

Back to “normal”?

The U.S. auto industry in 2023 & 2024

30TH ANNUAL AUTOMOTIVE INSIGHTS SYMPOSIUM
17 JANUARY 2024

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FEDERAL RESERVE BANK OF CHICAGO

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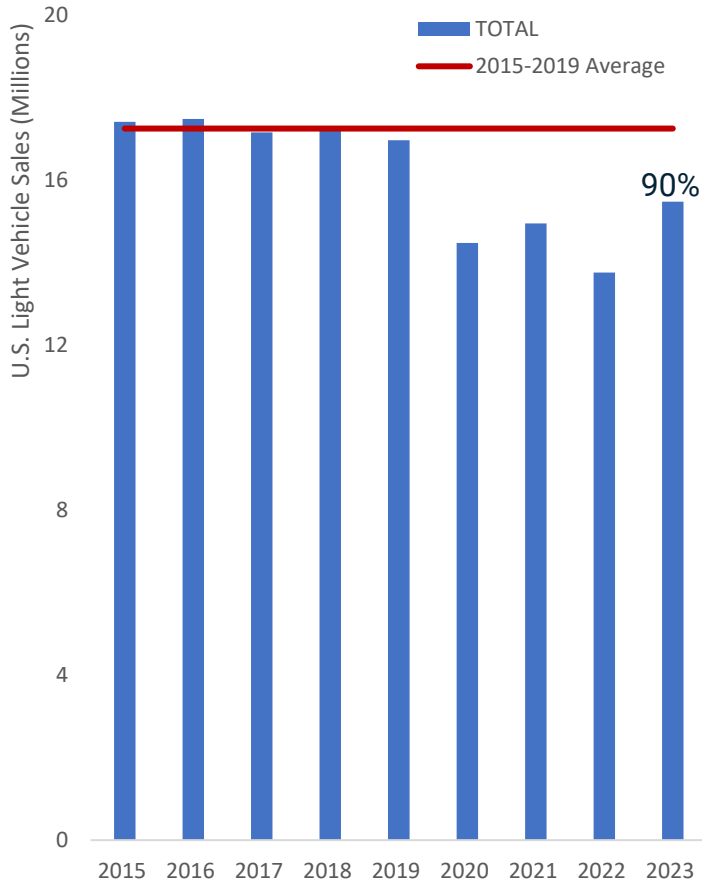
TRENDS

Is the auto industry
back to “normal”

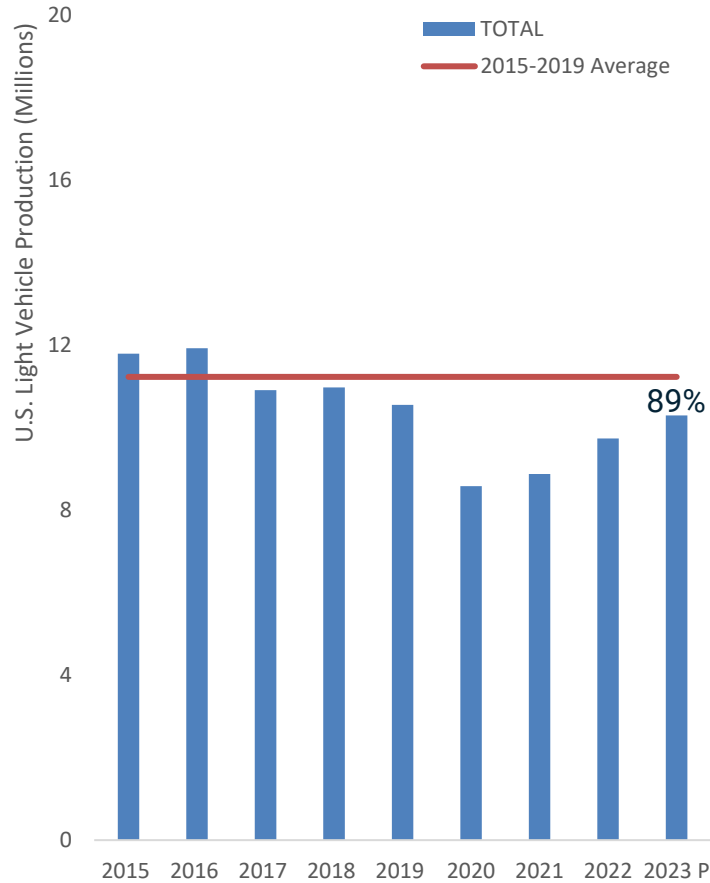


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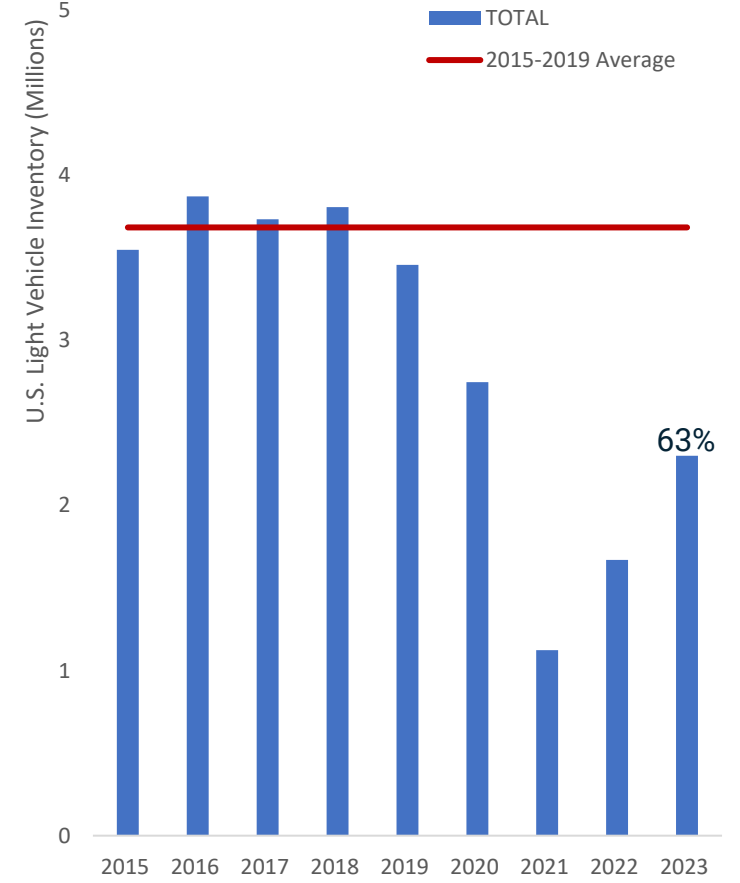
U.S. Light Vehicle Sales (2015-2023 vs. 2015-2019 Average)



U.S. Light Vehicle Production (2015-2023P vs. 2015-2019 Average)



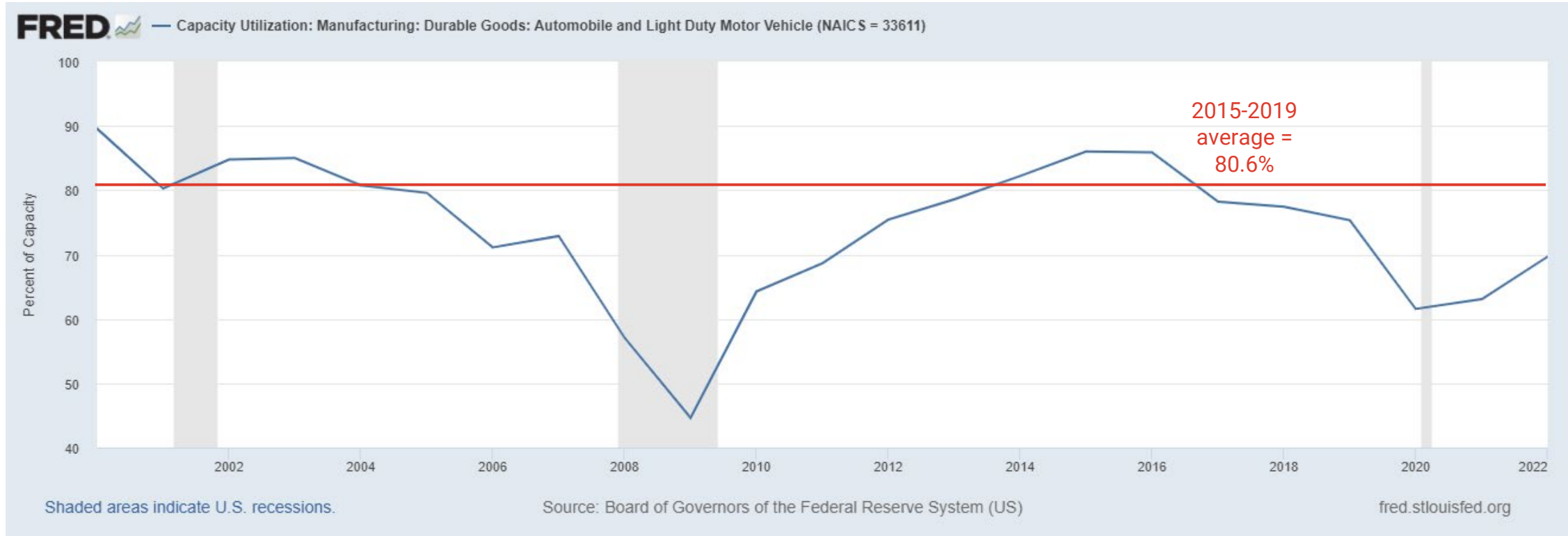
U.S. Light Vehicle Inventory (2015-2023 vs. 2015-2019 Average)



