



ELECTRIC VEHICLE EQUITY ROUNDTABLE

MAY 25TH 10:00 AM - 12:00 PM






SEE EA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Equitably Advancing Electric Transportation in South Carolina

William D. Bryan, Ph.D.
Director of Research
wbryan@seealliance.org



The Southeast Energy Efficiency Alliance (SEEA) promotes energy efficiency as a catalyst for economic growth, workforce development and energy security across 11 southeastern states including Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

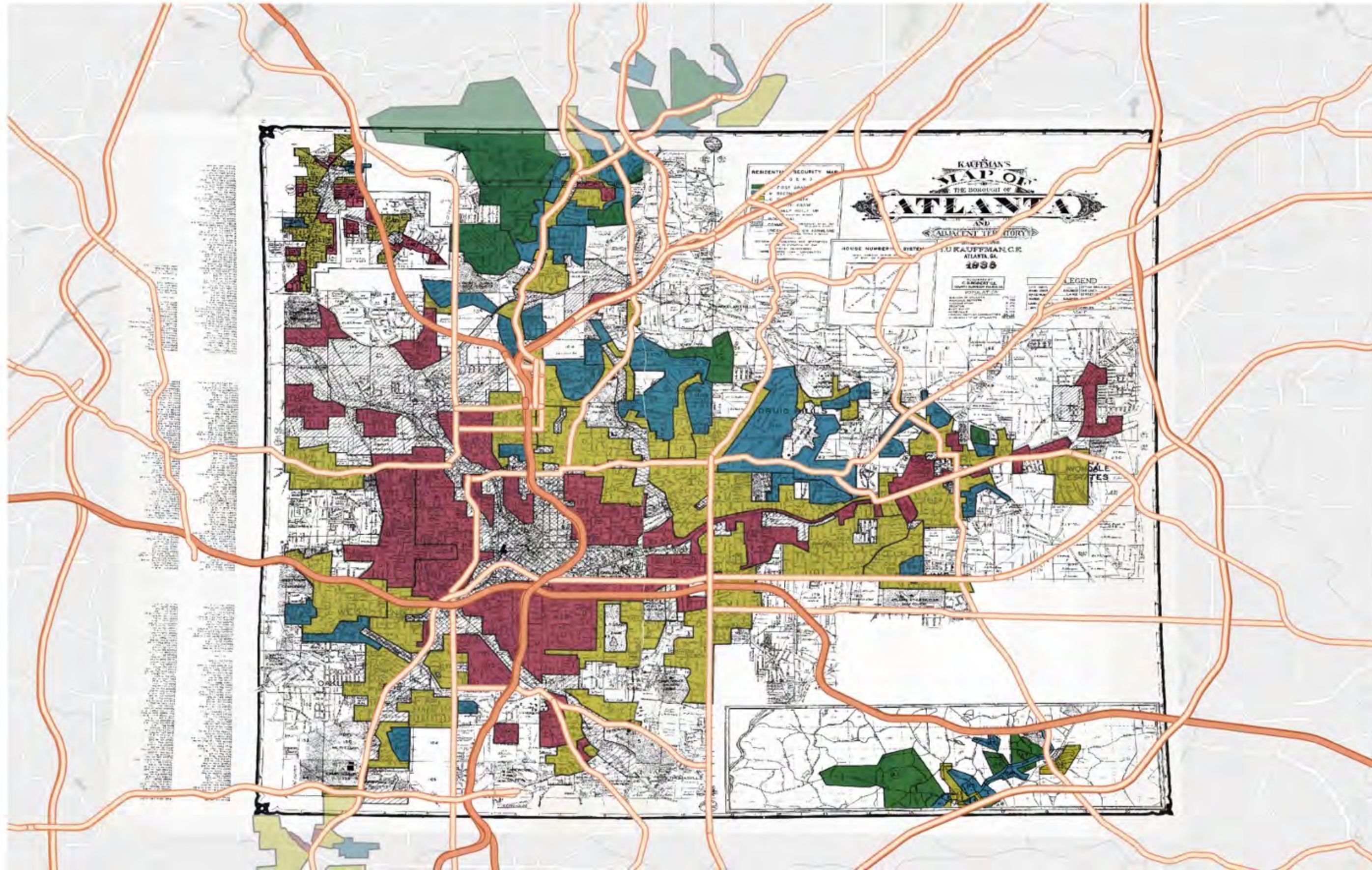
Advancing South Carolina's Electric Transportation: A GIS-based StoryMap



Elements of equitable electric transportation

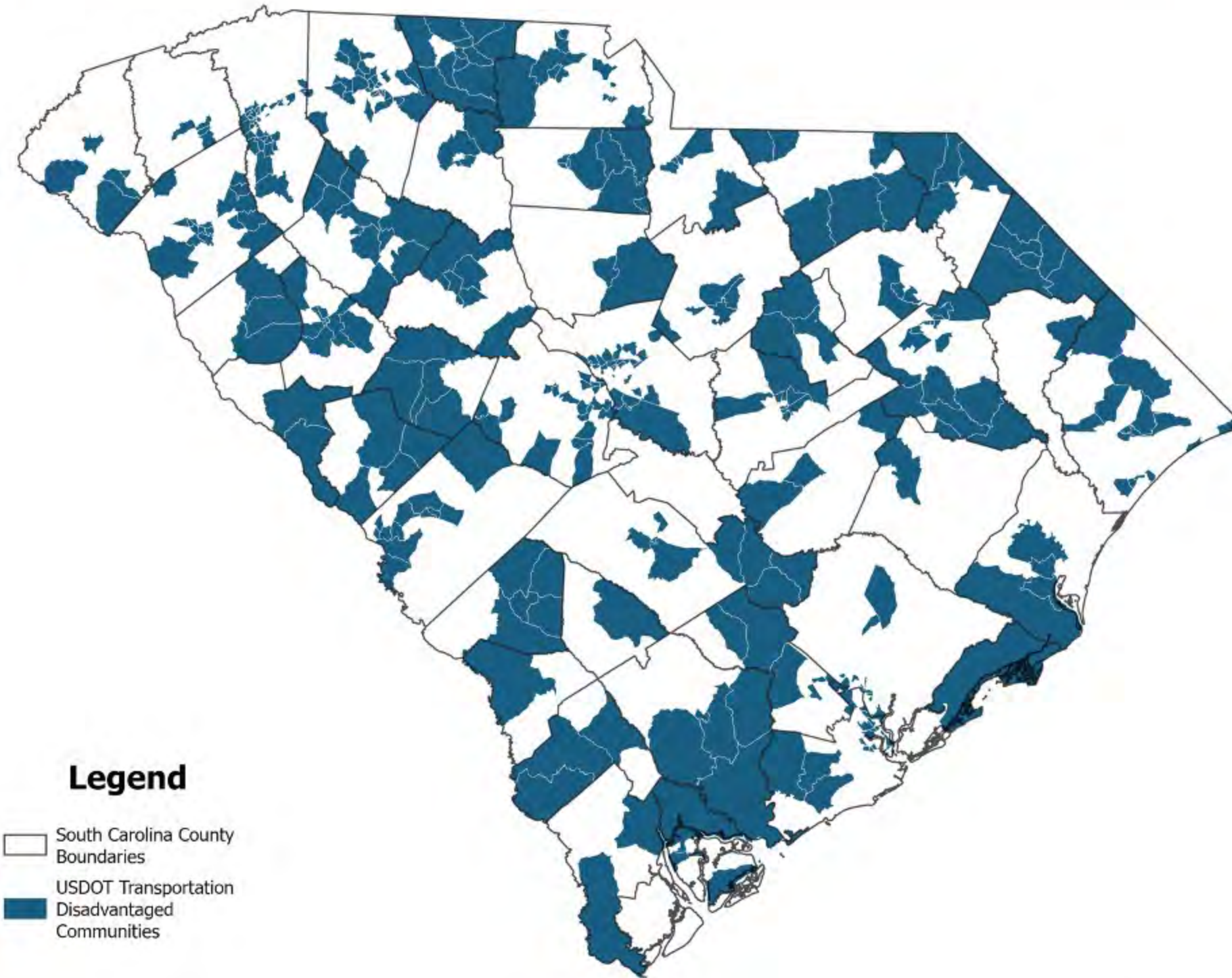
- **Distributional justice** relates to the fair distribution of resources, benefits, and burdens across society and the transportation system.
- **Procedural justice** relates to fairness in decision-making processes, especially those that develop policies and programs that impact people's ability to access healthy and secure transportation services. It requires that all affected communities have a voice in the decision-making process.
- **Restorative/intergenerational justice** relates to the acknowledgement of historical harms and the complex circumstances faced by front-line communities. Equitable decisions must acknowledge and account for these circumstances and prior harms.

