ALLIANCE FOR AUTOMOTIVE INNOVATION

New Mexico Transportation Infrastructure Revenue Subcommittee

The Necessary Conditions for a Transportation EVolution

Dan Bowerson, Senior Director – Energy & Environment

September 29, 2023

Types of Electric Vehicles (PHEVs, BEVs, FCEVs)

- **Plug-In Hybrid Electric Vehicles (PHEVs) - XC60 T8, Clarity, RAV4 Prime, Wrangler 4xe)**




- **Battery Electric Vehicles (BEVs - LEAF, Bolt, ID.4, F150, i5, MX 30, EV6, EQS)**



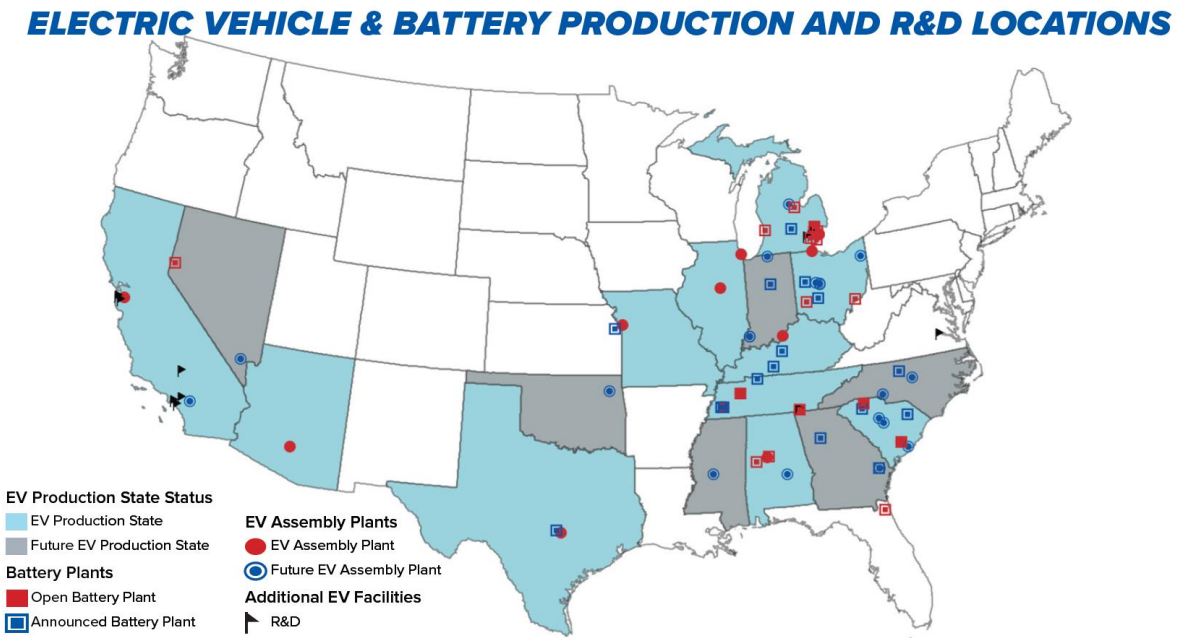


- **Hydrogen Fuel Cell Electric Vehicles (FCEVs - Mirai, Nexo)**





The Future Is Electric



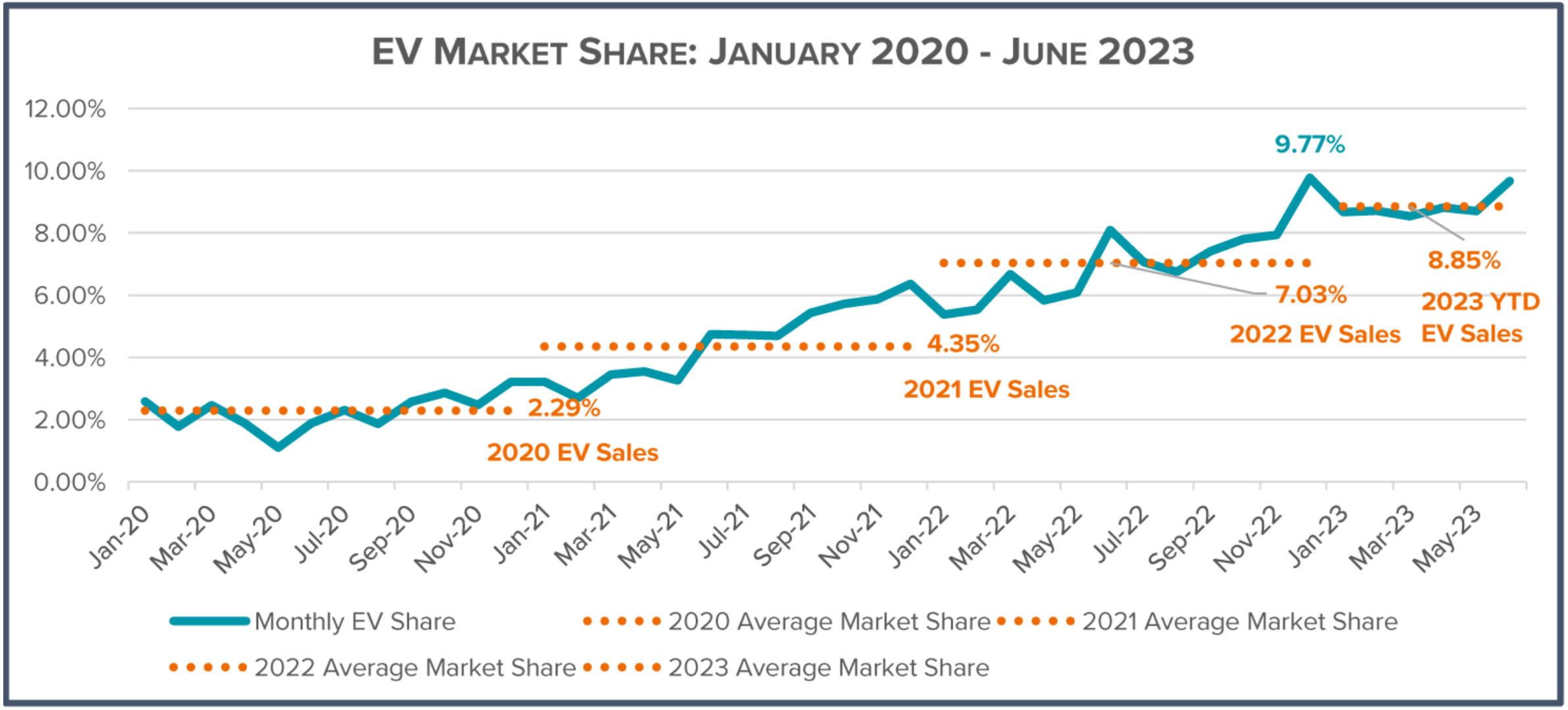
With the right complementary policies in place, the auto industry is poised to accept the challenge of driving EV purchases to between 40 and 50 percent of new vehicle sales by the end of the decade.

