Townhall:
Roadmap to
Electric Transportation
Transformation

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WHO WE ARE: SOUTHERN ALLIANCE FOR CLEAN ENERGY

THE LWVFL CLEAN ENERGY COMMITTEE
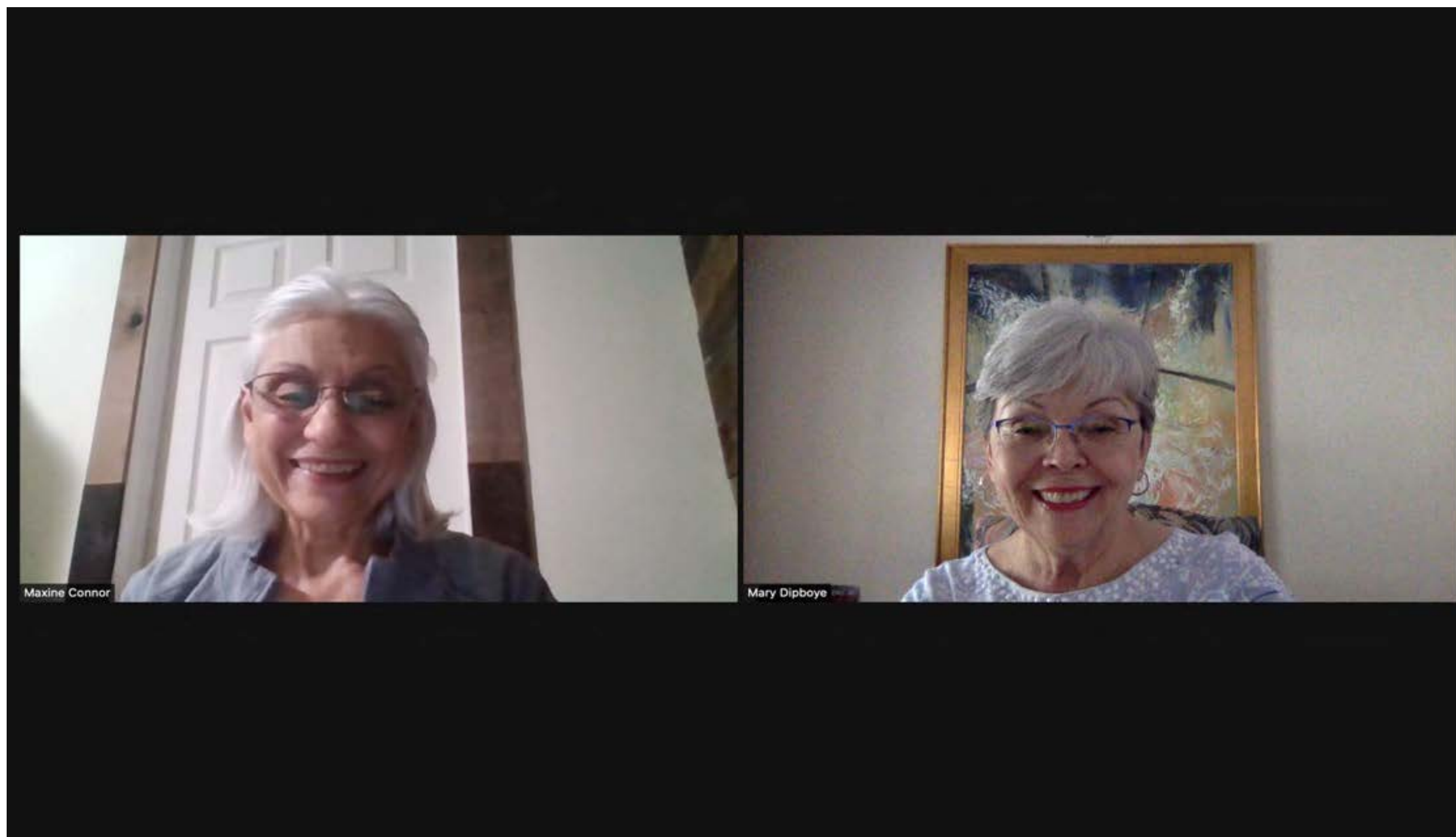
Maxine Conner,
Co-chair

Mary Dipboye.
Co-chair

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AGENDA

Why is electrification of transportation essential to fighting climate change?

EV 101: The Basics

Resources: Flyer, Electrify the South Policy Toolkit

Call to Action: Develop a plan for your community and outreach to local public officials

Why Electric Vehicles (EVs)?

The transportation sector is now the <u>largest source</u> of carbon dioxide (CO_2) pollution in the United States.

