CLEAN FUELS MICHIGAN

POWERING UP MICHIGAN COMMUNITIES FOR ELECTRIC VEHICLES

Michigan Association of Planning's Spring Institute: Renewable Energy
May 20th 2025

Presented by
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OUR STATEWIDE PERSPECTIVE

Affordable Clean Vehicles | Robust Infrastructure | Capable Workforce


EV Charging Basics
Why EVs?
Michigan's EV Landscape
Local Action

Roadmap

EV Charging Basics

EV Terminology

AC - alternating current

BEV - battery electric vehicle

DC - direct current

DCFC - DC fast charger

EV - electric vehicle

EVSE - electric vehicle supply equipment

ICE - internal combustion engine

PHEV - plug-in hybrid electric vehicle

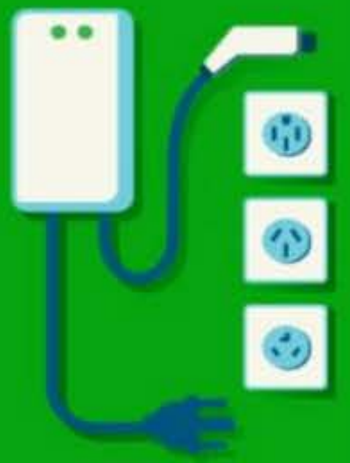
Level One
120V
Electrical source from a regular home outlet.

Charge Time
2-5 miles of range per 1 hour of charging.

Charging Electric Vehicles at Home:

Most EVs **Charge Overnight** via **Level 1**

Outlet Type	**Regular** GFI **Outlet**, available in your home
Charge Cost	Nissan Leaf (15 ¢/kWh): **$9.00**
Speed of Charge	2 to 5 miles of range per hour of charging (12-24 hours) Approx 72 miles per full charge
Primary Location	Residential
Other Locations	• On Street • Multi unit dwelling • Single family residential • Garages and driveways



Level Two
220V
Electrical source from a regular home dryer outlet, home hardwire, or public station.

Charge Time
10-20 miles of range per 1 hour of charging.

Charging Electric Vehicles at Home & Public

Requires permitting and licensed contractors for installation. **LEVEL 2**

Outlet Type	Charging Infrastructure (need electrician)
Charge Cost	Nissan Leaf (15 ¢/kWh): **$9.00** per session $1.5-5k+
Speed of Charge	**10 - 20 miles of range per hour of charged** (3-8 hours)
Primary Location	Residential Commercial
Other Locations	On Street Multi unit dwelling Single family residential Garages and driveways

DC Fast Charge
208 or 480V 3-Phase AC Electrical source from a public station.

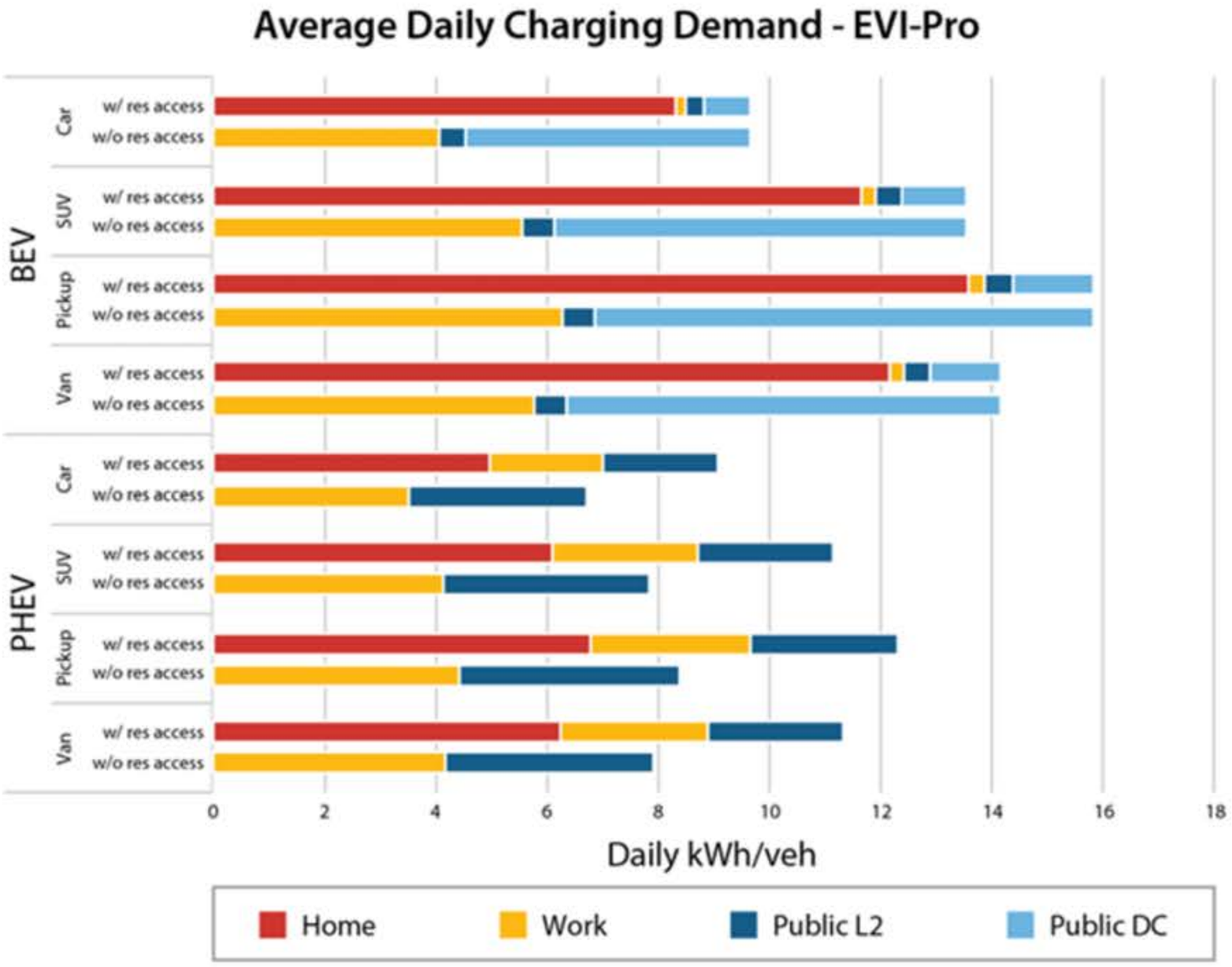
Charge Time
60-80 miles of range per 20 minutes of charging.

