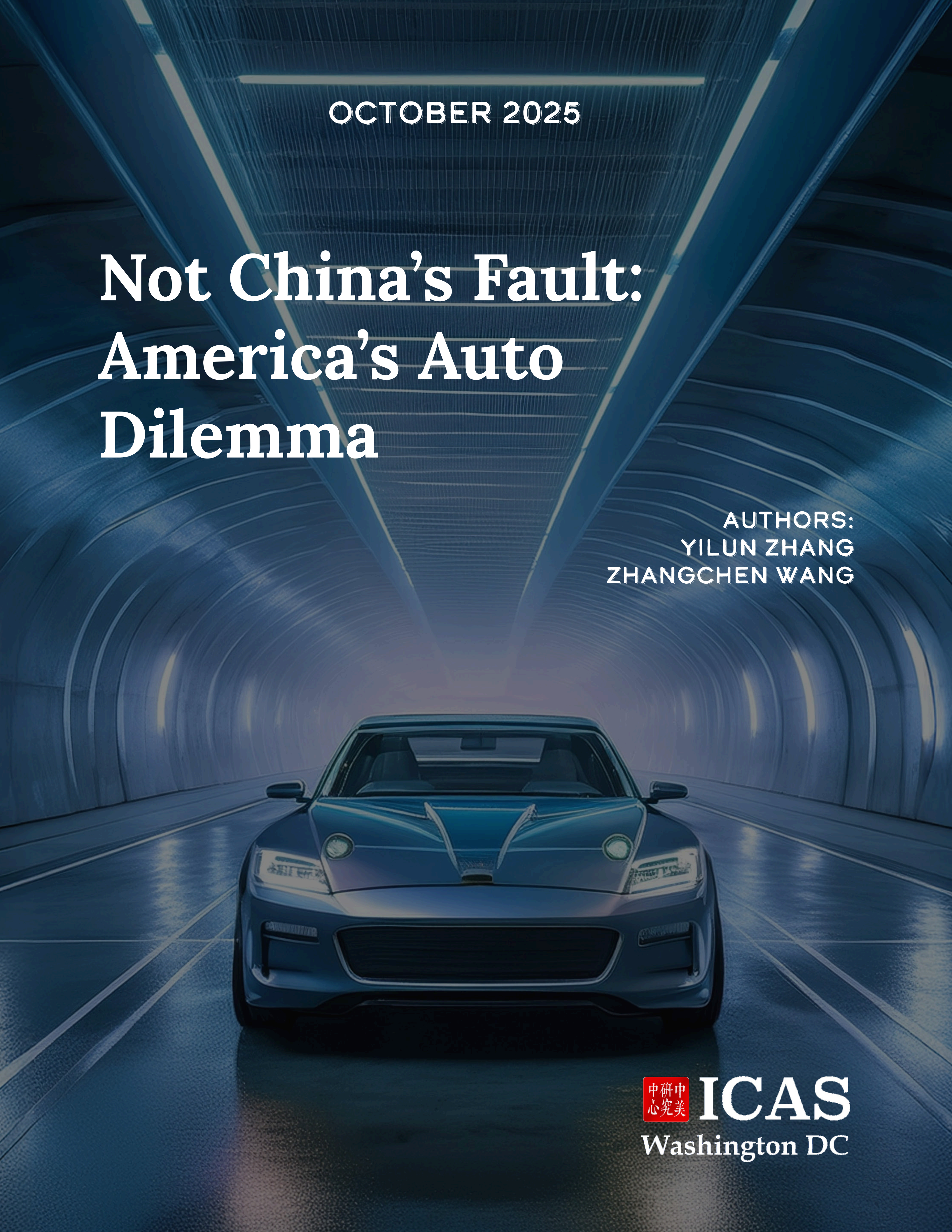

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Not China's Fault: America's Auto Dilemma

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JOINT PROJECT OF THE ICAS TRADE 'N TECHNOLOGY PROGRAM AND ICAS BLUE CARBON CLIMATE CHANGE PROGRAM

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—— WZ

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Executive Summary

The U.S. auto industry faces a structural crisis that cannot be explained away by simply citing foreign competition as a scapegoat. Decades of prioritizing SUVs and pickup trucks left Detroit unprepared for the global pivot to smaller, more efficient vehicles before an even more revolutionary turn towards electrification that paves ways towards future intelligent driving. While Tesla demonstrates that American firms can succeed in electrification, its success is not replicable at scale given its unique global supply chain combination that is no longer feasible in an era of retreat from globalization. For U.S. automakers, the central challenge is not American demand for newer and better cars but capacity: the U.S. lacks the production scale and industrial depth needed to compete with Europe, Japan, Korea, and especially China, which is usually, conveniently, and inaccurately cited as the one to blame for America's industrial decline.

Policy responses have so far failed to resolve this dilemma. The Biden administration sought to combine the climate-oriented regulation mandate with electrification-oriented infrastructure policy to promote demand for EVs, but without supply-side restructuring these measures accelerated the decline of internal combustion engine (ICE) vehicles without securing a competitive EV base. The Trump administration has emphasized protectionism and industrial reshoring, aiming at revitalizing U.S. industrial productivity. These efforts have not addressed the underlying need for full supply chain upgrading to address demand for innovative products. Both approaches have fallen short— Biden by ignoring industrial capacity, Trump by neglecting electrification as the precondition for intelligent mobility.

America's enduring advantages lie in technology. The U.S. leads in various sectors of artificial intelligence development - one that is essential to future intelligent driving - including semiconductor design, cloud infrastructure, and autonomous driving. These assets position it strongly in the future of intelligent vehicles. Yet, without scaled auto and battery production, these strengths remain stranded—powerful in theory but underutilized in practice. Closing this gap requires a strategy that links technological leadership to manufacturing scale.

Hybrids offer a pragmatic bridge. Unlike pure EV, HEV can be built on existing ICE platforms, requiring only incremental advances in electric drive and compact batteries. This lowers costs, promotes supply chain resilience, and aligns with America's reindustrialization goals. Hybrids also deliver meaningful environmental benefits, ease consumer adoption, and support gradual infrastructure buildout without destabilizing the fossil fuel economy that President Trump deeply adores. By expanding hybrid production, Detroit can resolve its capacity trap, prepare the ground for electrification, and create space for the application of U.S. technological advantages.

Strategically, the U.S. must treat protectionism as a temporary buffer, not a permanent solution. American Automakers should make better use of this period to scale hybrids, consolidate through financial restructuring, and eliminate inefficient producers. Internationally, America should avoid head-to-head EV competition with China, Japan, and Europe, instead pursuing asymmetric strategies that leverage brand strength, intelligent design, and differentiated pricing. Policymakers must also move beyond securitizing supply chains—especially exaggerated fears of rare earth dependence—and focus instead on the real contest: applying AI, chips, and data to industrial upgrading. While it is politically difficult to tone down the "China Shock"[1] rhetoric set by strategic competition with Beijing, the tariffs should be viewed as economic tools to benefit the U.S., not political tools to hurt China.

The policy implication is clear: America's auto revival depends on coupling hybrid transition with capacity rebuilding, embedding technology into scaled production, and resisting the drift toward oversecuritization. If Detroit can seize this moment, the U.S. has not yet lost the global race. But without decisive action, protectionism will entrench decline rather than reverse it.