We can do something about that!
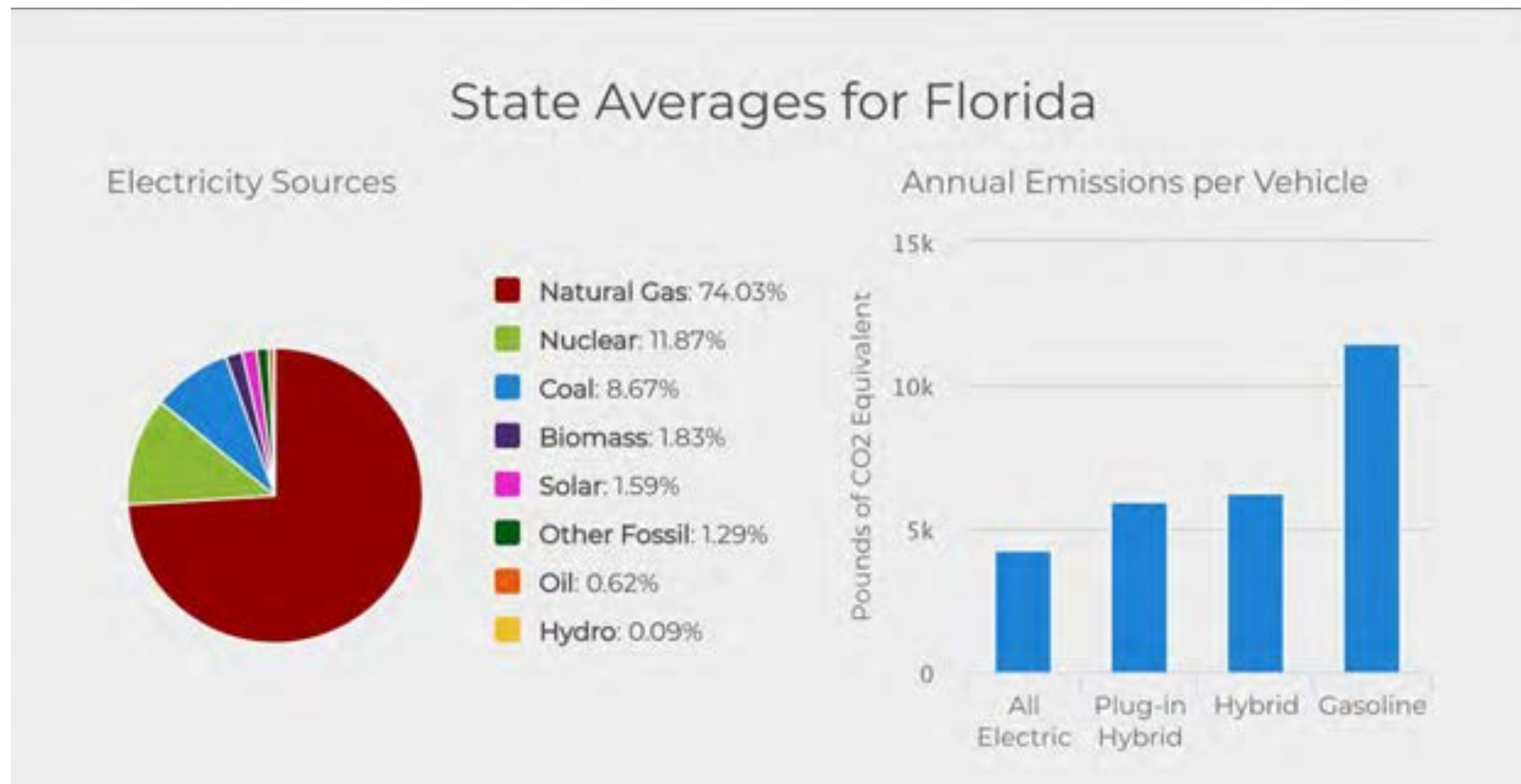
WHAT IS AN EV?

WHY DRIVE ELECTRIC?   REDUCED EMISSIONS

EVs emit over 60% less life cycle GHG emissions compared to gasoline vehicles.

In FL, the average EV produces only ~~4,261~~ 4,132 lbs. of CO_2e per year, compared to 11,435 lbs. by gasoline powered vehicles.

An average EV on the road in the U.S. has the same greenhouse-gas emissions as a car getting 88 miles per gallon (MPG).

State Averages for Florida

Electricity Sources

- Natural Gas: 74.03%
- Nuclear: 11.87%
- Coal: 8.67%
- Biomass: 1.83%
- Solar: 1.59%
- Other Fossil: 1.29%
- Oil: 0.62%
- Hydro: 0.09%

Annual Emissions per Vehicle

Pounds of CO2 Equivalent

All Electric — Plug-in Hybrid — Hybrid — Gasoline

Source: Department of Energy: AFDC, Union of Concerned Scientists

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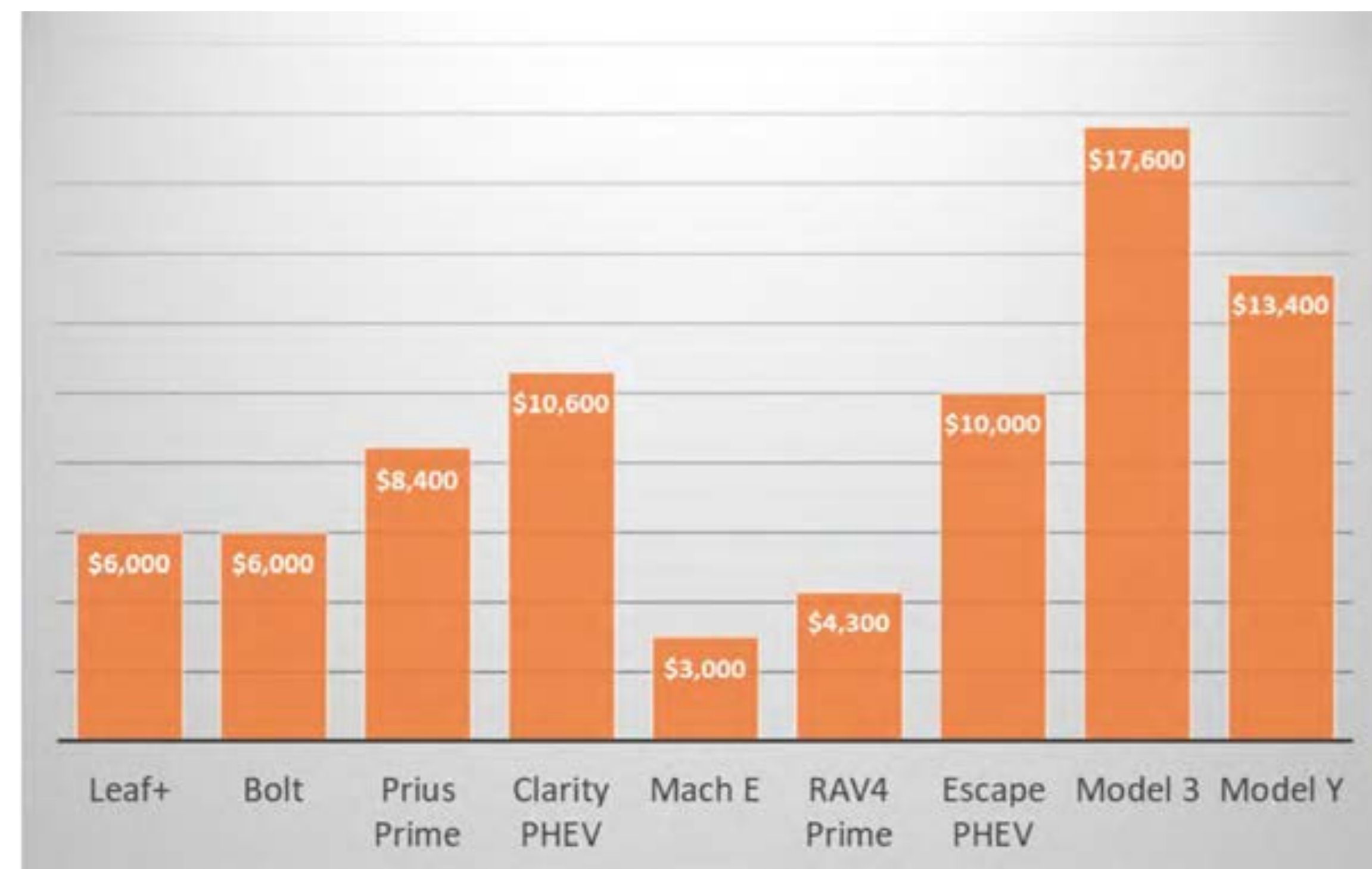
Why Drive Electric? Lower Lifetime Ownership Costs

Lifetime Savings From EVs vs. Best-Selling Gasoline Powered Vehicles in Class

Typical driver saves **$6,000 to $10,000** over the life of the vehicle,

vs.

owning a comparable gas-powered vehicle.