Charging Electric Vehicles - Public / Vacation

Requires permitting and licensed contractors for installation. **LEVEL 3**

Outlet Type	Charging Infrastructure (need electrician)
Charge Cost	Nissan Leaf (23-35 ¢/kWh): **$15.00-$25.00** per session
Install Cost	$80k-$120k+
Speed of Charge	80-200 miles of range per hour of charged (30min-1 hour)
Primary Location	Commercial Only
Other Locations	Parking lots/garages Public/municipal Transportation hubs Hotels Retail/Workplaces Office parks or Industrial facilities Fleets

EV Charging Behavior

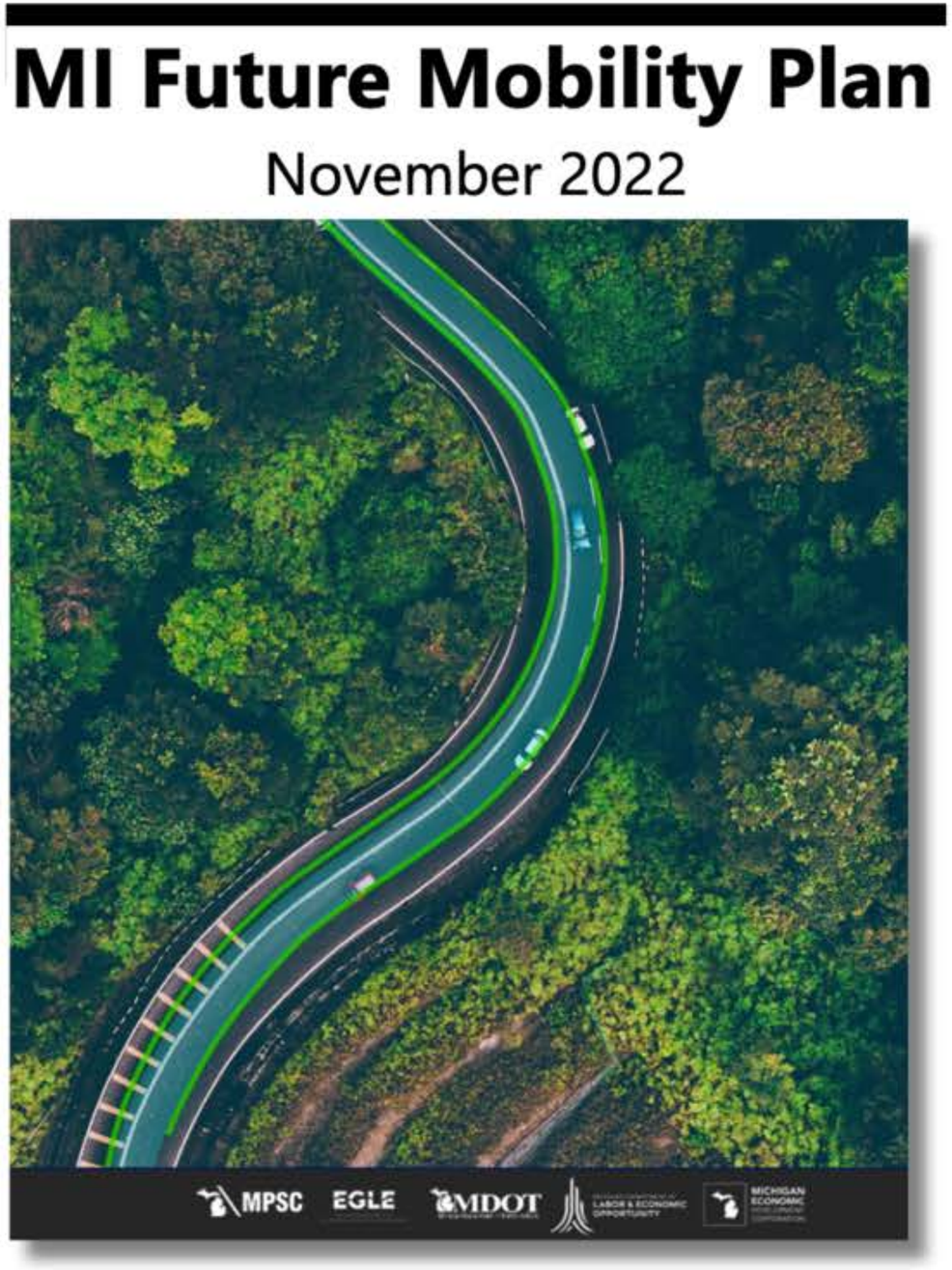



Why EVs?

Why EVs

State Goals

- Build the infrastructure necessary to support **2 million electric vehicles on Michigan roads by 2030.**
- Increase access to clean transportation options – including public transit – by 15 percent each year.



Why EVs

State Goals

- By 2030, **deploy 100,000 EV chargers to support 2,000,000 EVs** and improve access to hydrogen infrastructure.
- Maintain at least 80% of EV charging off-peak to minimize impacts on the grid.

Why EVs

Supporting Michigan Industry

- Ford aims to reach 40-50% EV volume by 2030
- GM aims to electrify 50% of its fleet by 2030, and offer 100% electrified fleet by 2035
- Numbering over one million jobs, the auto industry represents more than 20% of Michigan's workforce and is responsible for more than 27% of Michigan's GDP

MAGAZINE · FORTUNE 500

Ford and GM are going all in on electric cars, and thousands of jobs hang in the balance

BY JACLYN TROP
June 1, 2022 at 6:00 AM EDT

A NEW MODEL T?: A Ford employee works on an F-150 Lightning, the model Ford hopes will woo more U.S. drivers to EVs.
PHOTOGRAPH BY SPENCER LOWELL FOR FORTUNE

Why EVs

Supporting Michigan Industry

AUTOS

Chinese automakers overtake U.S. rivals in sales for the first time, report shows

PUBLISHED FRI, JUN 14 2024·2:54 AM EDT | UPDATED FRI, JUN 14 2024·12:21 PM EDT

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KEY POINTS

- Chinese brands sold 13.4 million new vehicles last year, while American brands sold about 11.9 million units, according to Jato Dynamics.
- Chinese sales were boosted by increased global demand, growth in emerging markets and its leading brand, BYD.