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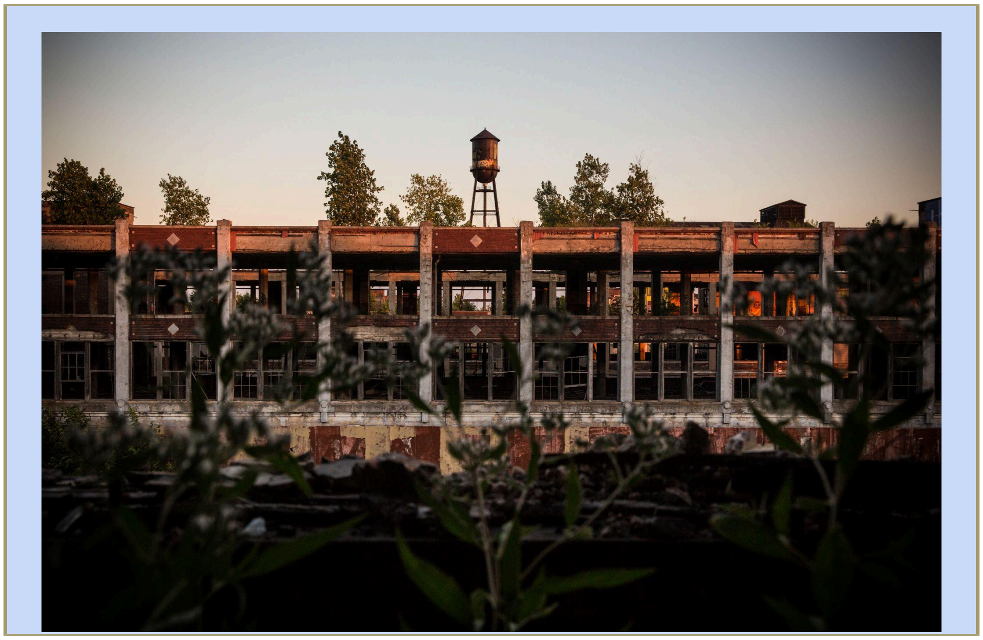
[1] James Pethokoukis, "Bracing for China Shock 2.0," American Enterprise Institute, July 16, 2025 https://www.aei.org/articles/bracing-for-china-shock-2-0/

Part I | The U.S. Auto Industry at a Crossroads

Detroit's Decline: From Global Leader to Domestic Huddle



DETROIT, MI - SEPTEMBER 04: Ruins at the abandoned Packard Automotive Plant seen in 2013. (Photo by Andrew Burton/Getty Images)

At the midpoint of the 20th century, Detroit was not only the beating heart of American industry but also a global symbol of mass production and consumer culture. The "Big Three"—General Motors, Ford, and Chrysler—set the standard for scale, technological prowess, and brand power. In 1962, GM alone held close to 50 percent of the U.S. domestic market, and together the Big Three controlled over 90 percent[2]. American cars were exported across Europe, Asia, and Latin America, widely associated with prosperity and modernity.

That dominance began to erode in the 1970s. A series of oil shocks exposed the vulnerability of America's large, fuel-hungry sedans, while Japanese automakers seized the opportunity with smaller, more fuel-efficient models. Imports from Japan grew from less than 5 percent of the U.S. market in 1970 to over 20 percent by the mid-1980s[3]. Toyota's Corolla and Honda's Civic became household names, offering reliability and efficiency at a price point that Detroit struggled to match. By 1985, Japanese brands had captured enough market share that the U.S. government negotiated voluntary export restraints with Tokyo to protect domestic producers.

[2] Mark J. Perry, "Animated Chart of The Day: Market Shares of US Auto Sales, 1961 To 2018," American Enterprise Institute, June 18, 2019 https://www.aei.org/carpe-diem/animated-chart-of-the-day-market-shares-of-us-auto-sales-1961-to-2016

[3] Candace Howes, "Japanese Auto Transplants and the U.S. Automobile Industry," Economic Policy Institute, 1993 https://files.epi.org/page/-/old/studies/japanese_auto-1991.pdf

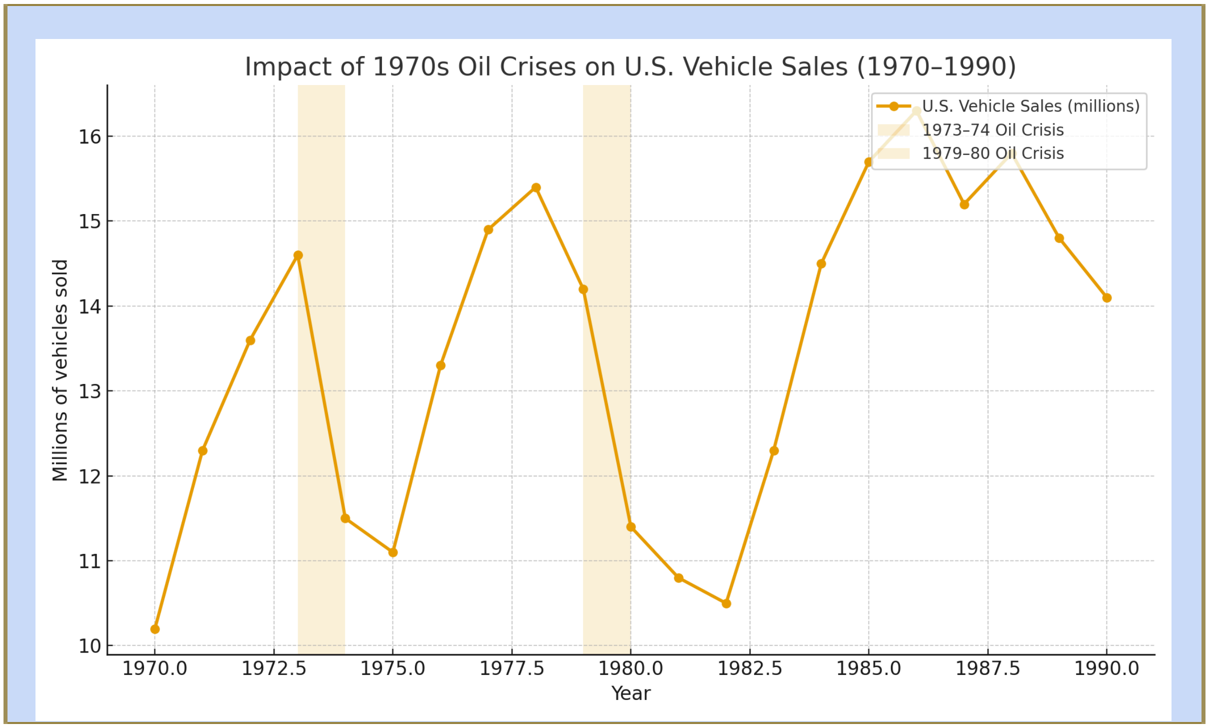


Chart 1: Impact of 1970s Oil Crises on U.S. Vehicle Sales (1970-1990)[4]

U.S. policymakers also introduced new regulations to cope with the oil shocks. The 1975 Energy Policy and Conservation Act created Corporate Average Fuel Economy (CAFE) standards[5], designed to push automakers toward better efficiency. Yet the rules included a critical loophole: SUVs and light trucks were held to less stringent standards than passenger cars[6]. Rather than competing head-on with Japanese and European firms in compact and mid-sized segments, Detroit increasingly shifted production toward SUVs and pickups. Cheap gasoline reinforced this trend, and the higher profit margins of larger vehicles made it financially attractive.

