CLEAN FUELS OHIO

OHIO'S CLEAN TRANSPORTATION ADVOCATE

EV Opportunities in Rural Ohio

June 15, 2022

Agenda

1. Welcome & Intro
2. EV Market Snapshot
3. EVSE Infrastructure in Ohio
4. Drive Clean Rural USA Project
5. Support & Funding
6. Questions & Answers


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OHIO
We are making Ohio a cleaner and more prosperous state

EV MARKET SNAPSHOT

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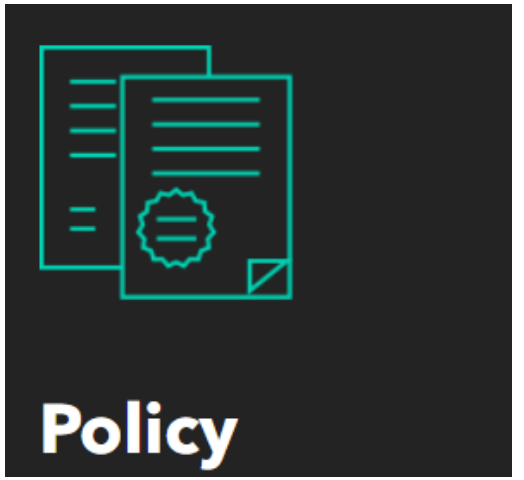
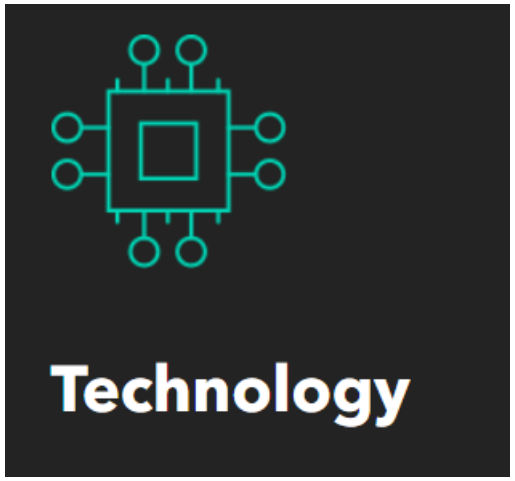
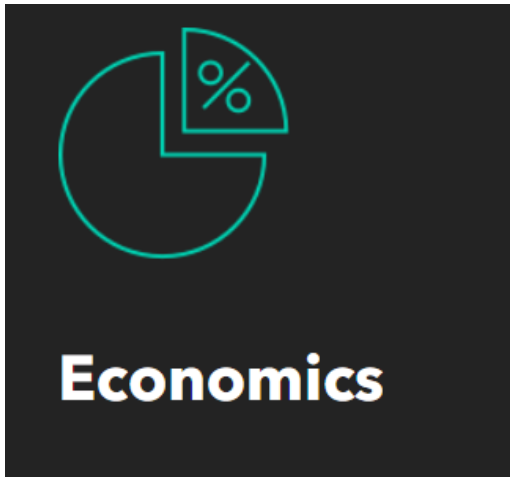
DRIVING THE EV MARKET

BloombergNEF

Electric Vehicle Outlook 2022







*https://about.bnef.com/electric-vehicle-outlook/#toc-download

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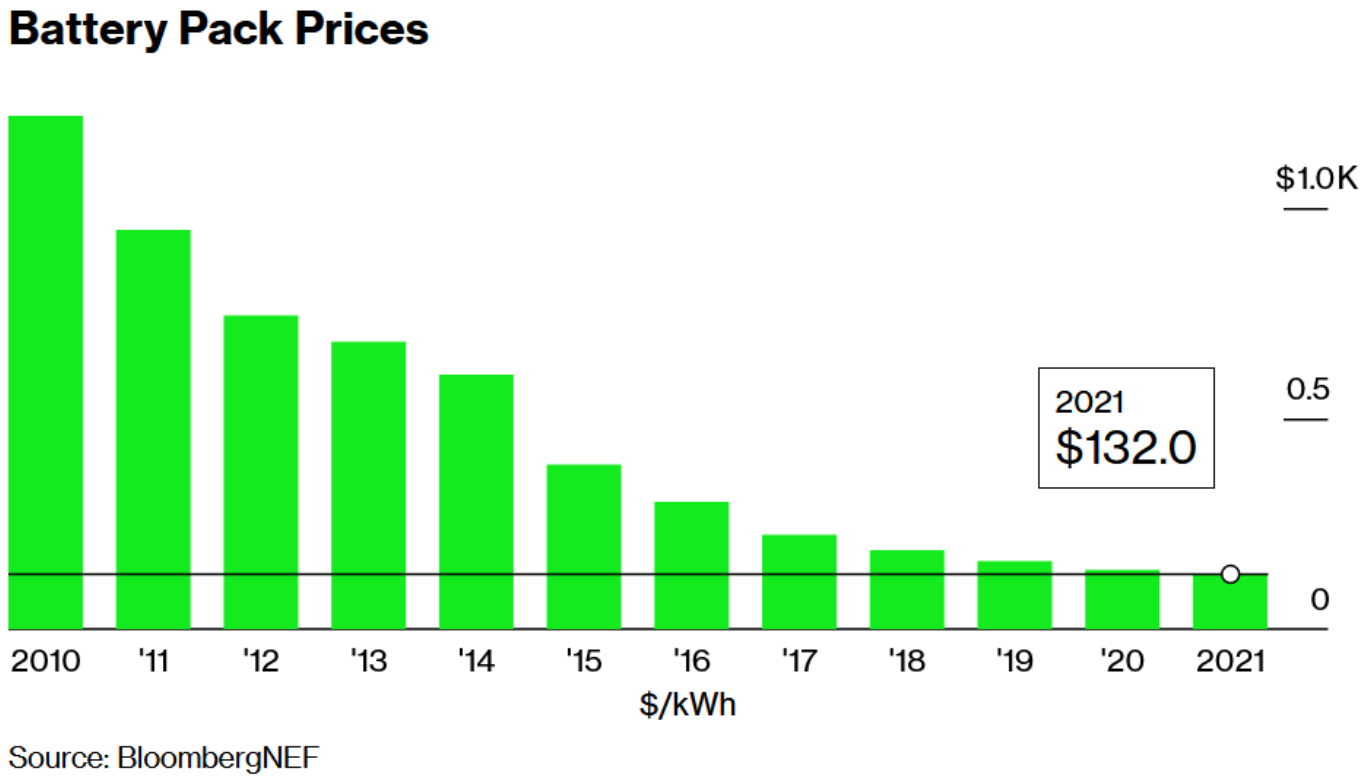
BATTERY COSTS FALLING FAST

