

Wisconsin EV State Policy Bootcamp

July 26th, 2023



Electrification
Coalition

About the Electrification Coalition

The **Electrification Coalition** is a nonpartisan, nonprofit organization that develops and implements a broad set of strategies to facilitate the widespread adoption of electric vehicles to overcome the economic, public health, and national security challenges that stem from America's dependence on oil.



The Problem

We are heavily dependent on an unstable oil market.

The U.S. is the **world's largest consumer** of crude oil and petroleum, accounting for nearly **20% of daily global oil demand** with only **4% of the world's population**.

- 90% of America's transportation sector is dependent on oil-based fuels.
- Transportation is responsible for approximately 70% of all U.S. petroleum consumption.



National Security

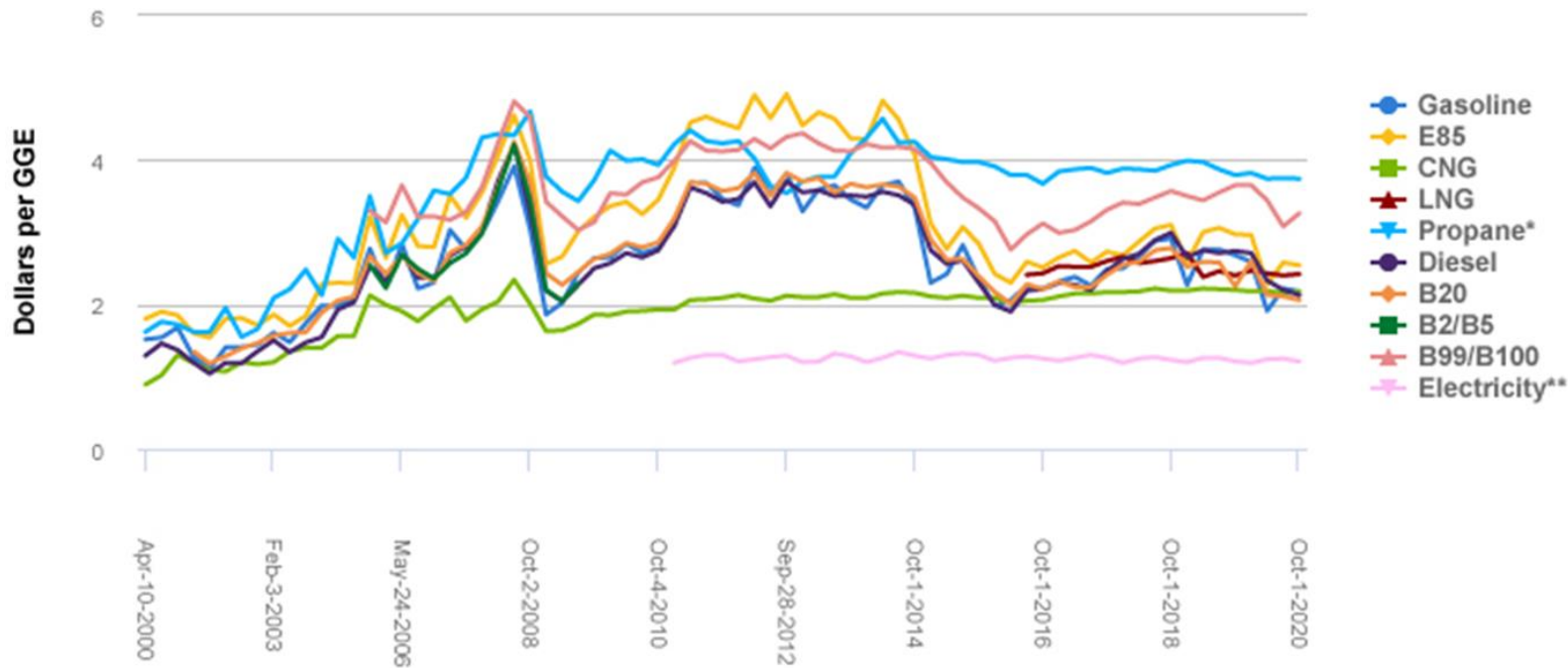
Effects of the Ukraine war on gas prices

(Prices in EUR/MWh at Trading Hub Europe, Data: powernext.com)



The Case for Electrification

Average Retail Fuel Prices in the United States



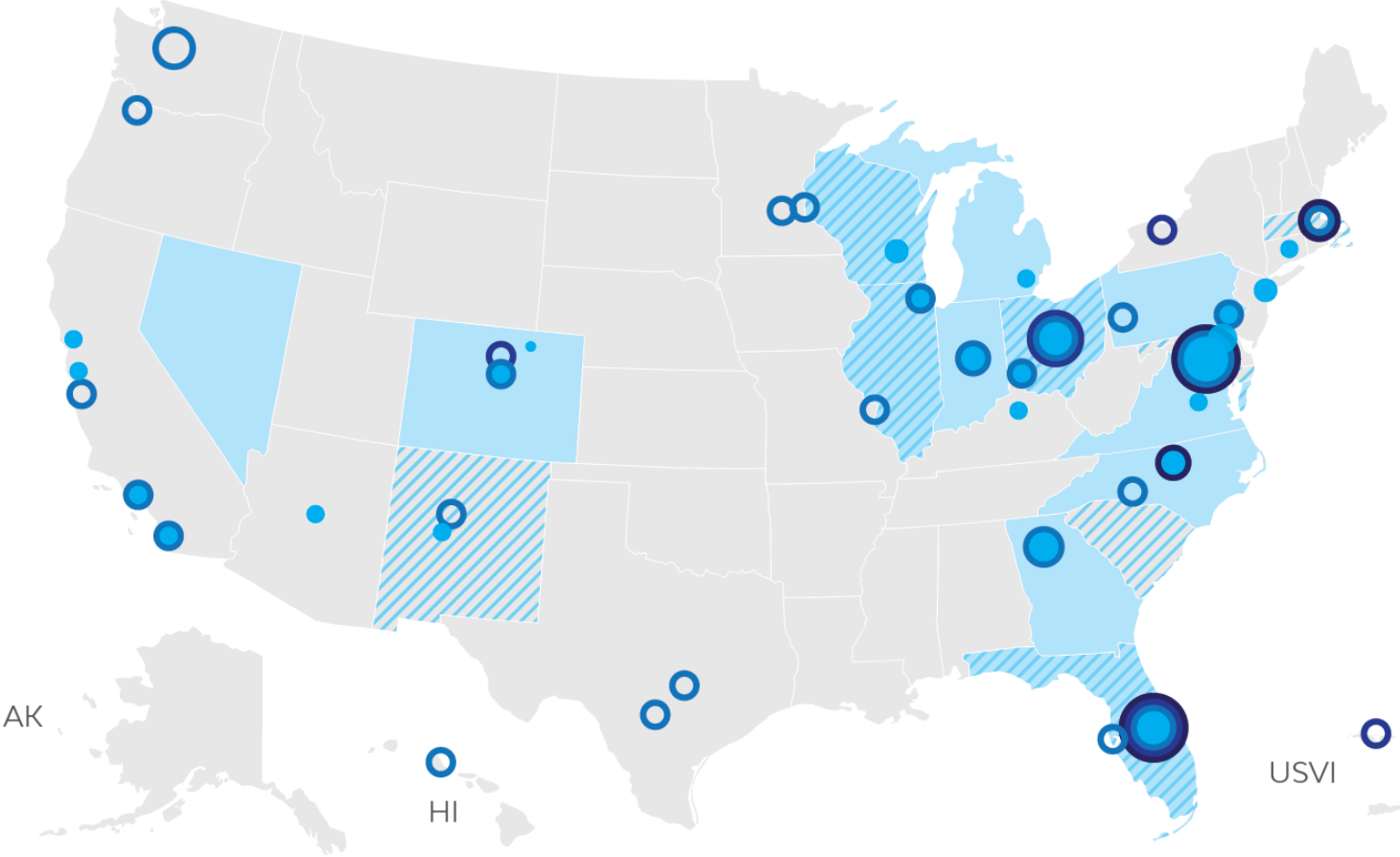
Electricity is 100% domestically produced, and rates have stayed **low and consistent**, insulating consumers and fleets from oil price volatility.

Electric mobility is one of the best scalable alternatives for reducing U.S. oil dependence, and they are the only vehicles that will get **cleaner over time**.

Policy Priorities in Wisconsin

- Rural access and implementation
- NEVI implementation
- Workforce development
- Direct sales from the manufacturer
- Allowing vehicles to charge by the kilowatt hour

The EC National Presence



AK

HI

USVI



- Staff Locations
- ACCC Cities
- Smart / Accelerator Cities
- Roadmap Cities
- Priority States
- ▨ State Fleet Cohorts

WISCONSIN ELECTRIC VEHICLE MARKET UPDATE

Market Overview and Policy Landscape

July 2023





OVERVIEW

Overview

EV Market

Manufacturing

Federal Funding

State Funding



A DC-based policy tech firm established 2015

Atlas Public Policy equips businesses and policymakers to make **strategic, informed decisions that serve the public interest**. Atlas builds analytical tools and dashboards using powerful, accessible technology, and offers expert advisory services to tackle the pressing issues of the day.

Transportation

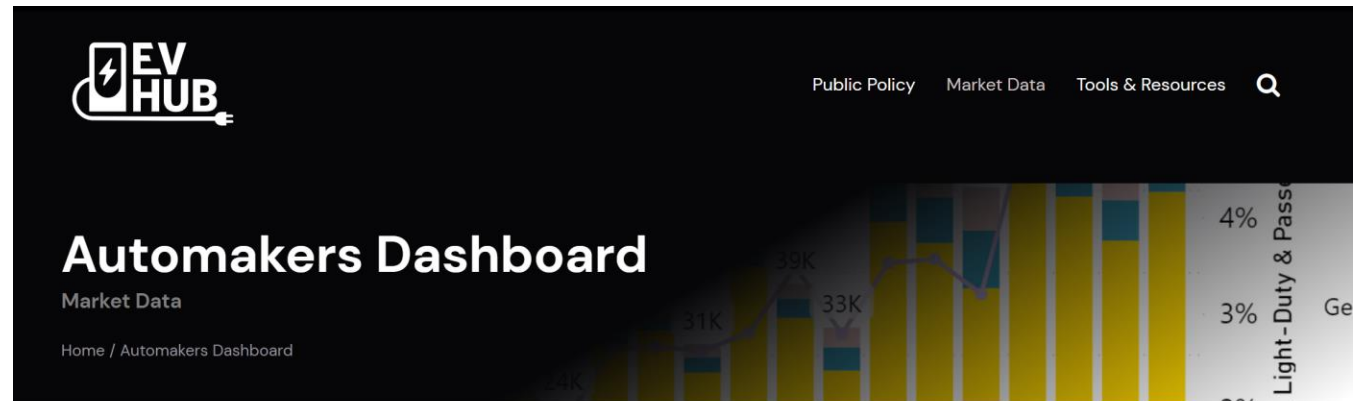
Buildings

Climate

Disinformation

ABOUT THE DATA

- EV Hub gives stakeholders from across the EV industry quick access to key data and information on the market, policies and regulations, and activities by the EV community
- Data drawn from EV Hub unless otherwise noted
- **Free access for public agencies and Clean Cities Coordinators!**
- www.atlasevhub.com



Manufacturers of passenger cars and light trucks are key actors in the transportation electrification market. With Automakers Dashboard, we track data on vehicle deployment at the state level, current and future vehicle model offerings, company positions on key issues, employment data, and EV investments in the United States. We welcome your [feedback](#) on how we can improve your access to this vital information.

+ Dashboard Data Sources

Automakers

National EV sales by make and model over time. Explore sales data by manufacturer, technology, and date.

Reset View | Help | Jump to a Page: Home GO

EV SALES

DEEP DIVE ON SALES

EV sales by make and model over time. Explore sales data by state, manufacturer, technology, and date.

Cumulative Sales from 2011 to 2023

3,515,257	2,459,163	1,056,094	120 Mod...	32 Makes
EV Sales	BEV Sales	PHEV Sales	EV Models	EV Makes

BEV Sales	PHEV Sales
2,459,163	1,056,094

Filters



EV MARKET

Overview

EV Market

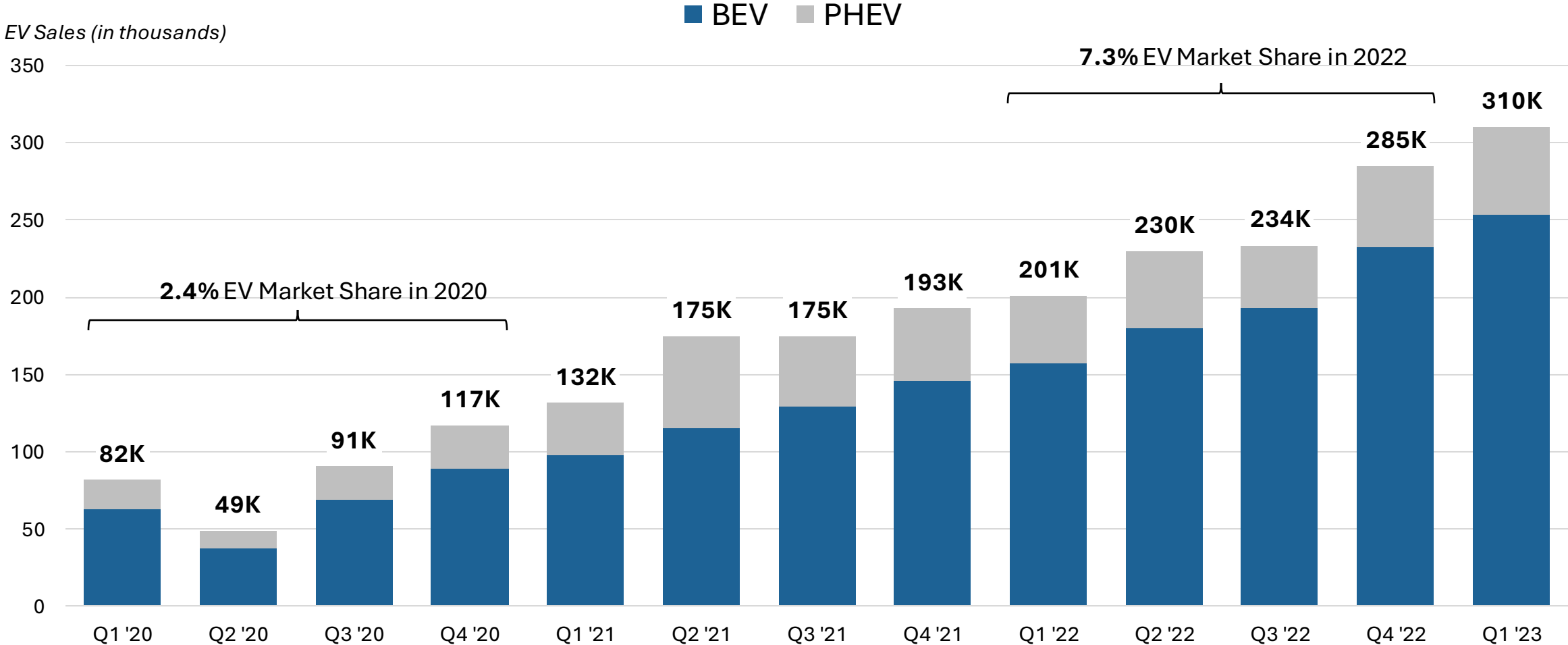
Manufacturing

Federal Funding

State Funding

U.S. EV MARKET SHARE HAS TRIPLED SINCE 2020

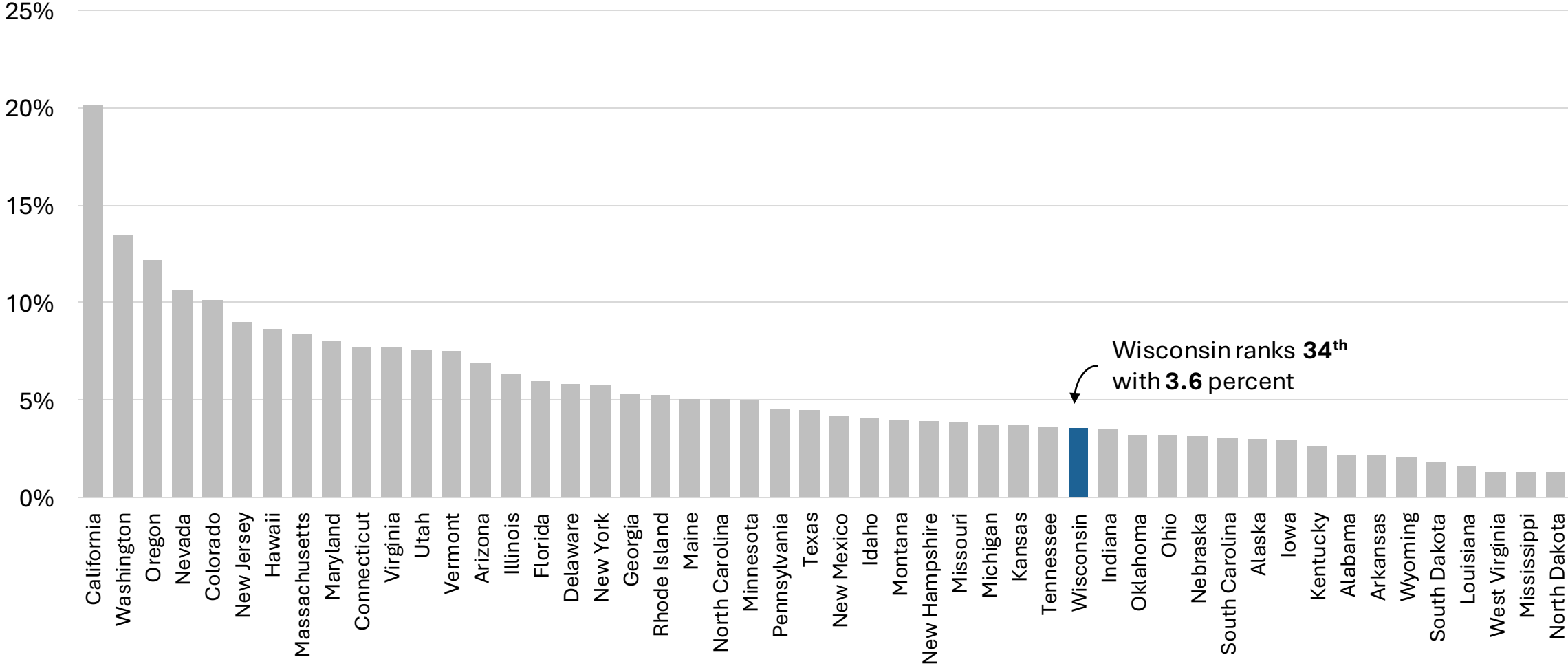
National EV Sales by Quarter (Jan 2020 – Mar 2023)



WISCONSIN TRAILS IN EV MARKET SHARE

2022 EV Market Share by State

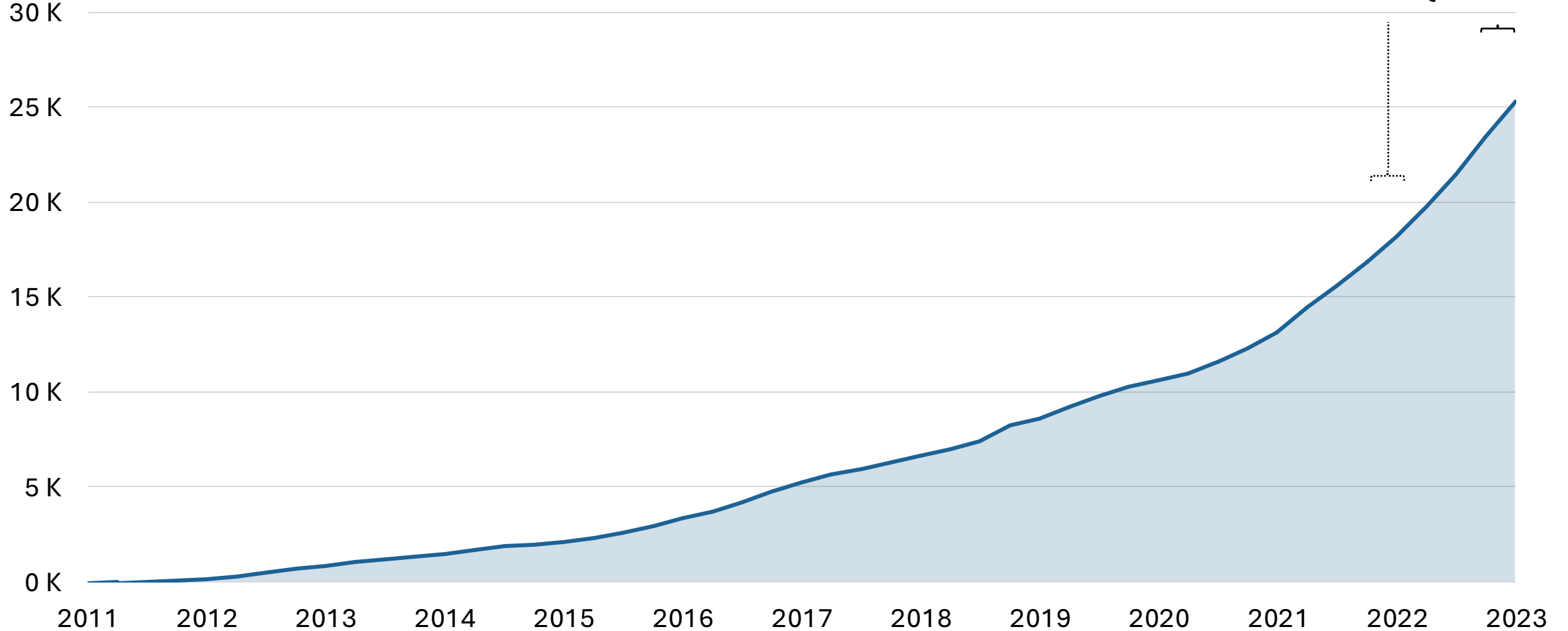
EV Market Share



OVER 25K EVS SOLD IN WISCONSIN

Cumulative EV sales in Wisconsin (Jan 2011 – Mar 2023)

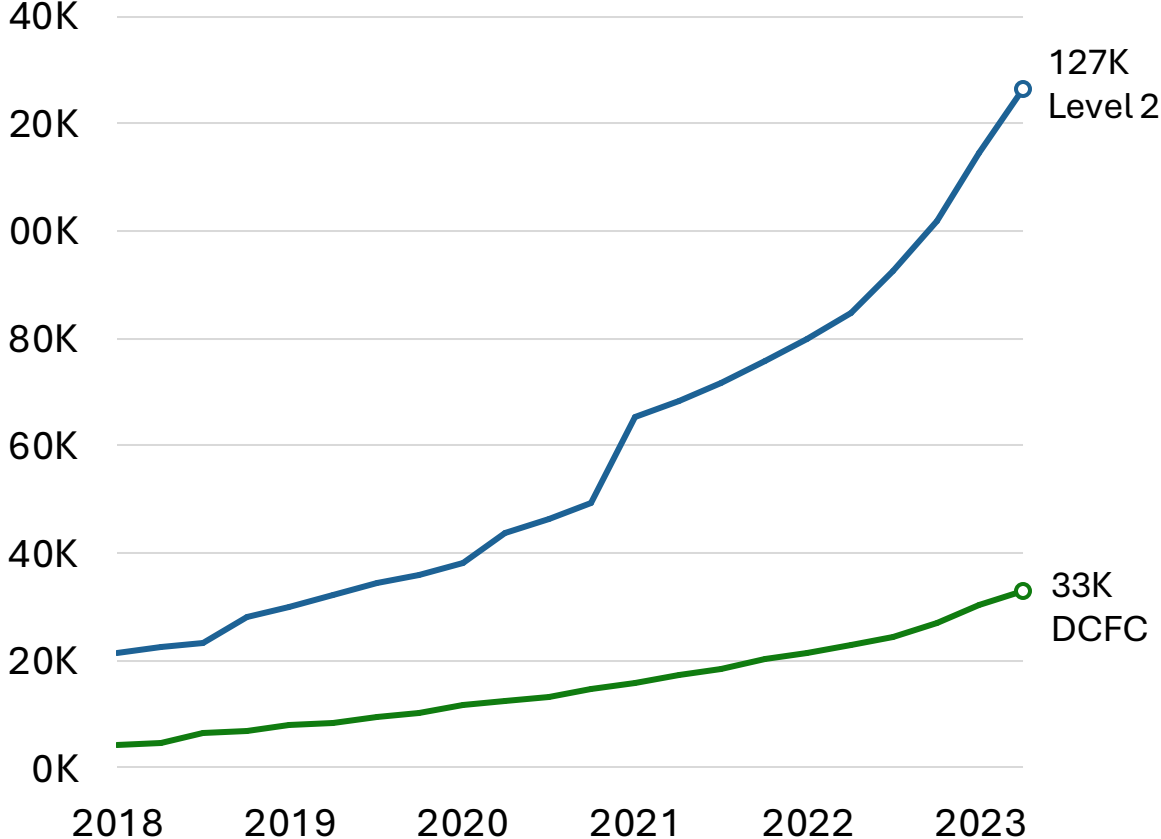
Sales (in thousands)



