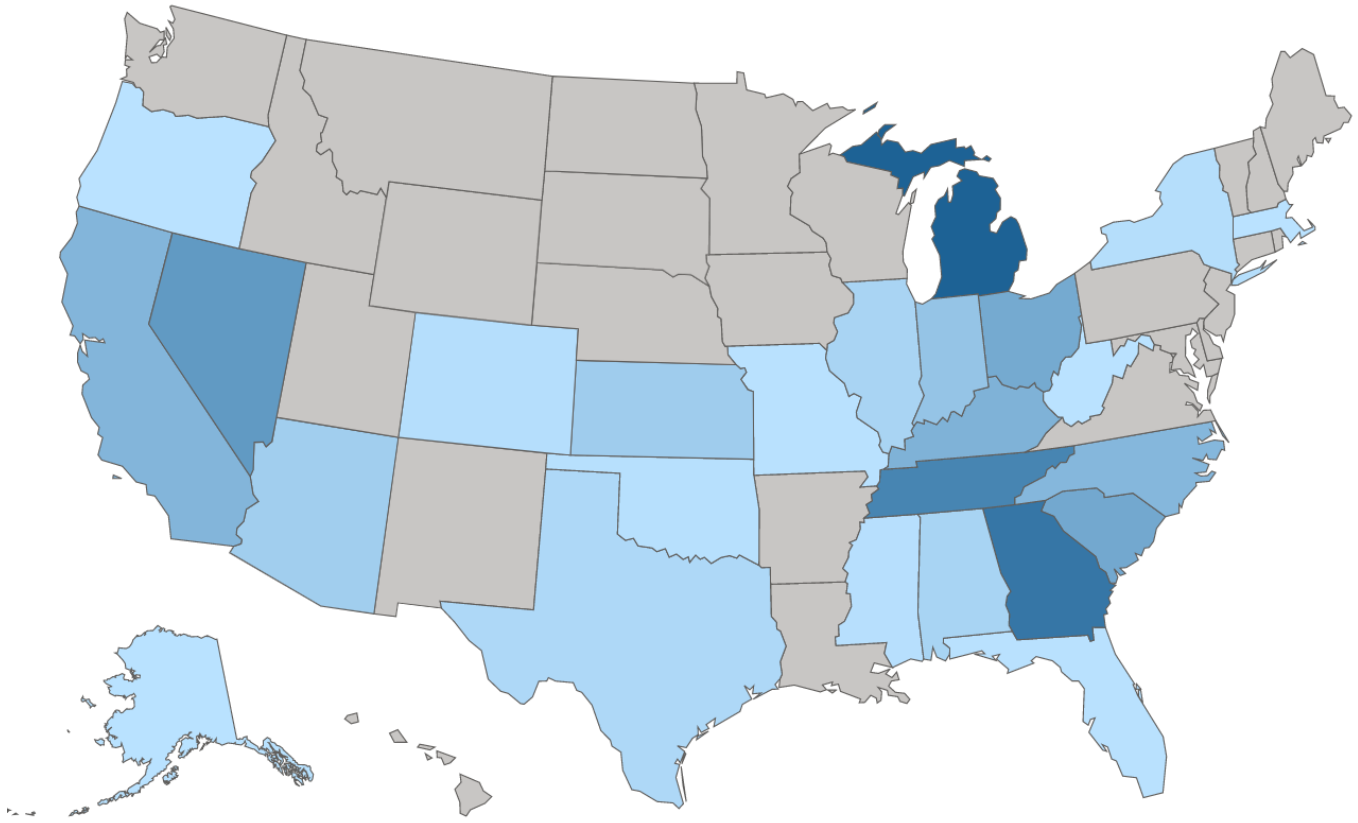
# FEDERAL LEGISLATION SPURS EV MANUFACTURING INVESTMENT

Announced Investment in EV and EV Battery Manufacturing Facilities (2010 to 2022)



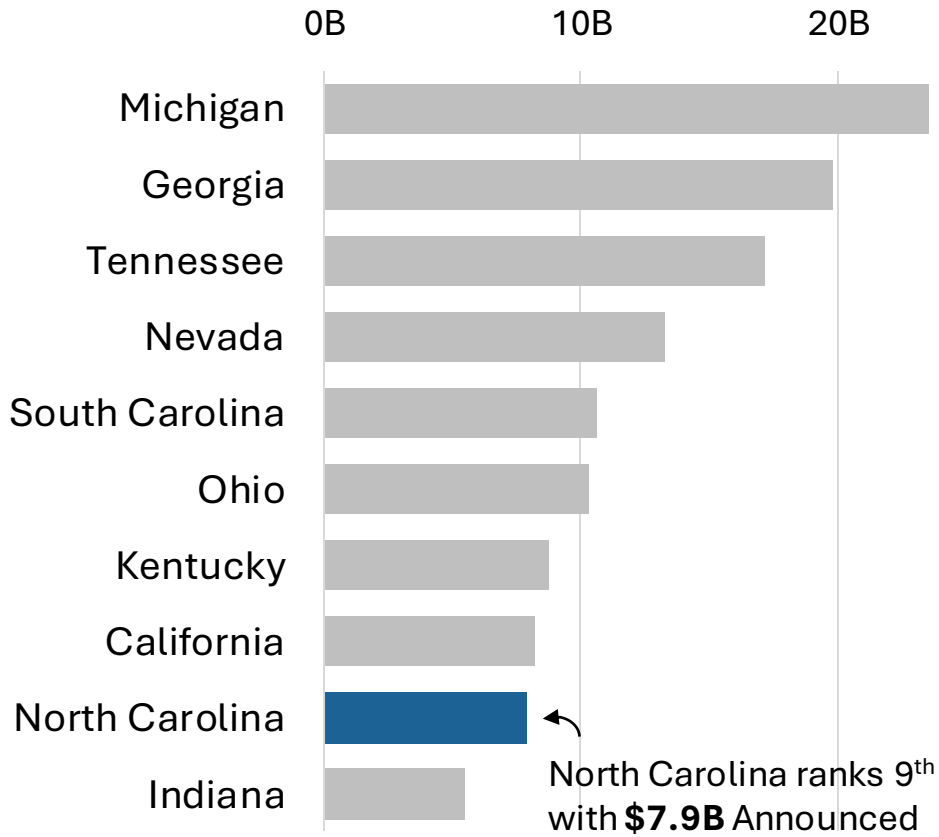
# NORTH CAROLINA SET TO LEAD IN EV MANUFACTURING

Current and Planned EV Manufacturing Investment by State



Top 10 States by EV Investment

*Investment (in billions)*



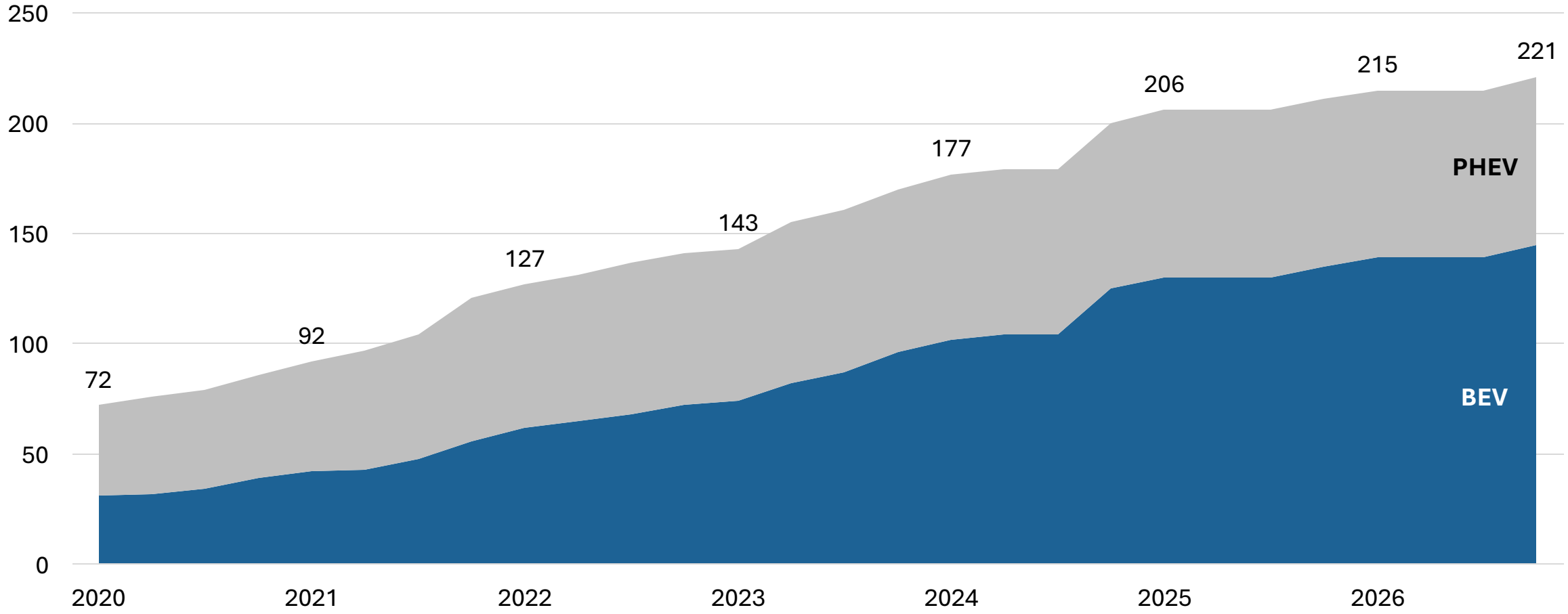
**$4 billion VinFast Electric Vehicle Factory**