Falling lithium-ion battery prices

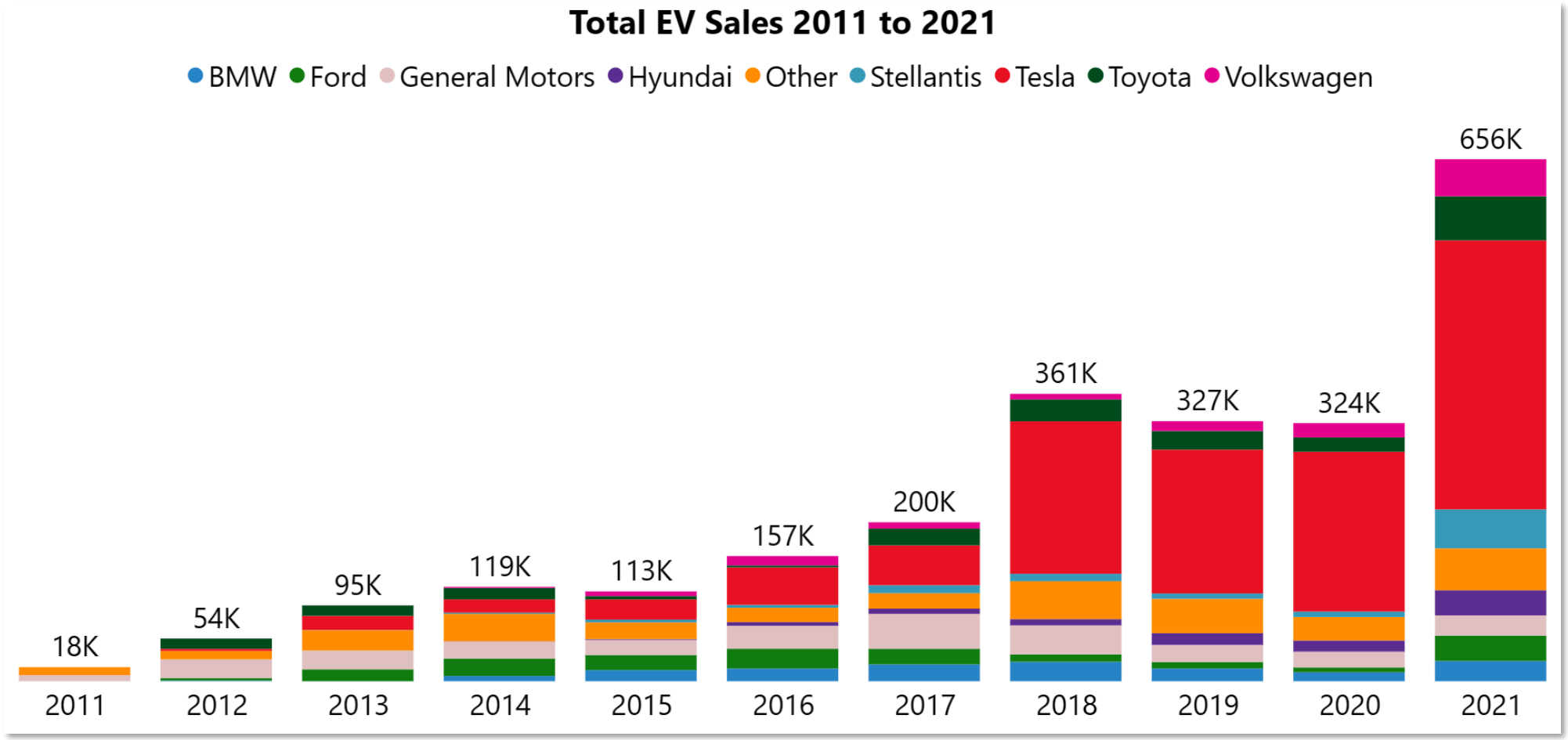


Source: BloombergNEF

$132/kWh **(volume weighted price average), down 89% from 2010-2021**

Most analysts agree **EV price parity** vs conventional fuels **when battery costs are <$100/kWh,** likely achieved in **the mid-late-2020s**.

*https://about.bnef.com/electric-vehicle-outlook/#toc-download



U.S. EV Sales Soar 102% in 2021

- 655K EVs sold in 2021, more than a quarter of all EVs sold
- EVs achieve 5.8 percent market share in Q4
  - 4.4 percent market share for the year
- 71K EVs sold in December sets all-time record
  - Monthly sales records in each month of 2021

Source: Automakers Dashboard - Atlas EV Hub

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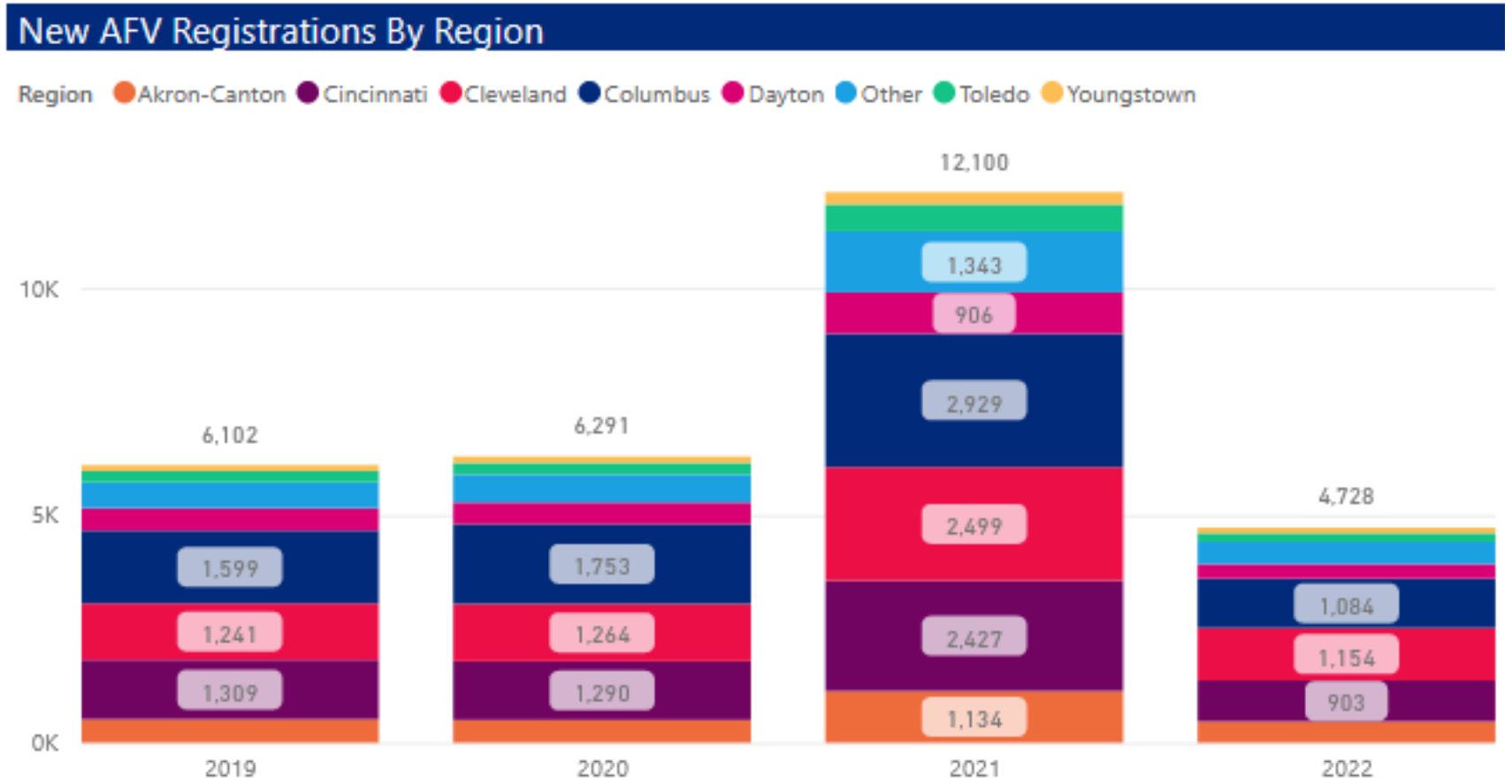
OHIO EV SALES GROWTH

2021 Ohio EV Sales Set Record Pace

*https://drive.ohio.gov/wps/portal/gov/driveohio/about-driveohio/resources/ohio-alt-fuel-vehicle-reg-dashboard



