

# Beneficial Electrification

Leadership North Carolina

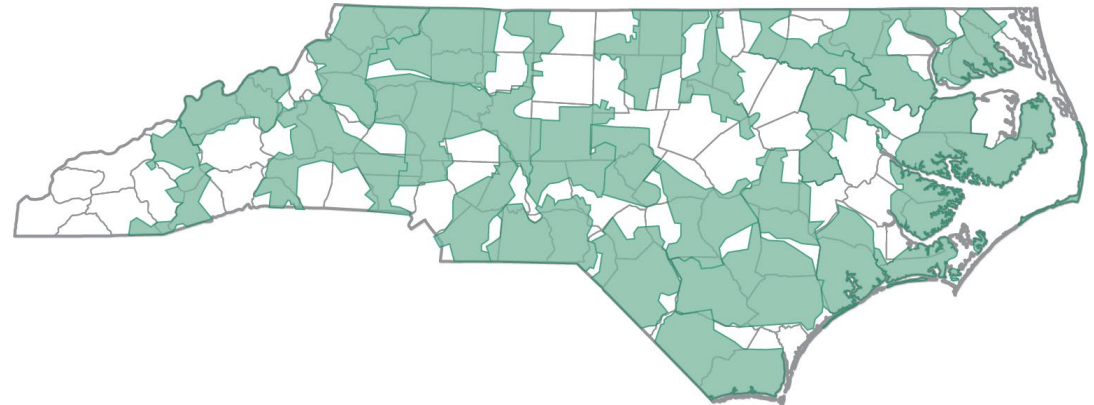
Diane Huis, SVP, Innovation and Business Development

April 15, 2021



**NC** Electric  
Cooperatives

Your Touchstone Energy® Cooperatives 



# NC Electric Co-op Territory

**950,000**

Households and businesses served by NC Electric Cooperatives

**93**

Counties in NC

NORTH CAROLINA'S  
ELECTRIC POWER PROVIDERS  
SERVICE AREAS

**26**

Member owned  
not-for profit  
cooperatives

Powering Everyday life  
for  
**2.5 Million**

**24%**  
of the population

**45%**  
of the land mass





# *Building a* **BRIGHTER FUTURE**



## **Sustainable, Affordable Energy**

Pursue a goal of net-zero carbon emissions by 2050 using new and existing resources to ensure electricity continues to be delivered at the lowest possible cost.



## **Reliability & Innovation**

Leverage new technologies and innovation to deliver reliable electricity across resilient, co-op operated electric grids.

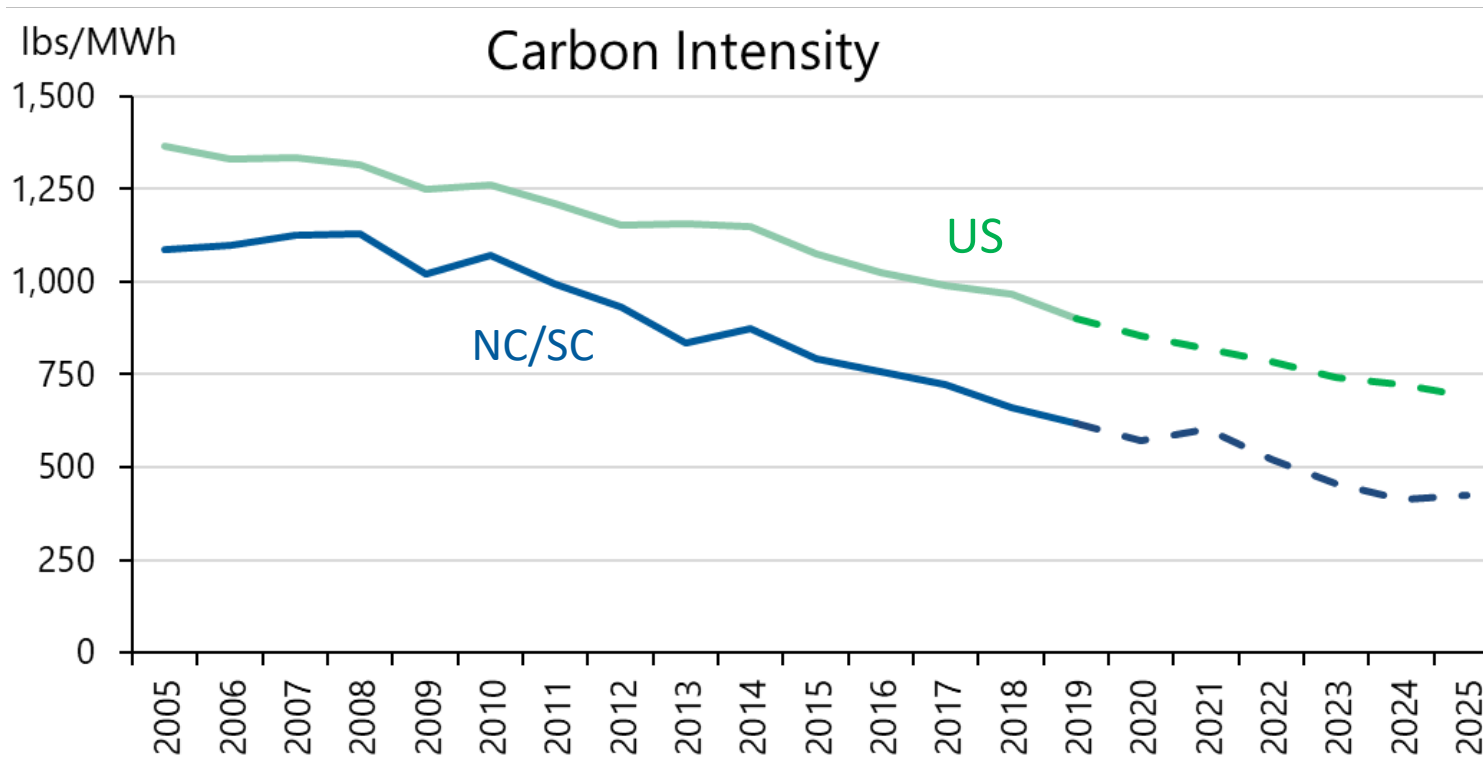


## **Local Community Support**

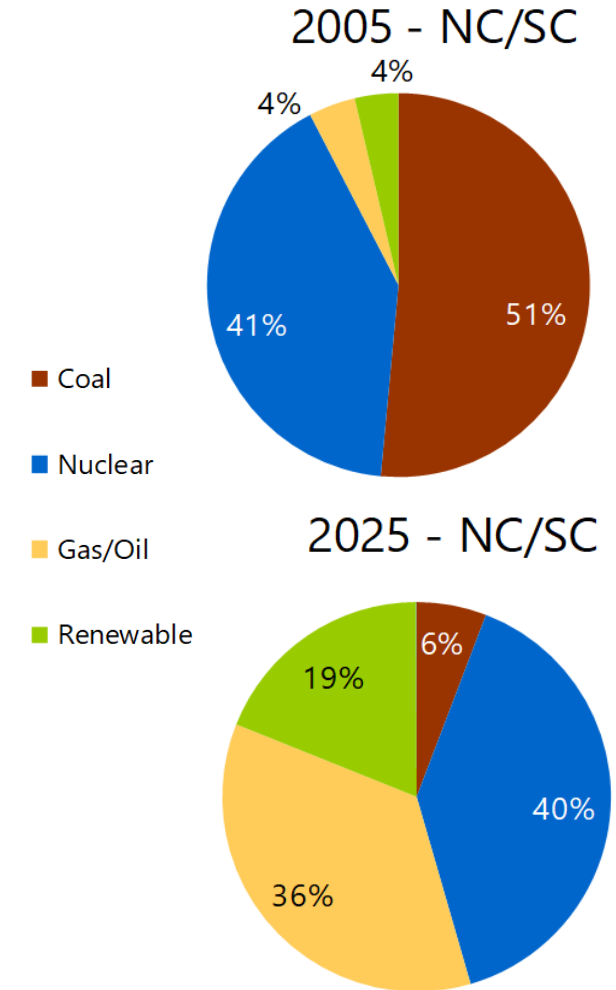
Enrich the lives of our local members through continued education initiatives, economic development and community-focused activities.



# Electricity is Getting Cleaner over Time



Source: [www.EIA.gov](http://www.EIA.gov)





Respond at [pollev.com/kellyturner183](https://pollev.com/kellyturner183)