Transportation inequities are rooted in historical policies and practices



South Carolina's "transportation disadvantaged" communities

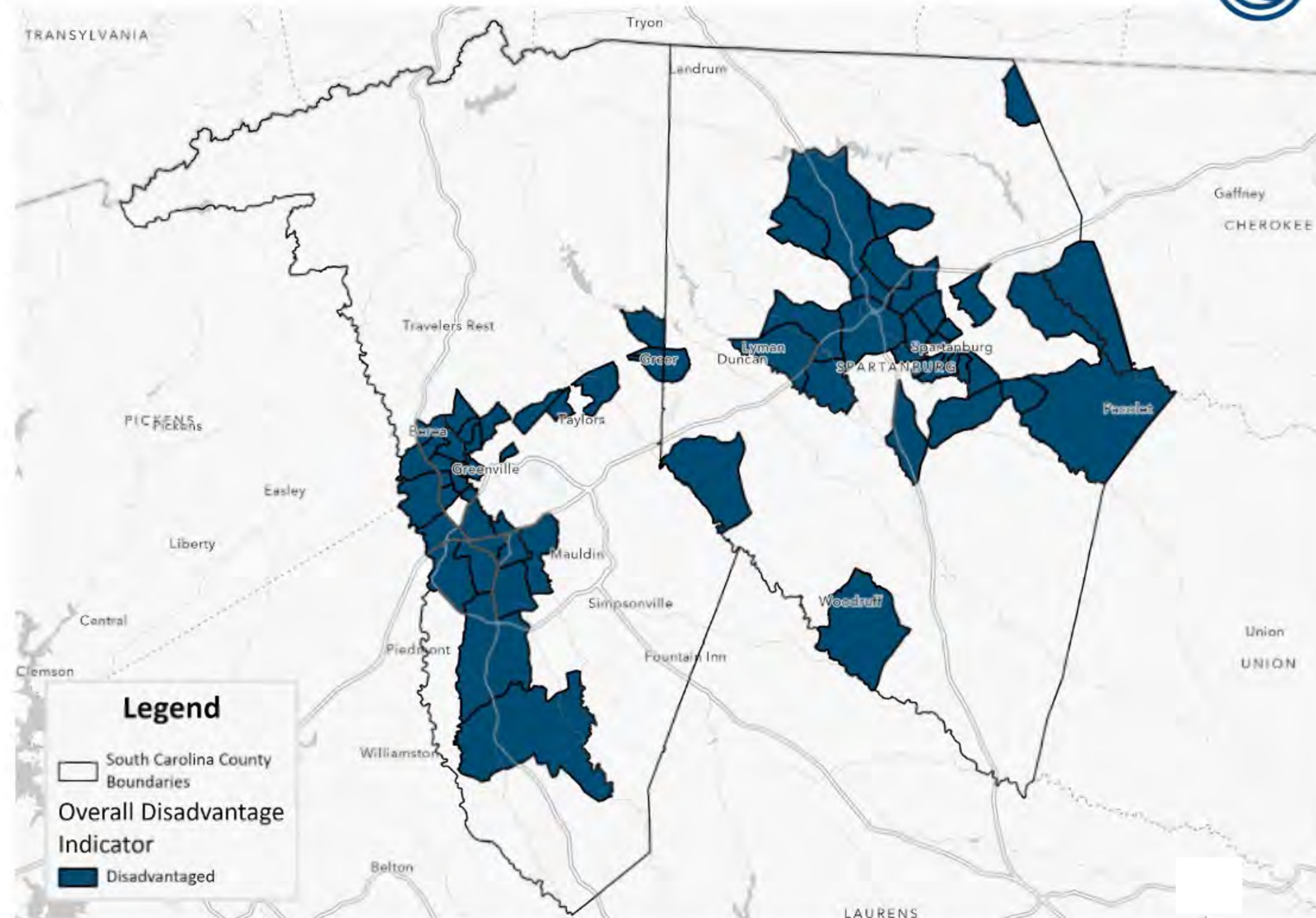
USDOT considers **378 census tracts** in South Carolina to be disadvantaged and eligible for J40 investments, as shown in the map below.



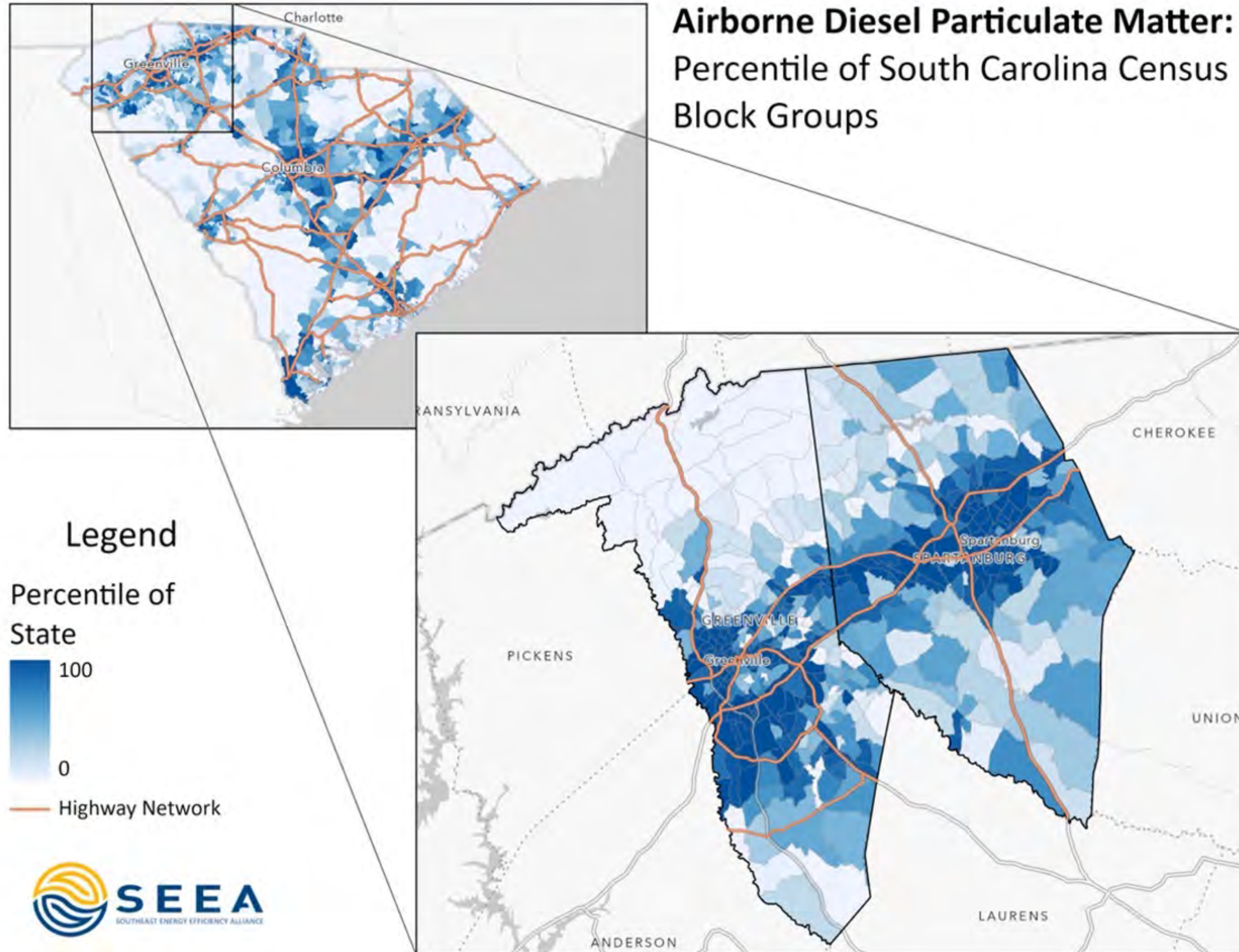
“Transportation disadvantaged” communities in the upstate

Spartanburg and Greenville Counties lead the state in the number of transportation disadvantaged census tracts (66).

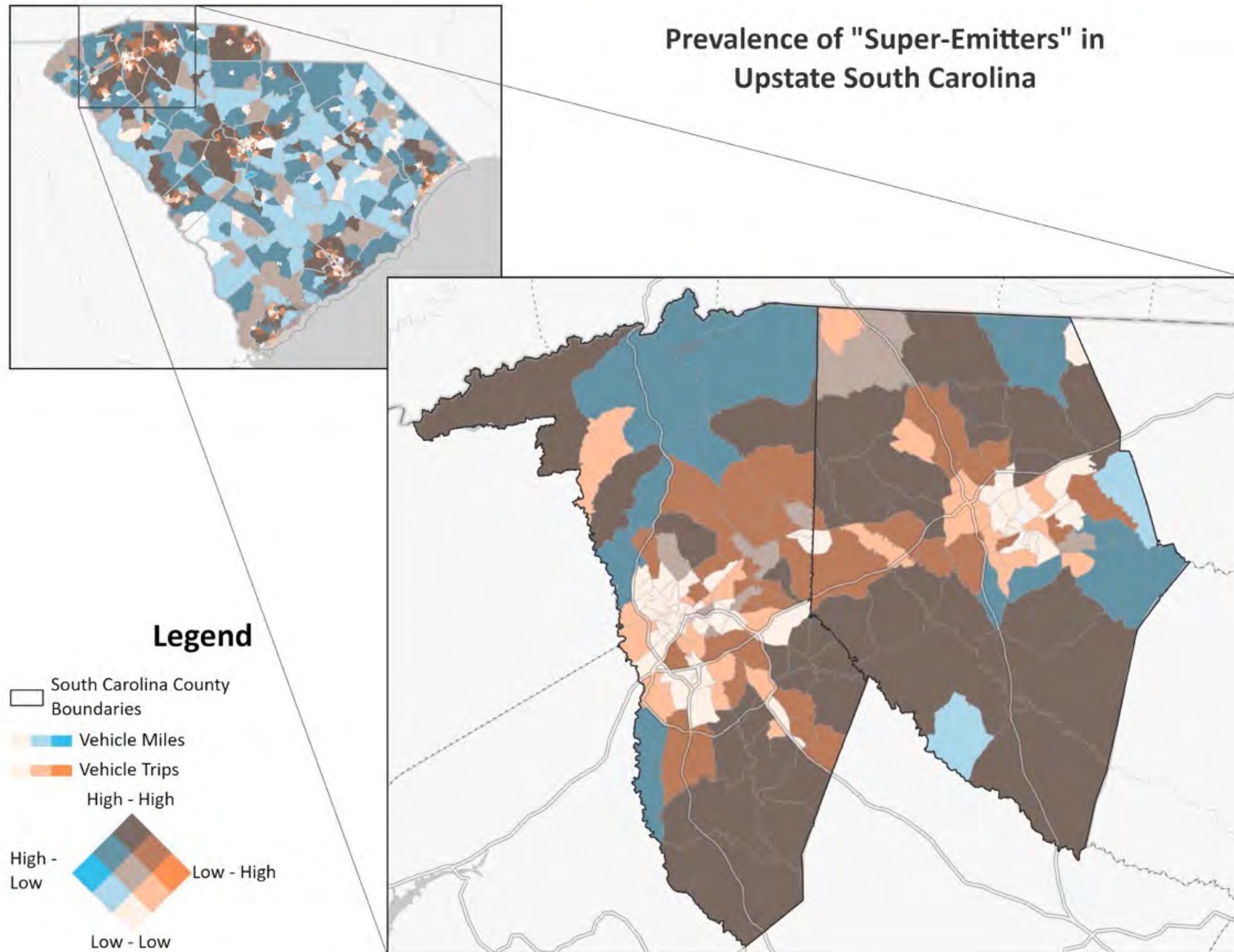
"Transportation Disadvantaged" Communities in Upstate South Carolina