***Data includes dedicated battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV)*

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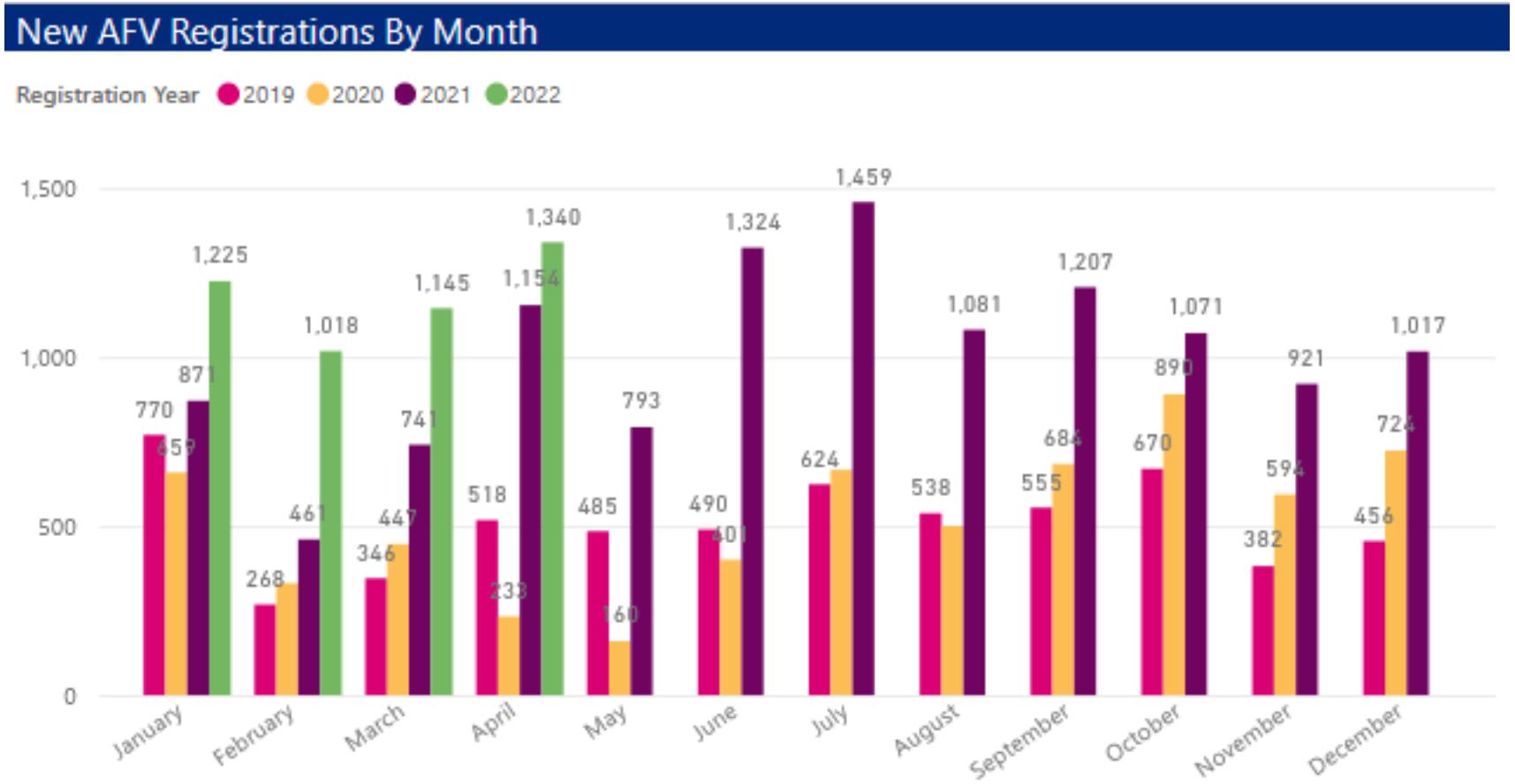
OHIO EV SALES GROWTH

2022 Ohio EV Sales Outpacing 2021 Record

*https://drive.ohio.gov/wps/portal/gov/driveohio/about-driveohio/resources/ohio-alt-fuel-vehicle-reg-dashboard



***Data includes dedicated battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV)*

BARRIERS & OPPORTUNITIES FOR RURAL EV ADOPTION

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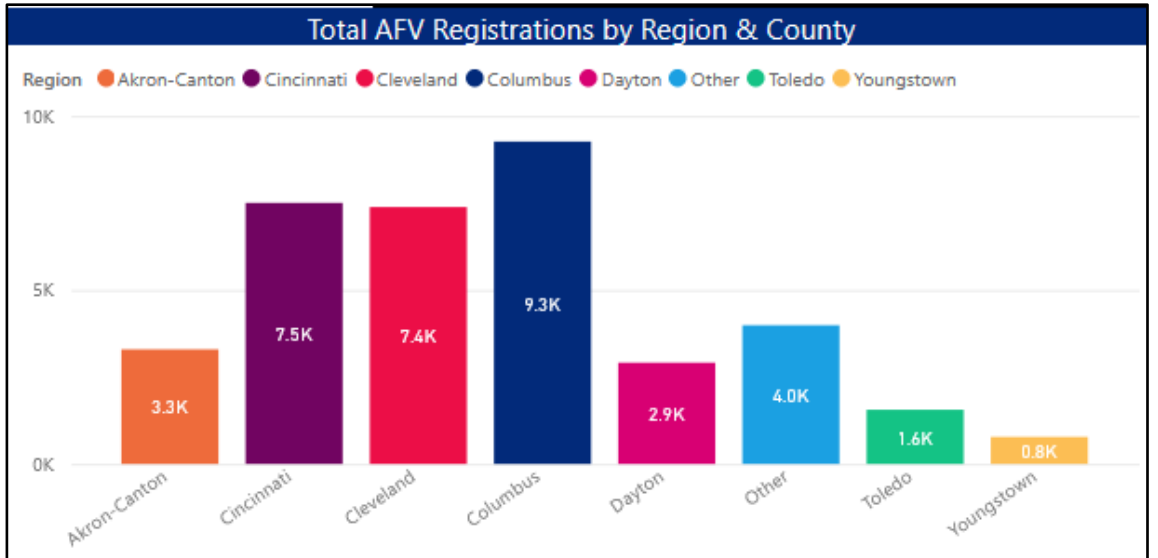
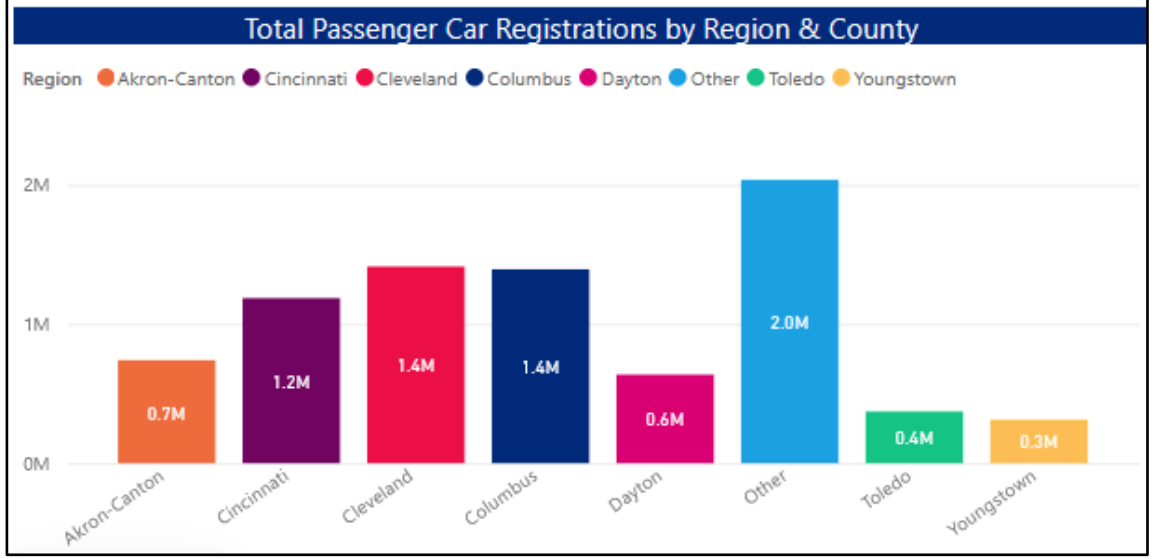
TRANSPORTATION ENERGY BURDEN

- Rural counties make up a majority of the "Other" category
- Mismatch between total passenger car registrations and AFV registrations relative to the rest of the state