Source: Wards Informa

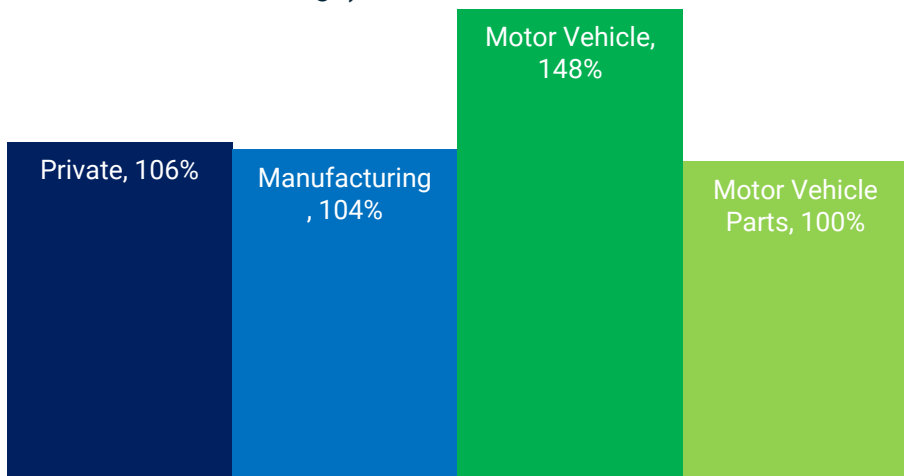
TRENDS

U.S. Automobile & Light Duty Motor Vehicle Manufacturing Capacity Utilization, 2000-2022

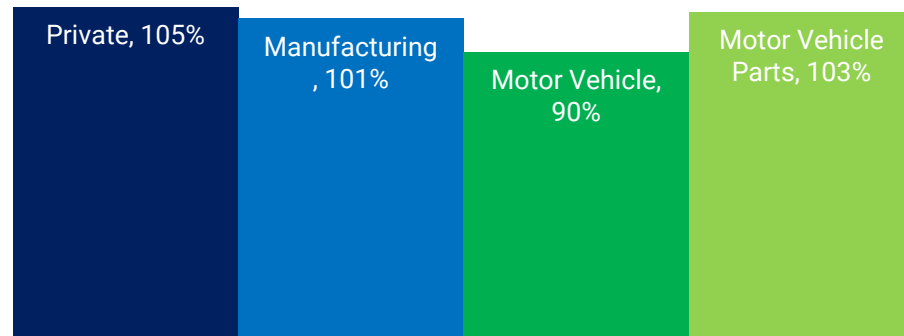


TRENDS

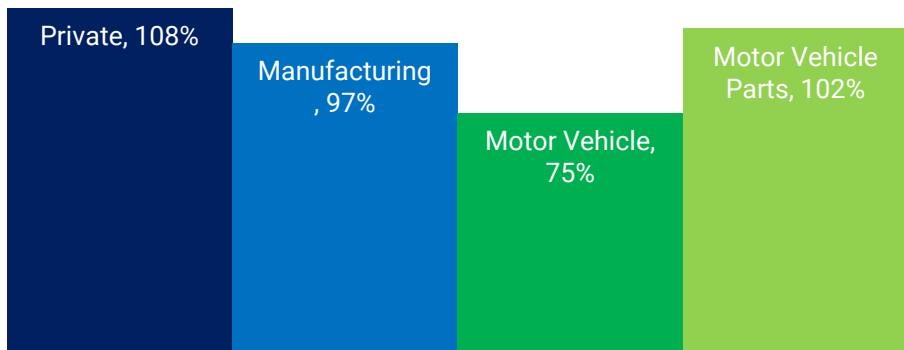
Production & Non-Supervisory Employment (2023 11 Months/2015-2019 Average)



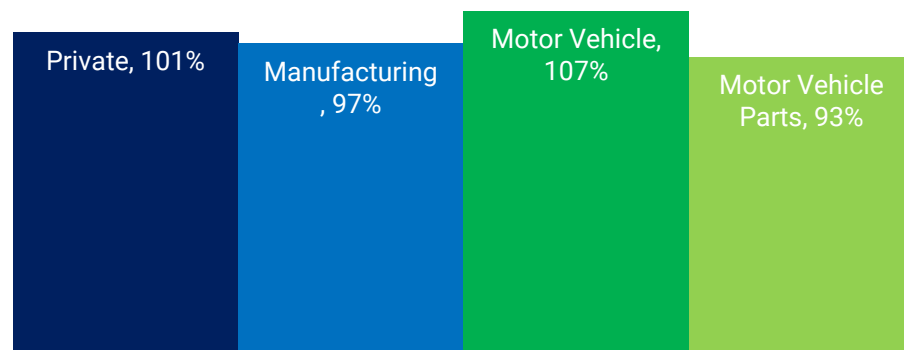
Production & Non-Supervisory Real Wages (2023/2015-2019 average)



Labor Productivity (2022/2015-2019 average)



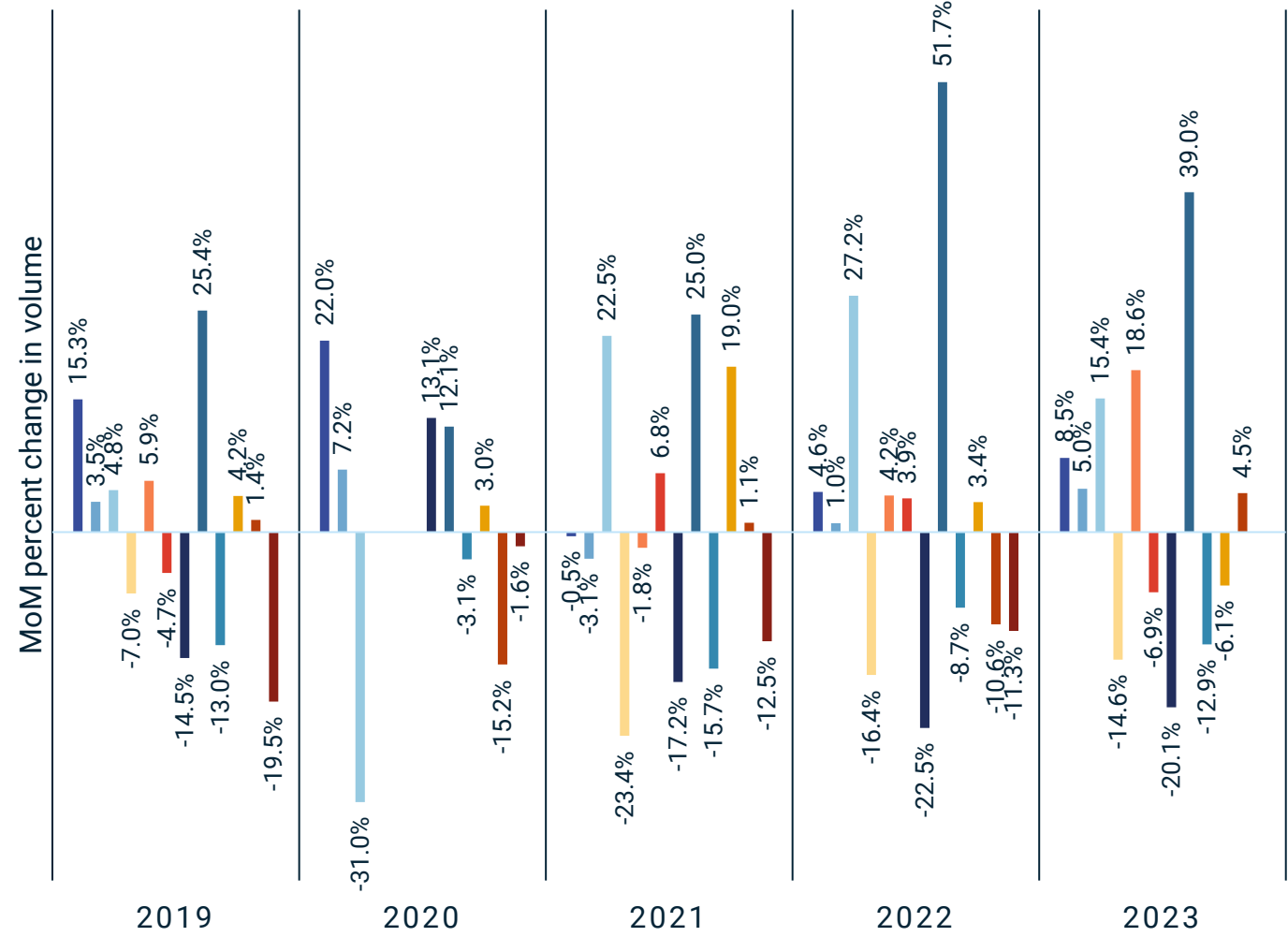
Production & Non-Supervisory Average Weekly Hours (2023/2015-2019 average)