Electric transit equity is largely an issue of emissions

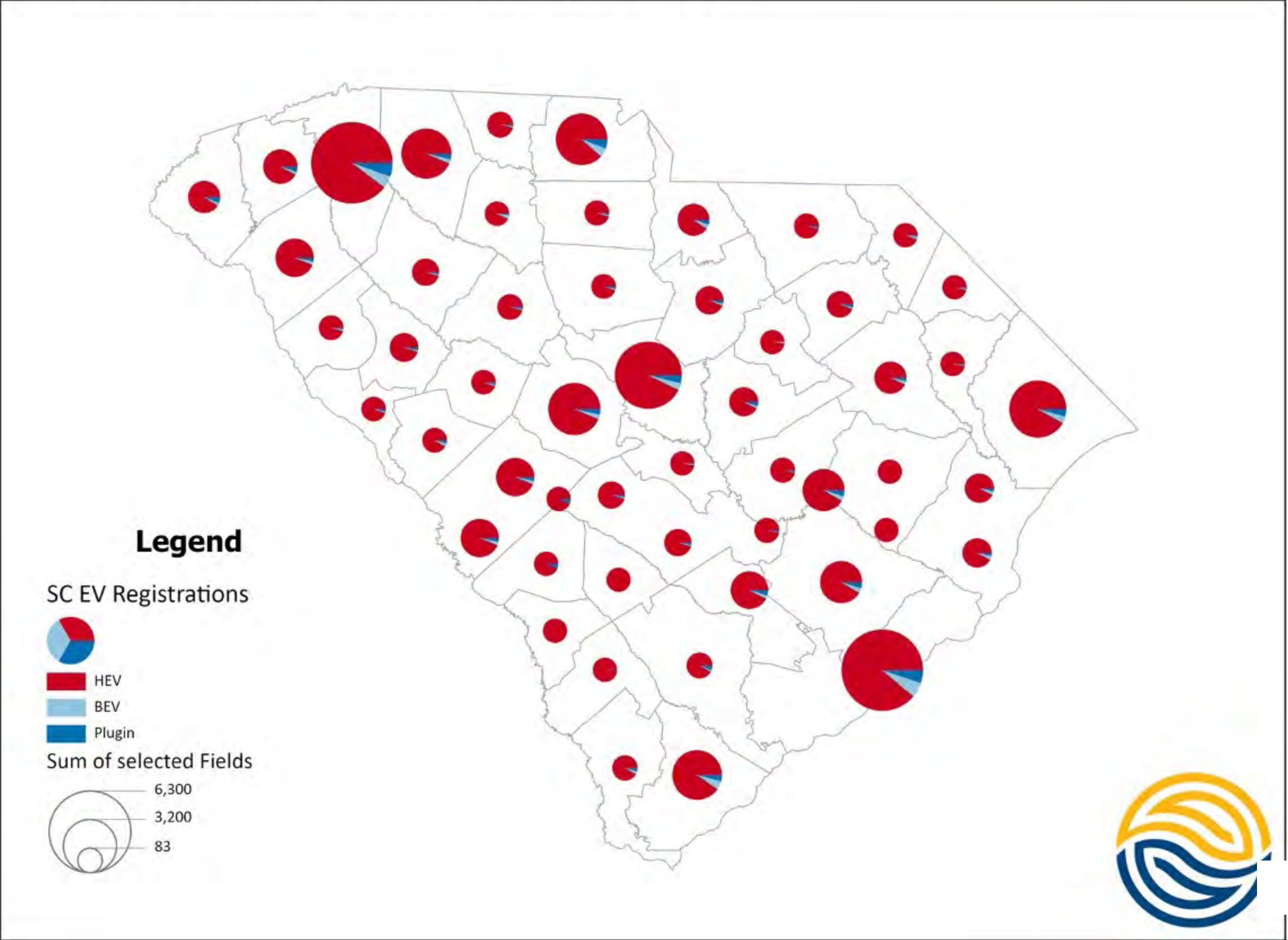


...a consequence of prevailing commuting patterns and freight networks

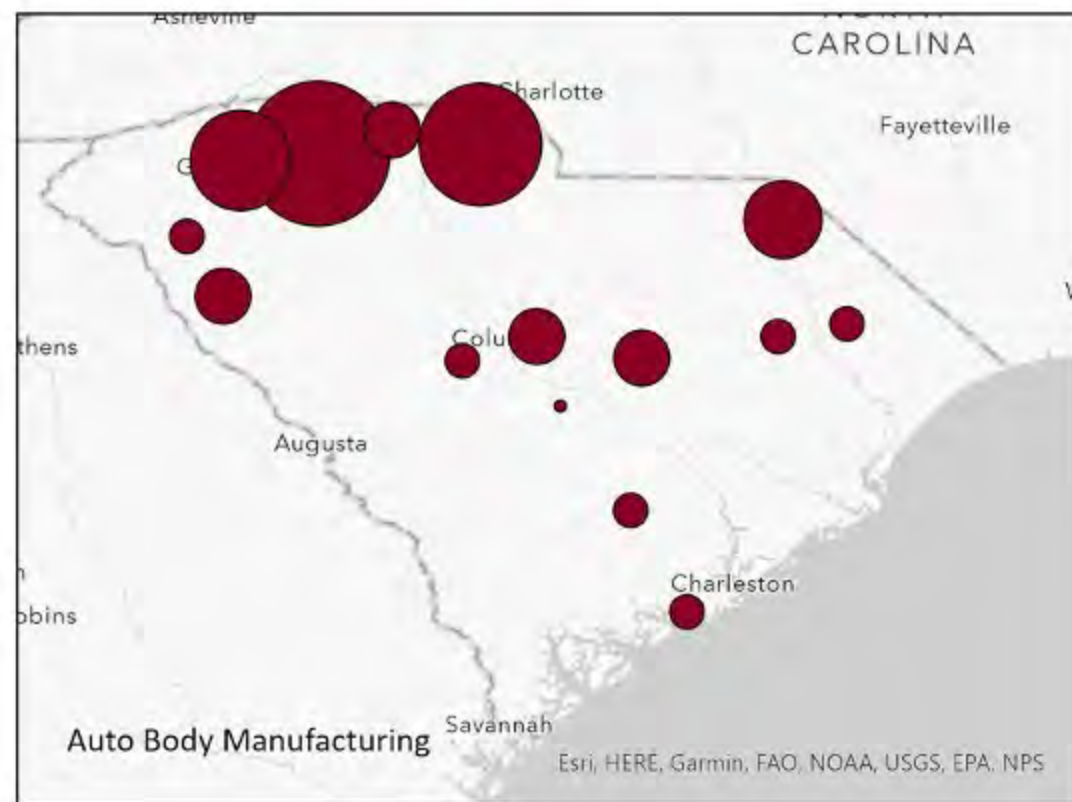
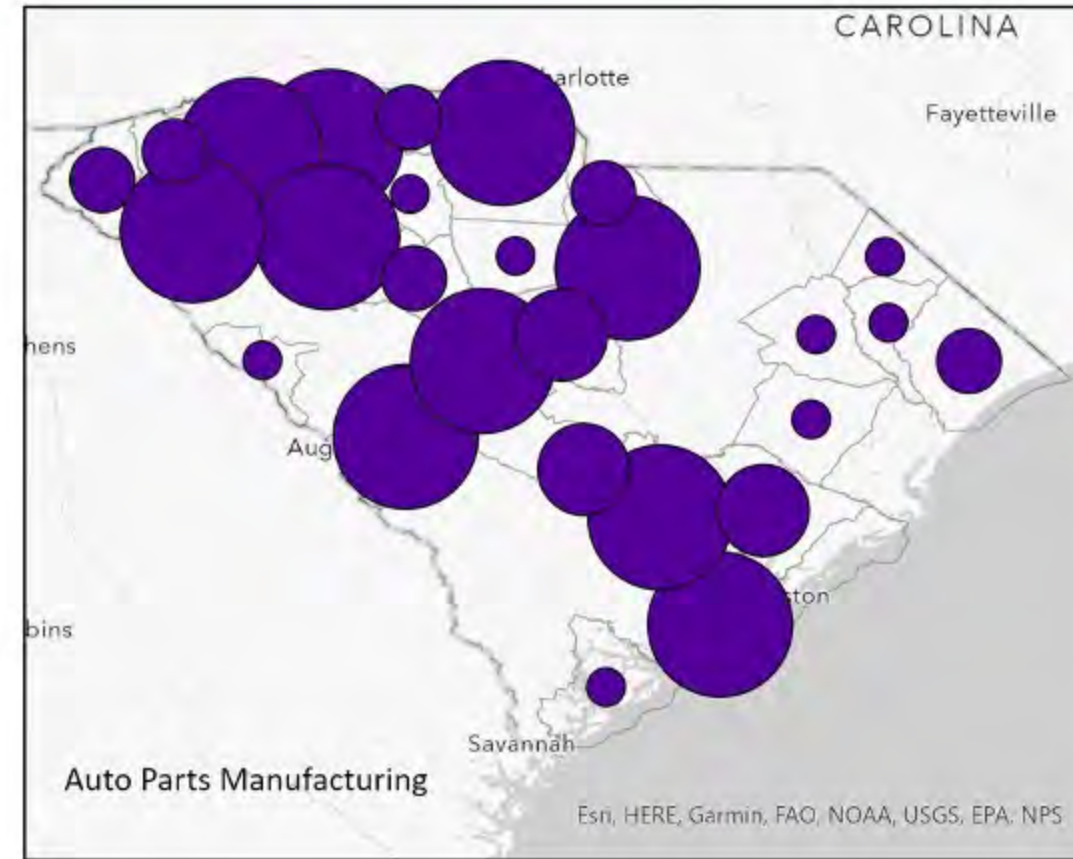
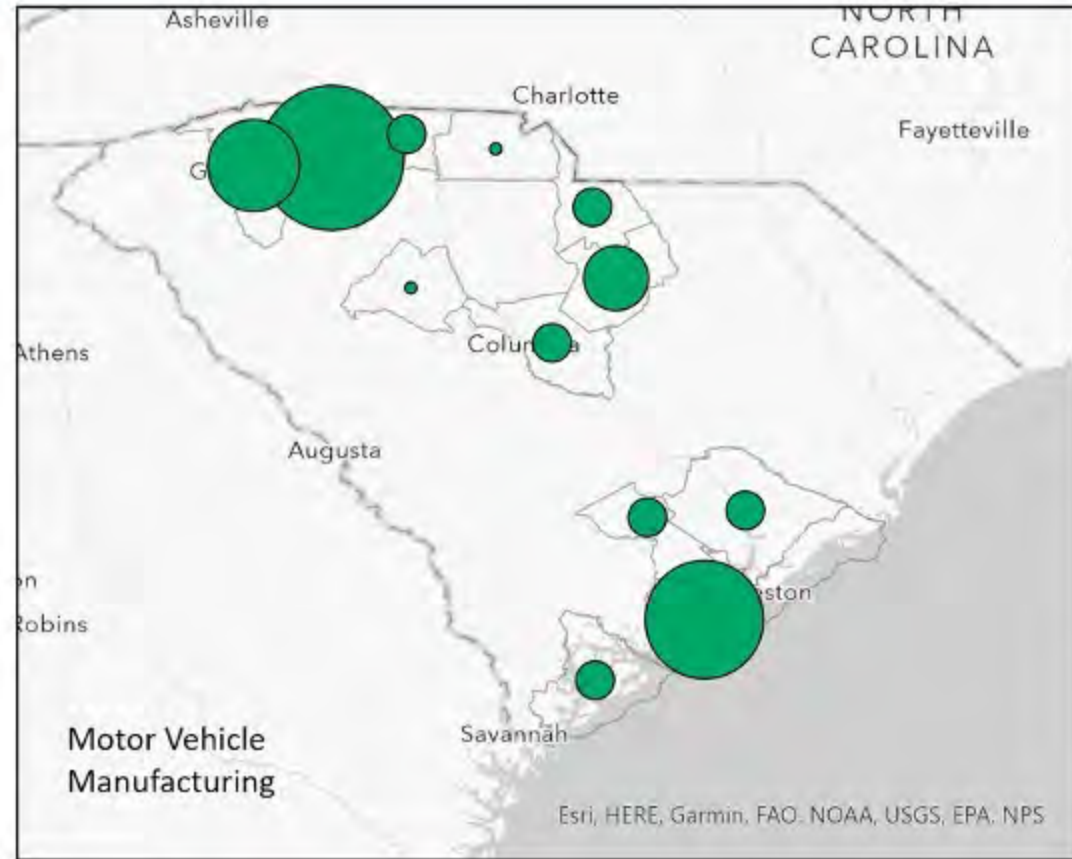