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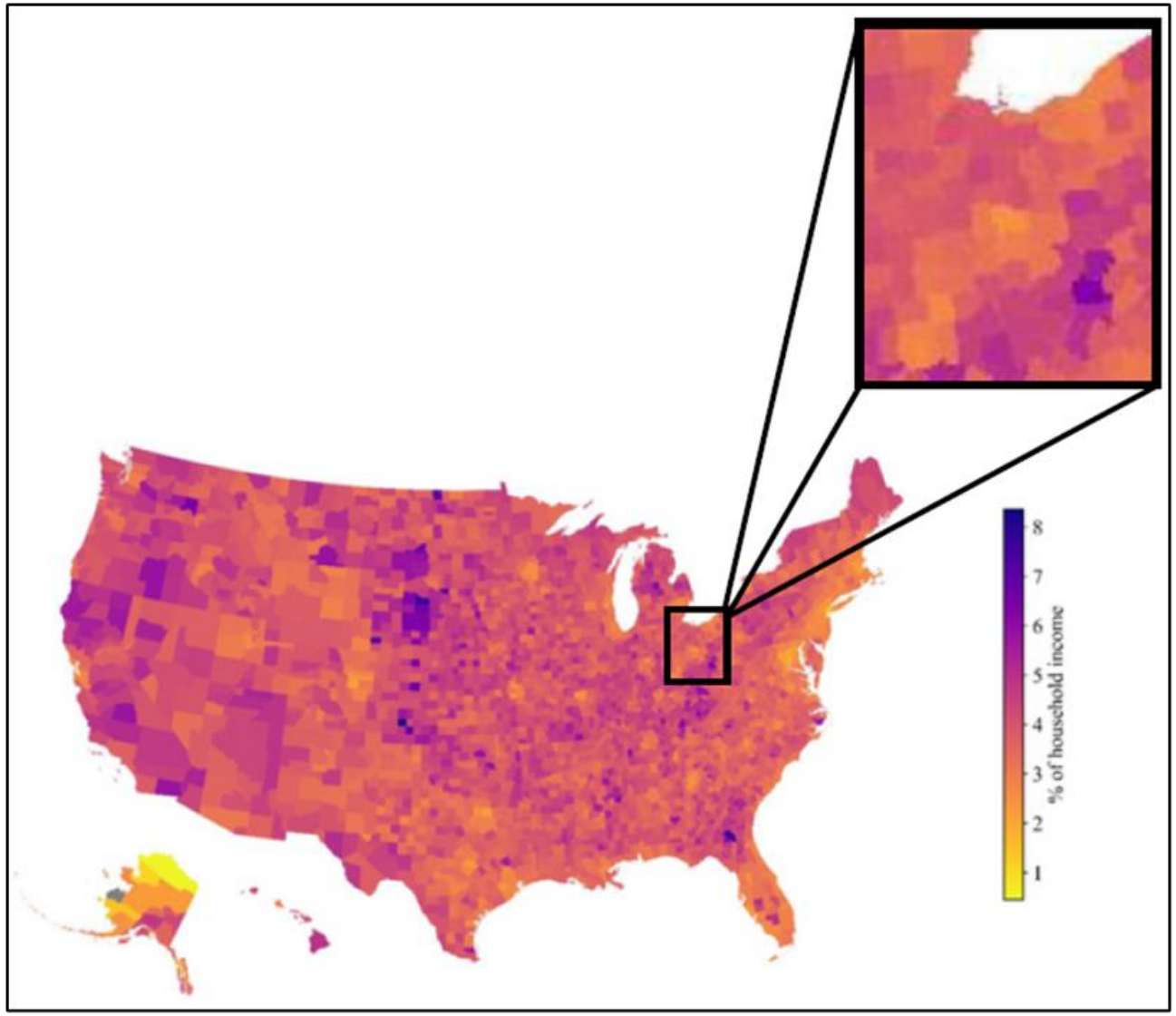
TRANSPORTATION ENERGY BURDEN

- Proportion of a household's annual income that is spent on vehicle fuel costs
- "Rural households drive further and have a higher transportation energy burden than suburban and urban households"



https://www.osti.gov/biblio/1760477-affordability-household-transportation-fuel-costs-region-socioeconomic-factors

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EV COST SAVINGS

CR Consumer Reports™

Electric vehicles save consumers money

A Consumer Reports analysis of electric vehicle (EV) ownership costs takes fuel, maintenance and repair costs into account, in addition to purchase price, financing, and resale value.

Owning an electric vehicle will save the typical driver $6,000 to $10,000 over the life of the vehicle, compared to owning a comparable gas-powered vehicle.

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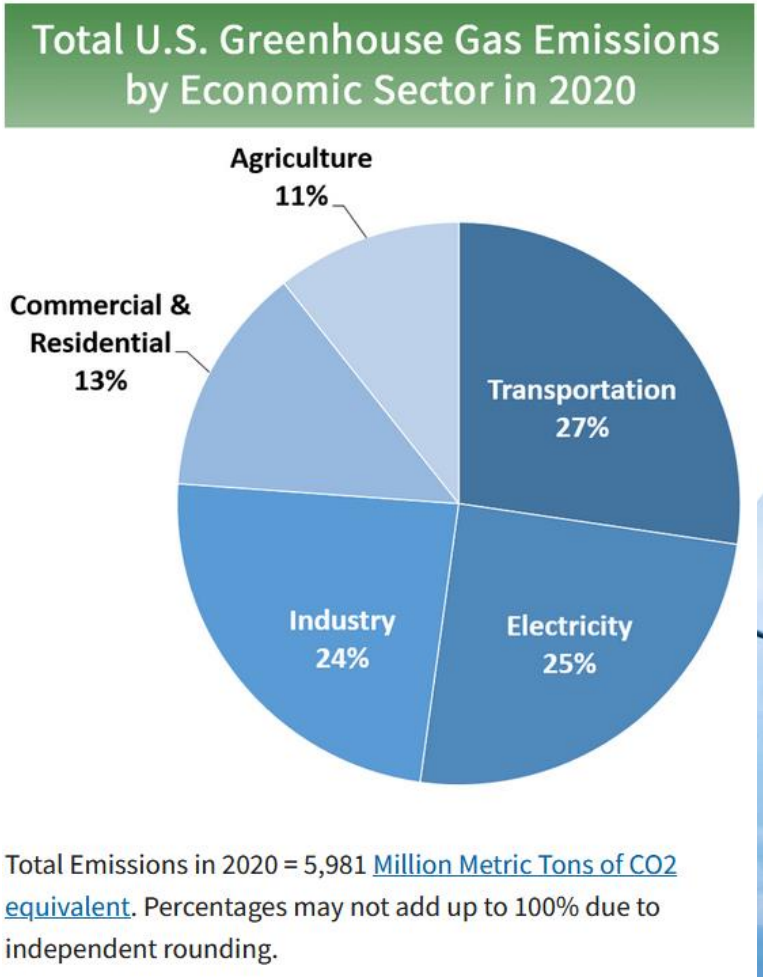
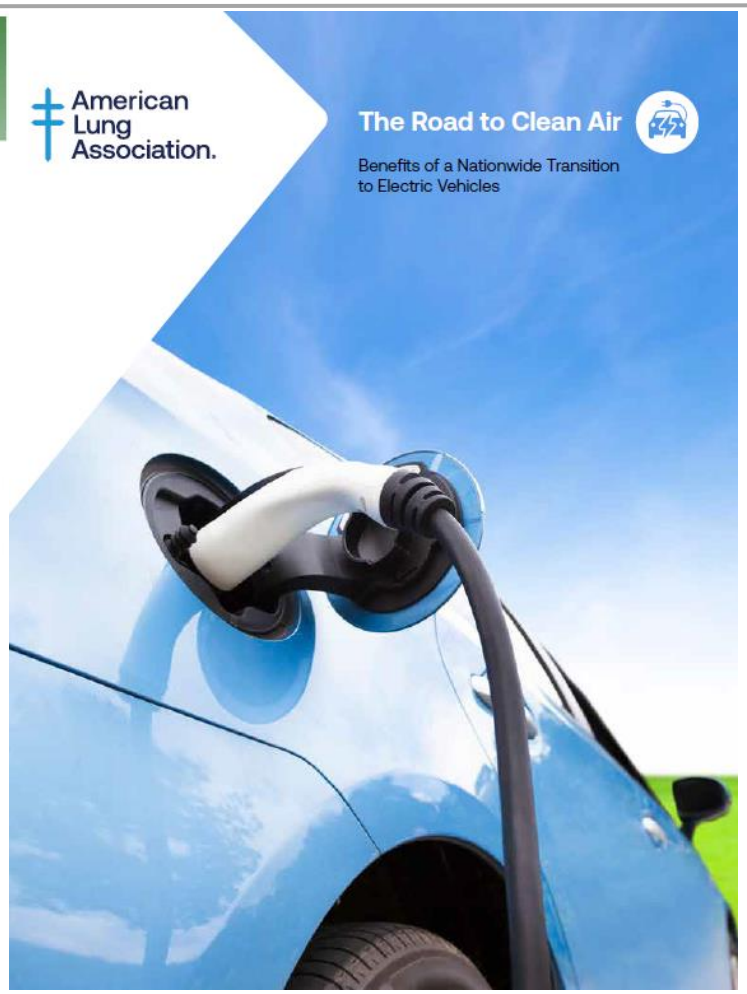
DECARBONIZATION & CLEAN AIR