Source: U.S. Bureau of Labor Statistics, U.S. International Trade Administration, NAICS 3361XX & 3363XX

U.S. Production, month-over-month % change in volume, 2019-November 2023 (excluding April-June 2020)

■ Jan ■ Feb ■ Mar ■ Apr ■ May ■ Jun ■ Jul ■ Aug ■ Sep ■ Oct ■ Nov ■ Dec



TRENDS

Production schedules have been volatile

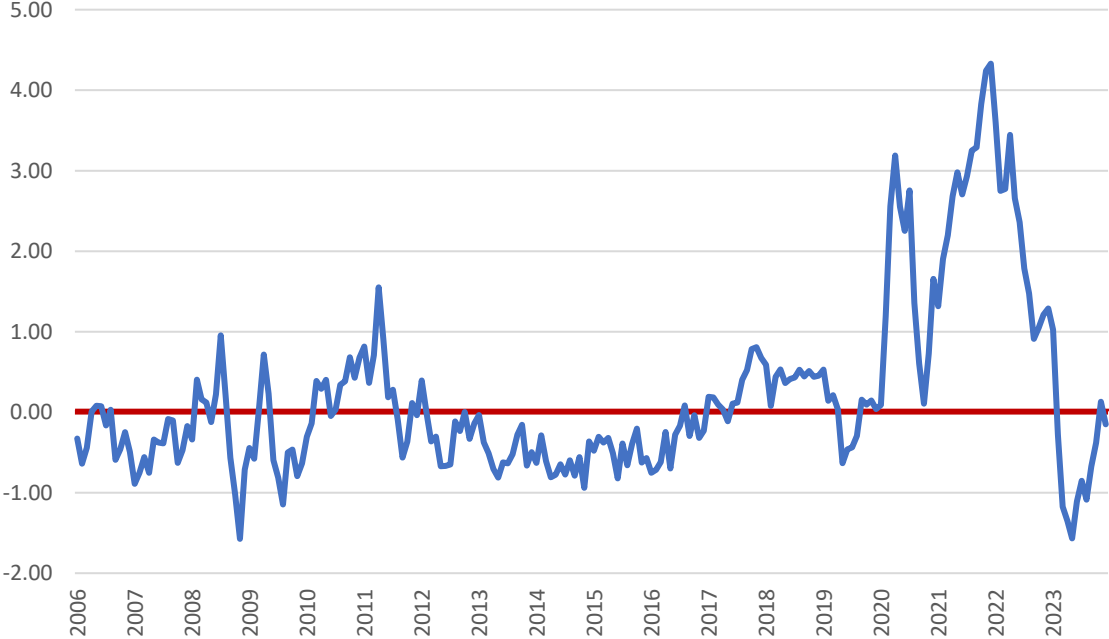
Source: Wards Informa

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Supply chain pressures easing are bringing down goods inflation; back to neutral

- All industries
- Net change in supply chain flows has been negative since May
- Moved back slightly above normal (0) in November 2023 for the first time since January indicating pressures were rising and then back below normal in December

Global Supply Chain Pressure Index
(standard deviations from average)



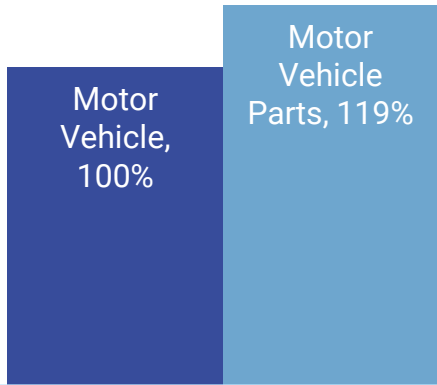
Source: Federal Reserve Bank of New York using data from Bureau of Labor Statistics; Harper Petersen Holding GmbH; Baltic Exchange; IHS Markit; Institute for Supply Management; Haver Analytics; Refinitiv

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U.S. Motor Vehicle & Parts Trade

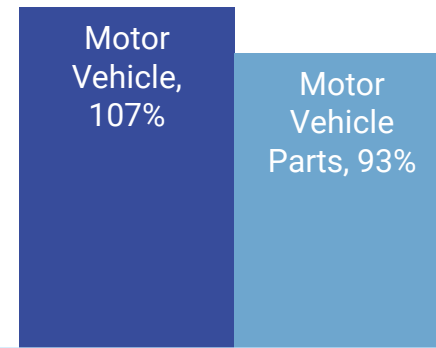
Imports

(USD Billions 2022/
2015-2019 average)



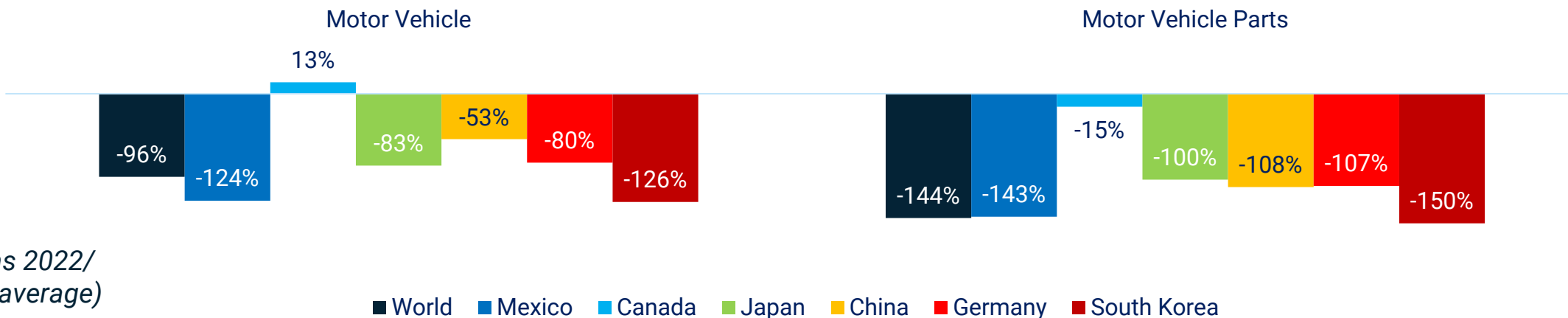
Exports

(USD Billions 2022/
2015-2019 average)



Balance of Trade

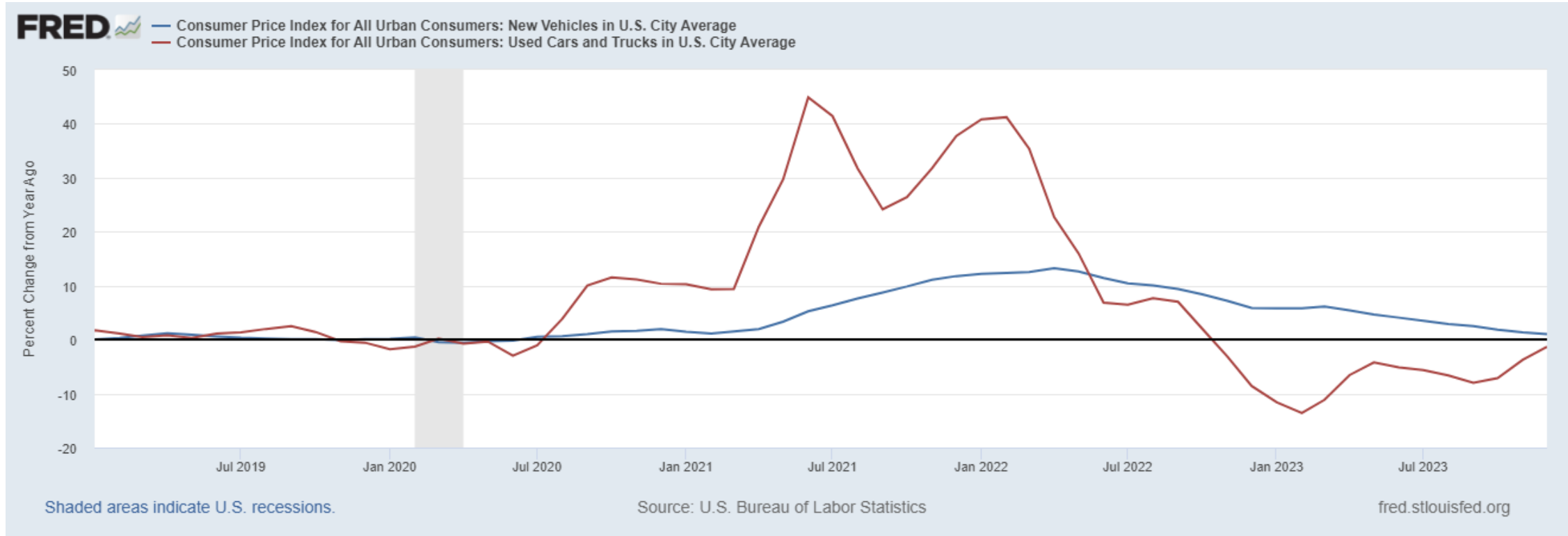
(USD Billions 2022/
2015-2019 average)