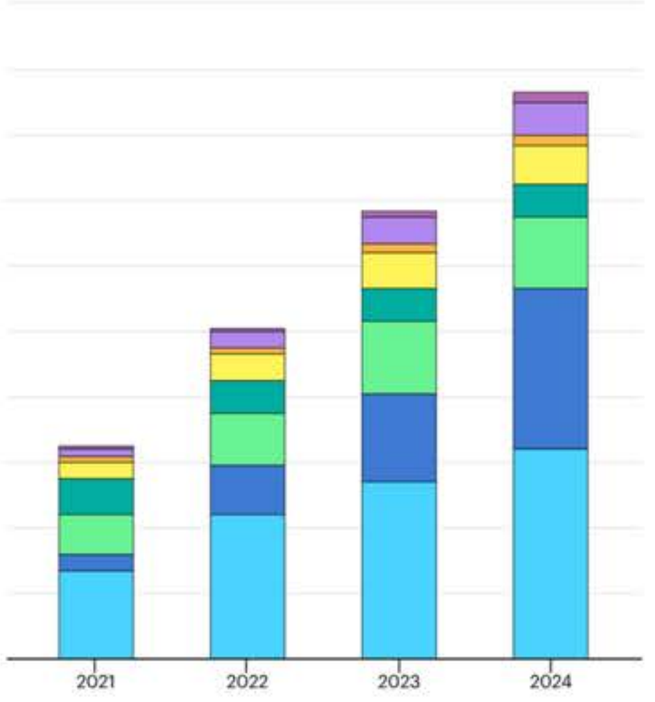
WATCH LIVESTREAM

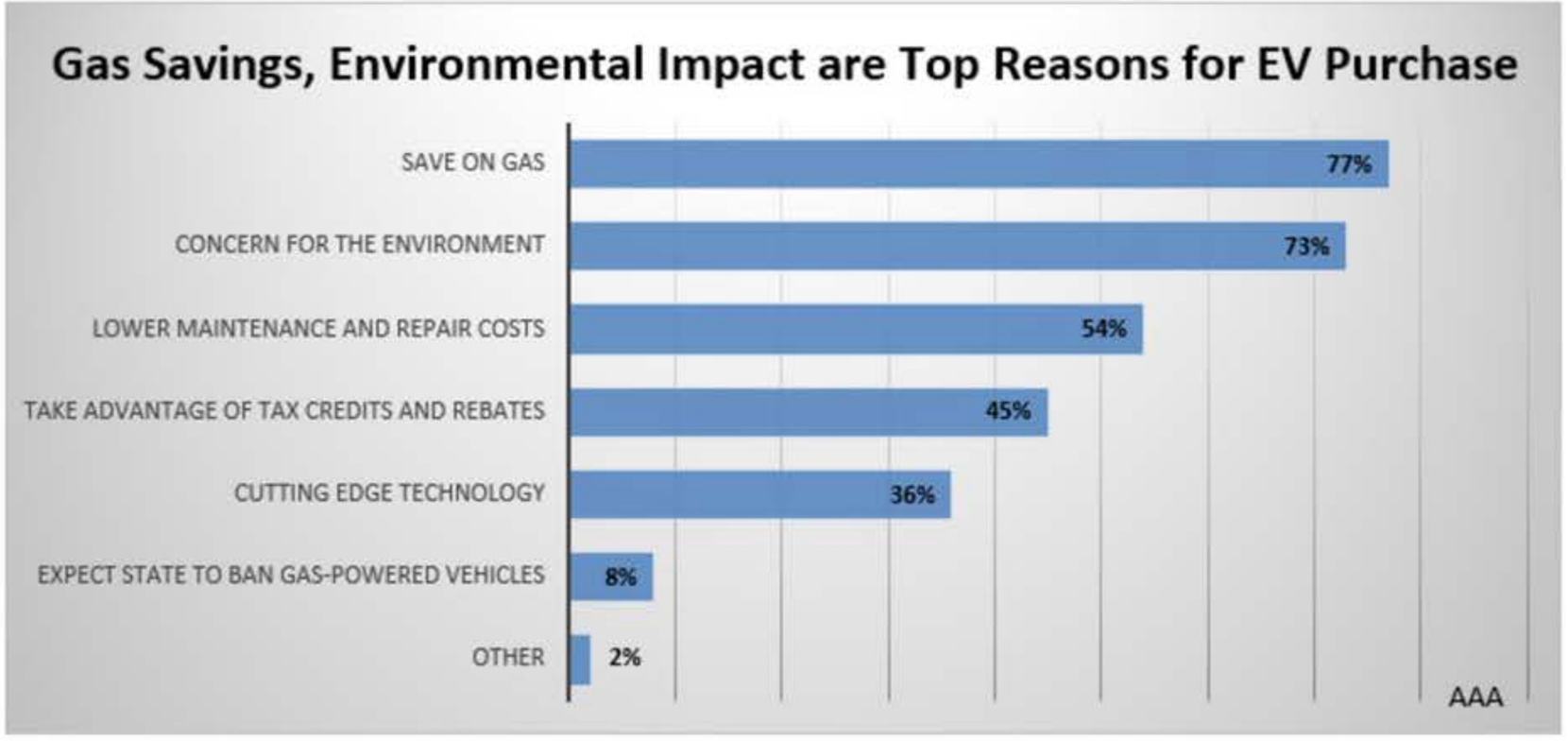
Prefer to Listen?