https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions



https://www.lung.org/clean-air/electric-vehicle-report

- **27%** of US greenhouse gas emissions come from transportation, more than any other sector
- transitioning to a nationwide electric transportation system by 2050 would **save approximately 6,300 lives** every year and **avoid 93,000 asthma attacks** and **416,000 lost work days** annually

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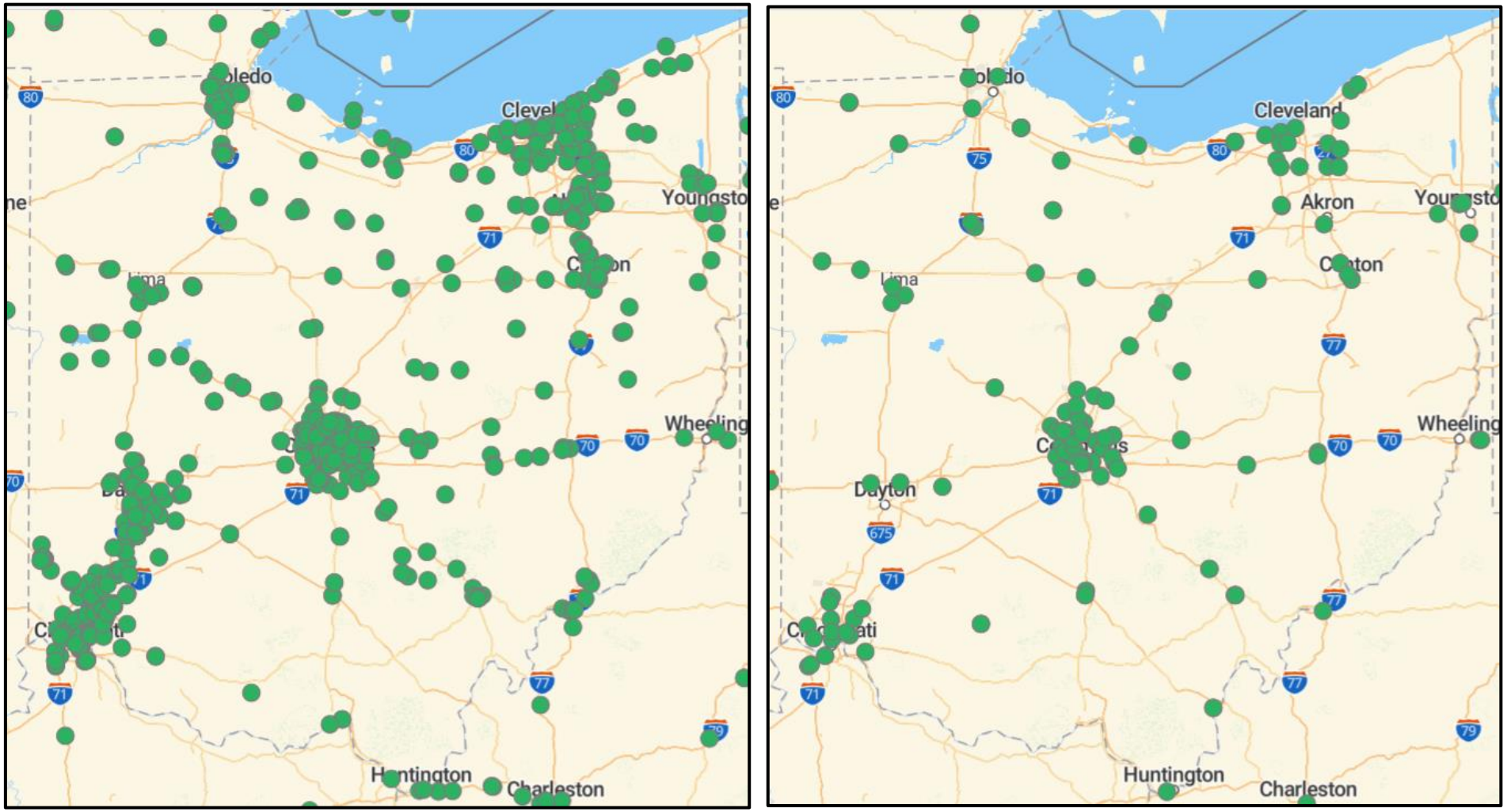
OHIO LEVEL 2 & DC FAST CHARGERS



Source: Alternative Fuels Data Center, https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC

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FHWA ALT FUEL CORRIDORS

Criteria for Corridors

	Electricity	CNG Compressed Natural Gas	LNG Liquefied Natural Gas	H_2 Hydrogen	LPG Propane
	Only public stations				
1 mile from the highway	5 miles from the highway				
50 miles between stations	150 miles between stations	200 miles between stations	150 miles between stations	150 miles between stations	
Only DC fast electric vehicle charging stations that have at least four EVSE ports with CCS connectors and each support a power output of at least 150 kW	Only fast-fill stations with 3,600 psi fill pressure		Only retail stations (accept payment at the point of sale)	Only primary stations (offer fueling capabilities for vehicles)	