Source: U.S. Bureau of Labor Statistics, U.S. International Trade Administration, NAICS 3361XX & 3363XX

TRENDS

2020-November 2023 U.S. New & Used Vehicle Price Inflation (Consumer Price Index, YoY% change)



U.S. Incentives Share of Average Transaction Price 2018-November 2023

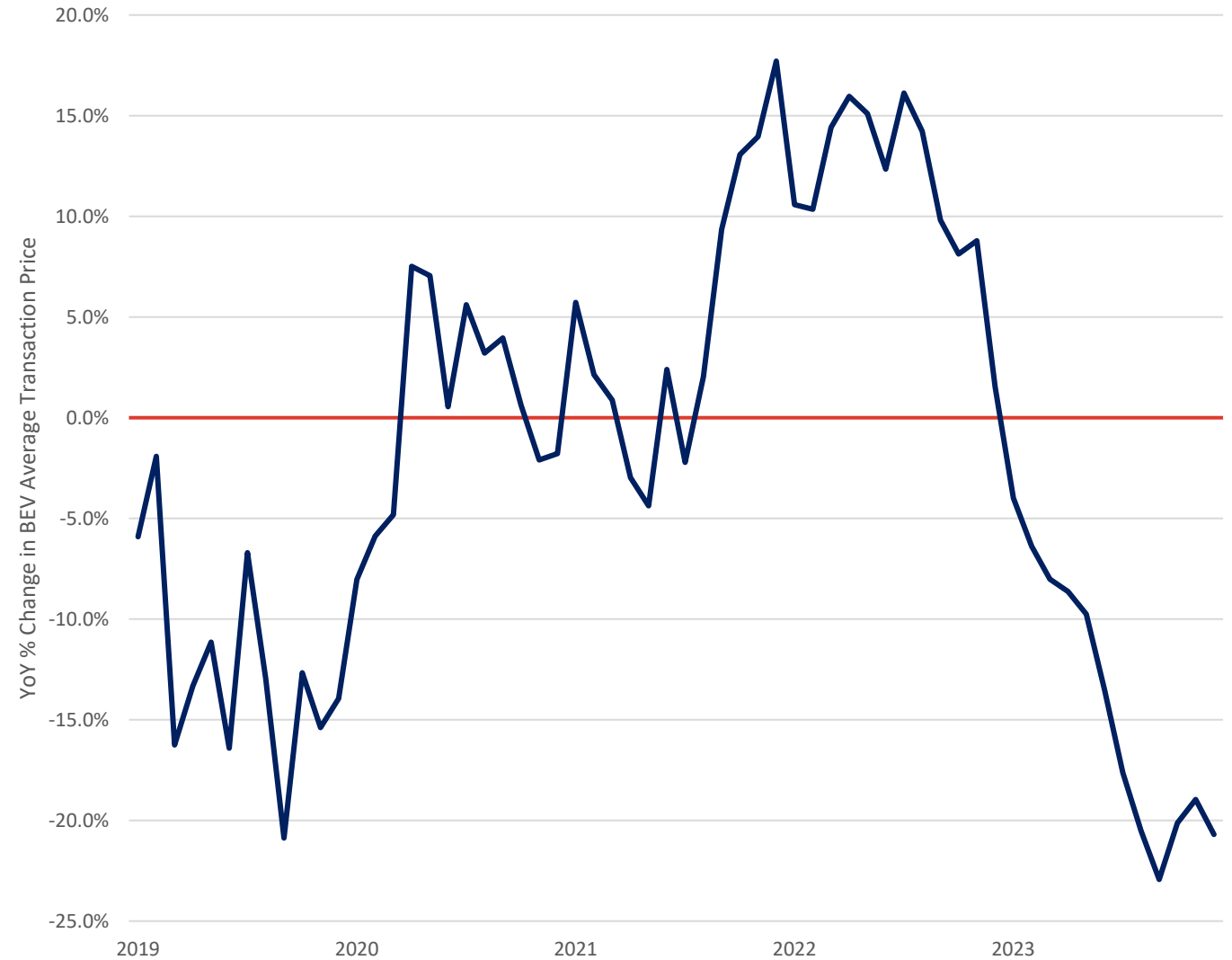


Source: Federal Reserve

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The incentive share of average transaction prices is rising again

U.S. BEV Average Transaction Price, YoY% change
2019-2023

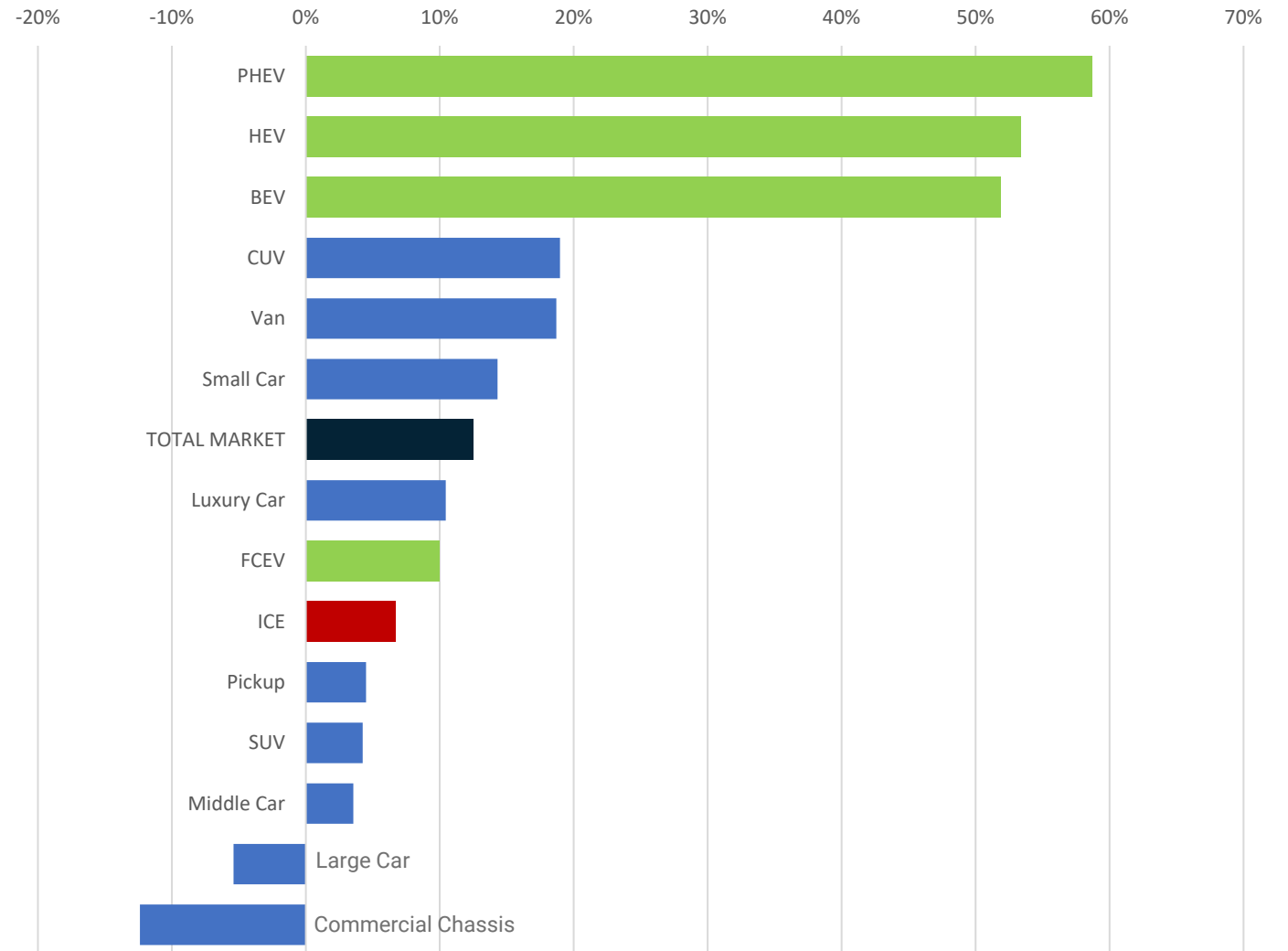


Source: Kelley Blue Book

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BEV prices are falling driven by incentives & price cuts

U.S. Light Vehicle Sales by Segment, YoY % Change 2022-2023



Source: Wards Informa

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Electrified vehicles were the fastest growing segments in the U.S. market in 2023



PUBLIC LAW 117-58—NOV. 15, 2021

135 STAT. 429

Public Law 117-58
117th Congress

An Act

To authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes.

Nov. 15, 2021
(H.R. 3684)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,
SECTION 1. SHORT TITLE.—This Act may be cited as the “Infrastructure Investment and Jobs Act.”
(D) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Infrastructure Investment and Jobs Act.
23 USC 101 note.

Sec. 1. Short title; table of contents.
Sec. 2. References.

DIVISION A—SURFACE TRANSPORTATION

Sec. 10001. Short title.
Sec. 10002. Definitions.
Sec. 10003. Effective date.

