

# The Changing EV Landscape

## *...and its Implications for Michigan*

17 MAY 2024

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**FEDERAL RESERVE BANK OF CHICAGO**

*The views expressed here do not necessarily reflect the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.*

# Agenda

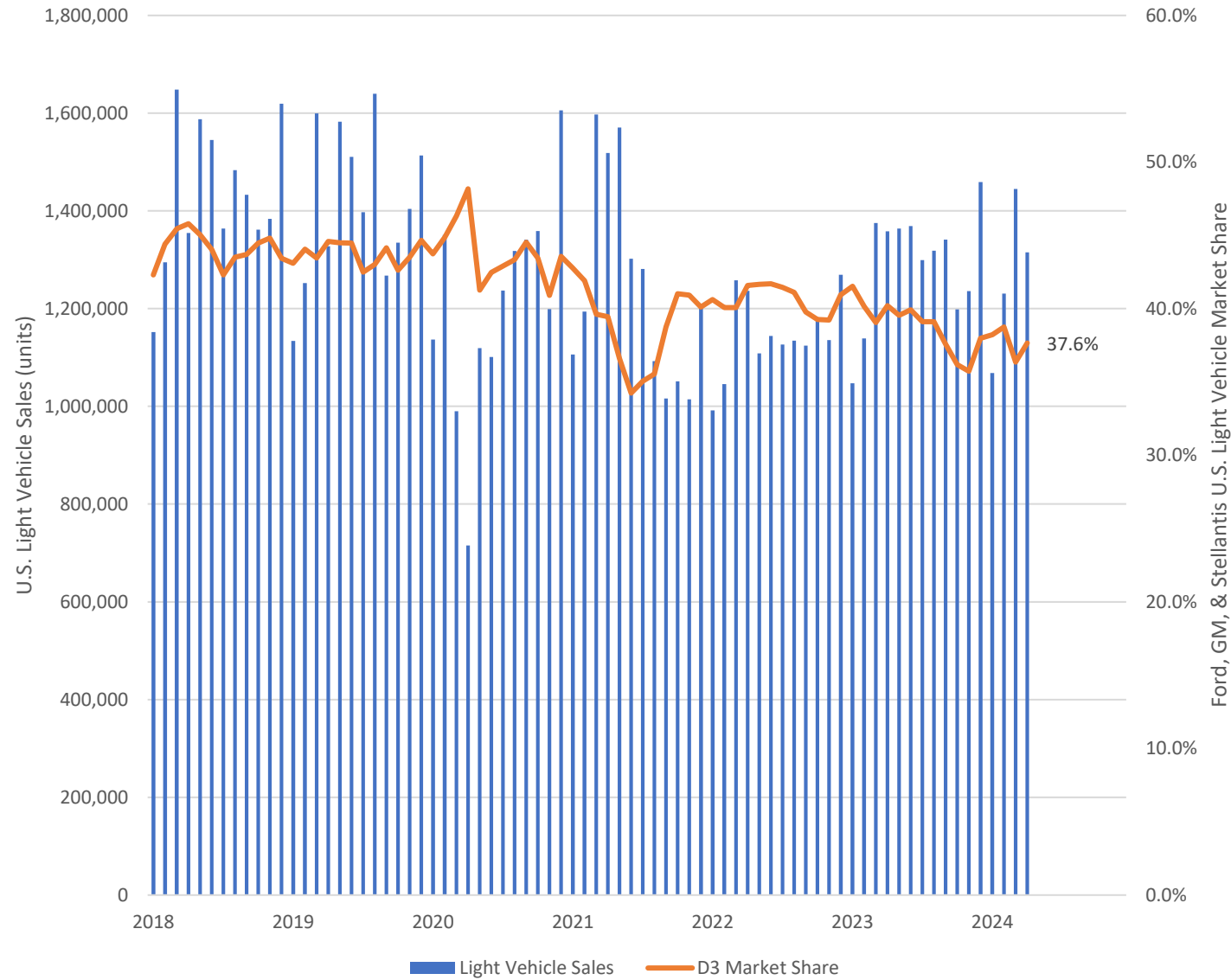
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- U.S. light vehicle market
- U.S. & Michigan employment & production
- Making the (profitable) leap to electrification
- Review of recent policy changes
- Wrap up

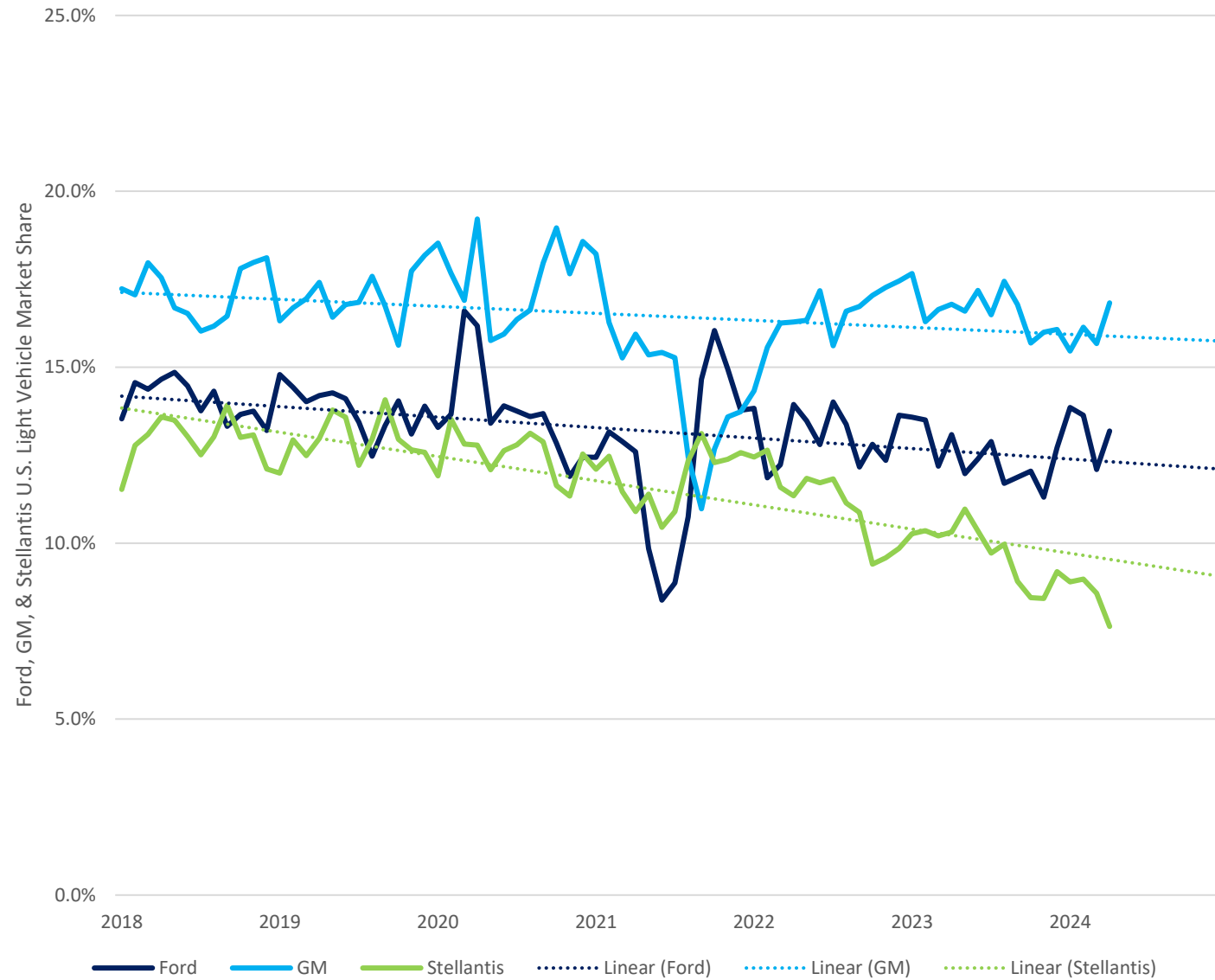
# U.S. Light Vehicle Market

*Including U.S. & Michigan EV Adoption*

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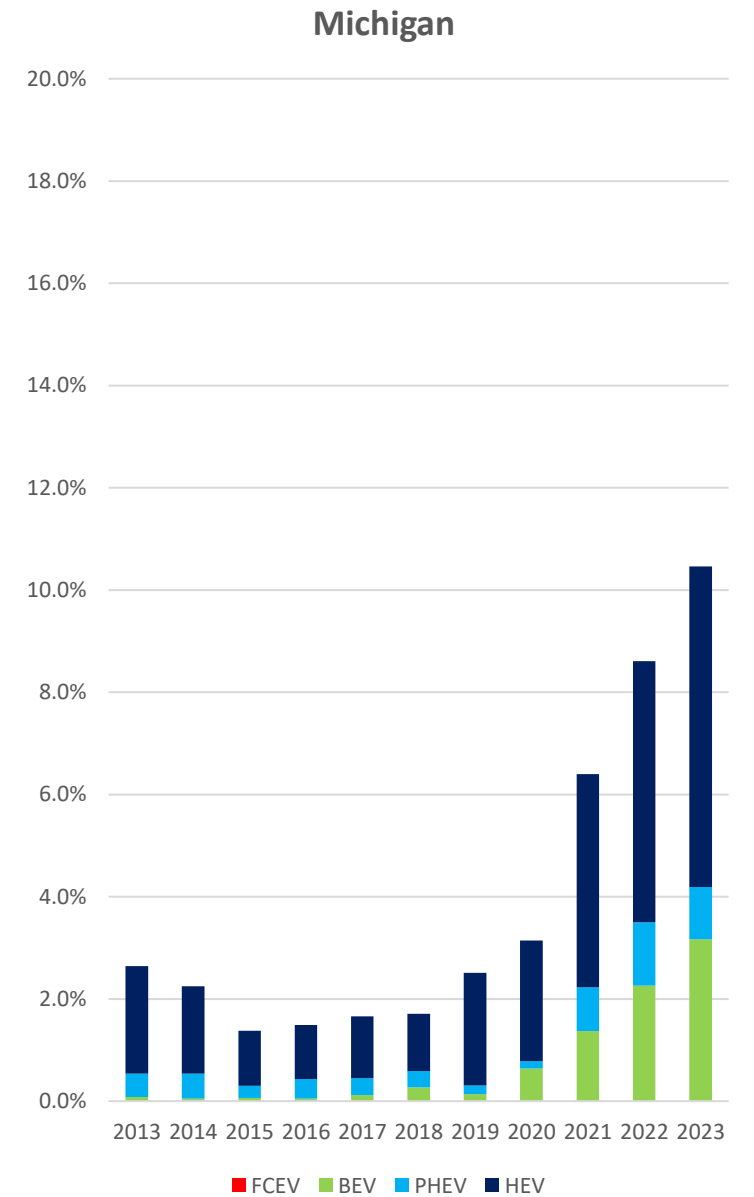
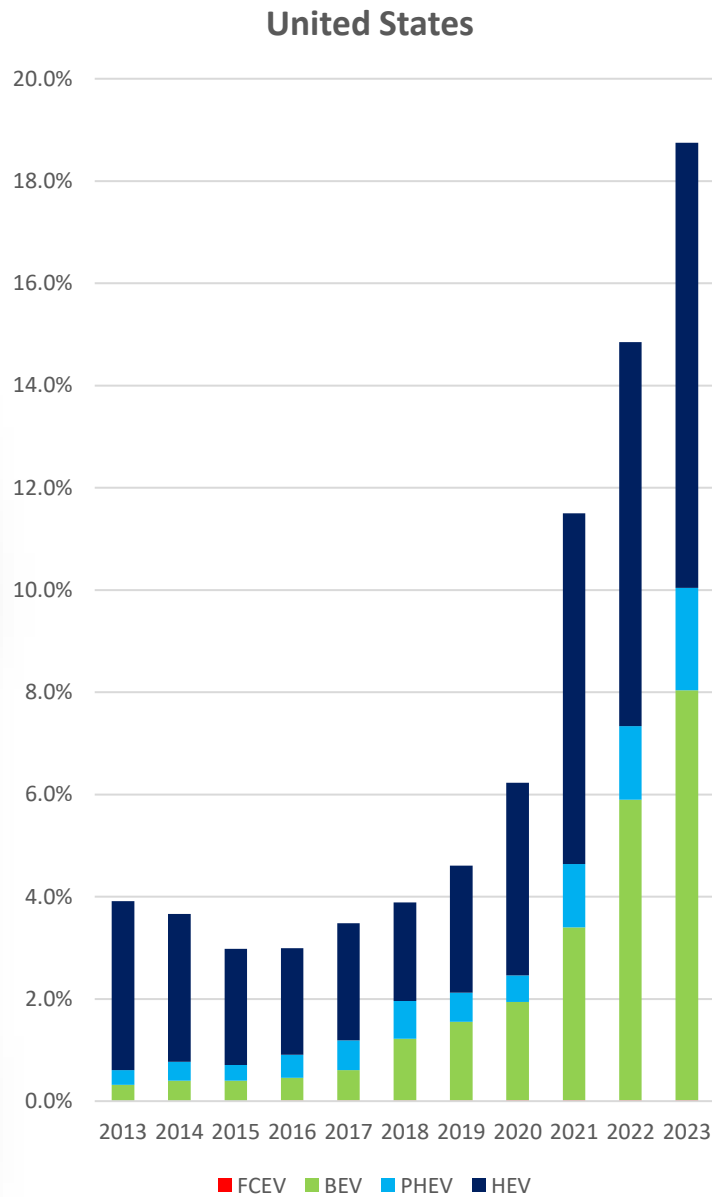