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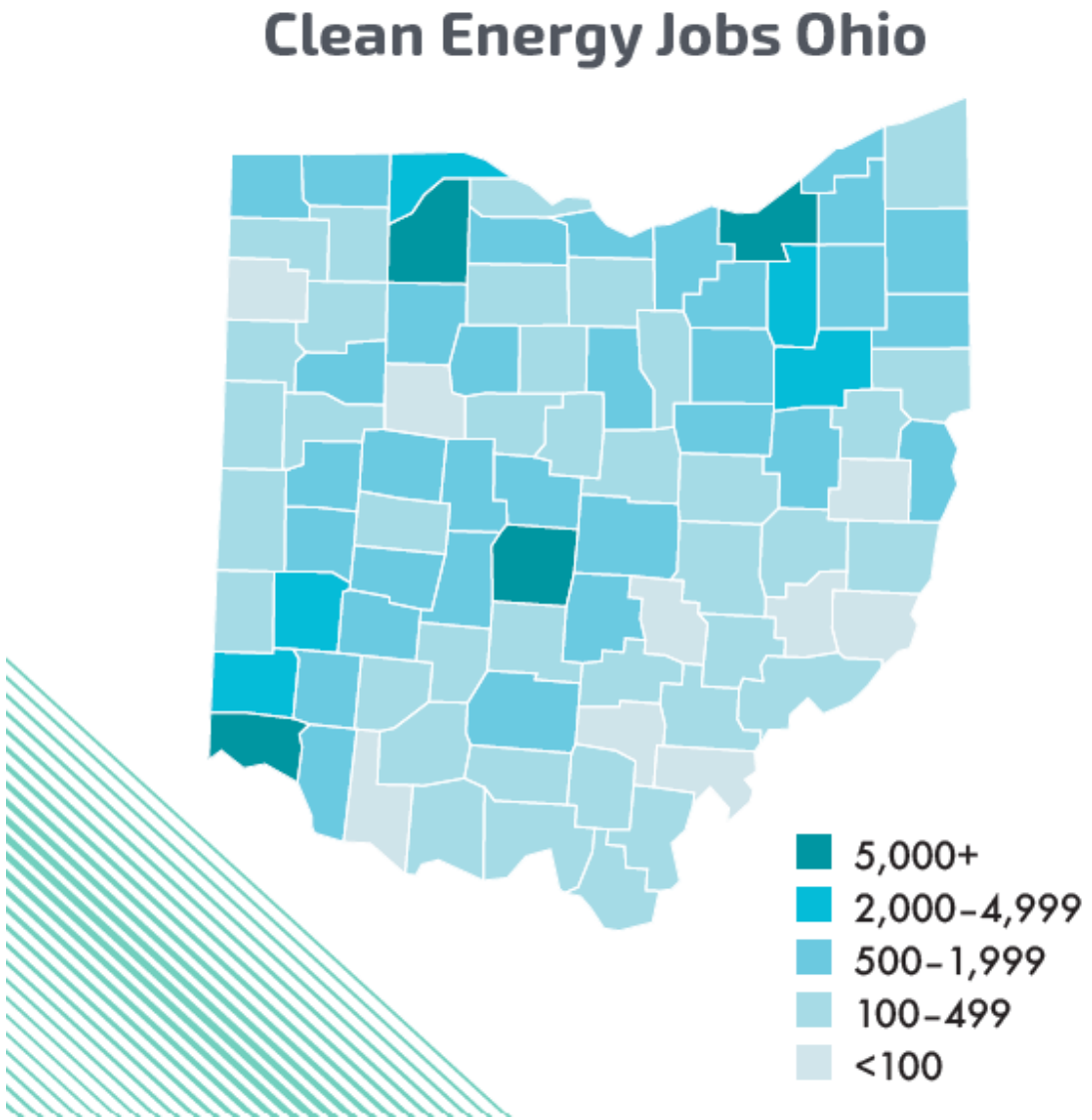
WORKFORCE DEVELOPMENT OPPORTUNITY

- Clean transportation is Ohio's fastest growing clean energy industry: saw **3% job growth in 2020**
- **EV jobs saw 8.9% job growth**, driving Ohio's clean transportation workforce
- **More than 15%** of Ohio's clean energy jobs are located in rural areas

https://www.cleanjobsmidwest.com/state/ohio



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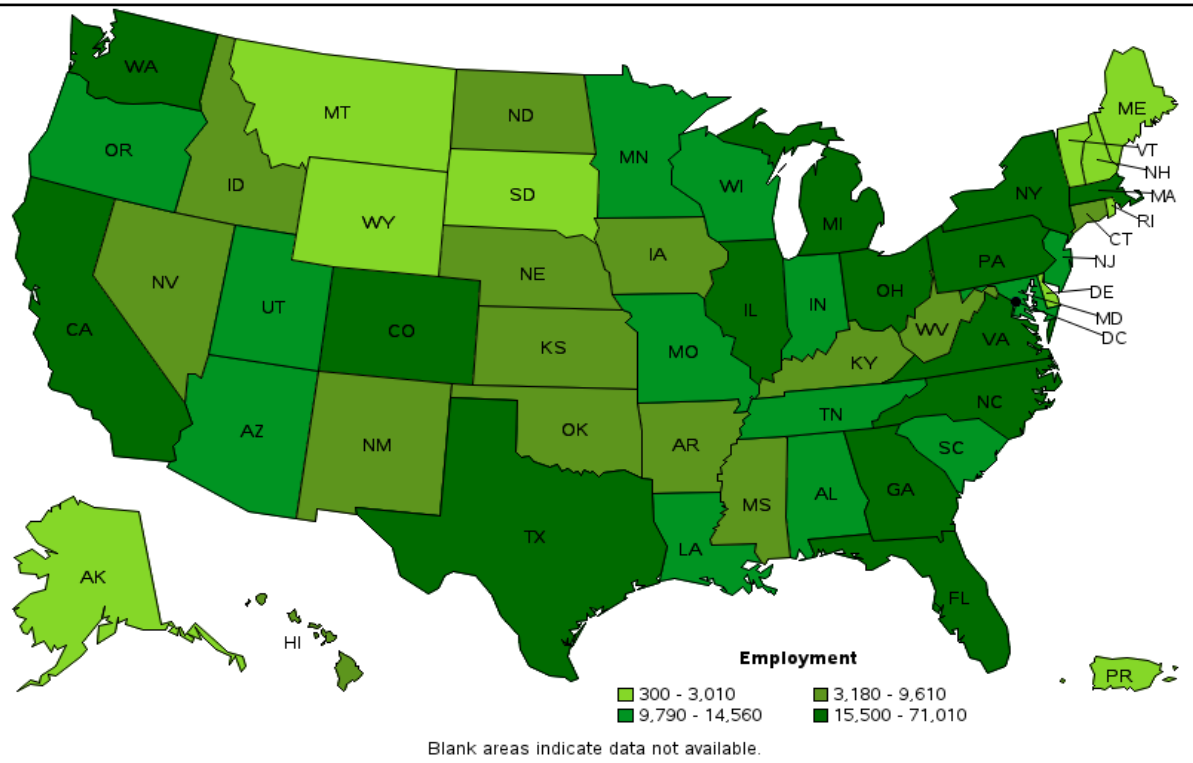
WORKFORCE DEVELOPMENT OPPORTUNITY

- Value chains extending beyond clean transportation industry proper and vehicle supply chains
- Ohio is among the **top 5** states with the **highest number of employed electricians**



States with the highest employment level in Electricians:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
California	71,010	4.32	0.92	$ 36.49	$ 75,900
Texas	60,890	5.03	1.07	$ 24.69	$ 51,350
Florida	41,900	4.96	1.05	$ 22.06	$ 45,880
New York	36,310	4.18	0.89	$ 39.11	$ 81,340
Ohio	23,430	4.56	0.97	$ 26.30	$ 54,700

https://www.bls.gov/oes/current/oes472111.htm#(3)

DRIVE CLEAN RURAL USA PROJECT

Drive Clean Rural USA:

Helping Rural Communities Benefit from Clean Fuels & Vehicles

DRIVE CLEAN RURAL USA

DELIVERING CLEAN FUEL BENEFITS

Managed by

Transportation Energy Partners

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Funding from

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

VEHICLE TECHNOLOGIES OFFICE

Drive Clean Rural USA overview

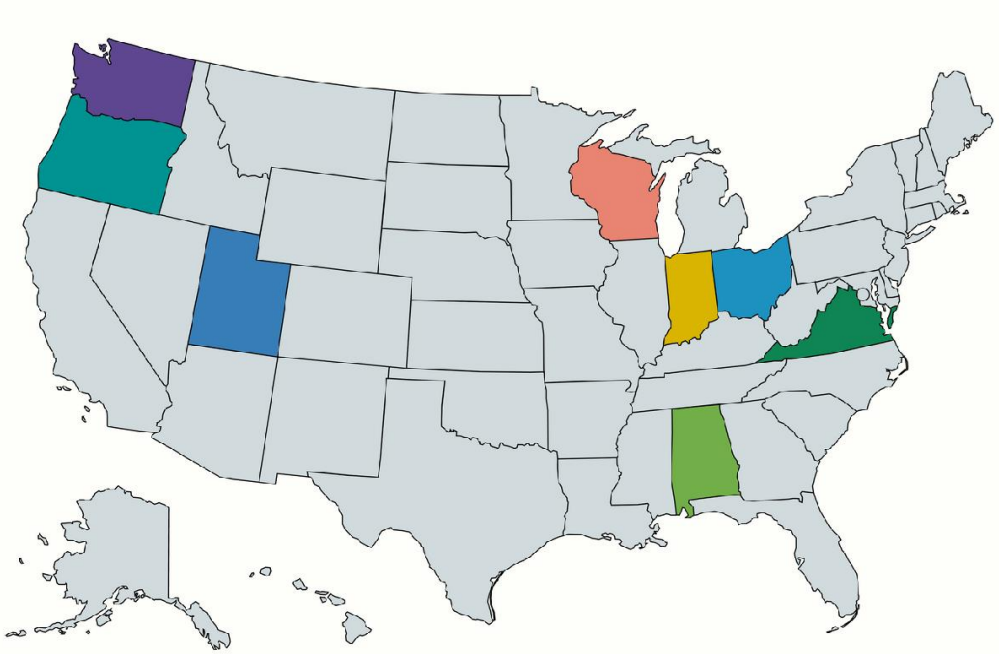
PROJECT GOAL

Remove barriers and accelerate access to clean fuel solutions that deliver

- financial savings
- clean air
- economic opportunities

to rural communities.