TITLE I—FEDERAL-AID HIGHWAYS

Subtitle A—Authorizations and Programs

- Sec. 11101. Authorization of appropriations.
- Sec. 11102. Obligation ceiling.
- Sec. 11103. Definitions.
- Sec. 11104. Apportionment.
- Sec. 11105. National highway performance program.
- Sec. 11106. Emergency relief.
- Sec. 11107. Federal share payable.
- Sec. 11108. Railway-highway grade crossings.
- Sec. 11109. Surface transportation block grant program.
- Sec. 11110. Nationally significant freight and highway projects.
- Sec. 11111. Highway safety improvement program.
- Sec. 11112. Federal lands transportation program.
- Sec. 11113. National highway freight program.
- Sec. 11114. Congestion mitigation and air quality improvement program.
- Sec. 11115. Alaska Highway.
- Sec. 11116. Toll roads, bridges, tunnels, and ferries.
- Sec. 11117. Bridge investment program.
- Sec. 11118. Safe routes to school.
- Sec. 11119. Highway use tax evasion projects.
- Sec. 11120. Construction of ferry boats and ferry terminal facilities.
- Sec. 11121. Vulnerable road user research.
- Sec. 11122. Wildlife crossing safety.
- Sec. 11123. Consolidation of programs.
- Sec. 11124. Consolidation of programs.
- Sec. 11125. GAO report.
- Sec. 11126. Territorial and Puerto Rico highway program.
- Sec. 11127. Nationally significant Federal lands and Tribal projects program.
- Sec. 11128. Tribal high priority projects program.
- Sec. 11129. Standards.
- Sec. 11130. Public transportation.

136 STAT. 1366

PUBLIC LAW 117-167—AUG. 9, 2022

Public Law 117-167
117th Congress

An Act

Making appropriations for Legislative Branch for the fiscal year ending September 30, 2022, and for other purposes.

Aug. 9, 2022
(H.R. 4346)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. TABLE OF CONTENTS.

The table of contents for this Act is as follows:

Sec. 1. Table of contents.
Sec. 2. References.

DIVISION A—CHIPS ACT OF 2022

- Sec. 101. Short title.
- Sec. 102. Creating helpful incentives to produce semiconductors (CHIPS) for America fund.
- Sec. 103. Semiconductor incentives.
- Sec. 104. Opportunity and inclusion.
- Sec. 105. Additional GAO reporting requirements.
- Sec. 106. Appropriations for wireless supply chain innovation.
- Sec. 107. Advanced manufacturing investment credit.

DIVISION B—RESEARCH AND INNOVATION

Sec. 10000. Table of contents.
Sec. 10001. Short title.
Sec. 10002. Definitions.
Sec. 10003. Budgetary effects.

TITLE I—DEPARTMENT OF ENERGY SCIENCE FOR THE FUTURE

- Sec. 10101. Mission of the Office of Science.
- Sec. 10102. Basic energy sciences program.
- Sec. 10103. Biological and environmental research.
- Sec. 10104. Advanced scientific computing research program.
- Sec. 10105. Fusion energy research.
- Sec. 10106. High energy physics program.
- Sec. 10107. Nuclear physics program.
- Sec. 10108. Science laboratories infrastructure program.
- Sec. 10109. Accelerator research and development.
- Sec. 10110. Isotope research, development, and production.
- Sec. 10111. Increased collaboration with teachers and scientists.
- Sec. 10112. High intensity laser research initiative; helium conservation Office of Science emerging biological threat preparedness initiative; midscale instrumentation and research equipment prioritization of appropriations.
- Sec. 10113. Established program to stimulate competitive research.
- Sec. 10114. Research security.

TITLE II—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Sec. 10201. Definitions.
Subtitle A—Authorization of Appropriations
Sec. 10211. Authorization of appropriations.

136 STAT. 1818

PUBLIC LAW 117-169—AUG. 16, 2022

Public Law 117-169
117th Congress

An Act

Aug. 16, 2022
(H.R. 5376)

Appropriations authorizations.

To provide for reconciliation pursuant to title II of S. Con. Res. 14.
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—COMMITTEE ON FINANCE
Subtitle A—Deficit Reduction

SECTION 10001. AMENDMENT OF 1986 CODE.
Except as otherwise expressly provided, whenever in this subtitle an amendment or repeal is expressed in terms of an amendment to, or repeal of, a section or other provision, the reference shall be considered to be made to a section or other provision of the Internal Revenue Code of 1986.

PART 1—CORPORATE TAX REFORM

26 USC 55.

SEC. 10101. CORPORATE ALTERNATIVE MINIMUM TAX.
(a) IMPOSITION OF TAX.—
(1) IN GENERAL.—Paragraph (2) of section 55(b) is amended to read as follows:

“(2) CORPORATIONS.—
“(A) APPLICABLE CORPORATIONS.—In the case of an applicable corporation, the tentative minimum tax for the taxable year shall be the excess of—

“(i) 15 percent of the adjusted financial statement income for the taxable year (as determined under section 56A), over

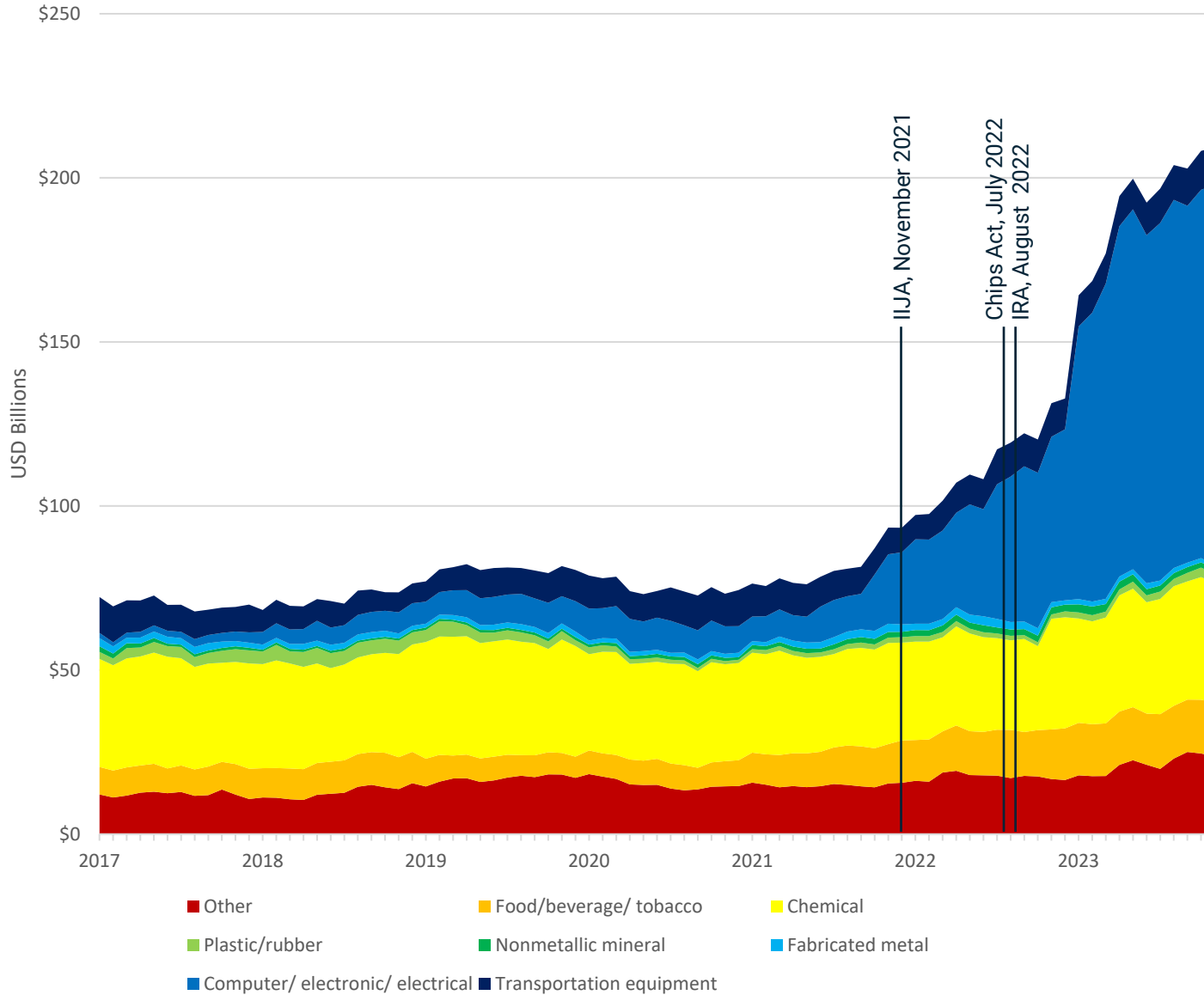
“(ii) the corporate AMT foreign tax credit for the taxable year.

“(B) OTHER CORPORATIONS.—In the case of any corporation which is not an applicable corporation, the tentative minimum tax for the taxable year shall be zero.”