-Auto Innovators (Aug. 5, 2021)

- $115+ Billion in U.S. Investment by autos and battery partners since 2017
- $1.2 Trillion Global EV Investment by 2030
- U.S. Battery plant manufacturing capacity set to grow 649% by 2025

https://www.autosinnovate.org/posts/communications/The%20Future%20Is%20Electric%20Infographic

What are customers buying?



Source: https://www.autosinnovate.org/getconnected

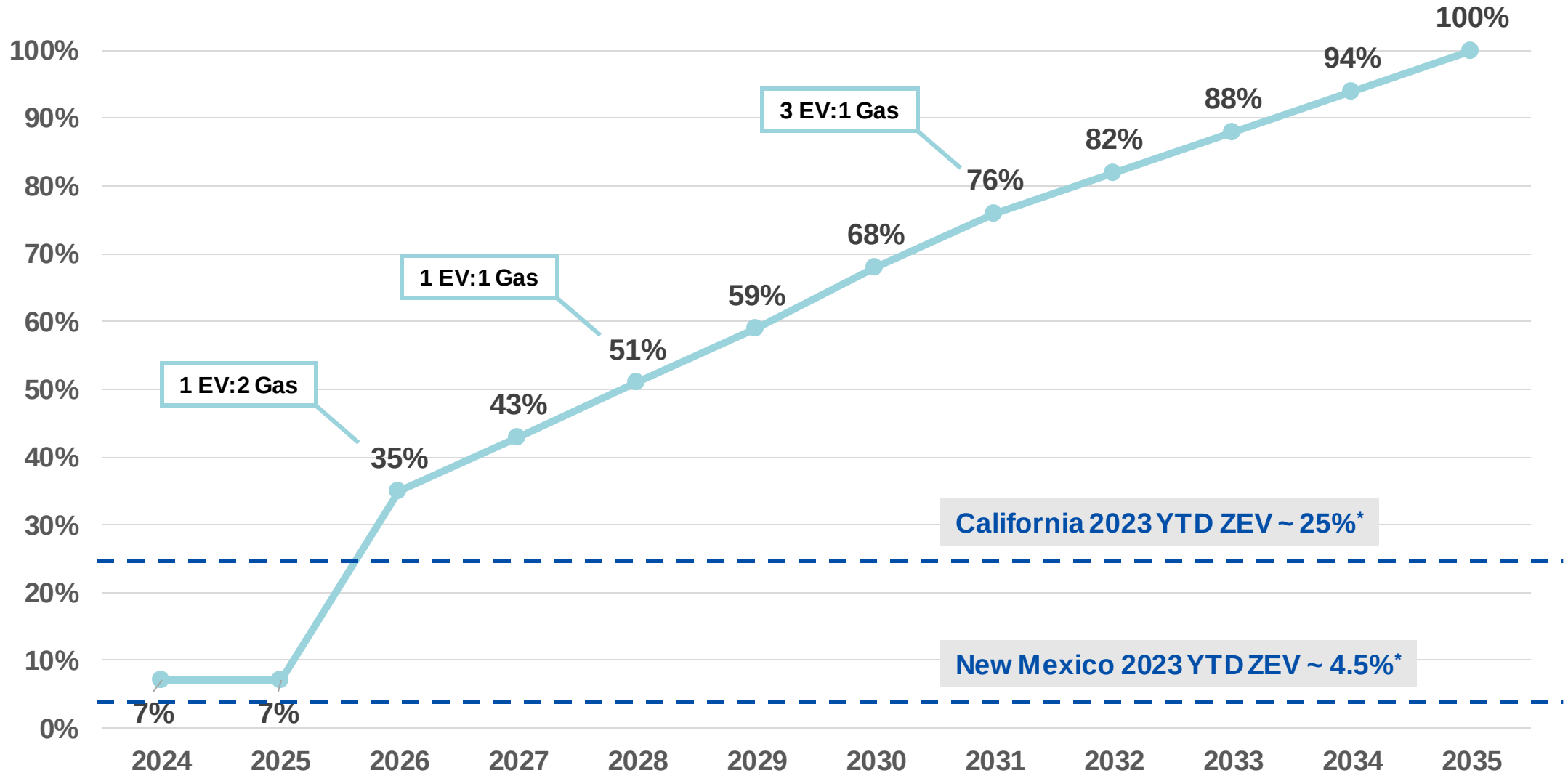
Regulatory Landscape

1 Tailpipe, 4 Agencies, 7 Regulations

California	U.S. EPA	NHTSA	DOE
GHG Likely rulemaking in 2024 for MY 2026+	**GHG** MY 2027-2032 (proposed 5/5/2023)	**CAFE** MY 2027-2031 (proposed 8/17/2023)	**EV Fuel Economy Calculation (PEF)** (Proposed 3/29/2023)
Other Emissions (LEV 4) Final rules thru MY2035	**Other Emissions (Tier 4)** MY 2027-2032 (proposed 5/5/2023)		
ZEV Mandate Final rules through MY2035 (100% EV)			