VinFast’s first U.S. facility will produce 1,500 EVs, employ 7,500 in Chatham County

# AUTOMAKERS PLAN TO EXPAND AND DIVERSIFY EV OFFERINGS

EV Model Availability (2020 to 2026)

*Cumulative Announced EV Models*



# FEDERAL FUNDING

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EV Market
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Electrification Coalition

# IIJA AND IRA UNLEASH BILLIONS

**EV Charging**

- **$5 billion** for National Electric Vehicle Infrastructuree (NEVI) Formula
- **$2.5 billion** for Charging and Fueling Infrastructure (CFI) grants

**MDHD Vehicles**

- **$5.6 billion** for Low or No Emission (Bus) Grant Program
- **$5 billion** for Clean School Bus Program
- **$3 billion** for Grants to Reduce Air Pollution at Ports
- **$1 billion** for Clean Heavy-Duty Vehicles

**Manufacturing**

- **$6 billion** for battery processing and manufacturing
- **$40 billion** in loan authority for advanced energy manufacturing

**Tax Credits**

- **$7,500** for purchase of a new EV ($4,000 for used)
- **$40,000** Tax Credit for purchase of clean commercial vehicle
- **$100,000** for fueling infrastructure in low-income and rural communities

# FEDERAL FUNDING IS COMING TO NORTH CAROLINA

- Formula funding available under the Infrastructure Investment and Jobs Act:
  - **$109 million** for an EV charging network in the state
  - **$171 million** to reduce transportation-related emissions
  - **$194 million** to increase the resilience of its transportation system
- Competitive funding awarded to North Carolina:
  - **$12 million** for electric school buses
  - **$18 million** for electric transit buses and facilities
- North Carolina can still compete for over **$50 billion** in other EV-eligible grant funding

Source: Department of Transportation

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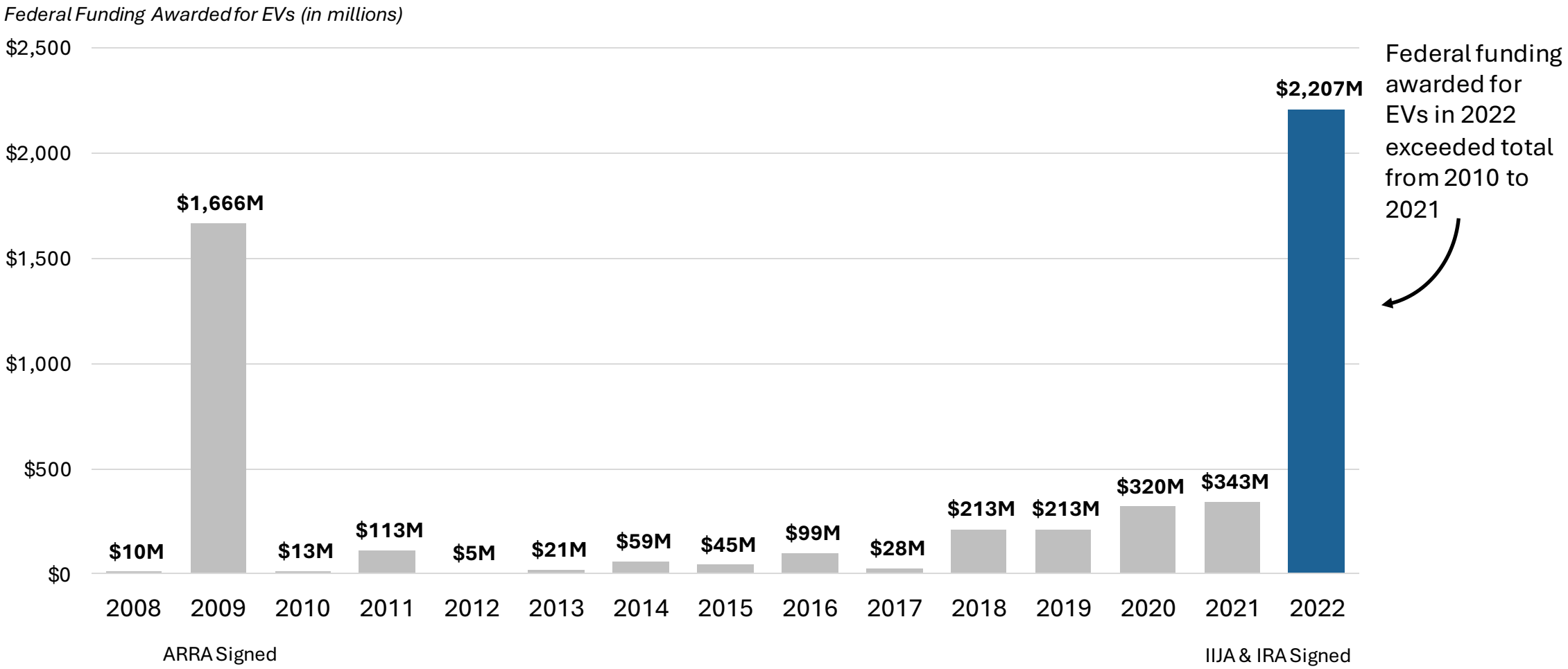
# IIJA AND IRA ARE ALREADY MAKING AN IMPACT




*Includes funding for deployment, manufacturing, and research and development. Excludes loans and tax credits.*

# STATE FUNDING

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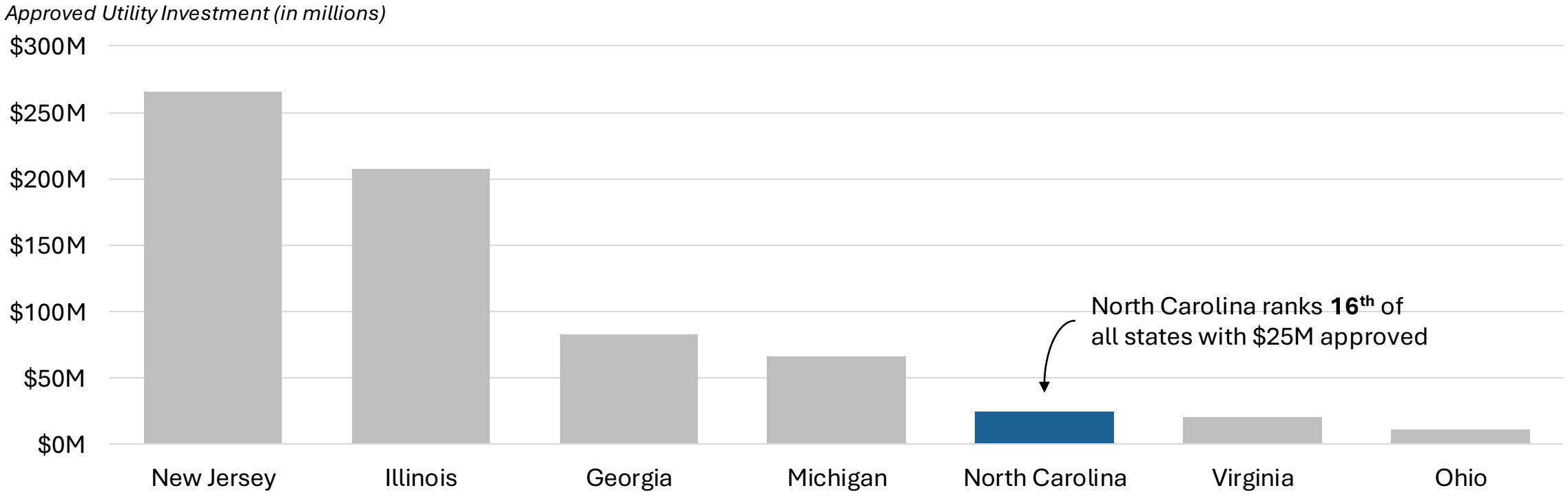
# NORTH CAROLINA TRAILS SIMILAR-POPULATION STATES IN UTILITY INVESTMENT FOR EVS

Utility investment approved for EVs compared to similar-population states (through March 2023)




**Electric Utility EV Initiatives**

- Duke Energy Fast Charging Stations
- Duke Energy Public Level 2 Charging and Multifamily Location EV Charging
- Duke Energy Electric School Bus and Infrastructure Rebate
- Touchstone Energy Network Electric Vehicle Incentives

*Similar population states represent the six closest states to North Carolina in total population*

# Snapshot on the EV Market: Maximizing North Carolina's Policy and Economic Opportunities

WORLD RESOURCES INSTITUTE

# THE SHIFT FROM GAS TO GRID:

## POLICY & ECONOMIC OPPORTUNITIES IN TRANSPORTATION ELECTRIFICATION

JENNIFER RENNICKS

MAY 2023

# TRANSPORTATION ELECTRIFICATION & FEDERAL POLICY

## Infrastructure Investment & Jobs Act 2021

- $5B Clean School Bus Program
- $7.5 B Electric Vehicle Charging Programs

## Inflation Reduction Act 2022

- $1B Clean Heavy Duty Vehicle Program
- Commercial Clean Vehicle tax credits (45W)
- EV tax credits (30D)
- EV charging tax credits (30C)

# CLEAN SCHOOL BUS PROGRAM


The Bipartisan Infrastructure Law allocates up to $5 billion for cleaner school buses through EPA.