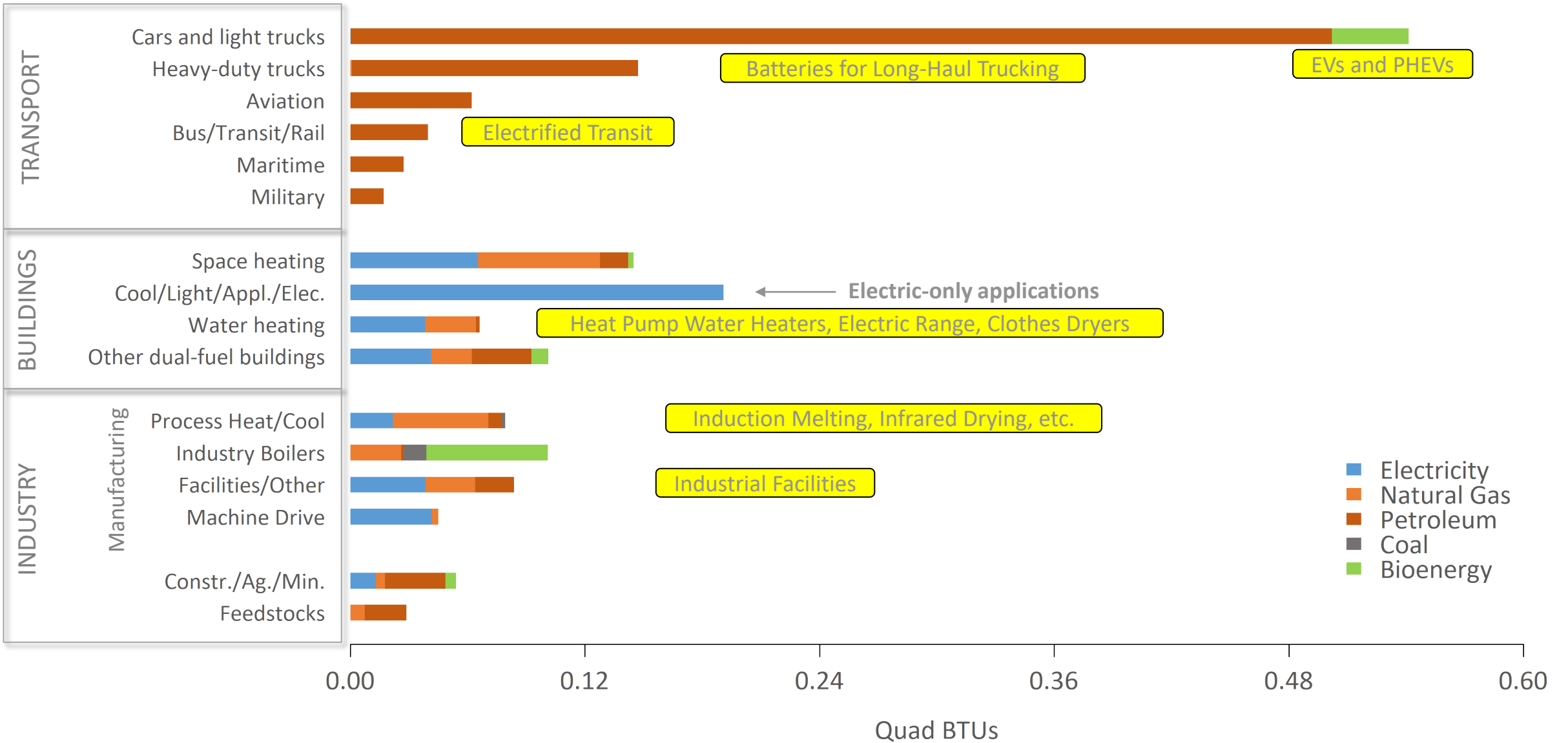
Text **KELLYTURNER183** to **22333** once to join, then **A or B**

**Is this the first time you are hearing about the environmental benefits of beneficial electrification?**

Yes **A**

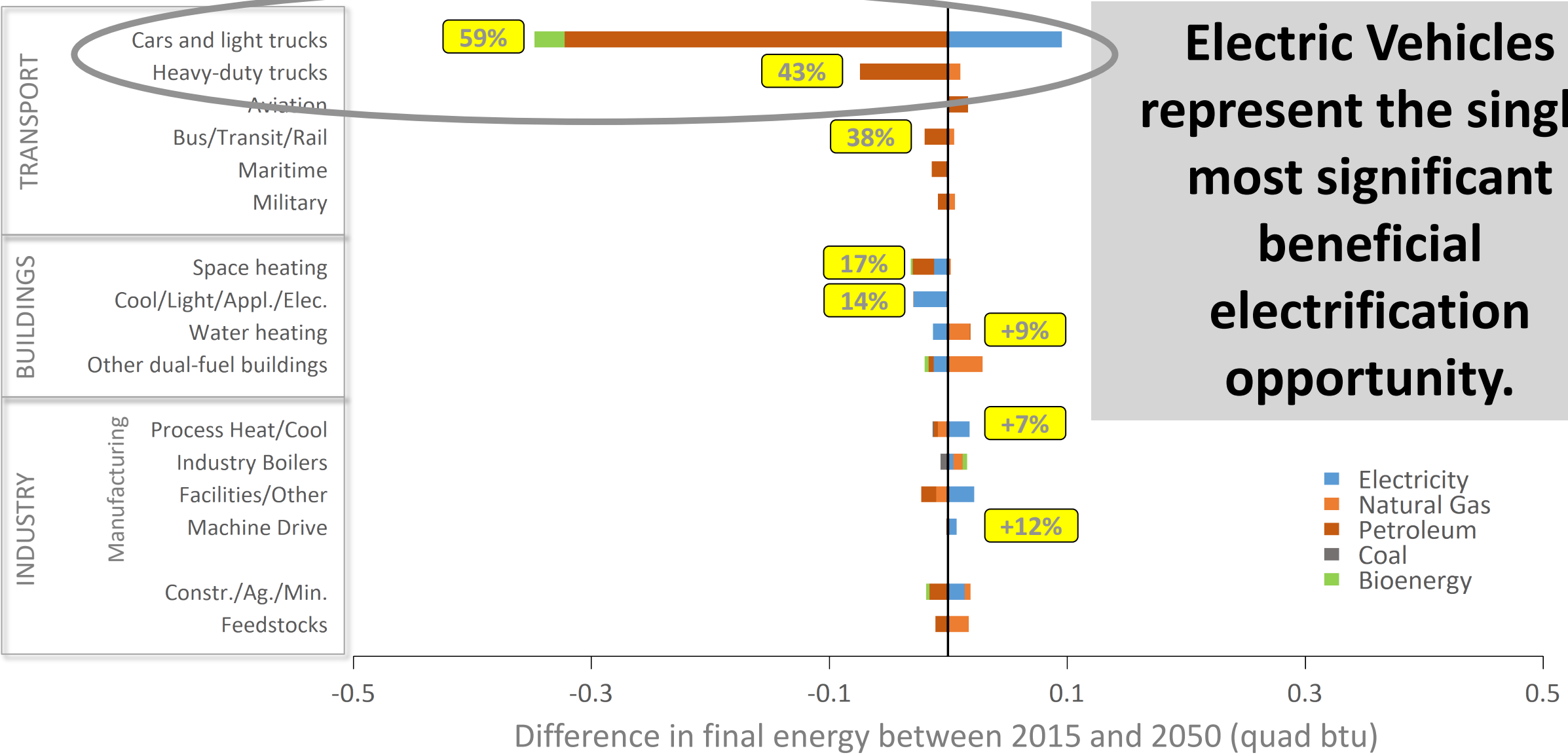
No **B**

# 2015 North Carolina Final Energy by Fuel / End-Use Application



# Electricity growth *only* occurs in transport and industrial sectors

**Electric Vehicles represent the single most significant beneficial electrification opportunity.**





When poll is active, respond at [pollev.com/kellyturner183](https://pollev.com/kellyturner183)

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## Which of the following describes you?