By the 1990s and 2000s, this transition had reshaped the industry. SUVs and pickups grew from about 20 percent of U.S. new vehicle sales in 1980 to more than 60 percent by the early 2020s[7]; in 2023, "light trucks" (a category that includes SUVs, pickups, and minivans) accounted for nearly 80 percent of all U.S. sales. The Big Three adapted accordingly, but at the cost of global competitiveness. Their combined share of the U.S. market, once above 90 percent, fell steadily: GM dropped from nearly half in the 1960s to about 17 percent in 2024, Ford hovered around 13

[4] Data source: Annual sales data (1931–2009 time series; I extracted 1970–1990 segment): Ward's Automotive Group compiled table, via Tidridge PDF "US Vehicle Sales, 1931–2009." & Oil-shock timing/context: Federal Reserve History—"Oil Shock of 1973–74" & "Oil Shock of 1978–79."

[5] S.622 Energy Policy and Conservation Act 1975, U.S. Congress https://www.congress.gov/bill/94th-congress/senate-bill/622

[6] Alexandre Mouravskiy, "What Is the SUV Loophole and Will It Close?" Capital One Auto Navigator, September 29, 2023 https://www.capitalone.com/cars/learn/finding-the-right-car/what-is-the-suv-loophole-and-will-it-close/2654

[7] Petar Djekic, "The Unchecked Rise of Trucks and SUVs in America," Cornell Journal of Law and Public Policy,November 25, 2024 https://publications.lawschool.cornell.edu/jlpp/2024/11/25/the-unchecked-rise-of-trucks-and-suvs-in-america

percent, and Chrysler (now part of Stellantis) below 12 percent[8]. Foreign automakers—first Japanese, then Korean and European—secured permanent footholds. Hyundai and Kia, for example, went from negligible presence in the 1980s to nearly 11 percent of the U.S. market in 2024[9].

The long-term consequences were severe. By doubling down on larger vehicles, Detroit lost both the platforms and the supplier ecosystems needed for compact and mid-sized cars. Hybrids became dominated by Toyota and Honda, whose Prius and Accord hybrid lines sold millions globally; Volkswagen, Renault, and other European brands set benchmarks in fuel-efficiency engineering.

These weaknesses became starkly visible during the 2008 global financial crisis. Collapsing credit markets and plunging sales pushed GM and Chrysler into bankruptcy protection, while Ford avoided insolvency only by mortgaging nearly all of its assets in 2006. The U.S. government intervened with an unprecedented rescue: the Treasury's Troubled Asset Relief Program (TARP) ultimately committed more than $80 billion in loans and equity purchases to stabilize the industry[10]. By 2014, most of these funds were repaid, though taxpayers still absorbed an estimated $11 billion net loss[11].

The bailout kept Detroit alive but did not reverse its decline. Even as the U.S. economy returned to steady growth in the 2010s, the Big Three failed to regain global competitiveness. Between 2009 and 2019[12], GM's share of the U.S. market slipped from 19.8 percent to 16.9 percent, Ford from 15.5 to 14.1 percent, and Chrysler/Stellantis from 11.2 to under 12 percent[13]. By contrast, Toyota grew to nearly 15 percent[14], while Hyundai-Kia rose above 8 percent[15]. Meanwhile, the sales mix tilted further toward SUVs and pickups: cars still accounted for about 50 percent of U.S. light-vehicle sales in 2012, but by 2019 that figure had fallen below 30 percent[16], underscoring Detroit's dependence on one shrinking niche.

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[8] Kristin Dziczek et al, "Contribution of General Motors to the Economies of Nine States and the United States in 2019," Center for Automotive Research, 2020 https://www.cargroup.org/wp-content/uploads/2020/02/GM-CONTRIBUTION-February-2020.pdf
[9] "Hyundai, Kia Claim 11 Percent U.S. Market Share in January-May," Korea JoongAng Daily, June 29, 2025 https://koreajoongangdaily.joins.com/news/2025-06-29/business/industry/Hyundai-Kia-claim-11-percent-US-market-share-in-January May/2341072
[10] "Auto Industry Program Overview," U.S. Department of The Treasury https://home.treasury.gov/data/troubled-assets-relief-program/automotive-programs/overview
[11] Eric Beech, "U.S. Government Says It Lost $11.2 Billion on GM Bailout," Reuters, April 30, 2014 https://www.reuters.com/article/business/us-government-says-it-lost-112-billion-on-gm-bailout-idUSBREA3T0MU/
[12] "2009 U.S. Automotive Sales by Automaker – The Best-Selling Automotive Manufacturers By Sales Volume," Good Car Bad Car, 2009 https://www.goodcarbadcar.net/2009-us-auto-sales-figures-by-manufacturer/
[13] "2014 U.S. Automotive Sales by Automaker – The Best-Selling Automotive Manufacturers By Sales Volume," Good Car Bad Car, 2014 https://www.goodcarbadcar.net/2014-us-auto-sales-figures-by-manufacturer/
[14] "Toyota Sales Data, Trends, Analysis & Current Lineup for the U.S Automotive Market," Good Car Bad Car, 2025 https://www.goodcarbadcar.net/toyota-us-sales-figures
[15] "Hyundai Motor Group Sales Data, Trends & Analysis for the U.S Automotive Market," Good Car Bad Car, 2025 https://www.goodcarbadcar.net/hyundai-kia-group-us-sales-figures/
[16] "Flash Report, Sales Volume, 2019," Marklines Information Platform, January 4, 2020 https://www.marklines.com/en/statistics/flash_sales/salesfig_usa_2019