*** President Biden EO 14037 set a goal of 50% ZEV by 2030.**

California ACC II – ZEV Mandate



* See: https://www.autosinnovate.org/getconnected

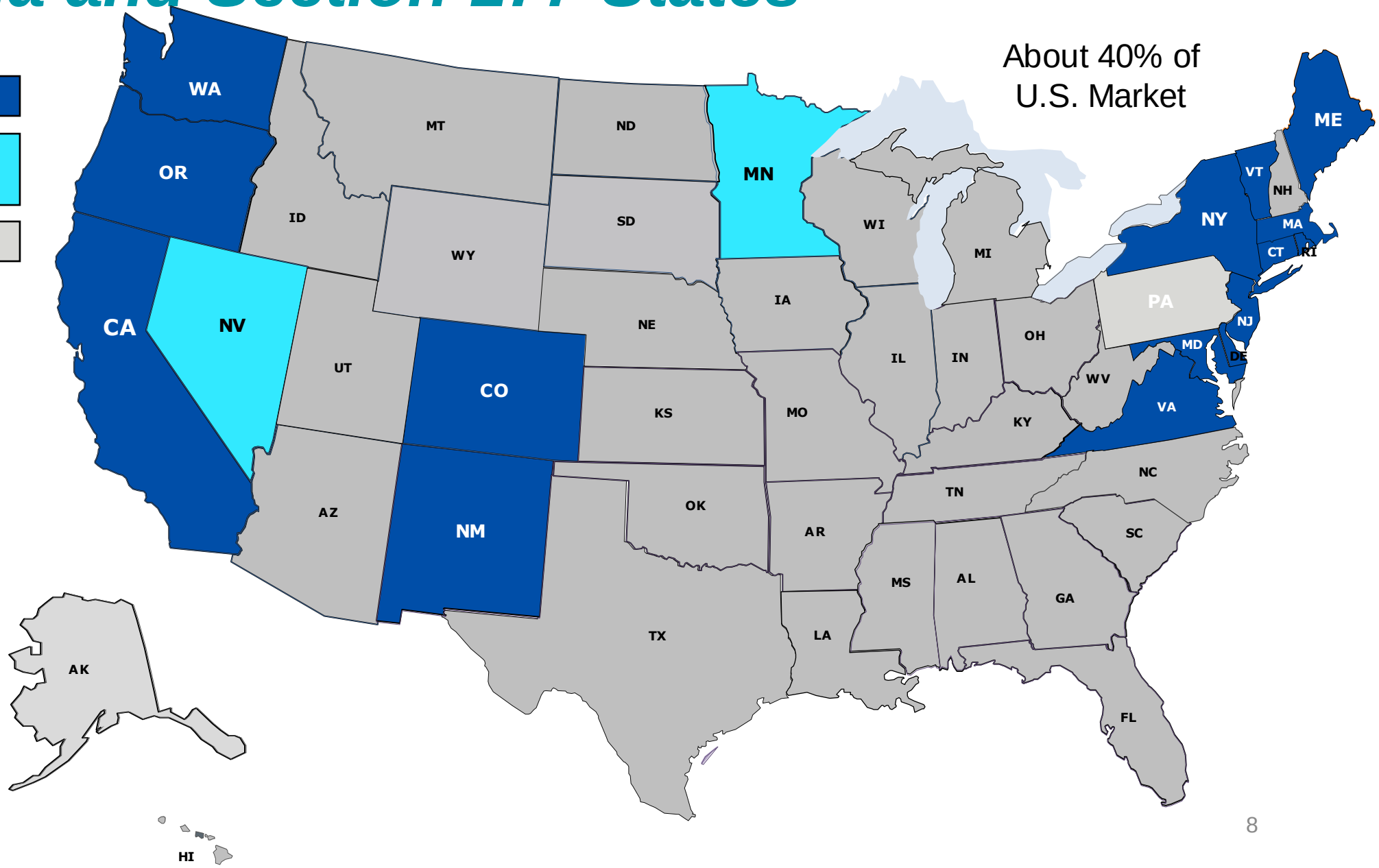
California and Section 177 States

LEV, GHG, and ZEV

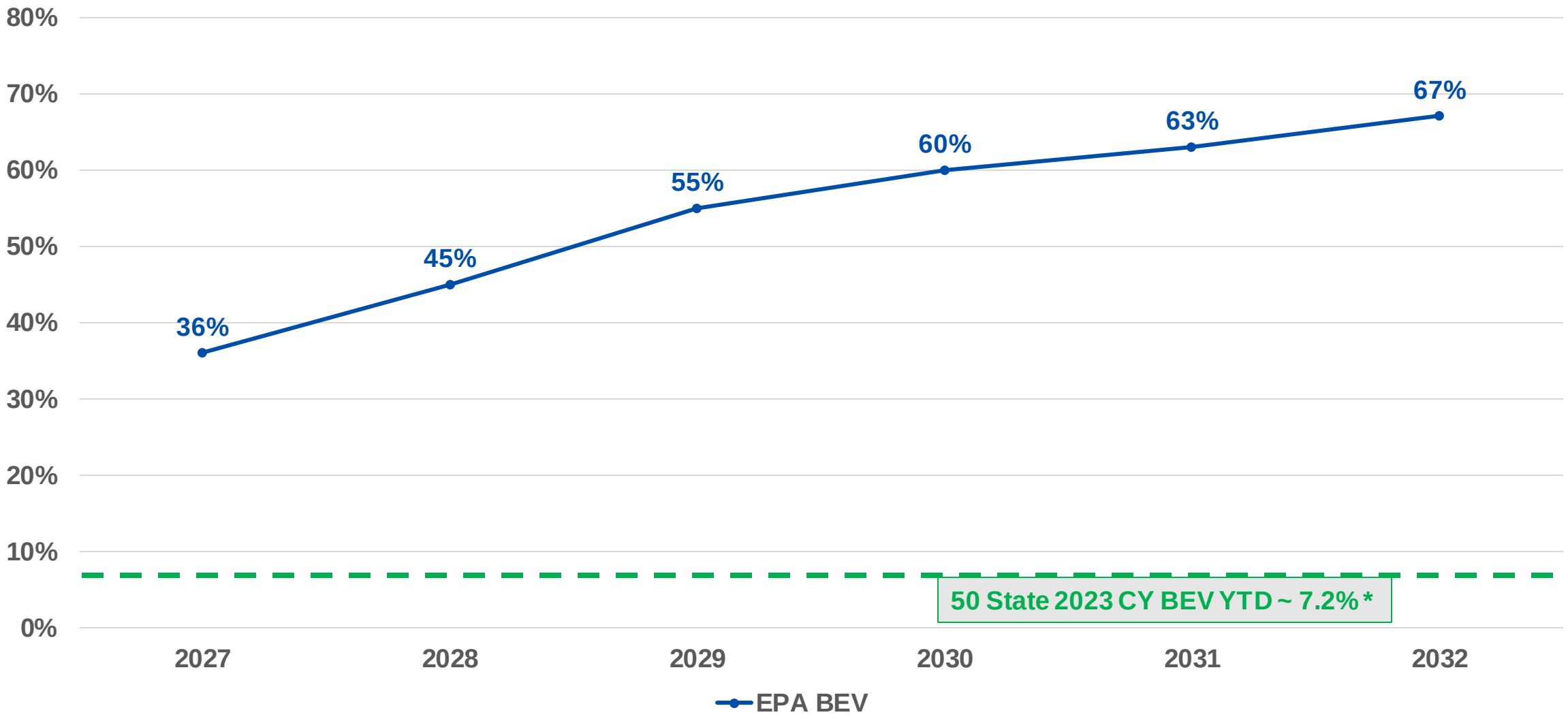
LEV, GHG, and ZEV
Not currently adopting ACC II

LEV only

Not all states have fully adopted ACC II (2026 and later) regulations. This summary reflects the current assessment of state direction. Some states may also adopt only certain years (e.g., CO thru 2032).