Own a plug-in electric  
vehicle

Considering a plug-in  
EV for my next vehicle

No plans to buy an  
EV for my next vehicle

# If you don't own or are not considering an electric vehicle, why not?

Too expensive to buy

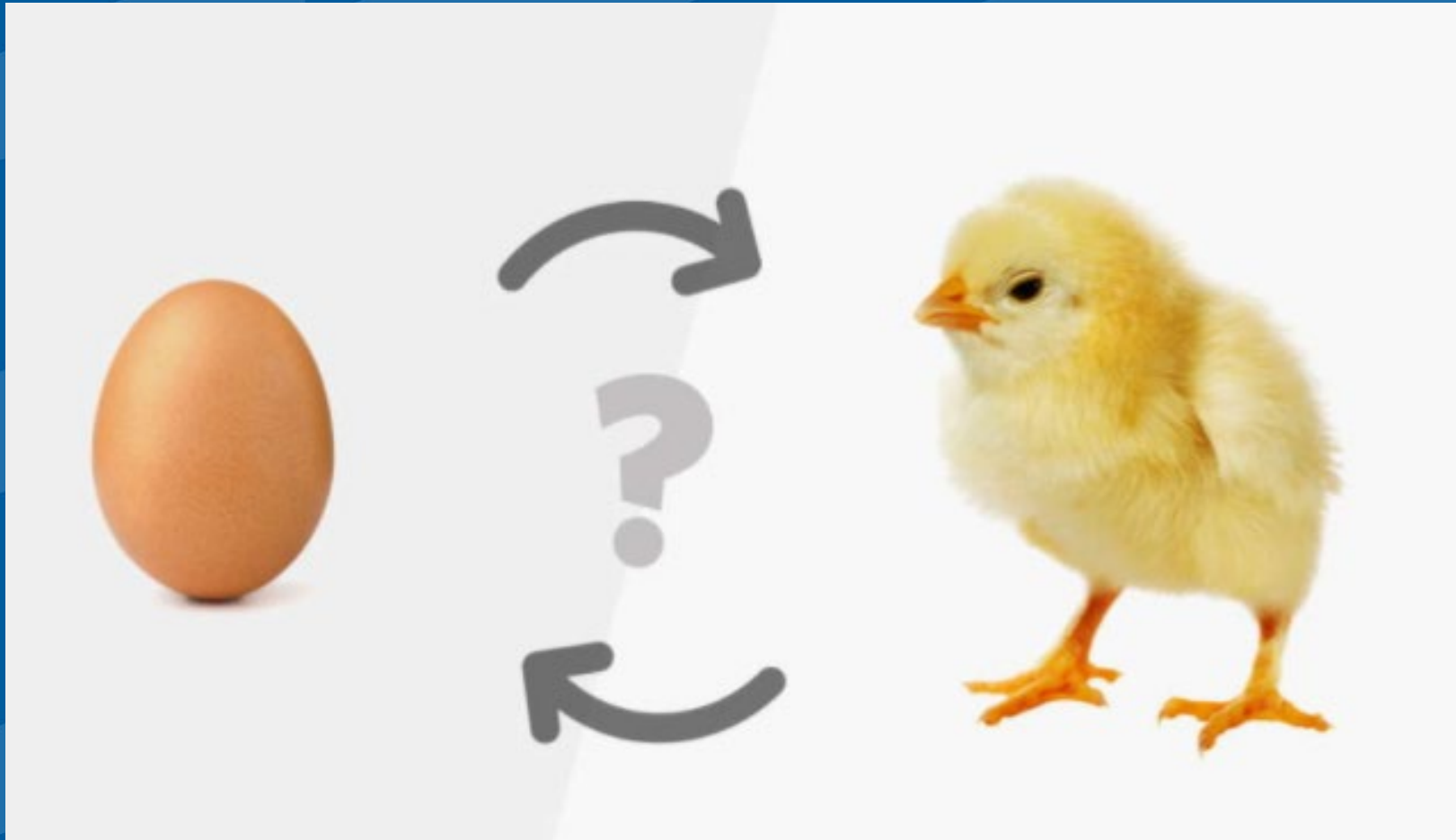
Nowhere to charge

Doesn't come in the  
model I like to drive

Had never thought  
about it

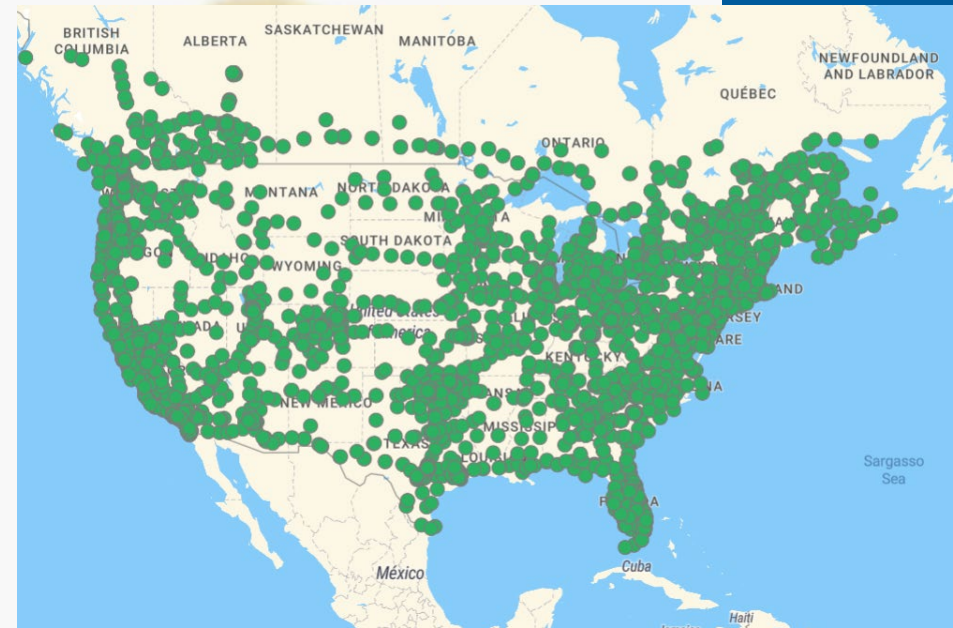
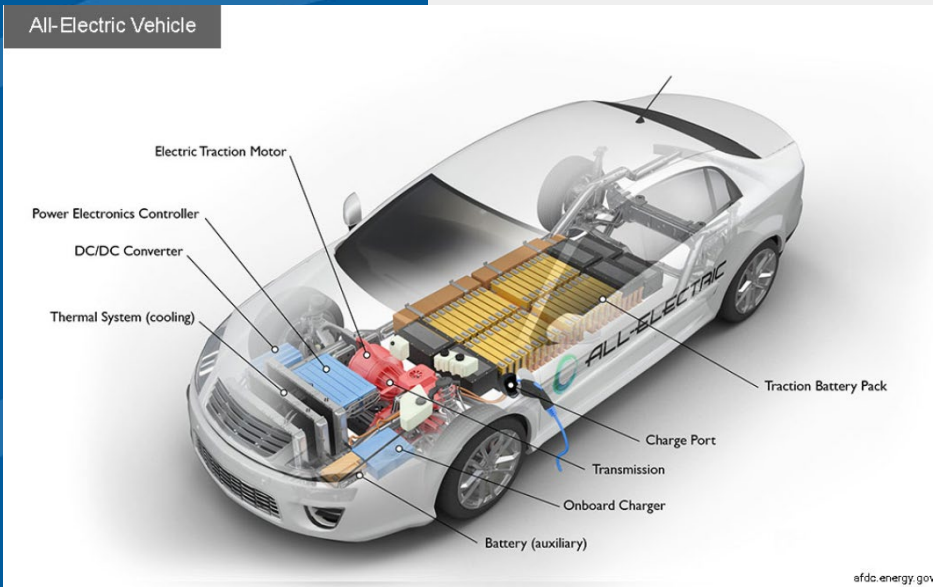
Other