**U.S. Light Vehicle Sales & Ford/GM/ Stellantis "D3" Market Share, 2018-2024YTD**



**Ford, GM, & Stellantis U.S. Light Vehicle Market Share, 2018-2024YTD**

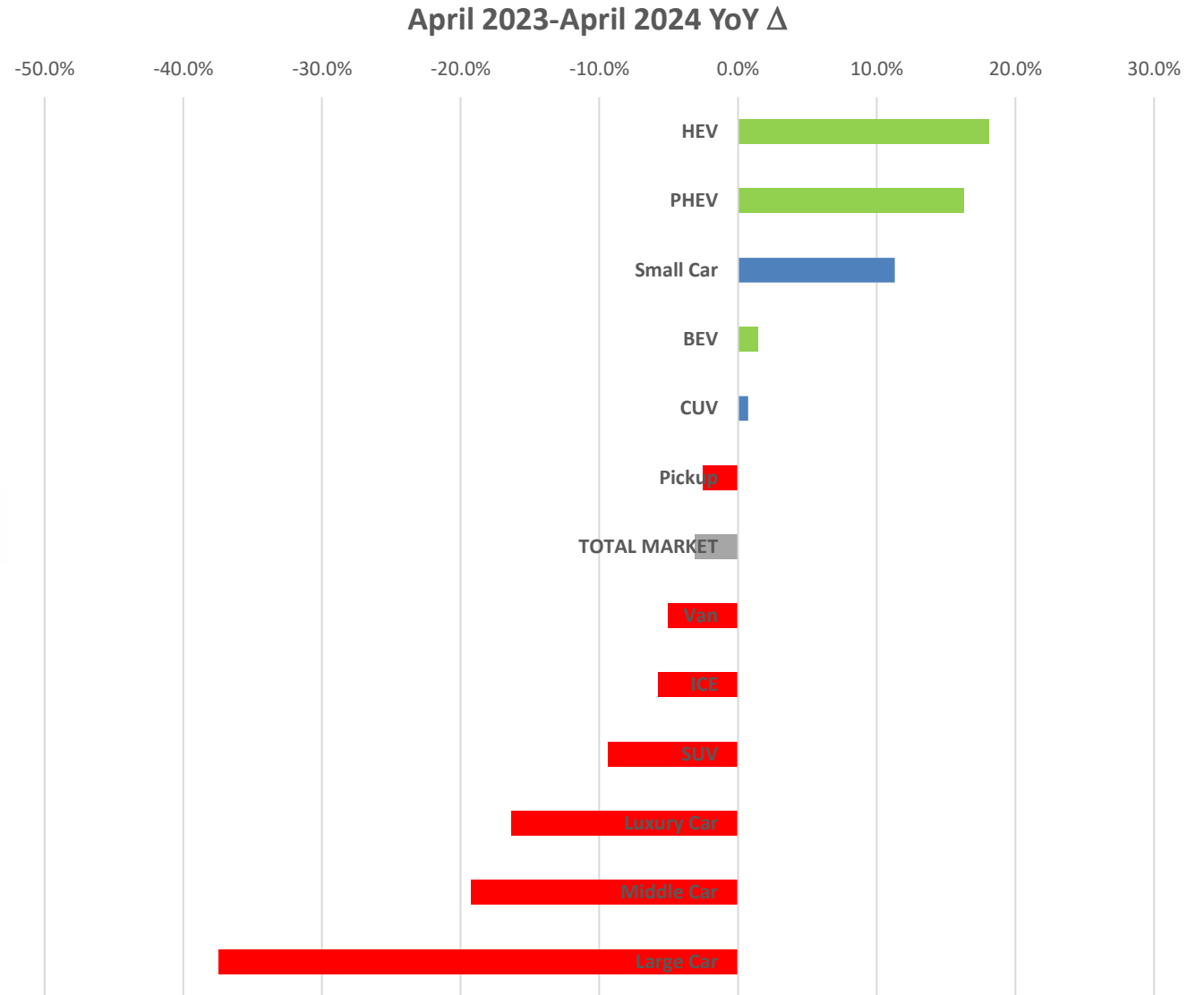
# U.S. vs. Michigan EV Market



Source: Alliance for Automotive Innovation

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**HEVs & PHEVs  
are the fastest  
growing  
segments in  
the U.S.  
market  
(BEVs still  
growing, too)**



# U.S. & Michigan Employment & Production

*Including Michigan's Role in EV manufacturing*

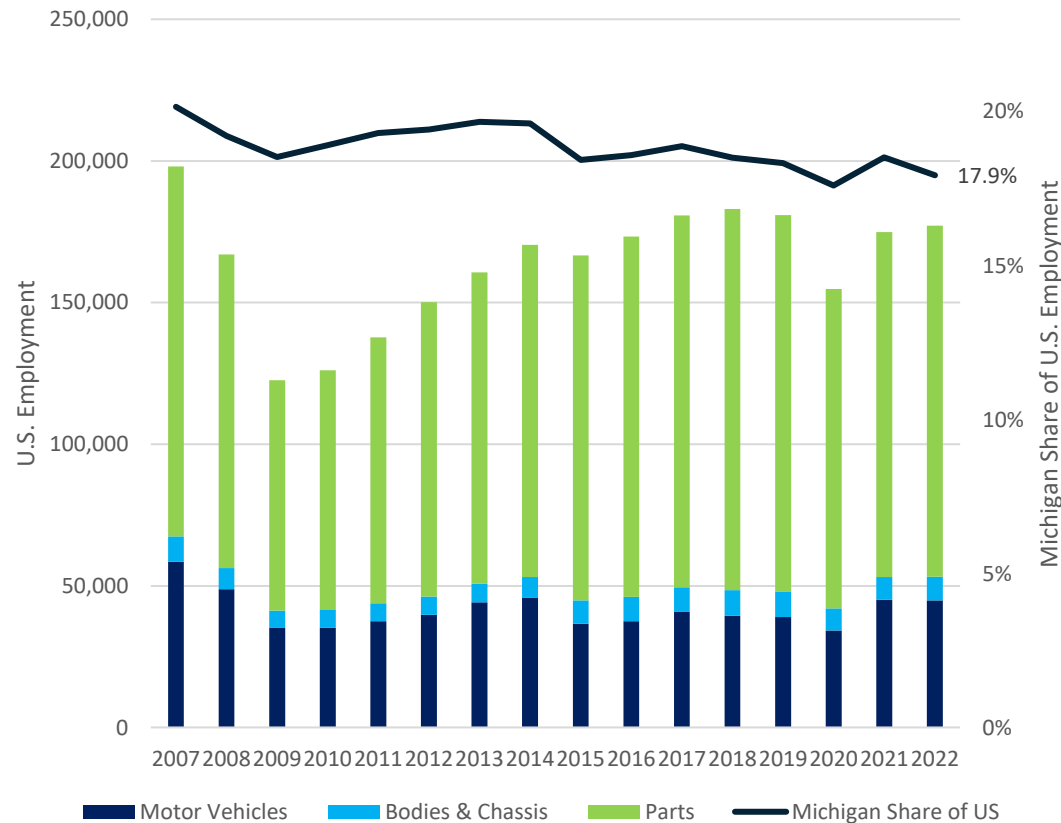
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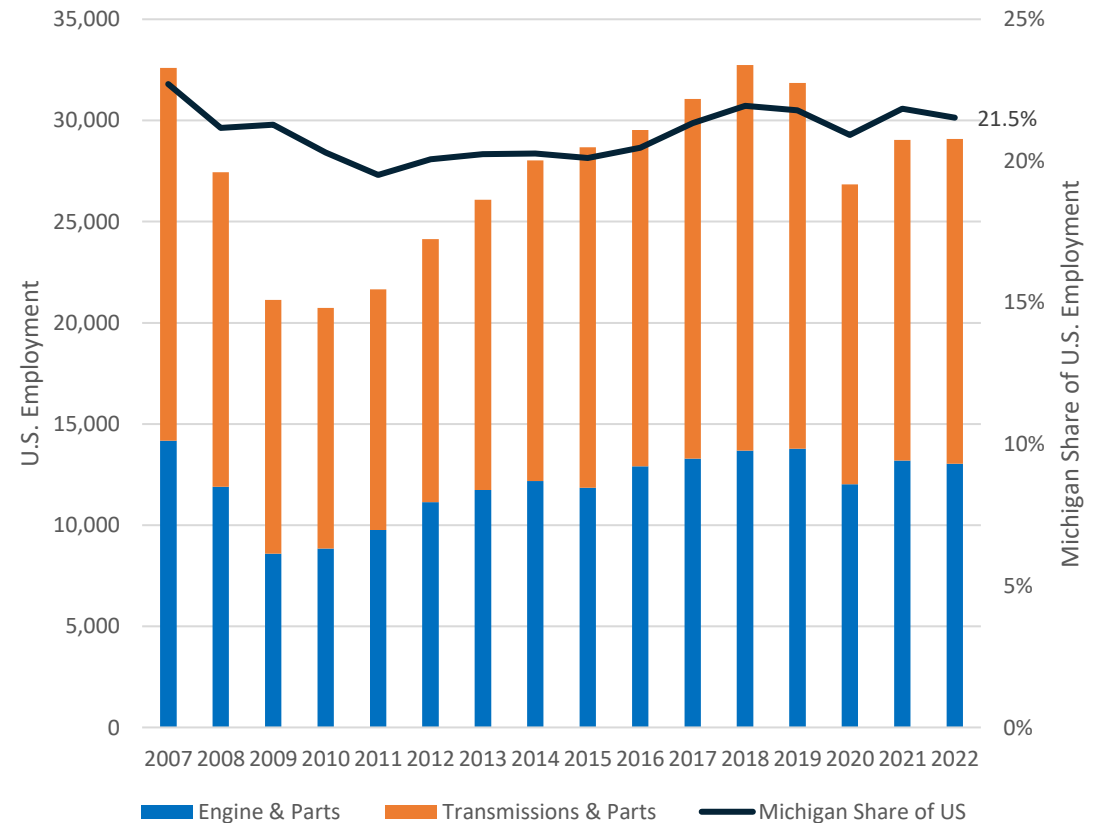
## EMPLOYMENT & PRODUCTION