EPA Proposed Regulation – Pure Battery Electric Vehicles

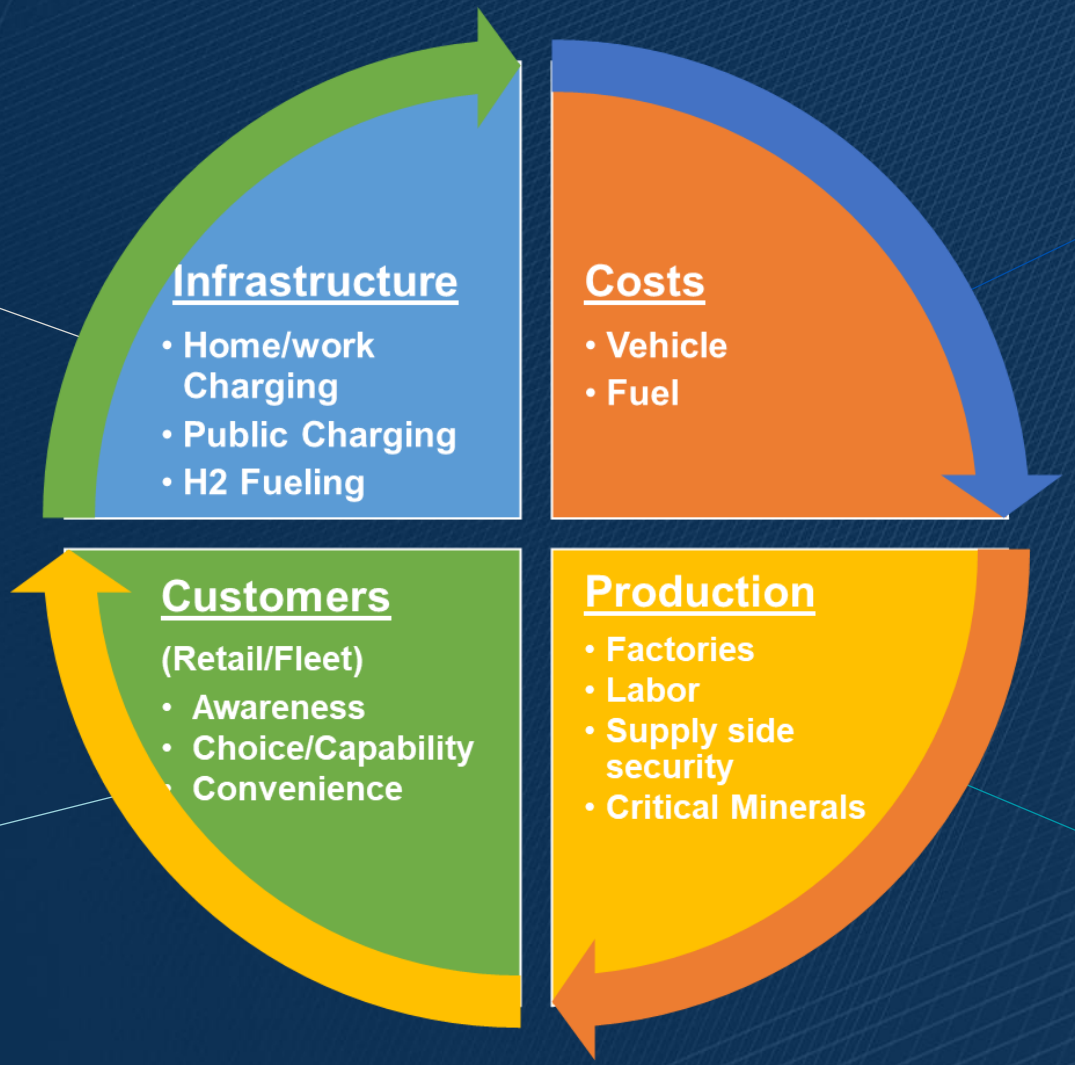


* See: https://www.autosinnovate.org/getconnected

Keys to Expanded Electric Vehicle Adoption

- Convenient, easy to use, everywhere
- Top reason to reject an EV "Nowhere to Charge"

- Buy-in from all new vehicle purchasers

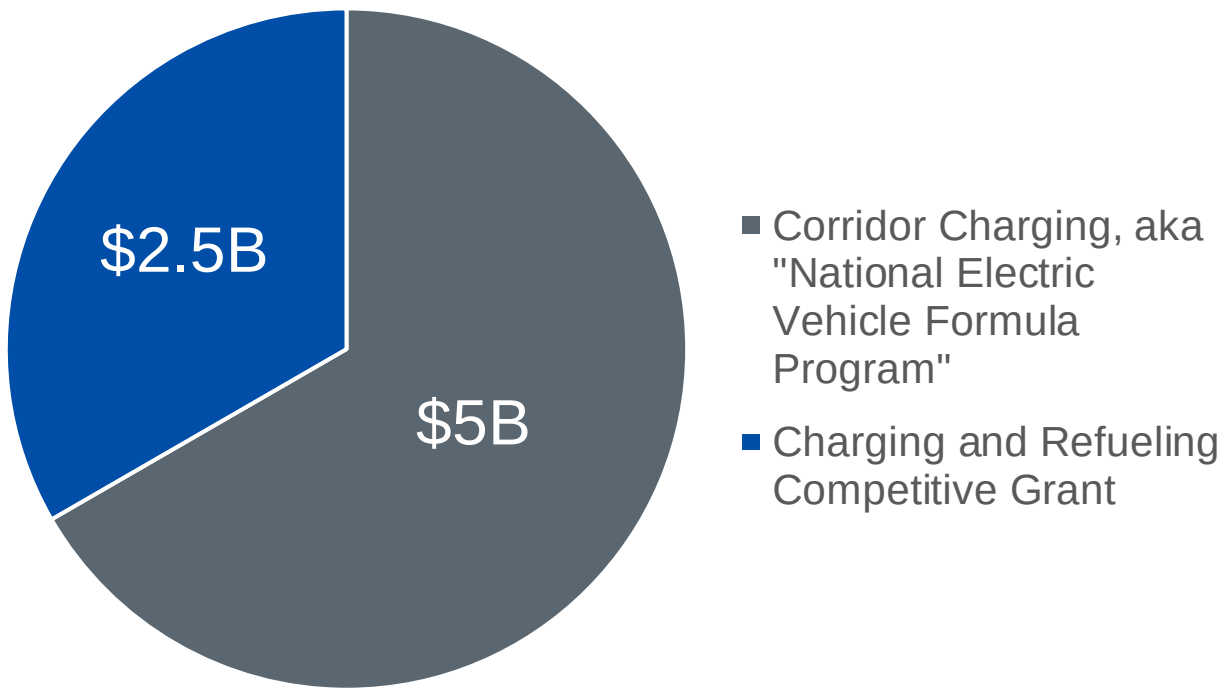


- EVs still more expensive than gas - Incentives help bridge the gap
- Fuel must be cheaper than gas

- Automakers investing $515 billion domestically by 2030 (starting line)
- Building a new global supply chain from scratch, hundreds of factories.