All-electric vehicles have a ways to go in providing affordable and clean transportation at scale

Number of Electric Vehicle Registrations by Type of Vehicle



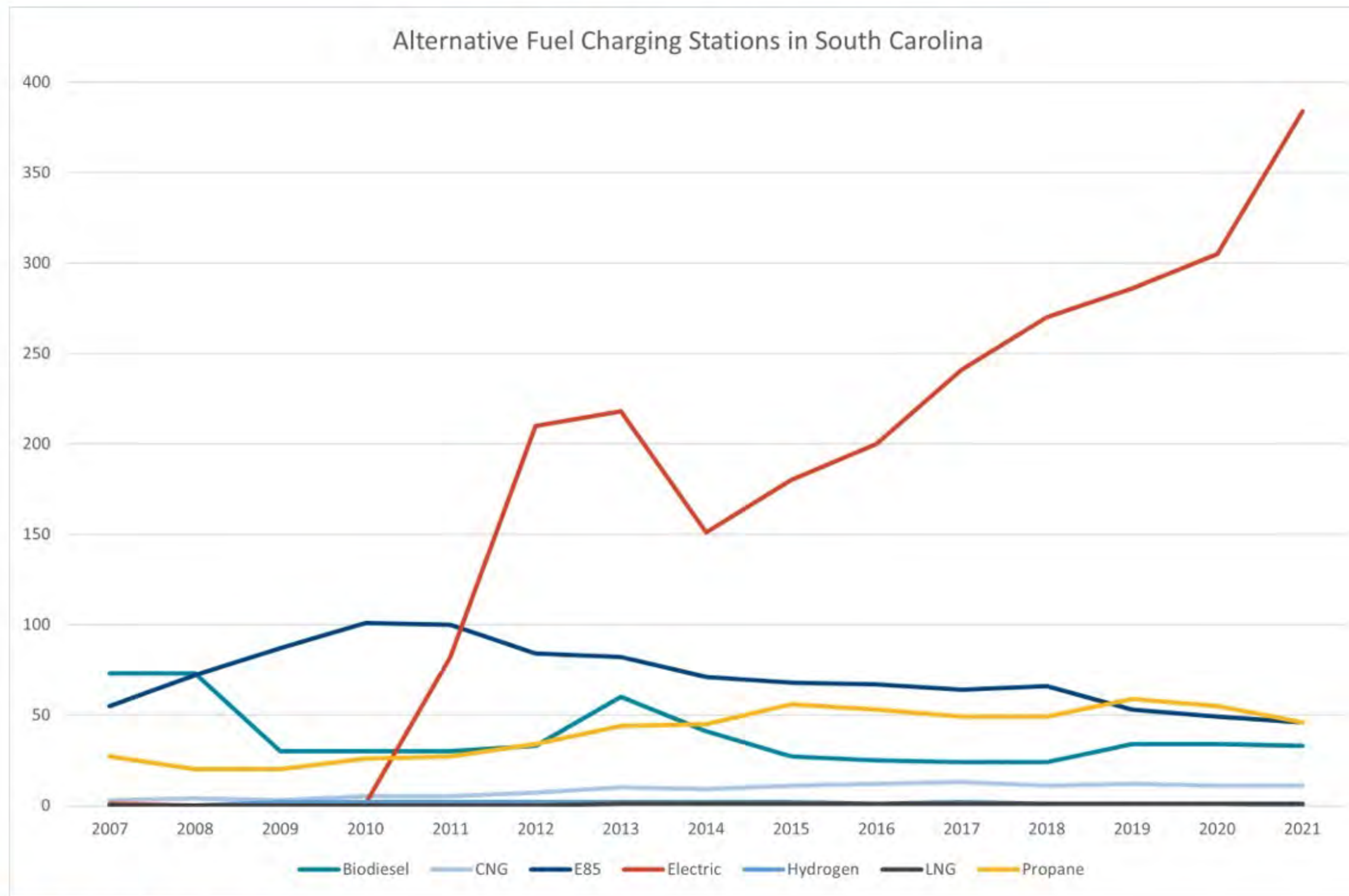
The economic development benefits, however, are already being realized



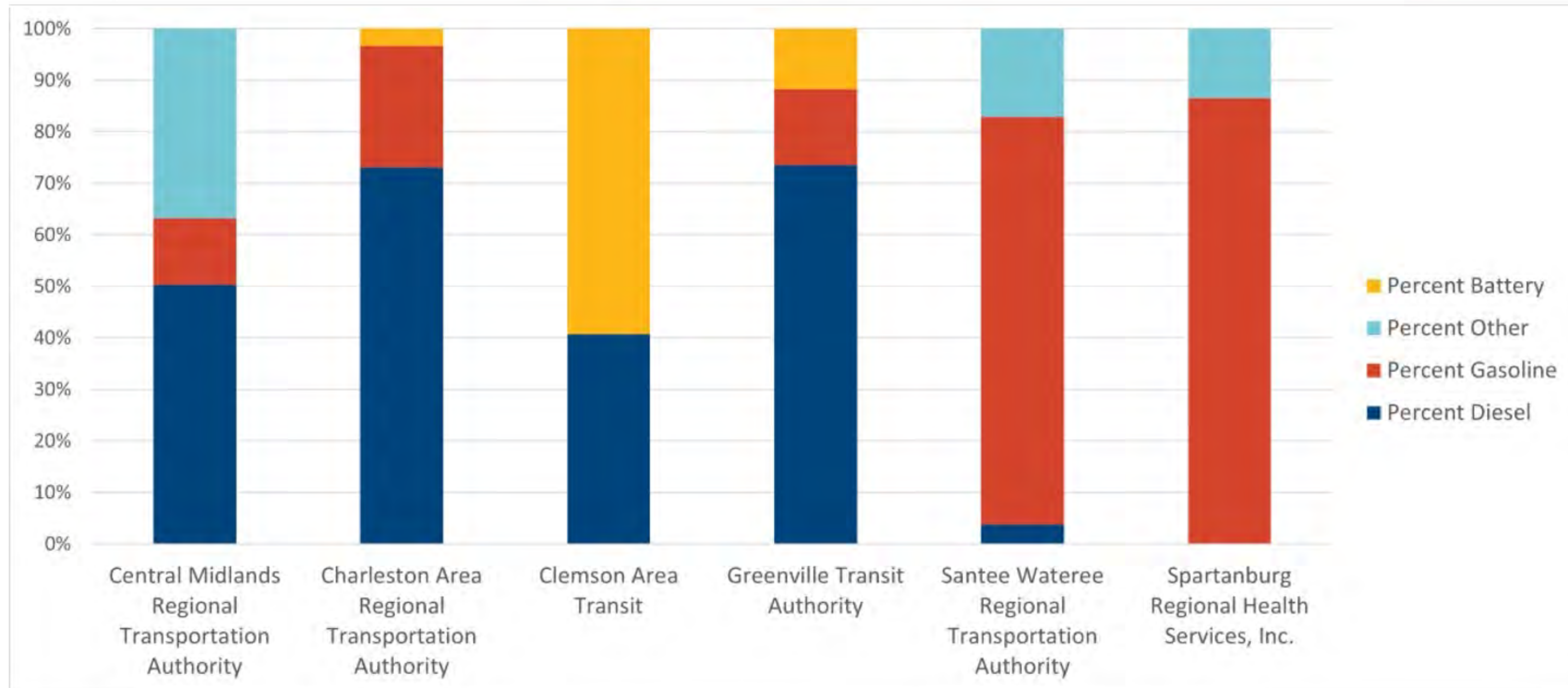
Number of Firms



Opportunities for developing more accessible charging infrastructure



Affordability improvements and GHG reductions available by expanding clean public transit



SC Transportation Equity StoryMap



Storytelling



Proposal Development



Policy Guidance/
Recommendations



Justice40 Priorities

Clean Transportation

- Improvement in public transportation accessibility, reliability, and options
- Reduction of exposure to harmful transportation-related emissions
- Access to clean, high-frequency transportation
- Access to affordable electric vehicles, charging stations, and purchase programs

Training and Workforce Development

- Increased participation in good job training programs that target participation from disadvantaged communities, including formerly incarcerated individuals and youth transitioning out of foster care
- Increased climate-smart training, including training to identify waste, efficiencies, and GHG inventories

Thank You



SMART ENERGY. STRONG ECONOMY. FOR ALL.