WISCONSIN PUBLIC CHARGING NETWORK FOLLOWS NATIONAL TREND OF STEADY GROWTH

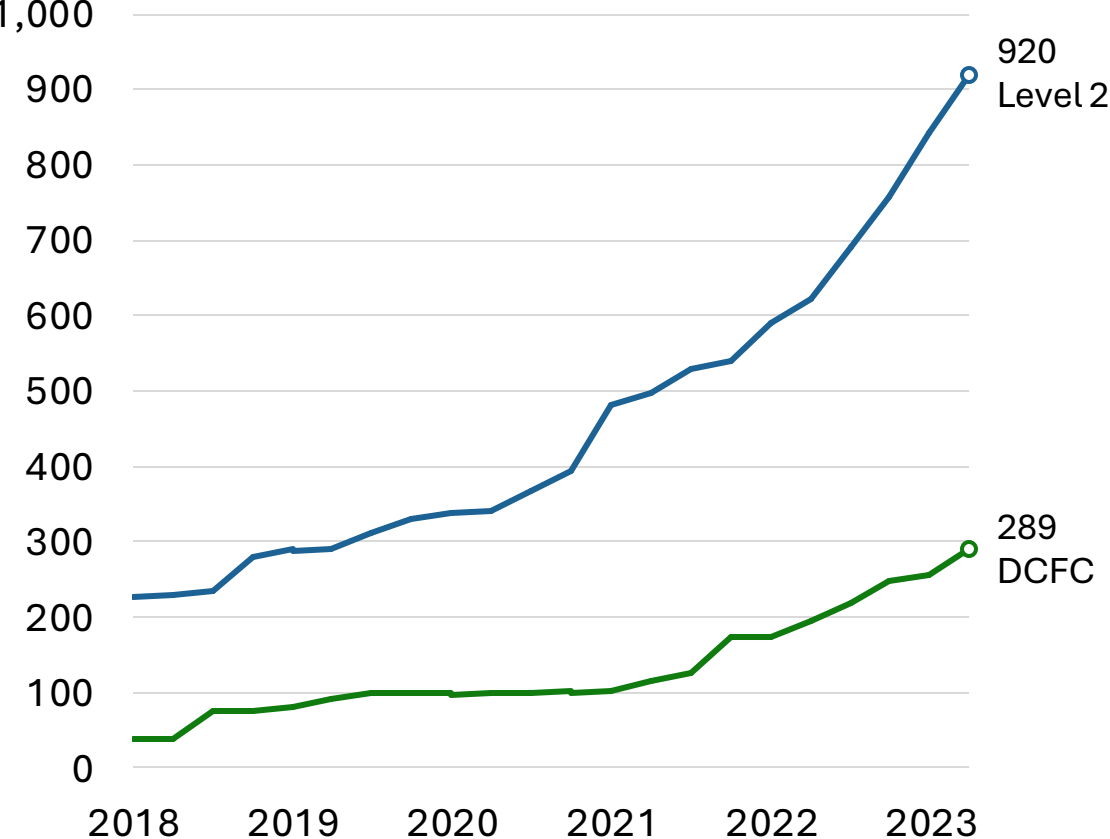
Nationwide

Cumulative Ports (in Thousands)



Wisconsin

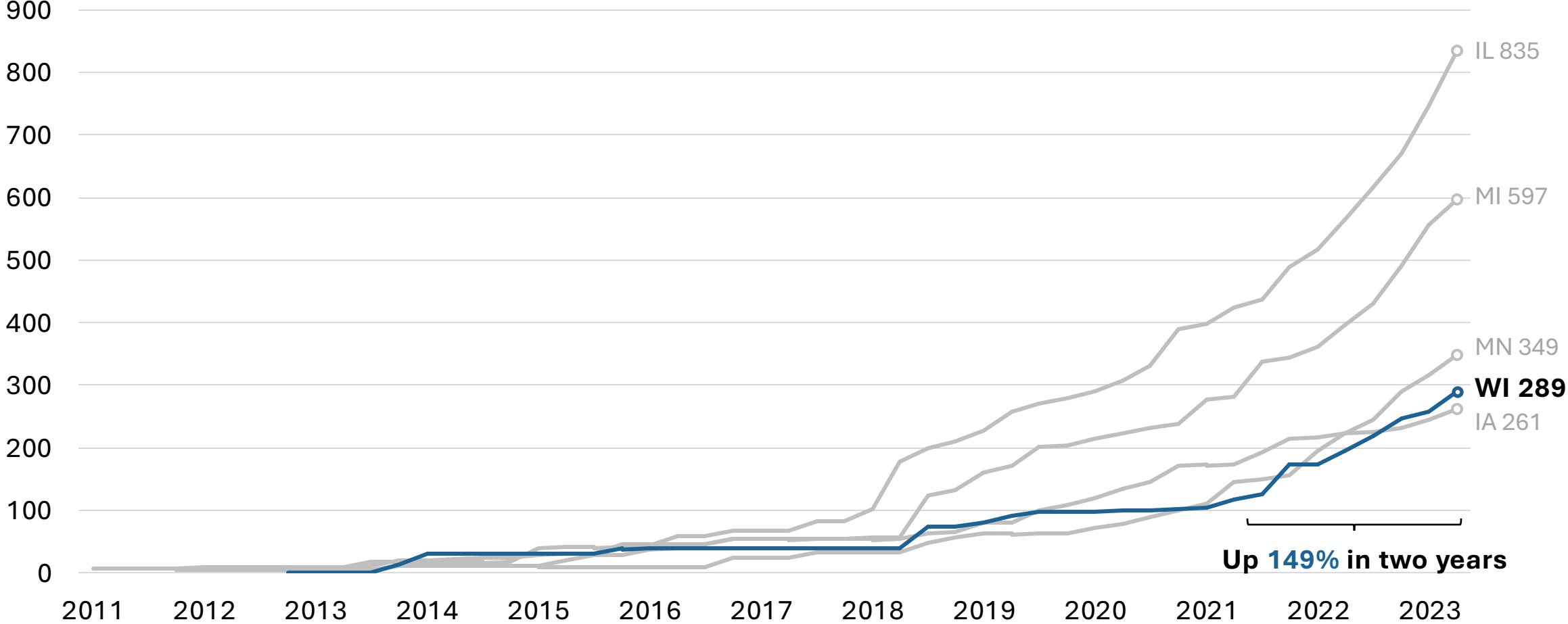
Cumulative Ports



WISCONSIN DCFC INSTALLATIONS TRAIL NEIGHBORING STATES

Wisconsin DCFC stations compared to neighboring states (Jan 2011 – Jun 2023)

Cumulative Ports





MANUFACTURING

Overview

EV Market

Manufacturing

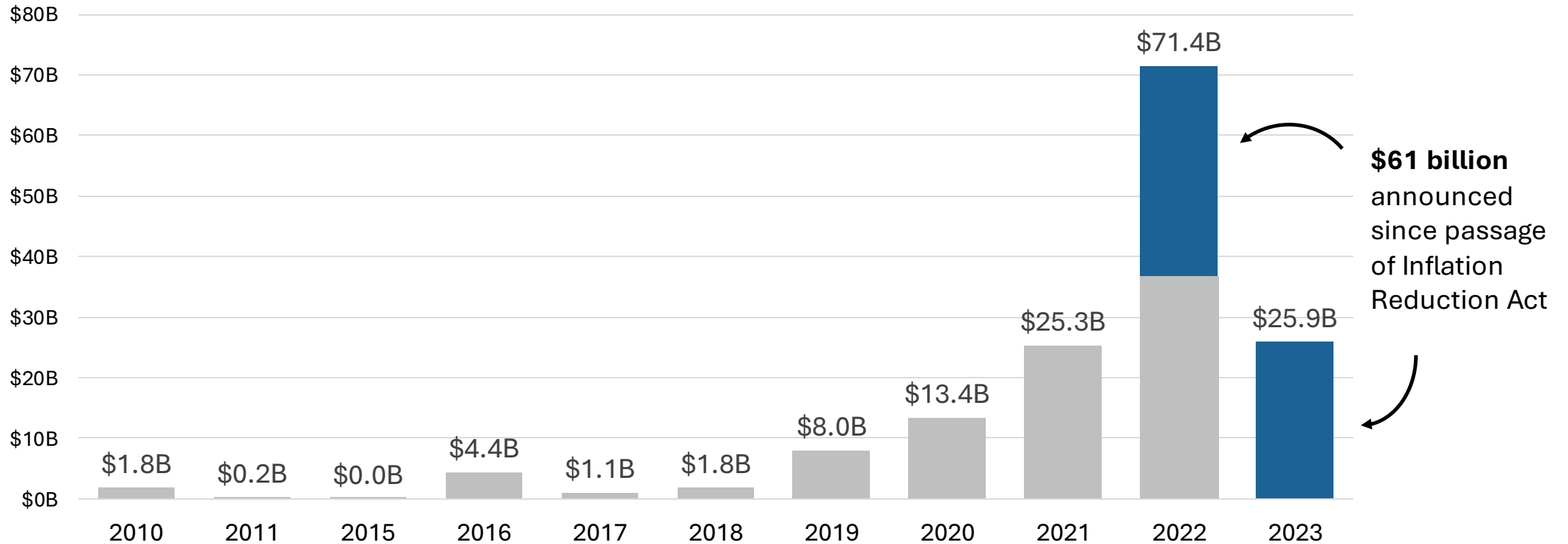
Federal Funding

State Funding

FEDERAL LEGISLATION SPURS EV MANUFACTURING INVESTMENT

Announced Investment in EV and EV Battery Manufacturing Facilities (Jan 2010 to Jun 2023)

Announced Investment (in billions)



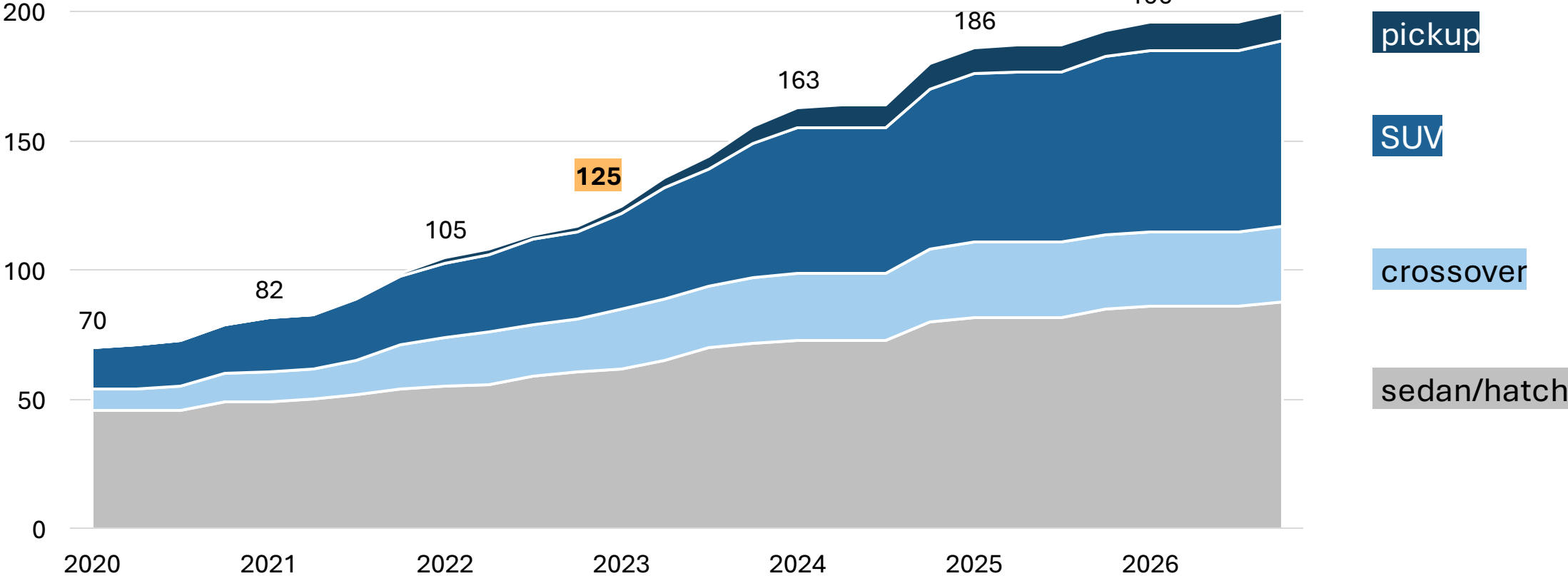
AUTOMAKERS PLAN TO EXPAND AND DIVERSIFY EV OFFERINGS

Current and Announced EV Model Availability

by release model year (2020 to 2026)

75 new models by 2026

Cumulative Announced EV Models





STATE FUNDING

Overview

EV Market

Manufacturing

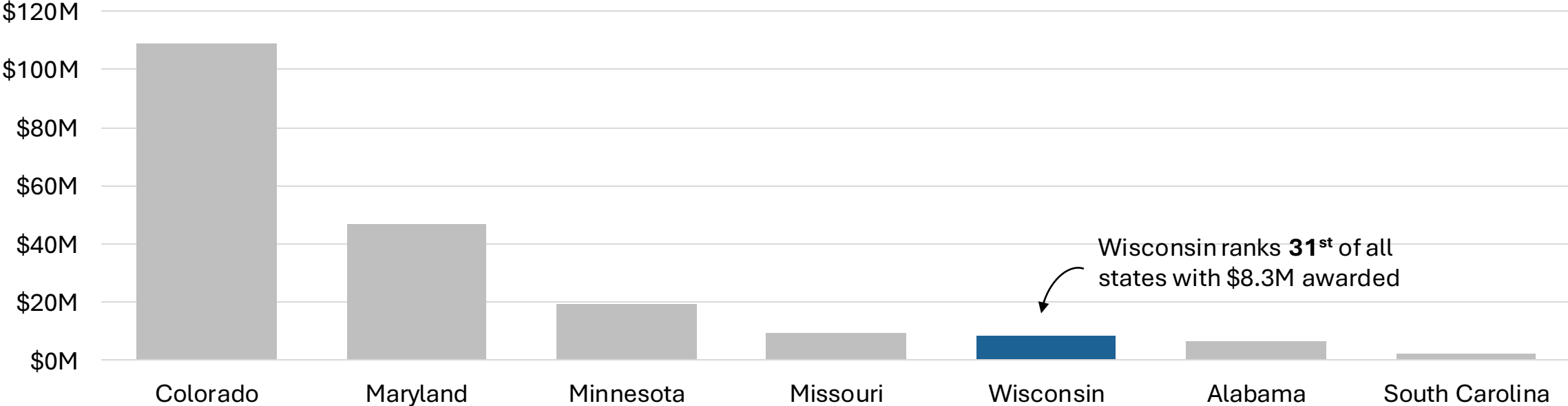
Federal Funding

State Funding

WISCONSIN PUBLIC FUNDING FOR EVS TRAILS SIMILAR-POPULATION STATES

Public funding awarded for EVs and EV charging compared to similar-population states (through June 2023)

Public Funding Awarded (in millions)



EV Funding Initiatives in Wisconsin

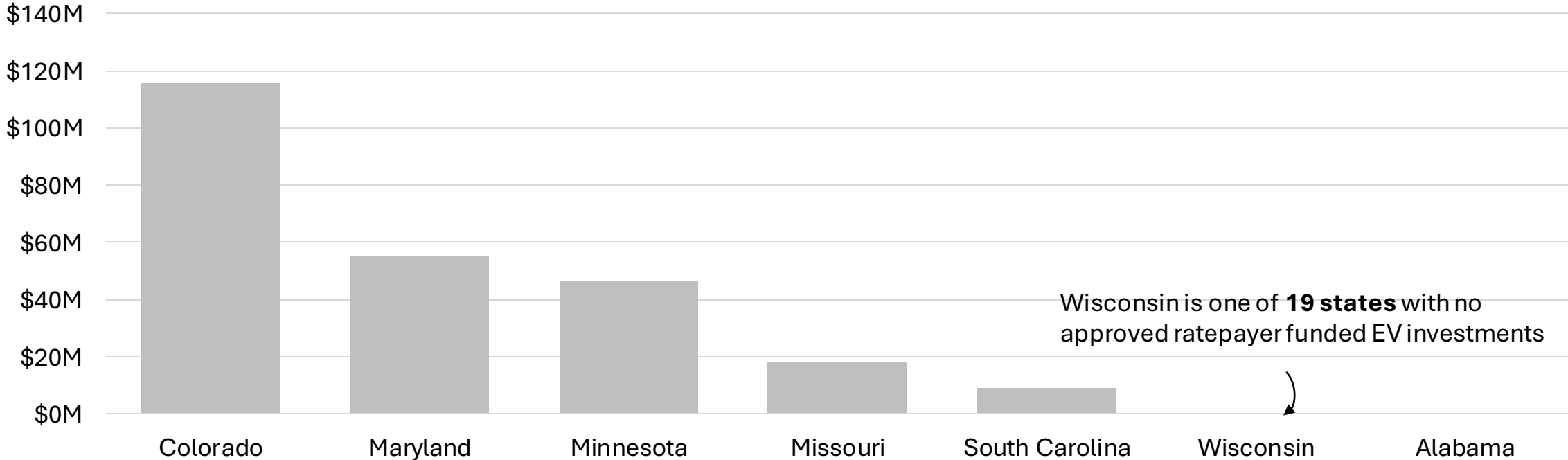
- Wisconsin Department of Administration awarded \$8.3 million over two rounds from Wisconsin’s VW Settlement through the Transit Capital Assistance program for 8 electric transit buses
- \$11.4 million from VW Settlement still available for state fleet replacements and transit buses

Similar population states represent the six closest states to Wisconsin in total population

WISCONSIN HAS NOT APPROVED RATEPAYER FUNDED INVESTMENTS IN EVS

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

Approved Utility Investment (in millions)



Electric Utility EV Initiatives Funded through Program Revenue

- Xcel Energy [EV Accelerate at Home](#) installs utility-owned charging stations at residential homes
- Madison Gas & Electric [Charge@Home](#) leases charging stations to residential customers
- Xcel Energy and Madison Gas & Electric offer electric vehicle time-of-use rates

Similar population states represent the six closest states to Wisconsin in total population



FEDERAL FUNDING

Overview

EV Market

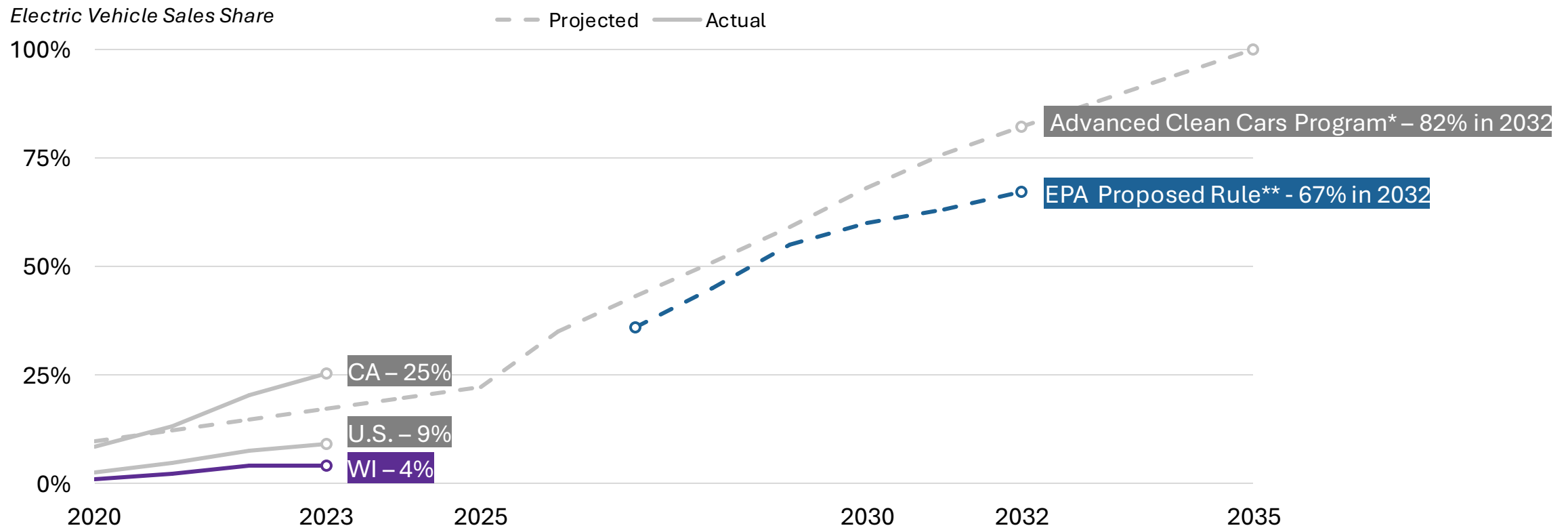
Manufacturing

Federal Funding

State Funding

PROPOSED EPA EMISSIONS STANDARDS WOULD REQUIRE STEEP RAMP IN PASSENGER EV SALES

Actual and projected EV market share under Advanced Clean Cars and proposed EPA regulations



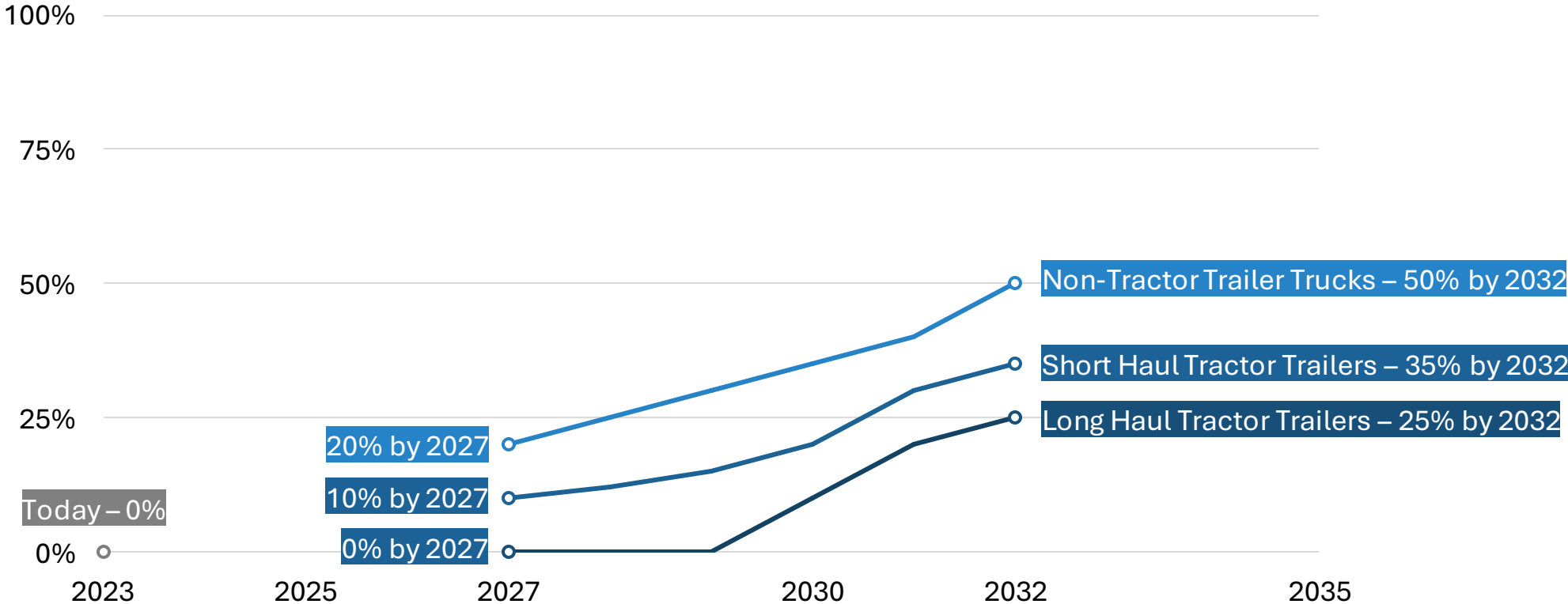
*Advanced Clean Cars includes hydrogen fuel cell vehicles

**Proposed EPA standards would also apply to complete medium-duty vans and pickups (class 2b - 3)

PROPOSED EPA EMISSIONS STANDARDS WOULD REQUIRE ACCELERATION OF ZEV HEAVY-DUTY VEHICLES

Actual and projected heavy-duty (class 4-8) ZEV market share under proposed EPA vehicle emissions standards

Electric Vehicle New Sales Share



IIJA AND IRA UNLEASH BILLIONS

EV Charging

- **\$5 billion** for National Electric Vehicle Infrastructure (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

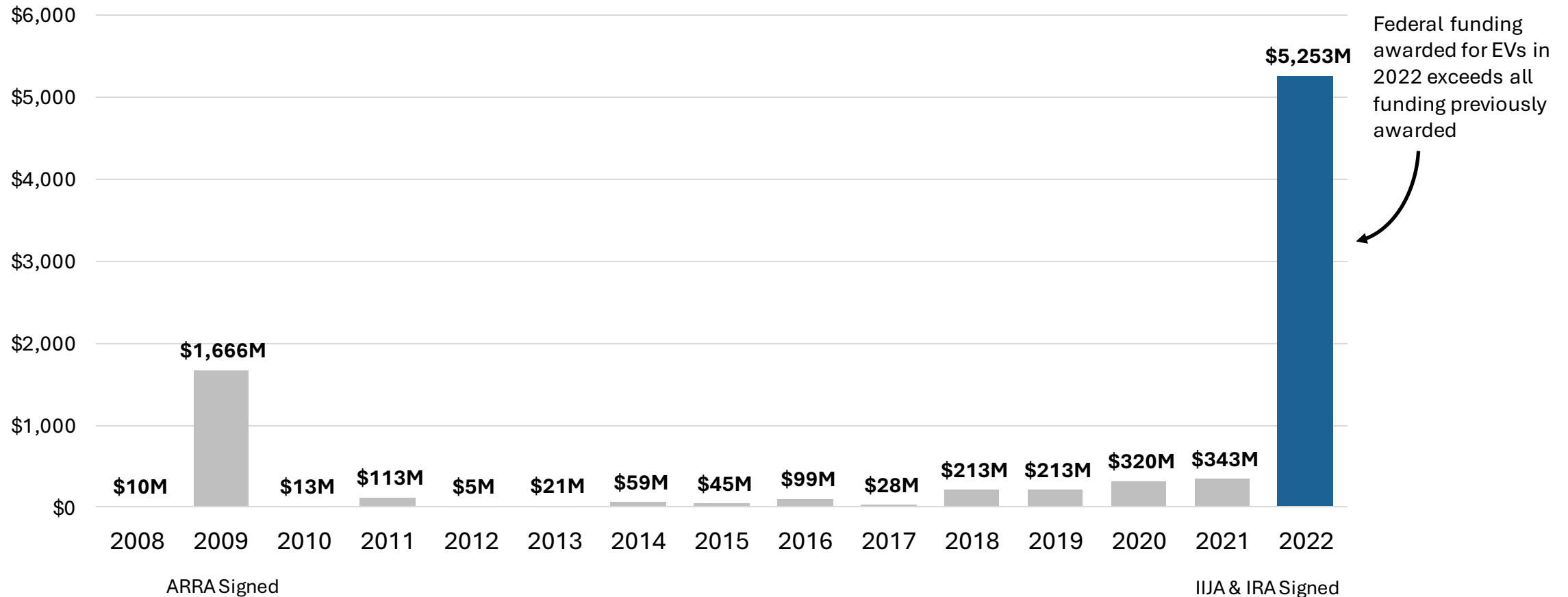
- **\$7,500** for purchase of a new EV (\$4,000 for used)
- **\$40,000** Tax Credit for purchase of clean commercial vehicle
- **\$100,000** for fueling infrastructure in low-income and rural communities