8 PILOT STATES



Transportation Energy Partners

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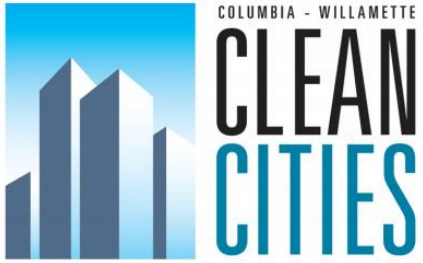
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy
VEHICLE TECHNOLOGIES OFFICE

Clean Cities partners



Industry partners

PLANNING

Bowman

BIODIESEL

National Biodiesel Board

REG Renewable Energy Group

ANTI-IDLING & HYBRID ELECTRIC VEHICLES

Altec

ELECTRIC VEHICLES

Dominion Energy

EDTA Electric Drive Transportation Association

ROUSH CLEANTECH

HYDROGEN

TOYOTA

NATURAL GAS

Dominion Energy

ingevity

LANDIRENZO

NGVAMERICA Natural Gas Vehicles for America

PROPANE

Alliance AutoGas POWERED BY PROPANE

ECO VEHICLE SYSTEMS

ENERGY FOR EVERYONE propane

ROUSH CLEANTECH

U-HAUL

Project timeline

NOW-JUN ‘22
Identifying 24 counties for pilot program

JUL ’22-JUN ‘23
FREE technical assistance for pilot counties

JUL ’23-JUN ‘24
Share successes & lessons learned nationally

FURTHER SUPPORT & FUNDING OPPORTUNITIES

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FEDERAL EV/EVSE BIL FUNDING

Complete Clean Transportation Areas of the IIJA/BIL

Program Name	Agency Name	Funding Amount
National Electric Vehicle Infrastructure Formula Program	Department of Transportation	$5,000,000,000
Charging and Fueling Infrastructure Grants (Community Charging)	Department of Transportation	$1,250,000,000
Charging & Fueling Infrastructure Grants (Corridor Charging)	Department of Transportation	$1,250,000,000
Low or No Emission (Bus) Grants	Department of Transportation	$5,624,550,890
Clean School Bus Program	Environmental Protection Agency	$5,000,000,000
Electric or Low-Emitting Ferry Program	Department of Transportation	$250,000,000
Electric Drive Vehicle Battery Recycling And 2nd Life Apps	Department of Energy	$200,000,000
Low or No Emission Vehicle Component Assessment Program	Department of Transportation	$26,169,974
TOTAL - ELECTRIC VEHICLES, BUSES AND FERRIES		**$18,600,720,864**

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OHIO EV/EVSE INCENTIVES

Ohio EPA VW Settlement Grants

Ohio's DMTF Program Schedule for 2022

May, 2022 (tentative):	Announce Awards for DC Fast EV Charging Stations
June 6, 2022	Request for Applications opens for non-road equipment (locomotives and cargo handling equipment)
August 12, 2022	Application deadline for non-road equipment (locomotives and cargo handling equipment)
TBA 2022:	Public comment period on proposed amendment to Ohio's VW Beneficiary Mitigation Plan to allocate any remaining funds.
TBA 2022:	Release RFA for Electric School Bus Pilot Project

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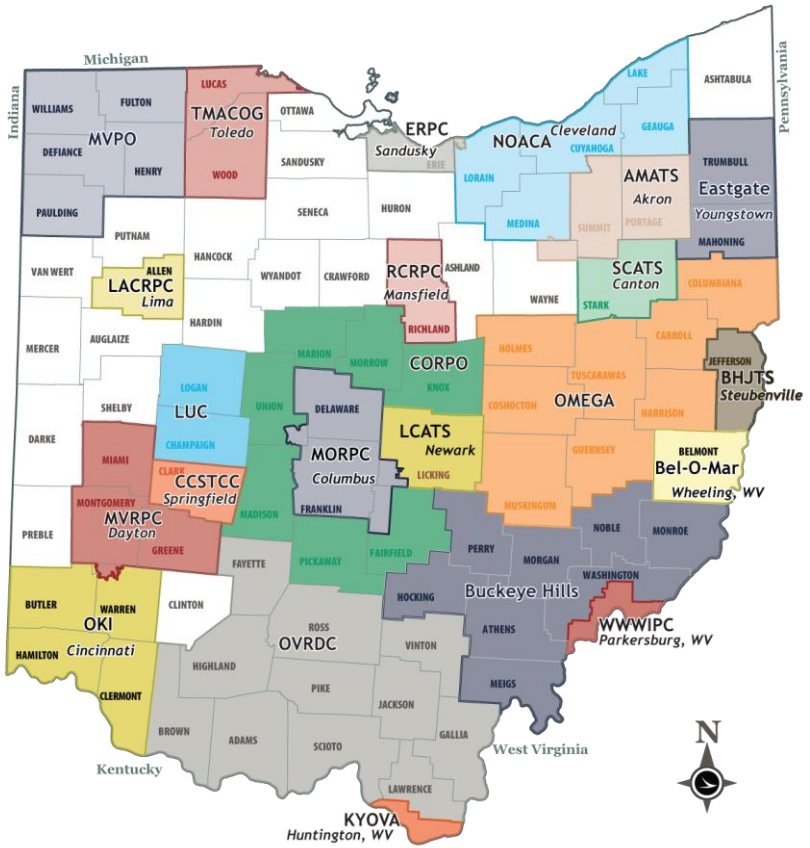
ADDITIONAL FUNDING SOURCES