NOW Squawk on the Street

UP NEXT Money Movers

Global Electric Car Sales, 2021-2024





Why EVs

Consumer Trends

- About a quarter of Americans are “very likely” to consider purchasing an EV, according to a new J.D. Power survey on electric vehicles.

- Last year, American consumers purchased 1.3 million electric vehicles, which was a new record, according to KBB.

Why EVs

Federal Incentives

Bipartisan Infrastructure Law

Signed into law in November 2021, creating more than $1.2 trillion for transportation and infrastructure across America, including $128 billion for clean mobility solutions

AKA: Infrastructure Investment and Jobs Act (IIJA)

Programs are broken down into Formula vs. Competitive Funds

Inflation Reduction Act

Signed into law in August 2022, it is the single largest investment in clean mobility in the nation's history

$485 billion of new spending for clean energy incentive programs and tax breaks with an emphasis on bolstering the economy

Michigan's EV Landscape

Electric Vehicle Adoption in Michigan

78,006

Plug-in EVs in Michigan

Source: Registration data from June 2024

3

Michigan's Rank in the Midwest

Source: Registrations Per Capita in 2023 compared to 12 states

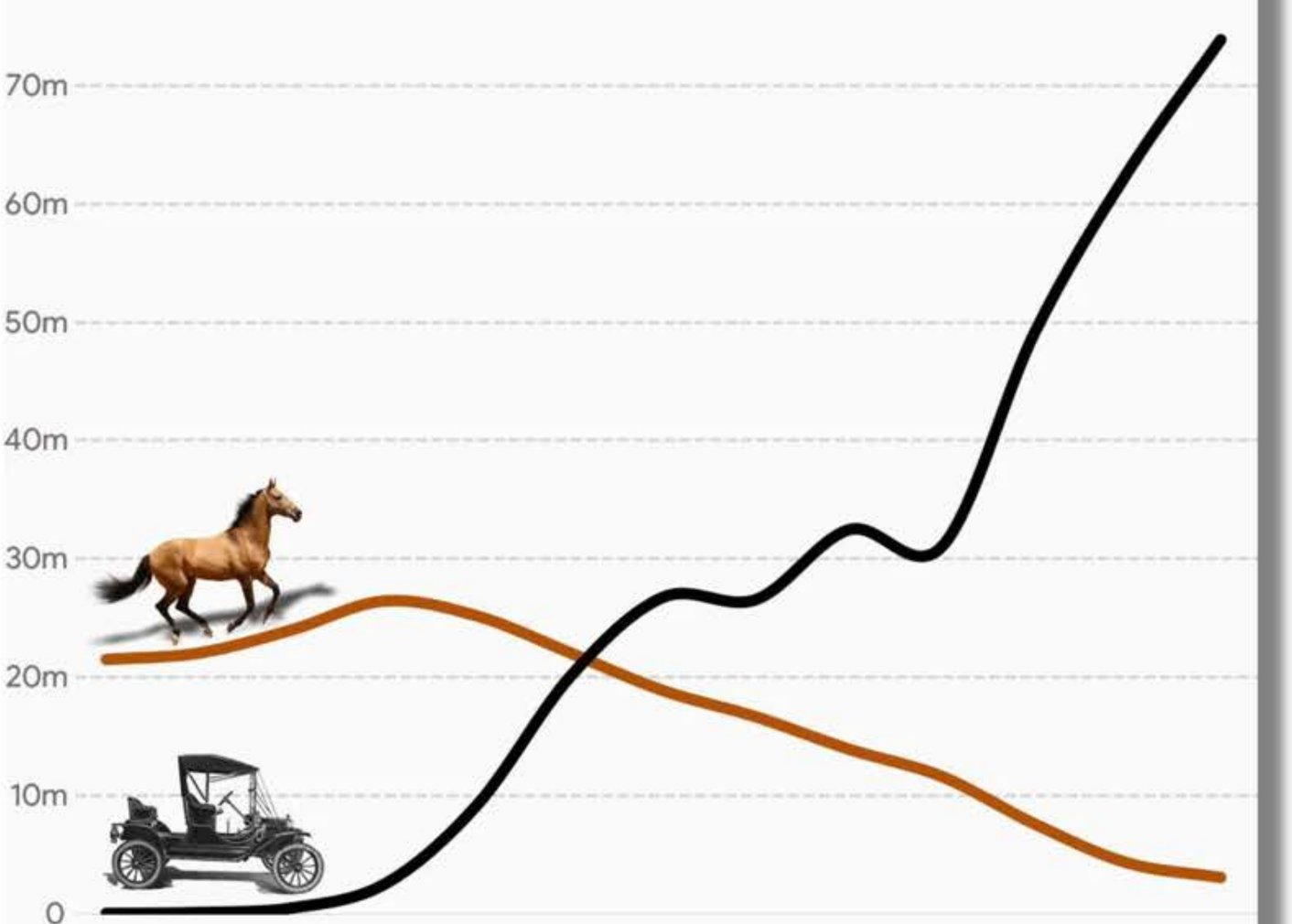
2 million EVs =
~23% of vehicles on
Michigan roads