WWW.SEEALLIANCE.ORG



ELECTRIC VEHICLE EQUITY ROUNDTABLE

MAY 25TH 10:00 AM - 12:00 PM



**South Carolina Electric Vehicle Charging
Infrastructure Deployment Plan**

**In Support of the National Electric Vehicle
Infrastructure Formula Program**

(SC NEVI Plan)

August 1, 2022



2023

**Upstate Forever & Sustaining Way
EV Equity Roundtable**

Rob Bedenbaugh, PE, CPM

SCDOT – Director of Engineering Support

SC NEVI Plan

www.scdot.org/nevi



NEVI

National Electric Vehicle Infrastructure (NEVI) Formula Program

<https://driveelectric.gov/>

- **500,000 EV chargers nationally by 2030**
- **Support national network – Alternative Fuel Corridors**
- **Emphasis on rural locations**
- **Equity**
- **SC will receive approximately \$70 million over 5 years**

Level 1 Charger

Source – www.cars.com



Level 2 Charger

Source – www.cars.com



DC Fast Charger

Source – www.usnews.com



NEVI

Technical Details

- **Maximum 50 mile spacing along the interstates**
- **No more than one (1) travel mile from the interstate**
- **Four (4) – minimum 150kw DC Fast Chargers per site**
- **Combined Charging System (CCS) ports**

Justice40 and NEVI

Disadvantaged Communities (DACs)

- **Goal of having 40% of benefits flow to DACs**
- **Disadvantages in:**
 - **Transportation, health, environmental, economic, resilience, housing, and other factors**
- **Electric Vehicle Charging Justice40 Map**
 - [Electric Vehicle Charging Justice40 Map \(arcgis.com\)](https://arcgis.com)
- **November 8, 2022 – Roundtable with Under Secretary of Commerce for Minority Business Development Donald Cravins, Jr.**

Equity and NEVI

Fairness in mobility and accessibility for all users

- **Meaningful engagement with DACs**
- **Jobs and job training**
- **Opportunities for Disadvantaged Business Enterprises (DBEs)**
- **Decreasing transportation costs**
- **Reducing transportation emissions**
- **Resilience**

**South Carolina Electric Vehicle Charging
Infrastructure Deployment Plan**

**In Support of the National Electric Vehicle
Infrastructure Formula Program**

(SC NEVI Plan)

August 1, 2022



SC NEVI Plan

www.scdot.org/nevi



**Rob Bedenbaugh
bedenbaugr@scdot.org**



ELECTRIC VEHICLE EQUITY ROUNDTABLE

MAY 25TH 10:00 AM - 12:00 PM





ELECTRIFY THE SOUTH



The Southern Alliance for Clean Energy (SACE) is a nonprofit organization that promotes responsible and equitable energy choices to ensure clean, safe, and healthy communities throughout the Southeast.

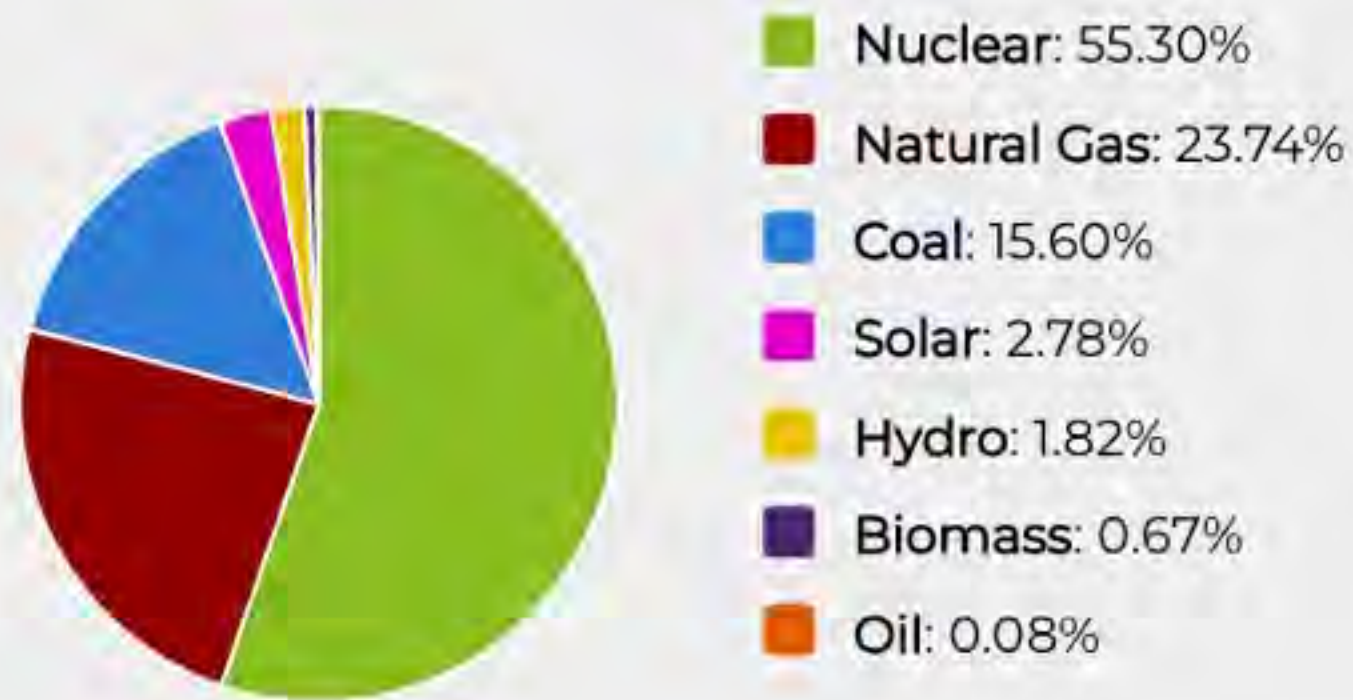
CONSUMER DEMAND



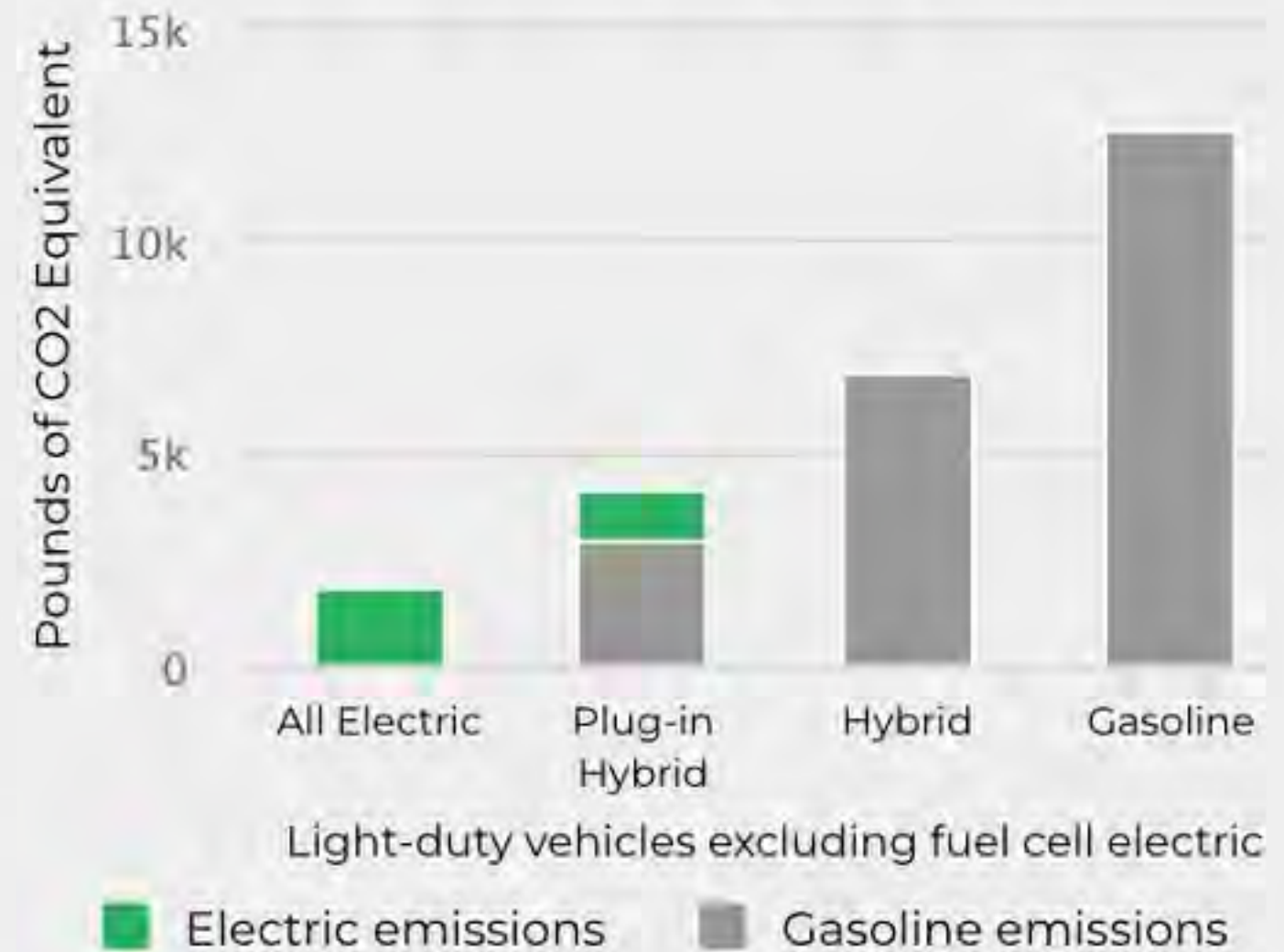
of Americans plan to buy or lease an electric-only vehicle, or are seriously considering doing so.