**2022 Rebate Awards (2023 Rebates = Fall)**

- Nearly $1 billion awarded to all 50 states, Indian tribes, territories
- 95% of awards were for electric school buses (ESBs)
- **5 school districts in NC were awarded 31 ESBs**

**2023 Grant Awards**

- $400 million available
- competitive grant process
- open for applications April 24 – August 22, 2023

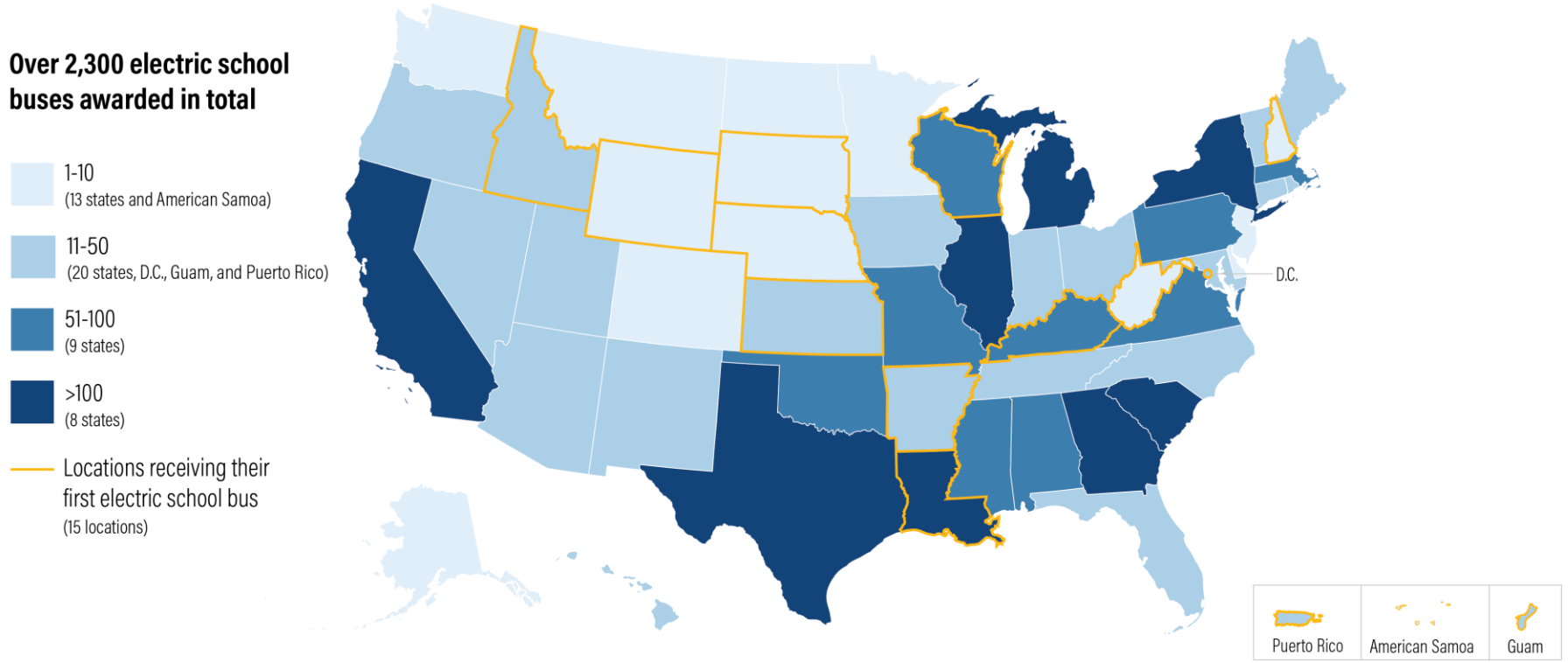
**Who is eligible?**

School districts, charter schools, Native nations, Tribal organizations, non-profit school bus associations, and school bus dealers/manufacturers

Source: EPA, EPA

# CLEAN SCHOOL BUS PROGRAM

## Electric School Buses Awarded in the Clean School Bus Program 2022 Rebates




*Source:* Awarded Clean School Bus Program Rebates | US EPA.
*Note:* State awards include awards made to tribal communities within that state.

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# ELECTRIC VEHICLE CHARGING PROGRAMS


The Bipartisan Infrastructure Law allocates up to $7.5 billion to establish a nationwide network of electric vehicle (EV) chargers that support access and reliability for all users.

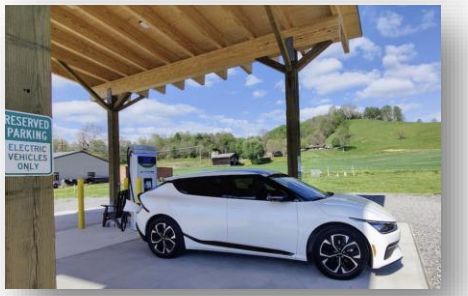
## National Electric Vehicle Infrastructure (NEVI) program

- $5 billion in formula funding to States to build out charging infrastructure along highway corridors – filling gaps in **rural**, **disadvantaged**, and **hard-to-reach locations** while instilling public confidence in charging
- $109 million to NC over 5 years

## The Charging and Fueling Infrastructure Grants

- $2.5 billion in competitive grants to support community and corridor charging, improve local air quality, and increase EV charging access in underserved and overburdened communities.

# IRA VEHICLE ELECTRIFICATION INCENTIVES


## $1B Clean Heavy Duty Vehicle Program

- grants & rebates to replace heavy-duty Class 6, 7 commercial vehicles with zero-emission vehicles
- and deploy infrastructure needed to charge, fuel, and maintain these vehicles; develop and train the necessary workforce

## Commercial Clean Vehicle tax credits (45W)

- Up $40,000 for businesses & tax-exempt entities, like schools

## EV tax credits (30D)

- For eligible vehicles up to $7,500 new; $4,000 used

## EV charging tax credits (30C)

- Up to a maximum of $1,000

# THANK YOU

Find out more at **wri.org/electric-school-buses**

**info@eschoolbus4kids.org**

Contact me at **jennifer.rennicks@wri.org**

# THE SHIFT FROM GAS TO GRID

TOM DELVISCIO
SR. MANAGER - CUSTOMER FLEET ELECTRIFICATION

MAY 5TH 2023


DUKE ENERGY®

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# EVs & The Grid: Utility Perspective

- The EV Market & Trends
- The Grid of the Past
- The Grid of the Future (for EVs)
- Duke Energy Current EVSE Program Offerings
- Conclusions

# The EV Market & Trends

## Consumer Behavior

- Adoption Rates Accelerating Nationally & Globally (0.2%→4.6% new car sales 2011→2022)
- Diversity of models available has increased substantially.
- Increased consumer sentiment favoring EVs as a means of addressing environmental concerns.
- Improved battery range & increased deployment of charging infrastructure has led to decrease in “range anxiety.”

## Federal & State Regulation/Policy

- IIJA is driving significant investments in the infrastructure needed to transition transportation fueling onto the grid.
- IRA is helping to address upfront capital burden associated with EV purchase compared to standard ICE options.
- IRA is also stimulating rapid growth domestic manufacturing due to material sourcing requirements.
- EO 80/247/271 & HB951

## Automotive Sector

- Consumer sentiment/demand sharply rising.
- Market pressures/price instability have supported switch to lower and/or more predictable fueling costs for their consumers.
- Every major OEM (not counting growing number of EV start-ups) are electrifying their product lines.
- Performance & driving experience plus “ecosystem opportunities” seen as new LOBs for OEMs.

# The Grid of the Past


## Poles & Wires

- Centralized Generation Plants
- Transmission System
- Distribution System
- Point of Load/Customer Delivery

## Load Growth

- Customer Requests
- Capacity Planning & Forecasting
- Slow, Steady & Predictable

## Cost & Reliability

- Generation Fleet (heavy investment & long asset life)
- Predictable Load Shapes
- Focus on consistent performance & system optimization.

## Transportation Electrification

- Relatively small percentage of early adoption.
- Home-based charging predominant.
- DCFC access primary limited to private networks.
- Predominance of light-duty vehicles with spread out charging infrastructure for C&I applications.

# The Grid of the Future (for EVs)


## Retail & Residential

- Great [Changing] Expectations (Value & ROI)
- What's a differentiator?
- Dryers, Dryers Everywhere!
- When is a car, more than a car?

## Fleet Electrification

- I'll take your dryer and raise you an electric boiler!
- The paradigms they are a shifting!
- Let's all CLUSTER together.
- Who get's stuck with the check?