Federal Incentives

Bipartisan Infrastructure Law EV Charging Infrastructure



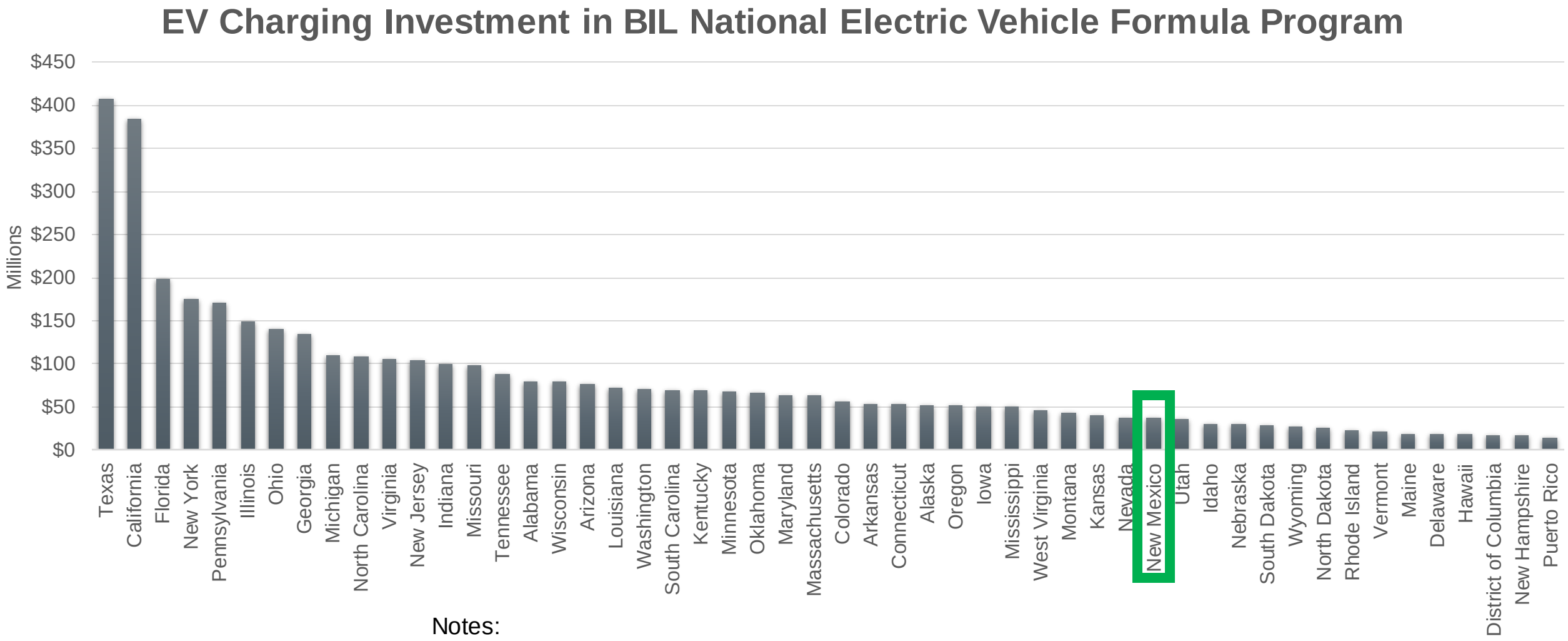
National EV Formula Program

- FY22 – FY26; Federal share = 80%
- Funds allocated to states using formula (23 U.S. Code § 104 subsection (c))
- To be used for EV charging on alternative fuel corridors
  - If alt. fuel corridors fully built out, funding may be used for publicly available chargers
- States submitted plans to DOT on intended funding usage
- DOT and DOE must provide guidance to states to prioritize investments, i.e.:
  - "current and anticipated market demands for [EV] charging infrastructure, including with regard to power levels and charging speed, and minimizing the time to charge current and anticipated vehicles"

Charging and Refueling Infrastructure Grants

- FY22 – FY26; Federal share up to 80%
- Charging *and* hydrogen, propane, and natural gas fueling
- 50% along FHWA-designated Alt. Fuel Corridors & 50% "Community Grants"
- Publicly accessible projects outside of Alt. Fuel Corridors given priority for rural, low income and underserved communities, and multi-unit dwellings

State EV Charging Funding through National Electric Vehicle Formula Program



Notes:

- Values rounded to the nearest $million.
- Does not take into account $2.5B for competitive grants.
- Source - White House Fact Sheets

Inflation Reduction Act

Manufacturing and Supply Chain

- 45X Manufacturing tax credits ($30.6 billion budget score)
- Advanced Technology Vehicle Manufacturing loans ($3 billion)
- Domestic manufacturing conversion grants ($2 billion)
- Defense Production Act to spur onshoring of critical minerals ($500 million)

Infrastructure

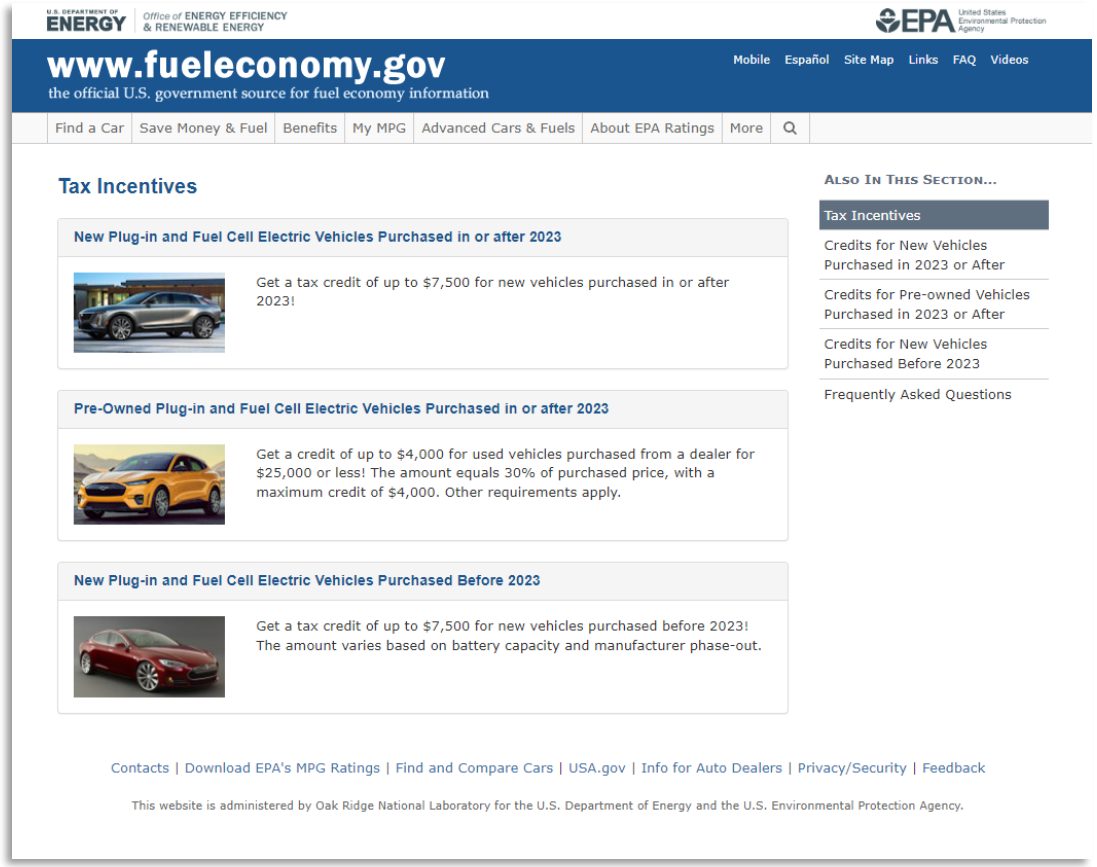
- 30C Alternative Fuel Refueling Property Credit ($1.7 billion budget score)
- 48C Advanced Energy Project Credit ($6.3 billion budget score)

Customer Incentives

- 30D Clean Vehicle Tax Credit ($7.5 billion budget score)
  - Up to $7,500 per vehicle
  - Removes per manufacturer cap on credits
  - Requires N. American production
  - Adds income and MSRP limits
  - N. American battery and component manufacturing requirements
  - Critical mineral sourcing / processing restrictions
- 45W Qualified Commercial Vehicle Tax Credit ($1.3 billion budget score)
  - Light vehicles qualify for up to $7,500 per vehicle
  - Commercial lessors of personal vehicles can qualify
- 25E Previously-Owned Clean Vehicle Tax Credit ($1.3 billion budget score)

Clean Vehicle Credit ($7,500)