EV VS GAS CAR EMISSIONS IN SOUTH CAROLINA

Electricity Sources



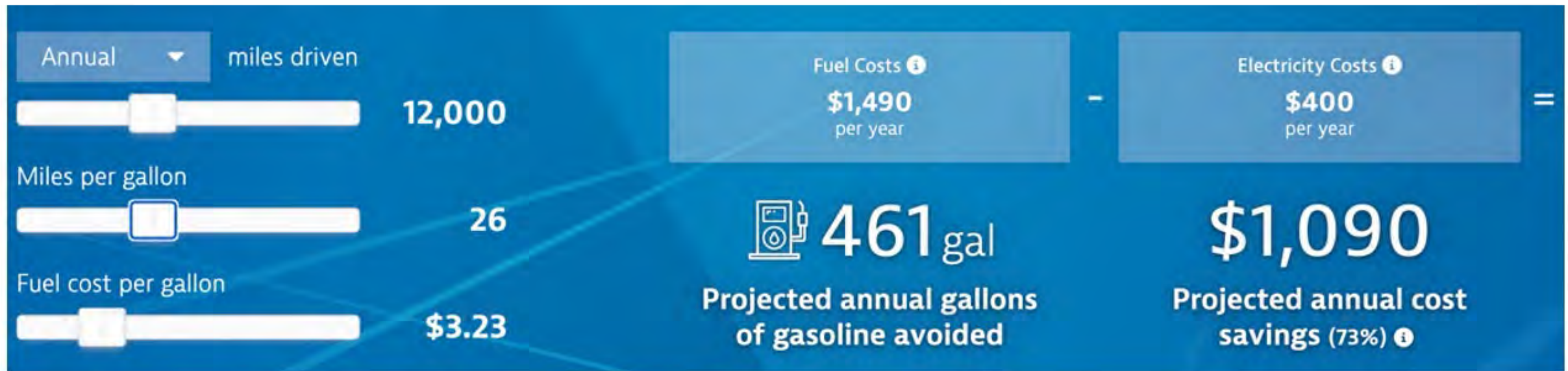
Annual Emissions per Vehicle



Source: Alternative Fuels Data Center

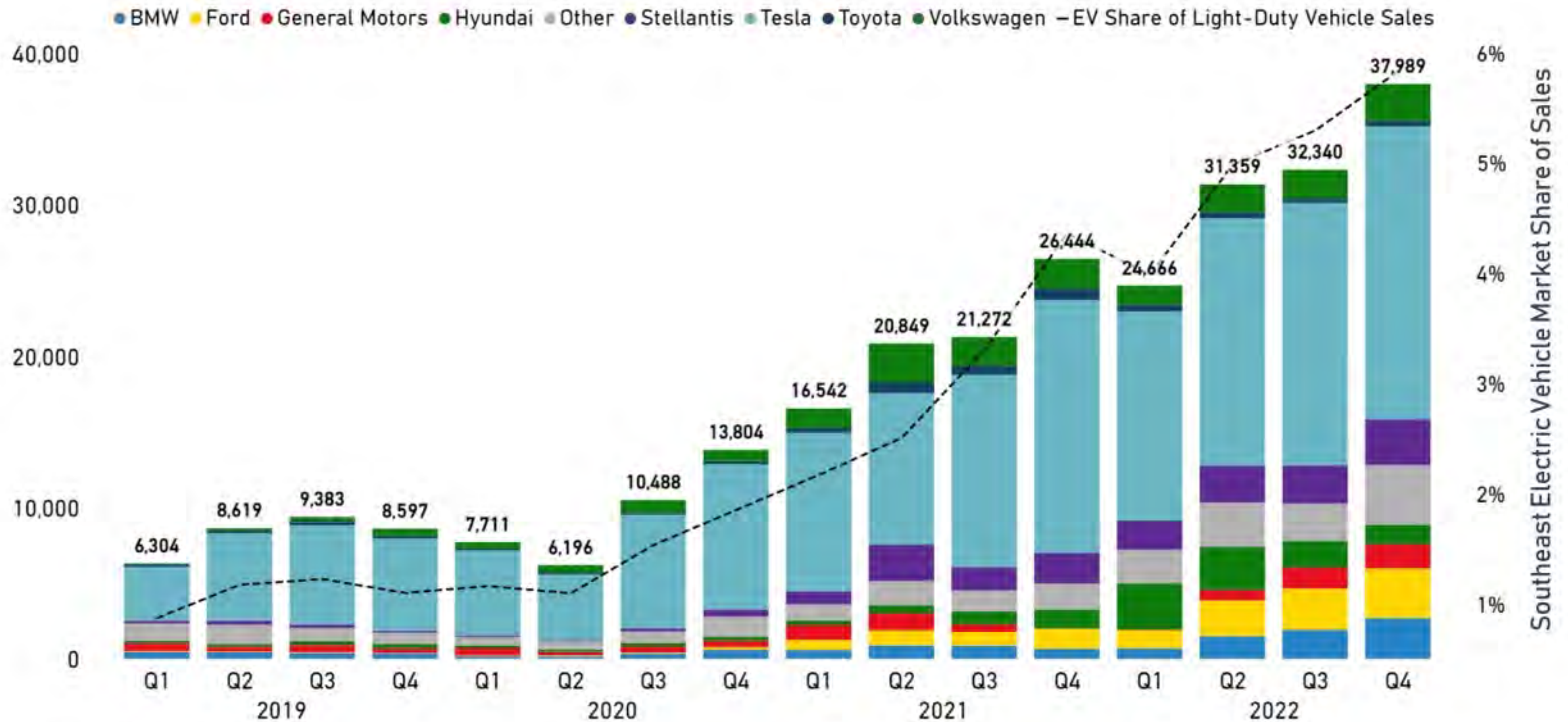


SAVINGS DRIVING ELECTRIC



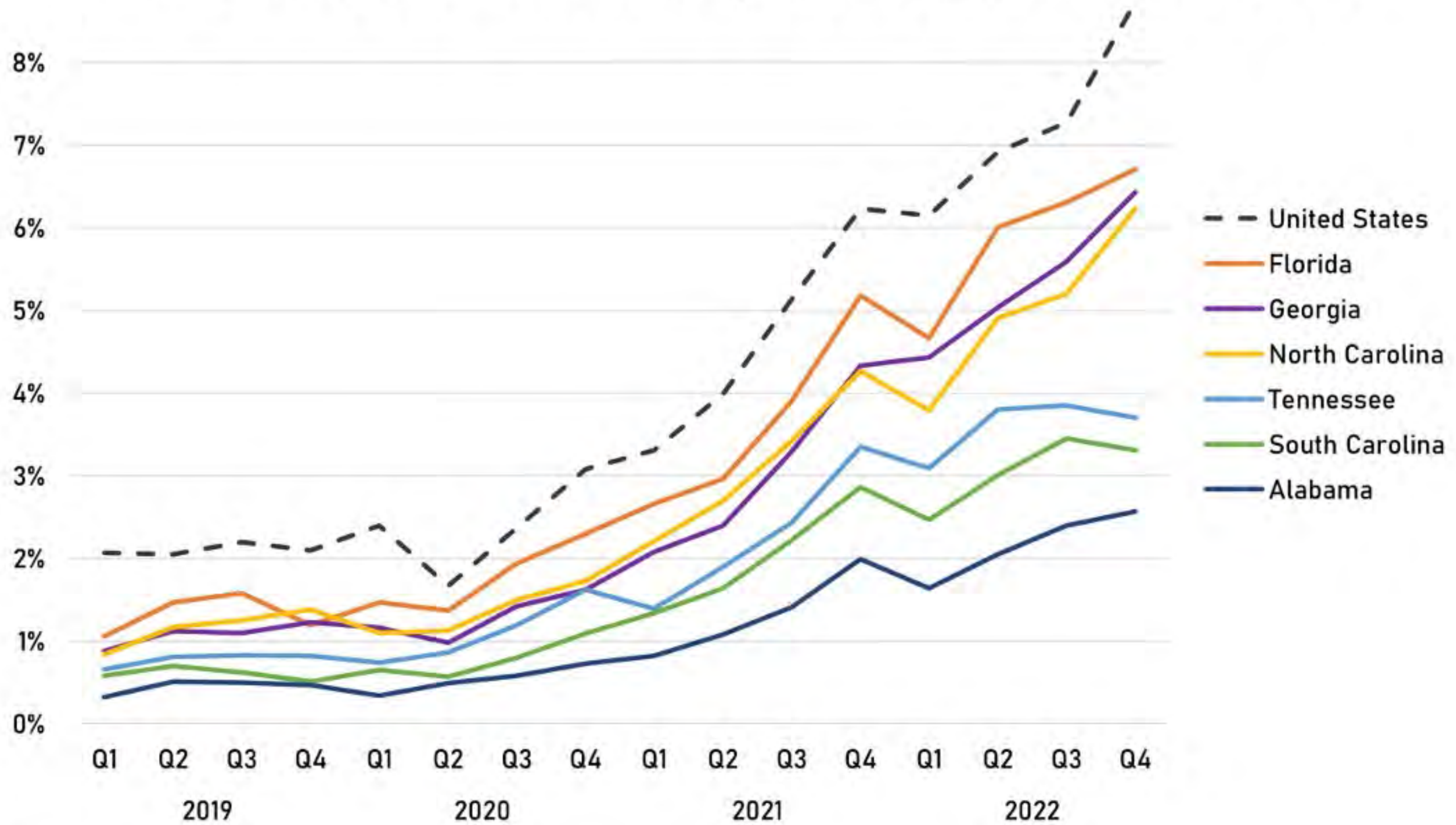
Source: Georgia Power

SOUTHEAST EV SALES, DECEMBER 2022



Source: Atlas EV Hub

EV MARKET SHARE, DECEMBER 2022



Source: Atlas EV Hub

SOUTH CAROLINA EV INDICATORS, DEC 2022



EMPLOYMENT

#4 in the Southeast per capita

- 4,205 jobs
- 436% growth in 2022



INVESTMENT

#3 in the Southeast per capita

- \$7.1 billion
- 783% growth in 2022



SALES

#5 in the Southeast in market share

- 16,032 cumulative sales
- 55% growth in 2022
- 3.3% of market share in Q4 2022



CHARGING DEPLOYMENT

#5 in the Southeast per capita

- Fast Chargers: 338 ports
- Level 2: 798 ports
- 24% growth in total ports in 2022



UTILITY INVESTMENT

- \$8.8 million
- No change in 2022.