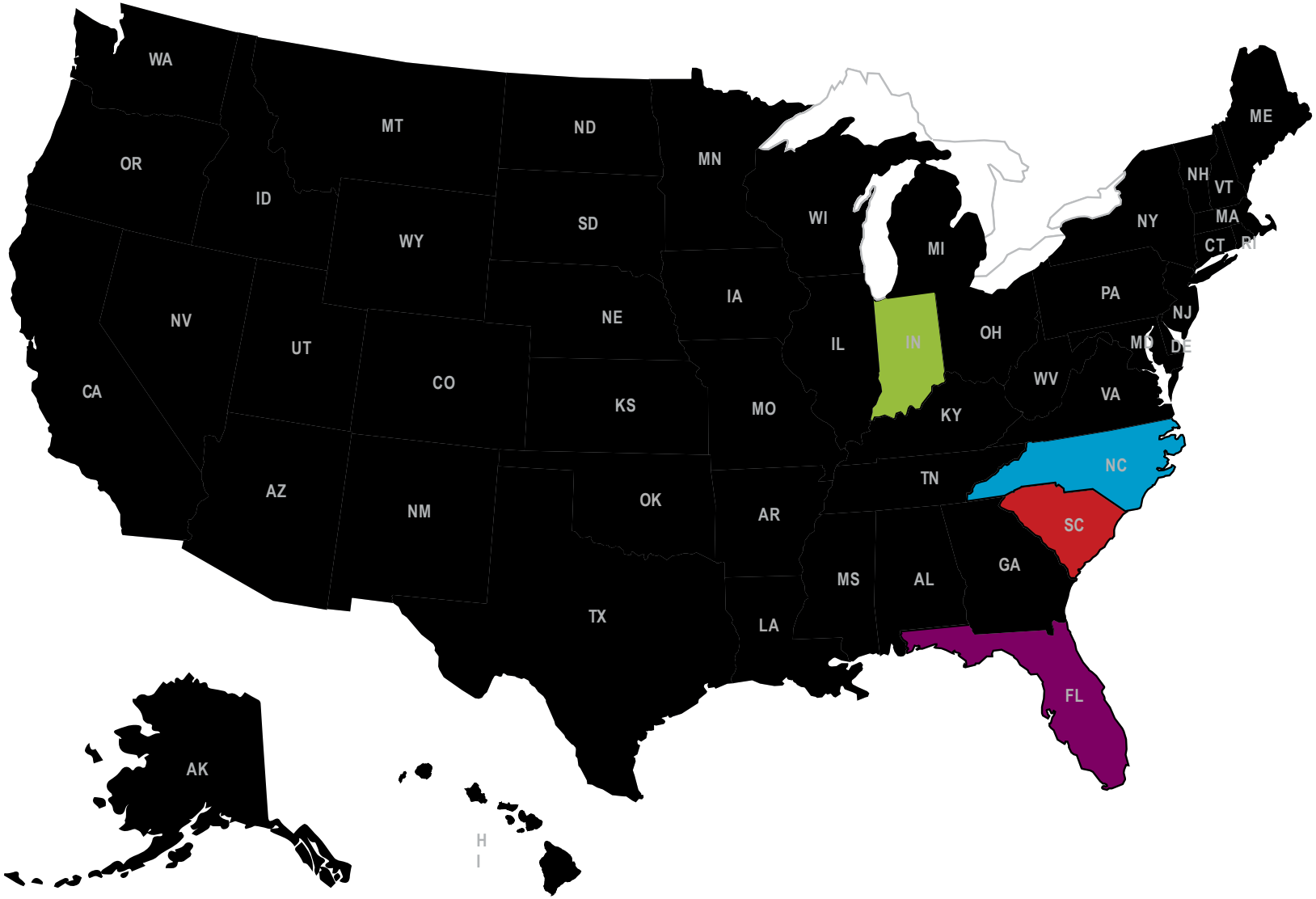
## Resiliency

- "Dirty" or Variable Load
- Internet of Things (IoTs)
- Pumping Electrons (vs Fluids)
- Critical Loads & Critical Events

## Balancing the Grid

- The landscape is changing…FAST!
- Customer needs, wants, & desires.
- One Way Flow vs. Air Traffic Control
- Balancing the pace of sea change on a fixed budget.

# Duke Energy Current EVSE Program Offerings

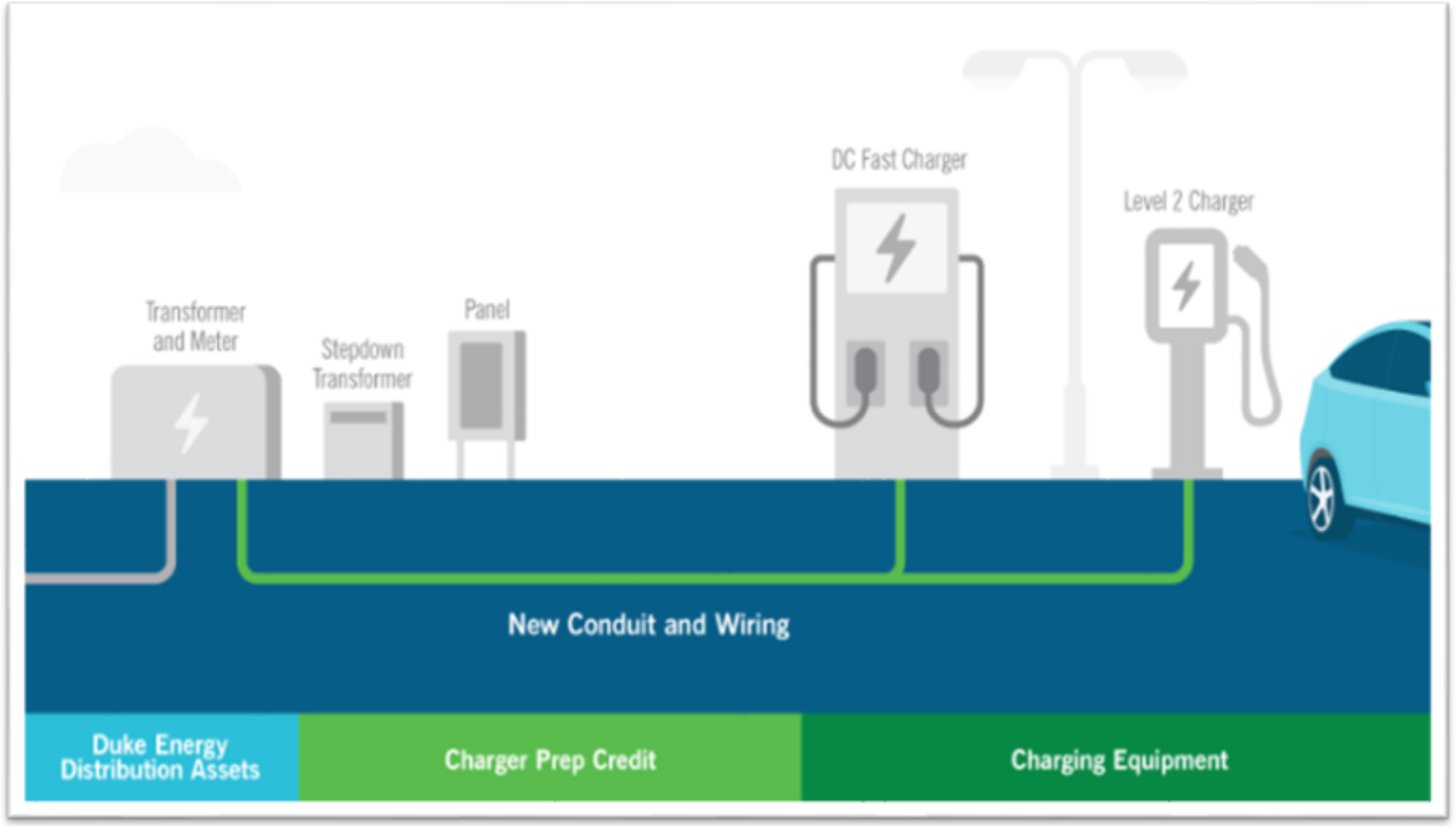



- NC
  - ✓ Charger Prep
  - ✓ HB Charger Prep
  - ✓ Park & Plug
- SC
  - ✓ Park & Plug
- Florida
  - ✓ Off-Peak CC
  - ✓ Commercial Charger Rebate
  - ✓ Park & Plug
- Indiana
  - ✓ Commercial Charger Rebate
  - ✓ Charger Solution (Com/Res)
  - ✓ FleetAdvisory

# Current North Carolina EVSE Program Offerings

## The How & Why:

- Charger Prep Credit (builder/residential/comm) is the primary support currently available.
- Supports added cost of infrastructure for residential through DCFC applications:
- The goals of this program is to breakdown cost barriers, simply access and support EVSE adoption across all communities.
- We are working on a suite of programs to help manage EV charging loads as they grow, so they are system beneficial.
- Additional pilot programs represent foundational deployments that will help us understand grid impacts of various EVSE use cases.
- These data/learning will be shared with our government partners to inform & align on programs like NEVI for example.




- Up to $1,133 for residential chargers (existing home) & $150 new construction for builders.
- $725 to $30,347 per charger depending on this estimated duty cycle and size of the charging unit.
- Assistance finding vetting contractors if needed.

# Current Grid-Edge Pilot Programs



## F-150 Lightning V2G Pilot

- Designed to leverage V2G DR during peak periods for leased Lightnings
- Estimated $300/yr. to participating customer
- Simplified process by selecting 1 manufacturer & model
- Aligned with market partner as ~80% of Lightnings are leased (vs. purchased)

## Micro-Grid Fleet Depot

- Collaboration of Utility (Duke), EVSE Market Provider (Electrada) & Major MHD OEM (Daimler NA).
- "Will provide commercial grade charging experience for users while reinforcing reliability, clean power and optimization by integrating with solar, storage and microgrid controls software applications."
- Primary goals are to create model to support accelerated MHD adoption & better understand real-time impacts to the grid.

# Conclusions

- Transportation Electrification provides an opportunity to:
  - ✓ Meet State decarbonization goals.
  - ✓ Assist in the reduction of GHG (Green House Gas) emissions.
  - ✓ Provide overall bulk electric system benefit with the proper rate structures and managed charging programs in place.