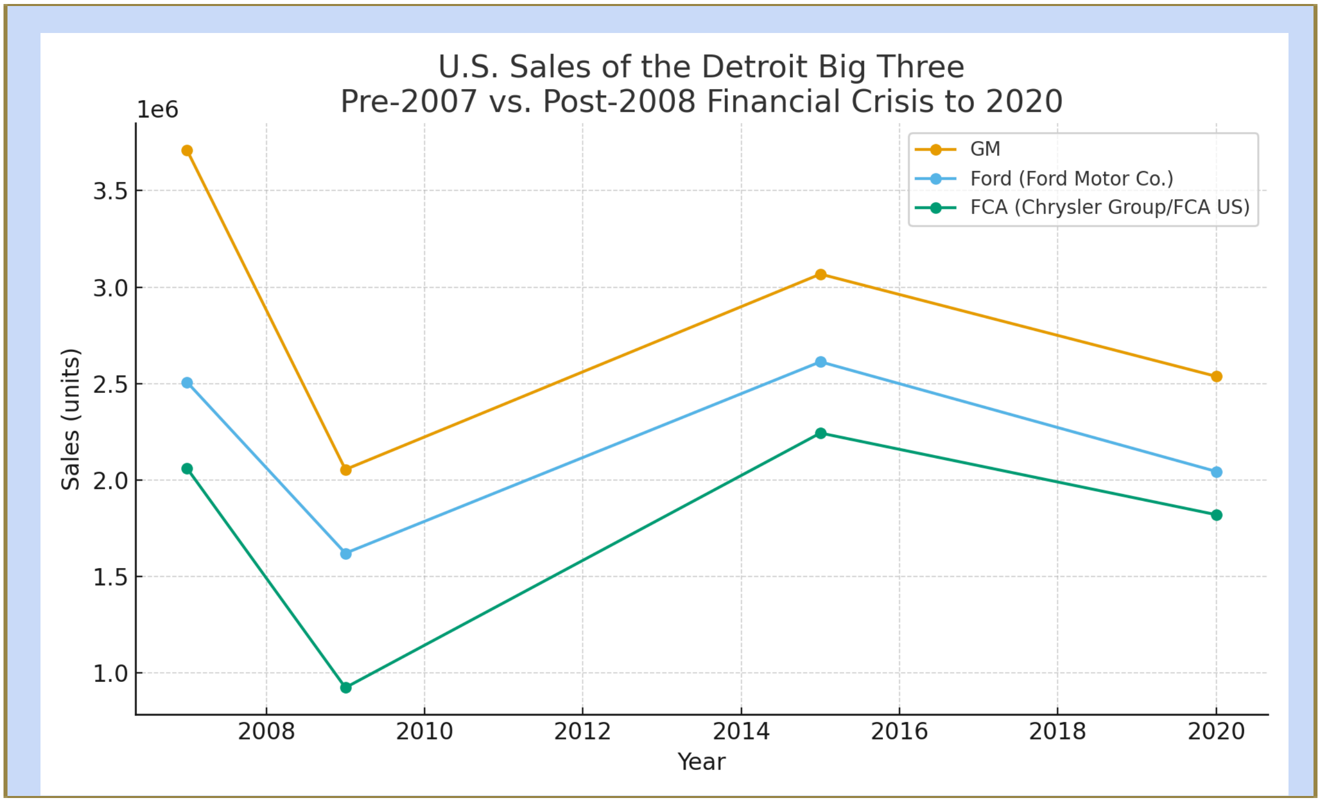

Chart 2: U.S. Sales of the Detroit Big Three Pre-2007 vs Post 2008 Financial Crisis to 2020[17]

In short, the bailout bought time but not transformation. The decade between the financial crisis and the COVID-19 pandemic was one of relative macroeconomic stability for the United States, but Detroit remained structurally constrained. It is profitable in its domestic truck and SUV stronghold, but absent from the compact and affordable segments that defined growth abroad. When the EV era arrived, Chinese manufacturers leveraged scale to occupy the affordable mass-market segment. In contrast, traditional U.S. automakers were left competing primarily in the large-vehicle niche—profitable domestically, but increasingly irrelevant abroad[18]. As new EV competitors —not only Tesla from domestic, but also BYD and many others from China - begin to explore the EV truck territory, Detroit is expected to be pushed further to the margin. Moreover, as old competitors such as Hyundai and Kia in Korea, and Volkswagen and Renault in Europe long on the way to transition to hybrid and electrification, the legacy American giants have steadily entered a phase of slow, chronic decline as they huddled in Motown.

[17] Data from General Motors Sales Data, Trends & Analysis for the U.S Automotive Market, Auto industry sets all-time sales record in 2025, & Stellantis Sales Data Trends & Analysis for the U.S Automotive Market
[18] “Highlights of the Automotive Trends Report,” United States Environmental Protection Agency, November 25, 2024 https://www.epa.gov/automotive-trends/highlights-automotive-trends-report

Tesla as the Exception, Not the Rule

The emergence of Tesla is often portrayed as evidence that America remains at the forefront of automotive innovation, particularly in electrification and intelligent mobility. The company's achievements are indeed remarkable. Since delivering its first Roadsters in 2008 and scaling the Model S and Model 3, Tesla has almost redefined consumer expectations of what an electric vehicle could be. In 2023, Tesla sold more than 1.8 million vehicles globally[19], accounting for about 19 percent of worldwide EV sales[20]. In the United States, its market share in EV peaked above 80 percent before beginning to decline as competitors entered[21].

Tesla pioneered long-range battery technology and transformed EV from niche curiosities into aspirational products. Its supercharger network set a global benchmark for charging convenience. The company's direct-sales model bypassed traditional dealerships, while its ability to repeatedly tap equity markets allowed it to sustain years of losses while scaling production. Following its peak, Tesla's market capitalization briefly exceeded $1.2 trillion[22], more than the combined value of Toyota, Volkswagen, GM, Ford, and Stellantis . For more than a decade, Tesla demonstrated that EV could be both desirable and commercially viable, overturning entrenched skepticism in Detroit and beyond.

Yet Tesla's trajectory is an anomaly rather than a template. Unlike the Detroit Three, Tesla entered the market without legacy costs, entrenched labor structures, or sunk investments in internal-combustion production. It could build operations around EV from the ground up, avoiding the trade-offs of retooling dozens of ICE plants and shifting tens of thousands of workers. Moreover, Tesla's rapid expansion was fueled by unique financial conditions. Since its IPO in 2010, Tesla has demonstrated an unparalleled ability to raise funds from capital markets. Its initial public offering brought in $226 million, and over the following decade the company repeatedly tapped equity and debt markets to finance expansion. Between 2012 and 2019, Tesla raised more than $10 billion through secondary offerings and convertible debt. The pace accelerated in 2020, when—amid soaring stock prices—Tesla conducted three equity offerings that together added over $12 billion to its balance sheet[23].

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[19] "Global EV Outlook 2024," International Energy Agency, April 2024 https://www.iea.org/reports/global-ev-outlook-2024
[20] Ian Henry, "Tesla Struggling Globally as It Faces Intense Competition," Automotive World, July 18, 2025 https://www.automotiveworld.com/articles/tesla-struggling-globally-as-it-faces-intense-competition/
[21] Abhirup Roy, "Exclusive: Tesla Market Share in US Drops to Lowest Since 2017 as Competition Heats Up," Reuters, September 8, 2025 https://www.reuters.com/business/autos-transportation/tesla-market-share-us-drops-lowest-since-2017-competition-heats-up-2025-09-08/
[22] Akash Sriram, "Tesla Hits $1 Trillion Market Value as Musk-Backed Trump Win Fans Optimism," Reuters, November 8, 2024 https://www.reuters.com/business/autos-transportation/tesla-hits-1-trillion-market-value-musk-backed-trump-win-fans-optimism-2024-11-08/
[23] Lora Kolodny, "Tesla Stock Is Up More Than 4000% Since Its Debut 10 Years Ago," CNBC, June 29, 2020 https://www.cnbc.com/2020/06/29/tesla-stock-up-4125percent-since-ipo-ten-years-ago.html

Geography also played a critical, if not essential role. Tesla's Shanghai Gigafactory, opened in 2019, now produces more than 950,000 vehicles annually[24] —more than its original Fremont plant and Austin combined. The ability to pair American innovation with Chinese manufacturing scale at that specific geopolitical moment was decisive. With current U.S.–China tensions and 100 percent tariffs on Chinese EV imports, no other American automaker could replicate this dual-hemisphere model today.