IIJA AND IRA ALREADY MAKING AN IMPACT

Federal Funding Awarded for EVs (2008 to 2022)

Funding Awarded (in millions)



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

Source: [Atlas EVHub](#)

FEDERAL FUNDING IS COMING TO WISCONSIN

- Formula funding available under the Infrastructure Investment and Jobs Act:
 - **\$79 million** for an EV charging network in the state
 - **\$125 million** to reduce transportation-related emissions
- Competitive funding awarded to Wisconsin:
 - **\$26 million** for electric school buses
 - **\$42 million** for electric transit buses
- Wisconsin can still compete for additional EV-eligible grant funding



ATLAS
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Maria Redmond

Director of the WI Office of Sustainability and Clean Energy

Getting Up North: Plugging Rural Wisconsin into EVs

- Moderator: **Ryan Huebsch**, Executive Director, Wisconsin Conservative Energy Forum
- Panelists:
 - **Kaleb Vander Wiele**, DOT
 - **Lorrie Lisek**, Executive Director, Wisconsin Clean Cities
 - **Carly Ebben- Eaton**, Wisconsin Organizer, Blue Green Alliance
 - **Jeff Springer**, Dairyland Power Cooperative

*We, in the public sector,
need to be ready for this
transformational change -
and in Wisconsin, we will
be.*

– *Craig Thompson,
WisDOT Secretary*

WIEV

Wisconsin Electrification Initiative

Kaleb Vander Wiele – DOT Officer
Transportation Electrification Project Manager
WisDOT Division of Budget and Strategic Initiatives



BIPARTISAN INFRASTRUCTURE LAW

EV FUNDING OPPORTUNITIES

\$5 billion

National Electric Vehicle Infrastructure (NEVI) Formula Program

- \$78.65 million to Wisconsin over five years
 - \$11.64 million is Wisconsin's first allocation
 - \$16.75 million is Wisconsin's second allocation
-

\$2.5 billion

EV and other alternative fuel infrastructure discretionary grant funds

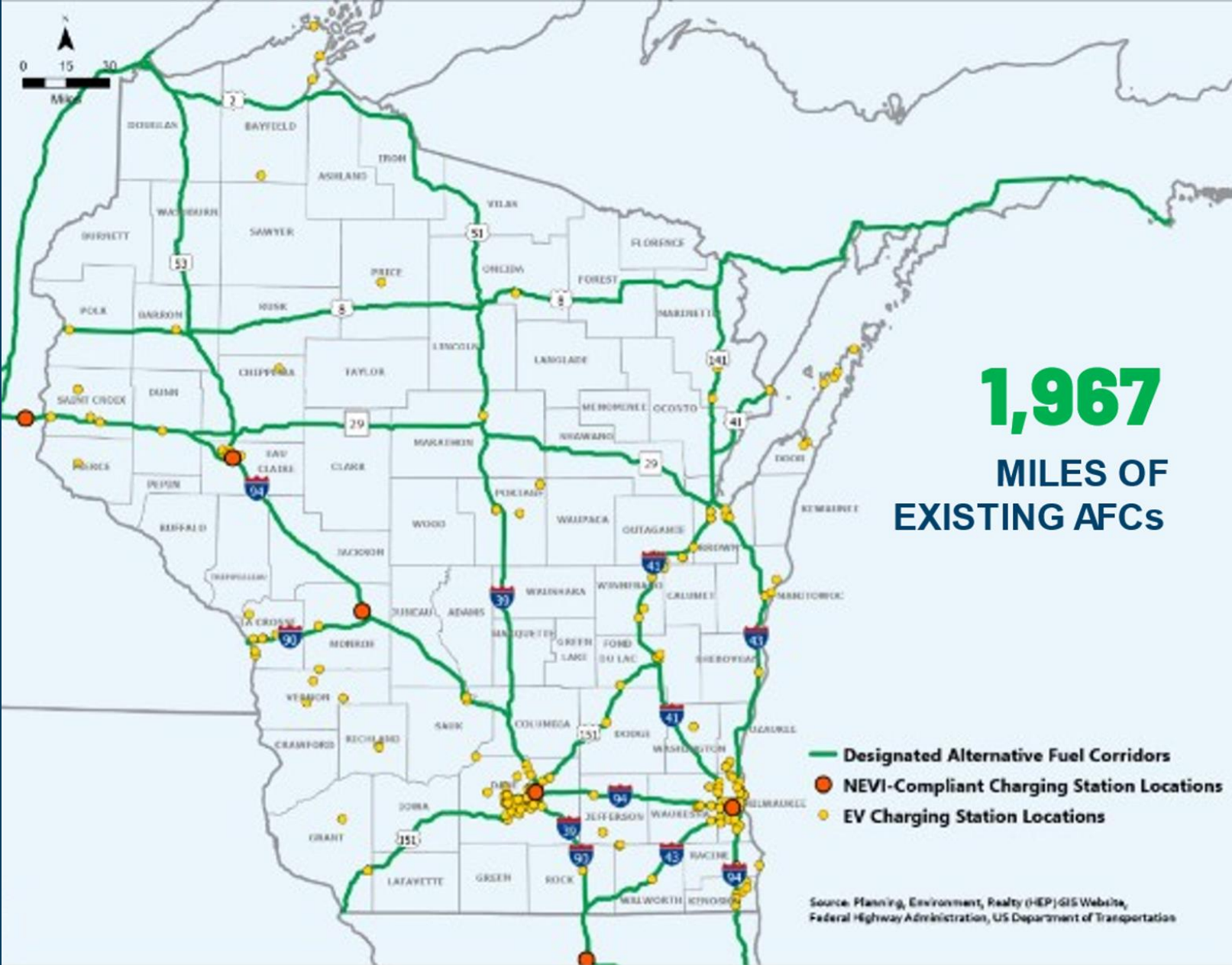
- **Corridor Charging Grant Program (\$1.25 billion)**
Strategically deploy publicly accessible EV charging stations and other alternative fuel infrastructure along Alternative Fuel Corridors.
- **Community Charging Grant Program (\$1.25 billion)**
Priority given to projects that expand access to alternative fueling infrastructure within rural areas, low- and moderate-income neighborhoods, and communities with a low ratio of private parking spaces.



NEVI PROGRAM CRITERIA



- Charging stations installed **every 50 miles along** the State's Alternative Fuel Corridors(AFC) within **1 travel mile of a highway intersection or exit.**
- EV charging station locations have a minimum of **four ports** that can charge a minimum of **150kW** simultaneously.
- Need to build out **AFCs** before Wisconsin can allocate discretionary NEVI funding.



WISCONSIN'S EXISTING EV INFRASTRUCTURE

306 Total publicly available charging station locations

164 Charging station locations within one mile of AFC exit or intersection

4 NEVI-compliant charging station locations

79 Tesla-only charging station locations
(not mapped)

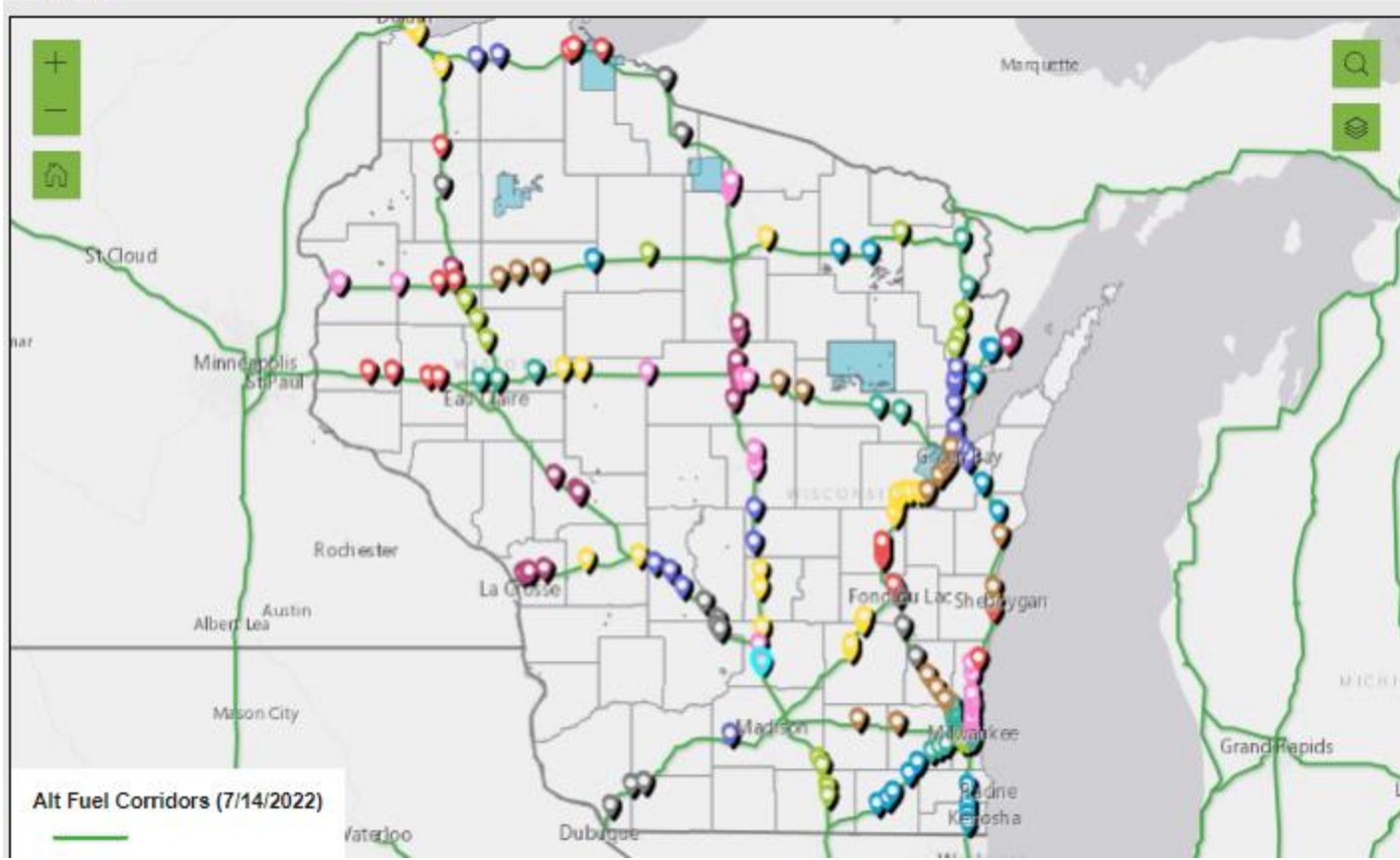
Source: <https://afd.energy.gov/stations/states>. Accessed on April 21, 2022



How WEVI Works

- WisDOT does not intend to own or operate charging stations.
- Charging stations funded by WEVI will primarily be hosted by private businesses.
- Final NEVI rules dictates installation, maintenance, and operation requirements.
- Site location is a critical component of eligibility.





[About the Process](#)

[Tutorial](#)

[General Feedback](#)



I-90 - E - Exit 115: County Rd CS

Exit 115: County Rd CS is part of the I-90 - E coverage gap group. There are 2 viable locations in this coverage gap group.

[Submit Feedback About Exit 115: County Rd CS](#)

Wisconsin EV State Policy Bootcamp

Plugging in Rural Wisconsin to EVs

Lorrie Lisek, Executive Director



July 26, 2023



Established in 1994, WCC continues to support our State and National energy and economic security through initiatives that support adoption of advanced fuels and energy saving strategies

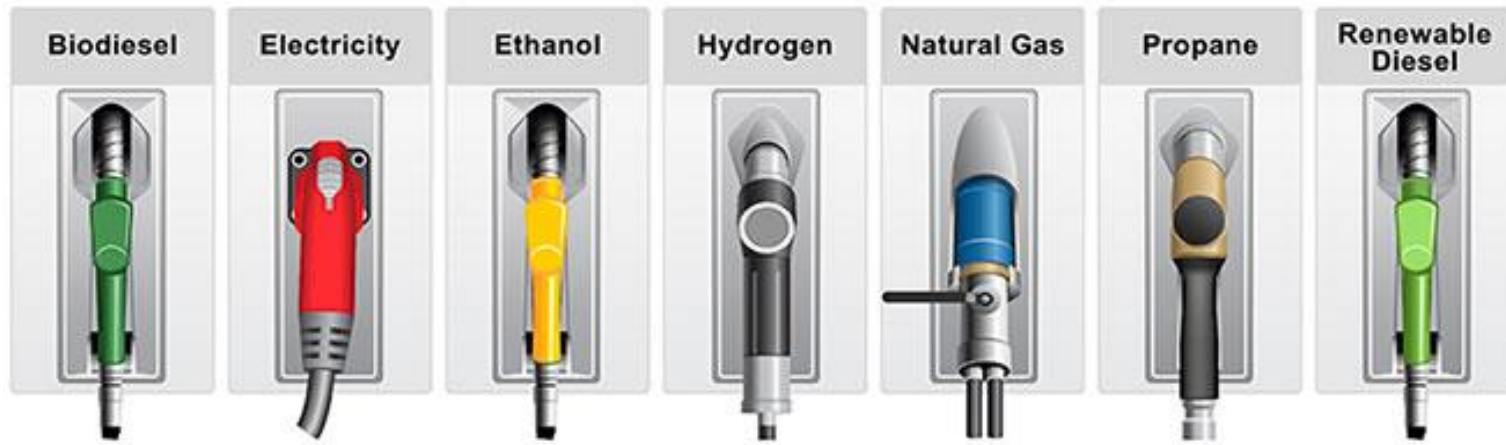


Building partnerships to advance affordable, domestic transportation fuels and technologies



Wisconsin Clean Cities:

- Serves as a forum for stakeholders to connect and collaborate on saving energy and using affordable alternative fuels
- Provides support and resources on new transportation technologies and infrastructure development
- Supports networks to assist members and stakeholders identify cost-effective solutions that work locally
- Assists to secure funding to support projects reflective of the Clean Cities mission



**Light-,
Medium-, and
Heavy-Duty
Vehicles**



**Alternative and
Renewable
Fuels and
Infrastructure**



**Idle Reduction
Measures and
Fuel Economy
Improvements**



**New Mobility
Choices and
Emerging
Transportation
Technologies**

Wisconsin Clean Cities Portfolio

Current WCC Grants & Projects

- DRIVE Electric Wisconsin - DRIVE Electric USA
- Drive Clean Rural USA
- EMPOWER – Workplace Charging
- WIEV – Wisconsin EV Infrastructure Program (NEVI)
- Clean Energy to Communities Program : Milwaukee County
- NFPA – Ready for EV's Program– Oak Creek, WI
- WI Smart Fleet 2.0
- Zero-Emission Freight Future
- Native Sun Electrification Project



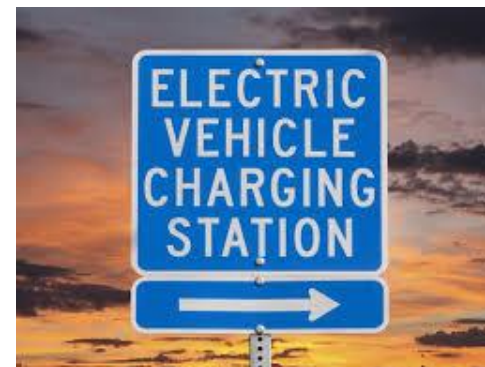
Recently Completed Projects

- M2M I-94 Clean Fuel Corridor Project
- DOE Vehicle Charging Innovations for Multi-Unit Dwellings Grant
- EPA DERA Grant
- Safer 2 Grant – WI Office of Energy Innovation
- NGV UP TIME Grant
- Heavy Duty EV Demonstrations for Freight & Mobility Solutions

Since 2011, WCC has assisted to secure over \$45M in funding for the implementation of projects in the transportation sector.

DRIVE Electric Wisconsin

- DRIVE Electric Wisconsin is part of DRIVE Electric USA, a partnership of U.S. Department of Energy Clean Cities coalitions working to significantly advance EV adoption in their states.
- The overarching goal of DRIVE Electric USA is to substantially increase EV adoption rates across consumer and fleet markets.
- The activities, outputs and outcomes in the project are built on seven priority areas of focused work.



Drive Clean Rural USA



- Drive Clean Rural USA is engaging with government leaders, business owners, fleet managers and farmers to remove barriers and accelerate access to clean fuel solutions that deliver financial savings, clean air and economic opportunity to rural communities.
- This eight-state DOE-funded project focuses on alternative fuel options through technical assistance, clean fuel transition planning & demo vehicles with an emphasis on business, economic & job development.



EMPOWER

Equitable, Mobility, Powering Opportunities for Workplace Electrification Readiness

- **Why**

- Provide reliable access where home charging is not possible
- Providing a pathway for EV ownership for those who would otherwise not have charging access
- Help to flatten the power demand curve by charging mid-day

- **What**

- Educational outreach
- Support infrastructure deployment in disadvantaged communities / businesses
- Charging infrastructure planning and installation

- **Who**

- Businesses across Wisconsin
- 40% minimum goal for impacted communities and businesses



EMPOWER
WORKPLACE CHARGING





Thank you!

Lorrie Lisek
Executive Director
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BLUEGREEN ALLIANCE



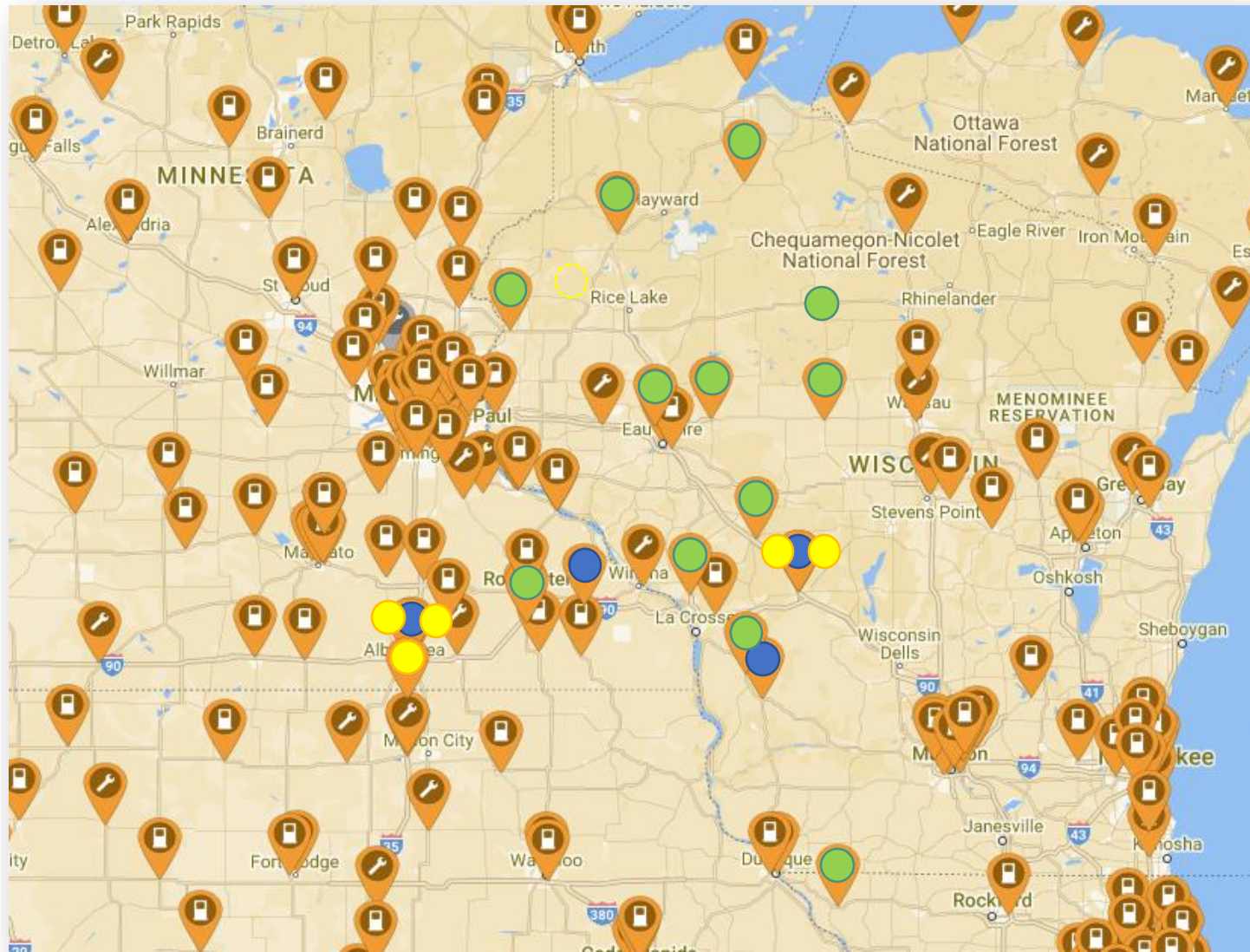
The BlueGreen Alliance unites labor unions and environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a clean, prosperous, and equitable economy.

Carly Eaton, PhD · WI Policy Organizer · cebbeneaton@bluegreenalliance.org

Building Charging for Rural Areas



Dairyland EV Infrastructure Efforts – Fast Chargers



- Past Projects
- 2021-23
- Built by others, powered by us
- 🔌 DC Fast Charger -powered by others
- 🔌 DC Fast Charger -under construction -powered by others

Lessons Learned

Parking spots located closest to the entrance are also most likely to get ICE'd



Pull through parking is needed already



Reliability needs to improve – EV's as primary vehicles



If you build it...