# References


- https://afdc.energy.gov/fuels/electricity_benefits.html
- https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions
- https://www.transportation.gov/rural/ev/toolkit/ev-benefits-and-challenges/community-benefits#:~:text=According%20to%20the%20American%20Lung,416%2C000%20lost%20work%20days%20annually.
- https://www.bls.gov/opub/btn/volume-12/charging-into-the-future-the-transition-to-electric-vehicles.htm
- https://energycenter.org/thought-leadership/blog/state-electric-vehicle-adoption-us-and-role-incentives-market
- https://www.energy.gov/eere/sustainable-transportation
- https://www.jdpower.com/cars/shopping-guides/5-ways-electric-cars-are-better-for-the-environment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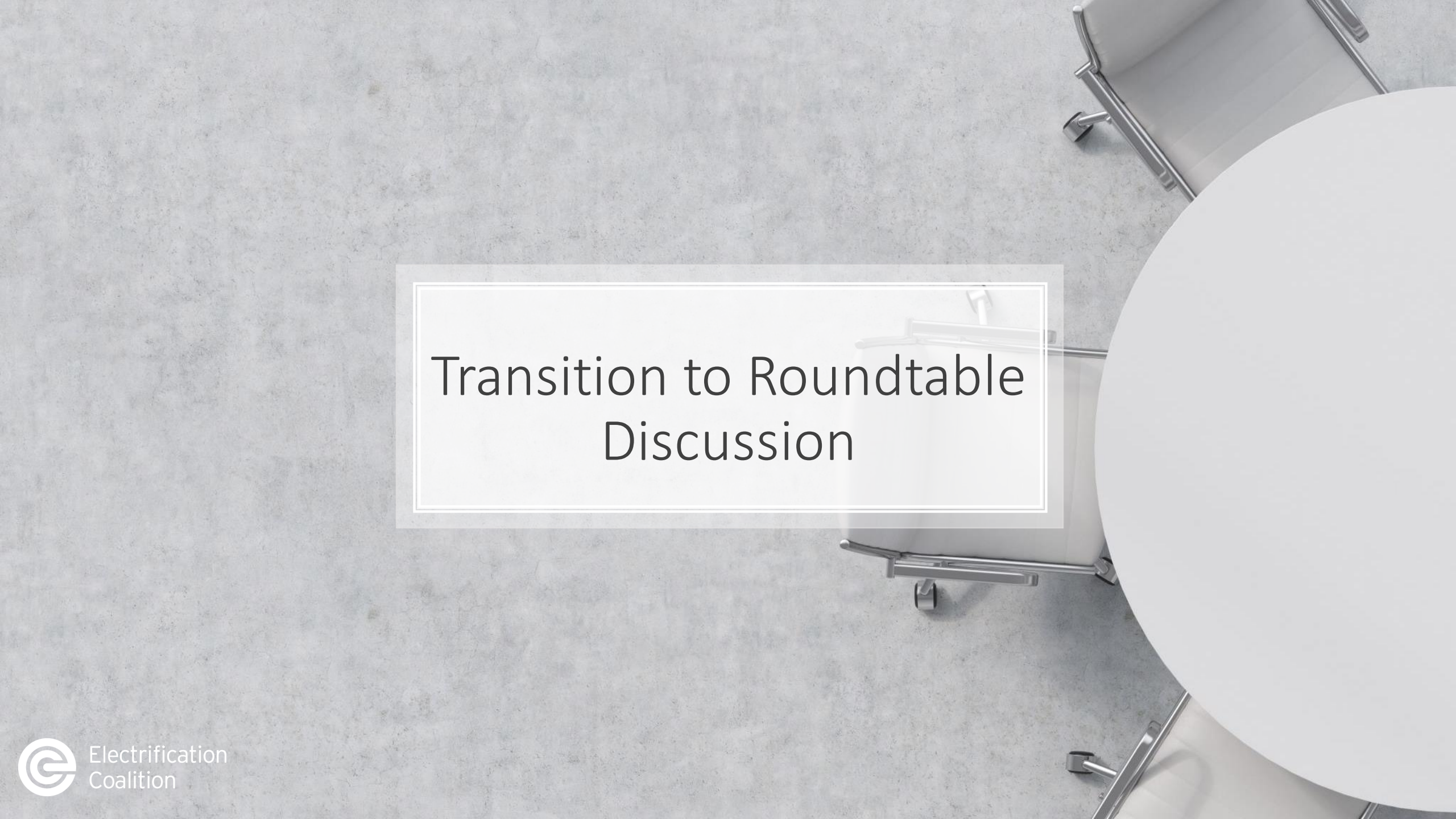
# Transition to Roundtable Discussion



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# Roundtable Discussion

- What are the challenges to deploying charging infrastructure in rural NC?
- What resources do you think are needed to support expanding charging infrastructure, applying for funding, etc.?
- What are best practices or successes on charging infrastructure in your community?

- Who in your community should be consulted to apply/partner in terms of the federal funding?
- How are you engaging city planning departments? Have you tapped the resources in your own community and how are you continuing to engage and ensure that local officials are involved?


# Roundtable Discussion

- What policies and programs are needed to ensure rural NC can take advantage of federal funding or deploy more charging infrastructure?
  - How can we educate people around incentives that benefit all in rural communities? And not just disproportionately higher income households
  - How can we ensure that low-income households, MUD and apartments are included?

- What are workforce development needs?

# Closing Question

After listening to these panels, what brings you hope or excitement within these sectors? (your biggest takeaway)?

# Federal Funding Opportunities

## EV Funding Finder and CFI Grant

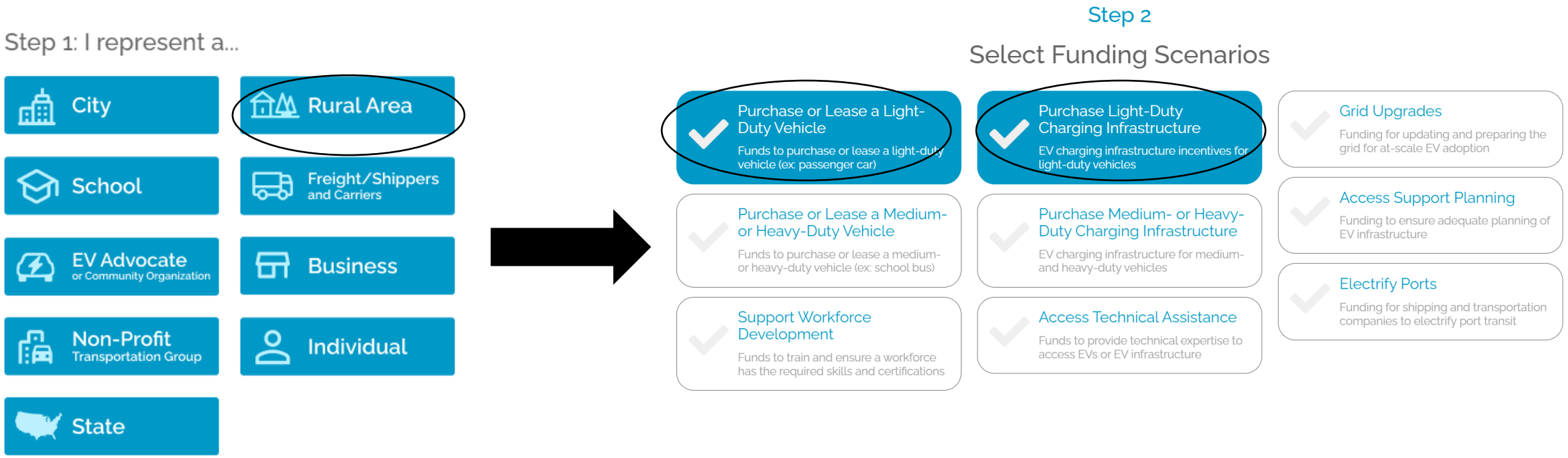
Electrification Coalition


# The EV Funding Finder

- Capitalizes on unprecedented investment in transportation electrification
- User-friendly tool to identify federal transportation electrification funding opportunities
- Answers the question, “Where is the money, and how do I get it?"
- Supports efficient, effective, and equitable deployment of funds