Compared to
~1% currently

MDOT's 2024 Fast Facts

Replacement of horses by cars

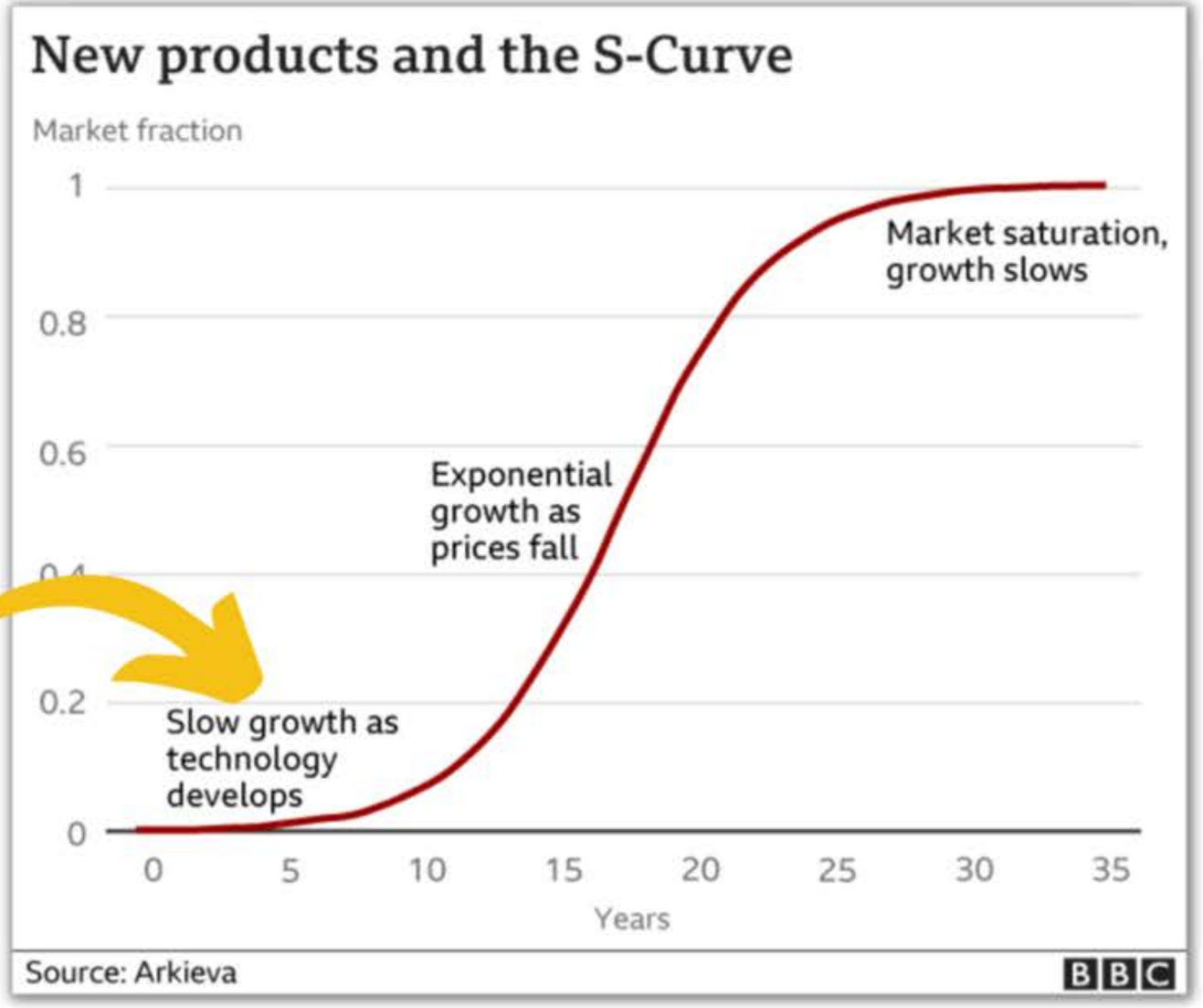
in the United States



StaDaFa.com

Source: Kilby, E.R. (2007). The demographics of the U.S. equine population. The state of the animals 2007 (pp. 175-205). Washington, DC: Humane Society Press.
U.S. Department of Transportation Federal Highway Administration

YOU ARE HERE


New products and the S-Curve
Market fraction
1
0.8
0.6
0.2
0
Market saturation, growth slows
Exponential growth as prices fall
Slow growth as technology develops
0
5
10
15
20
25
30
35
Years
Source: Arkieva
BBC

EV Charging Infrastructure Deployment

3,637

Public Charge Ports in Michigan

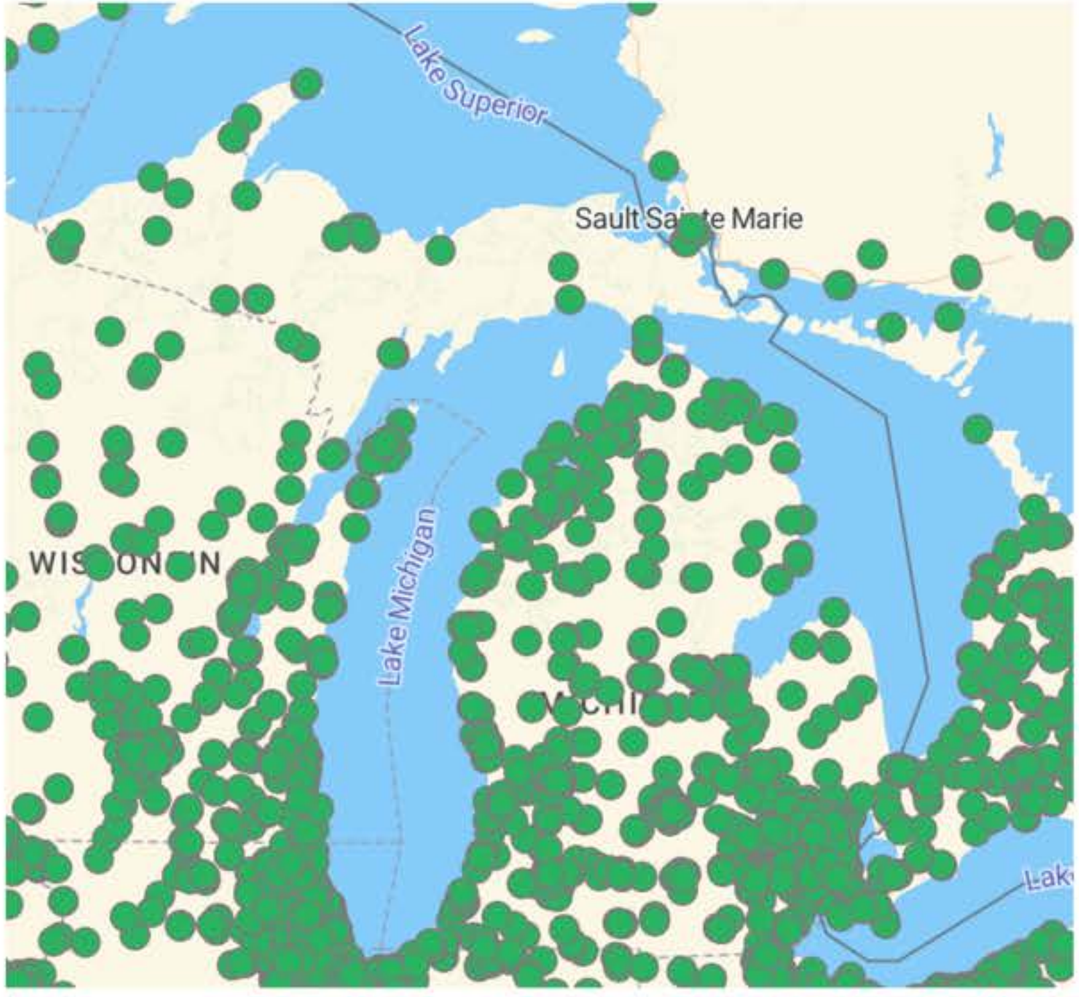
Source: Alternative Fuels Data Center accessed October 2024