(k) APPLICABLE CORPORATION.—Section 59 is amended by adding at the end the following new subsection:

“(1) APPLICABLE CORPORATION.—For purposes of this part—
“(A) IN GENERAL.—The term ‘applicable corporation’ means, with respect to any taxable year, any corporation (other than an S corporation, a regulated investment company, or a real estate investment trust) which meets the

**Value of Private Construction Put in Place,
Seasonally Adjusted Annual Rate, 2017-11/2023**



The annual value of private construction put in place in computer/electronic/electrical grew 5.5X larger since passage of the Infrastructure bill & 2.8X larger since passage of the Chips Act

Source: U.S. Census Bureau, Construction Spending



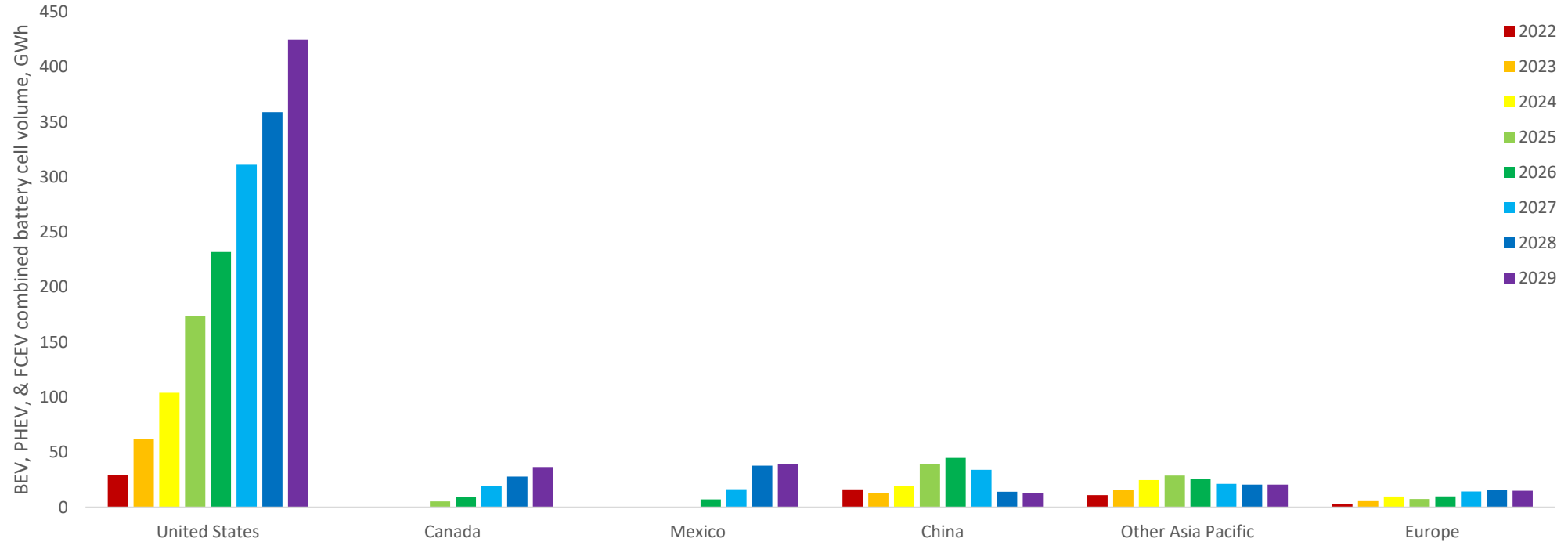
December 2023: Ohio opens the first EV fast charging station funded by the NEVI Program

Image Source: Governor DeWine, ODOT Celebrate Opening of First New EV Fast Charging Station in the Country Under NEVI Program | DriveOhio

TRENDS

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

U.S. BEV, PHEV, & FCEV Light Vehicle Volume Installation; Region/Country Source of Battery Cells
2022, 2023-2029 forecast



Source: S&P Global Mobility, High Voltage Battery forecast, November 2023.

TRENDS

IRA incentives available, but requirements start to bite

1 January 2023 (43 models/variants qualify):

18 April 2023 (43 models/variants qualify):

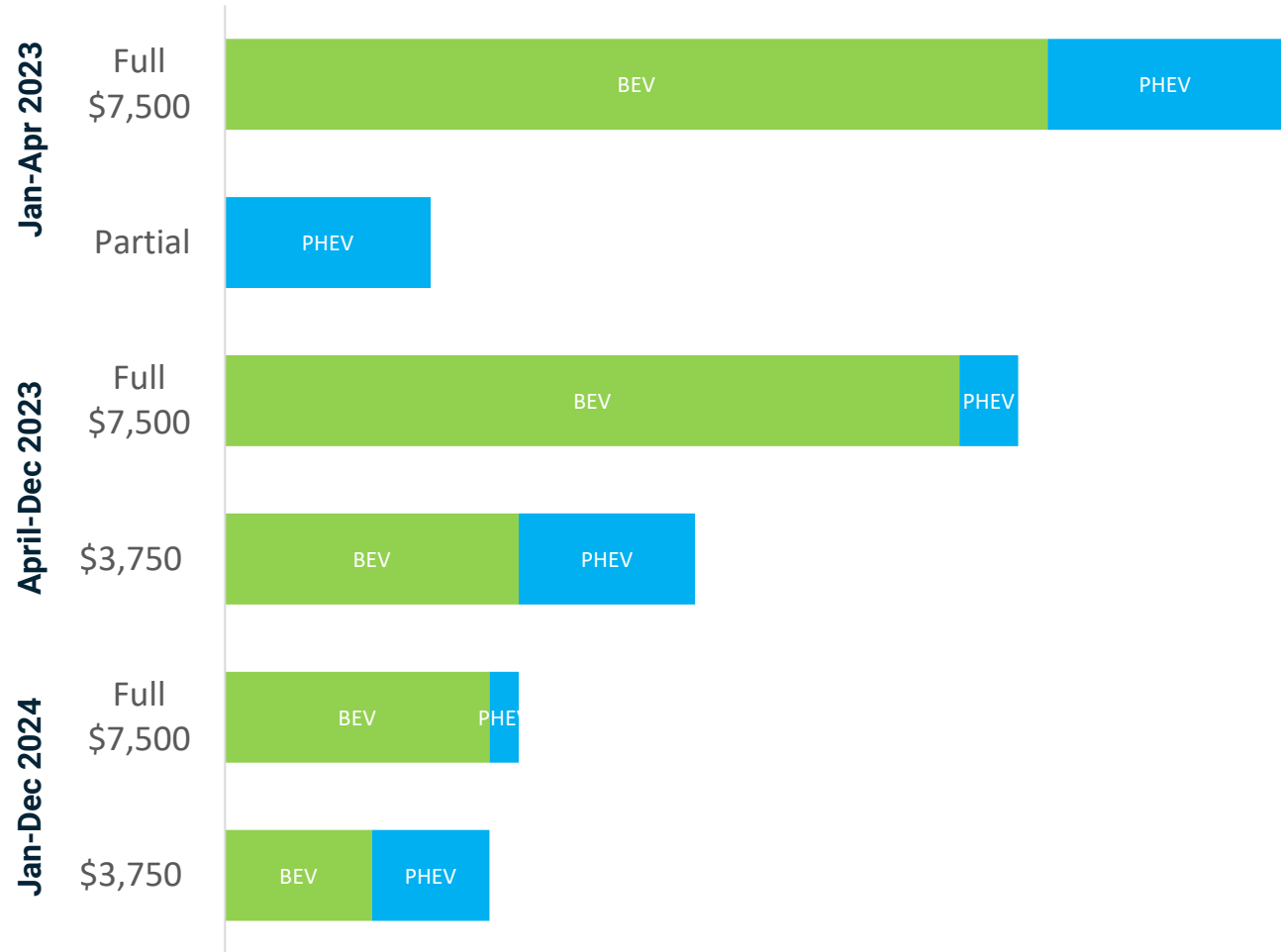
- 40% U.S. or FTA critical minerals
- 50% North American components

1 January 2024 (19 models/variants qualify):

- 50% U.S. or FTA critical minerals
- 60% North American components
- ZERO components from “Foreign Entities of Concern”
- Point-of-sale incentives begin

1 January 2025:

- 60% U.S. or FTA critical minerals (80% by 2027)
- 60% North American components (100% by 2029)
- ZERO components from “Foreign Entities of Concern”
- ZERO critical minerals from “Foreign Entities of Concern”