Source: Consumer Reports

$6,000	$6,000	$8,400	$10,600	$3,000	$4,300	$10,000	$17,600	$13,400
Leaf+	Bolt	Prius Prime	Clarity PHEV	Mach E	RAV4 Prime	Escape PHEV	Model 3	Model Y

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WHY DRIVE ELECTRIC? LOWER FUEL COSTS HOME CHARGING

MODEL	COST PER MILE (CENTS)	1,000 MILES COST (DOLLARS)
Gasoline	16.5	$165
Electric	3.1	$31
Electric from Solar	1	$10

Assuming $4.25 cost per gallon of gasoline and 25.7 mpg
33.7kW/h= 1 gallon
Assuming $.11/kWh and 120 mpge

Driving electric may add about $30-40 per month to your utility/power bill.

Driving electric will cut your fuel costs significantly.

UC Davis Electric Vehicle Explorer tool for calculating annual vehicle energy costs: gis.its.ucdavis.edu/evexplorer/#!/locations/start

ELECTRIFY THE SOUTH

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WHY DRIVE ELECTRIC? LOWER FUEL COSTS ON THE ROAD

MODEL	COST PER MILE (CENTS)	1,000 MILES COST (DOLLARS)
Gasoline	16.5	$165
Electric	9.8	$98
Electric from Solar	1	$10

Assuming $4.25 cost per gallon of gasoline and 25.7 mpg
33.7kW/h= 1 gallon
Assuming $.11/kWh and 120 mpge

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WHY DRIVE ELECTRIC? CONVENIENCE AND TIME SAVINGS

No trips to gas station

No oil changes

Very low maintenance

Charging at home is convenient

Drop the pump!

SAVE MONEY
SAVE TIME

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WHY DRIVE ELECTRIC? SUPERIOR EFFICIENCY

Vehicle	EPA Fuel Economy ↓	Driver MPG	Annual Fuel Cost
2020 Tesla Model 3 Standard Range Plus Automatic (A1), Electricity	**141** MPGe 148 132 combined city hwy city/hwy 24 kWh/100 mi	NA	$450
2019 Hyundai Ioniq Electric Automatic (A1), Electricity	**136** MPGe 150 122 combined city hwy city/hwy 25 kWh/100 mi	NA	$500
2020 Hyundai Ioniq Electric Automatic (A1), Electricity	**133** MPGe 145 121 combined city hwy city/hwy 25 kWh/100 mi	NA	$500
2019 Tesla Model 3 Standard Range Plus Automatic (A1), Electricity	**133** MPGe 140 124 combined city hwy city/hwy 25 kWh/100 mi	NA	$500
2020 Tesla Model 3 Standard Range Automatic (A1), Electricity	**131** MPGe 138 124 combined city hwy city/hwy 26 kWh/100 mi	NA	$500
2019 Tesla Model 3 Standard Range Automatic (A1), Electricity			

The average fuel efficiency in the US is 25.1 miles per gallon

The fuel efficiency for most electric cars is over 100 MPGe

Source: EPA, DOE

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WHY DRIVE ELECTRIC?   SUPERIOR TECHNOLOGY

Smoother ride

Quiet

Fun to drive

Computer on wheels

EVs have instant torque. The quickest car in the world is a Tesla Model S

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MODELS AND TRENDS

59 models sold today

91 new models on the way

234 average mile range

$460B in global investment

EV Market Adoption

- AGGRESSIVE
- MODERATE
- CONSERVATIVE

VOLVO
50% of its vehicle offerings will be EV.

FORD
40% of global sales will be EV.

GENERAL MOTORS
all light-duty cars and SUVs will be EV.
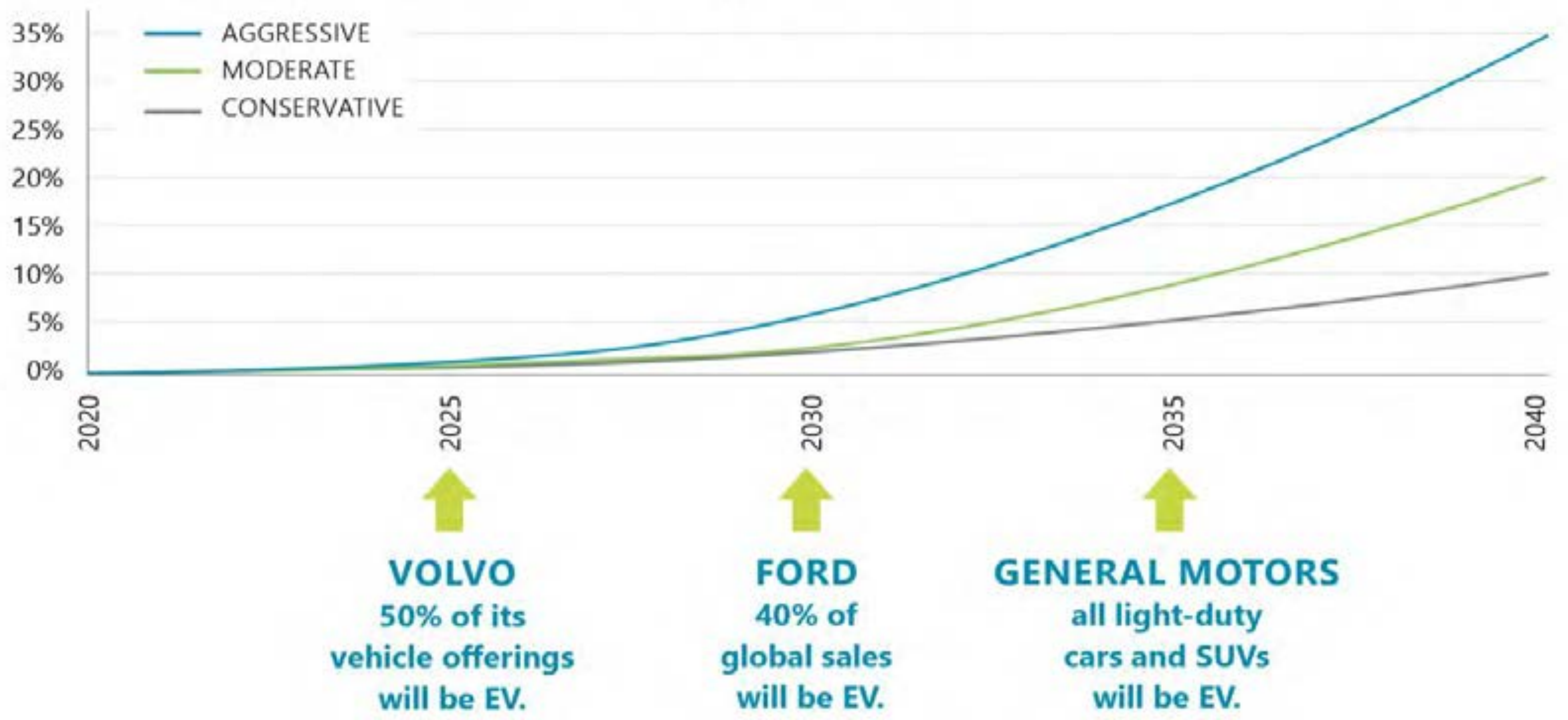
Source: Atlas Public Policy