US DOE EERE Funding

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

VEHICLE TECHNOLOGIES OFFICE

Ohio MPO Funding



Utility Incentives

AEP OHIO
An AEP Company

FirstEnergy

DUKE ENERGY

aes Ohio

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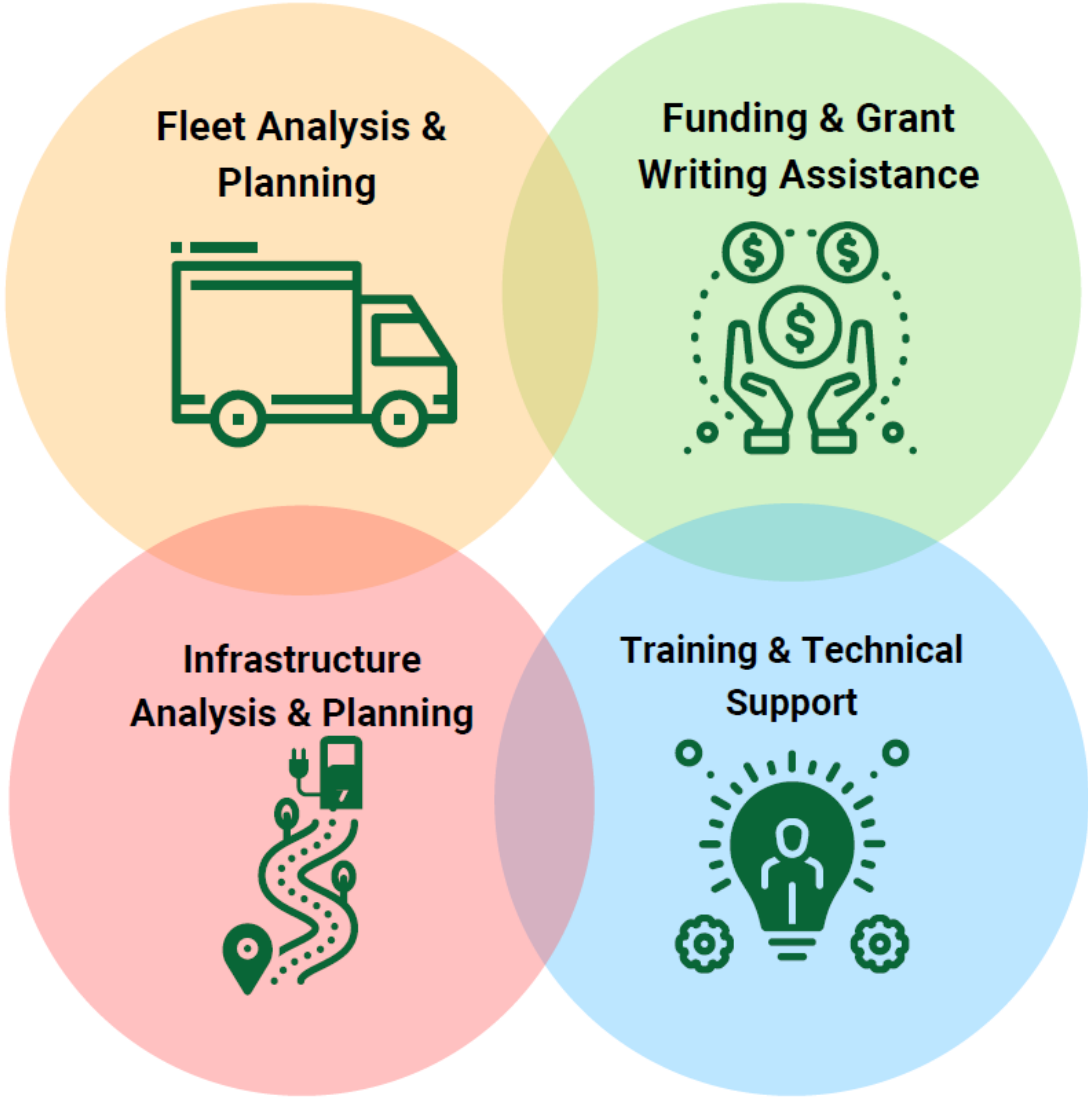
CONSULTING SERVICES OVERVIEW



HOW WE CAN HELP

For 20 years, our consulting services program has been improving the economic and environmental performance of fleet vehicles. Our services:

- Work with fleets of all types and vehicle classes
- Assess all commercially available fuel and technology options
- Provide tailored recommendations that save money and achieve quantifiable results

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EV FLEET ANALYSIS & PLANNING

1) Understanding Fleet Operations

a) Goal Setting

b) Data Gathering & KPIs

2) Options & Replacements

a) Available Vehicle Options

b) Replacement Feasibility

3) Future Planning & Management

a) Infrastructure Needs

b) Management Best Practices

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REPLACEMENT FEASIBILITY

GETTING THE JOB DONE
(FLEET PERFORMANCE)

SUSTAINABILITY GOALS & PLANNING

$ STAYING WITHIN BUDGET

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EVSE PLANNING - BY DEMAND

Where is the greatest quantity of charging being asked for now by current EV drivers and fleets?

DC Fast Chargers

- Within 1 mile of **FHWA designated Alternative Fuel Corridors** (50-mile gaps)
- High traffic volumes
- Access to ample parking
- Adjacent to restaurants or other publicly accessible amenities
- Available 3-phase power at location, or ability to upgrade

Level 2 Chargers

- Local attractions/destinations
- High traffic volumes
- High dwell times
- High EV registration count/EV fleet adoption rate
- Residences and workplaces
- Fleet depots

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EVSE PLANNING - BY NEED

Where can EV chargers contribute most to a local community, in terms of future-proofing, economics, environment, and equity?

DC Fast Chargers

- Utility upgrades in areas without available 3-phase power
- Rural communities where fleets and motorists travel long distances
- Communities far from FHWA designated alternative fuel corridors

Level 2 Chargers

- Charging deserts, even if EV registrations are low
- Opportunities for non-networked installations
- Communities with high transportation energy burden
- Communities with histories of energy extraction, pollution, or air quality issues

Power A Clean Future Ohio

LOCAL COMMUNITIES LEADING THE WAY

Power A Clean Future Ohio is building momentum now for a clean, prosperous future by equipping local leaders for equitable, community-driven carbon reductions in Ohio.

THE GOALS OF THE CAMPAIGN ARE TO:

Reduce the carbon footprint of local communities across Ohio.

Attract clean energy development to the state to create careers for Ohioans.

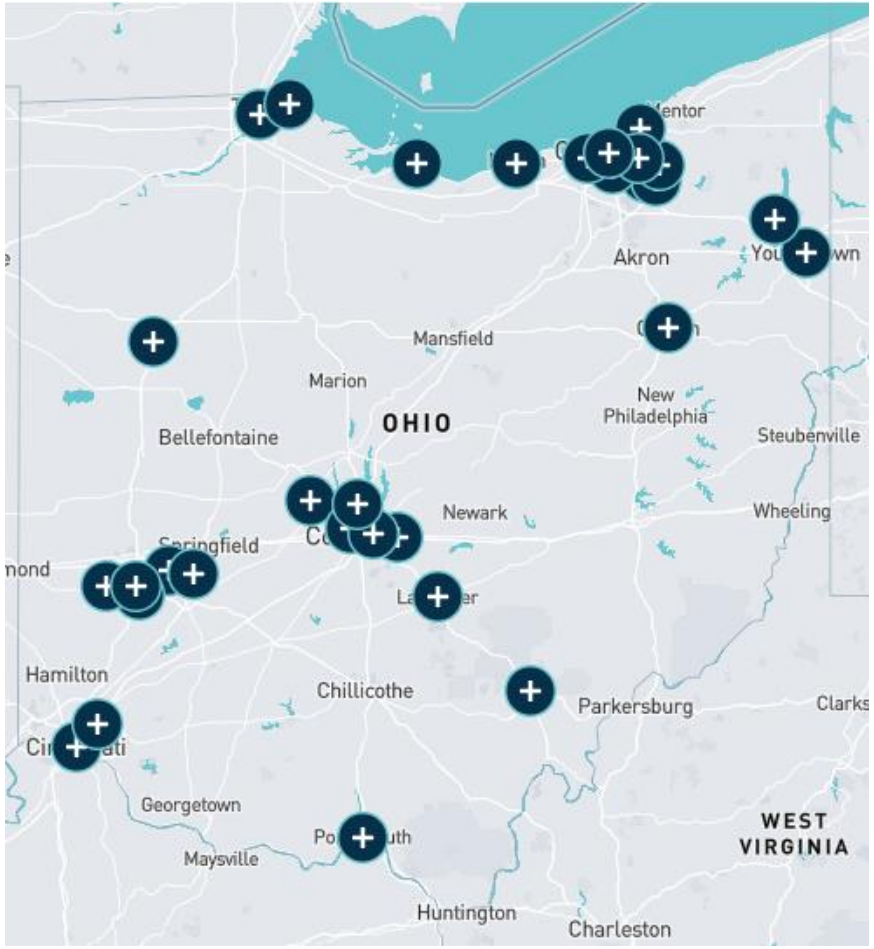
Implement equitable policy solutions supported by local communities.

Reduce energy costs for cities, businesses, and residents.

Power A Clean Future Ohio

LOCAL COMMUNITIES LEADING THE WAY

Power a Clean Future Ohio Communities:



FREE EV Fleet and EVSE Analysis and Planning services are available to PCFO Leading communities from Clean Fuels Ohio

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CONTACT INFORMATION

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Questions?