# Michigan's share of U.S. motor vehicle employment has been relatively stable—even with falling production share (next slide)

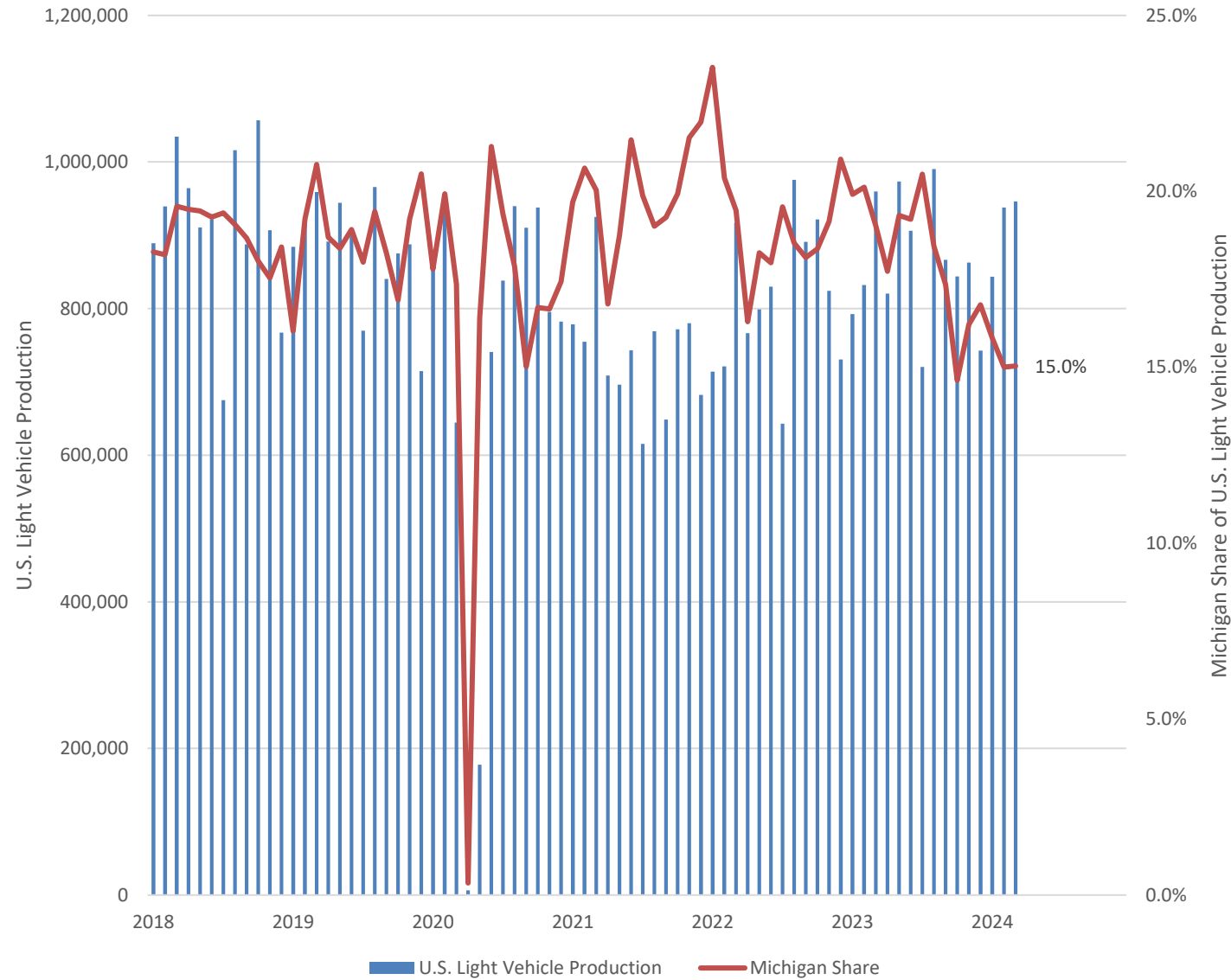
### U.S. Motor Vehicle, Body & Chassis, & Parts Employment, 2007-2022



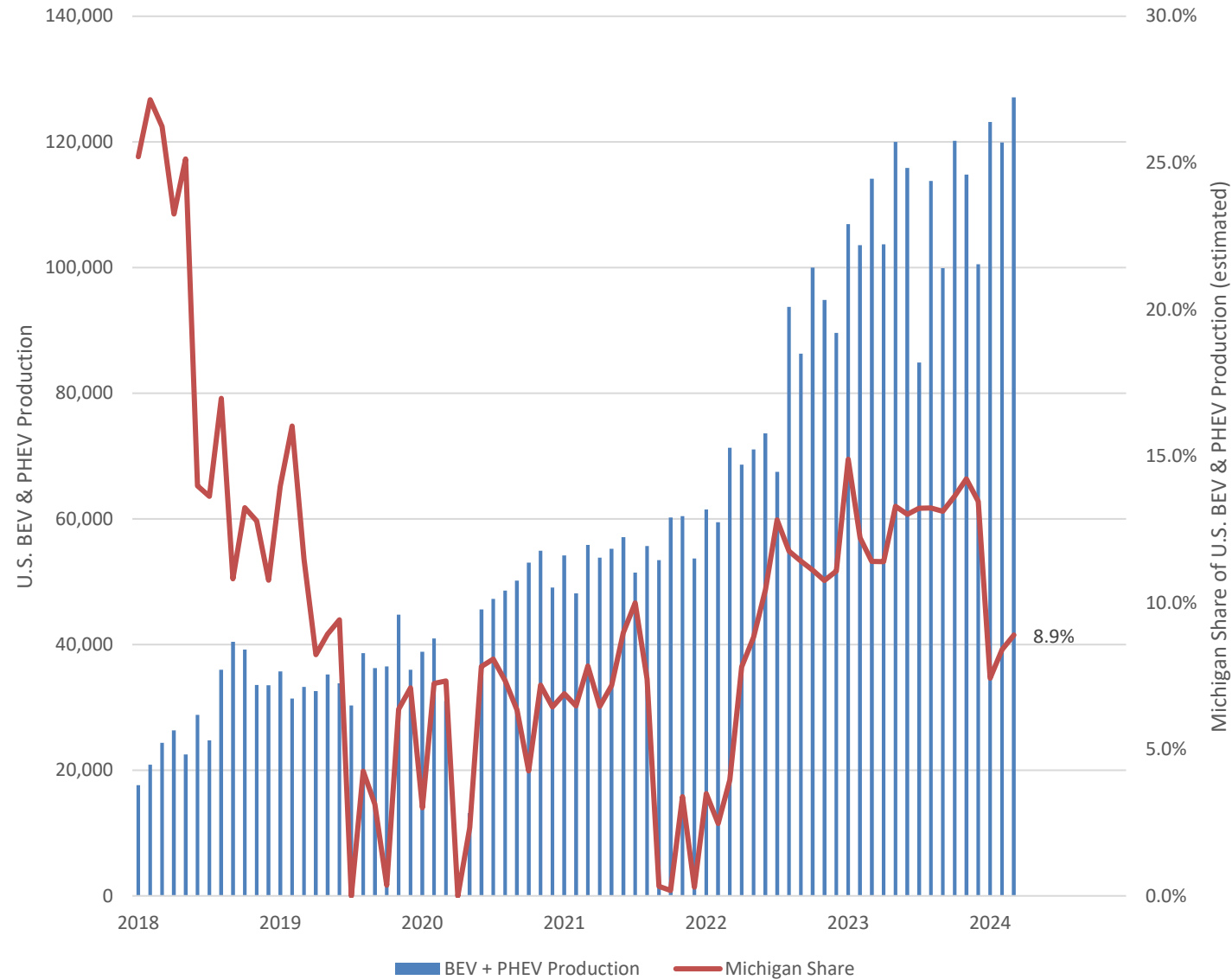
### U.S. Engine, Transmission, & Related Parts Employment, 2007-2022