Source: FLDOT EVMP

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HOW TO BROWSE EV MODELS?   PLUGSTAR WEBSITE

https://plugstar.com/

TYPES OF VEHICLES BY WEIGHT CLASS

Source: https://afdc.energy.gov/data/10381

Mack's battery-powered LR joins a growing list of electric-powered trash haulers. (Photo: Mack)

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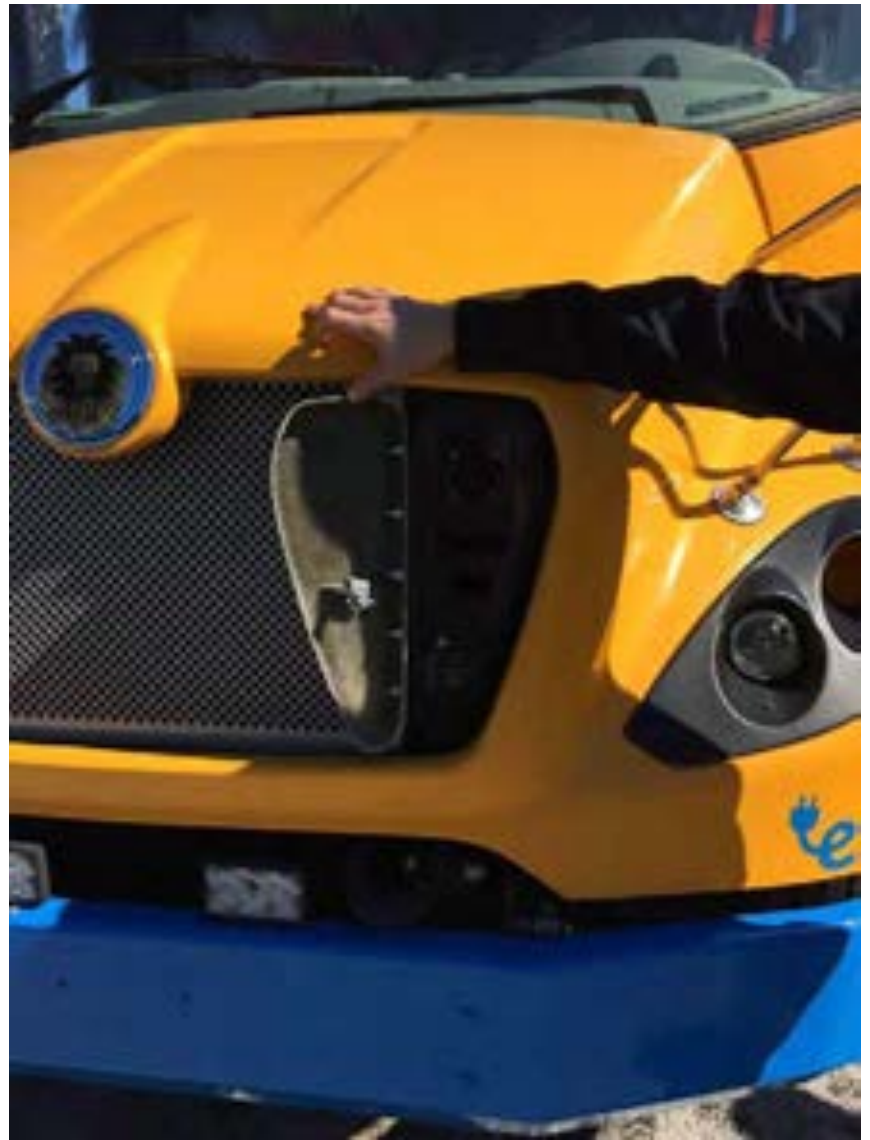
CHARGING AN EV

Existing EVSE Types and Use Cases

EVSE Type	Supply Voltage	Charger Examples	Power Level	Charge Rate (miles / hr)	Install Cost	Charging Use Cases	KEY POINTS
Level 1	120V (Toaster)	J1772 Connector	1 - 1.8 kW	3 - 7	$	Home / Overnight	Obsolete for commercial purposes
Level 2	208-240V (Clothes Dryer)	J1772 Connector	3.3 - 19.2 kW	10 - 60	$$	Home-work / Destination / Community	Currently dominant for commercial purposes
			7.7 kW typical	26			
DCFC	480V (Small office building)	CHAdeMO / SAE Combo (CCS)	50 kW	175	$$$	Travel along State Highways	Most applicable for long-range travel and evacuations
			150 kW	**500**			
			350 kW	1,200			

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RESOURCES:
FLYER TO LEAVE BEHIND

https://bit.ly/3EQtk4M

HOW CAN LEAGUES GET INVOLVED?
DELIVER THREE "ASKS" TO LOCAL PUBLIC OFFICIALS

Familiarize yourself with the benefits of electric transportation

Familiarize yourself the top 3 asks to local public officials

Work with SACE to prepare a customized approach to engage with your local public officials