They will come



Getting Up North: Plugging Rural Wisconsin into EVs

- Moderator: **Ryan Huebsch**, Executive Director, Wisconsin Conservative Energy Forum
- Panelists:
 - **Kaleb Vander Wiele**, DOT
 - **Lorrie Lisek**, Executive Director, Wisconsin Clean Cities
 - **Carly Ebben- Eaton**, Wisconsin Organizer, Blue Green Alliance
 - **Jeff Springer**, Dairyland Power Cooperative



Lunch and Learn

Presentations will begin at 11:50



Wisconsin's Electric Vehicle/Electrification Supply Chain Strategy

Flannery Geoghegan, Policy Senior Director

07.26.23

Background

- American Rescue Plan Act (ARPA) Planning Grant – US Department of Commerce Economic Development Agency (EDA)
- DOA applicant, split funding between WEDC and WisDOT
- Research and analysis to inform recommendations and identify priorities for a successful EV and EV charging station development, including infrastructure, supply chain, and workforce
- SRI International, an independent nonprofit research institution, carried out the work for WEDC

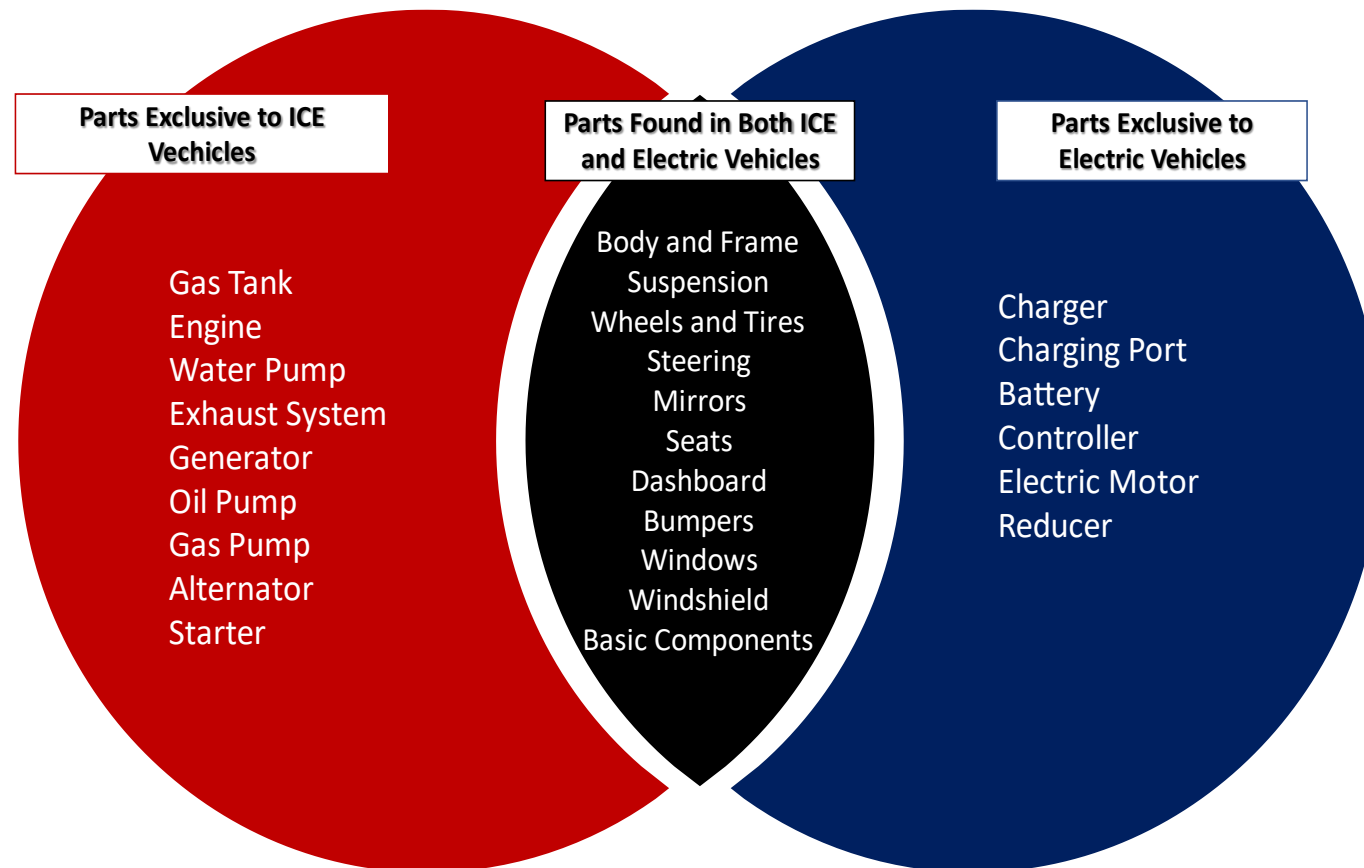
Report Findings

- Opportunity for Wisconsin to develop a globally competitive EV ecosystem centered on manufacturing
- Challenges to success include below-average productivity and worker shortages
- The State needs to support electric technologies through innovation and entrepreneurship
 - Build infrastructure and a regulatory agenda that enables EV adoption
- Collaboration between government, industry, and academia to implement recommendations

The Manufacturing Transition

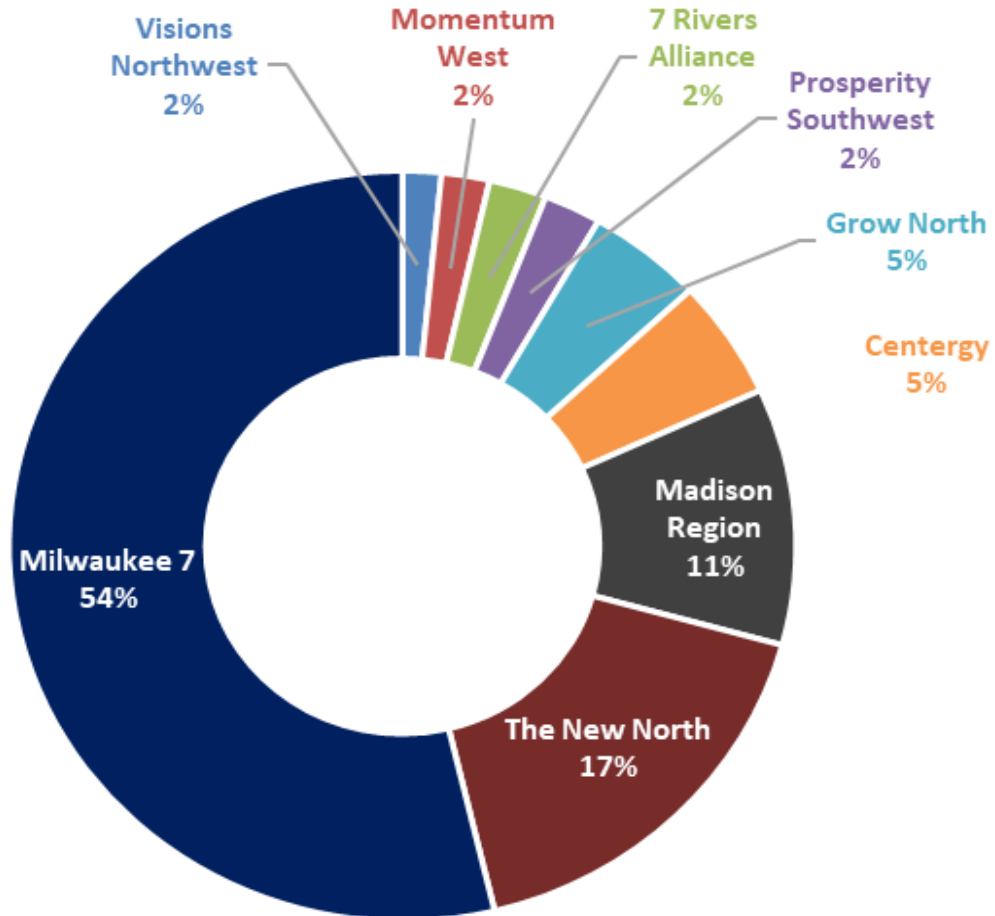
The Manufacturing Transition

Figure 1: Illustration of Automotive Component Groups Commonly Found in ICE-powered and Electric Vehicles. Source: SRI research



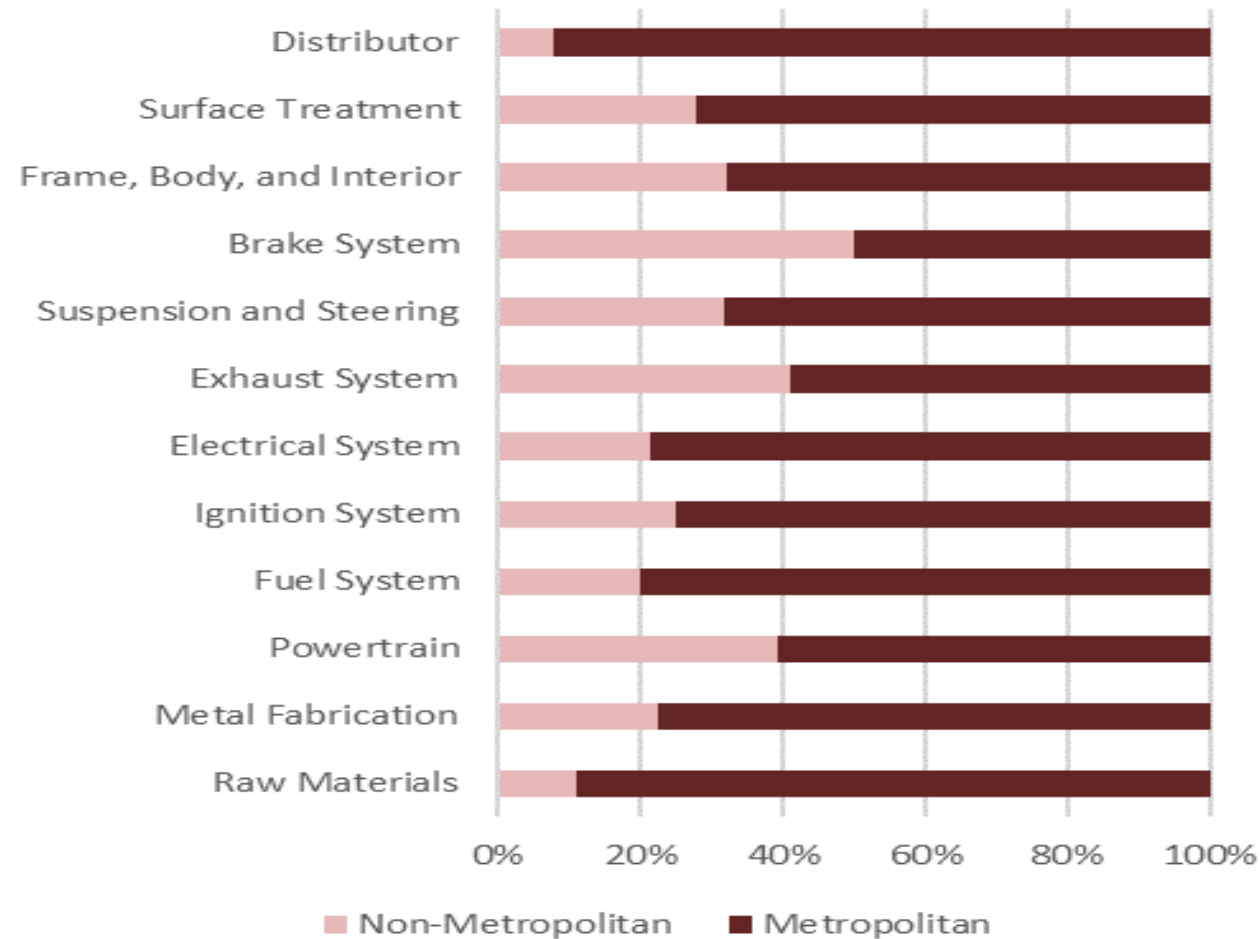
The Manufacturing Transition

Figure 4: Wisconsin Automotive Manufacturers by Economic Development Region, 2022. Source: SRI analysis of Marklines and ThomasNet data.



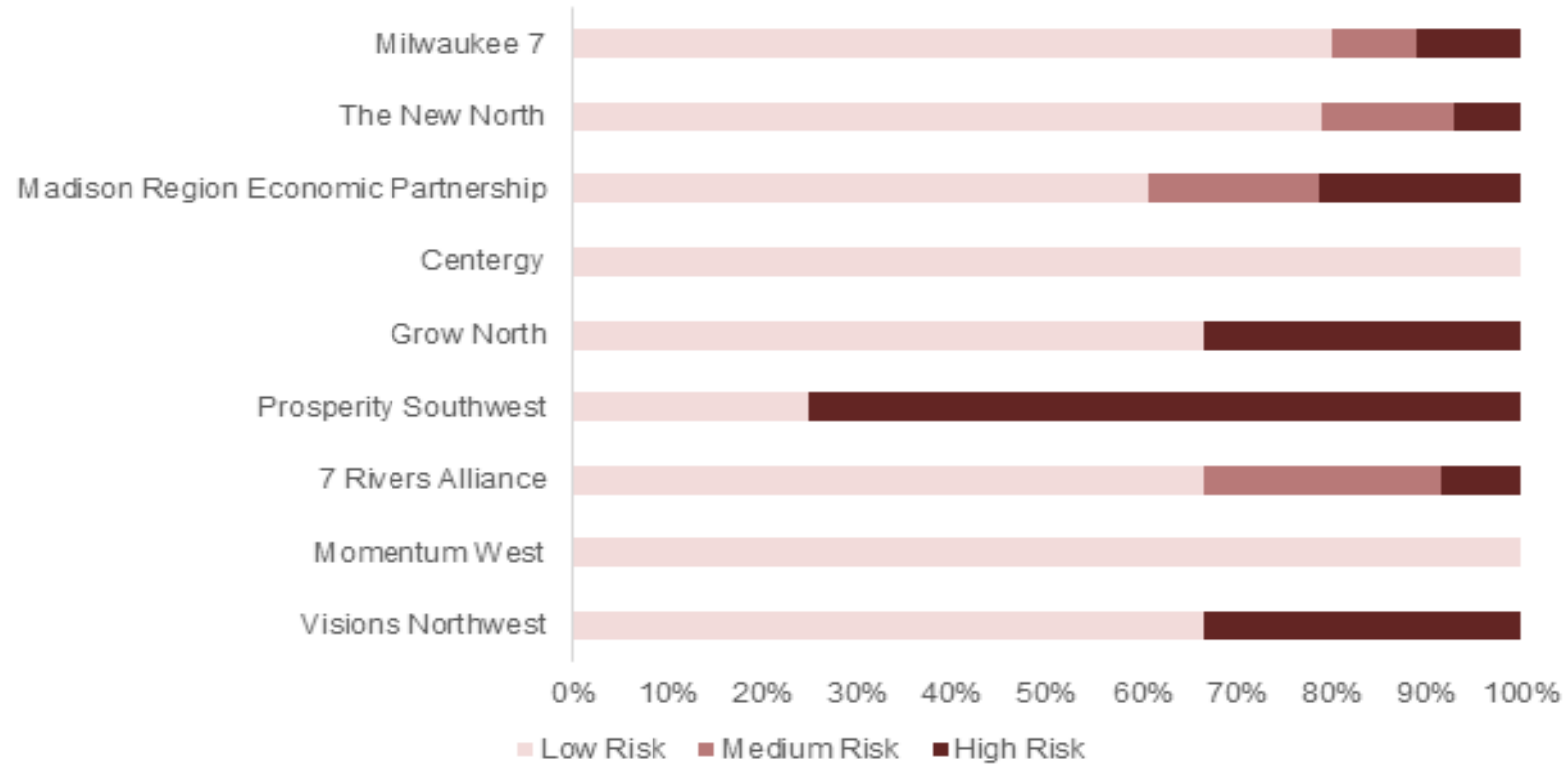
The Manufacturing Transition

Figure 5: Distribution of Automotive Manufacturers by Parts Category and Metropolitan Status. Source: SRI analysis of Marklines and ThomasNet data.



The Manufacturing Transition

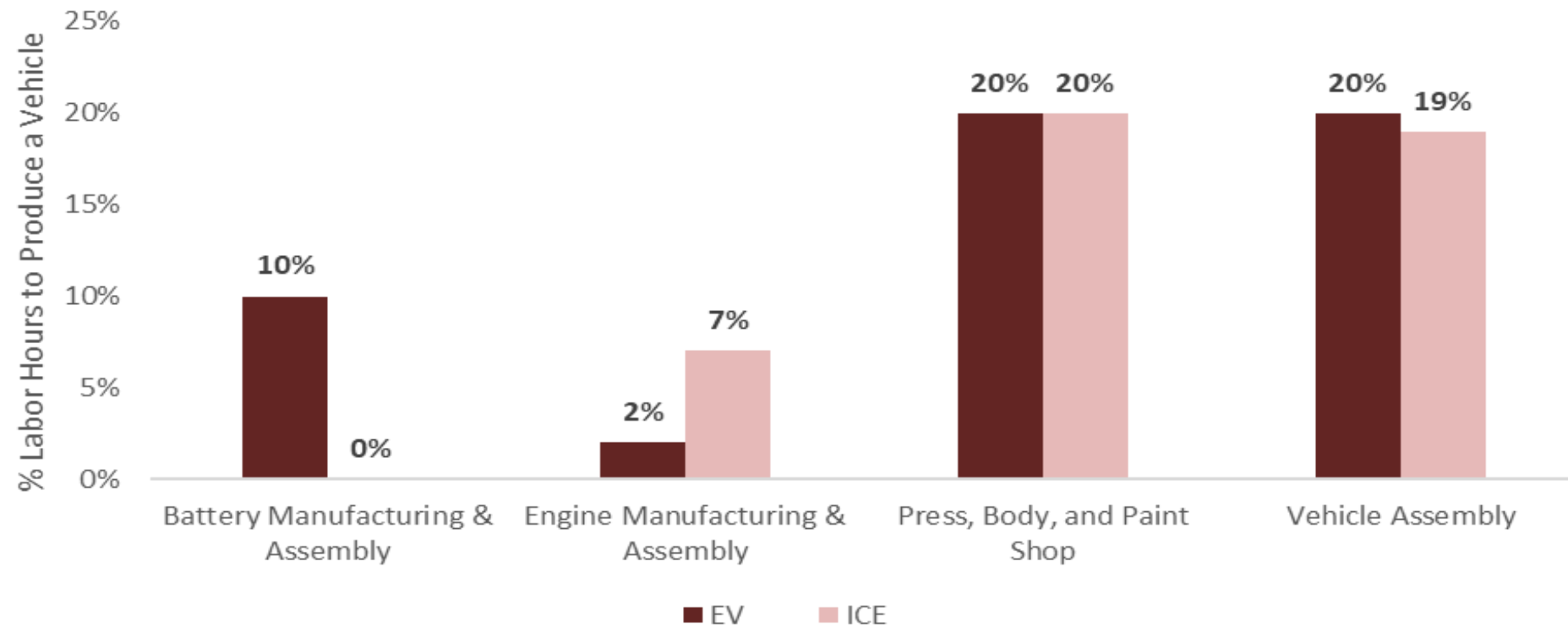
Figure 6: Distribution of Vulnerability Scores by Regional Economic Development Locations (2022).
Source: SRI analysis of Marklines and ThomasNet data.ⁱⁱ



The Workforce Transition

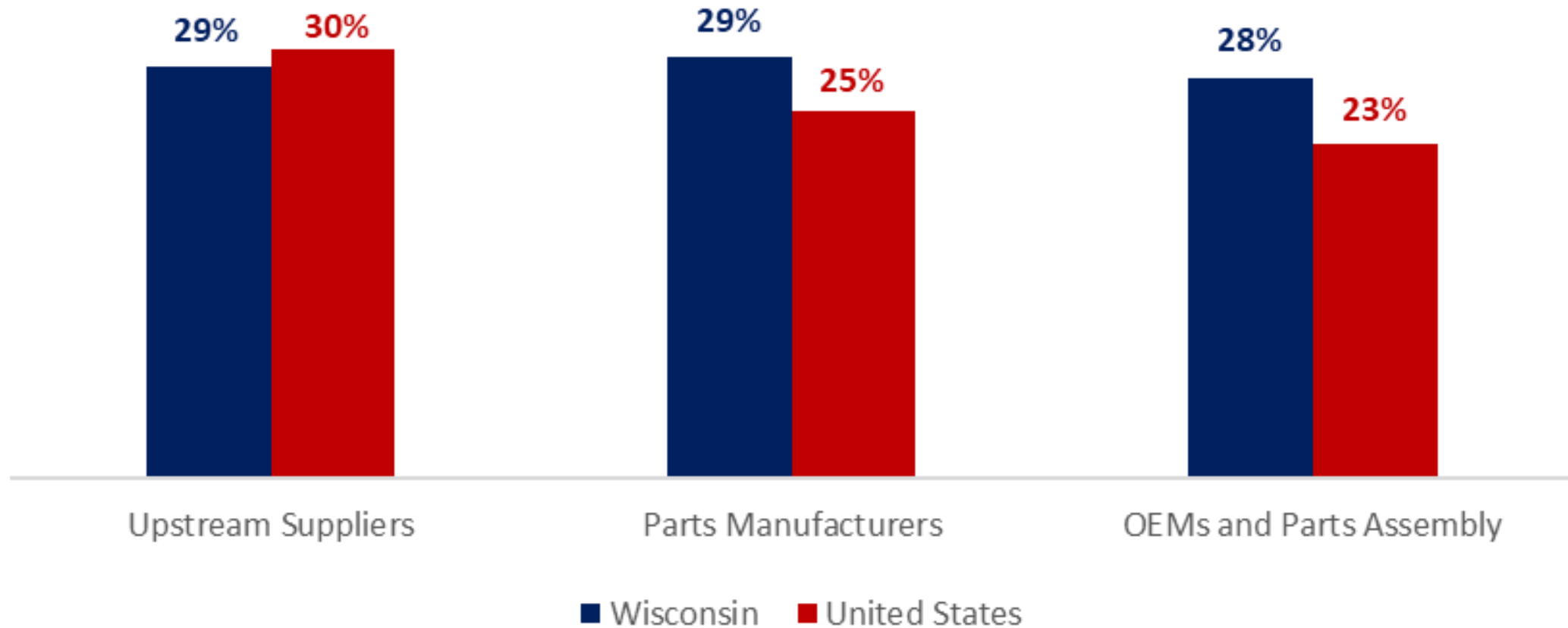
The Workforce Transition

Figure 16: Share of Labor Hours Required to Produce a Vehicle, ICE vs. EV, by Stage in the Manufacturing Process. Source: Boston Consulting Group.



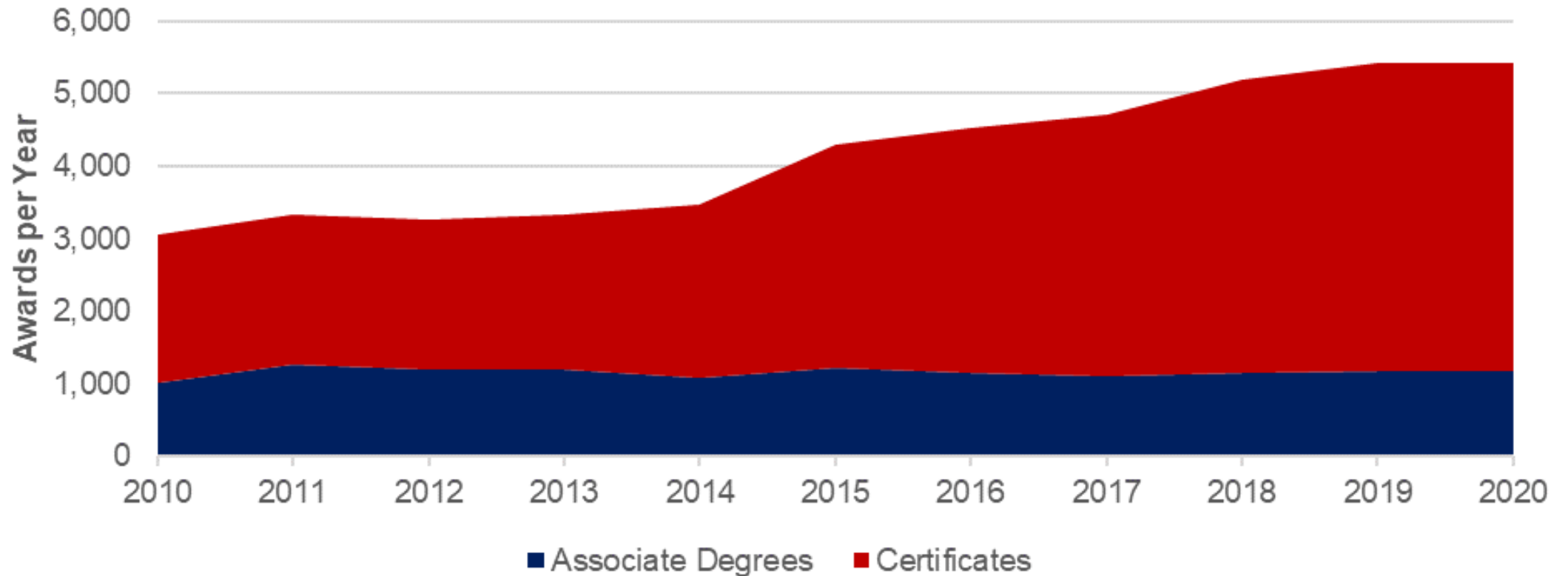
The Workforce Transition

Figure 17: Share of Workforce over 55 Years Old by Supply Chain Segment in Wisconsin and the United States. Source: SRI analysis of Lightcast data.



The Workforce Transition

Figure 19: Associate Degree and Certificates Awarded in Engineering Technician, Mechanical Technician, and Precision Production Programs at Wisconsin's Technical Colleges, 2010-2020. Source: SRI analysis of Lightcast data.



Recommendations

- 1. Enhance Productivity through Automation and Upskilling
- 2. Scale Up the Middle-Skill Workforce Pipeline
- 3. Improve Manufacturers' Access to Regional, National, and Global Markets
- 4. Build Connections between Innovators and Industry
- 5. Align EV Policymaking with Economic Development Interests
- 6. Prepare for the Future of Mobility and Sustainability

1. Enhance Productivity through Automation and Upskilling

- **Action Item 1.1: Refocus incentive programs to encourage and support productivity-enhancing capital investments by existing manufacturers.**
- Action Item 1.2: Strengthen cooperative efforts between the Wisconsin Economic Development Corporation and organizations with technical assistance capabilities, such as the Wisconsin Center for Manufacturing & Productivity, to develop and administer joint programs supporting manufacturers
- Action Item 1.3: Launch a manufacturing accelerator program for small and/or rural manufacturers in partnership with organizations such as the Wisconsin Small Business Development Center, the Wisconsin Center for Manufacturing & Productivity, and other stakeholders.
- Action Item 1.4: Establish technology demonstration centers that enable manufacturers to learn about, experiment with, and pilot new technologies and practices.
- Action Item 1.5: Mobilize Wisconsin's industrial automation and power electronics providers to boost productivity for under-resourced manufacturers and to accelerate their transition to EV supply chains.
- Action Item 1.6: Deepen engagement with rural counties whose economies are highly dependent on manufacturing.

2. Scale Up the Middle-Skill Workforce Pipeline

- Action Item 2.1: Establish and maintain relationships with technical colleges that (1) boost enrollment in programs that are in high demand by manufacturers and (2) direct talent to fill high demand positions.
- Action Item 2.2: Develop and launch a basic mechanical aptitude program to evaluate the skill level of job seekers, based on skills and needs identified by the industry.
- **Action Item 2.3: Remove barriers to labor force participation and increase job access for individuals who are not currently in the workforce.**
- Action Item 2.4: Improve perception of manufacturing occupations by launching a Made in Wisconsin marketing campaign.
- Action Item 2.5: Incentivize manufacturers implementing automation and other productivity-enhancing measures to invest in workforce upskilling.

3. Improve Manufacturers' Access to Regional, National, and Global Markets

- Action Item 3.1: Assist manufacturers in obtaining automotive industry certifications
- Action Item 3.2: Develop interoperability standards for EV components and EV charging equipment manufacturing.
- **Action Item 3.3: Partner with the Wisconsin Supplier Diversity Program to facilitate supplier relationships with Minority-Owned, Service-Disabled-Veteran-Owned, and Woman-Owned businesses in the private sector.**
- Action Item 3.4: Strengthen supply chain relationships with nearby EV OEM plants through the establishment of an automotive industry liaison

4. Build Connections between Innovators and Industry

- **Action Item 4.1: Launch a manufacturing innovation consortium of university researchers to work on use-inspired projects alongside industry partners.**
- Action Item 4.2: Establish a “hard tech” entrepreneurial mentorship network that connects experienced entrepreneurs and investors to promising power electronics, mechanical engineering, and advanced manufacturing startups seeking to commercialize new technologies.
- Action Item 4.3: Support international students, workers, and entrepreneurs in contributing to Wisconsin’s EV ecosystem.

5. Align EV Policymaking with Econ Dev Interests

- **Action Item 5.1: Identify and pursue changes to electric system infrastructure to align with EV adoption increases.**
- Action Item 5.2 Coordinate EV infrastructure and manufacturing development with other Midwestern states.