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment & Wages

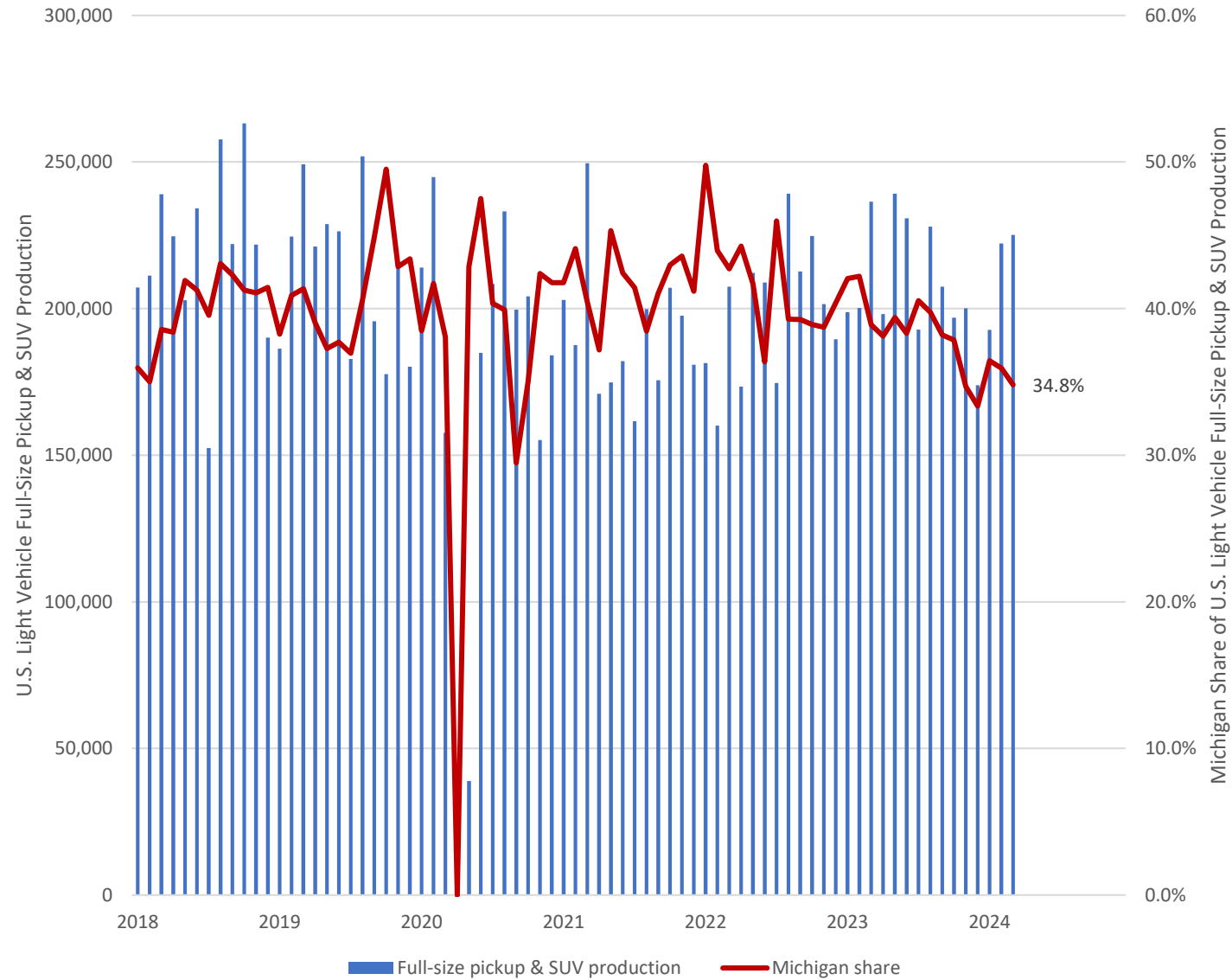


## U.S. Light Vehicle Production & Michigan Share, 2018-2024YTD

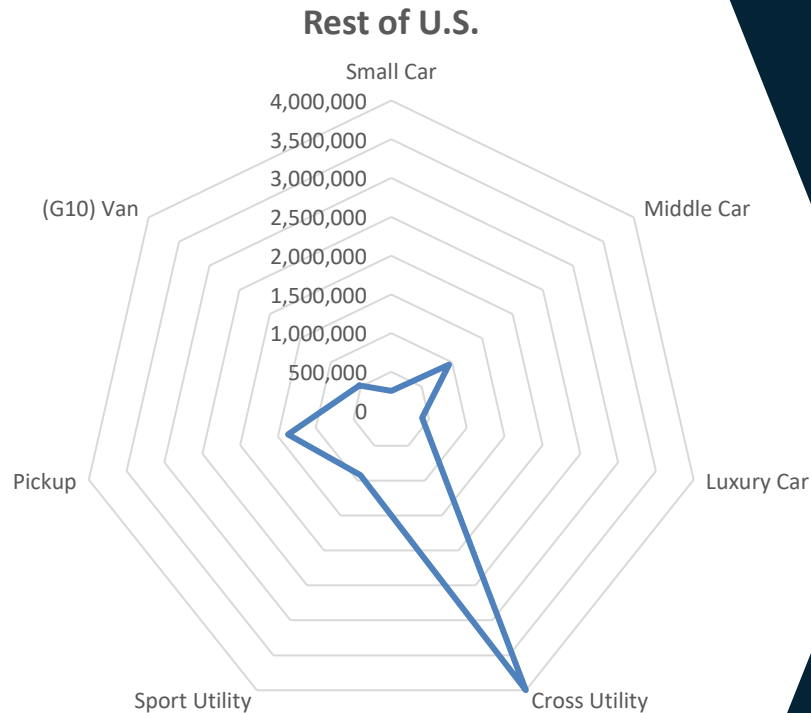
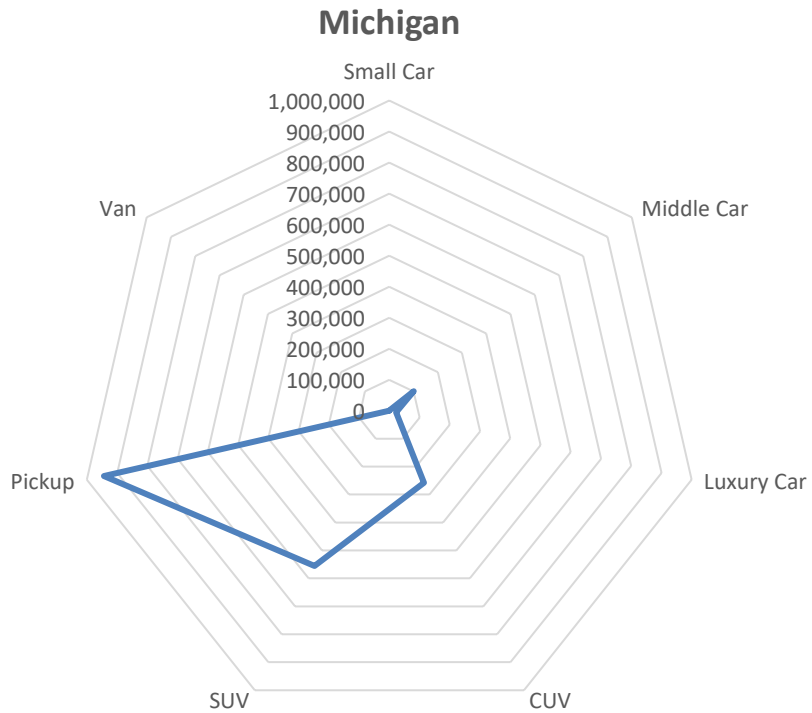


**U.S. Light Vehicle  
BEV & PHEV  
Production &  
Michigan Share,  
2018-2024YTD**

Source: Wards Informa, author's estimates

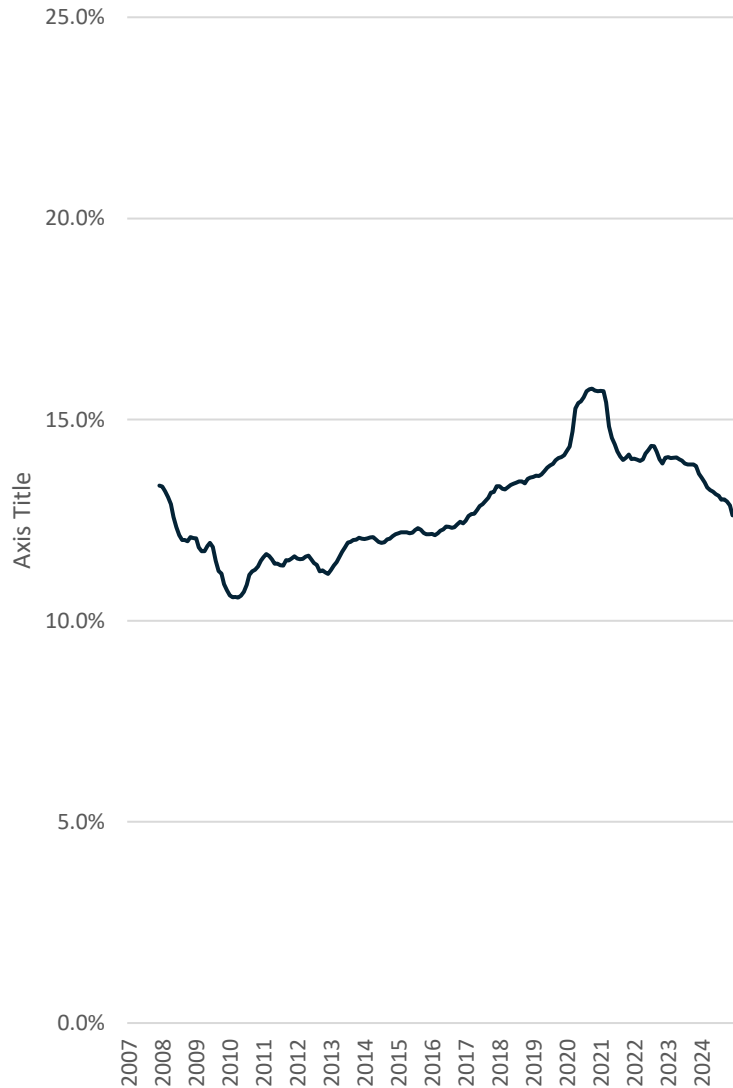


**U.S. Light Vehicle Full-Size Pickup & SUV Production & Michigan Share, 2018-2024YTD**

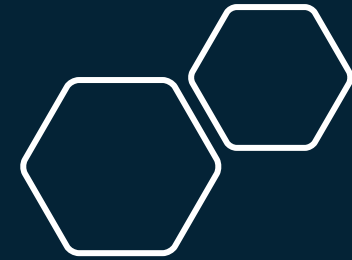
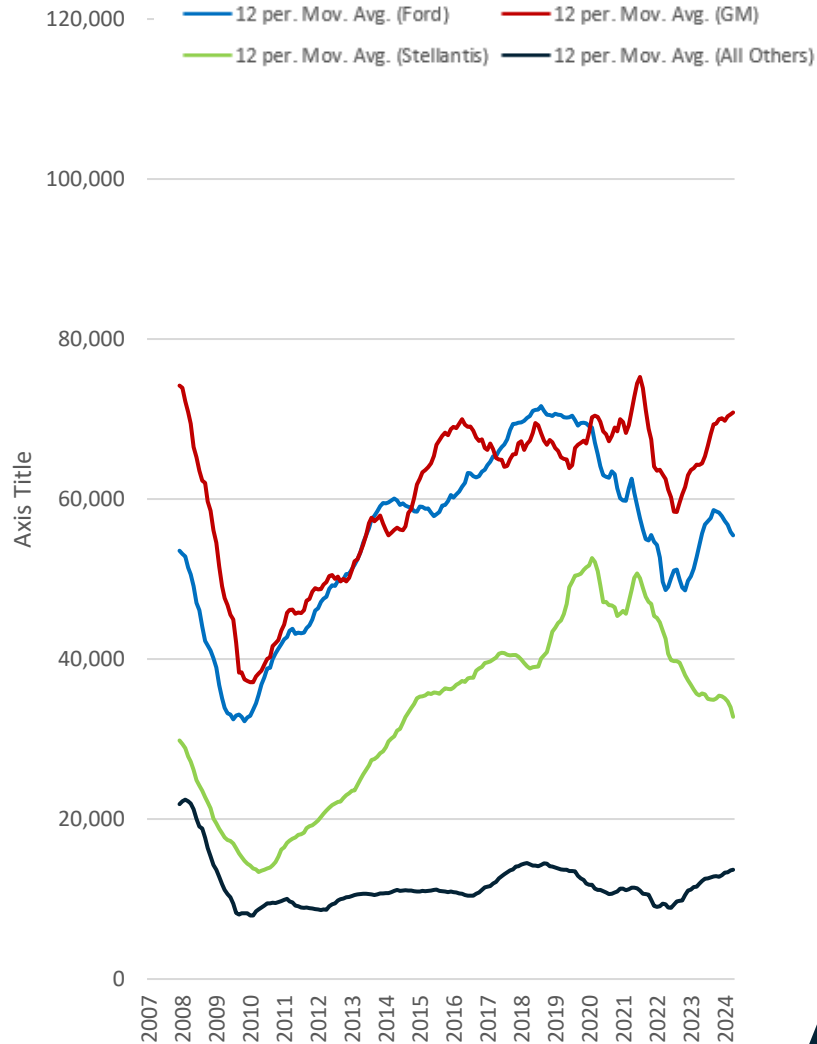