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HOW CAN LEAGUES GET INVOLVED?
BENEFITS OF TRANSITIONING TO ELECTRIC FOR LOCAL GOVERNMENTS

Keep pace with technology

Achieve lower fuel and maintenance costs

Reduce emissions

Improve public health

Project positive community image

LOCAL GOVERNMENTS ARE KEY TO EV ADOPTION: POLICY TOOLKIT PROVIDES ROADMAP

https://www.electrifythesouth.org/toolkit

How can Leagues get involved?
Deliver Three "Asks" to local Public Officials

1. Establish Fleet Goals

2. Adopt Policies to Increase EV Infrastructure

3. Develop Education and Outreach Programs

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How Can Local Governments Increase Adoption?
Set Fleet Goals

How Can Local Governments Increase Adoption? EV-Readiness Policies

WHAT IS EV READINESS?

An EV-readiness policy requires a percentage of parking spaces built to include electrical infrastructure that enables future EV charging.

Three Tiers of EV Readiness
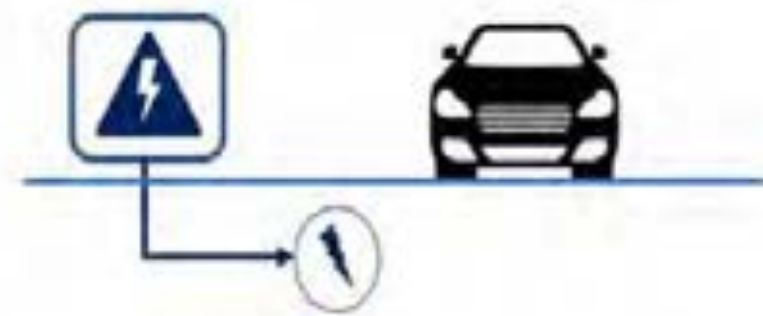
EV Capable Parking Spot: Electrical Panel Capacity & Conduit
Install electrical panel capacity and conduit (raceway) to accommodate the future buildout of EV charging with 208/240V, 40-amp circuits.
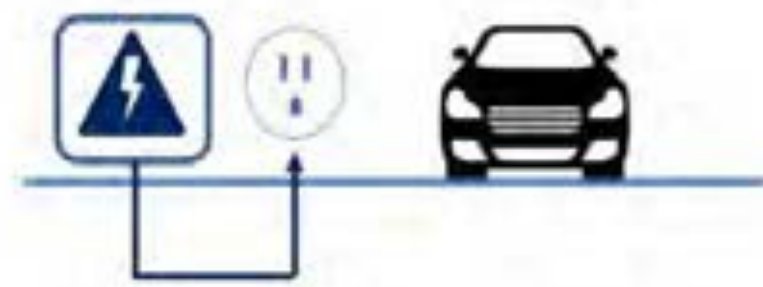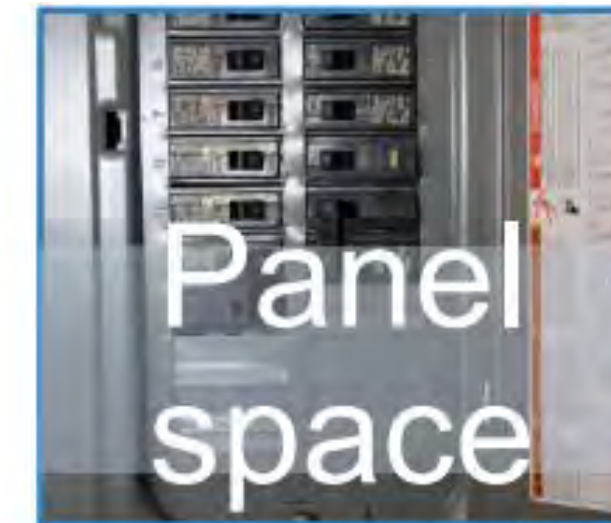
EV-Ready Parking Space: Install Full Circuit
Full circuit installations include 208/240V, 40-amp panel capacity, raceway, wiring, receptacle and overprotection devices similar to a dryer circuit.
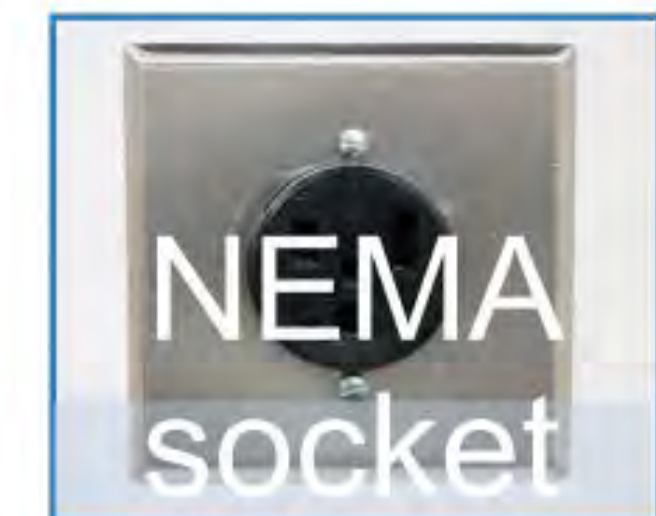
EVSE (electric vehicle service equipment) Installed
Install a minimum number of Level 2 EV charging stations.

Panel space

Conduit

Wiring

NEMA socket

(Home) EVSE

Source: SWEEP

Image: City of Orlando

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WHY IMPLEMENT EV READINESS POLICIES?
COST SAVINGS

- EV-ready during construction are typically low

- Estimated 0.13%-0.17% of project costs

- Post-construction can be 4 times higher

Cost per EV Parking Space: New Construction vs Retrofit
Case Study prepared for the City and County of San Francisco (2016)

The case study considers a parking lot with ten total spaces and two EV Parking Spaces, and compares the EV infrastructure installation costs at the time of new construction versus building retrofit. "EV Parking Spaces" define spaces that have an EV-Ready Outlet, and include the electrical panel capacity, raceways, breakers, outlet boxes, and wiring to install an EV charger at any given time in the future.