6. Prepare for the Future of Mobility and Sustainability

- Action Item 6.1: Explore opportunities to leverage Wisconsin's sand mining industry for novel applications in sustainability and mobility.
- **Action Item 6.2: Conduct long-range planning on the integration of emerging clean technologies and trends into Wisconsin's economy and communities.**

Next Steps

- Follow on study looking at a Statewide Electrification Cluster Strategy
- Visit <https://wedc.org/blog/wedc-report-shows-wisconsin-manufacturers-will-benefit-from-strategic-investments-in-expanded-ev-supply-chain/> for the full report
- Flannery.Geoghegan@wedc.org

EV Funding Finder & Dashboard for Rapid Vehicle Electrification

July 26, 2023
Wisconsin Bootcamp



Electrification
Coalition



EV Funding Finder

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 EV Funding Finder

Step 1: I represent a...

City

Rural Area

School

Freight/Shippers and Carriers

EV Advocate or Community Organization

Business

Non-Profit Transportation Group

Individual

State



Step 2

Select Funding Scenarios

Purchase or Lease a Light-Duty Vehicle
Funds to purchase or lease a light-duty vehicle (ex: passenger car)

Purchase Light-Duty Charging Infrastructure
EV charging infrastructure incentives for light-duty vehicles

Grid Upgrades
Funding for updating and preparing the grid for at-scale EV adoption

Access Support Planning
Funding to ensure adequate planning of EV infrastructure

Purchase or Lease a Medium- or Heavy-Duty Vehicle
Funds to purchase or lease a medium- or heavy-duty vehicle (ex: school bus)

Purchase Medium- or Heavy-Duty Charging Infrastructure
EV charging infrastructure for medium- and heavy-duty vehicles

Electrify Ports
Funding for shipping and transportation companies to electrify port transit

Support Workforce Development
Funds to train and ensure a workforce has the required skills and certifications

Access Technical Assistance
Funds to provide technical expertise to access EVs or EV infrastructure

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.

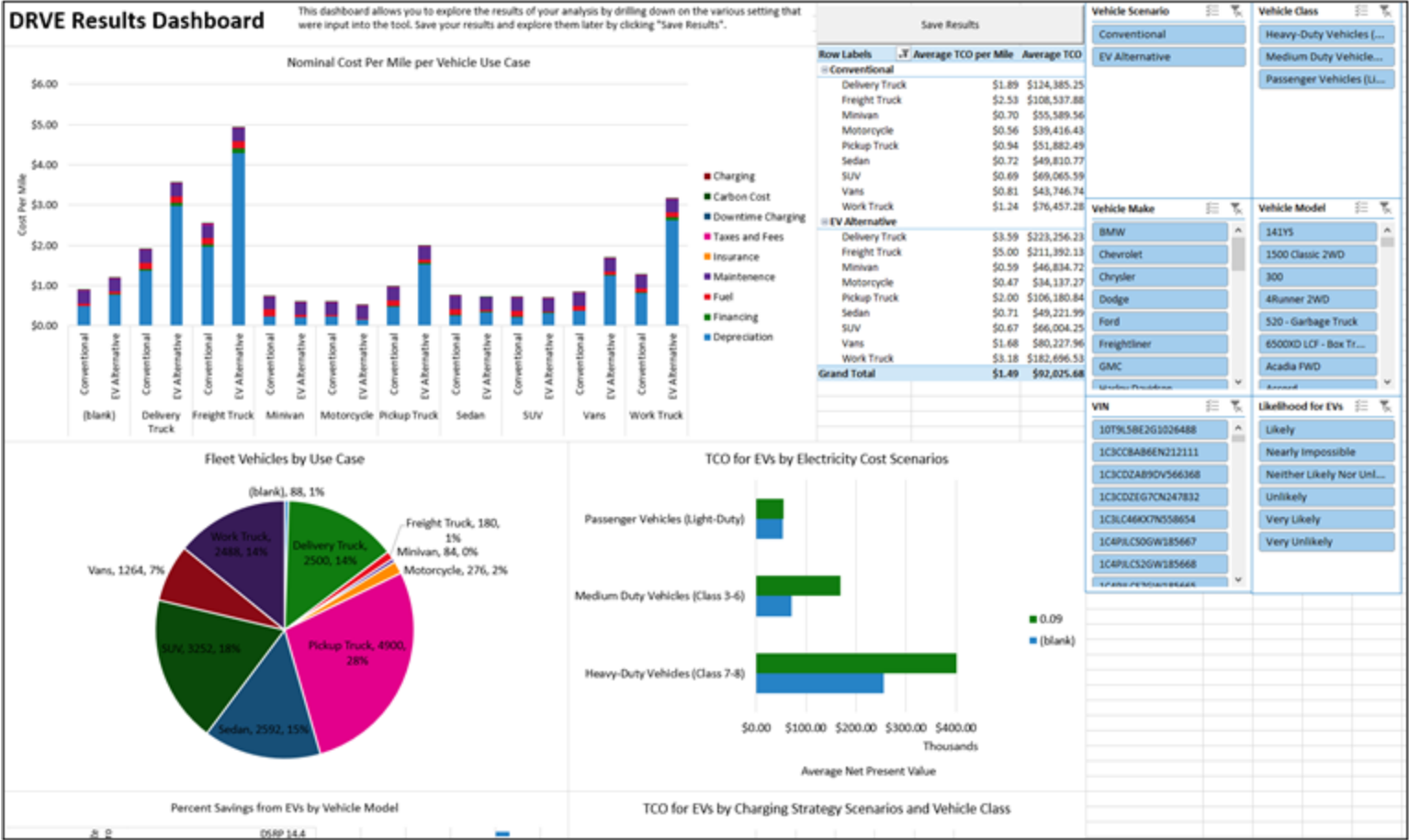
Businesses that want to install EV charging stations should partner with local governments and cities to become a "site host" for charging infrastructure. Under this grant, the charging infrastructure must be located on a public road or in other publicly accessible locations, such as public buildings, 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](#).



Dashboard for Rapid Vehicle Electrification

What is the DRIVE Tool?



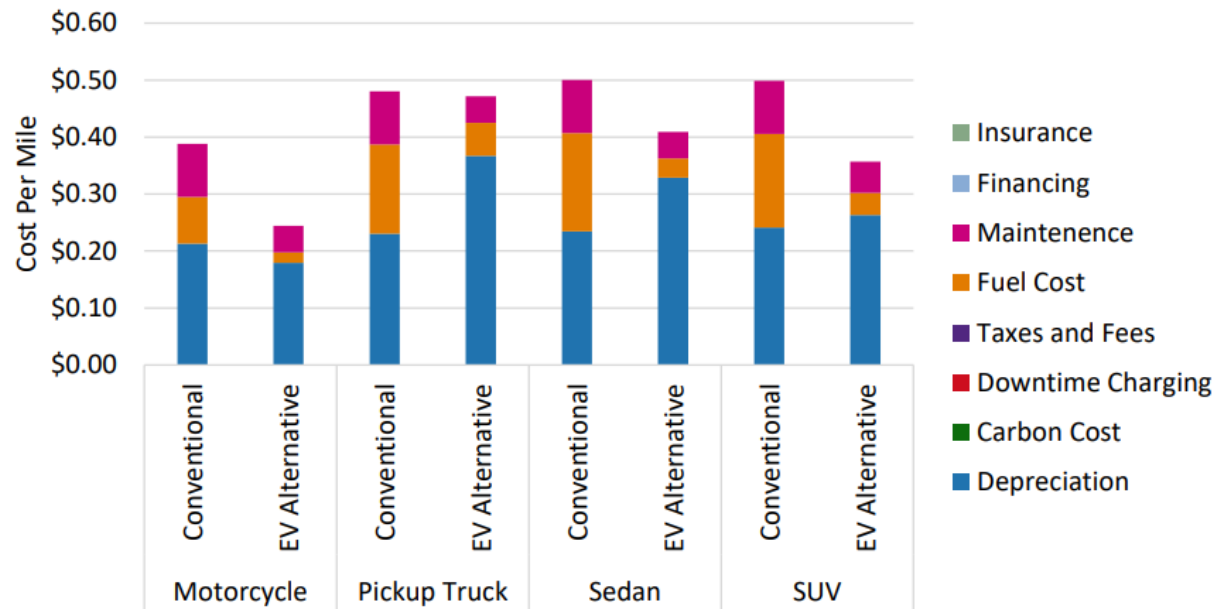
Why the DRIVE tool?

- Standard fleet analysis can be costly, take months, and be difficult to interpret
- **Free**, accessible, easy-to-use analysis tool that provides the **total cost of ownership** and other data in minutes
- Can integrate several **variables**, including fuel costs, purchase prices, federal and state incentives, infrastructure, and insurance

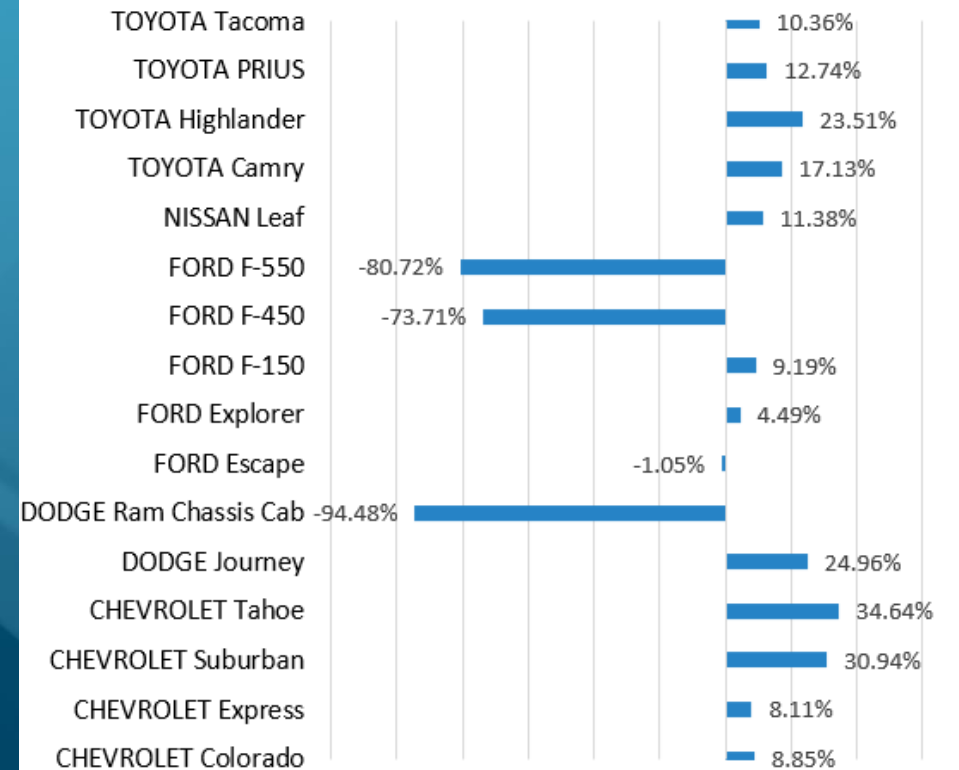


Results Snapshot

Figure 3: Light-Duty Nominal Cost Per Mile per Vehicle Use Case



Average Percent Savings by Original Fleet Vehicle



Vehicle Summary

Vehicle Summary							
Row Labels	EV Average NPV	EV Average CPM	Original Average NPV	Avg Percent Savings from EVs	Likelihood of Savings from EVs	Conventional Vehicle	EV Vehicle
<ul style="list-style-type: none"> [-] Pickup Truck <ul style="list-style-type: none"> [-] CHEVROLET Colorado <ul style="list-style-type: none"> 1GCDT14E098145851 \$33,611.83 \$0.40 \$36,875.47 8.85% Likely 2020 Chevrolet Colorado 2WD ICE 2022 Ford F-150 Lightning (Standard Range) BEV 1GCDT14E498145450 \$33,611.83 \$0.40 \$36,875.47 8.85% Likely 2020 Chevrolet Colorado 2WD ICE 2022 Ford F-150 Lightning (Standard Range) BEV 1GCHTBE31G1111556 \$33,611.83 \$0.40 \$36,875.47 8.85% Likely 2020 Chevrolet Colorado 2WD ICE 2022 Ford F-150 Lightning (Standard Range) BEV [-] FORD F-150 <ul style="list-style-type: none"> 1FTVX1EF7BKD87741 \$33,611.83 \$0.40 \$37,012.84 9.19% Likely 2020 Ford F150 Pickup 2WD ICE 2022 Ford F-150 Lightning (Standard Range) BEV [-] TOYOTA Tacoma <ul style="list-style-type: none"> 5TFUU4EN5EX106721 \$33,611.83 \$0.40 \$37,496.92 10.36% Likely 2021 Toyota Tacoma 2WD ICE 2022 Ford F-150 Lightning (Standard Range) BEV [-] Sedan <ul style="list-style-type: none"> [-] NISSAN Leaf <ul style="list-style-type: none"> 1N4AZ0CP4FC308532 \$28,808.04 \$0.34 \$32,507.35 11.38% Likely 2021 Nissan Altima ICE 2022 Nissan Leaf (40 kW-hr battery pack) BEV 1N4AZ0CP5FC304098 \$28,808.04 \$0.34 \$32,507.35 11.38% Likely 2021 Nissan Altima ICE 2022 Nissan Leaf (40 kW-hr battery pack) BEV [-] TOYOTA Camry <ul style="list-style-type: none"> 4T1BB46K38U060972 \$28,808.04 \$0.34 \$34,763.90 17.13% Likely 2022 Toyota Camry ICE 2022 Nissan Leaf (40 kW-hr battery pack) BEV 4T1BB46K88U061681 \$28,808.04 \$0.34 \$34,763.90 17.13% Likely 2022 Toyota Camry ICE 2022 Nissan Leaf (40 kW-hr battery pack) BEV 4T1BB46K88U061941 \$28,808.04 \$0.34 \$34,763.90 17.13% Likely 2022 Toyota Camry ICE 2022 Nissan Leaf (40 kW-hr battery pack) BEV [-] TOYOTA PRIUS <ul style="list-style-type: none"> JTDKN3DUXC5423846 \$26,682.04 \$0.32 \$30,576.51 12.74% Likely 2022 Toyota Prius ICE 2022 Chevrolet Bolt EV BEV [-] SUV <ul style="list-style-type: none"> [-] CHEVROLET Suburban <ul style="list-style-type: none"> 1GNSK5KC4FR649223 \$29,976.35 \$0.36 \$43,403.19 30.94% Very Likely 2020 Chevrolet Suburban C1500 2WD ICE 2021 Volkswagen ID.4 Pro BEV [-] CHEVROLET Tahoe <ul style="list-style-type: none"> 1GNSKDEC1GR371534 \$28,292.63 \$0.34 \$43,284.18 34.64% Very Likely 2020 Chevrolet Tahoe C1500 2WD ICE 2022 Hyundai Kona Electric BEV 1GNSKDEC5GR378437 \$28,292.63 \$0.34 \$43,284.18 34.64% Very Likely 2020 Chevrolet Tahoe C1500 2WD ICE 2022 Hyundai Kona Electric BEV [-] DODGE Journey <ul style="list-style-type: none"> 3C4PDDBG3FT684624 \$28,292.63 \$0.34 \$37,701.91 24.96% Very Likely 2020 Dodge Durango RWD ICE 2022 Hyundai Kona Electric BEV 3C4PDDBG5FT684625 \$28,292.63 \$0.34 \$37,701.91 24.96% Very Likely 2020 Dodge Durango RWD ICE 2022 Hyundai Kona Electric BEV [-] FORD Escape <ul style="list-style-type: none"> 1FMCU59349KA17957 \$34,428.76 \$0.41 \$34,071.37 -1.05% Likely 2021 Ford Escape AWD ICE 2021 Ford Mustang Mach-E AWD BEV 1FMYU96H65KD90859 \$34,428.76 \$0.41 \$34,071.37 -1.05% Likely 2021 Ford Escape AWD ICE 2021 Ford Mustang Mach-E AWD BEV [-] FORD Explorer <ul style="list-style-type: none"> 1FM5K8AR2GGD05718 \$36,544.86 \$0.44 \$38,261.95 4.49% Likely 2020 Ford Explorer AWD ICE 2021 Ford Mustang Mach-E AWD BEV 1FM5K8AR5GGD05714 \$36,544.86 \$0.44 \$38,261.95 4.49% Likely 2020 Ford Explorer AWD ICE 2021 Ford Mustang Mach-E AWD BEV 1FM5K8AR9GGA02080 \$36,544.86 \$0.44 \$38,261.95 4.49% Likely 2020 Ford Explorer AWD ICE 2021 Ford Mustang Mach-E AWD BEV [-] TOYOTA Highlander <ul style="list-style-type: none"> JTEEW41A592035892 \$28,260.98 \$0.34 \$36,948.29 23.51% Very Likely 2021 Toyota Highlander ICE 2022 Chevrolet Bolt EUV BEV 							

Making Electrification Work: EV Project Implementation

- Moderator: **Chelsea Chandler**, Clean Wisconsin
- Panelists:
 - **Erinn Monroe Nye**, Madison Gas and Electric
 - **Mahanth Joishy**, City of Madison
 - **Brian Lambert**, WEC Energy Group
 - **Erick Shambarger**, City of Milwaukee

An aerial night view of a busy city street, likely in Hanoi, Vietnam, showing heavy traffic and illuminated buildings. A blue semi-transparent overlay covers the center of the image, containing white text. The text reads "Lunch and Learn" in a large font, and "Panels will resume at 12:15 pm" in a smaller font below it. In the background, a sign for "The Olive Place" is visible, along with other street signs and a person standing near a bus stop.

Lunch and Learn

Panels will resume at 12:15 pm

MGE Transportation Electrification Programs



Planning

- Compare EV Options using our Explore My EV tool
- Fleet analysis tool available to fleets that meet certain criteria
- Technical assistance related to service requirements

MGoe
your community energy company

Compare and select an EV

After selecting an EV, you can see total costs compared to a gas vehicle.

Vehicle	Price after incentives	Starting MSRP	Total range	Electric range	MPGe	Battery size	Drive
Ford 2023 F150 Lightning XLT Extended Range	\$80,975	\$80,975	320 miles	320 miles	70 mi/gal	131 kWh	All wheel drive
Rivian 2023 R1T	\$65,500	\$73,000	289 miles	289 miles	64 mi/gal	105 kWh	All wheel drive

Specifications

Body style	Truck
Number of seats	5
MPGe	70 mi/gal
Battery size	131 kWh
Drive	All wheel drive

Specifications

Body style	Truck
Number of seats	5
MPGe	64 mi/gal
Battery size	105 kWh
Drive	All wheel drive

Residential Charging

- Charge@Home
 - MGE provides L2 charger at home for a monthly fee
 - No upfront cost (for standard installation)
- Charge Ahead
 - Earn incentive or energy savings for allowing MGE to shift charging to lower demand hours

Benefits of managed charging

Customer benefits:

- Reduces demand charges
- Customer doesn't need to actively manage charging
- Allows customer to specify when the vehicle is needed



Business Charging

Workplace, Apartment and Fleet Charging

- Monthly fee plus electricity, MGE provides Level 2 charger at your site
- 7-year commitment
- MGE takes care of operation and maintenance
- Networked chargers allow for demand management
- Customer controls who is allowed to use the charger

Workplace and Apartment charger program has the option to collect payment from employees and residents to receive reimbursement for electricity (managed through the vendor)



GE's Public Charging Network

- 50 Level 2 chargers
- 4 DCFC ChargePoint charging stations
- 8 Shell Recharge DCFC chargers at the “Hub”
- Public charging network is powered by renewable energy
- Find a map on our website



Decarbonizing Fleet Transportation in Madison, Wisconsin

JULY 26, 2023

ELECTRIFICATION COALITION PANEL,

MADISON WISCONSIN

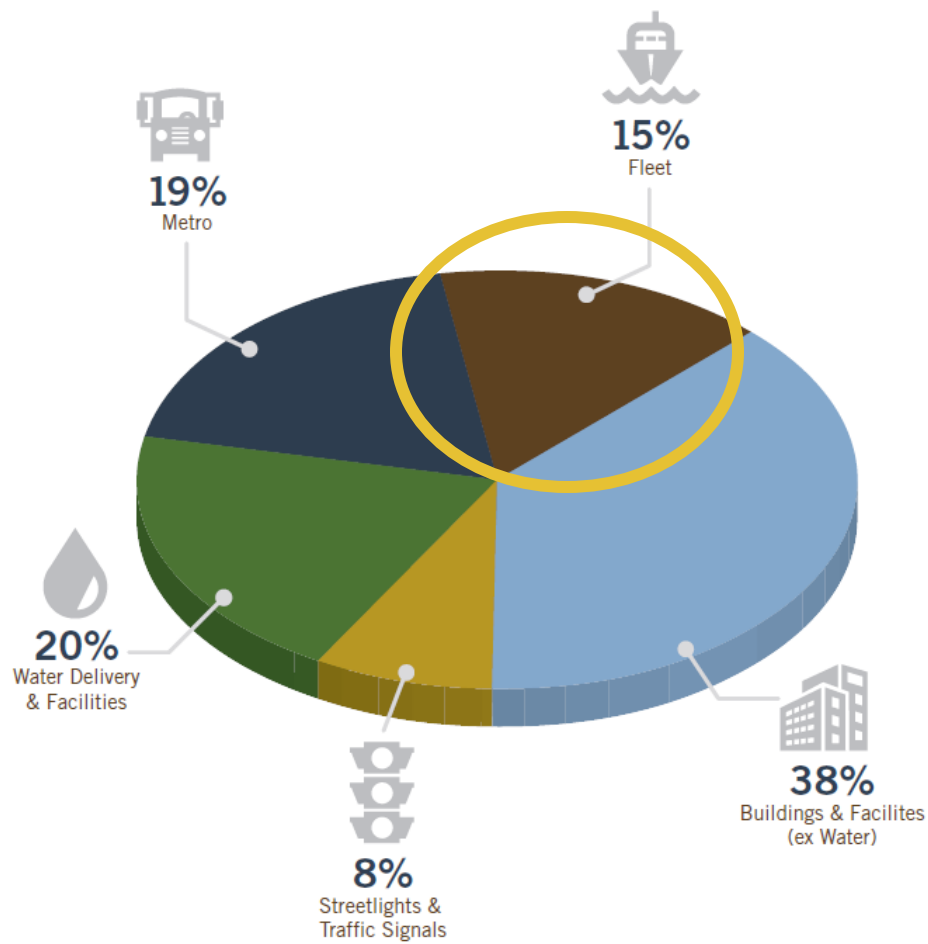


FLEET BY THE NUMBERS

- ✓ Acquisitions, Maintenance, Fueling, and Sale for 1,800 City vehicles
- ✓ 38 Full-Time Staff
- ✓ 10 Fuel Stations
- ✓ 3 Repair Garages
- ✓ 2 Shifts
- ✓ 3 Part-time Apprentices



FIGURE A-2. BASELINE CARBON EMISSIONS FOR CITY OPERATIONS BY CATEGORY*

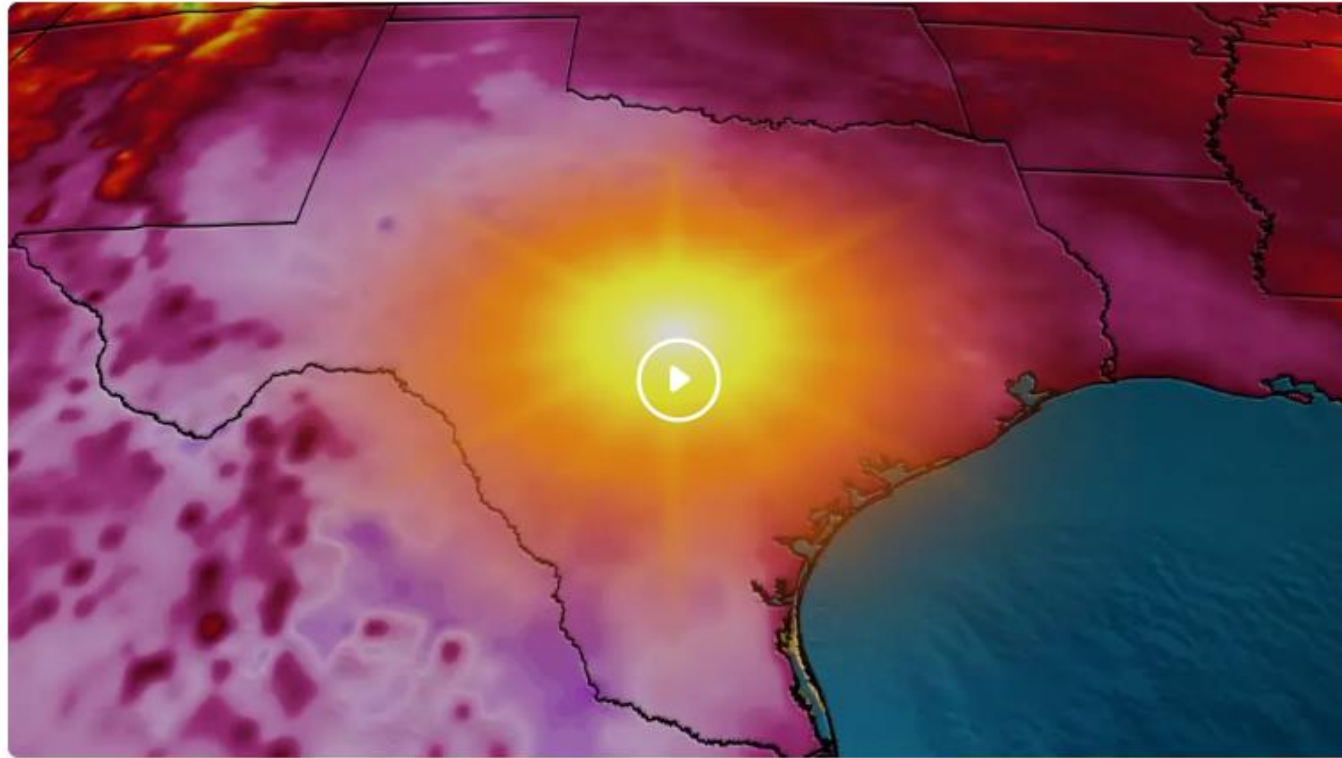


***Excludes landfill, city employee commute, and City-owned housing emissions. Source: HGA based on ICLEI*

- ▶ Figure A-2 shows baseline city operations emissions were 81,141 tons CO₂ broken out by category.
- ▶ 15% of 81,141 = 12,171.15 tons CO₂