SHANGHAI, CHINA - JUNE 02: Aerial view of Tesla Shanghai Gigafactory, 2023. (Photo by VCG/VCG via Getty Images)

Even so, Tesla's model has limits. Its vehicles remain largely premium products, with an average transaction price of about $54,000 in 2024, far above the U.S. new-car average of $47,500 and far from the sub-$30,000 EVs proliferating in China and Europe[25]. Production scaling has repeatedly faced bottlenecks, from "production hell" in 2017–2018 to quality control issues flagged by regulators in multiple markets. Its U.S. EV market share has fallen from 60 percent in 2020 to under 40 percent in 2024[26], as other competitors fielded affordable, high-quality EVs. Tesla's reliance on a charismatic yet politically ambitious founder has also introduced volatility; share prices fluctuated by more than 60 percent in 2022 alone , underscoring a risk profile that legacy firms could not withstand.

[24] Constantin Hoffmann, "Tesla Gigafactory Shanghai Reaches Maximum Production Capacity," Shop4Tesla, September 20, 2024 https://www.shop4tesla.com/en/blogs/news/tesla-gigafactory-shanghai-laeuft-auf-hochtouren#:~:text=With%20an%20annual%20production%20capacity,in%20China%20despite%20increasing%20competition.
[25] "Kelley Blue Book Report: Average New-Vehicle Prices Climb Higher For Fourth Consecutive Month, Flirt with All-Time High," Cox Automotive, January 15, 2025 https://www.coxautoinc.com/market-insights/december-2024-atp-report/
[26] "Global EV Outlook 2025," IEA, May 14, 2025 https://www.iea.org/reports/global-ev-outlook-2025/trends-in-electric-car-markets-2

MARCH 11, 2025: President Trump views Teslas with Elon Musk at the White House. (Image source: whitehouse.gov)

For Detroit, therefore, Tesla's rise offers inspiration but little practical guidance. GM and Ford cannot erase their legacy cost structures or re-enter capital markets as start-ups. The scale of completely upgrading their ICE production lines and mobilizing market capital to support an outdated EV fairy tale would attract little investor interest as they already move on to explore uncharted territories in cryptocurrency and artificial intelligence. Policymakers face a similar trap: celebrating Tesla as proof of U.S. leadership risks obscuring the structural reality. The broader American auto sector remains unprepared for electrification at scale, particularly in the affordable segments that will define global growth.

If Tesla is the exception for innovation, Detroit is the rule for inertia. ICE legacy, misaligned capacity, and missed opportunities for transition puts the U.S. auto industry at a crossroad. Unless this reality is acknowledged, the United States risks mistaking one company's exceptionalism for an industry-wide strategy. Tesla's achievements cannot mask the fact that the global EV race is now dominated by multiple new contenders—BYD in China, Hyundai and Kia in Korea, Volkswagen in Europe—while America's legacy automakers remain tethered to SUV and pickups. The danger is that Tesla's brilliance blinds policymakers to the industry's chronic decline, leaving Detroit even further behind as the next generation of EV and smart-car competitors write the rules of the game.

Not China's Fault

As the American auto industry confronts its mounting challenges, political and industry leaders in Washington have reached for a familiar refrain: blame China. While Detroit's retreat from global competitiveness long predated the rise of Chinese EV, from congressional hearings to campaign rallies, Chinese subsidies, industrial overcapacity, and the specter of cheap electric vehicle exports are invoked as existential threats to Detroit's survival[27]. This narrative is tidy and convenient. It situates America's manufacturing decline within the broader context of strategic rivalry with Beijing and allows policymakers to frame the problem as a national-security imperative rather than a combination of poor economic policy and corporate failure.

In reality, by the time firms like BYD, NIO, and XPeng became recognizable names abroad, American automakers had already vacated the compact, hybrid, and affordable EV segments that now drive the global market. China's rise was neither at the expense of Detroit's decline, nor was it carrying an ill intended mission to sabotage U.S. manufacturing.

China's rise in the EV sector is also better explained by scale and strategy than by subsidies alone. Between 2009 and 2022, Beijing spent an estimated over $100 billion on subsidies, but these were gradually phased down after 2020[28]. Beijing further expanded the effort by initiating its anti-involution campaign[29] in 2025 to stop price war with the EV sector particularly in its focus. What endured was an integrated industrial policy: binding EV credit quotas, sustained investment in charging networks (with more than 2.5 million public chargers installed by 2023), and expansion of the supply chain in lithium, cathodes, and graphite. These measures enabled China to build unmatched economies of scale. In 2024, China sold 11 million EVs, nearly 50 percent of all new cars sold domestically[30], with average transaction prices under $30,000. BYD alone delivered more than 3 million vehicles, surpassing Tesla as the world's largest EV producer[31].

By contrast, the United States remains below 10 percent EV penetration, with average EV prices near $55,000, far above the level accessible to mainstream consumers. The contrast highlights a simple point: Chinese firms succeeded not

[27] Breana Noble, "Some Fear Chinese Automakers' Playbook Is Existential Threat to U.S. Auto Industry," The Detroit News, July 18, 2025
https://www.detroitnews.com/story/business/autos/2025/07/18/china-automotive-components-sharing-standardization-ford-gm-stellantis/85240684007/
[28] Panle Jia Barwick, et al, "It's Not Just Subsidies: How China's EV Battery Firms Learned Their Way to Dominance," SCCEI China Briefs, August 15, 2025
https://sccei.fsi.stanford.edu/china-briefs/its-not-just-subsidies-how-chinas-ev-battery-firms-learned-their-way-dominance
[29] Manishi Raychaudhuri, "China's Fight Against Price Wars Is An Uphill Battle," Reuters, August 12, 2025
https://www.reuters.com/markets/asia/chinas-fight-against-price-wars-is-an-uphill-battle-2025-08-12/#:~:text=EARLY%20DAYS,shareholder%20to%20improve%20operational%20efficiency.
[30] "Global EV Outlook 2024," IEA, April 23, 2024 https://www.iea.org/reports/global-ev-outlook-2024
[31] Sam Meredith, "Chinese Ev Giant BYD Outpaces Tesla with Annual Sales of More Than $100 Billion," CNBC, March 25, 2025
https://www.cnbc.com/2025/03/25/ev-giant-byd-outpaces-tesla-with-annual-sales-of-over-100-billion.html

because they had permanent subsidy advantages, but because national policy created the sustainable scale and ecosystem that drove costs down. If subsidies alone were sufficient, President Biden's Inflation Reduction Act (IRA) EV tax credits would not have been rolled back in 2025 before delivering meaningful results.

Blaming Beijing may serve short-term political agendas, but it obscures the real issue. Detroit's challenge is a structural crisis, and it is not because of external factors. Unless U.S. automakers confront their own misalignment, no amount of China-bashing will restore competitiveness.

A Market Misaligned with Global Competition

The global auto industry has entered a new era defined by electrification, digitalization, and regulatory convergence. Across Asia and Europe, governments and companies have synchronized strategies to capture emerging markets for electric and hybrid vehicles. China's rise has been the most dramatic: by building the world's largest EV market, integrating supply chains from minerals to batteries, and nurturing a cohort of competitive manufacturers, Beijing has ensured that EVs are not a niche but the core of its industrial future.[32] Europe, meanwhile, has leveraged stringent emissions regulations and consumer incentives to accelerate electrification[33], with Volkswagen, BMW, and Mercedes aggressively retooling their fleets. Japan and South Korea have hedged differently, capitalizing on their hybrid dominance to maintain competitiveness while investing in next-generation battery technologies[34].