electrificationcoalition.org/ev-funding-finder/

# Using the Tool

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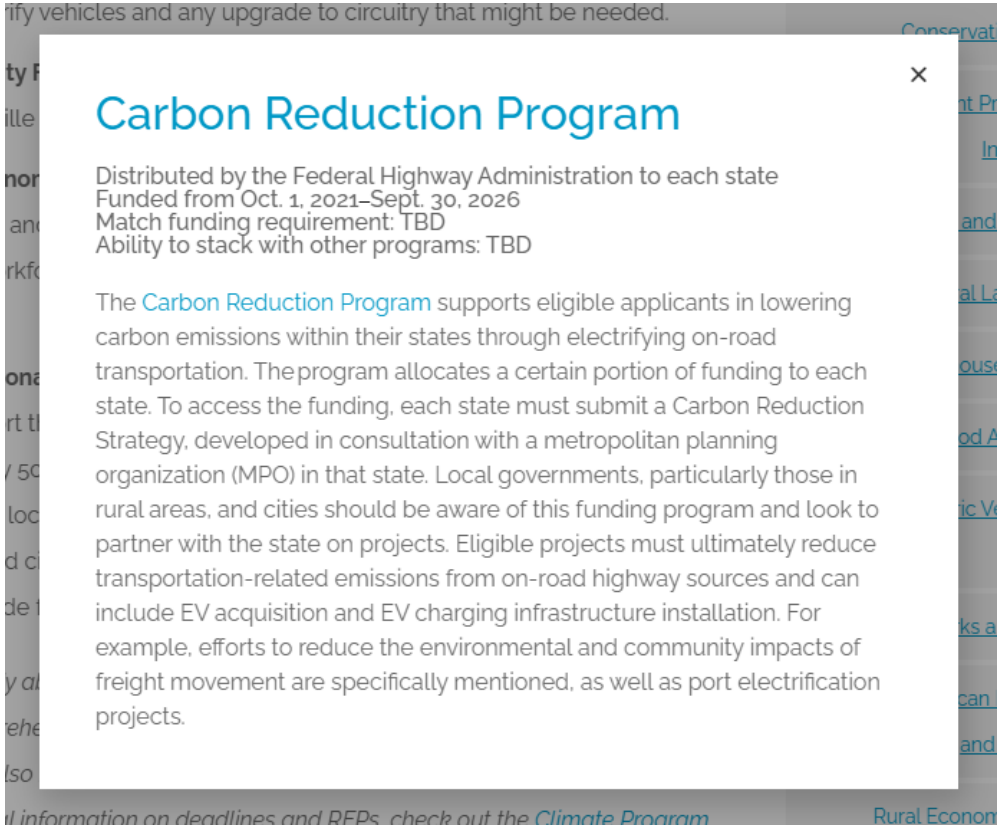
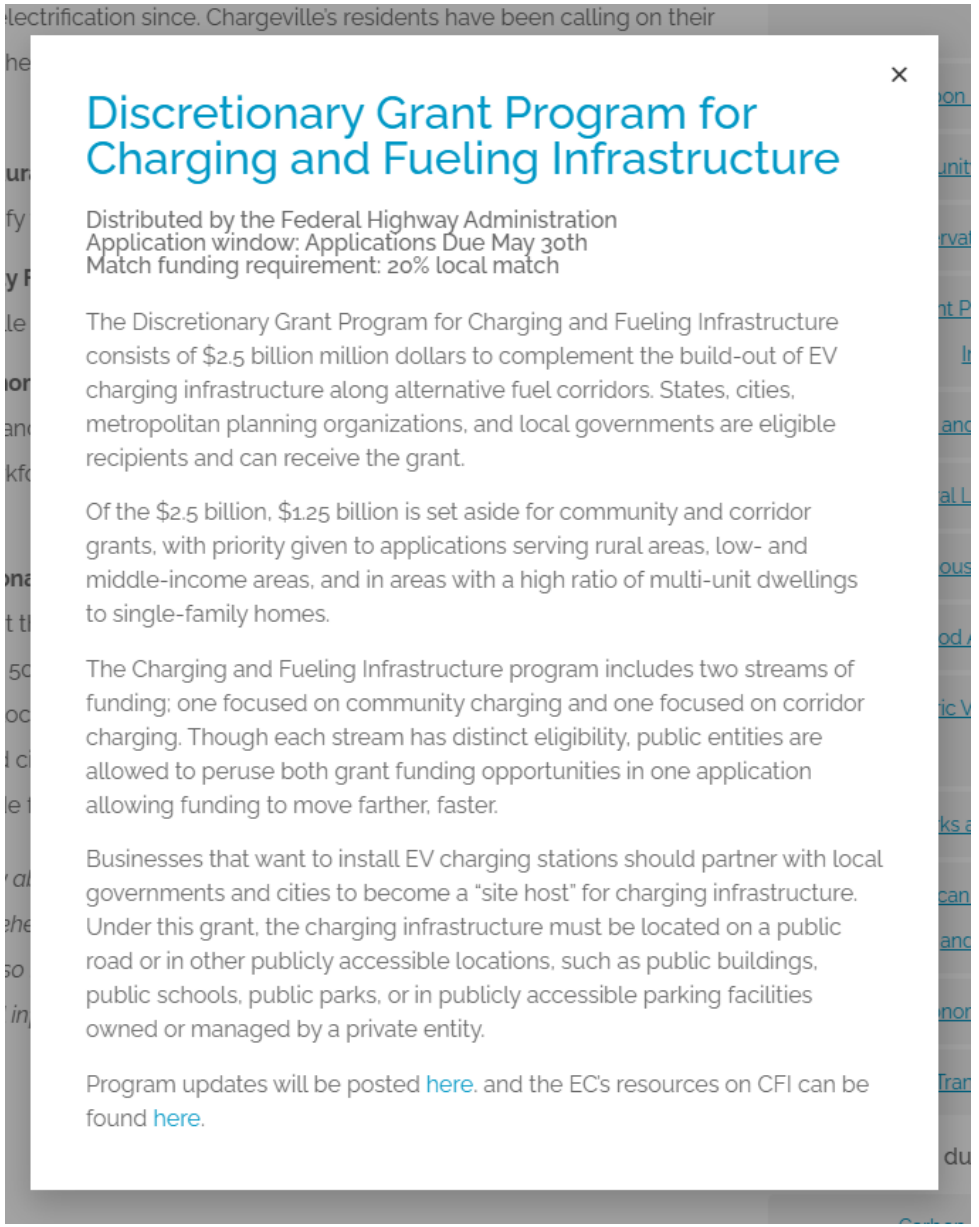
# Results



## Carbon Reduction Program

Distributed by the Federal Highway Administration to each state
Funded from Oct. 1, 2021–Sept. 30, 2026
Match funding requirement: TBD
Ability to stack with other programs: TBD

The Carbon Reduction Program supports eligible applicants in lowering carbon emissions within their states through electrifying on-road transportation. The program allocates a certain portion of funding to each state. To access the funding, each state must submit a Carbon Reduction Strategy, developed in consultation with a metropolitan planning organization (MPO) in that state. Local governments, particularly those in rural areas, and cities should be aware of this funding program and look to partner with the state on projects. Eligible projects must ultimately reduce transportation-related emissions from on-road highway sources and can include EV acquisition and EV charging infrastructure installation. For example, efforts to reduce the environmental and community impacts of freight movement are specifically mentioned, as well as port electrification projects.



## Discretionary Grant Program for Charging and Fueling Infrastructure

Distributed by the Federal Highway Administration
Application window: Applications Due May 30th
Match funding requirement: 20% local match

The Discretionary Grant Program for Charging and Fueling Infrastructure consists of $2.5 billion million dollars to complement the build-out of EV charging infrastructure along alternative fuel corridors. States, cities, metropolitan planning organizations, and local governments are eligible recipients and can receive the grant.

Of the $2.5 billion, $1.25 billion is set aside for community and corridor grants, with priority given to applications serving rural areas, low- and middle-income areas, and in areas with a high ratio of multi-unit dwellings to single-family homes.

The Charging and Fueling Infrastructure program includes two streams of funding; one focused on community charging and one focused on corridor charging. Though each stream has distinct eligibility, public entities are allowed to peruse both grant funding opportunities in one application allowing funding to move farther, faster.

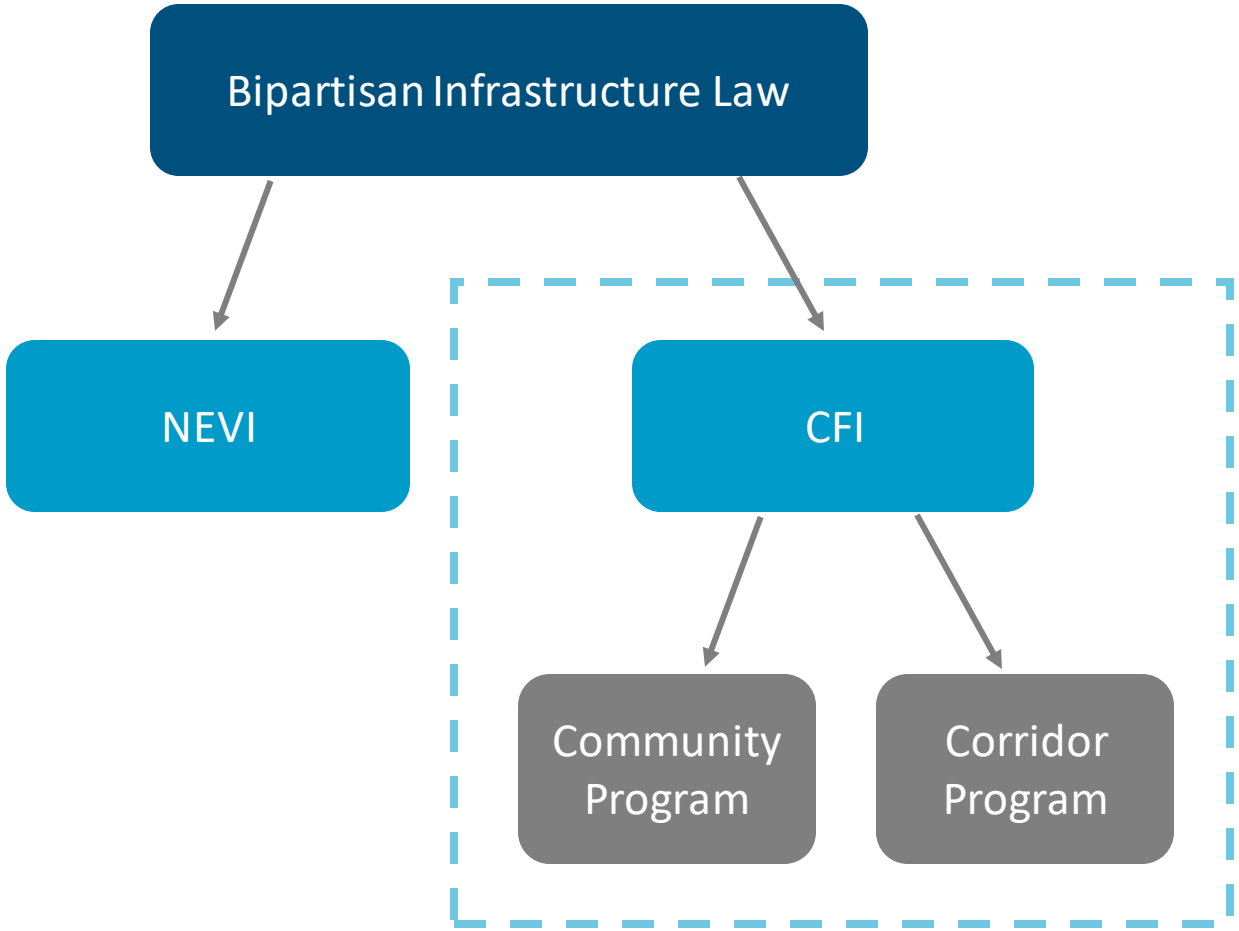
Businesses that want to install EV charging stations should partner with local governments and cities to become a "site host" for charging infrastructure. Under this grant, the charging infrastructure must be located on a public road or in other publicly accessible locations, such as public buildings, public schools, public parks, or in publicly accessible parking facilities owned or managed by a private entity.