EXTREME HEAT DANGER

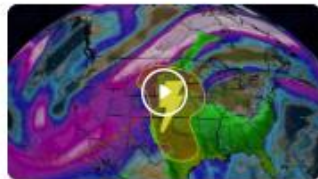
ALL-TIME RECORDS BROKEN



Texas Oven On Full Blast, And It's Not Over Yet



Bret Could Strengthen On Approach To Caribbean Islands



Widespread Severe Threat: What We Know



30 Million Under Heat Alerts; Power Grid Asks For Voluntary Restrictions



Something Wrong With Strawberries



KOIN 6 WEATHER

HISTORIC HEAT WAVE

PORTLAND

SATURDAY	SUNDAY	MONDAY
108°	112°	116°
JUNE 26, 2021	JUNE 27, 2021	JUNE 28, 2021



Emission Reduction Tracker

Since 2018



343.07K

LBS. OF CO2 REDUCED IN OUR MAIN FACILITY



4.28M

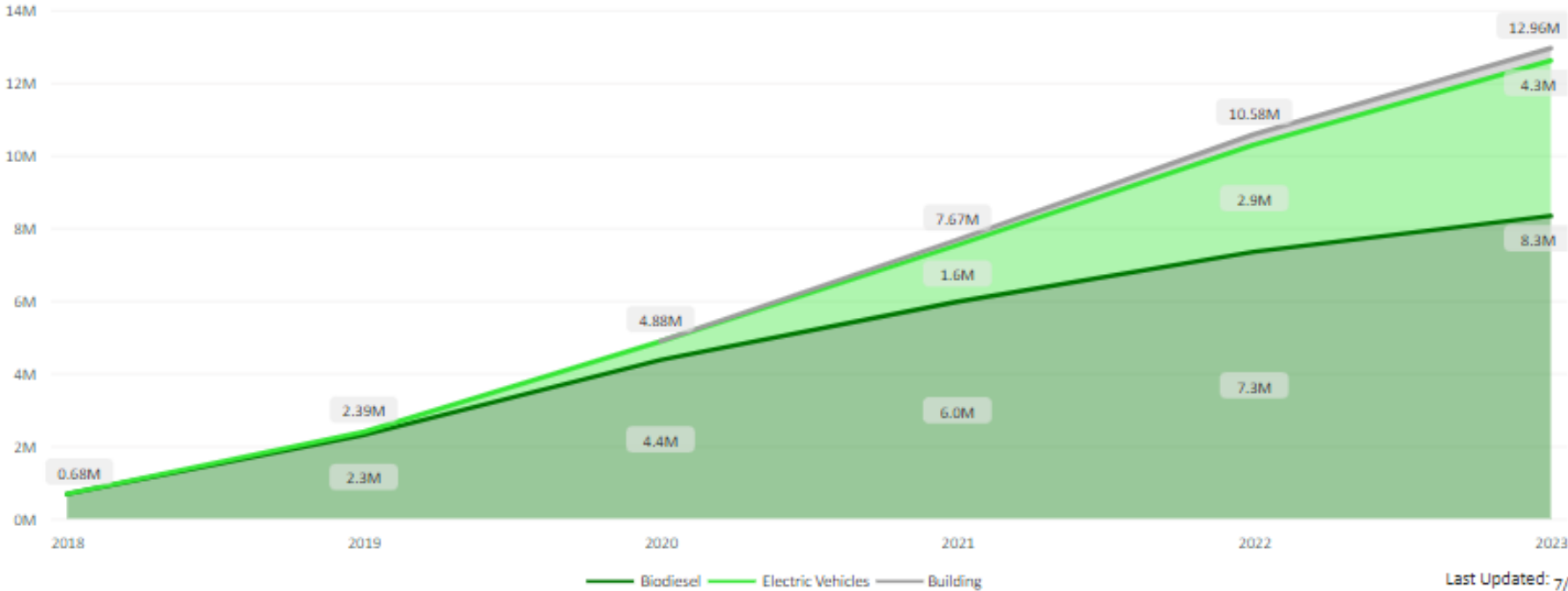
LBS. OF CO2 REDUCED BY ELECTRIC AND HYBRID VEHICLES



8.34M

LBS. OF CO2 REDUCED BY BIODIESEL

Cumulative CO2 Reductions by Type



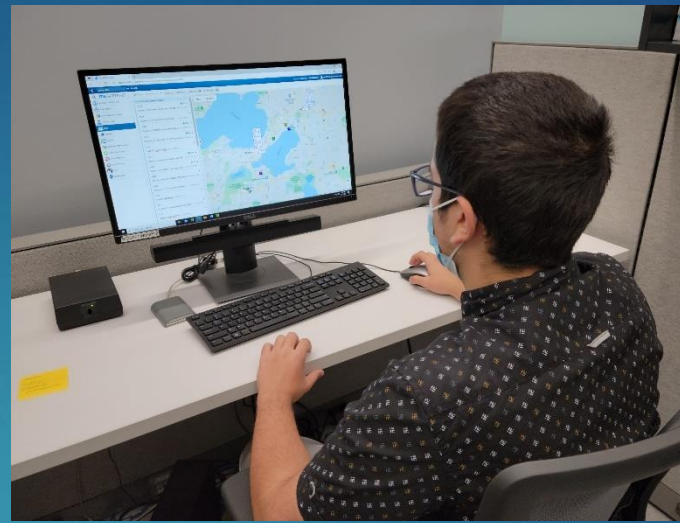
Last Updated: 7/3/2023 12:07:27 PM

NEW FLEET HQ BUILDING



- ▶ FIRST LEED GOLD CERTIFIED CITY FLEET GARAGE IN NORTH AMERICA. Featuring: Solar power panels, solar water heating panels, solar wall for building heat, off-grid solar EV chargers, sun-catchers, CNG repair bays, City EV chargers, Public EV chargers, employee EV chargers, gas/biodiesel fuel stations, natural lighting

**APPRENTICES:
THE NEXT
GENERATION
OF
AUTOMOTIVE &
ENGINEERING
PROFESSIONALS**



BIODIESEL

- ✓ Renewable energy source
- ✓ Largely soybean, agricultural waste and waste oil based
- ✓ Grown and processed in Midwestern states- supporting local economy including WI
- ✓ Reduces emissions and carbon footprint
- ✓ Reduces dependence on foreign oil and gas
- ✓ Blends up to 20% or B20 in warm months
- ✓ B100 pilot has commenced in 2022



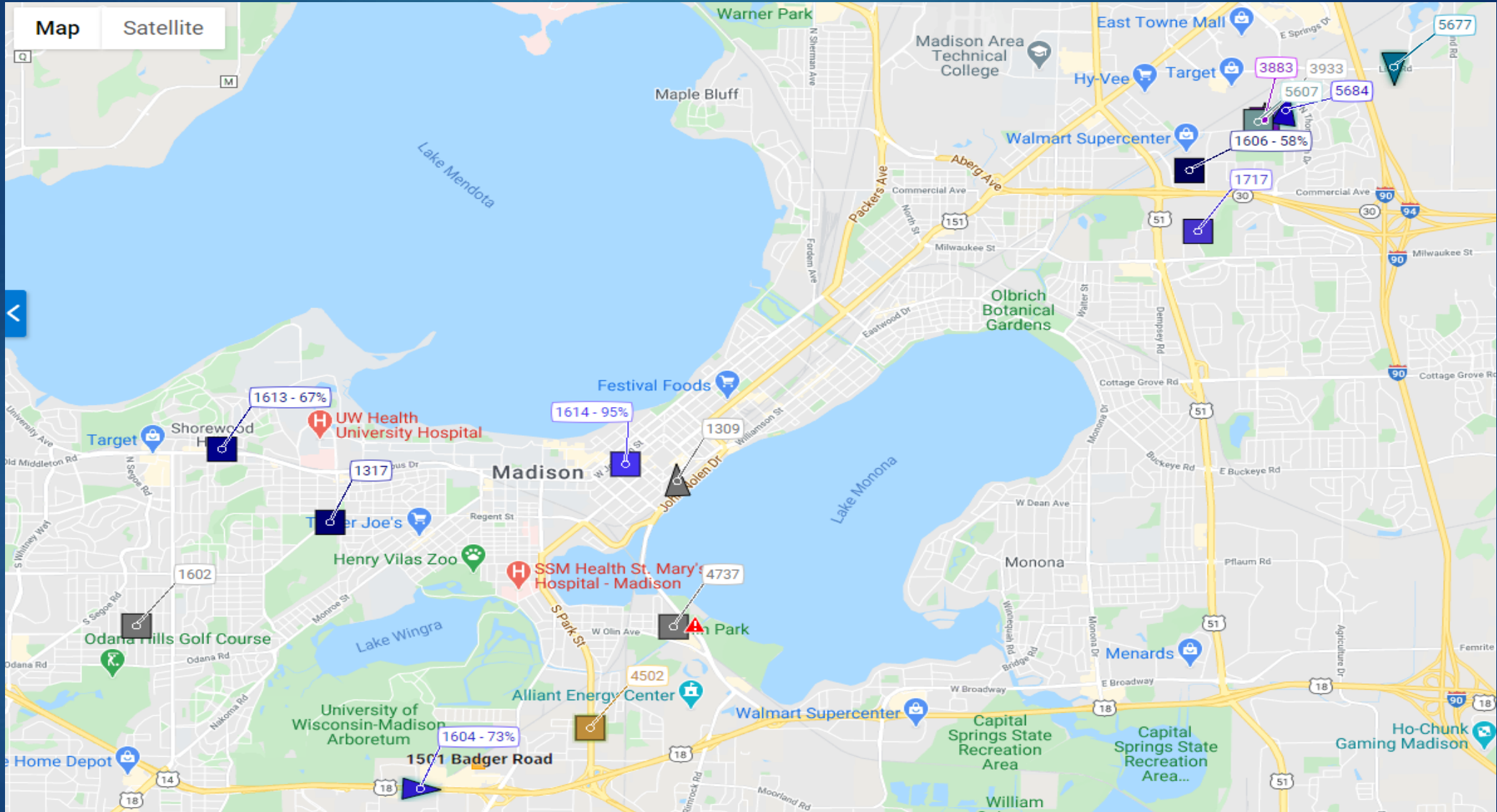
TYPES OF EVs OWNED – 94 & COUNTING



TYPES OF EVs OWNED- CONT'D



GPS/TELEMATICS



150 HYBRID-ELECTRIC VEHICLES & 1000+ SOY TIRES, BIO FLUIDS



OUTREACH/PARTNERSHIP ACTIVITIES



Lorrie Lisek
Executive Director
Wisconsin Clean Cities



Mandela Barnes
Lieutenant Governor
State of Wisconsin



Maria Redmond
Director
Wisconsin Office of Sustainability & Clean Energy



Mahanth Joishy
Fleet Superintendent
City of Madison Fleet Service



Transportation & Innovation Expo

05.23.2019 EXPO

A sustainable transportation, infrastructure, technology and fleet vehicle conference and expo

Sponsored by

FORD FLEET

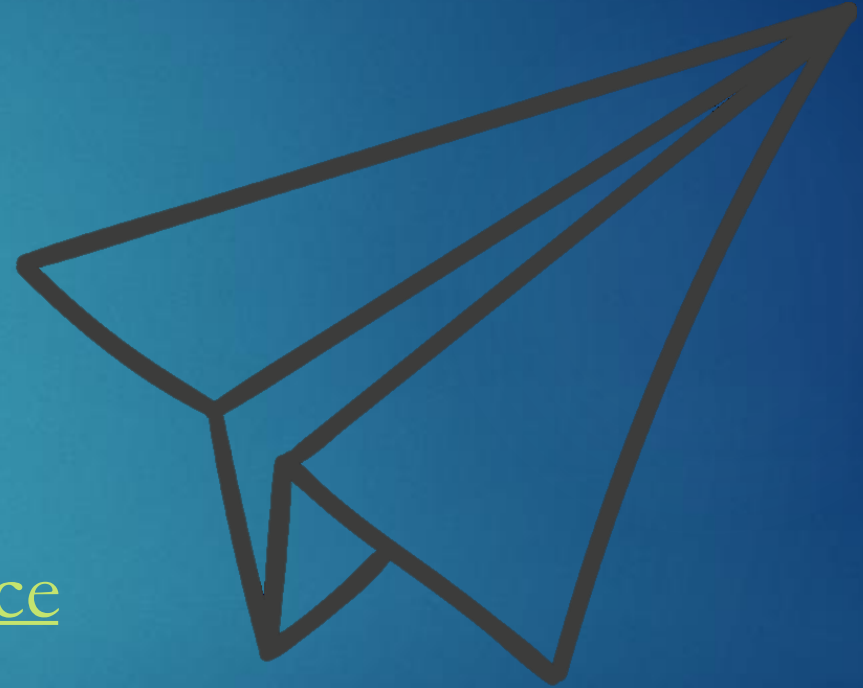
Québec

CONTACT

Mahanth Joishy
Fleet Superintendent

mjoishy@cityofmadison.com

www.cityofmadison.com/fleet-service



 @MadisonWIFleet

 @MadisonWIFleet

EV Charging Pilots

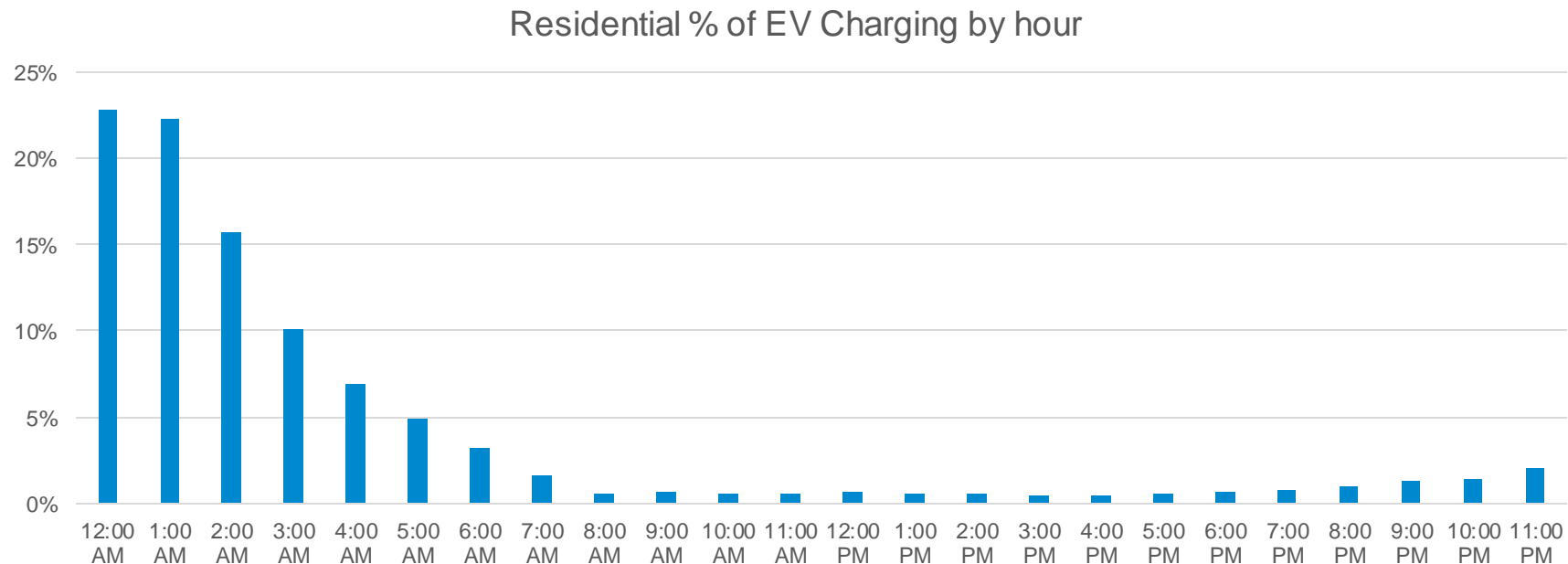
- Launched at WPS and We Energies on March 1, 2022
- Objective is to help remove financial barriers to install EV charging and, for residential, provide price signals for when to charge
- Residential Program:
 - Helps customers obtain a Level 2 EV charger for their home, and provides time-of-use rates for EV charging
 - Currently have 165 approved applications
- Commercial Program:
 - Provides incentives to help customers with costs associated to installing EV charging
 - Currently working with over 60 customers spanning over 100 sites in various stages of the process.
 - Charger site installation load ranges from 36 kW to 5 MW

Residential Pilot overview

- Must: own/lease an EV; obtain a L2 charger from the pilot; have a 240V outlet available for the charger; have Wi-Fi available where the charger is installed.
- Pilot options:
 - Self-install or program install
 - Pre-pay or bundled
 - Charger-only or whole home time of use
- Charger: Enel X Juicebox 40 plug-in (9.6 kW)

Residential Pilot – what we've learned

- Strong customer preference for self-installation pre-pay, charger-only.
- Many customers are already buying their own Level 2 chargers and looking for an off-peak rate or EV charging credit.
- Integration of charger interval data for billing comes with costs and challenges.
- Customers are looking for charging price signals and willing to program their cars and chargers.



Commercial Pilot overview

- Business must be in Wisconsin and receive electric service on a We Energies or WPS commercial rate with a demand component.
- Installing new Level 2 or DC fast chargers
 - Cannot be chargers already installed and in use
 - Minimum requirement of 4 charging ports, or 50 kW of added load from EV chargers
- Will require additional meter installed
 - New service or check meter

Commercial Pilot incentives

- An overall incentive amount is calculated for each customer, unique to their project
 - Total incentive amount based upon planned EV charging load being added and the demand rate.
- Allowance
 - First, incentive dollars are applied as an allowance towards cost of utility work that needs to be done.
- Rebate
 - Any leftover dollars are available to customer in form of a rebate.
 - Max amount is up to amount of excess allowance.
 - Offsets customer side of meter “make-ready work” such as panel upgrade, additional wiring, meter socket, electrician fees, etc.
 - Not eligible for rebate:
 - Cost of the chargers (including installation and maintenance)
 - Ongoing costs like software, LTE connection, licensing
 - Cost of the utility meter to measure the EV usage

Commercial Pilot: Customer Example

- We Energies Cg3 customer
- Installed 7 ports of 100kW DC fast chargers
- Committing to added demand of 500 kW

Total Incentive:	\$220,000
Utility upgrade costs (allowance):	\$140,000
Remaining allowance (rebate):	\$80,000

- Customer actual costs: \$65,000
- Customer receives rebate check for \$65,000

Commercial Pilot: what we've learned

- Use cases: fleets, public charging, employees, visitors
- Customers are interested in this incentive structure
- Commercial customers want to purchase their own chargers.
- Customers are learning along with us – equipment, layout, timing, cost, etc.
- Evolution in preference towards DC fast charging.

EV CHARGING STATIONS FOR THE GENERAL PUBLIC



ECO
ENVIRONMENTAL
COLLABORATION
OFFICE

Why Electric Vehicles (EVs)

- Improve local air quality with no tail-pipe emissions
- To address climate change, we need to transition vehicles off of combustible fossil fuels for energy
- Vehicle electrification is being done in conjunction with transitioning electric power sources away from fossil fuels
- The bipartisan infrastructure bill allocates \$7.5 billion to build EV charging networks.
- Car manufacturers are increasingly offering new electric vehicles, particularly in regions with good EV Charging Infrastructure

CLIMATE AND EQUITY PLAN

[Milwaukee.gov/ClimatePlan](https://milwaukee.gov/ClimatePlan)

Vehicle Electrification is one of the “Ten Big Ideas”

- Municipal Fleet EV Purchasing Policy (File 222725 Adopted). More to be done for City Fleet EV Charging Infrastructure
- Develop and adopt a formal charging network plan for deploying an electric vehicle charging network, including municipally sited stations.
- Explore a city ordinance that requires EV charging infrastructure at parking lots, multi-family residential buildings, mixed use developments and other commercial properties.



CITY POLICY ON PUBLIC EV CHARGING

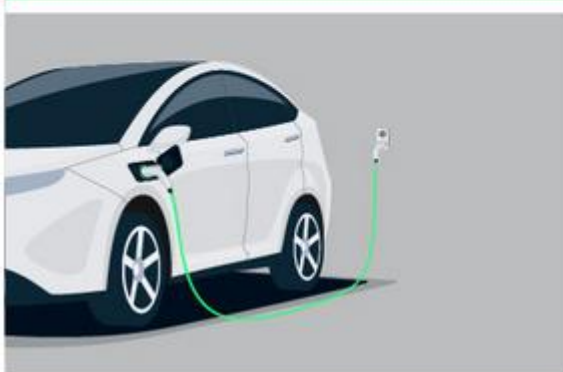
ECO first installed Public EV Chargers in 2012 (CCFN 110141).

First EV Charging policies passed in 2012 (CCFN# 120040)

- Chapter 101.27.8: Prohibits non-electric vehicles using EV Charging Stations
- Chapter 309-22: Selling Electric Vehicle Recharging Services to the Public (for City-owned chargers)
- Chapter 295: Zoning Code for Public Chargers; Adopted in 2021, CCFN#210486



Know your EV Charging Stations



LEVEL 1



4-6 miles/hour
Replenish Rate



7-30 hours for full charge

Approximate time to charge a battery*

CHARGE
110/120V

LEVEL 2



10-20 miles/hour
Replenish Rate



2-10 hours for full charge

Approximate time to charge a battery*

CHARGE
208/240V

DIRECT CURRENT (DC) FAST CHARGING*



120-200 miles/hour
Replenish Rate



20-90 minutes for full charge

Approximate time to charge a battery*

CHARGE
480V or 208V

*dependent on the size of the battery

Graphic of the difference between Level 1, 2, and 3 EV chargers



Level 2 Public Station



THREE FEDERAL GRANTS

NEVI – grants to States to for EV Fast Charging every 50 miles on designated major interstates and corridors (WISDOT managed)

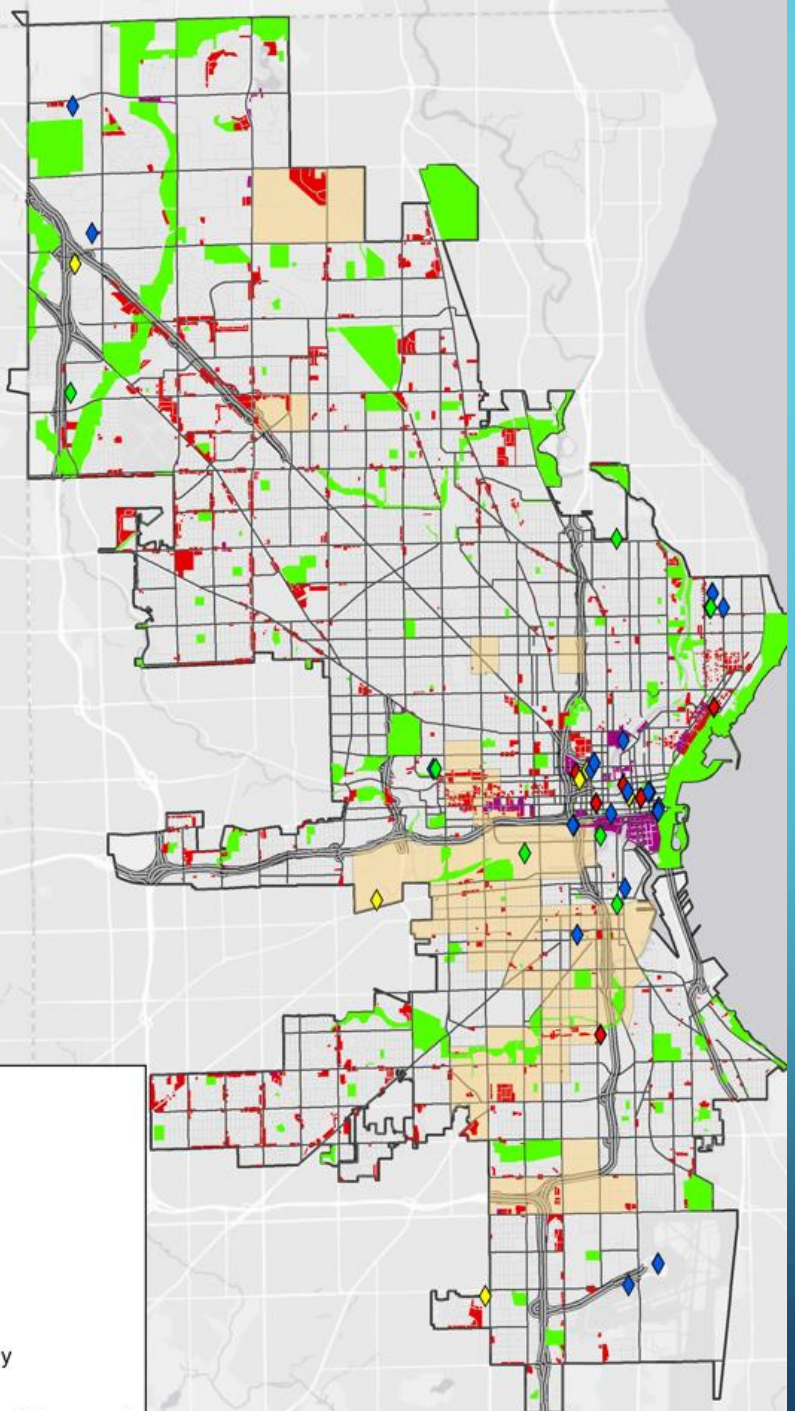
Charging and Fueling Infrastructure Discretionary Grant Program

- **Community Program**
- Corridor Program

COMMUNITY CHARGING GRANT PROPOSAL

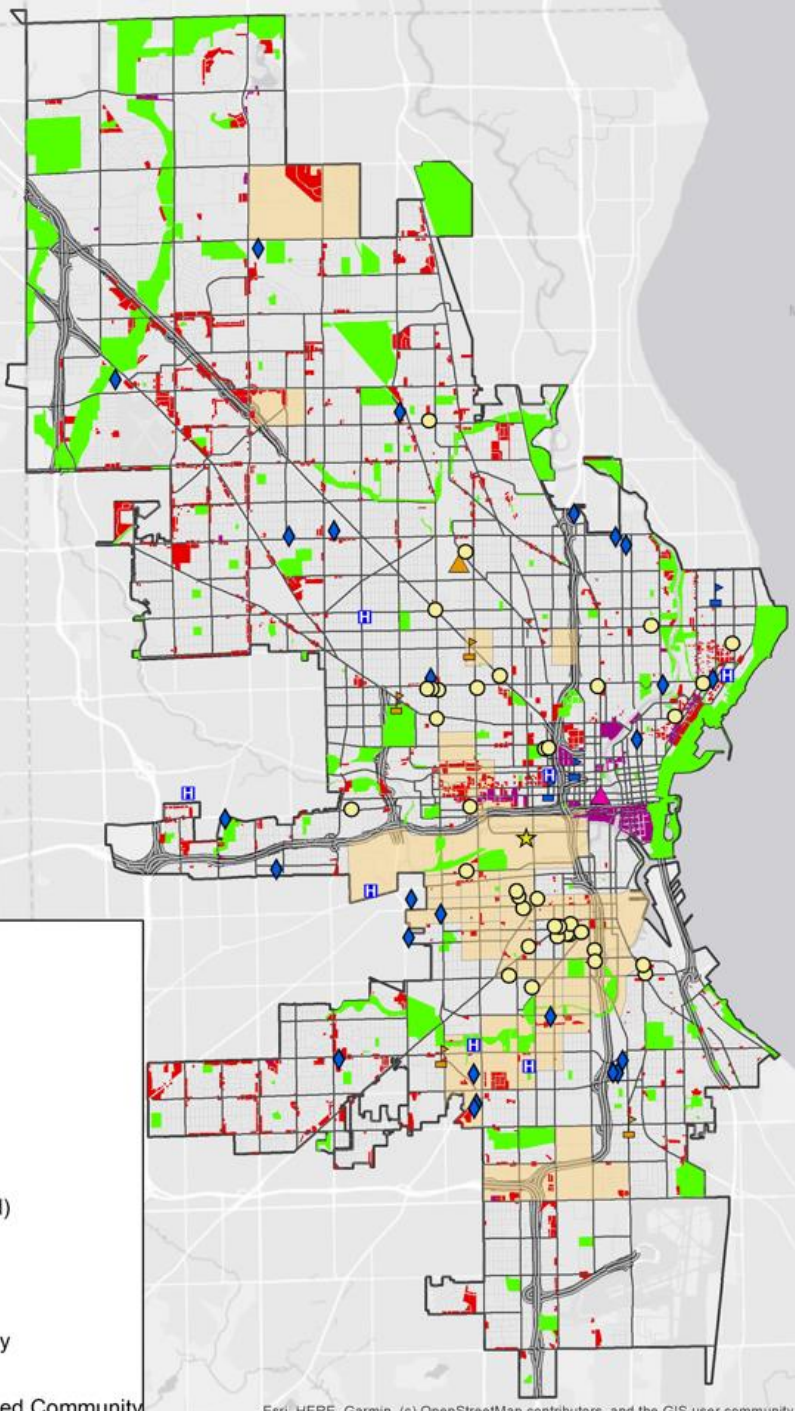
- Proposal, including a Preliminary Charging Plan, due May 30th
- 80% Federal Share
- Max award is \$15m. National experts from WSP Engineering hired to develop the plan with ECO and stakeholders
- Public/Private Partnership so majority of local share is private partner, backed by charging revenues
- Fund public charging station installations, with equity in mind.
- Public outreach and finalization of plan after May 30th.