PUBLIC FUNDING

#1 in the Southeast per capita

- \$186.5 million approved funding
- \$37.15 public funding per capita



ELECTRIC VEHICLE EQUITY ROUNDTABLE

MAY 25TH 10:00 AM - 12:00 PM



Understanding the opportunities and barriers to creating a robust EV charging network

Dr. Jiangfeng (Jeff) Zhang

Associate Professor; Fellow IET

Department of Automotive Engineering

Clemson University

Email: jiangfz@clemson.edu

864 283 7231

May 25, 2023



Department of

AUTOMOTIVE ENGINEERING





What we do at ICAR

Arbin BT2000 (6V 200A & 20V 300A)



Department of
AUTOMOTIVE ENGINEERING

- Batter testing and modeling
- Battery pack/EV charging
- EV powertrain energy management
- Charging station management
- New materials (solid state)



OPAL-RT 30kW microgrid

dSPACE SCALEXIO

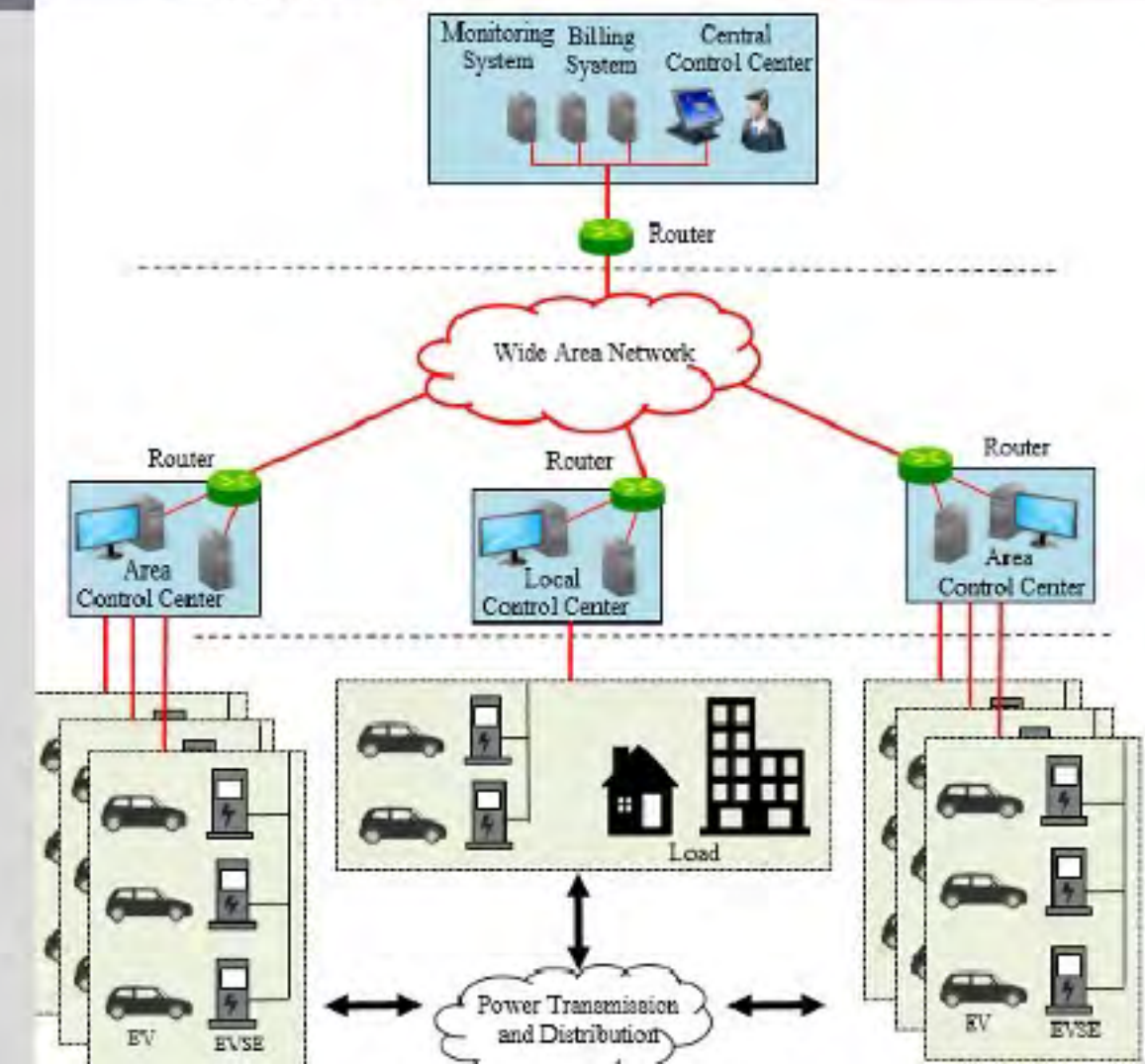


dSPACE ds1104



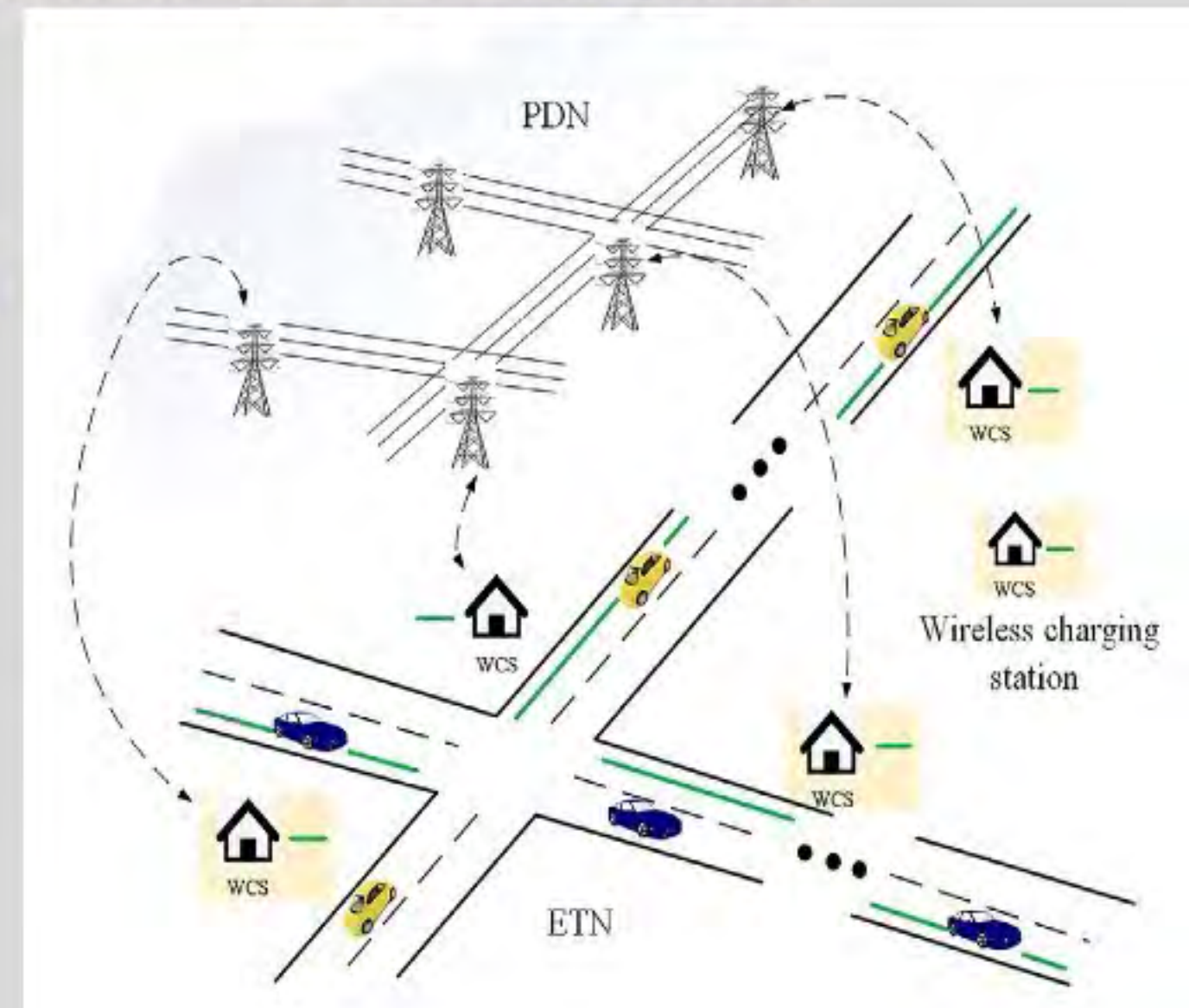
EV Charging Infrastructure

- EV Chargers
 - Level 1: 1-1.4 kW; 30-40 hrs (for a 60kWh EV)
 - Level 2: 3.9-19.2 kW, 2.5-4.5 hrs
 - Level 3: 24-300kW, 30-40 min



Charging infrastructure planning: Sitting & Sizing

- Traffic flow;
- Current power distribution network
- Source of power: Coal X natural gas? Nuclear? Renewable (solar, hydro, wind,...)✓
- Environmental impact
- Cost-benefit analysis (for particularly rural areas)
- Nontechnical factors:
 - Land use
 - Source of fund
 - Acceptance
 - ...