**Michigan Light Vehicle Production is More Concentrated in Pickups & SUVs than the Rest of the U.S.**

Full Size Pickup Share, 12 month MA



Ford, GM, Stellantis, & Others Full-Size Pickup Volumes



**U.S. full-size pickup market share has been falling & volume impact varies across automakers**

# Making the Profitable Leap to Electrification

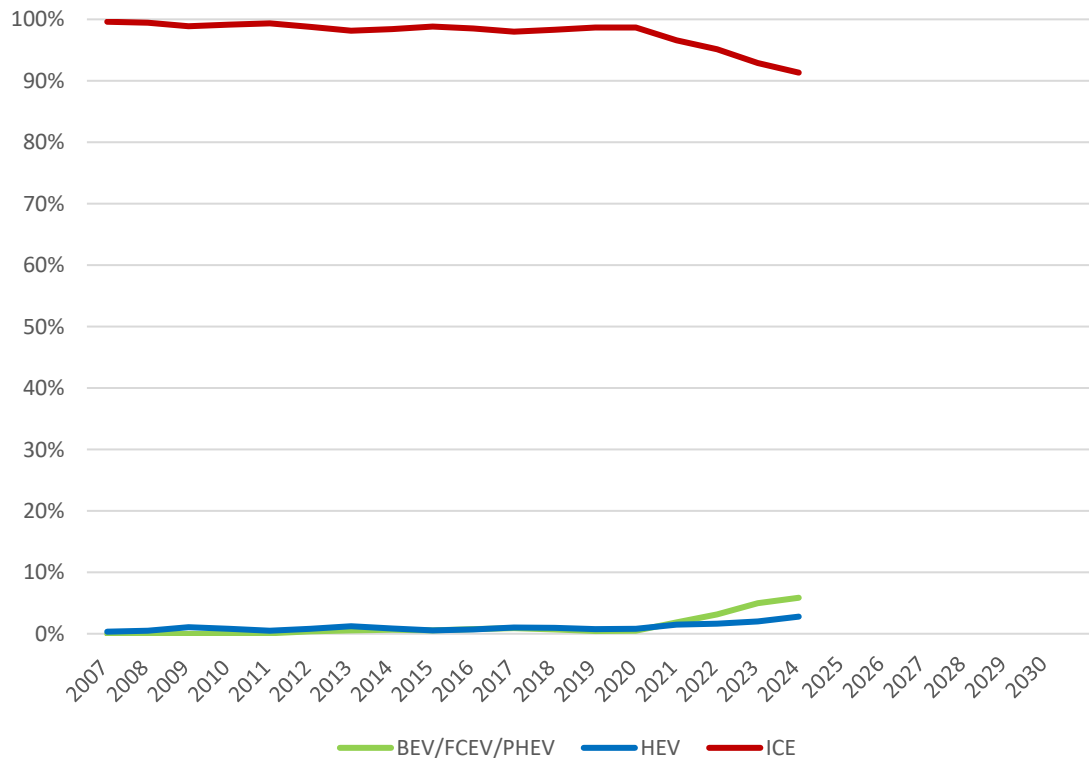
*Legacy full-line producers face specific hurdles*

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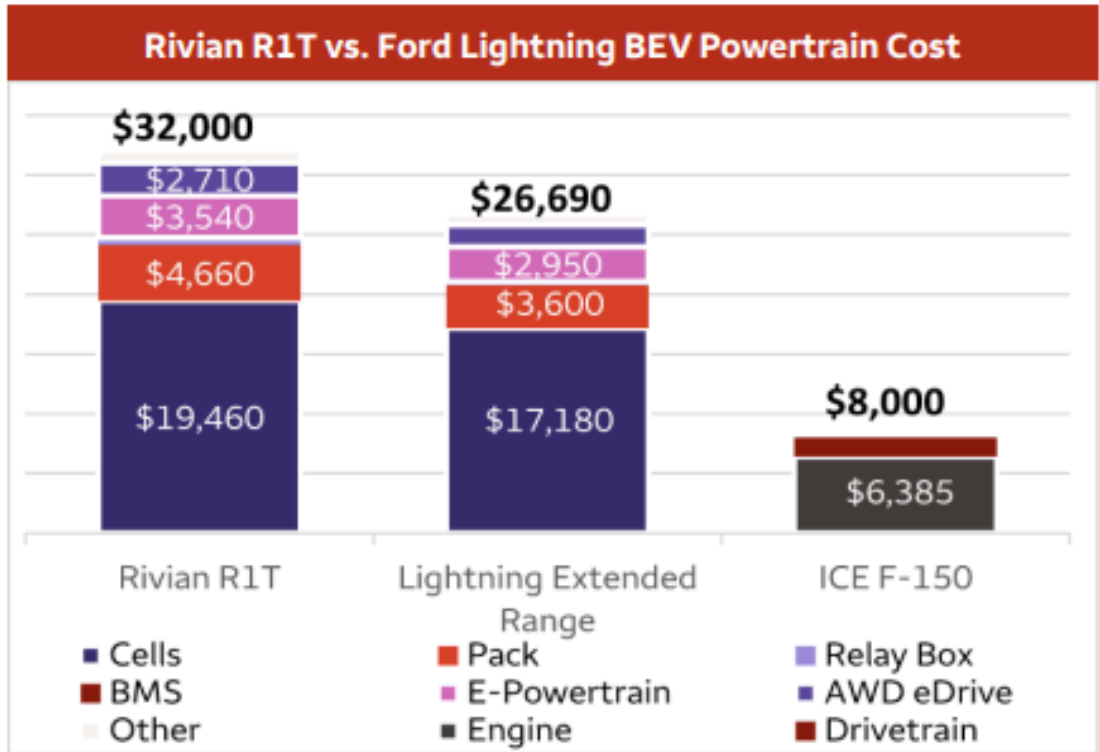
### EV TRANSITION

# Volume of more profitable ICE vehicles is falling which puts pressure on automakers to make profitable EVs

#### Combined Ford, GM, & Stellantis U.S. Market Share by Propulsion Type, 2007-2024



Source: Wards Informa



Source: A2Mac1; Wells Fargo Securities, LLC

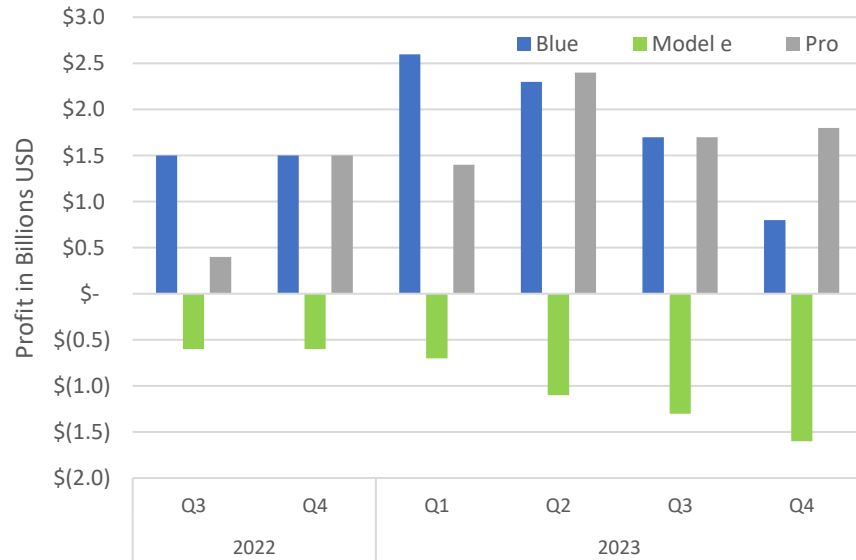


## EV TRANSITION

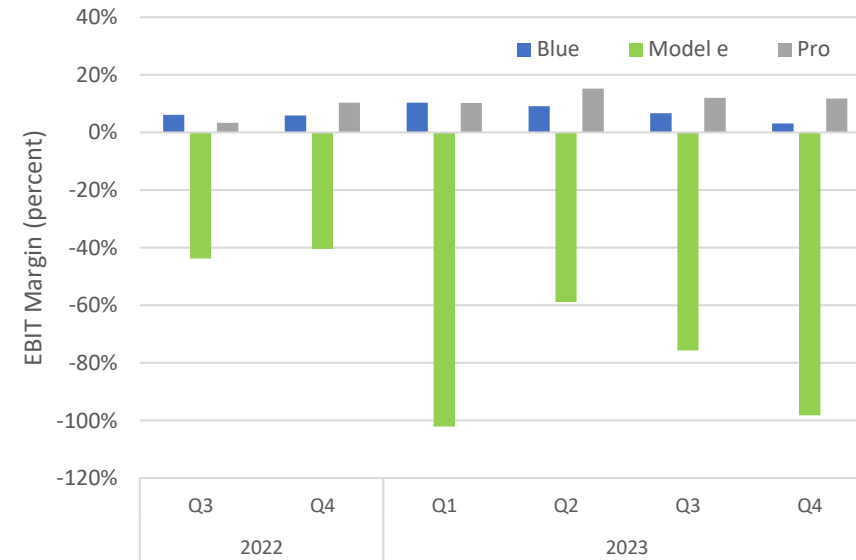
# Legacy automakers are challenged to make money on BEVs

- Losing scale on profitable ICE vehicles pressures legacy firms to quickly get profitable
- Ford is the only “Detroit Three” automaker that breaks out EV profits with EV losses = \$28K/unit
- Without the Model e division, Ford could achieve up to 50% higher profits without EVs

EBIT for ICE (Blue), EVs (Model e), & Commercial Vehicles (Pro)