- **30D tax credit is effectively a consumer tax credit wrapped in industrial policy**
- **Early 2023 was the "high water mark" for eligible vehicles**
  - 43% - or 39 out of 91 EVs for sale in the U.S. were eligible for $7,500 30D tax credit
- **As of September 5th, less than 20 vehicles qualify for all or half of the $7,500 tax credit (30D)**
- **Department of Treasury will soon issue guidance that will determine future eligibility due to "Foreign Entities of Concern" for Battery Components**



https://fueleconomy.gov/feg/taxcenter.shtml

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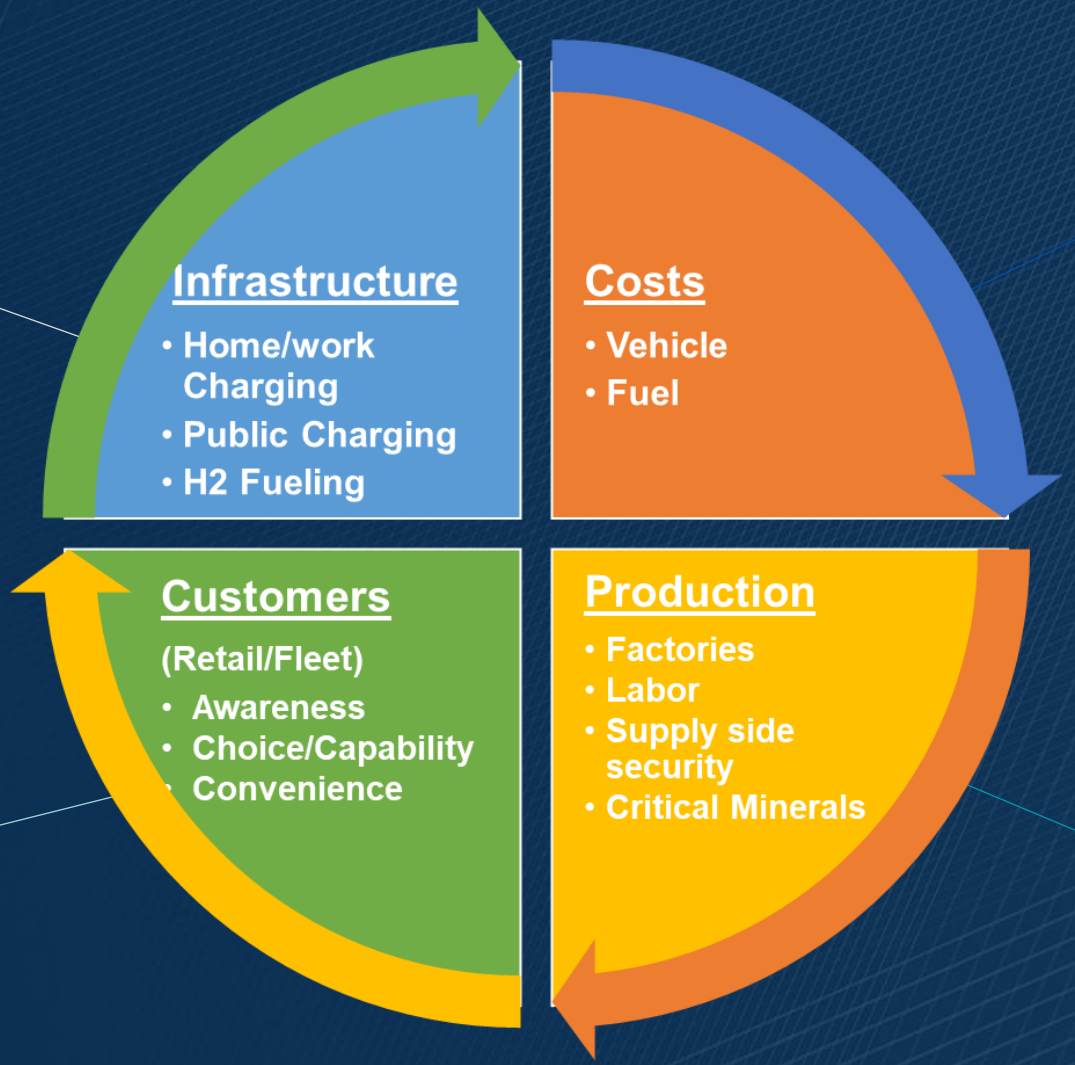