Graphic: Southwest Energy Efficiency Program

Source Plug In Electric Vehicle Infrastructure

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WHY EV READY IS SO IMPORTANT? ACCESS TO CHARGING

80% of charging happens at home.
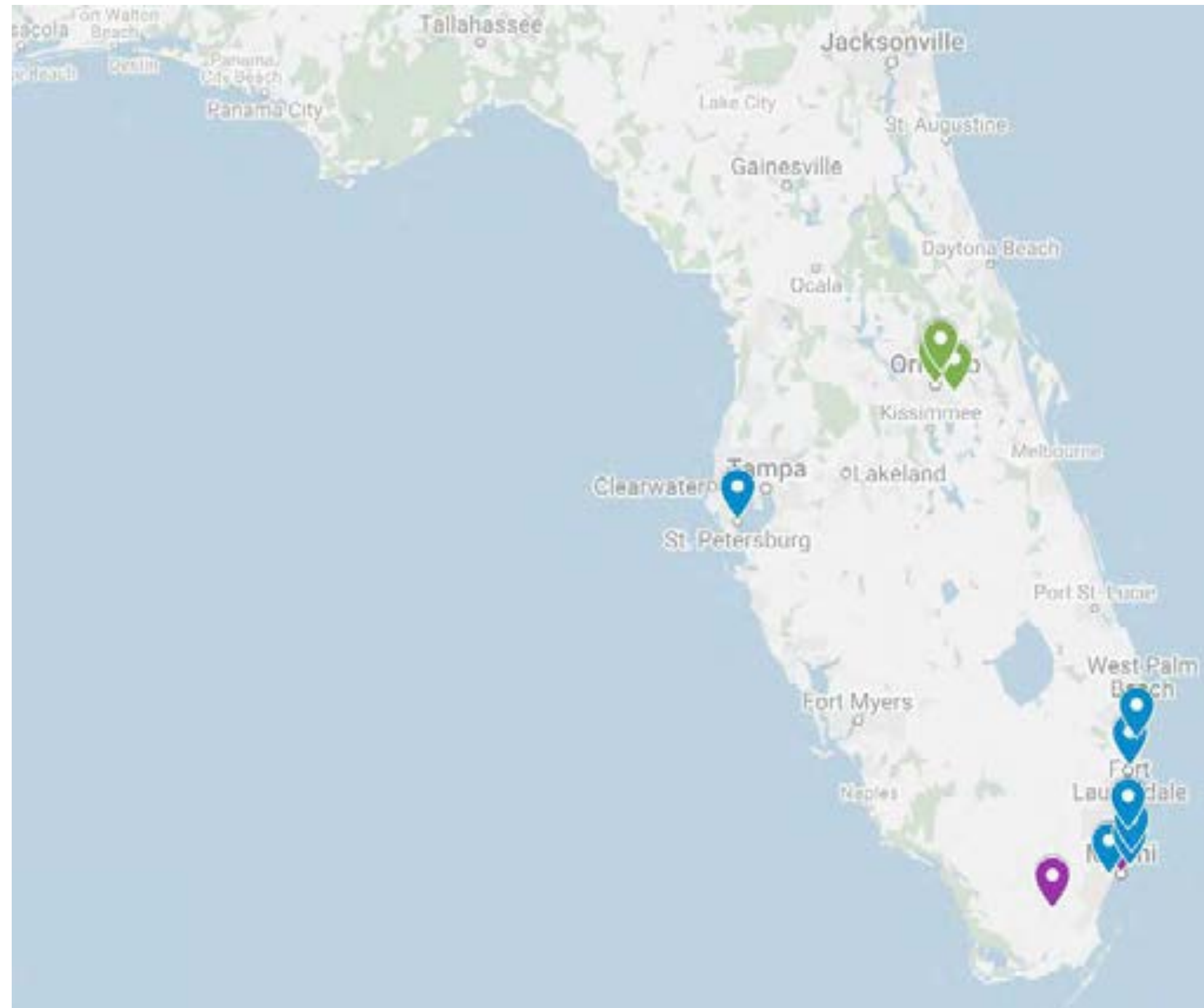
Low or no **access** to home charging is a well established barrier to EV adoption.

Increasing access to home charging addresses **energy justice.**
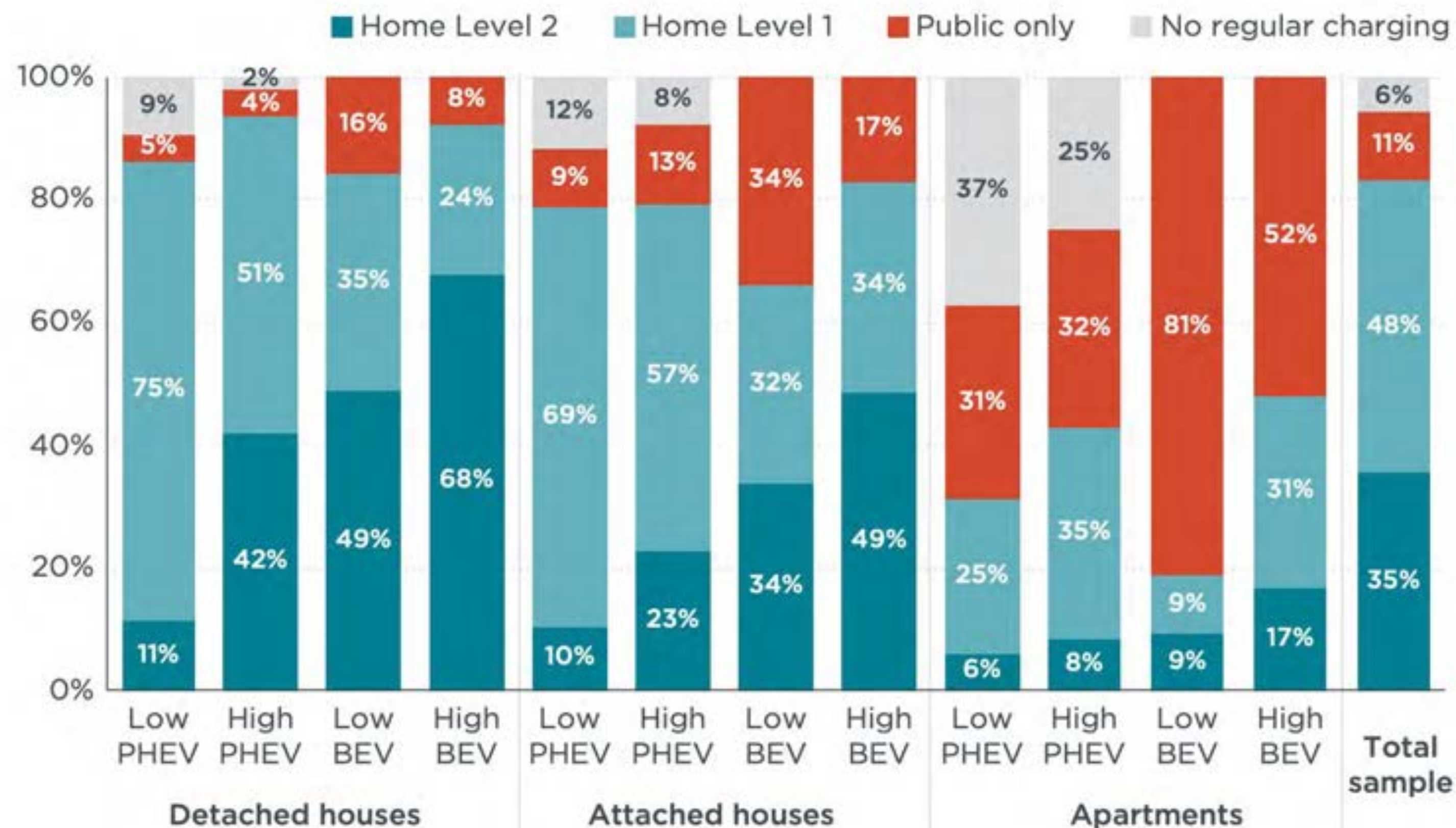
Source: ICCT Report