3

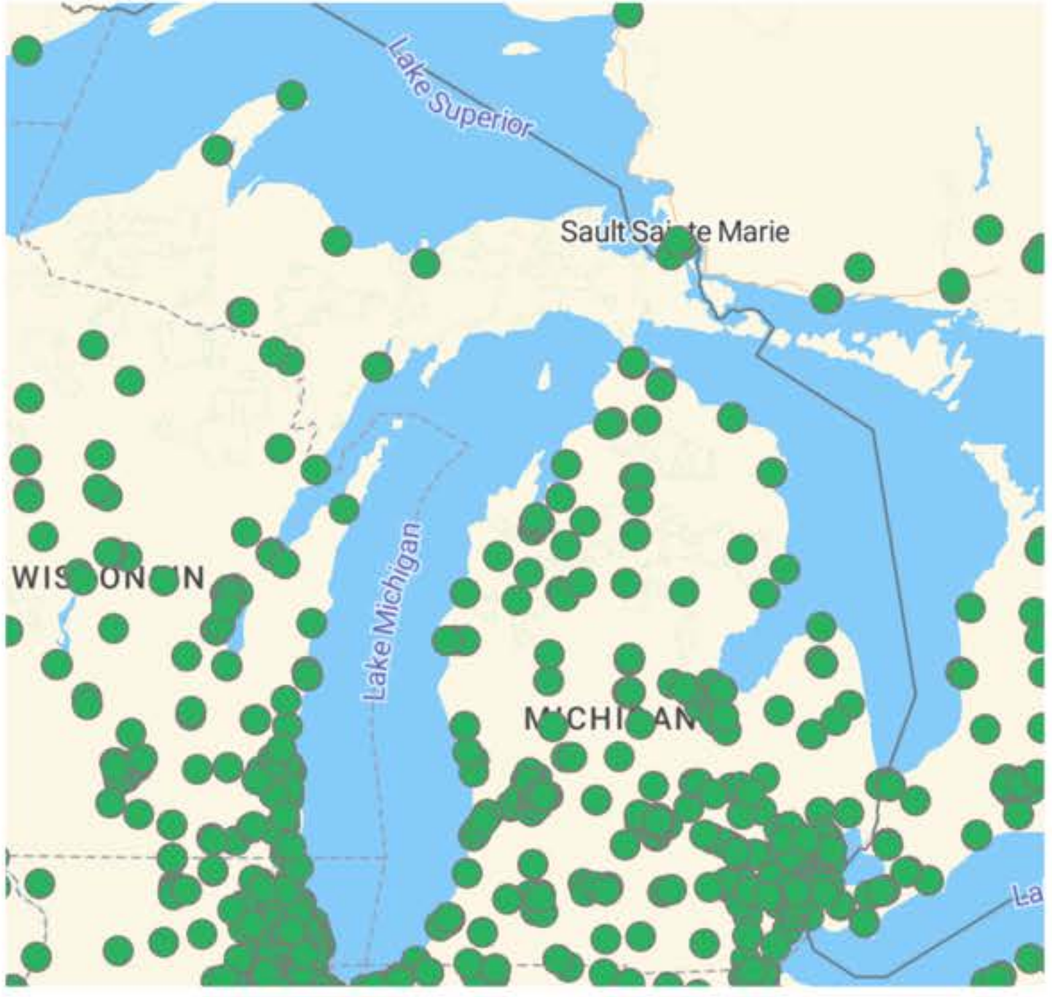
Michigan's Rank in the Midwest

Compared to 12 Midwest states

DC Fast + Level 2

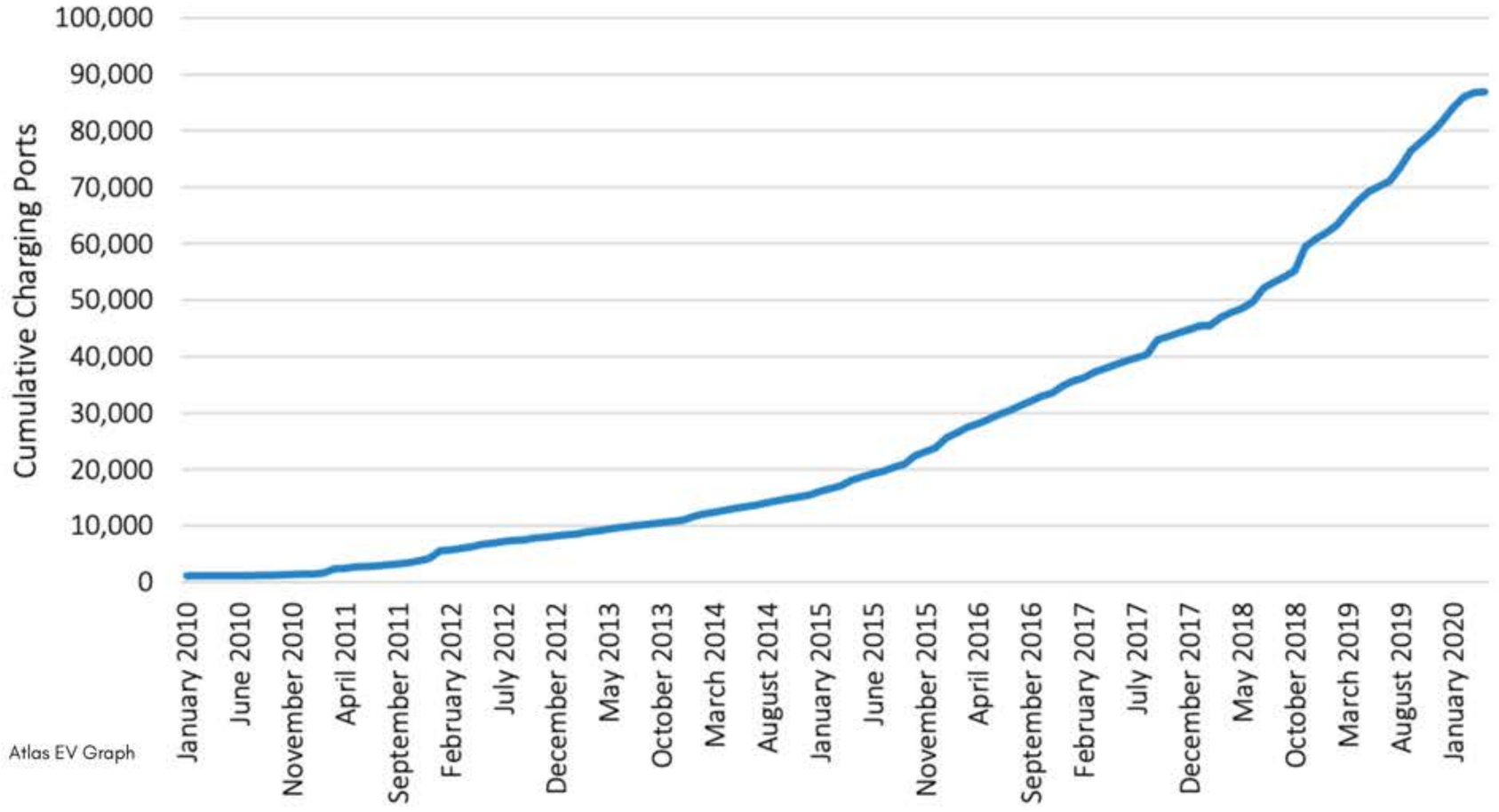


DC Fast



FHWA estimates approximately 1,000 new public chargers are added each week

FIGURE 1: U.S. CHARGING DEPLOYMENT OVER TIME



Atlas EV Graph

Michigan's National Electric Vehicle Infrastructure (NEVI) Program

$21.2M awarded 19%

The NEVI Program, created by the Bipartisan Infrastructure Law, allocates $110 million to Michigan for public charging. Round 1 has been awarded, and future rounds will continue to deploy publicly available DC Fast Chargers. Learn more here.

Round 2

Utility Rebates & Incentives

Michigan utilities offer various rebates and incentives to make owning and charging...

READ ON

Charger and Fueling Infrastructure (CFI) Program

What to Know about EV Charging

EV Charging is a powerful economic development tool

One study found after analyzing data from 4000 EV chargers and 140,000 businesses that installing one EV charger boosts annual spending at nearby establishments by 1.4% annually

DCFC are critically needed.

AND, more than 80% of charging happens at home, overnight.

- multi-family residents
- low-income neighborhoods
- driveway and garage orphans

Clean School Buses in Michigan

Clean school buses play a vital role in communities by reducing students' exposure to harmful pollutants and fostering a safer and healthier environment for young riders. Beyond their immediate benefits, they represent a powerful commitment to clean mobility, setting an example that helps normalize and accelerate the adoption of zero-emission transportation across public and private fleets.