EBIT Margin for ICE (Blue), EVs (Model e), & Commercial Vehicles (Pro)

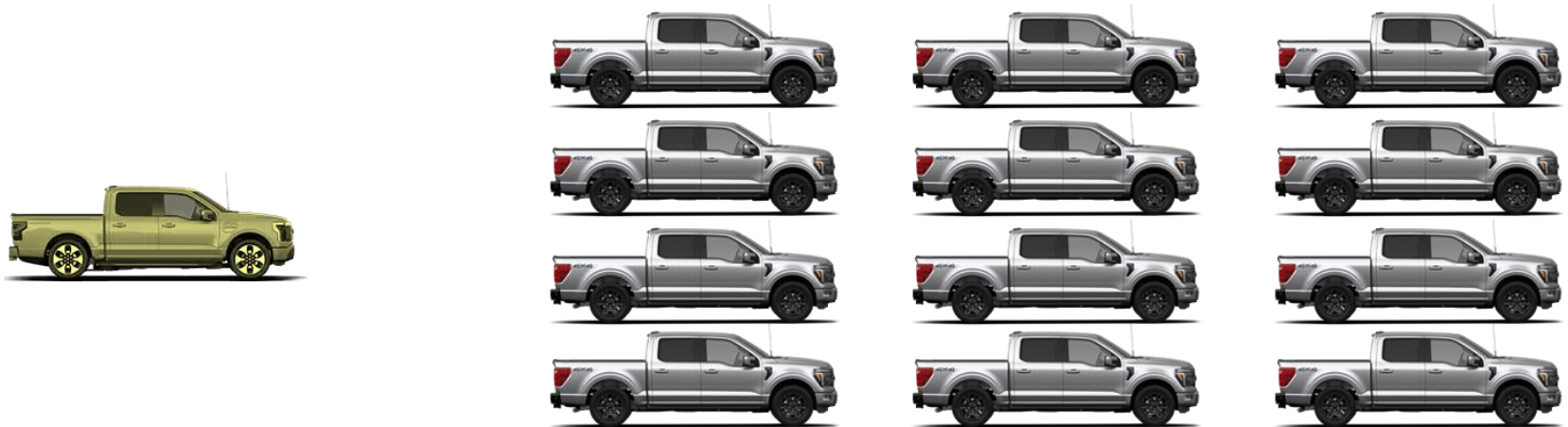


Source: Ford Motor Company Q4 & 2023 Year-End Financial Results

## EV TRANSITION

# But legacy automakers can't afford NOT to make BEVs for regulatory compliance

Regulatory



1 F-150 Lightning allows Ford to sell 12 F-150s with Internal Combustion Engines;  
By 2032, every Lightning will only enable Ford to sell 1.5 F-150 ICE trucks

Profits



...but right now, Ford must sell at least 2 F-150 ICE trucks to make up for the profits lost on every F-150 Lightning

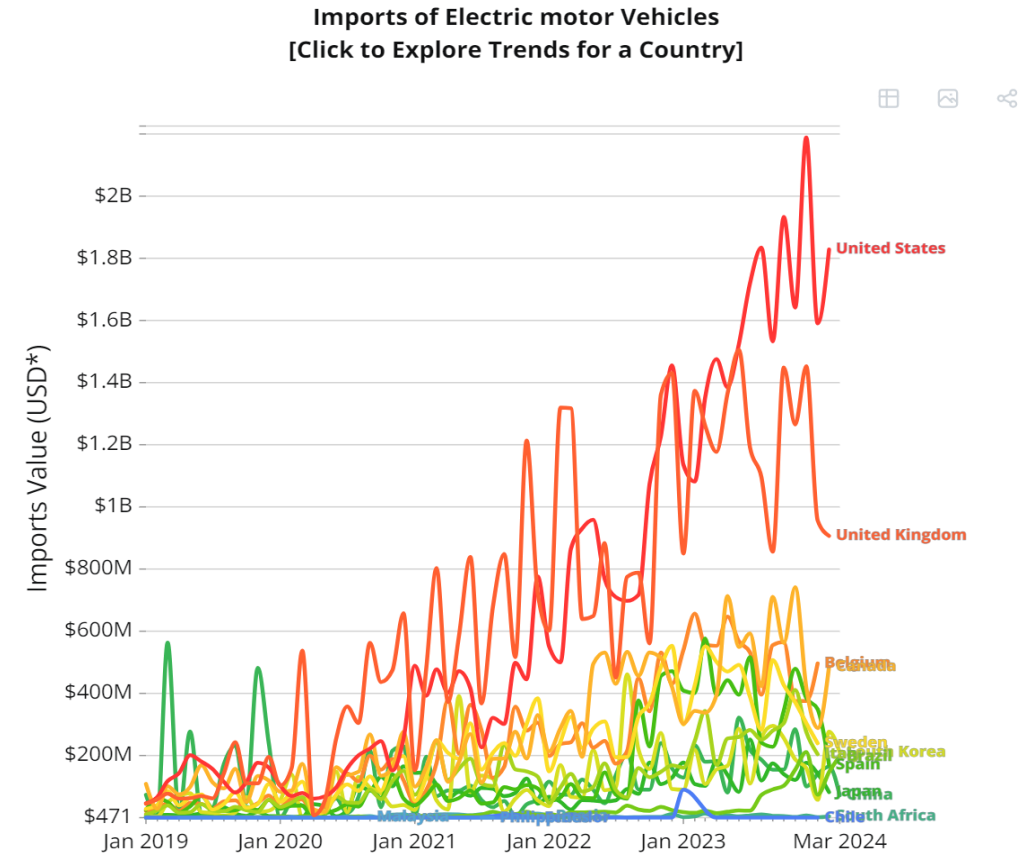
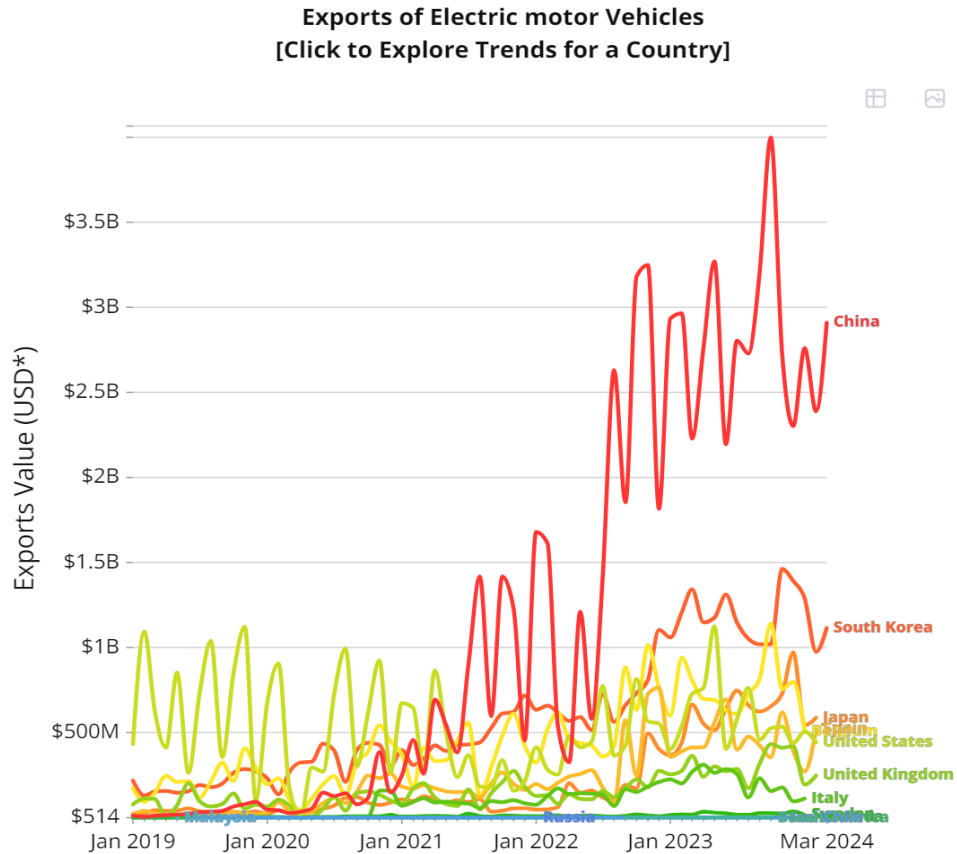
## China's Role in U.S. EV Market

*Few Chinese vehicles, but China holds a dominant position in EV supply chain*

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## CHINA'S ROLE IN U.S. EV MARKET

China is the world's largest exporter of EVs & the U.S. is the world's largest importer—but but there are few Chinese EVs sold in the United States



### CHINA'S ROLE IN U.S. EV MARKET

In fact, there are only **THREE** Chinese-made vehicles sold in the U.S., & only one is a BEV;  
Most U.S. BEV imports are from Germany, South Korea, & Mexico



Buick Envision

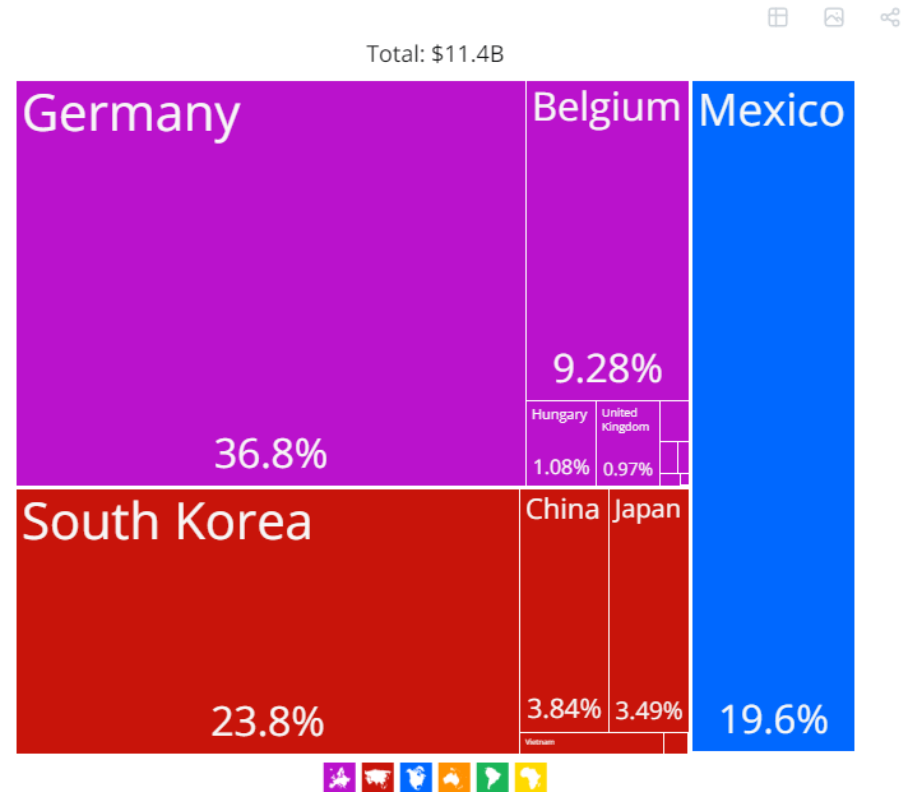


Some Lincoln Nautilus versions



Polestar 2 (BEV)