LOCAL GOVERNMENTS WITH EV READY POLICIES

EV ready
- [Miami-Dade County, FL](#)
- [Surfside, FL](#)

EV capable, ready and EVSE installed
- [Boca Raton, FL](#)
- [Boynton Beach, FL](#)
- [Coral Gables, FL](#)
- [Hollywood, FL](#)
- [Miami, FL](#)
- [Miami Beach, FL](#)
- [St Petersburg, FL](#)
- [Winter Park, FL](#)
- [Orlando, FL](#)

In consideration:
- Orange County

FLORIDA DEPARTMENT OF TRANSPORTATION

EV INFRASTRUCTURE MASTER PLAN

July 2021

FDOT

- **Develop minimum EV-ready parking requirements:**
Work with state and local government partners to establish minimum EV-ready parking requirements for planning future EVSE or requirements for installing EVSE based on different land uses or building types. This needs to acknowledge the crossover between EV charging spaces and ADA required spaces.

https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/fto/fdotevmp.pdf?sfvrsn=2bf9e672_4

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How Can Local Governments Increase Adoption?
Education and Events

Anatomy of an Amazing EV Website:

What the local government is doing to promote EVs

Education

Links to trusted partners

Link to Federal tax credits for vehicles

Link to Federal incentives

Link for Florida Incentives

Information for developers

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How Can Local Governments Increase Adoption? Education and Events

Anatomy of an Amazing Ride and Drive or Presentation:

How "normal" it is

Instant torque

Smooth performance

Superior technology (show all the features)

Superior efficiency of an EV (over 100 MGPe vs 25 MPG)

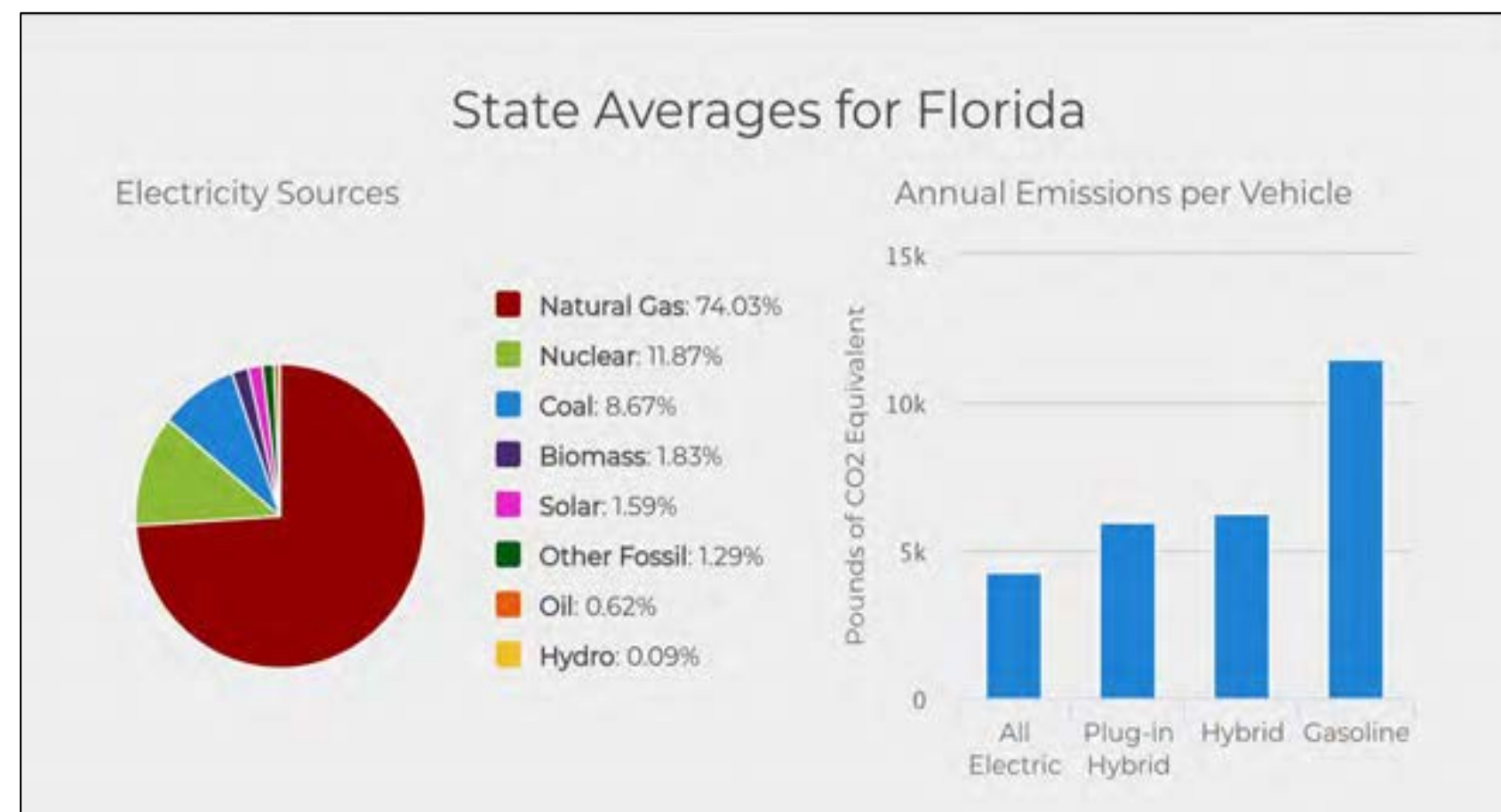Lower cost to fuel

Lower maintenance costs

Total cost to own (often lower)