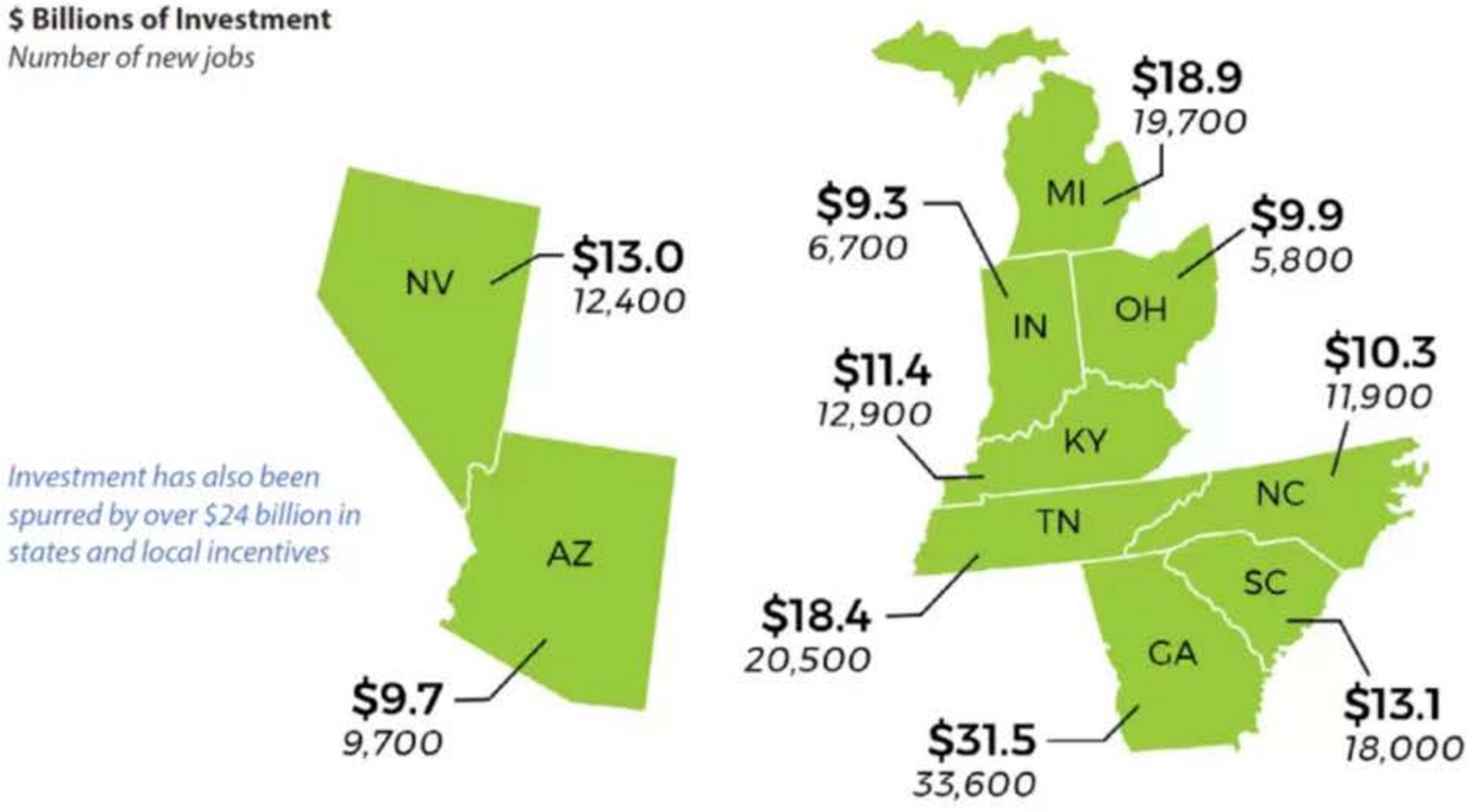
315

Electric School Buses Committed

Source: WRI accessed October 2024

Investment & Jobs

Manufacturers have announced over $165 billion in investment in U.S. EV and EV battery manufacturing facilities in the last eight years. More than half of that (56 percent) has happened in the last year since IRA passage. [Source: EDF]



Local Action

Siting, Zoning, Permitting

The Problem

- EVSE/EVSI is not often included in local ordinances
- Median time frame for project approval is 51 days
- Lack of clarity hinders development and discourages EVSP engagement

Best Practices

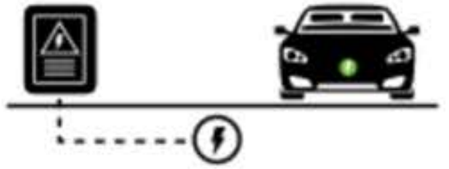
- Include EV chargers in comprehensive municipal plans and zoning guidelines.
- Engage with key stakeholders.
- Ensure the permit review and inspection process is clear and transparent.
- Update zoning codes to appropriately classify EV chargers according to the use case - accessory use or primary approved use.

EV Ready Building Codes and Parking Ordinences

Building retrofits to install EVSE in existing buildings are costly. Including EV readiness in building codes requires new construction to at minimum have the electrical capacity for EVSE in parking lots. These upgrades are significantly cheaper to include during construction and help future proof new buildings.

1. EV-Capable

Install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.



2. EVSE Ready Outlet

Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet.

3. EVSE Installed

Install a minimum number of Level 2 EV charging stations.

State of Michigan Community EV Toolkit

Electric Vehicle Supply Equipment (EVSE) Planning Tools

Zoning

Zoning can be used as a planning tool to allow, incentivize or require EVSE either throughout a municipality's zoning districts or in specific areas.

Zoning for EVSE would need to

Parking

The municipal code can utilize parking ordinances and management as a tool to address a number of aspects of EV charging infrastructure: the scope of EVSE pre-wiring or installation from a transportation

Codes

Codes govern the structural aspect of EVSE installation; codes for EVSE include building and electrical codes as well as those that regulate the communications aspects of EVs and EVSE at the network scale.

Permitting

Electrical permitting is the local enforcement of the electrical code.

Most electrical work in homes and businesses requires a permit and generally must be performed by an electrician

Timely Funding Opportunities

Charge Up Michigan

- Lesser amount of 33.3% of the total cost of the project or up to $70,000 for EV Chargers

Lake Michigan EV Circuit

- Lesser amount of 33.3% of the total cost of the project or up to $70,000 for EV Chargers ($5,000 for L2) located on designated nodes on routes around Lake Michigan

Clean Fuel and Charging Infrastructure Program

- Multifamily housing charging awards up to $300,000
- Fleet Charging - *coming soon*
- Public Charging - *coming soon*

Michigan Clean School Bus Program

- Funding for up to 90% of the cost for clean school buses and associated infrastructure needs

All programs are designed to be stackable with federal tax credits, federal funding programs, and utility programs.

Where to Start

Collaboration is critical

- **Charger Hardware Vendor**: Provides charger equipment
- **Changer Software Vendor**: Provides charger software for online connection, payment, and data collection
- **Consultant**: Outsourced experts that provide advice on site design, engineering services, or other areas of interest
- **Contractor**: Coordinates with all project partners to provide turn-key services
- **Electrician**: Installs the chargers
- **Operation & Maintenance Provider**: Provides services for operation and maintenance of hardware and software
- **Owner**: Invests in the chargers and reaps the benefits and responsibilities of the chargers, but may or may not be the site host
- **Site Host**: Owner of the property that house the chargers
- **Utility**: Provides power to the chargers

4 ports with 150 kW each is a big charging station!

Clean Mobility Dashboard

Michigan's progress to leading the clean mobility transition.

Clean Fuels Michigan is dedicated to accelerating the transition to clean transportation in Michigan. Through state-level advocacy, Clean Fuels Michigan ensures the successful adoption and implementation of policies that will retain Michigan's leadership position in the global automotive economy.

Robust Infrastructure

Clean fuel vehicles require robust refueling infrastructure, from deploying charging stations in residences to hydrogen refueling on corridors, building infrastructure for sustainable aviation fuel delivery, and much more.

Affordable Clean Vehicles

Michiganders and Michigan fleets need access to clean vehicles on timelines that work for their needs and at prices that work for their wallets.

Capable Workforce

Michigan must establish a robust talent pipeline for the clean mobility technician workforce necessary to support the operations and maintenance needs in the clean mobility sectors.

Give us feedback so we can continue to *innovate*

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