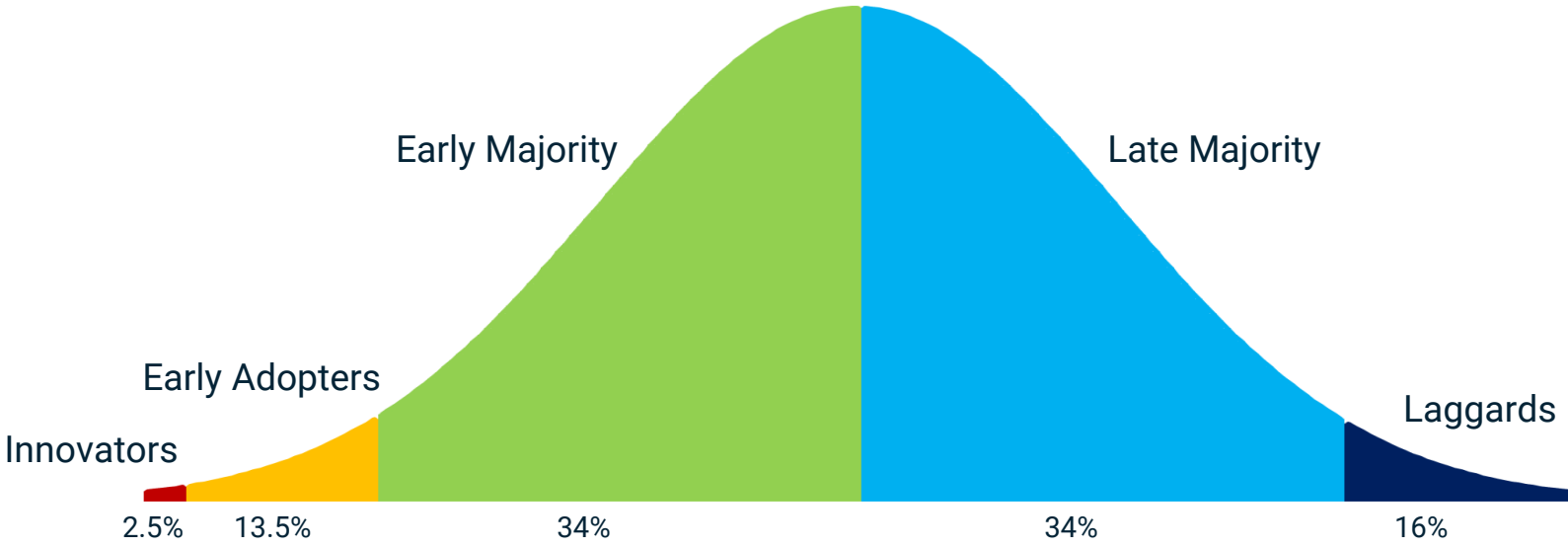


Attention: Not every version of the models listed below will necessarily qualify. Please check with the dealer/seller to determine the eligibility of your specific vehicle.

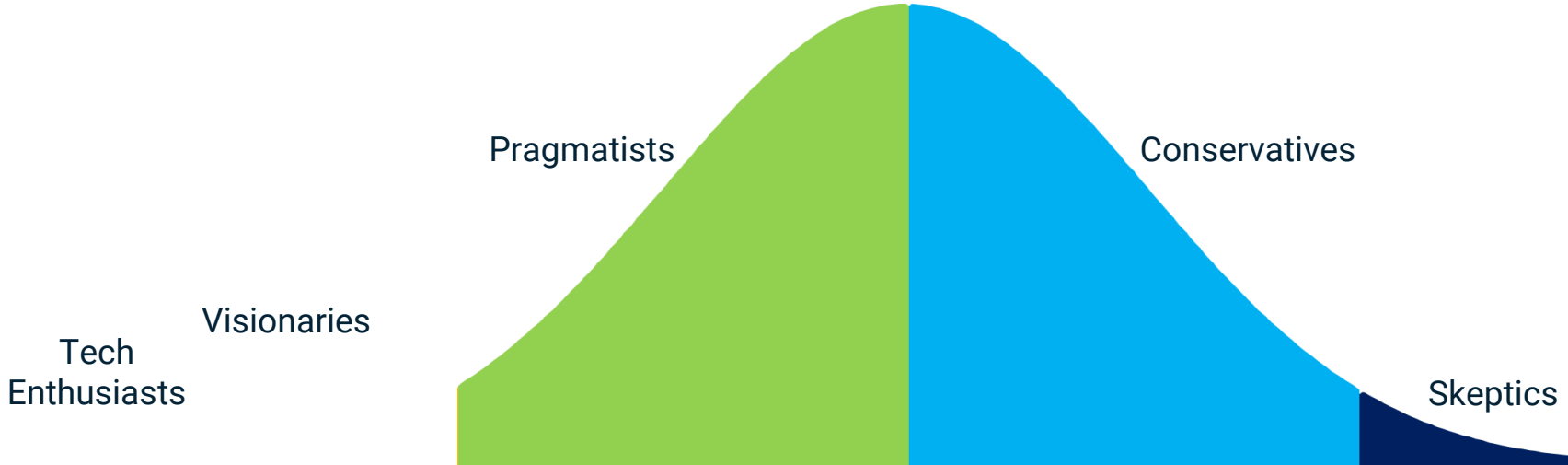
Are EV sales
about to run
out of charge?



Rogers' Technology Adoption Life Cycle



Moore's Crossing the Chasm





How to convince
the pragmatists?

The
Economist

Europe's Silicon Valley

The new contest for sea power

What science says about old leaders

A special report on philanthropy

JANUARY 13TH-19TH 2024

CHINA'S EV ONSLAUGHT

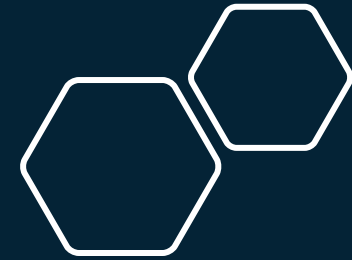
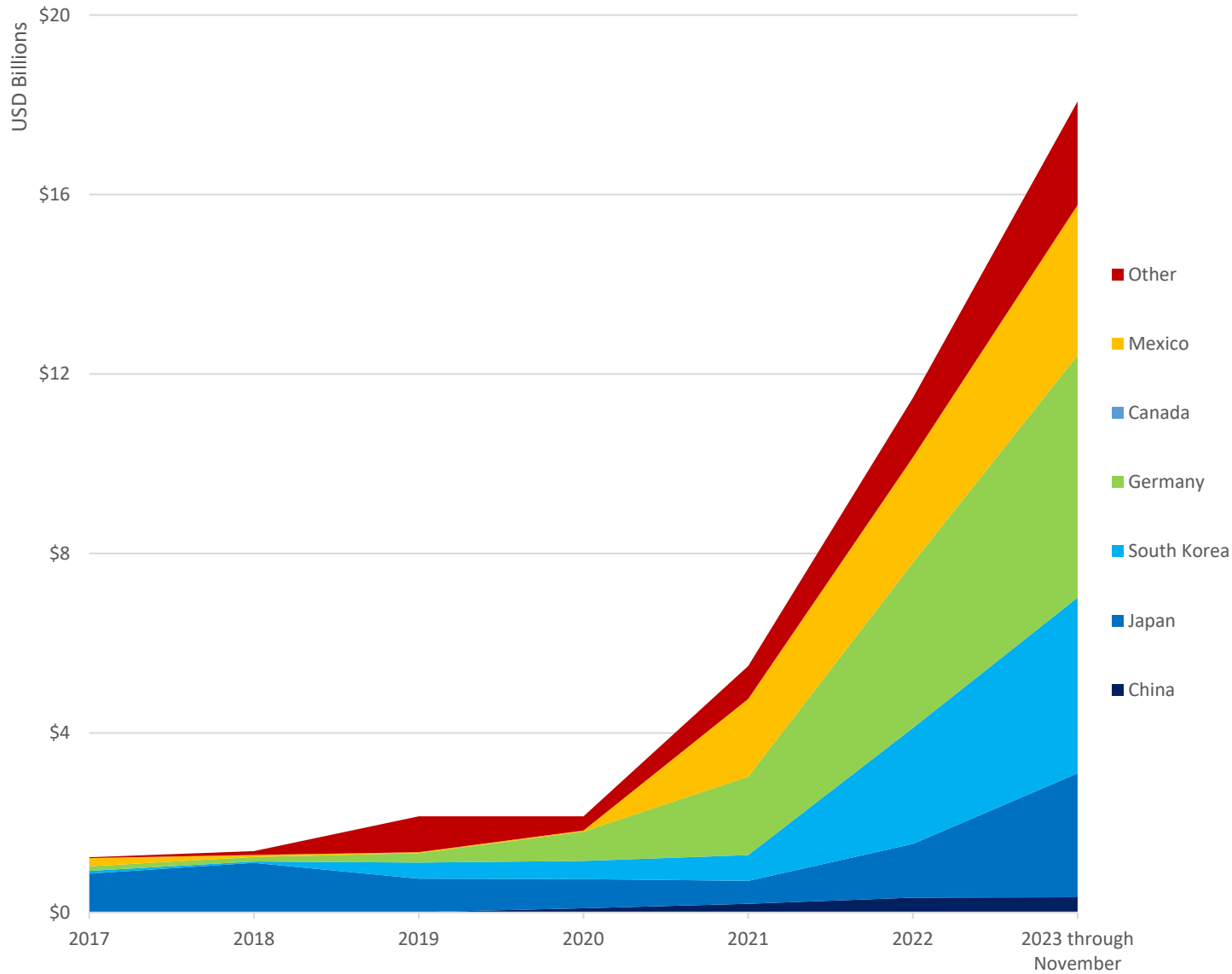


China...