Existing Charging Station Locations



- Legend**
- ◆ DC Fast
 - ◆ Level 2
 - ◆ Level 1
 - ◆ Tesla
- Zoning**
- Mixed Use
 - Parks
 - Residential: Multi-Family
- Justice 40 Areas**
- Historically Disadvantaged Community

Potential Charging Station Locations



- Legend**
- Hospital
 - Library
 - Shopping Malls
 - ★ Casino
 - ▲ Office Building
 - University
 - ◆ Retail Store
 - Parking Lot (City Owned)
- Zoning**
- Mixed Use
 - Parks
 - Residential: Multi-Family
- Justice 40 Areas**
- Historically Disadvantaged Community

October 2018

Complete Streets Policy
Approved by Common

September 2022

WisDOT National Electric
Vehicle Infrastructure Plan

May 2023

Preliminary Electric Vehicle
Infrastructure Charging Plan
Complete

Summer/Fall 2023

Final EV Infrastructure
Charging Plan Planning Process

September 2022

WisDOT National Electric
Vehicle Infrastructure Plan

April 2023

Milwaukee Climate and Equity Plan

May 2023

US DOT Charging and Fueling
Infrastructure (CFI) Discretionary
Grant Application Due

November/ December 2023

Tentative CFI Grant Awards
Announced by US DOT

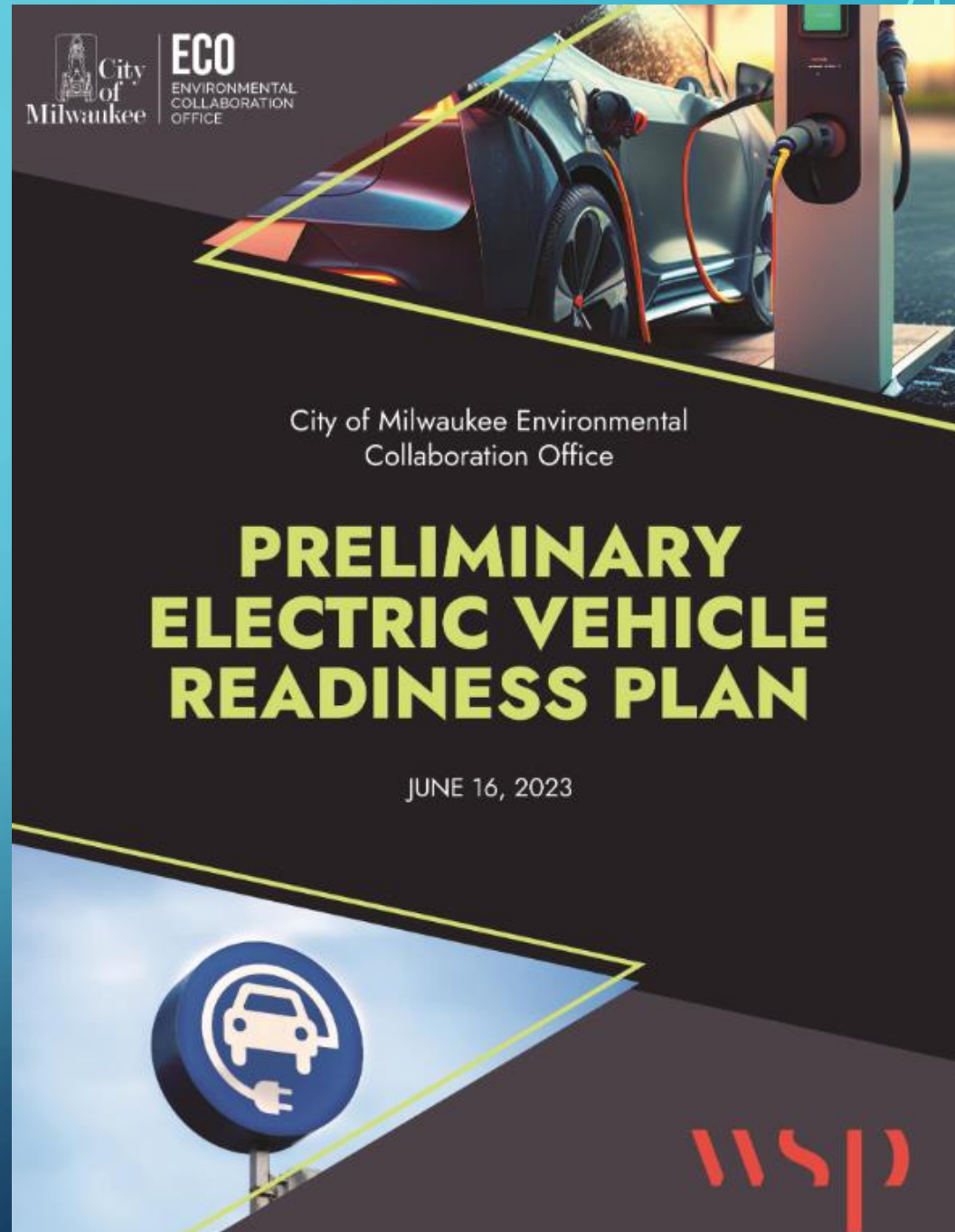
MILWAUKEE.GOV/EV

ERICK SHAMBARGER

ESHAMB@MILWAUKEE.GOV



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Making Electrification Work: EV Project Implementation

- Moderator: **Chelsea Chandler**, Clean Wisconsin
- Panelists:
 - **Erinn Monroe Nye**, Madison Gas and Electric
 - **Mahanth Joishy**, City of Madison
 - **Brian Lambert**, WEC Energy Group
 - **Erick Shambarger**, City of Milwaukee

Getting Buses in the Streets: Electric School Buses in WI

- Moderator: **Francisco Sayu**, Emerging Technologies Director, RENEW Wisconsin
- Panelists:
 - **Dr. Jonathon Temte**, Healthy Climate Wisconsin
 - **Joshua Williams**, Highland Electric Fleets
 - **Tyler Salamasick**, Environmental Protection Agency, Region 5
 - **Craig Hayes**, Wild Rose School District



Francisco Sayu
Emerging Technology Director





RENEW Wisconsin is a nonprofit organization dedicated to building a stronger, healthier, more vibrant Wisconsin through the advancement of renewable energy. We work on policies and programs that support solar power, wind power, biogas, local hydropower, geothermal energy, and electric vehicles.



Health Benefits from Electrifying School Buses

Jon Temte, MD/PhD

Professor of Family Medicine and Community Health

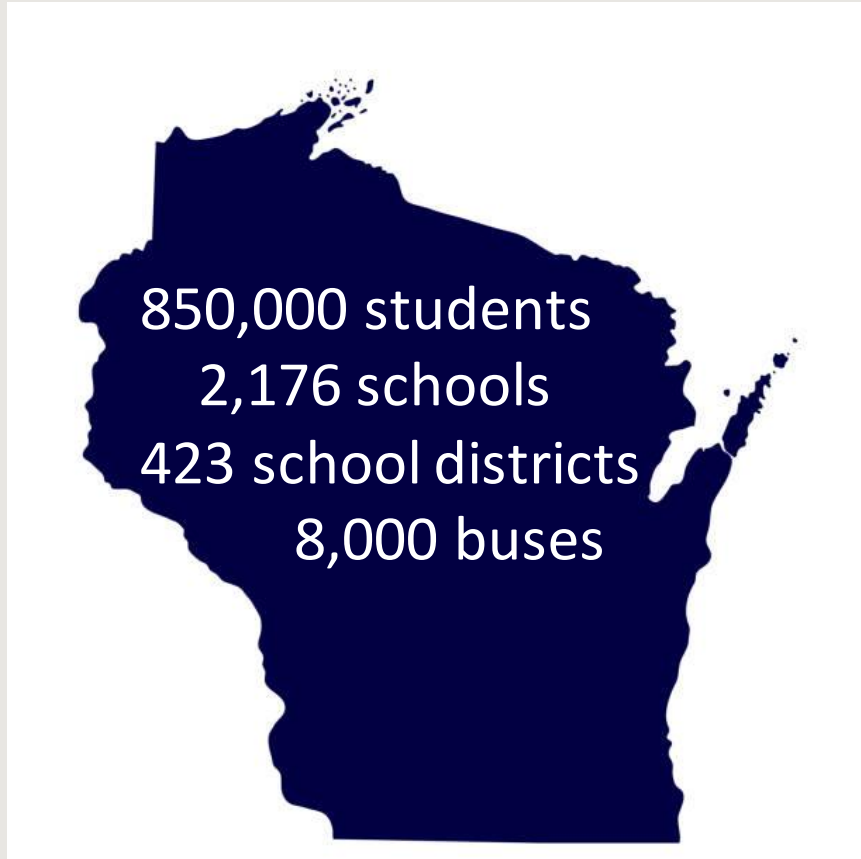
Associate Dean for Public Health and Community Engagement

University of Wisconsin School of Medicine and Public Health

Board Member -- Healthy Climate Wisconsin



Risks to Wisconsin Children



- Risks are higher for students who typically ride buses for 1/2 to 2 hours a day
 - Children are more susceptible to air pollution because:
 - respiratory systems are still developing
 - faster breathing rates.
 - Asthma affects 6.3 million American school children
 - the most common long-term childhood disease
 - Potential Carcinogens
 - 2.3–4.6 additional cancer deaths per 100,000 children
-

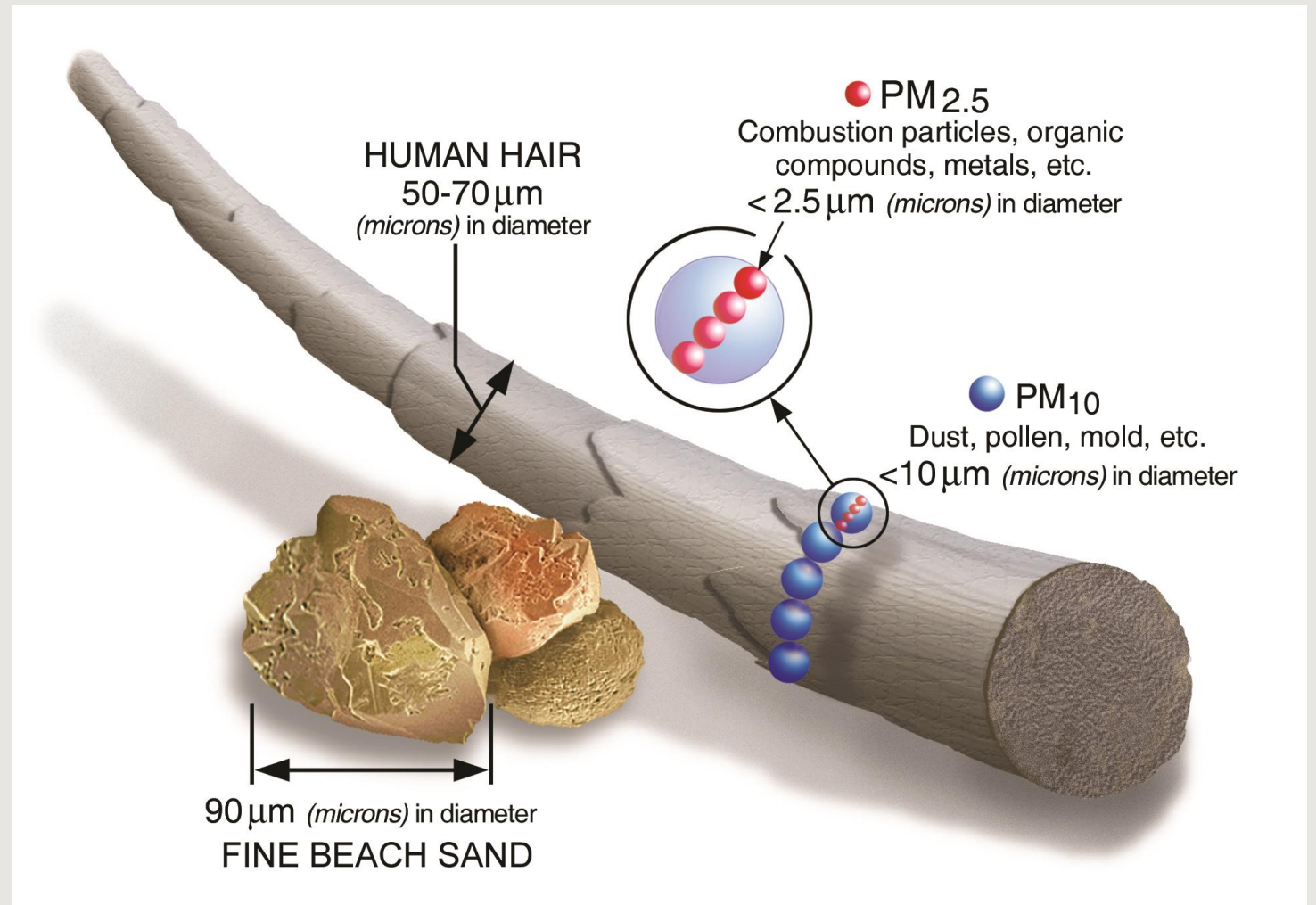
Health Effects of Traditional Diesel Busses

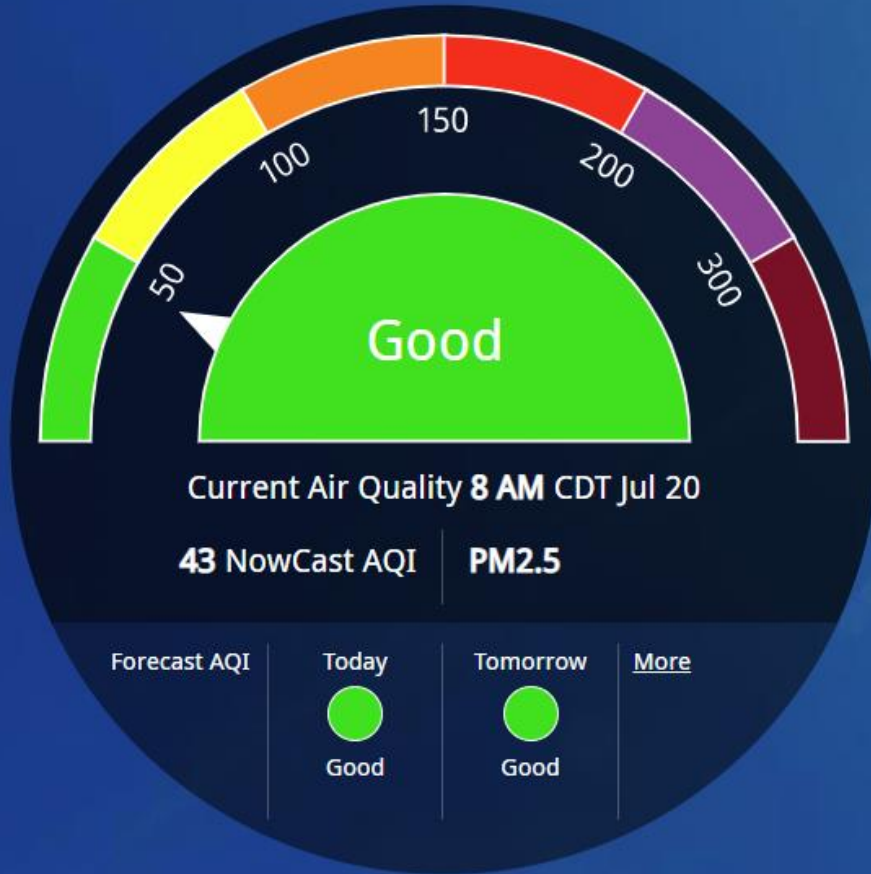
- Air pollutant levels inside school buses can be greater than the ambient levels outside the bus
- crankcase (10-25% of pollutants)
 - PM_{2.5}
- Exhaust (75-90% of pollutants)
 - ultrafine particles (<1μm)
 - black carbon
 - Polycyclic aromatic hydrocarbons



PM_{2.5}

- Particulate matter (PM)
 - damages hearts and lungs
- Diesel emissions contribute to
 - ozone pollution
 - climate change
 - acid rain
- AirNow
 - <https://www.airnow.gov>





Madison, WI

Dane, Columbia, and Sauk Counties Reporting Area

[Monitors Near Me](#)[Recent Trends](#)

Potential Health Outcomes of Electric Buses



- **Short term**
 - Cleaner Air
 - Less inflammation
 - **Medium term**
 - Normalization of Electric Vehicles
 - Better Health
 - **Longer term**
 - Healthier People
 - Healthier Communities
 - Healthier Climate
-

Resources

American Lung Association

The Electric School Bus Solution

<https://www.lung.org/policy-advocacy/healthy-air-campaign/electric-school-bus-solution>

Environmental Protection Agency

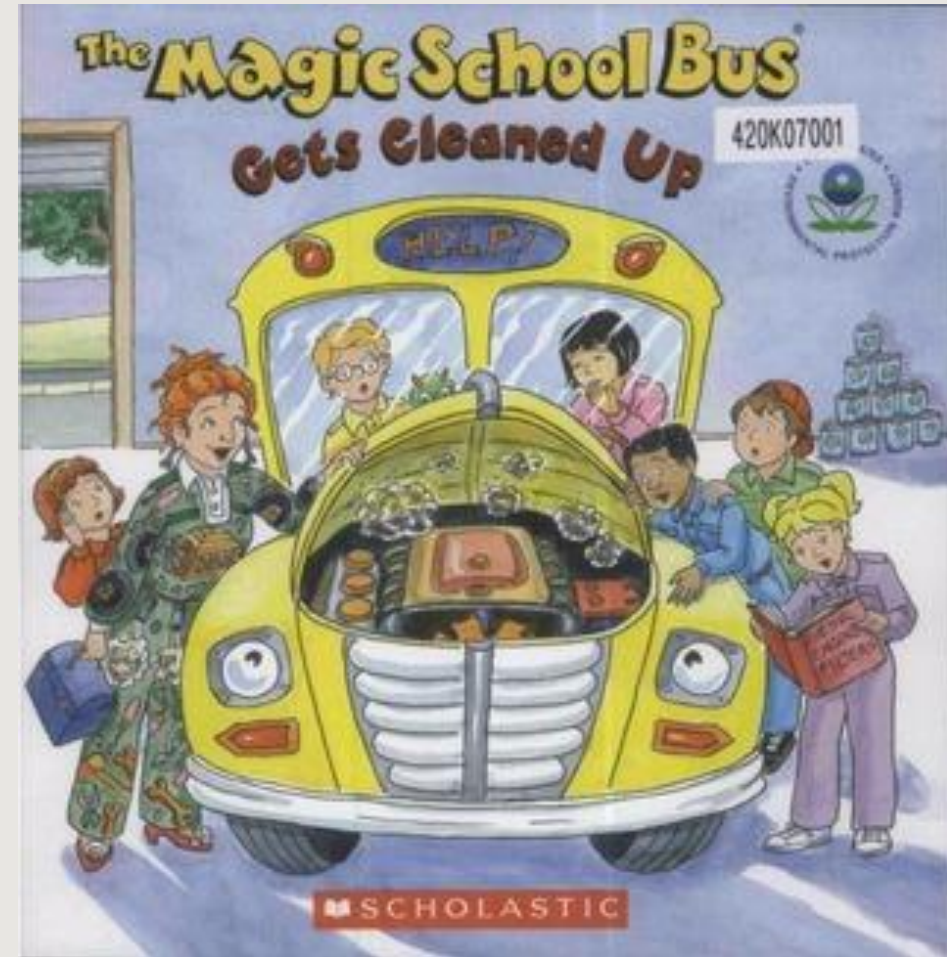
Reducing Diesel Emissions from School Buses

<https://www.epa.gov/dera/reducing-diesel-emissions-school-buses>

Diesel exhaust, school buses and children's health

Weir E. Diesel exhaust, school buses and children's health. CMAJ. 2002 Sep 3;167(5):505.

PMID:12240819; PMCID: PMC121970.



See: <https://www.epa.gov/dera/magic-school-bus>



Highland

Electric School Bus EaaS

July 2023

Broad fleet electrification experience

Cunningham Transport,
Alberta, Canada

Red Lake, MN

Dearborn Public Schools, MI

Jackson Public Schools, MI

Peak to Peak Charter
Schools, Inc., CO

Salinas City Elementary
School District, CA

Hardin County Community
District No. 1, IL

South Burlington School
District, VT

Fleet Contractor, MA

Beverly Public Schools, MA

Unionville-Chadds Ford School
District, PA

Baltimore City Public Schools,
MD

Baltimore County Public
Schools, MD

Montgomery County Public
Schools, MD

Manassas City Public Schools,
VA

500+

ELECTRIC SCHOOL BUSES UNDER
CONTRACT

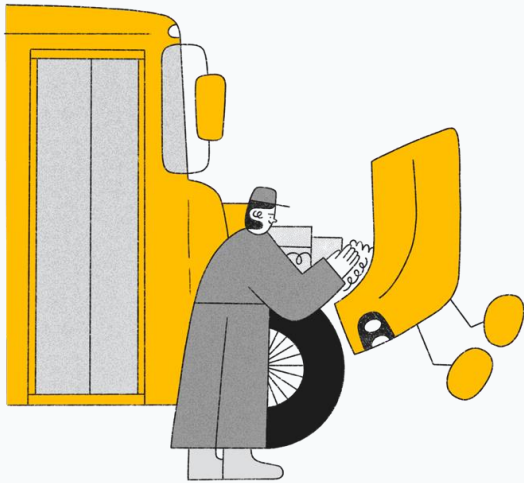


Projects



Active & pipeline states

How EaaS tackles complexity and risk



- 1 Plan** We design and implement the entire project.
- 2 Budget** We create a budget together that encompasses all aspects of the electric fleet.
- 3 Build** We procure school buses & infrastructure and manage the construction of depot upgrades.
- 4 Train** We train drivers & mechanics to operate & maintain the new fleet.
- 5 Charge** We charge the school buses during off-peak hours, ensuring a “full tank” before each trip.
- 6 Maintain** We provide a complete service plan, reimbursing for all repair costs, including parts and labor.