# Which Comes First?

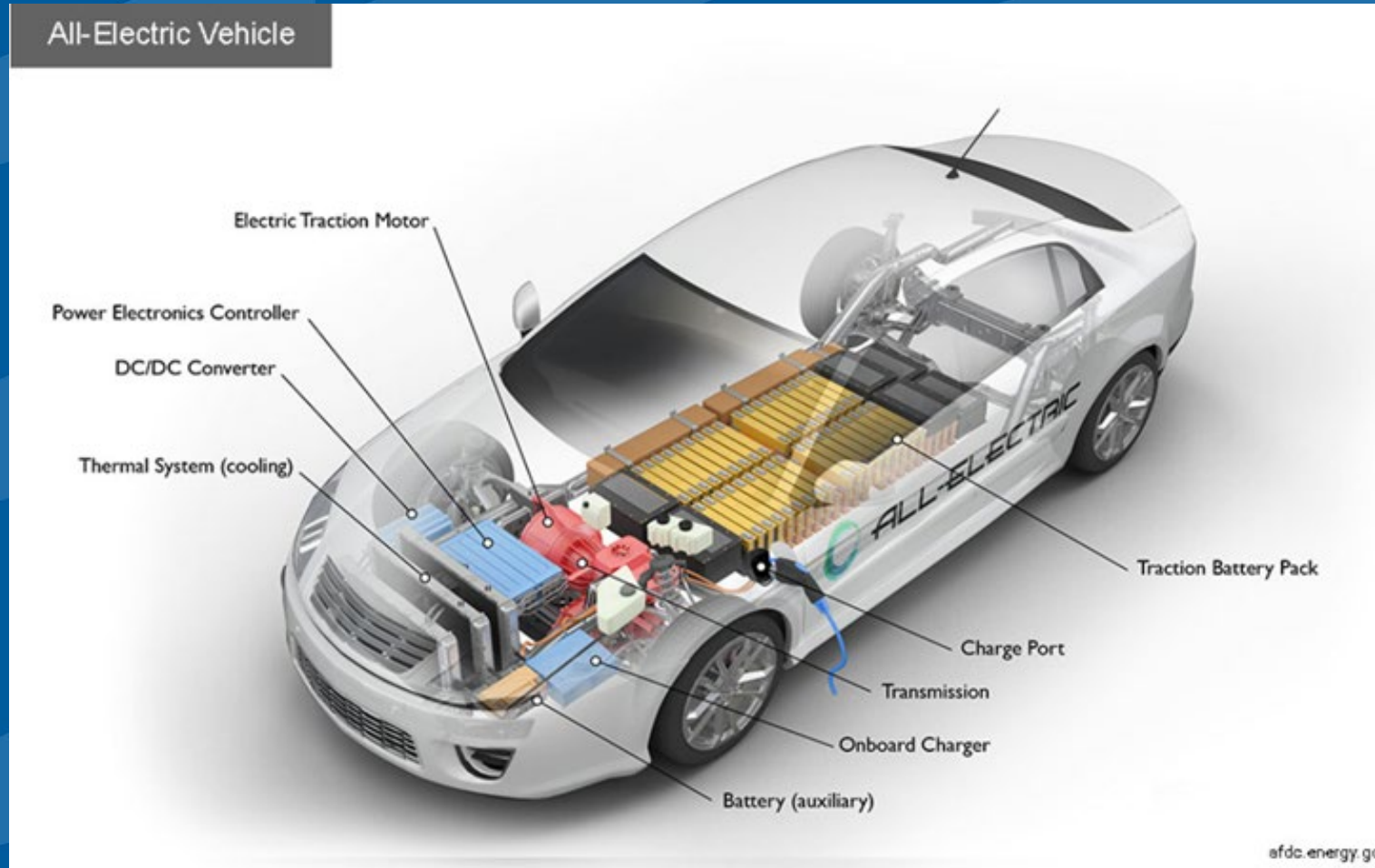




# Which Comes First?

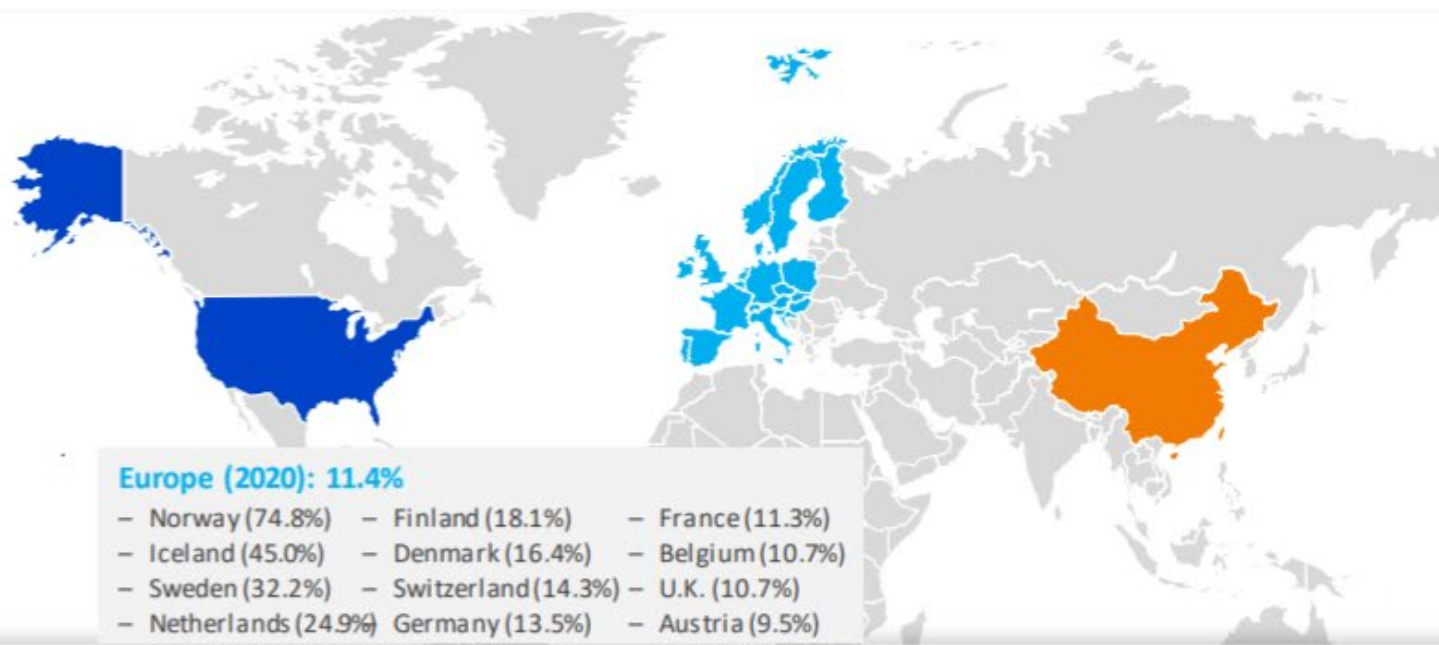


# Electric Vehicle Market Overview

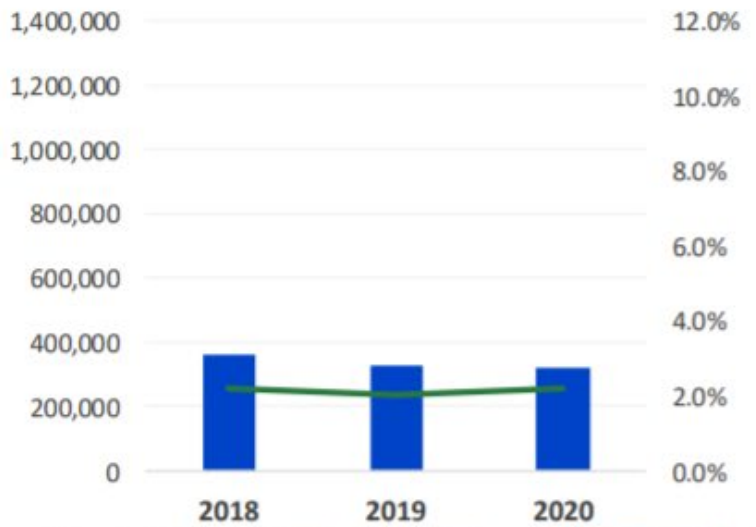


# Electric transportation is a global market

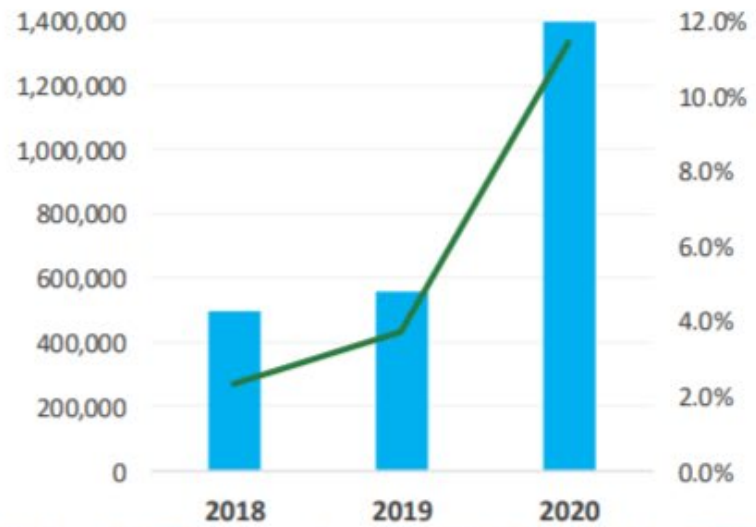
Despite global pandemic, EV sales grew especially where supported by strong policy and EV supply



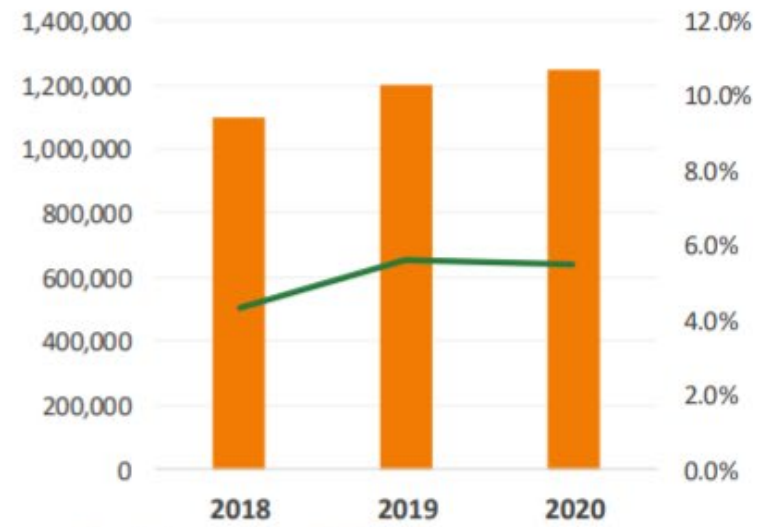
**US EV Sales 2018–2020**



**Europe EV Sales 2018–2020**



**China EV Sales 2018–2020**



Source: EPRI analysis, February 2021; <https://cleantechnica.com/2021/02/08/global-plugin-vehicle-sales-up-43-in-2020-european-sales-up-137/>; <https://insideevs.com/news/489169/european-countries-plugin-market-share-q1q4-2020/>; <https://www.spglobal.com/platts/en/market-insights/latest-news/metals/121720-chinas-ev-sales-to-reach-more-than-13-mil-units-in-2020-caam>; <http://www.ev-volumes.com/>



# But purchasing decisions are made locally

What does it take for a customer to buy an EV?