By contrast, the United States remains misaligned with these global dynamics. Detroit's product mix is still overwhelmingly skewed toward high-margin pickups and SUV, vehicles that are not only poorly suited to international markets but also increasingly out of step with international regulatory and environmental pressures. Where Chinese and European automakers are competing in small, affordable EV segments, U.S. companies offer few credible alternatives. The absence of U.S. automakers from critical global segments is not simply a gap in product lines; it is a reflection of an industrial base optimized for the wrong markets.

The consequences of this misalignment are twofold. First, U.S. automakers have little presence in fast-growing overseas markets where compact EV dominate sales. As a result, they are unable to benefit from economies of scale that their competitors enjoy, reinforcing the capacity trap at home. Second, within the

[32] "New Energy Vehicle Industry Development Plan (2021–2035) (original text in Chinese)," General Office of the State Council, October 20, 2020 https://www.gov.cn/zhengce/content/2020-11/02/content_5556716.htm

[33] Philip Blenkinsop, "Eu Brings Forward Review of 2035 Zero Emission Vehicles Target," Reuters, September 12, 2025 https://www.reuters.com/sustainability/climate-energy/eu-bring-forward-review-2035-vehicle-emissions-targets-2025-09-12/

[34] Kotaro Hosokawa, "Samsung SDI to Start Mass-Producing Solid-State Batteries in 2027," Nikkei Asia, March 7, 2024 https://asia.nikkei.com/business/technology/samsung-sdi-to-start-mass-producing-solid-state-batteries-in-2027

domestic market, they are vulnerable to shifting consumer preferences and policy signals. Should oil prices rise, emissions standards tighten, or subsidies prioritize smaller EV, Detroit's oversized product strategy could quickly turn from strength to liability. In effect, the U.S. auto industry is playing a different game from its competitors—one that may maximize profits in the short run but undermines long-term competitiveness.

This divergence is not new. For decades, American automakers justified their reliance on large vehicles by citing consumer demand and profitability. But in a world where technology, climate imperatives, and market competition are converging, that logic has run its course. The global auto market is no longer segmented neatly by region; it is increasingly integrated around common technologies and standards. By failing to align with these shifts, the United States risks becoming a bystander in an industry it once dominated.

Ultimately, the U.S. auto industry's problem is not that it faces impossible competition, but that it is competing on the wrong terms. Rather than positioning themselves in the global mainstream of affordable, efficient EVs and hybrids, American automakers are clinging to a model of oversized vehicles that isolates them from both global trends and domestic imperatives. This misalignment ensures that, while Detroit's trucks and SUVs may remain profitable at home in the near term, the future of the auto industry is being written elsewhere.

MUNICH, GERMANY - SEPTEMBER 09: The Chinese producer of electric cars BYD presents its EV on the opening day of the IAA MOBILITY 2025 automobile fair in Munich, Germany. (Photo by Johannes Simon/Getty Images)

The trajectory of America's auto industry reveals a sobering truth: decline was set in motion long before EV became a global battleground. Detroit's overreliance on profitable but oversized vehicles hollowed out its competitiveness in the very segments that came to define international markets. Tesla's rise demonstrates that innovation is possible, but its success highlights the incapacity of the legacy industry rather than offering a replicable model. Faced with this reality, U.S. policymakers and industry leaders have often sought a more convenient explanation—casting China's industrial policy and rising EV exports as the decisive cause of American decline. Yet as the evidence shows, the problem is homegrown. The United States is not losing only to China; it is failing to keep pace with Japan's hybrid leadership, Europe's regulatory-driven electrification, and Korea's disciplined scaling strategies. China may loom largest in today's political rhetoric, but Detroit's struggle is part of a broader competitive shortfall.

This misdiagnosis matters. By externalizing blame, Washington risks treating symptoms rather than causes. Instead of addressing structural weaknesses—misaligned capacity, limited product diversity, and lagging technological investment—the policy debate has gravitated toward tariffs, subsidies, and symbolic gestures aimed at Beijing. The next section explores this policy and political landscape: how federal initiatives, state-level divergences, and congressional rhetoric attempt to reshape America's auto trajectory, and why these efforts often reveal more about political imperatives than industrial solutions.

Part II | Washington's Auto Policy: Between Stimulus and Protectionism

Biden's Demand-Side Gamble

The Biden administration sought to jump-start America's EV transition by targeting the demand side of the market. Through the Inflation Reduction Act (IRA)[35] and a suite of emissions standards[36] and proposals[37], Washington aimed to tilt consumer behavior toward electric vehicles and nudge manufacturers away from internal combustion engines. The Biden Administration believed that if buyers were offered generous tax credits and if regulators raised the cost of ICE compliance, automakers in Detroit would be willing to retool for an electric future. In theory, this strategy promised to generate a virtuous cycle of rising demand, accelerating investment, and eventual industrial renewal.

However, the results were far less transformative in reality. Tax credits alone did little to accelerate adoption, because most U.S. EV remained premium models, tax credits were insufficient to make them more affordable and attractive to ordinary consumers looking for reasonably priced cars. Many consumers were also reluctant to abandon familiar driving habits or to rely on an insufficient EV infrastructure. At the same time, although higher emissions standards tightened the screws on ICE sales and created financial pressure on legacy automakers, they never led to direct boosts in EV production capacity or technological advancement that would benefit Detroit automakers.

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35 "Inflation Reduction Act of 2022," IRS, 2022 https://www.irs.gov/inflation-reduction-act-of-2022

36 "Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles," U.S. Environmental Protection Agency (EPA), April 18, 2024 https://www.federalregister.gov/documents/2024/04/18/2024-06214/multi-pollutant-emissions-standards-for-model-years-2027-and-later-light-duty-and-medium-duty

37 "Biden-Harris Administration Proposes Strongest-Ever Pollution Standards for Cars and Trucks to Accelerate Transition to a Clean-Transportation Future," EPA Press Office, April 12, 2023 https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strongest-ever-pollution-standards-cars-and

AUGUST 16, 2022: Joe Biden signing the IRA. (Official White House Photo by Cameron Smith)

Therefore, Biden's policies squeezed legacy manufacturers between falling profitability on their traditional lines and rising costs of electrification without providing the industrial support needed to bridge the gap. Detroit's problem was never simply insufficient demand for EVs; it was a capacity trap rooted in decades of dependence on trucks and SUVs. Stimulating consumer demand alone could not undo that structural imbalance.

Automakers saw their ICE business models under siege, their EV pipelines unprepared, and their labor costs inflexible. The IRA's tax credits may have been designed to signal certainty, but led to the opposite effects in reality. They underscored the mismatch between political ambition and industrial reality. For Detroit, the promise of demand-driven renewal rang hollow when the underlying production base was incapable of delivering at scale.

The Limits of Tax Credits as Industrial Policy

The Biden administration's bet on consumer-side incentives soon ran into practical limits. The IRA's EV credits, worth up to $7,500 per vehicle, came with shifting and complex eligibility requirements: North American final assembly, escalating thresholds for critical-mineral sourcing, vehicle price caps, and income limits. As of January 2024, these stricter supply-chain and sourcing rules caused the number of new EV models eligible for the full tax credit to drop from ~43 models at the end of 2023 to only ~19 models at the start of 2024[38].