Our Guarantee: Buses will be charged & route-ready every school day – if not, we pay for the downtime

V2G at scale with Highland



120 kW / 360 kWh
V2G PROJECT IN MASSACHUSETTS

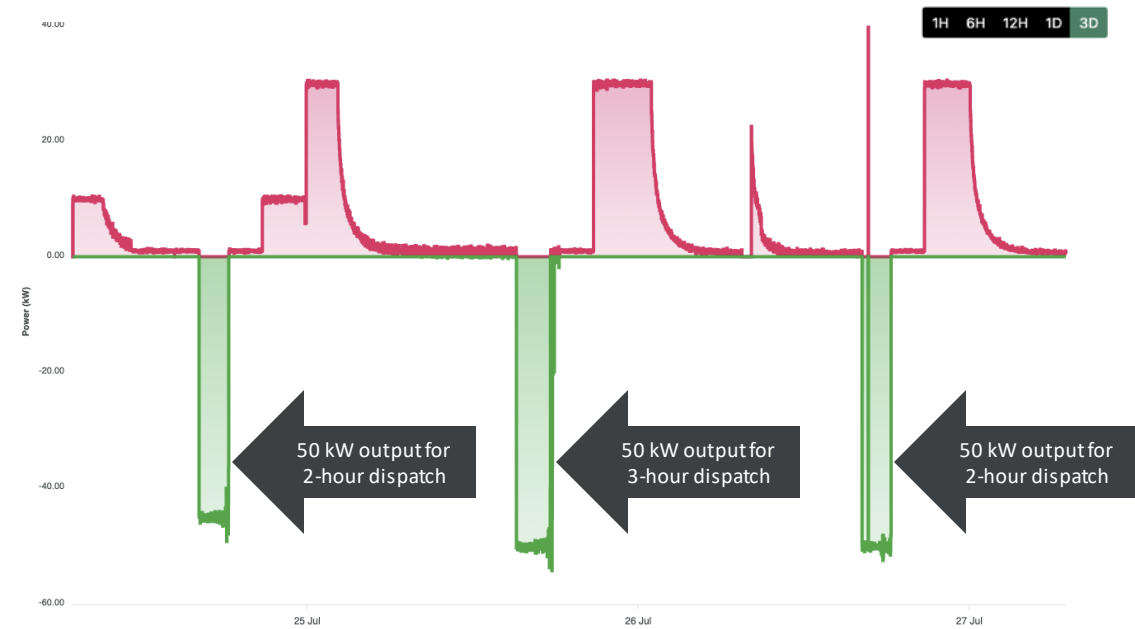


240 kW / 720 kWh
V2G PROJECT IN VERMONT

REAL RESULTS

In the summers of 2021 and 2022, Highland orchestrated a commercial V2G program with National Grid in Massachusetts, that sent **10.8 MWh** back to the grid over **158 hours**.

Single Bus V2G Performance Summer 2022 – Massachusetts¹



1. Snapshot from Highland's energy management software system, developed in coordination with partner Synop. Output not a guarantee of future performance.



EPA CLEAN SCHOOL BUS

WISCONSIN

Clean School Bus Funding 2023

Tyler Salamasick

U.S. Environmental Protection Agency

Region 5 - Chicago

Overview of the Bipartisan Infrastructure Law (BIL) Clean School Bus Program

Under **Title XI: Clean School Buses and Ferries**, the Bipartisan Infrastructure Law (BIL) provides **\$5 billion** over five years (FY22-26) for the replacement of existing school buses with zero-emission and clean school buses.

These new clean school bus replacements will produce either zero or low tailpipe emissions compared to their older diesel predecessors.

School bus upgrades funded under this program will result in cleaner air on the bus, in bus loading areas, and in the communities in which they operate.

The first funding opportunity was the **2022 Clean School Bus Rebates**. The second funding opportunity is the **2023 Clean School Bus grant competition**.



CSB Rebates verses CSB Grants

While both grants and rebates provide selectees with award funds prior to purchasing eligible buses and infrastructure, there are a few differences between these types of funding programs:

	Rebates	Grants
Application Process	Quick and simple	Longer, more detailed
Selection Process	Random number generated lottery process	Evaluation of application materials and scoring criteria
Project period support, flexibility, and duration	Shorter project period; less support and flexibility in funding provided to applicants	Longer project period; may offer more support for recipients during the project, as well as flexibility in funding – such as covering project implementation costs - and timing of the project, such as longer project periods to complete the project.

EPA encourages school districts to consider which competition structure (grants or rebates) best suits their needs.



Application packages must be submitted to EPA via [Grants.gov](https://www.grants.gov) no later than 8/22/23 at 11:59 p.m. ET.
For more information, please visit www.epa.gov/cleanschoolbus.



2023 CSB Grant Program Overview



EPA anticipates awarding approximately **\$400 million** in CSB funding under this FY23 Notice of Funding Opportunity (NOFO). **Anticipating rebates end of 2023.**

This NOFO **includes two sub-programs**, one for school district and Tribal applicants (School District Sub-Program) and one for third-party applicants (Third-Party Sub-Program).

Eligible activities include the replacement of existing internal-combustion engine (ICE) school buses with electric, propane, or compressed natural gas (CNG) school buses, as well as the purchase and installation of electric vehicle supply equipment (EVSE) infrastructure.

EPA is prioritizing applications that will replace buses serving high-need local education agencies, Tribal school districts funded by the Bureau of Indian Affairs or those receiving basic support payments for students living on Tribal land, and rural areas. EPA is committed to ensuring the CSB Program delivers on the **Justice40 Initiative to ensure that at least 40% of the benefits of certain federal investments flow to disadvantaged communities.**



Application packages must be submitted to EPA via [Grants.gov](https://www.grants.gov) no later than 8/22/23 at 11:59 p.m. ET.
For more information, please visit www.epa.gov/cleanschoolbus.



Prioritization Criteria

2023 CSB Grants*

*Please note that program criteria may be different from prior CSB funding opportunities and are subject to change in future rounds of CSB funding

The Bipartisan Infrastructure Law allows EPA to prioritize certain communities that will benefit from the CSB program. For this funding opportunity, prioritized communities include:

HIGH-NEED SCHOOL DISTRICTS AND LOW-INCOME AREAS

- School districts listed in the Small Area Income and Poverty Estimates (SAIPE) School District Estimates for 2021 as having **20% or more students living in poverty**.
- School districts located in the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.
- Title I-funded public school districts and charter school districts not listed in the SAIPE data.
- **Title I-funded large public school districts (more than 35,000 students and/or more than 45 public schools) that do not meet the 20% SAIPE threshold.**

RURAL

- School districts identified with **locale code “43-Rural: Remote”** by the National Center for Education Statistics (NCES).

BUREAU OF INDIAN AFFAIRS FUNDED SCHOOL DISTRICTS

SCHOOL DISTRICTS THAT RECEIVE BASIC SUPPORT PAYMENTS FOR CHILDREN WHO RESIDE ON INDIAN LAND



Applications due Tuesday, August 22
www.epa.gov/cleanschoolbus

Eligible Applicants

School District Sub-Program

Eligible entities: (1) State and Local Governmental Entities (e.g., school districts), (2) Public Charter School Districts, and (3) Indian Tribes, Tribal Organizations, or Tribally-controlled Schools

Minimum of **15 buses**
Maximum of **50 buses**

Targeting large single-fleet turnovers that may have been limited by the 25-bus maximum in the rebate program.

Third-Party Sub-Program

Eligible entities: (1) Nonprofit School Transportation Associations and (2) Eligible Contractors (including OEMs, Dealers, and Private Bus Fleets)

Minimum of **25 buses**
Maximum of **100 buses**
Application must include at least 4 school district beneficiaries.

Targeting school districts - particularly small, rural, Tribal, or low-income beneficiaries - that may benefit from third-party technical support, grant administration, and coordination (e.g., with utilities)

Prioritization Criteria

2022 CSB Rebates*

*Please note that program criteria are subject to change in future rounds of CSB funding

- **High-need school districts and low-income areas**

School districts listed in the Small Area Income and Poverty Estimates (SAIPE) School District Estimates for 2020 as having **20% or more students living in poverty**

School districts not listed in the SAIPE data, including most charter schools, **that self-certify as having 20% or more students living in poverty.** *EPA may ask for supporting documentation to confirm this self-certification.*

School districts located in the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands

- **Rural school districts**

School districts identified with locale codes “43-Rural: Remote” and “42-Rural: Distant” by the National Center for Education Statistics (NCES)

- **Tribal school districts**

Bureau of Indian Affairs funded school districts and school districts that receive basic support payments for children who reside on Indian land



Getting Buses in the Streets: Electric School Buses in WI

- Moderator: **Francisco Sayu**, Emerging Technologies Director, RENEW Wisconsin
- Panelists:
 - **Dr. Jonathon Temte**, Healthy Climate Wisconsin
 - **Joshua Williams**, Highland Electric Fleets
 - **Tyler Salamasick**, Environmental Protection Agency, Region 5
 - **Craig Hayes**, Wild Rose School District



Ingeteam

50 YEARS ELECTRIFYING
A SUSTAINABLE FUTURE

Ingeteam

ELECTRIFYING
A SUSTAINABLE FUTURE

KEY FIGURES



More than **80 years**
in the electrical sector



Present in **24 countries**



+4,800 employees



5.5% of turnover invested in
R&D every year. **+500** people
dedicated to R&D
\$200M invested in the last 5 yrs

Energy transition leader

Ingeteam



Wind Energy Sector

57 GW installed. Generators and converters



Solar PV Energy

25 GW of PV power inverters



E-Mobility

40,000 EV Charging connectors



Green Hydrogen

2006 in-house electrolyser development



Battery Energy Storage Systems (BESS)

3 GWh of BESS installed worldwide (generation and distribution substations)



Hydro Sector

11 GW of installed hydropower



Marine Sector

More than 700 vessels propelled with our technology
1,000+ LV & MV converters, motors and generators (+1.9 GW)



Water Sector

More than 12,000 Submersible Pumps
(+1.35 GW)



Railway & Mobility Sector

More than 700 traction converters and very high-speed traction motors. High Speed Trains



Power Transmission & Distribution Sector *Smart Grids*

More than 9,000 automated substations up to 500 kV



Power Plants Services Business

22 GW of maintained power. Full O&M 1,500 employees

Renewable energy generation, storage, transport, clean consumption & electrification

Ingeteam main manufacturing plants



**EV Chargers,
Converters, Inverters &
Controls**
181,000 ft²

Sesma (Navarra)
Zamudio (Bizkaia)
Ortuella Bizkaia)



**EV Chargers
Frequency converters
Electric machines**
140,000 ft² (361,500 ft² lot)

Milwaukee, WI



Electric machines
576,000 ft²

Beasain (Gipuzkoa)
Segorbe (Castellon)



**Converters, Inverters &
Controls**
56,500 ft²

Sao Paulo



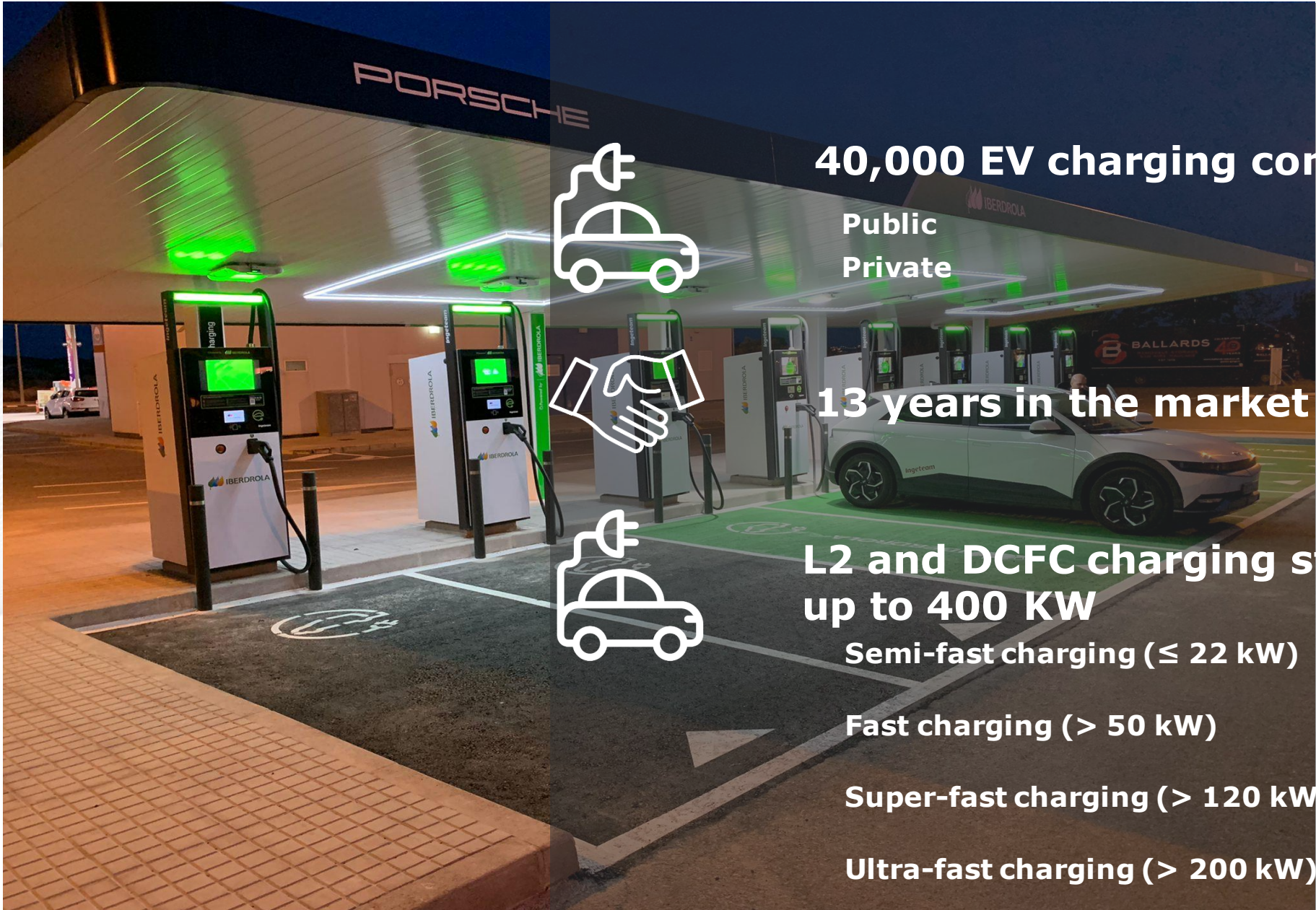
**Automation & Control
Electronic Devices**
35,000 ft²

Zamudio (Bizkaia)



Frequency converters
55,000 ft²

Chennai



40,000 EV charging connectors

Public
Private



13 years in the market



**L2 and DCFC charging stations
up to 400 kW**

Semi-fast charging (≤ 22 kW)

Fast charging (> 50 kW)

Super-fast charging (> 120 kW)

Ultra-fast charging (> 200 kW)

INGEREV® EV chargers

Ingeteam

FUSION



Semi-fast charging (≤ 22 kW)

RAPID 50



Fast charging (> 50 kW)

RAPID 60



Super-fast charging (> 120 kW)

RAPID 120/180



Ultra-fast charging (> 200 kW)

RAPID ST200

RAPID ST400



reddot winner 2022

Ingeteam Inc. USA

3550 W. Canal St
MILWAUKEE, WI

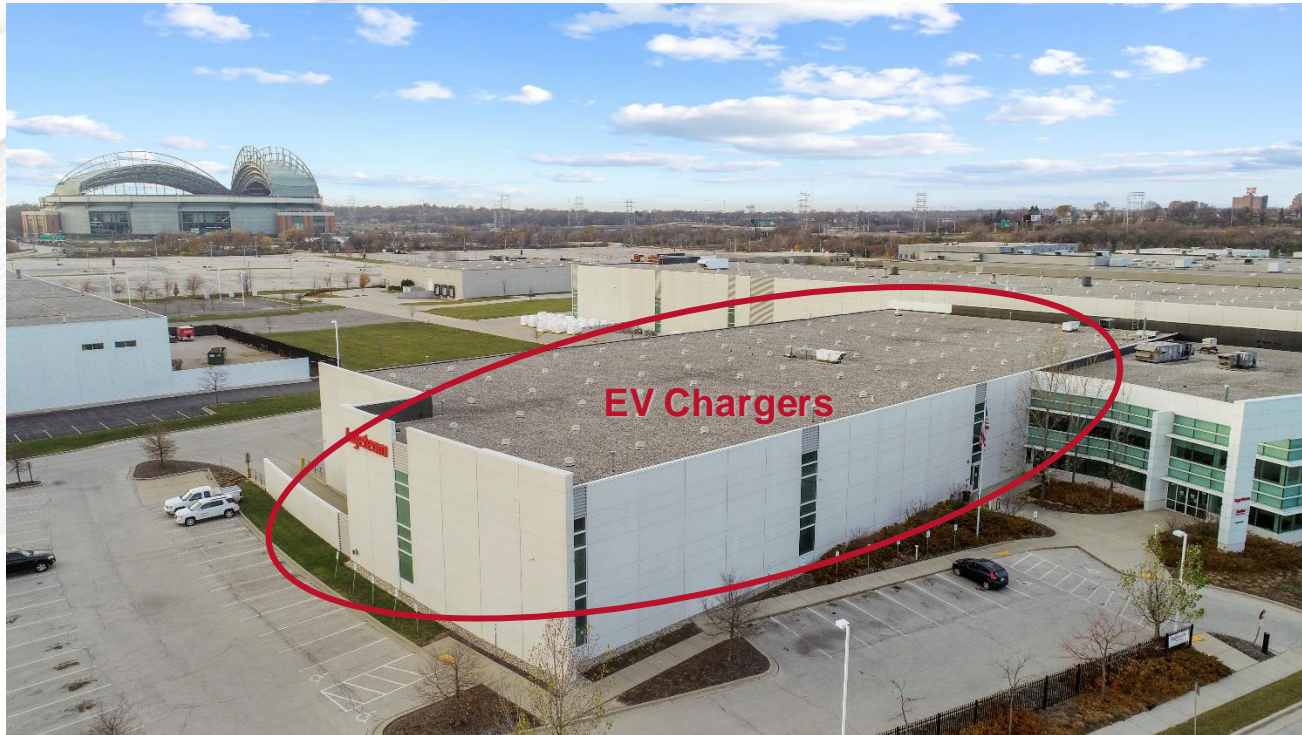
Ingeteam



- Operating since **2011**
- Total investment of **\$20M**
- Total built **area 140,000 ft²**
(**361,500 ft²** lot)
- Manufacturing center for **EV Chargers**, Wind Generators, Motors and Power Converters
- 160 Direct Operating **clean energy Jobs**
- 30+ **Service engineers** in the US

Ingeteam Inc. USA

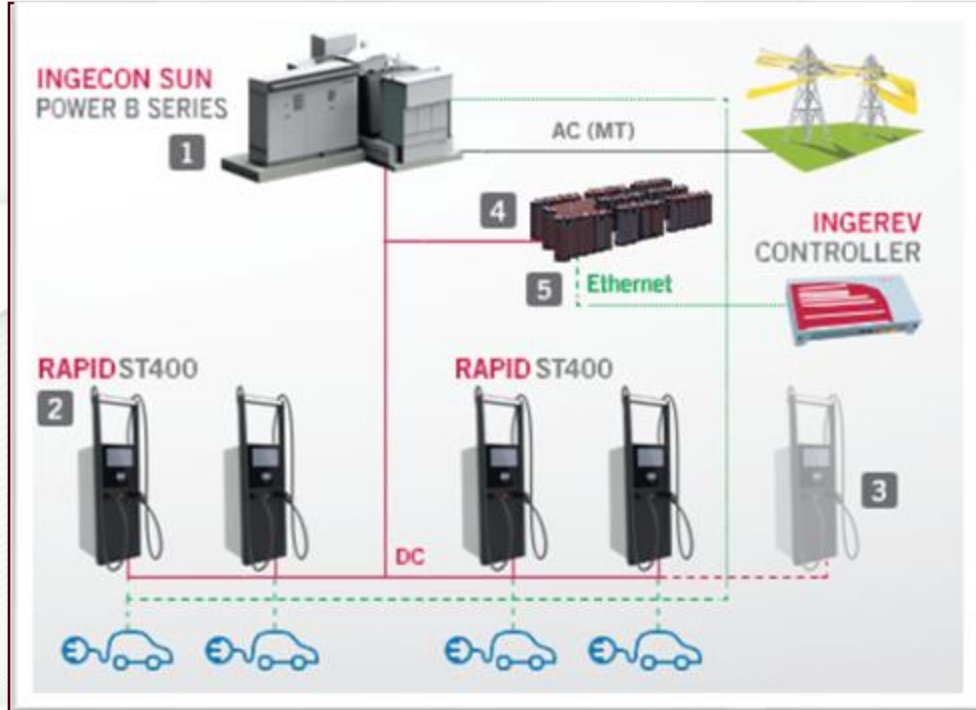
EVSE production facility



- **DCFC** and **L2** EV chargers manufacturing
- **NEVI** and **Buy America** compliant
- **40,000 ft²** floor area
- 1st unit will be manufactured 2H **2023**
- **10,300 EV chargers/year**
- **EVSE repair and upgrading** capabilities
- Ingeteam spare parts **warehouse**

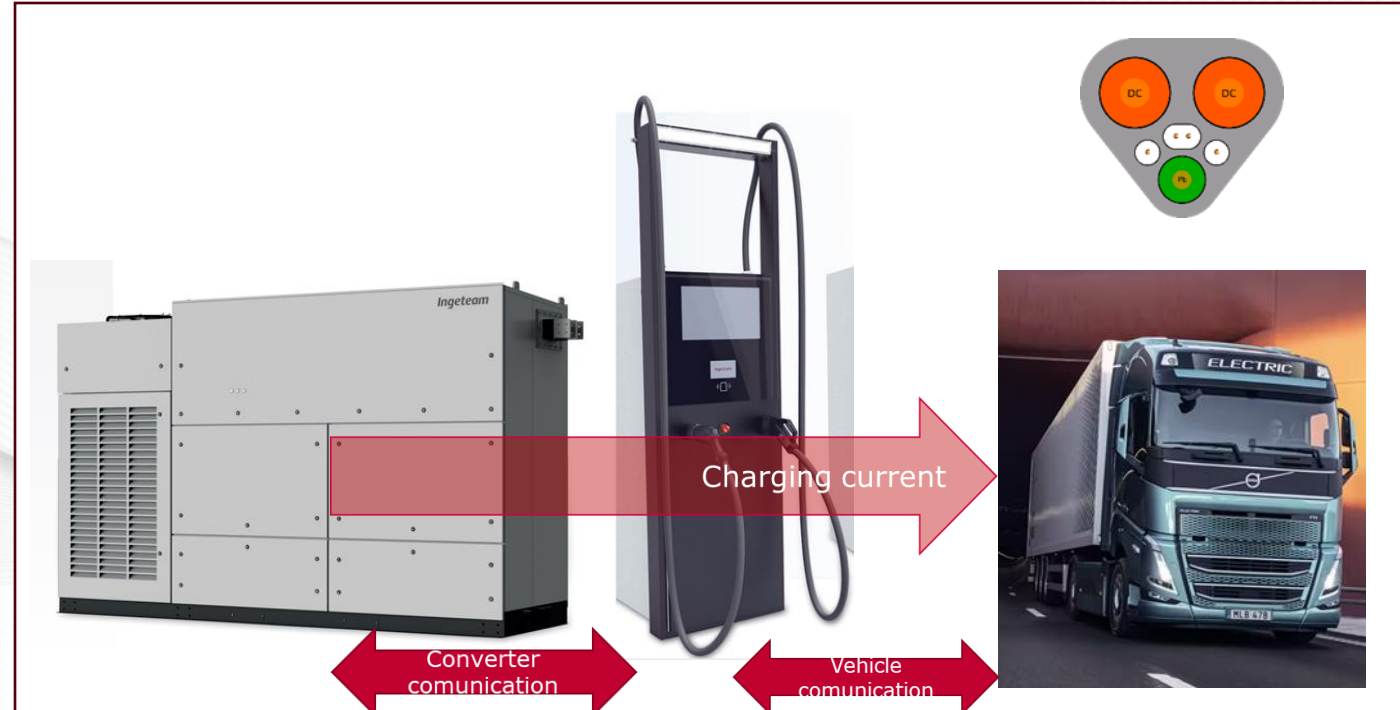


Ingeteam new developments



1. Single **central AC/DC converter**
2. Each **charging point** includes a DC/DC converter
3. Additional **charging points**
4. **Battery storage**
5. Very simple and immune layout

Ingeteam MCS



AC input Specifications

Current (AC) = 3200 A
Voltage (AC) = 320 V

IT System

MCS charging specifications

- Up to 3000 A of DC charging current.
- Maximum DC voltage level of 1250 V.
- Maximum power 1700 kW.
- MCS charging connector and cable are liquid cooled.

Selected customers and references

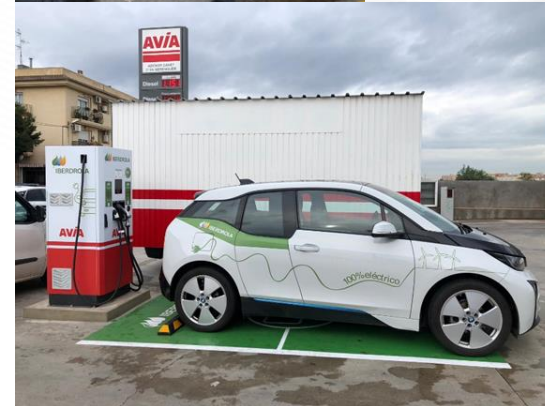
Municipalities & Utilities



OEM



O&G providers



Selected customers and references

Retail and C-stores



Charge Point Operators (CPO)



Ingeteam EV Charging solutions



Ingeteam



**19 ULTRA-FAST CHARGING STATIONS
2 RAPID ST 400 + 6 RAPID ST 200 (x2)
INGECON SUN STORAGE Power Series B AC/DC CONVERTER
PORSCHE-IBERDROLA (AVANGRID), SPAIN**



THE REAL  DREAM
team

BE PART OF
THE ENERGY TRANSITION
BE A HERO.

Jesus Rodriguez
jesus.rodriguez@ingeteam.com
+1 414 567 8717





Thank you!

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YELLOW LANE

CITY BUSES
STAY ON
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SUNG MOTOR