Vehicle Cost Calculator

Range (median 2021 = 234)

MSRP range

Buying a used EV

HOW CAN LOCAL GOVERNMENTS INCREASE ADOPTION? EDUCATION AND EVENTS

Anatomy of an Amazing Ride and Drive or Presentation:

Emissions reduction benefits/Zero tailpipe emissions

1. Greenhouse gas emissions reduction benefits (climate, environment)
2. Criteria pollutant emissions reduction benefits (public health, environment)

The lifetime emissions of EVs are less than 50% traditional car, even when emissions from manufacturing are considered.

State Averages for Florida

Electricity Sources

- Natural Gas: 74.03%
- Nuclear: 11.87%
- Coal: 8.67%
- Biomass: 1.83%
- Solar: 1.59%
- Other Fossil: 1.29%
- Oil: 0.62%
- Hydro: 0.09%

Annual Emissions per Vehicle

(Pounds of CO_2 Equivalent)

All Electric | Plug-in Hybrid | Hybrid | Gasoline

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HOW CAN LOCAL GOVERNMENTS INCREASE ADOPTION? EDUCATION AND EVENTS

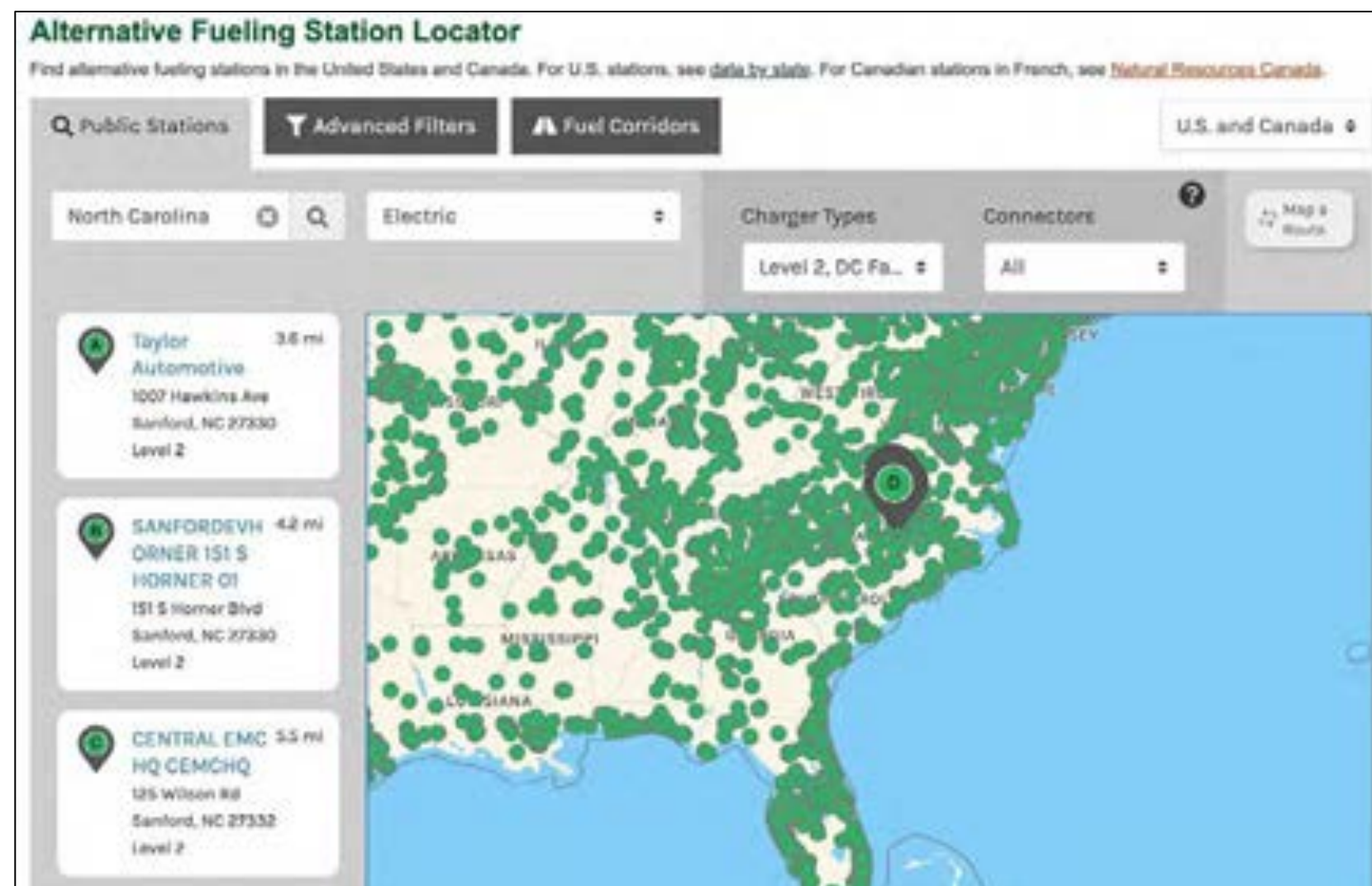## Anatomy of an Amazing Ride and Drive or Presentation:

How to Charge Demonstrations

Level 1 Charging

Level 2 Charging (show locations-Plugshare, AFDC website)

Charging at a supercharger/EA site

How to install a 240 line for a home charger

Powering with renewables

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CALL TO ACTION: HOW YOU CAN ENGAGE?

Schedule a one on one call with me.

NEXT STEP: CONTACT DORY

Dory Larsen

Email: dory@cleanenergy.org

QUESTIONS + STAY CONNECTED

ElectrifyTheSouth.org

Monthly newsletters, electric vehicle actions, EV blogs for new and established drivers, and more!

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