[38] "IRA EV Tax Credits: 2024 Guide," New York State, 2024 https://www.nyserda.ny.gov/Featured-Stories/Updated-IRA-EV-Tax-Credits-Explained

Consumers struggled to know whether their purchase would benefit, and automakers were forced into reactive product tweaks rather than long-term planning. What was meant to provide clarity instead created uncertainty.

The fiscal and political side was similarly fragile. While the IRA credits aimed to make EVs affordable, these incentives required substantial federal outlays at a time of budget pressures. In mid-2025, Congress passed the "One Big Beautiful Bill," which ended the $7,500 tax credit for new EVs and the $4,000 credit for used EVs effective September 30, 2025[39]—several years ahead of earlier schedules. This rollback happened before many manufacturers had fully retooled their supply chains or production lines to meet the tougher sourcing requirements.

International comparisons underscore the shortfall. Europe links consumer incentives to binding emissions regulations and regulatory certainty. China used subsidies not just to boost demand but to build upstream and downstream ecosystem capabilities—battery minerals, manufacturing capacity, charging infrastructure—and phased subsidies gradually as scale and domestic sourcing improved. Korea likewise combined incentives with industrial discipline.

Trump's Protectionist Turn

If the Biden administration leaned too heavily on stimulating demand, the Trump administration's approach swung in the opposite direction of shielding supply. Trump framed his auto policy within the broader banner of *reshoring* [40]and *reindustrialization*[41], deploying tariffs[42], buy-American mandates, and rhetorical attacks on globalization. The logic was that by raising barriers to imports and reducing foreign competition, U.S. automakers would regain space to rebuild. In practice, however, these measures did little to address the structural weaknesses embedded in Detroit's production base.

Tariffs on foreign autos and parts may have raised costs for competitors, but they also increased expenses for American manufacturers reliant on global supply chains. Tariffs on parts alone could cost the U.S. auto industry $26 billion[43], adding roughly $3,000 per vehicle. Rather than prompting investment in new domestic

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[39] David Shepardson, "US Electric Vehicle Tax Breaks Will Expire on Sept. 30," Reuters, July 3, 2025 https://www.reuters.com/sustainability/us-electric-vehicle-tax-breaks-will-expire-sept-30-2025-07-03/

[40] Andrea Shalal, et al, "Trump Set to Soften Auto Tariffs after Industry Pushback," Reuters, April 29, 2025 https://www.reuters.com/business/autos-transportation/trump-reduce-impact-auto-tariffs-officials-say-2025-04-28/

[41] "Fact Sheet: President Donald J. Trump Incentivizes Domestic Automobile Production," The White House, April 29, 2025 https://www.whitehouse.gov/fact-sheets/2025/04/fact-sheet-president-donald-j-trump-incentivizes-domestic-automobile-production/

[42] "Fact Sheet: President Donald J. Trump Adjusts Imports of Automobiles and Automobile Parts into the United States," The White House, March 26, 2025 https://www.whitehouse.gov/fact-sheets/2025/03/fact-sheet-president-donald-j-trump-adjusts-imports-of-automobiles-and-automobile-parts-into-the-united-states/

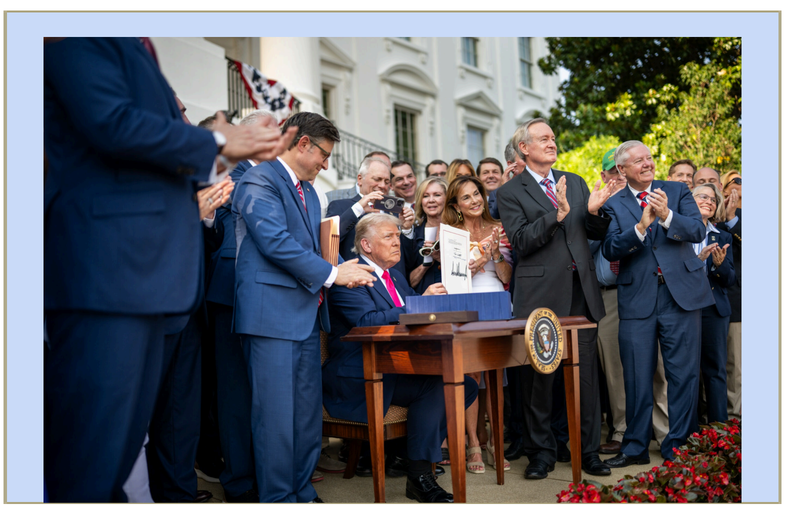
[43] Mike Colias, et al, "The Peril of Trump's Tariffs for America's Auto Titans," The Wall Stree Journal, April 4, 2025 https://www.wsj.com/business/autos/the-peril-of-trumps-tariffs-for-americas-auto-titans-ae3504e0

capacity, they reinforced existing inefficiencies. In this case, Detroit will continue to focus on its most profitable trucks and SUVs because these segments could better absorb higher input costs. Far from encouraging innovation, protectionism gave the industry cover to double down on the very business model that had led to its decline. Without properly addressing the scale constraints by tackling the industry development model, leaves American manufacturers, particularly automakers, out at the limbo of the global market.

Equally significant was the administration's preference for fossil fuels. Trump consistently celebrated oil and gas production as engines of national prosperity, which is also a signal to automakers that the cultural and political climate favored the continuation of ICE dominance. In comparison, the tentative momentum around EV that had been built during the Biden years was undermined by a White House visibly skeptical of electrification. For Detroit, this created a comfortable status quo: so long as domestic demand for large ICE vehicles remained politically protected, there was little incentive to disrupt established practices with costly EV investment.

The contradictions were stark. On the one hand, the administration called for a revival of U.S. manufacturing strength; on the other, its fiscal conservatism opposed the kind of target-oriented consistent spending required to rebuild supply chains for batteries, semiconductors, and charging networks. Reindustrialization was promised rhetorically but never delivered materially. Without targeted supply-side investments, tariffs and slogans could not generate the capacity transformation Detroit required. Instead, the industry became more insular, less exposed to competitive pressures, and more dependent on its legacy ICE portfolio.

Trump's protectionist turn thus deepened, rather than resolved, the capacity trap. It left U.S. automakers more shielded at home but even less competitive abroad, clinging to a model increasingly disconnected from global market realities. What was sold as a pathway to industrial revival became, in effect, a license for complacency.



JULY 4, 2025: President Trump signing the “OBBB”. (Official White House Photo by Daniel Torok)

A Policy Pendulum Without Direction

Taken together, the Biden and Trump years illustrate a policy pendulum swinging between stimulus and protectionism, yet never settling on a coherent industrial strategy. Biden's administration sought to accelerate electrification by stimulating demand, but without upgrading the supply side, subsidies and standards only exposed Detroit's incapacity to respond. Trump's administration promised industrial revival through tariffs and nationalist rhetoric, yet failed to invest in the supply chains and technologies that would have made reshoring credible. The result has been two very different approaches with a common flaw: neither touched the core problem of capacity misalignment.