## Automotive OEMS

- Design
- Build
- Market

## Car Dealers

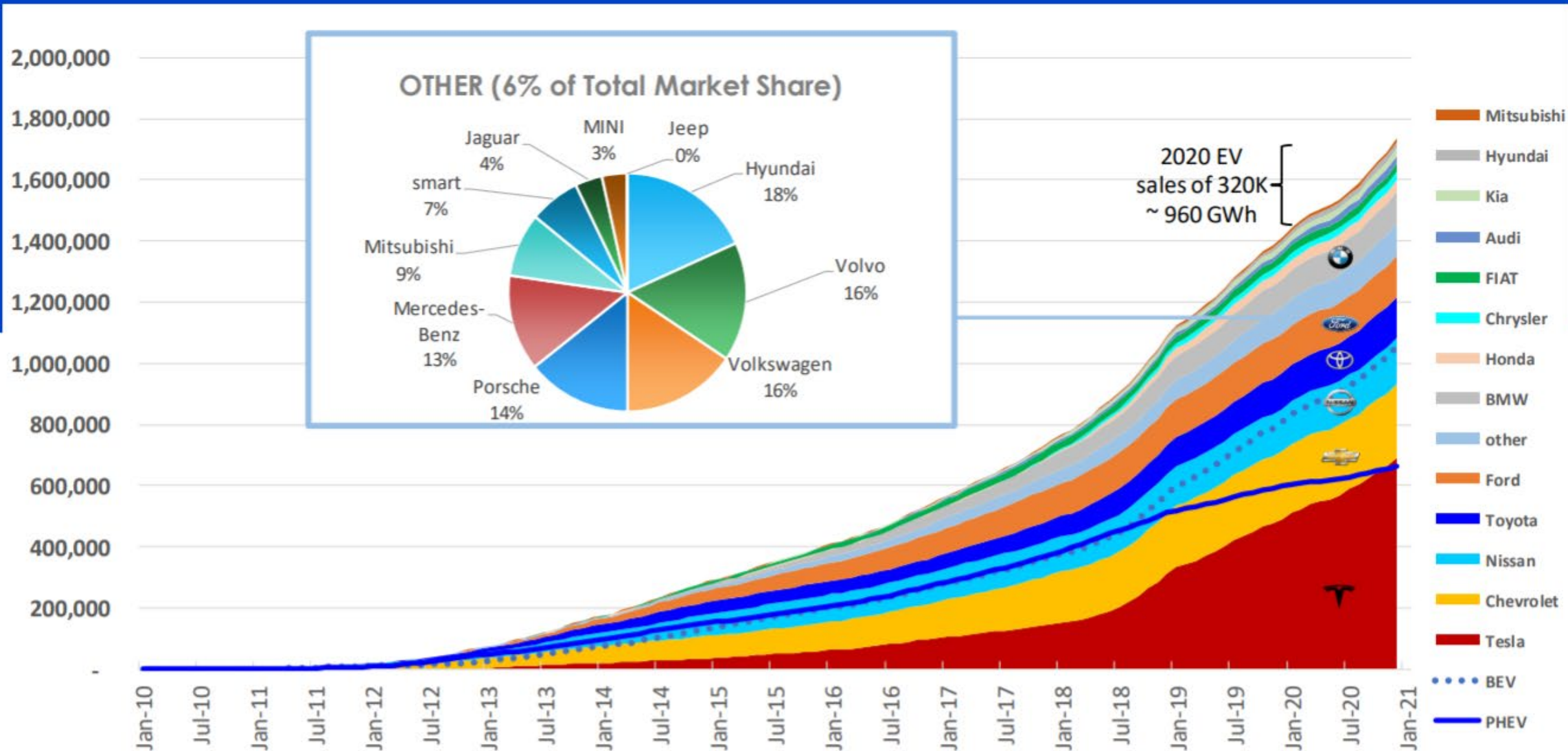
- Stock
- Market

## Customers

- Awareness
- Education
- Desire and Ability to buy

# US Electric Vehicle Sales Exceed 1.7M – 5,100 GWh annual load

EV Sales 2010- 2020



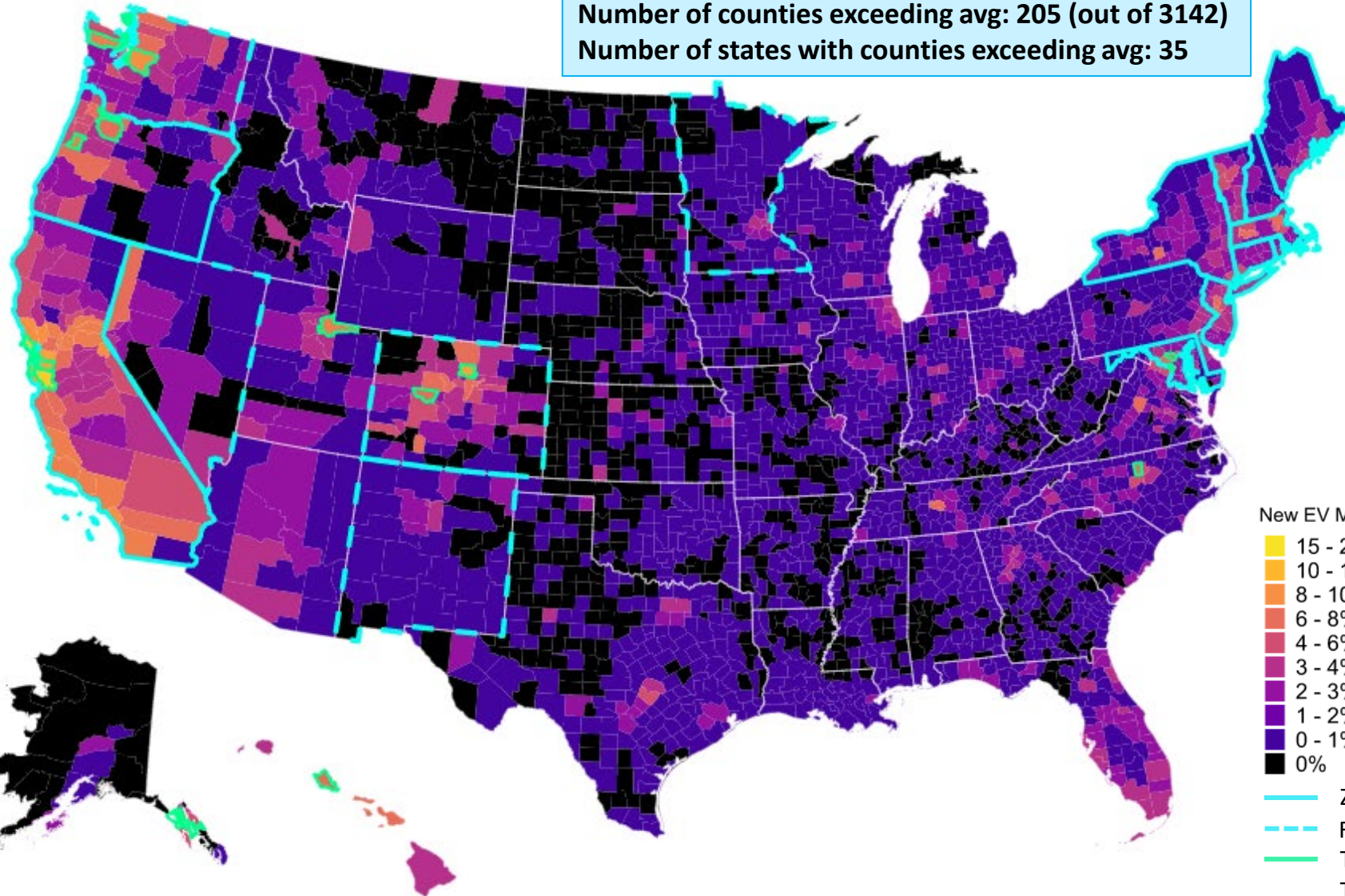


# US Nationwide New EV Market Share Jan 2020 – Dec 2020

Nationwide avg new EV market share: 2.1%  
 Number of counties exceeding avg: 205 (out of 3142)  
 Number of states with counties exceeding avg: 35

## Top 5 counties in CA and Top 15 counties outside CA

Santa Clara, CA	18.1%
Marin, CA	16.9%
Alameda, CA	14.6%
San Francisco, CA	14.2%
San Mateo, CA	10.8%
Boulder, CO	10.1%
San Juan, WA	9.7%
King, WA	8.2%
Benton, OR	6.8%
Jefferson, WA	6.7%
Multnomah, OR	6.6%
Summit, UT	6.1%
Washington, DC	5.8%
Clackamas, OR	5.7%
Honolulu, HI	5.6%
Broomfield, CO	5.5%
Orange, NC	5.3%
Hoonah-Angoon, AK	5.3%
Howard, MD	5.1%
Pitkin, CO	5.1%



New EV Market Share

- 15 - 20%
- 10 - 15%
- 8 - 10%
- 6 - 8%
- 4 - 6%
- 3 - 4%
- 2 - 3%
- 1 - 2%
- 0 - 1%
- 0%

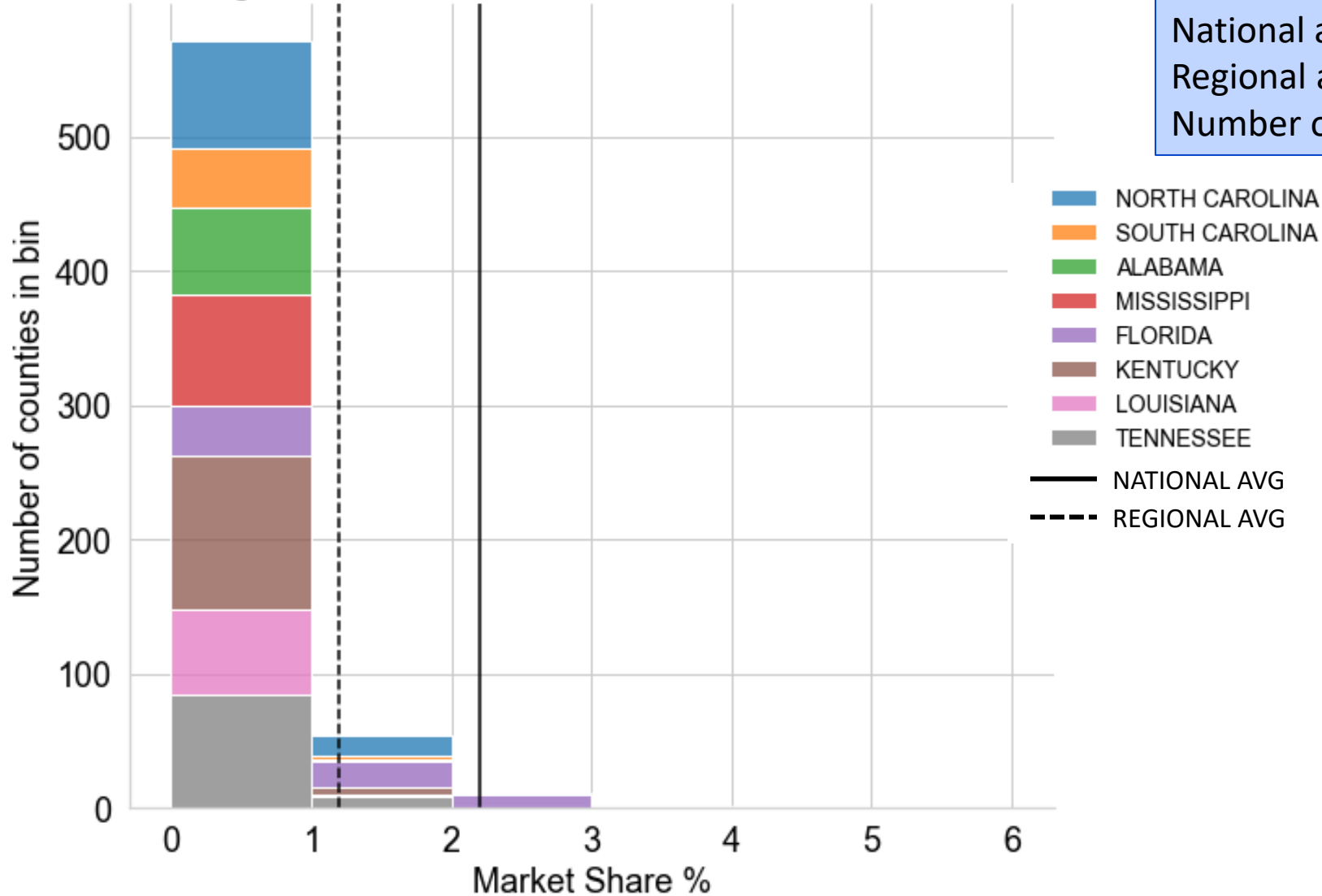
- ZEV state
- Future\* ZEV states
- Top 5 counties in CA and Top 15 counties outside CA

\*CO and WA will become ZEV states in 2023. MN, NM, and NV have announced that they intend to become ZEV states in the future.