Exporters of Electric motor Vehicles to United States (2022)  
[Click to Select a Country]

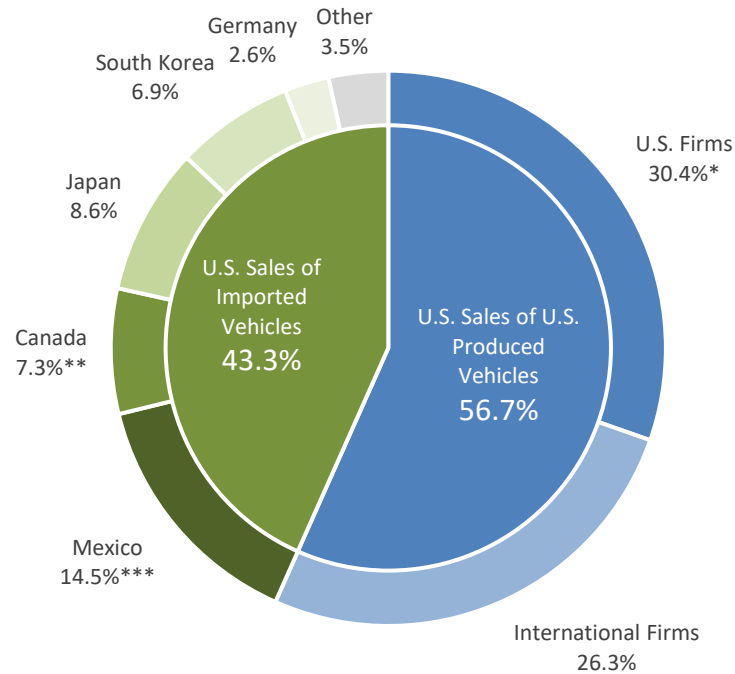


Data Source: Wards Informa; Photos: Buick, Lincoln, & Polestar media sites; OEC world

CHINA'S ROLE IN U.S. EV MARKET

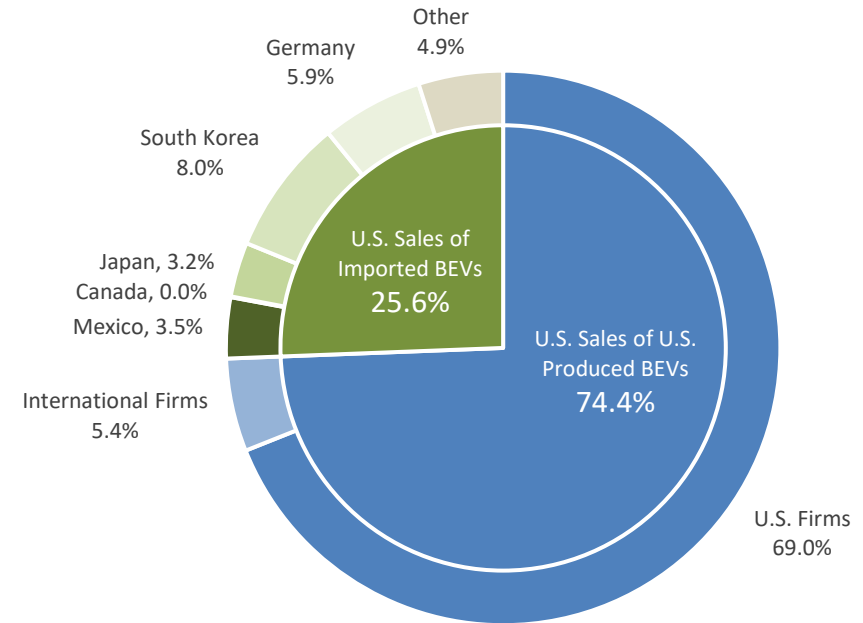
U.S. firms' U.S.-produced vehicles account for just 30.4% of U.S. light vehicle sales but 69% of BEVs

2023 = 15.5M U.S. Light Vehicles Sold



\* Ford/GM/Stellantis share of U.S. Firms' share=25.9%  
 \*\* Ford/GM/Stellantis share of Mexico share=7.2%  
 \*\*\* Ford/GM/Stellantis share of Canada share=2.9%  
 Total Ford/GM/Stellantis share of U.S. Sales=39.3% (includes non-NA imports)  
 Other includes: Austria (0.1%), Belgium (0.3%), China (0.3%), Hungary (0.4%), India (0.02%), Italy (0.4%), Netherlands (0.1%), Serbia (0.0%), Slovakia (0.6%), Spain (0.2%), Sweden (0.5%), Thailand (0.09%), Turkey (0.09%), & the UK (0.5%).

2023 = 1.2M U.S. Light BEVs Sold



\* Ford/GM/Stellantis share of U.S. Firms' share=9.2%  
 \*\* Ford/GM/Stellantis share of Mexico share=3.5%  
 \*\*\* Ford/GM/Stellantis share of Canada share=0.0%  
 Total Ford/GM/Stellantis share of U.S. Sales=12.8%  
 Other includes: Austria (0.04%), Belgium (2.1%), China (0.6%), Hungary (1.9%), & the UK (0.3%).

## Wrap-up

*Michigan has a strong footing in both EV & non-EV production*

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# Wrap-up

- 1) U.S. market remains solid, but “D3” market share continues to erode (& full-size pickup share is something to keep an eye on given Michigan’s dependence on this segment)
- 2) Electrified vehicles are still the fastest growing part of the market. The EV “slowdown” is a slowdown in growth rates—not negative growth
- 3) Michigan has a strong EV footprint & ICE footprint—greater adoption of PHEV/HEVs may prolong Michigan’s engine & transmission production
- 4) Making profitable EVs is a huge challenge—full-line producers have both advantages (can shift to meet market demand) & disadvantages (losing volume on profitable models crimps cash for investment/R&D)
- 5) China dominates EV & EV battery/component production—non-China sourcing will take time to develop



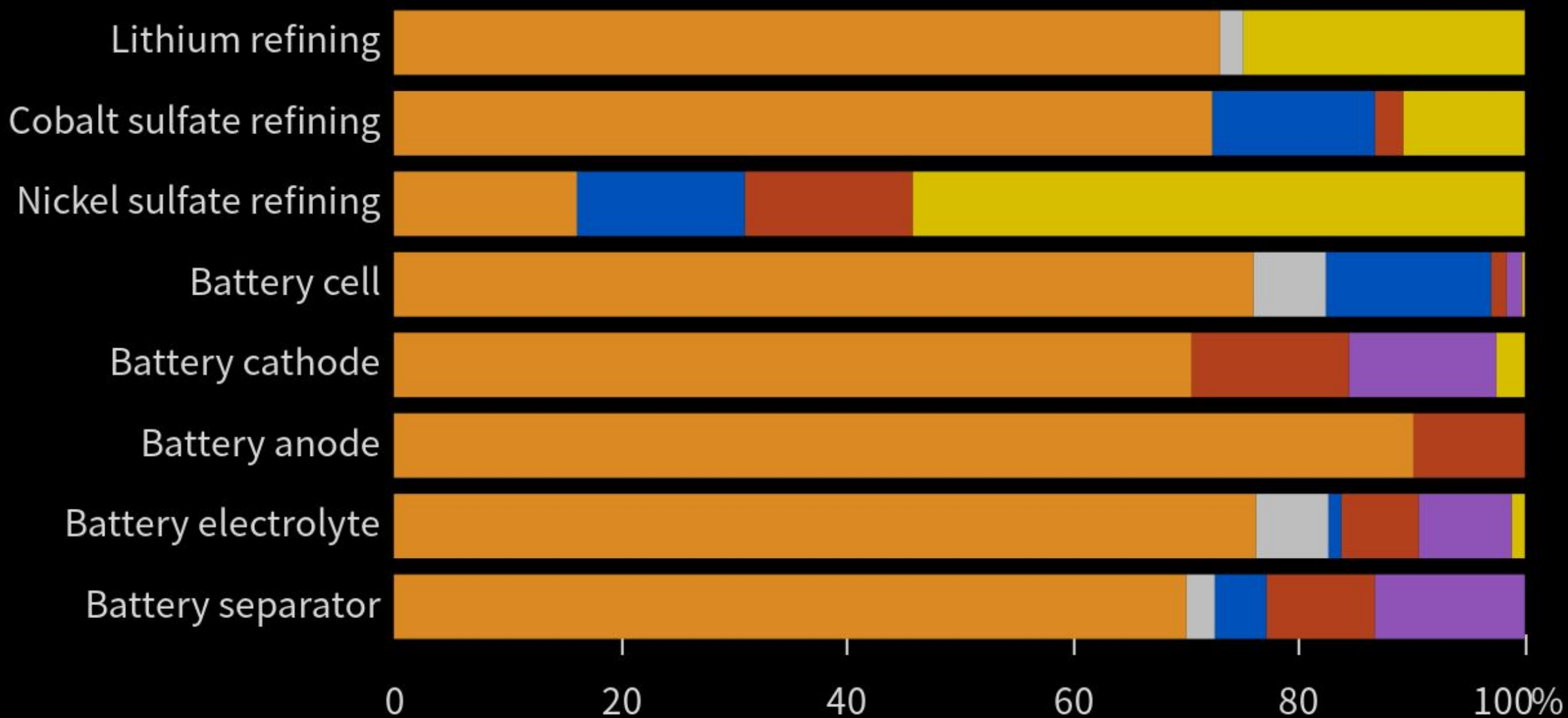


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# The country dominates much of the battery industry