Program updates will be posted here, and the EC's resources on CFI can be found here.

Electrification Coalition

# Charging and Fueling Infrastructure Grant Program (CFI)

- Supplement, not supplant, necessary private sector investment
- Facilitate broad public access to a national charging and alternative fuel infrastructure network
- Implement Justice40 objectives
- Advance job quality, workforce development, and workforce equity
- Reduce greenhouse gas and vehicle-related emissions



# Eligible Applicants

| Eligible Applicants | Community Program | Corridor Program<br>*Must partner with a private entity |
|---|---|---|
| A State or political subdivision of a State | Yes | Yes |
| A metropolitan planning organization | Yes | Yes |
| A unit of local government | Yes | Yes |
| A special purpose district or public authority with a transportation function, including a port authority | Yes | Yes |
| An Indian Tribe | Yes | Yes |
| A territory of the United States | Yes | Yes |
| An authority, agency, or instrumentality of, or an entity owned by, 1 or more entities as listed above | Yes | Yes |
| A group of entities as listed above | Yes | Yes |

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# Funding Allocation Timeline

- The $2.5 Billion will be awarded over the span of five years (Until FY26)

- FY22-23: $700 Million
  - Community program: $350 for community charging
    - Minimum anticipated award: $500,000
    - Maximum award of $15M
  - Corridor program: $350 million for AFCs
    - Minimum anticipated award: $1M
    - No maximum

- Applications due May 30, 2023

- Next funding cycle expected 2024


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# Key Priority to Rural Areas

- Priority for projects that expand access to EV charging infrastructure within rural areas and low- and moderate-income neighborhoods
- Focus on the extent to which the project contributes to geographic diversity among eligible entities
  - Achieving a balance between urban and rural communities
- Focus on the extent to which the project meets current or anticipated market demands for charging and fueling infrastructure

# Competitive Application Tips

- **Tell Your Story** – Focus not just on the location of chargers, but how they will serve and be used by the community
- **Partnering and Scalability** – Consider what public, private, and non-profit partners can be involved in the application and approach
- **Be Clear on Timelines and Implementation Plans** – Applicants may need to secure private charging entities, site locations, or other project-specific details *after* the grant application is awarded
- **Leverage Community Engagement and Educational Engagement Opportunities** – up to 5% of funding for Community Program projects can be directed to EV and charging educational programming

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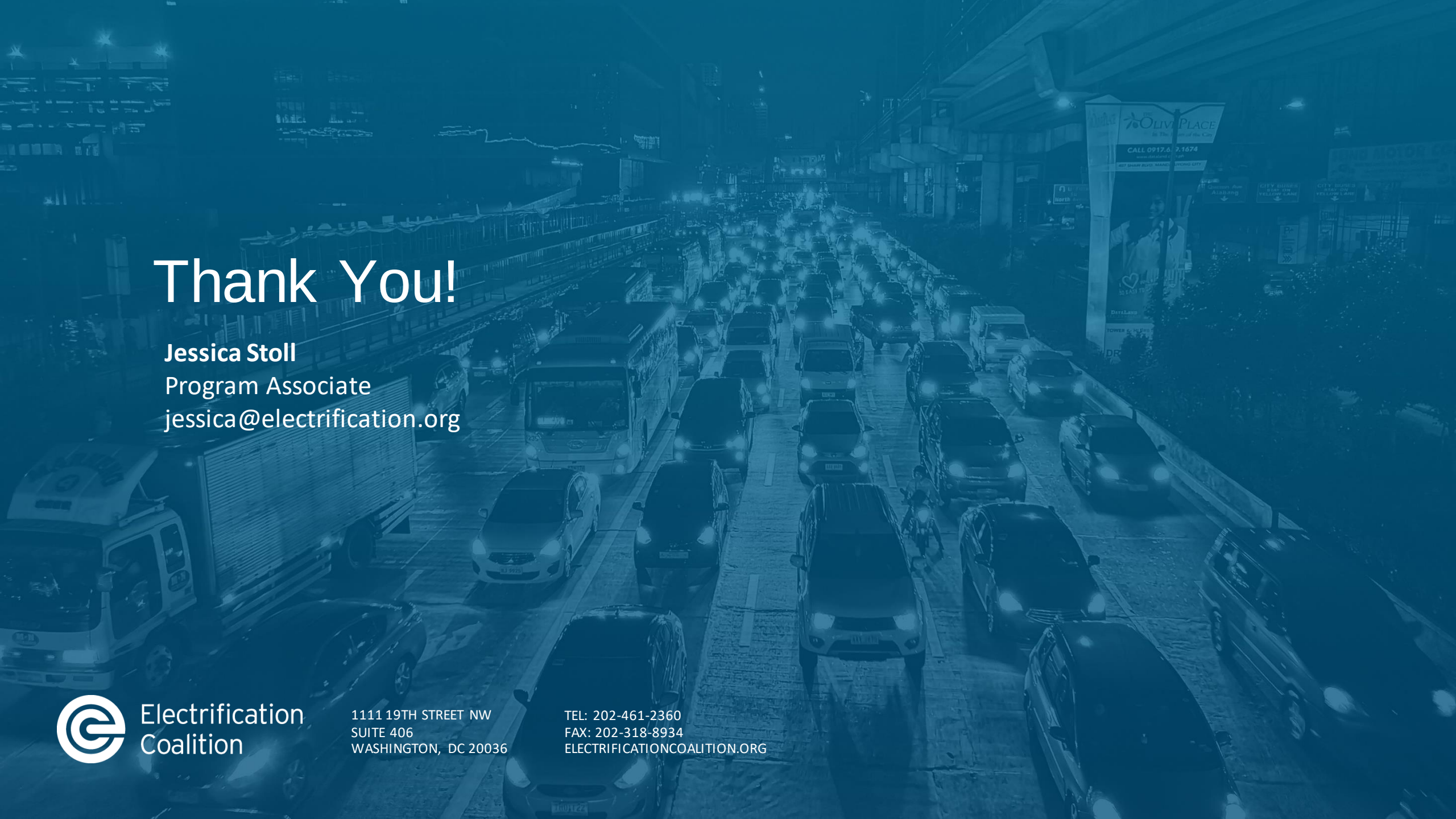
# EC Support

- On-call technical support
- Letter of support
- Review part of the application
- Partner on community engagement



# Thank You!

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# Pulling a Project Together: Available Technology and Implementation

Panelists:

# Complementary Framework

Training, Outreach, Partnerships

Information & Tools

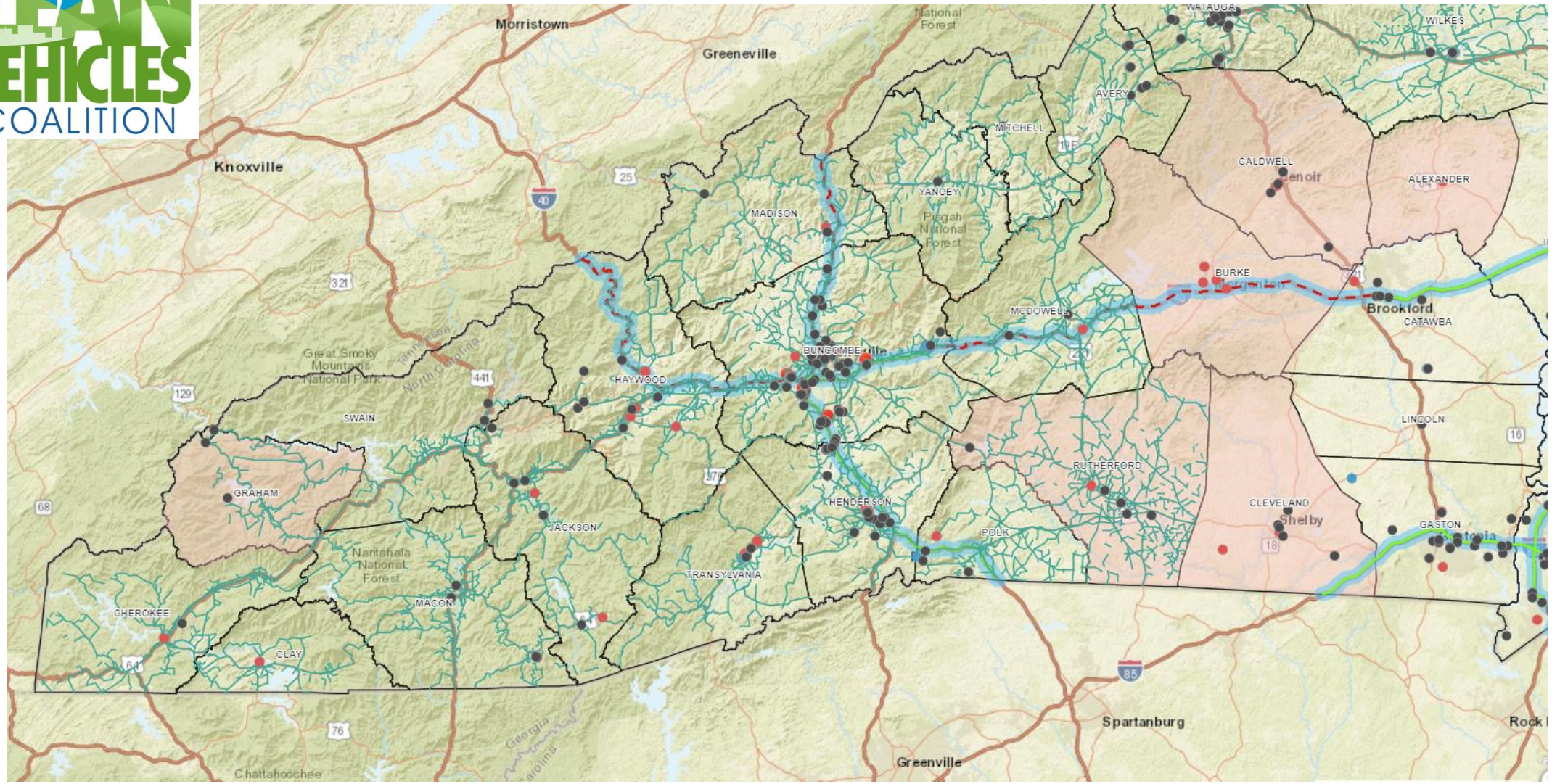

Competitively Awarded Financial Assistance

Technical Assistance

**Clean Cities coalitions are locally based with the ability to tap national resources.**

LAND OF SKY CLEAN VEHICLES COALITION

LAND OF SKY
CLEAN VEHICLES
COALITION



# Native Electric


Katie Tiger, EBCI Air Quality Supervisor

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Donnie Owle, CBC Service Manager

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# Background on Native Electric

# EBCI AQP & CBC Partnership

- Biodiesel Production facility – 2012
  - Funded by EPA
  - Used cooking oil from Qualla Boundary
  - CBC school bus fleet runs on B20 blend (20% biodiesel, 80% diesel)

# CBC/EBCI Going Electric

- Received assistance from Land of Sky Clean Vehicles Coalition
- Applied to the NCDEQ Division of Air Quality from VW Settlement funds
- Applied in 2019
- Received notification of award late 2020

# Why an Electric School Bus?

- Improve air quality by reducing diesel emissions
- Provide a healthier riding environment for the children by reducing exposure to PM and NOx (linked to asthma)

# First Electric School Bus in North Carolina!

- Funded by NCDEQ Division of Air Quality from VW Settlement funds
- March 15, 2022, E-Bus Celebration
- EPA Administrator Regan and NC Governor Cooper


# Youth Engagement

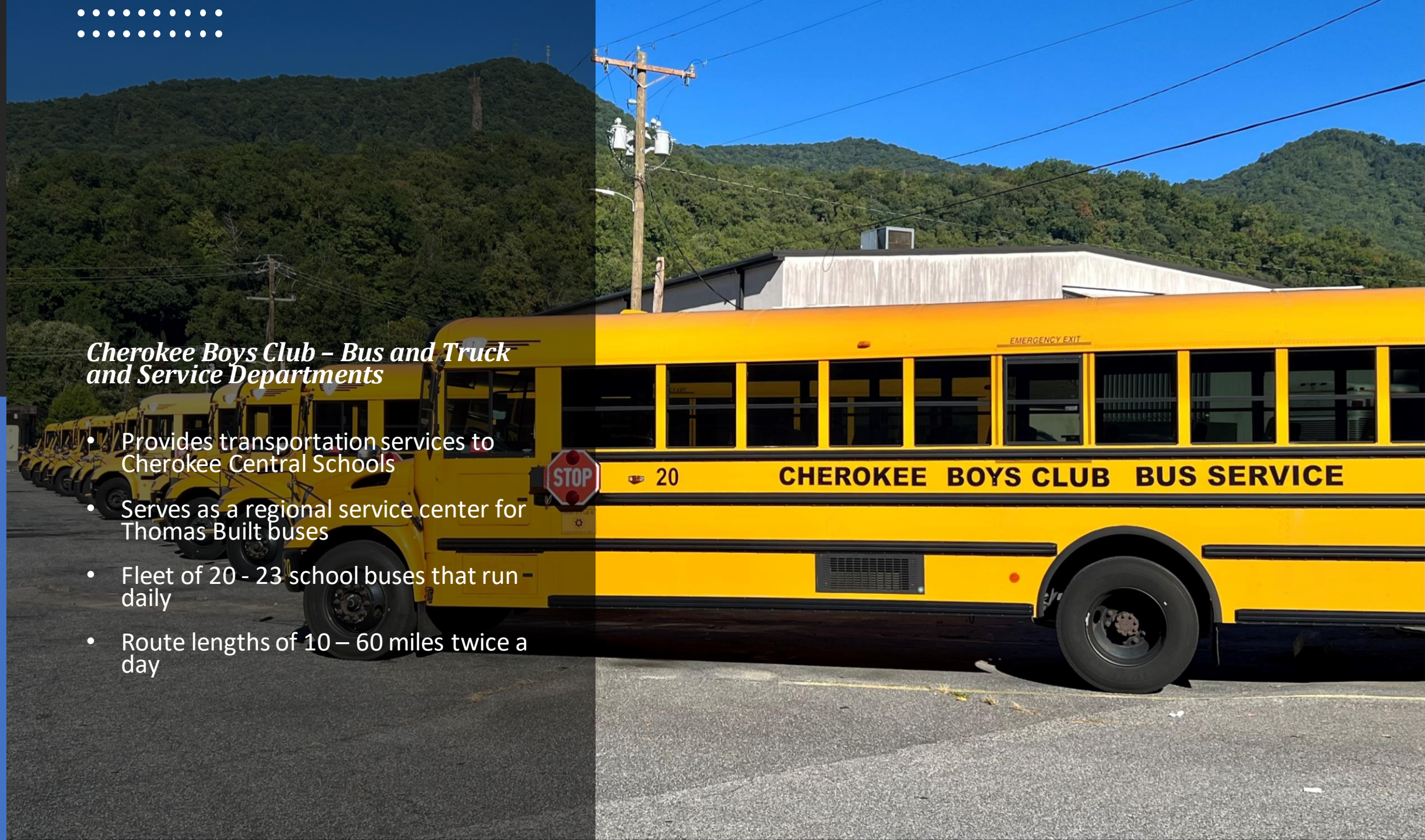
- EBCI AQP taught an electric bus lesson with CCS 5th graders
- 5th graders taught same lesson to pre-K class

# Cherokee Boys Club, Inc.

- 1932 – Cherokee Boys Farm Club was established
- 1964 – EBCI incorporated the Cherokee Boys Club
  - Non-profit, self-supporting Tribal Enterprise
- CBC Departments:
  - Bus and Truck
  - Service
  - Cherokee Children's Home
  - Ray Kinsland Leadership Institute
  - Childcare Division
  - Construction and Facilities
  - Administration and Finance

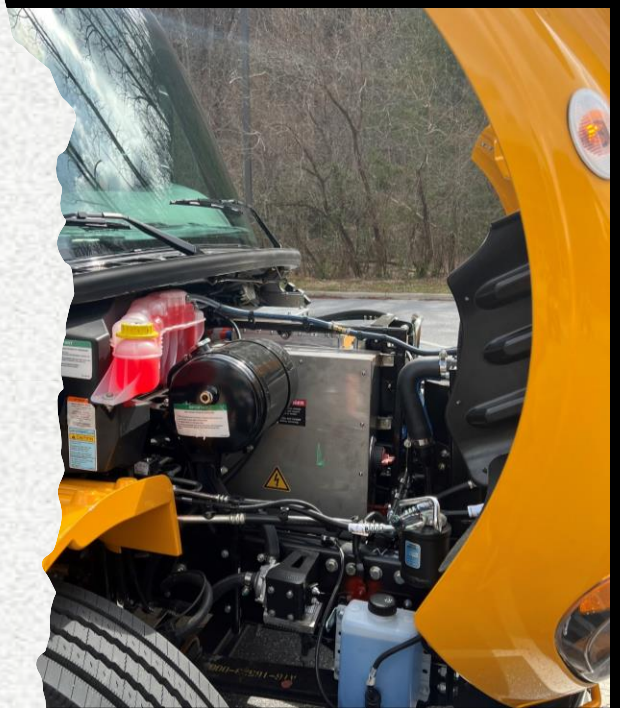
## *Cherokee Boys Club – Bus and Truck and Service Departments*

- Provides transportation services to Cherokee Central Schools
- Serves as a regional service center for Thomas Built buses
- Fleet of 20 - 23 school buses that run daily
- Route lengths of 10 – 60 miles twice a day



# Most Noticeable Benefits of ESB

- Monthly diesel fuel cost: $800 - $1,000
- Monthly electric cost of ESB: $400
- Children get a healthier riding environment
- Reduced maintenance
- Safety features
- Terrain performance – regenerative braking
- Range is about 130 miles in the mountains

# Future CBC Fleet Electrification Plans

- EPA DERA grant – EBCI, CBC, Duke Energy, NCCETC
  - 4 ESB's expected **ANYDAY**
  - V2G charging, Duke Energy's pilot project
- ARP funding (Agelink Childcare Facility)
  - 1 additional ESB and charger expected **ANYDAY**
- Solar canopy bus depot
  - Cherokee Preservation Foundation grant received
  - Project design phase
- Apply for **14 - 17** more ESB's to fully electrify CBC school bus fleet.


SGI - ᏫᎾᎩ

Thank You!



# Questions for Donnie?


# Closing Remarks

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