Benefits vs Challenges


Benefits:

- Reduced emission, climate change, clean air
 - Improved health for particularly underserved communities with less opportunities to access medical service
- Job opportunities

Challenges:

- Slow charging time & long queuing time: (XFC, Optimal Charging station management)
- Insufficient power supply:
- Power failure,
- Extreme weather
- Insufficient workforce: (training)

C charging station management & resilient charging network

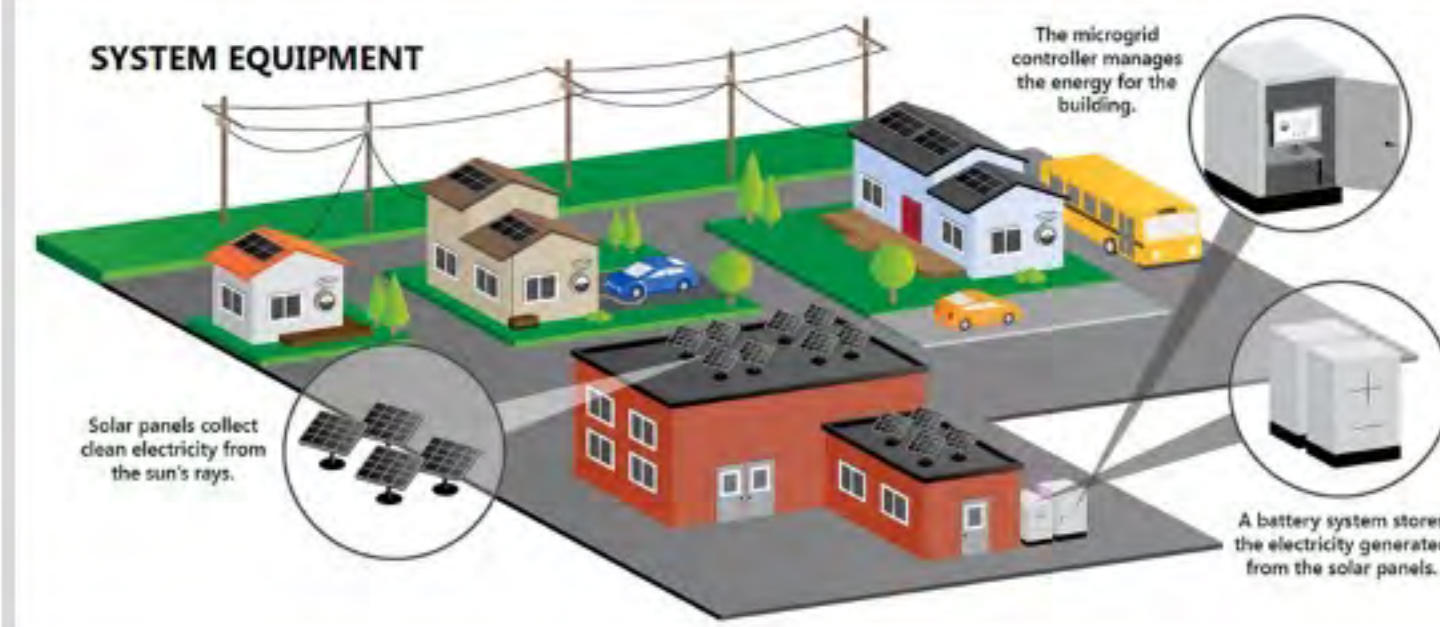
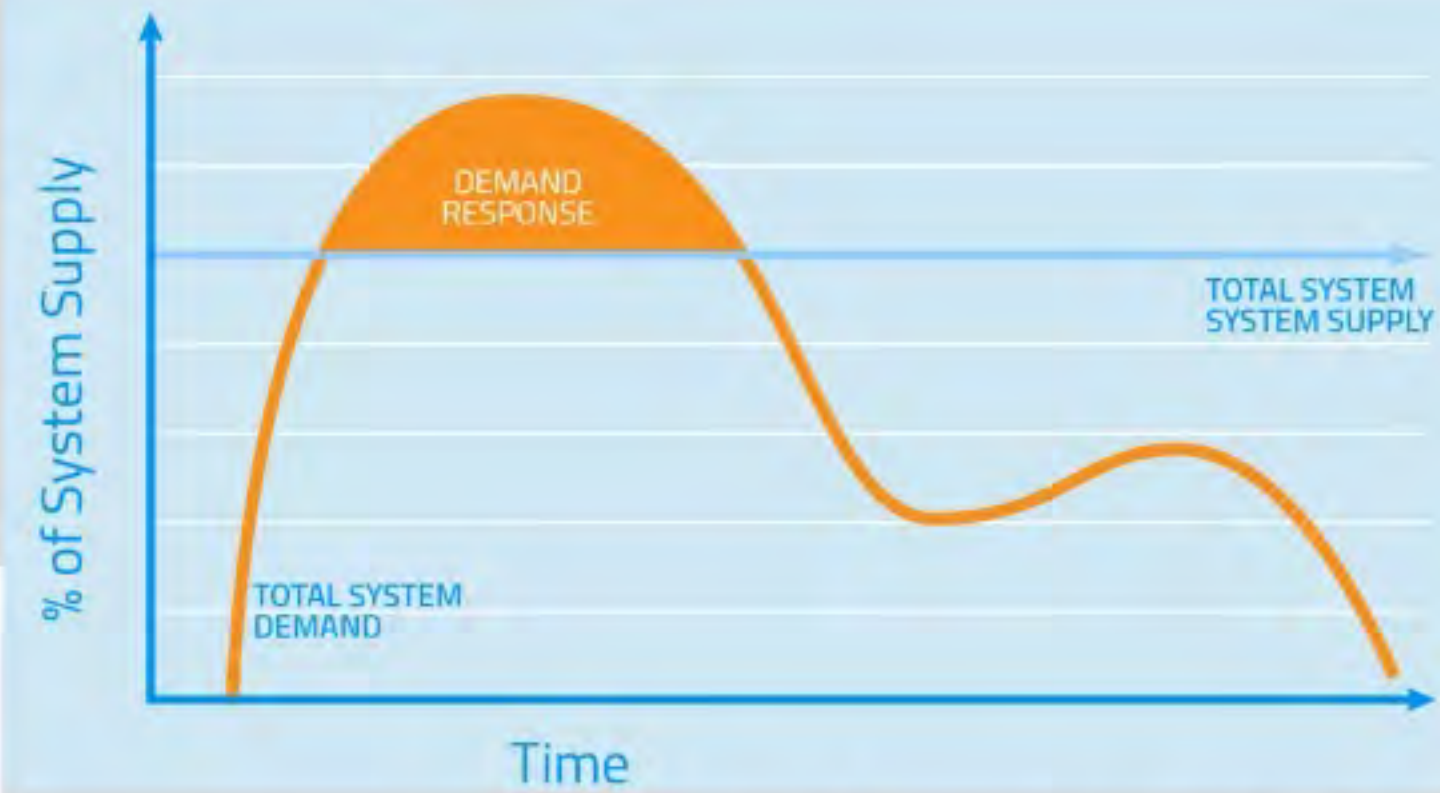
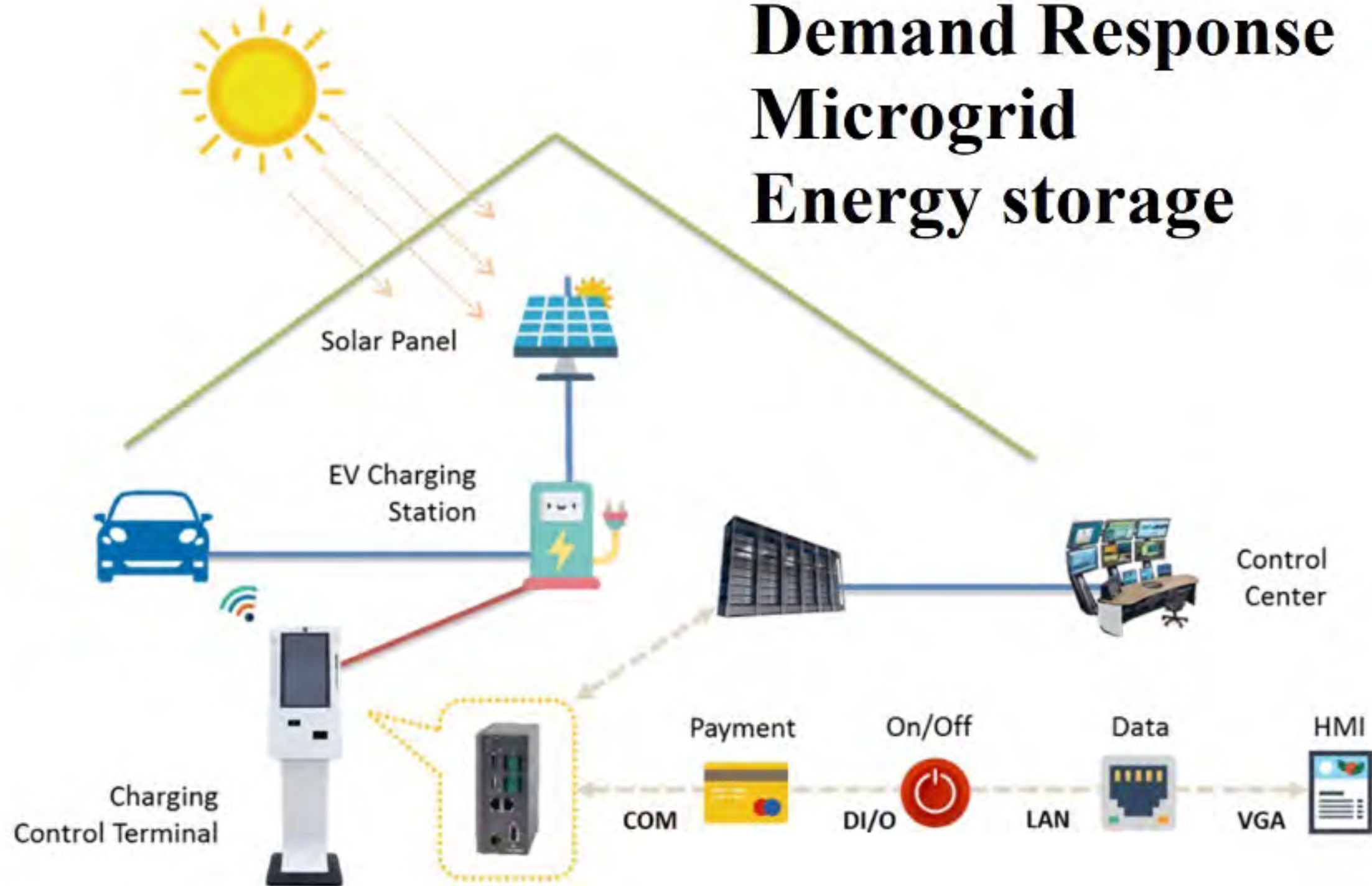


We can help at
ICAR

A resilient charging network

(DE-FOA-0002881)

Demand Response Microgrid Energy storage





ELECTRIC VEHICLE EQUITY ROUNDTABLE

MAY 25TH 10:00 AM - 12:00 PM