China US Europe Japan South Korea Rest of the World

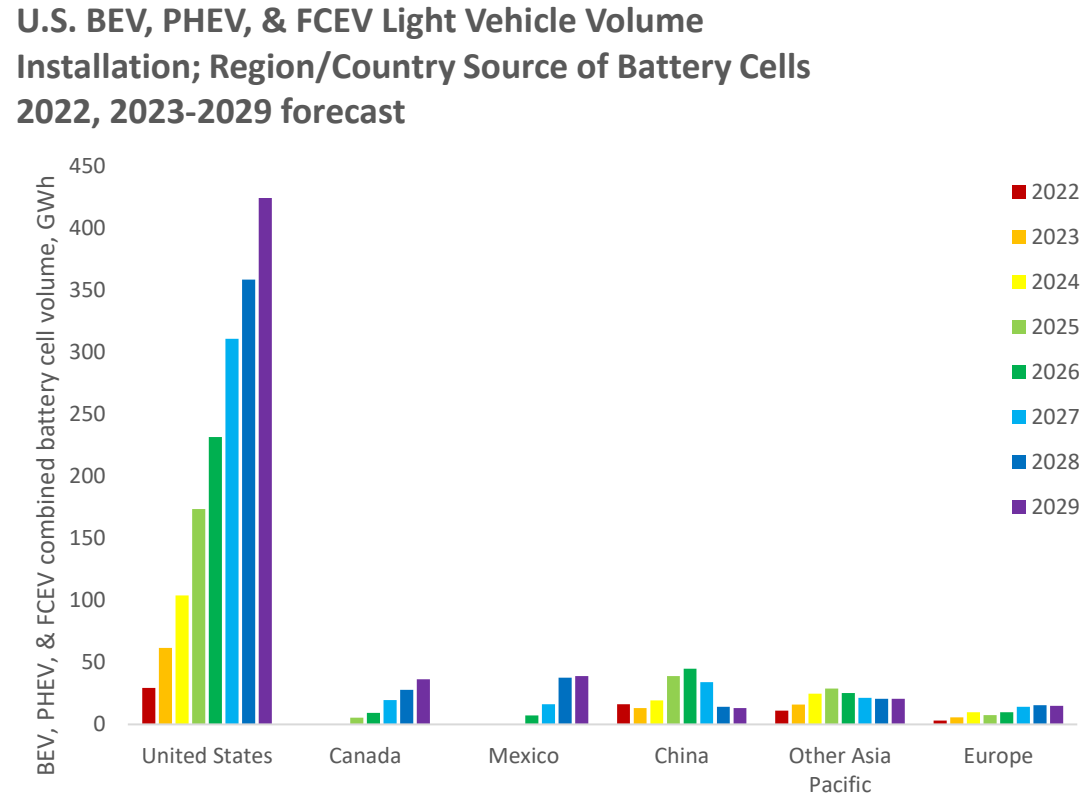
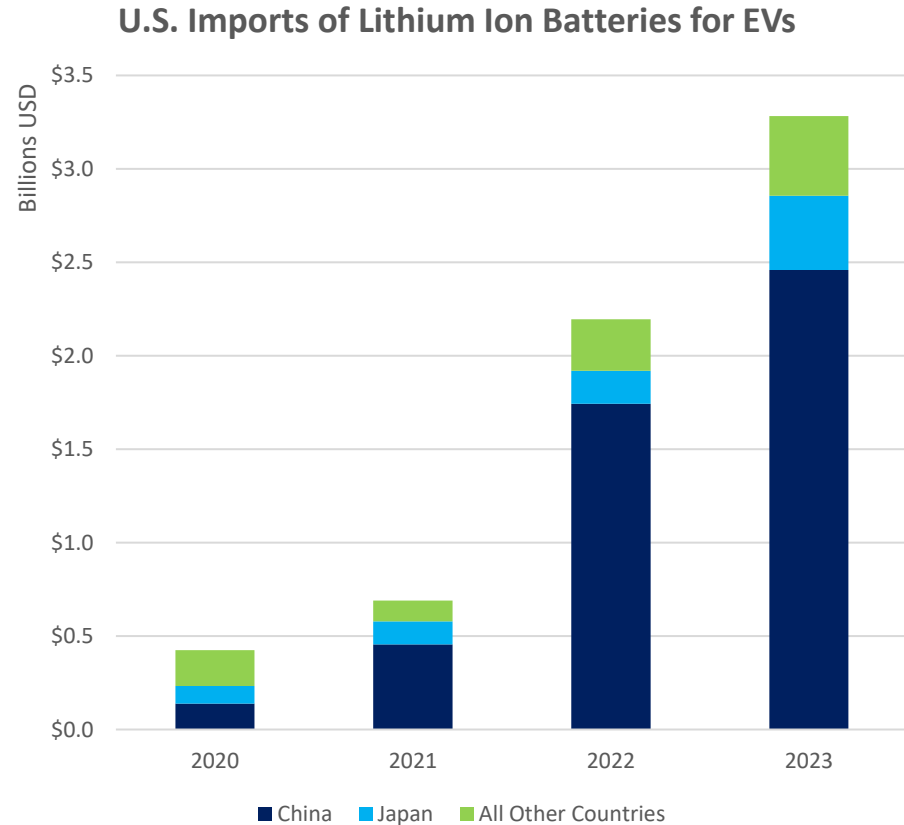


Source: BloombergNEF

Bloomberg

### CHINA'S ROLE IN U.S. EV MARKET

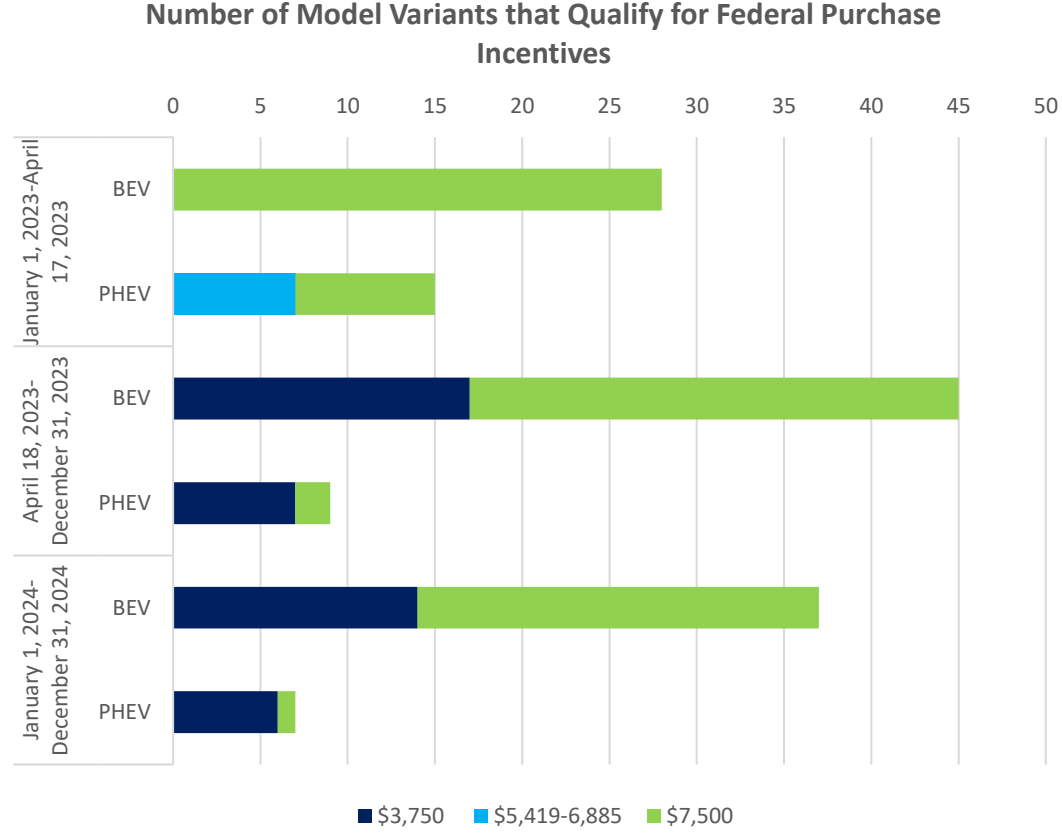
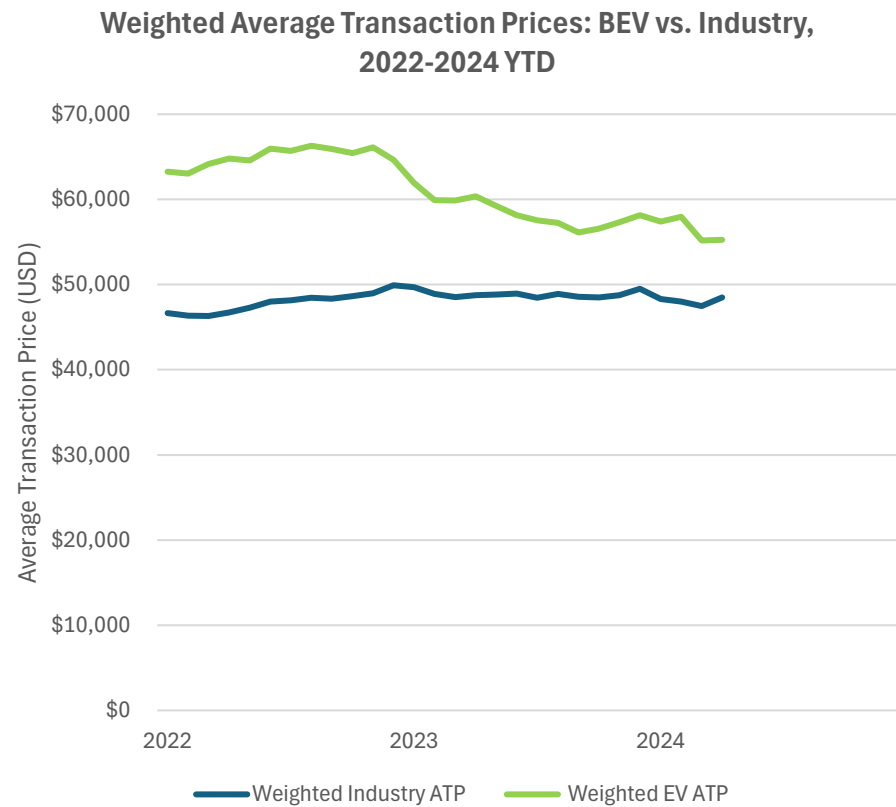
# U.S.-produced battery electric, plug-in hybrid, & fuel cell vehicles are expected to rapidly shift to U.S.- sourced battery cells



Source: U.S. ITC Dataweb; S&P Global Mobility, High Voltage Battery forecast, November 2023.

## CHINA'S ROLE IN U.S. EV MARKET

# U.S.-produced battery electric, plug-in hybrid, & fuel cell vehicles are expected to rapidly shift to U.S.-sourced battery cells



Source: Cox Automotive/Kelley Blue Book/fueleconomy.gov

## CHINA'S ROLE IN U.S. EV MARKET

# Proposed U.S. Section 301 tariff modifications on Chinese imports of strategic products

Battery parts (non-lithium-ion batteries)	Increase rate to 25% in 2024
Electric vehicles	Increase rate to 100% in 2024
Facemasks	Increase rate to 25% in 2024
Lithium-ion electrical vehicle batteries	Increase rate to 25% in 2024
Lithium-ion non-electrical vehicle batteries	Increase rate to 25% in 2026
Medical gloves	Increase rate to 25% in 2026
Natural graphite	Increase rate to 25% in 2026
Other critical minerals	Increase rate to 25% in 2024
Permanent magnets	Increase rate to 25% in 2026
Semiconductors	Increase rate to 50% in 2025
Ship to shore cranes	Increase rate to 25% in 2024
Solar cells (whether or not assembled into modules)	Increase rate to 50% in 2024
Steel and aluminum products	Increase rate to 25% in 2024
Syringes and needles	Increase rate to 50% in 2024

[U.S. Trade Representative Katherine Tai to Take Further Action on China Tariffs After Releasing Statutory Four-Year Review | United States Trade Representative \(ustr.gov\)](#)