# New EV Market Share: South and Southeast

Jan 2020 – Dec 2020

Stacked Histogram of New EV Market Share: South and Southeast Co



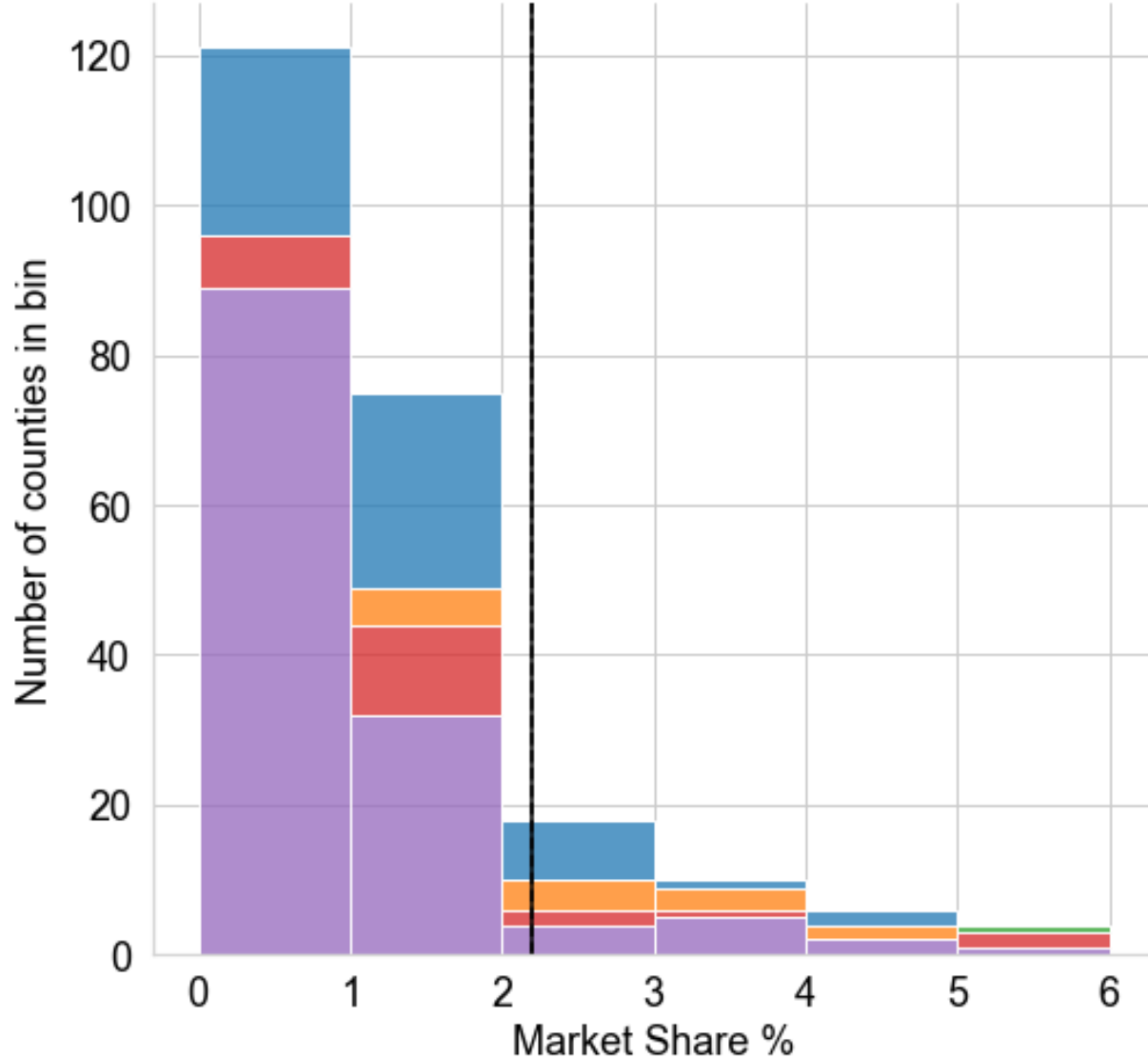
National avg new EV market share: 2.1%  
Regional avg new EV market share: 1.2%  
Number of counties in region: 641



# New EV Market Share: Northeast

Jan 2020 – Dec 2020

Stacked Histogram of New EV Market Share: Northeast Count



National avg new EV market share: 2.1%  
Regional avg new EV market share: 2.2%  
Number of counties in region: 234

- NEW YORK
- MASSACHUSETTS
- DISTRICT OF COLUMBIA
- MARYLAND
- VIRGINIA
- NATIONAL AVG
- REGIONAL AVG

# Why are NC's numbers so low? No electric pick-up trucks!!!



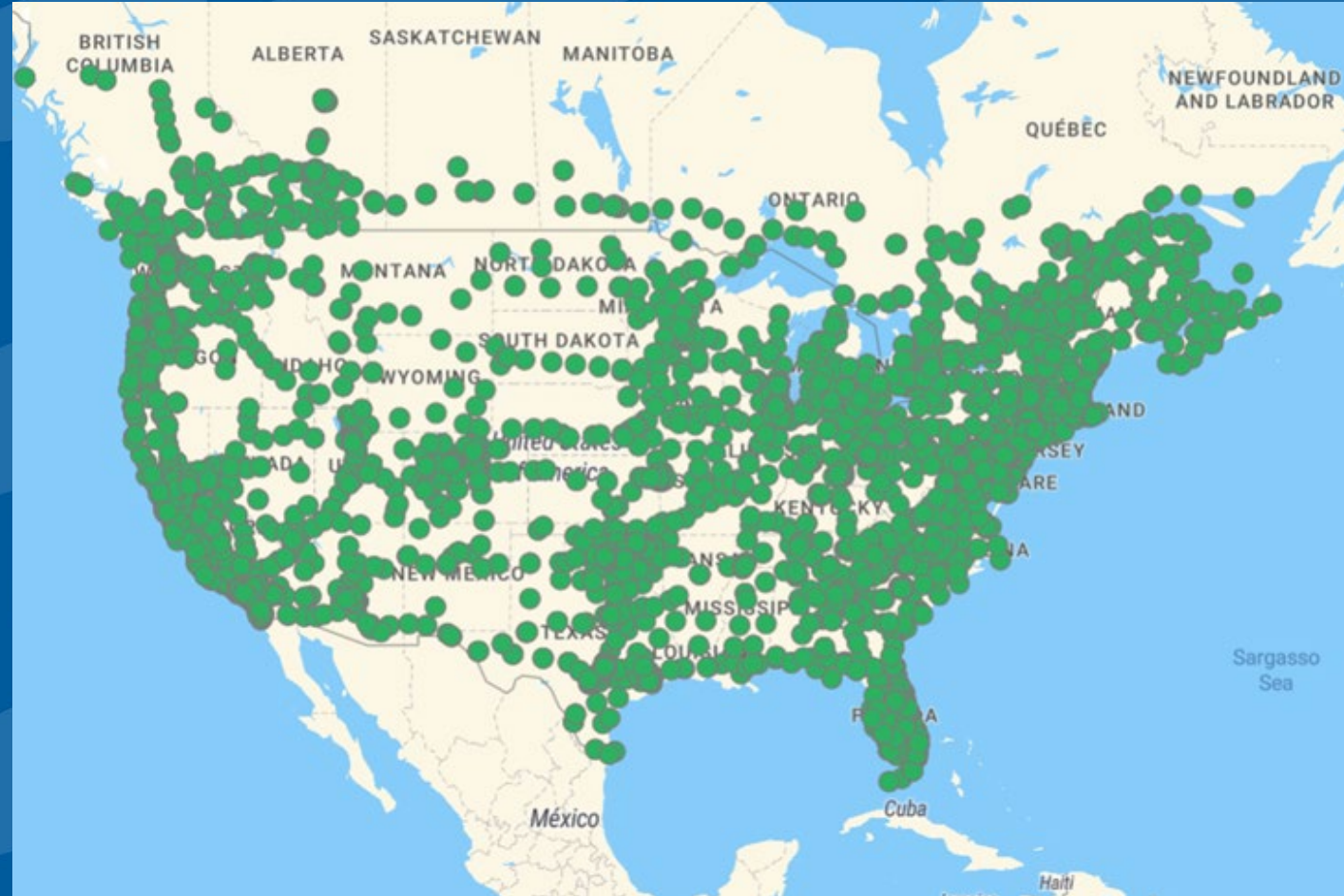
Rivian



But - they are coming!



# Electric Vehicle Charging Infrastructure



# EV Charging Equipment

## AC Level 1

- 1.4 kW – 3.3 kW
- 3 – 5 miles of charge/ hour

## AC Level 2

- 3.8 kW – 19.2 kW
- 8 - 24 miles of charge/ hour
- 2 plugs

## DC Fast Charge

- 50 kW to 350 kW
- 80% charge in 20 to 30 minutes

Home

Workplace

Destination/Travel corridor





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## Does your workplace offer EV charging?