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Infrastructure is lacking…

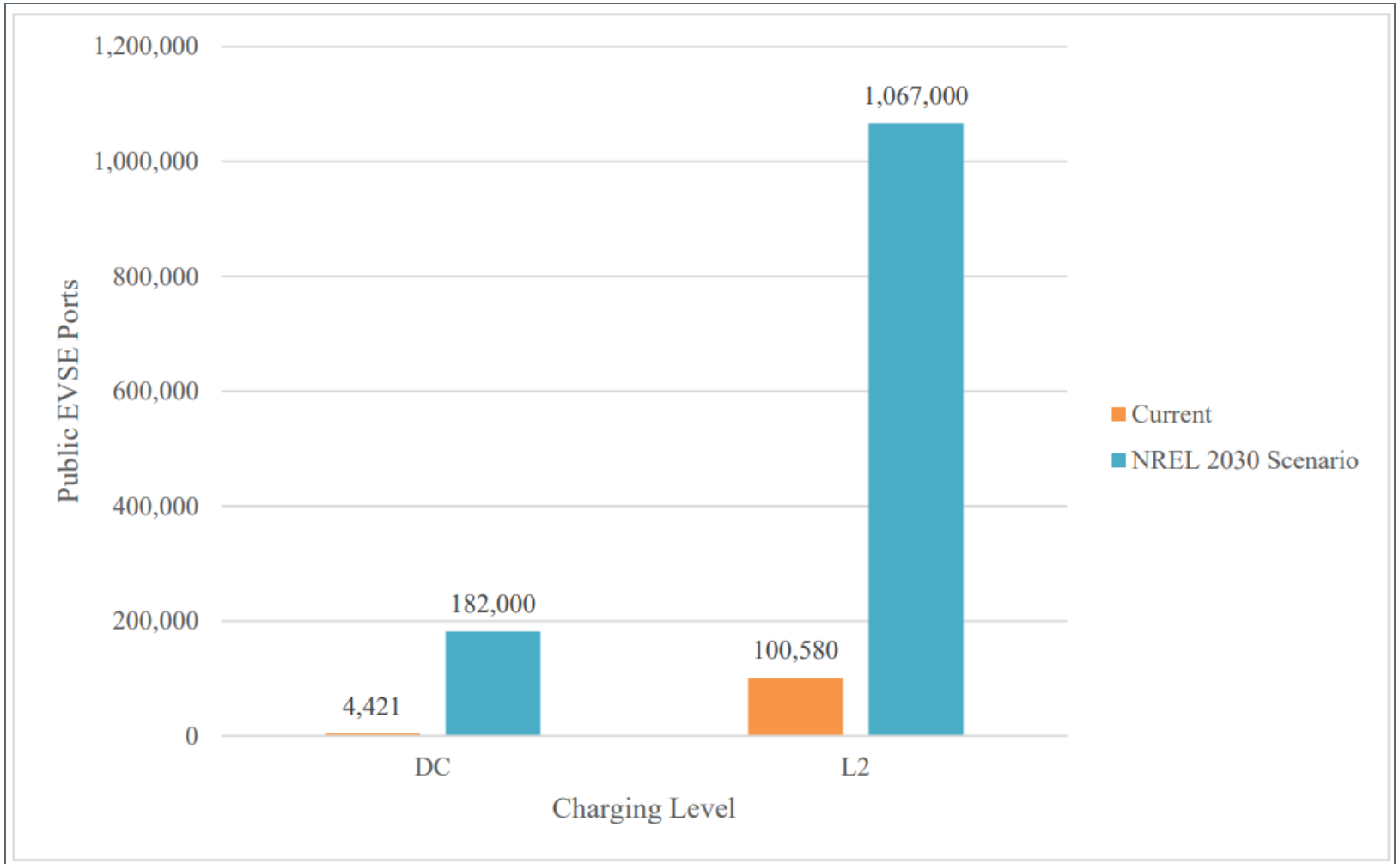
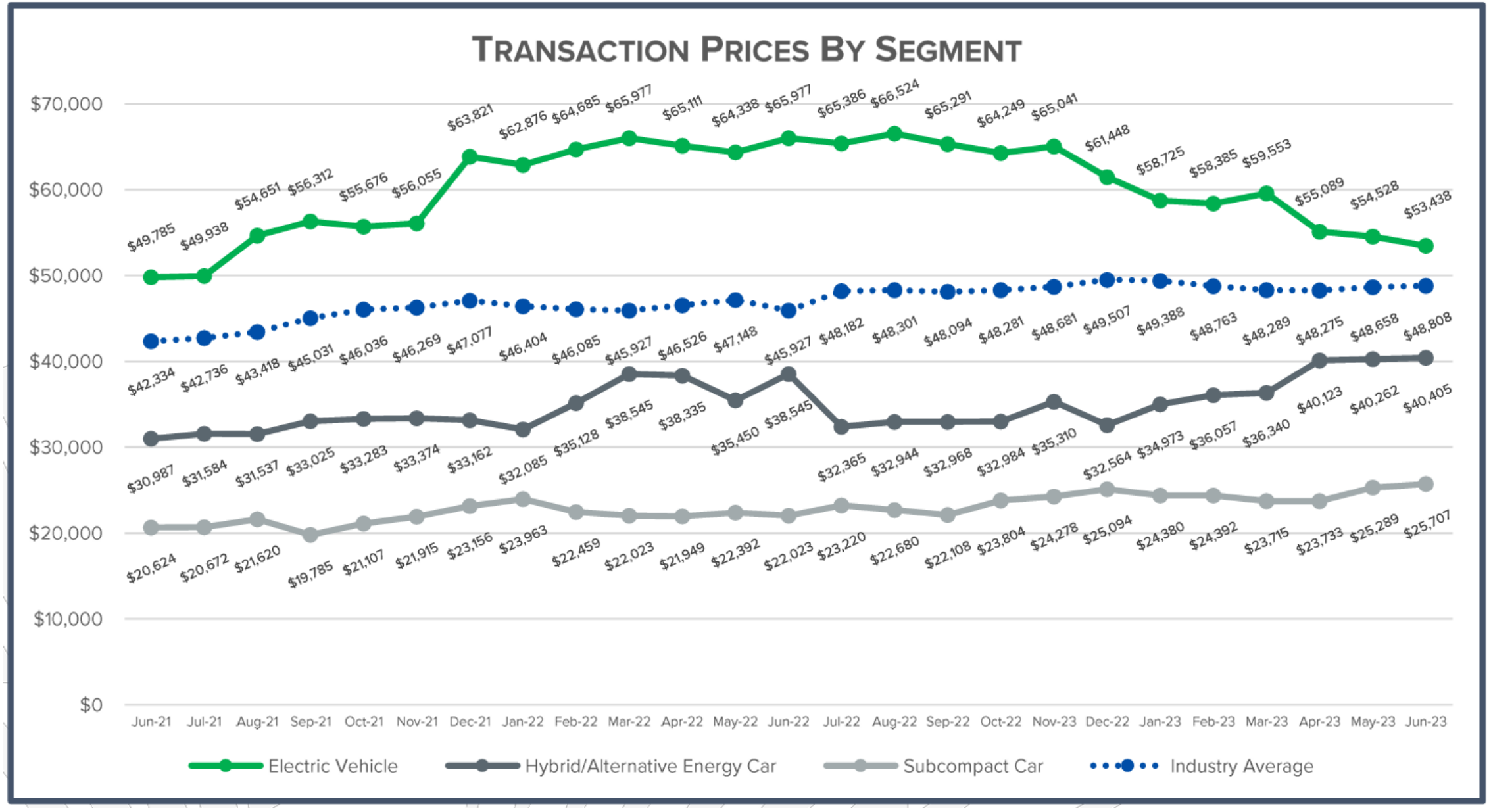


Figure 2. Current availability of public charging (excluding Tesla-only) versus NREL's scenario of 2030 public infrastructure requirements in the United States

Kelly Blue Book Transaction Price



The Global Competition to Electrify Everything

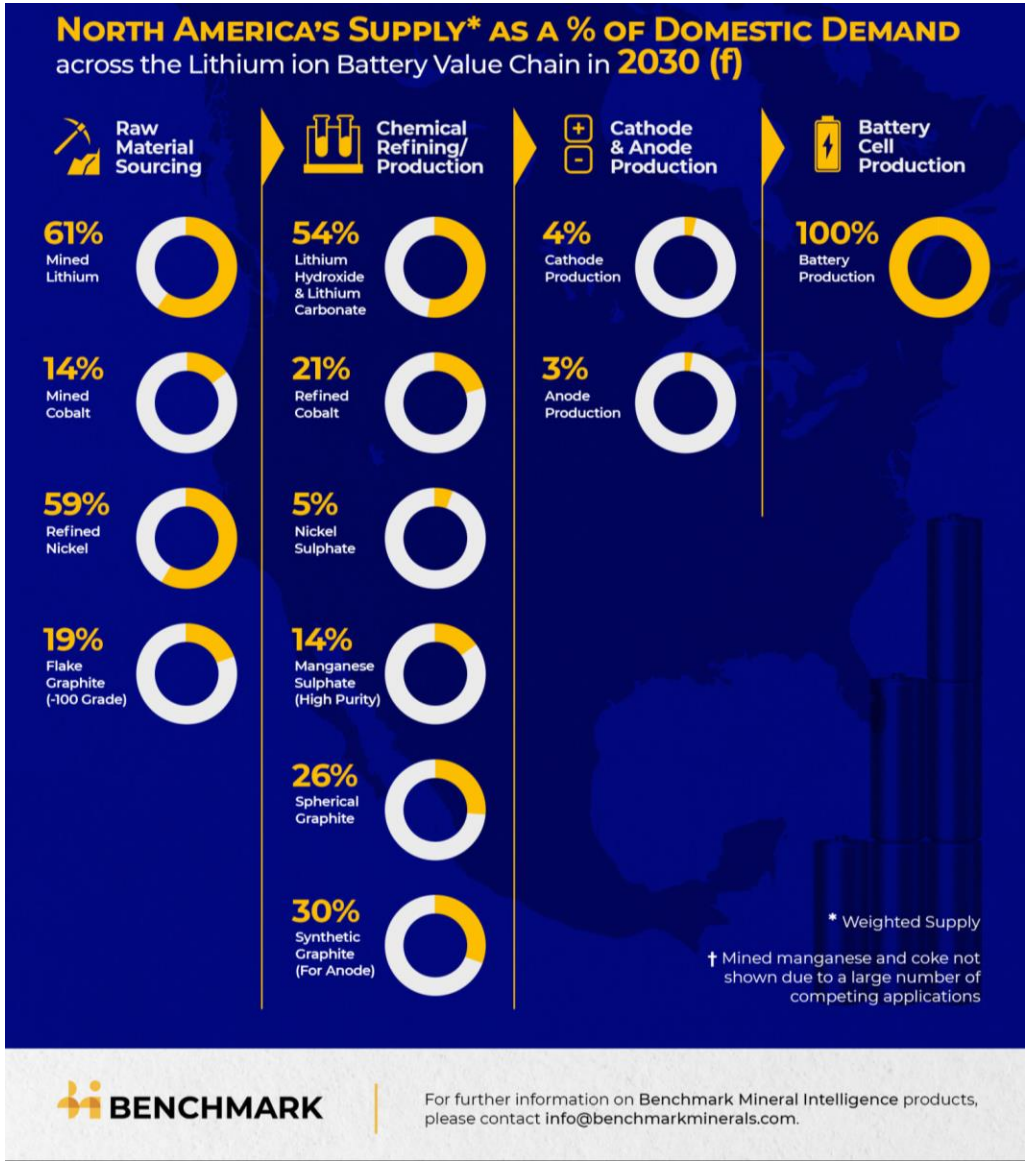
Test for Electrification: Does It Move? Or even if it doesn't…