- Was the #1 Vehicle exporting nation in 2023—reversing a trade deficit as recently as 2021 to a trade surplus
- Had the #1 Global electric vehicle brand in 2023 (BYD)
- Gained an 8% share of the EU's EV market in 2023—prompting an EC trade investigation
- Chinese-build light vehicles (ICE, not EV) went from 0% to 20% of Mexico's market (ICE) in 6 years
- Makes up just 1% of Mexico's foreign direct investment, but is the fastest growing source of FDI since 2016
- Chinese market is becoming more Chinese—lower market share for JV & import brands
- Started to impose export restraints on critical inputs such as natural graphite & neodymium magnets

Value of U.S. BEV Passenger Vehicle Imports by Country

2017-November 2023



There was only one Chinese-built passenger EV in the U.S. market in 2023

- EVs made up 9% of the value of U.S. passenger vehicle imports
- Chinese EVs were just 0.17% of U.S. imports





TRENDS

Macroeconomic
headwinds or
smooth sailing?



Trade in 2024 and beyond:

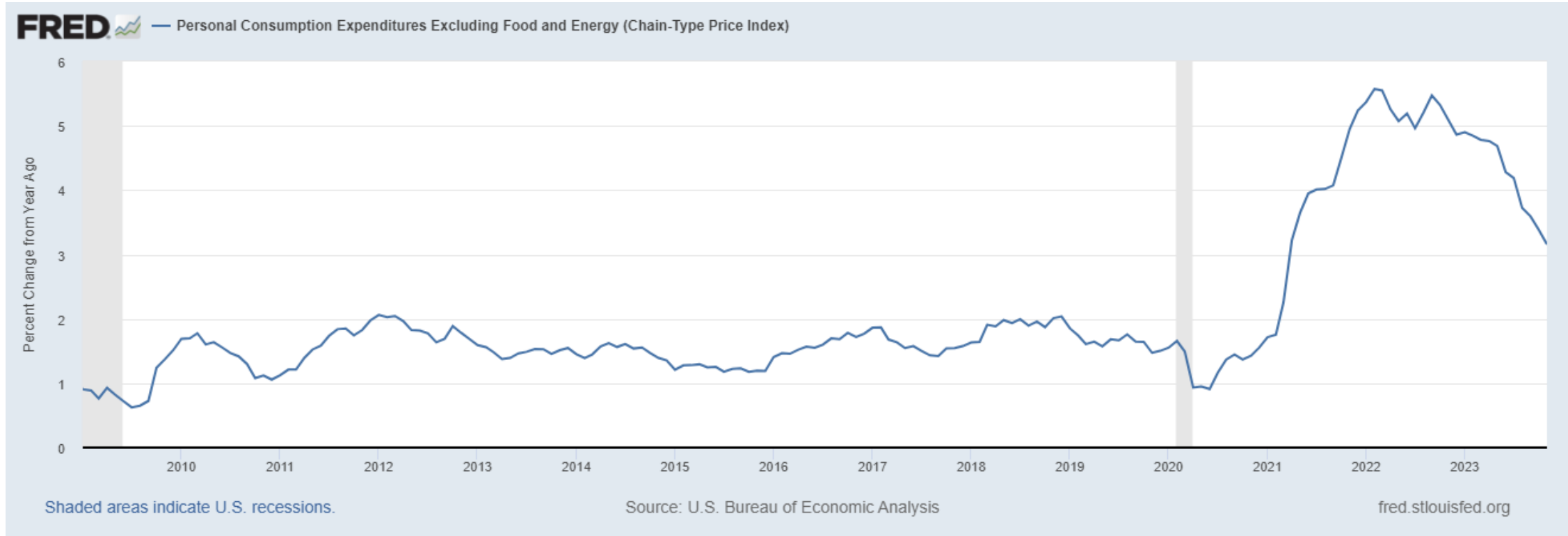
- Need to develop non-China sources of components & critical minerals
- Some in Congress are talking about raising trade barriers
- EVs are likely to be a focus in this election year

Labor in 2024 and beyond:

- Impact of change in labor costs
 - Outsourcing/offshoring
 - Automation
 - Flow-through to other automakers, suppliers, & sectors
- Success of UAW organizing in the sector
- Longer-term consequences
- Rising wages may be a lagging inflation indicator

TRENDS

2009-November 2023 U.S. Inflation (Core Personal Consumption Expenditures, YoY% change)



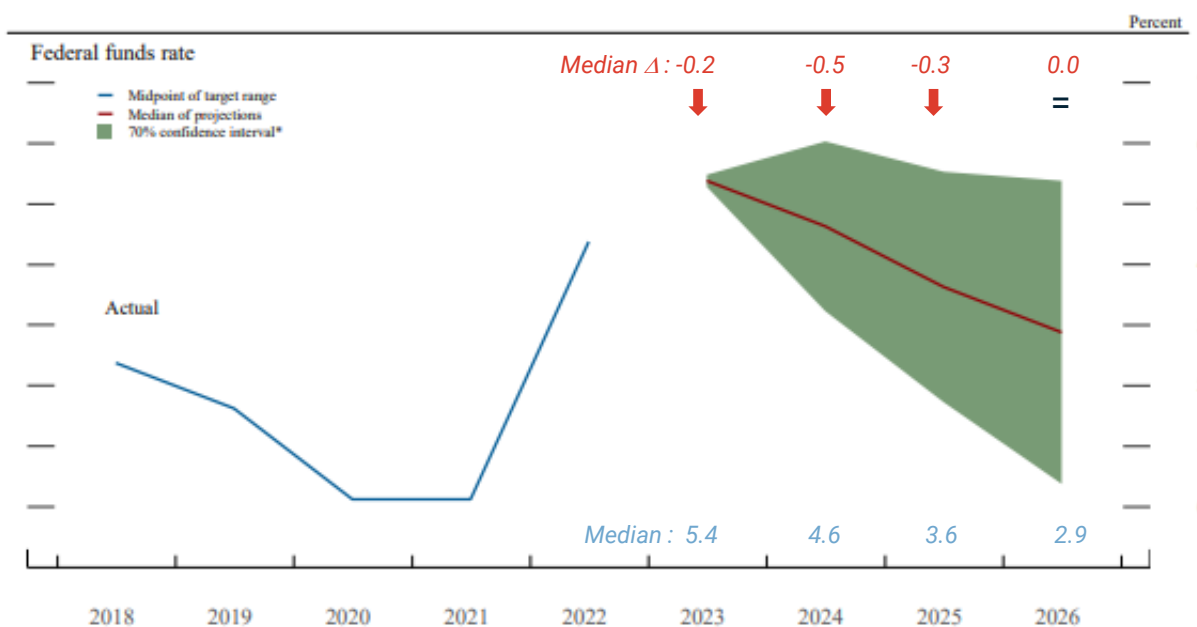
TRENDS

Summary of Economic Projections

(in response to a question about adding the word “any” to the statement on determining the extent of any additional policy firming) “We added the word ‘any’ as an acknowledgement that we are likely at or near the peak rate for this cycle.”

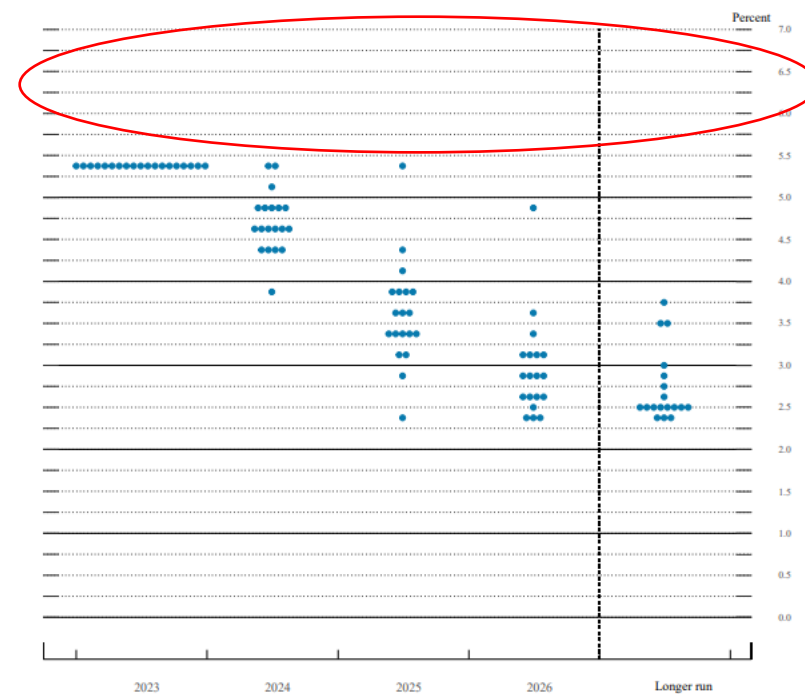
– Fed Chair Jerome Powell
13 December 2023 Press Conference

Figure 5. Uncertainty and risks in projections of the federal funds rate



Source: Federal Reserve Board of Governors, 14 December 2023
Change since September 2023 SEP: ↓ Lower ↑ Higher =Same

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Sales	Almost
Production	Almost
Inventory	X
Capacity Utilization	X
Trade	✓
Employment	✓
Supply Chain	✓
Real Wages	X/✓
Working Hours	✓/X
Productivity	X
BEV Prices	?
Incentives	X
New Vehicle Inflation	✓
Used Vehicle Inflation	✓
Inflation	Almost





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