Yes

No

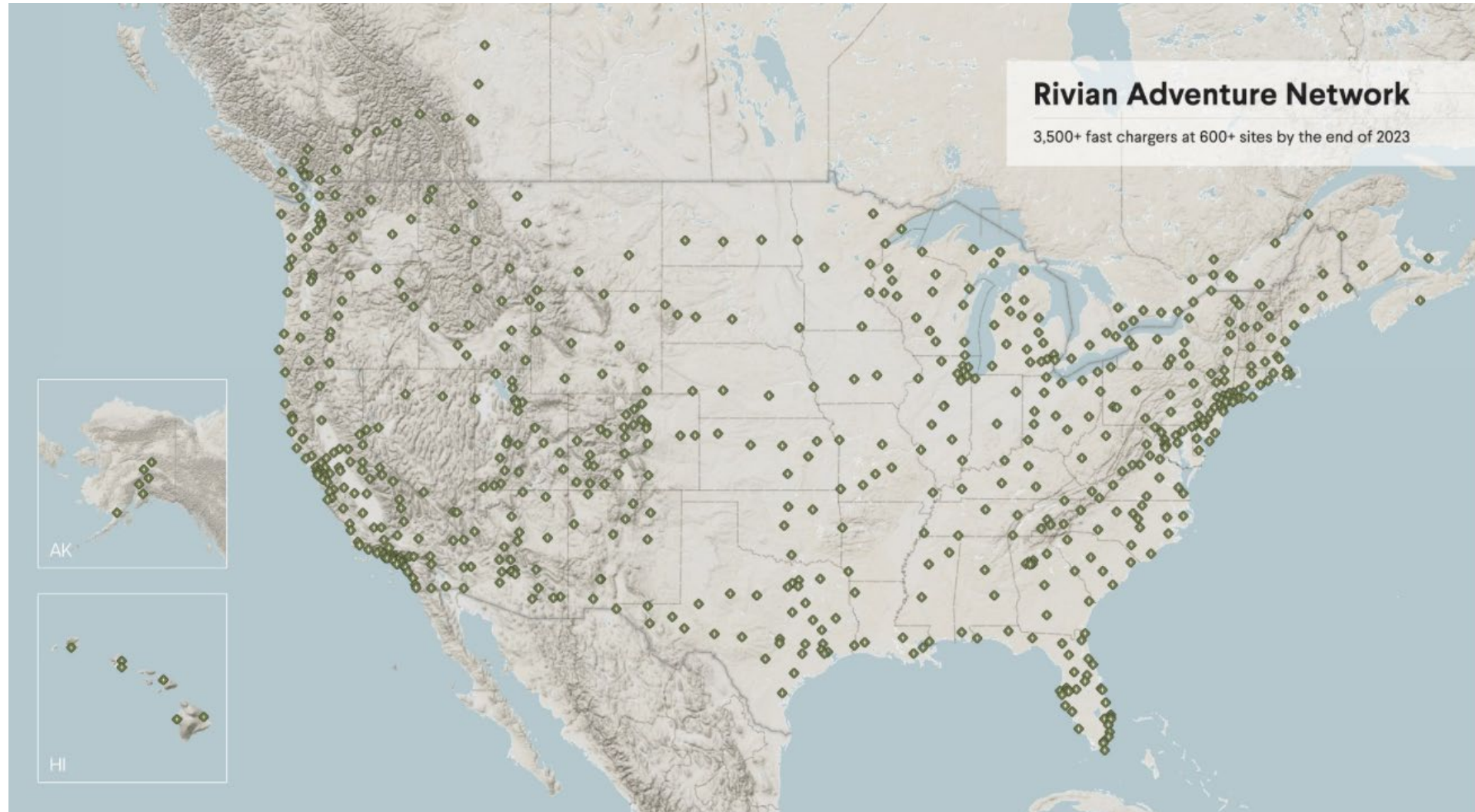
I don't  
know

# Tesla Continues to Expand Their “Tesla Only” Network

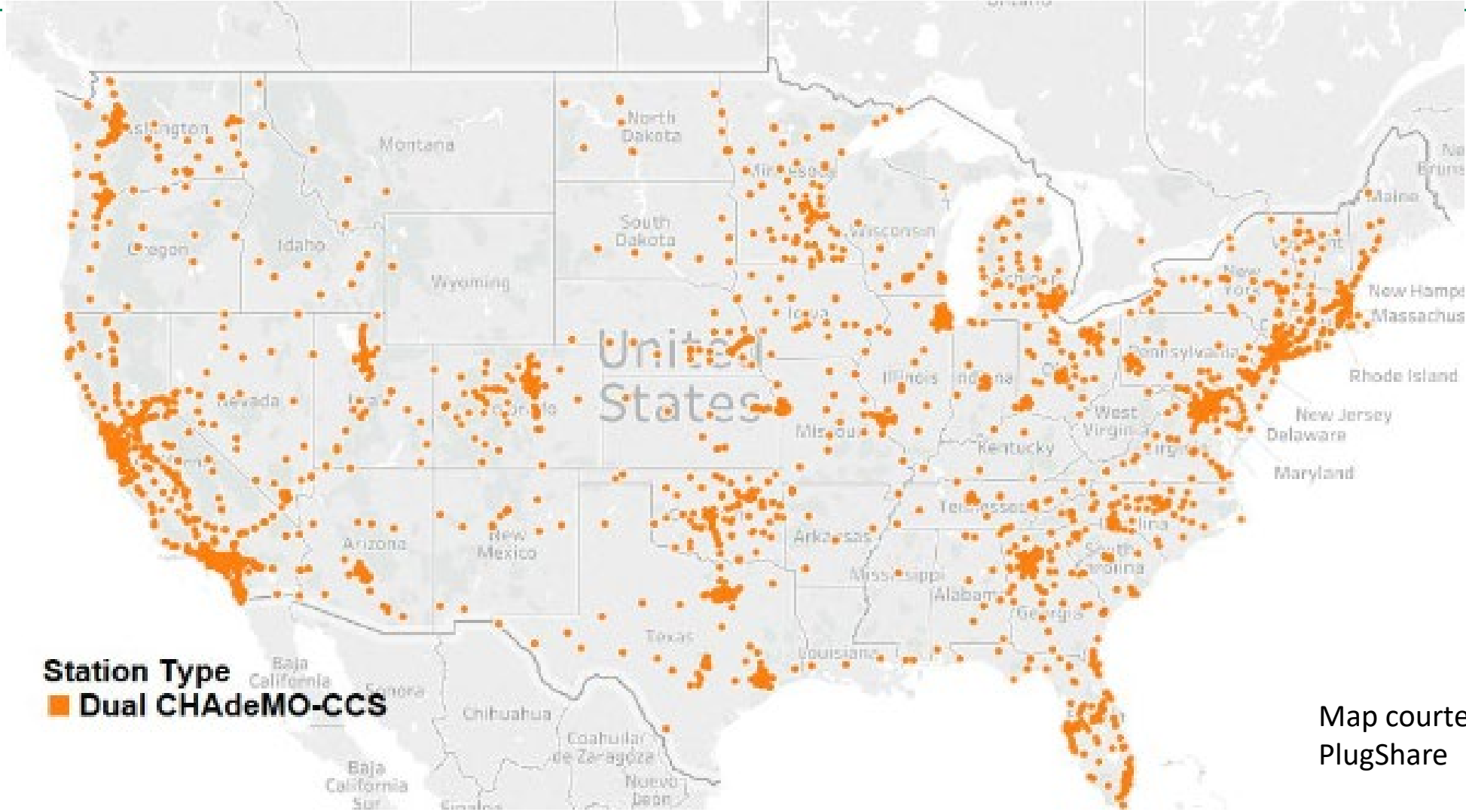




# Rivian is Planning Their Own Charging Network

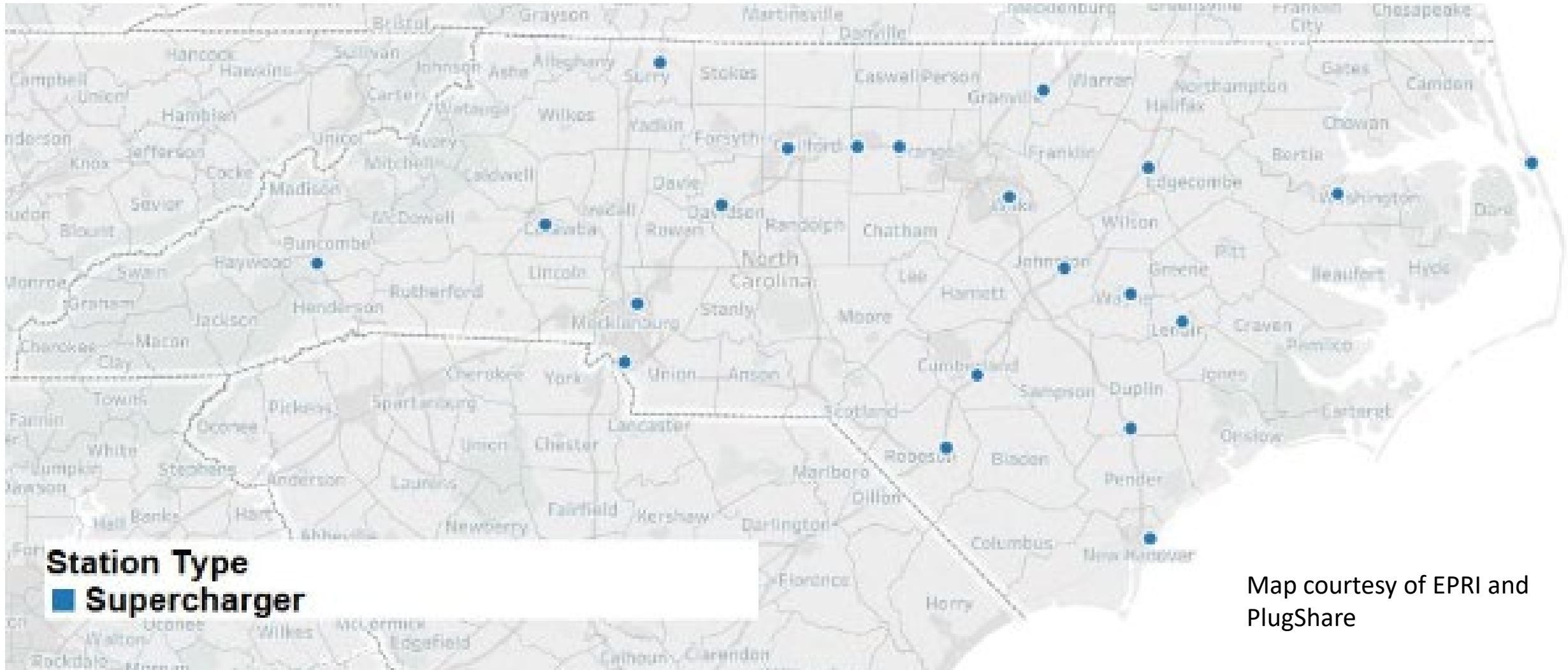


# Other EV Chargers Lag Behind



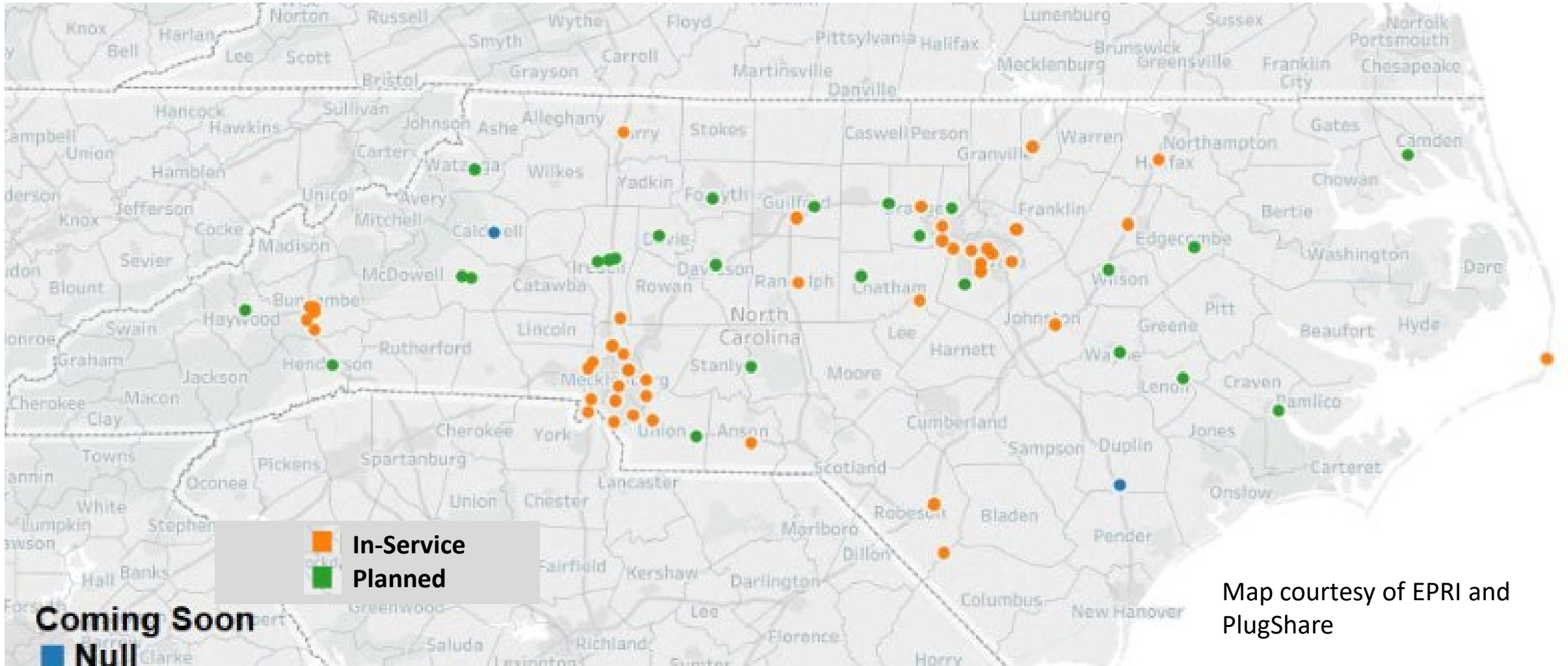
Map courtesy of EPRI and PlugShare

# Traveling Across NC by Tesla

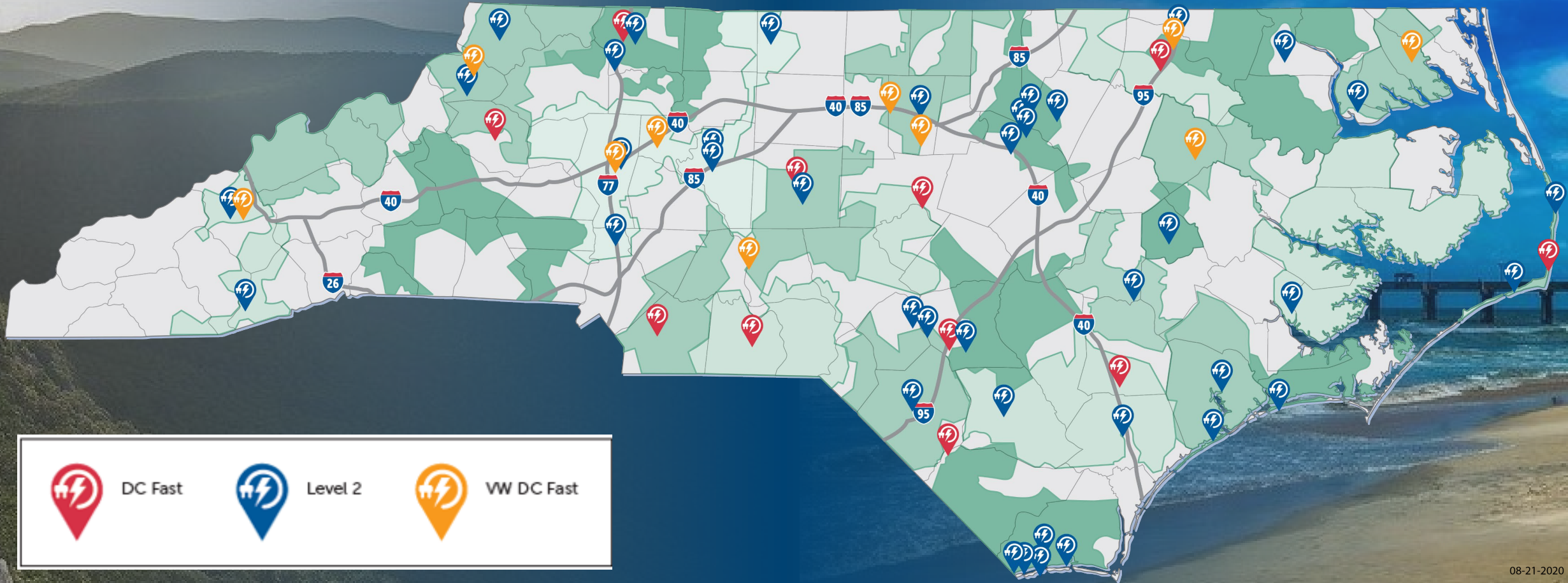




# Grant Funding & Utility Activities are Behind Growth for Non-Tesla DC Fast Chargers



# NC Electric Cooperatives EV Charging Network



# Electric School Buses

- Randolph Middle School electric school bus