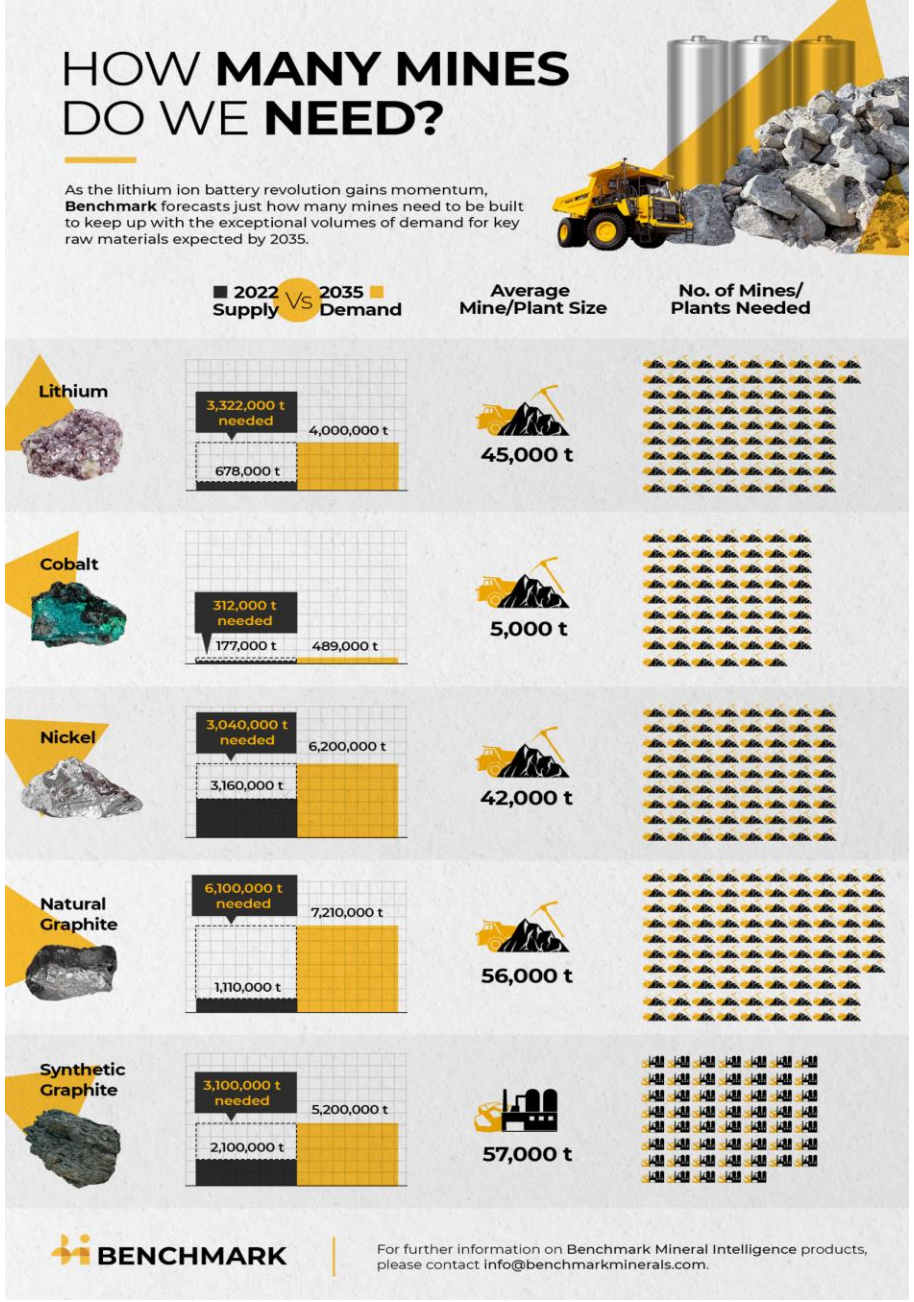
- Large Off-Road Vehicles
- Light-Duty Vehicles
- Traditional (phones, laptops)
- Stationary Source Energy Storage

- Heavy-Duty Vehicles
- Small Off-Road (e.g., lawn & garden)
- e-Bikes, Scooters

Image source: https://www.wsj.com/articles/electrification-of-everything-11620843173

Supply Chain Challenges





Sources:

- Benchmark Minerals Intelligence, "Can North America Build a Battery Supply Chain?" (Nov. 17, 2022) https://source.benchmarkminerals.com/article/can-north-america-build-a-battery-supply-chain
- Benchmark Minerals Intelligence, "More than 300 new mines required to meet battery demand by 2035", https://source.benchmarkminerals.com/article/more-than-300-new-mines-required-to-meet-battery-demand-by-2035

Key Takeaways

1. **The auto industry is committed to electrification, but can't do it alone.**
2. **Regulatory requirements must be aligned with market realities**
3. **Consumer incentives, charging infrastructure, and EV supply chains need to be established/sustained**
4. **Complimentary policies – Utility Investments / Public Utility Commission, Building Codes, Clean Fuel Standards / Low Carbon Fuel Standards, etc. – are necessary to make the transition successful.**

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Resources

- New Vehicle Registration One-Pager – All 50 States (2022)
- Get Connected EV Quarterly Report
- Reading the Meter: State of the Industry Reports
- Economic Impact by State
- EV Dashboard (sales and market share by state)
- EV Infographic (EV and battery production locations in U.S.)
- EV Agenda