- One of five electric school buses awarded VW funding
- Partnership with DPI/Randolph EMC/NCEMC/Randolph County school system
- Will provide:
  - Data on costs, emissions, charging patterns, and
  - Benefits to community, children, co-op



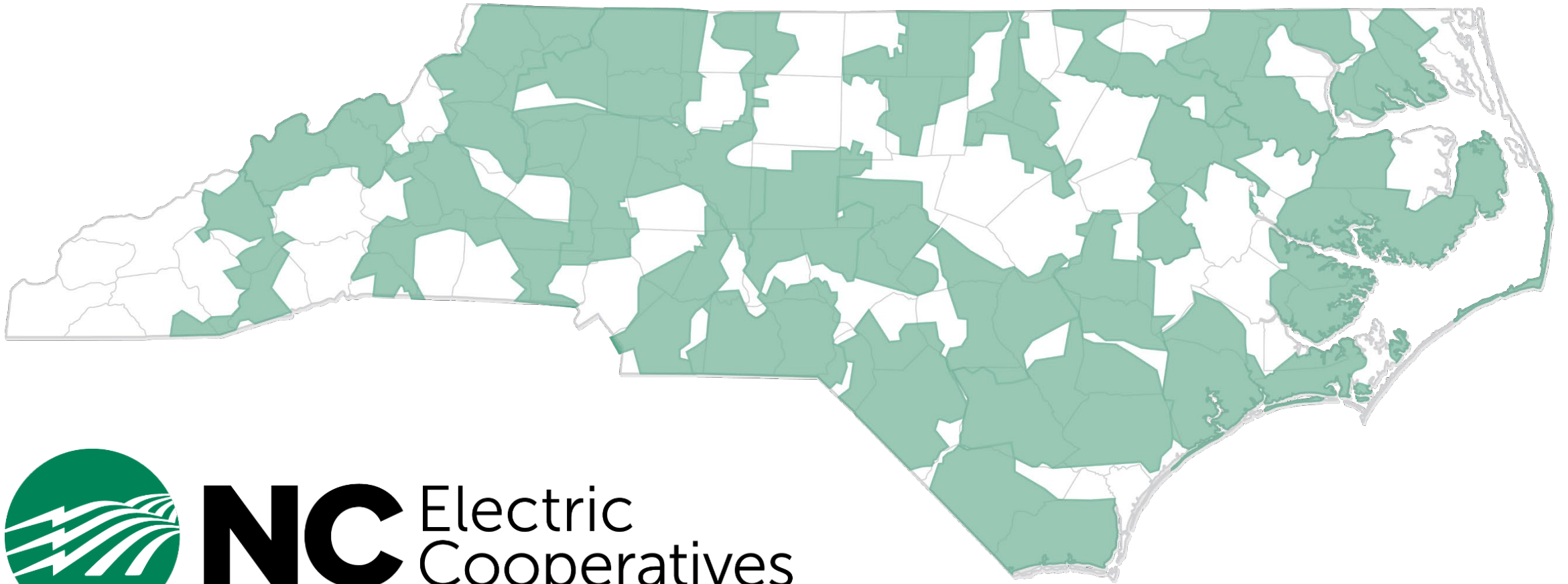


# BEST Solutions

Beneficial Electrification & Sustainable Technology







**NC** Electric  
Cooperatives

Your Touchstone Energy® Cooperatives 



**What one or two words describe beneficial electrification?  
(use hyphens for multi-word responses)**