For automakers, this inconsistency has been debilitating. Policy support appears and disappears with the electoral cycle, oscillating between climate-driven ambition and fossil-fuel favoritism. Subsidies are offered one year and stripped back the next; tariffs are imposed but then diluted by exemptions. This unpredictability undermines the long-term investment horizon required to retool plants, secure supply chains, and build new technologies. Facing such uncertainty, Detroit's firms default to the path of least resistance: preserve ICE profits, resist large-scale disruption, and delay irreversible commitments.

The larger irony is that both approaches reinforce complacency. Stimulus without industrial upgrading sustains the illusion of progress, while protectionism without investment entrenches the status quo. What Detroit needs—a coordinated strategy that links climate imperatives with supply-side reindustrialization—remains absent.

Washington has not yet produced a policy mix that reconciles its economic, environmental, and industrial goals. Without such alignment, Detroit will remain too dependent on yesterday's capacity to compete in tomorrow's markets, and too uncertain of policy direction to risk transformation. It is this vacuum of coherent strategy that sets the stage for the next dimension of America's auto dilemma: the imperatives of industrial greenification that make electrification unavoidable, whether Detroit is ready or not.

Part III | Two Paths, One Dead End, and One Way Out

Biden's Climate Ambition: Necessary but Incomplete

From a climate perspective, the transportation sector is central to global greenhouse gas reduction efforts. Scientific consensus—both internationally[44] and within the United States[45]—has established that cutting these emissions is essential to slowing global warming and mitigating climate change. Since transportation accounts for about a quarter of global carbon emissions[46], and road transport makes up roughly 75 percent of that total[47], no serious decarbonization pathway can bypass the auto sector. One of the Biden administration's most consequential contributions to the auto debate was to frame electrification not only as an industrial issue but as a climate imperative. By linking EV adoption to America's climate agenda, the administration injected a sense of urgency into a debate that for decades had revolved only around jobs, trade balances, and consumer choice. This perspective deserves recognition: without sustained progress in reducing emissions from cars and trucks, neither U.S. climate credibility nor global climate goals are achievable.

As mentioned previously, Biden's climate framing also carried an implicit industrial ambition. Through the Inflation Reduction Act and new vehicle standards, the administration aimed not only to cut emissions but to revive American competitiveness in a sector long in decline—treating climate policy as industrial policy and giving Detroit a rationale for renewal. Yet the strategy has flaws as it relies on demand-side subsidies and emissions mandates, and discourages ICE sales before new supply chains are ready. Automakers thus faced shrinking legacy profits and inadequate new output, widening the gap between political ambition and industrial reality. In effect, the administration demanded transformation without providing the means to achieve it.

This is why Biden's climate ambition must be judged as both necessary and incomplete. It recognized the scale of the environmental challenge and sought to position America on the right side of history, but it fell short of delivering the supply-side reindustrialization that could have made this ambition credible. Without addressing the underlying capacity trap, climate-driven electrification risks

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[44] The Core Writing Team, "Climate Change 2023 Synthesis Report: Summary for Policymakers," IPCC, 2023 https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf
[45] "Overview of Greenhouse Gases," U.S. Environmental Protection Agency (EPA), January 16, 2025 https://www.epa.gov/ghgemissions/overview-greenhouse-gases
[46] Hannah Ritchie, et al, "Breakdown of Carbon Dioxide, Methane And Nitrous Oxide Emissions by Sector," Our World in Data, June 2020 https://ourworldindata.org/emissions-by-sector
[47] Hannah Ritchie, "Cars, Planes, Trains: Where Do Co_2 Emissions from Transport Come From?" Our World in Data, October 6, 2020 https://ourworldindata.org/co2-emissions-from-transport

becoming a mandate that exposes weakness rather than a catalyst that rebuilds strength.

"Detroit Michigan ~ Old Packard Automotive Plant ~ My Old Photo" by Bill Badzo, CC BY-NC-SA 2.0

Trump's Industrial Revival: Ambition Without Vision

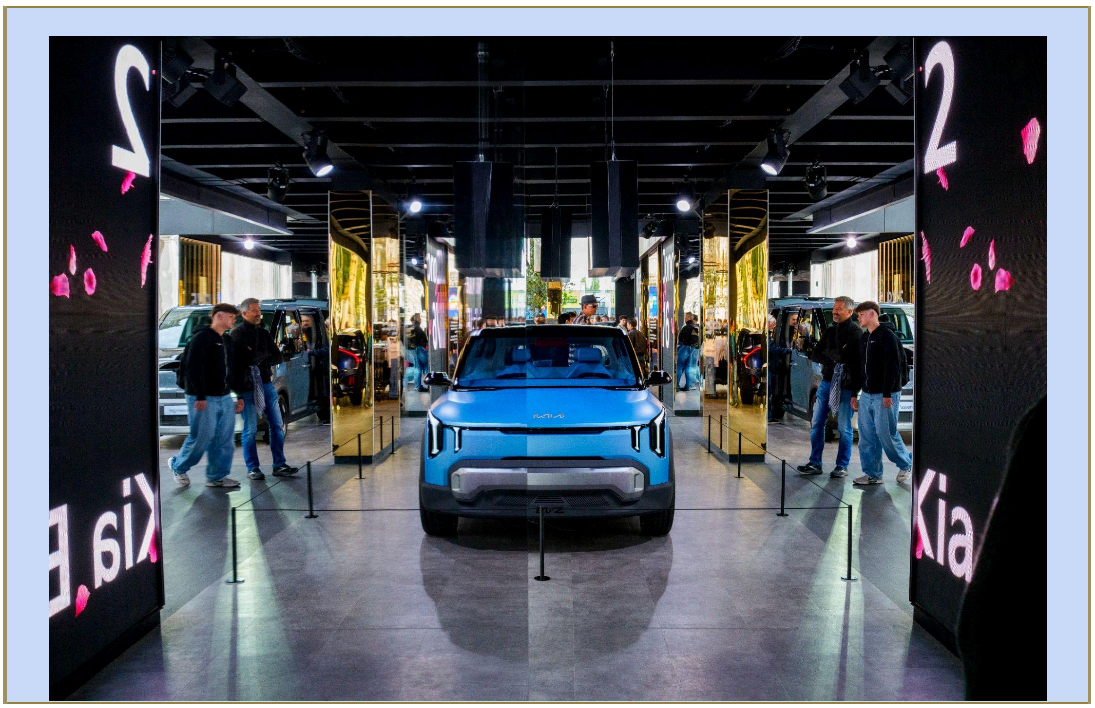
If the Biden administration's ambition was to decarbonize, the Trump administration's ambition was to ignore carbon emission and still focus on reindustrialization. Trump repeatedly argued that America could no longer afford to rely on foreign production for critical goods[48], and that the hollowing out of the industrial Midwest was both an economic and political liability. In this sense, his rhetoric captured a kernel of truth: without rebuilding its manufacturing base, the United States cannot hope to compete in autos or in any other sector that underpins its middle class. The call for industrial revival was not misplaced.

The problem lay in the path chosen. Rather than investing in supply-side transformation, the administration leaned on tariffs and protectionist rhetoric to insulate Detroit from global competition. This may have shielded legacy profits in the short term, but it did nothing to retool plants, modernize supply chains, or build the technological foundation for a new generation of vehicles. Worse still, by signaling

[48] "Fact Sheet: President Donald J. Trump Declares National Emergency to Increase our Competitive Edge, Protect our Sovereignty, and Strengthen our National and Economic Security," The White House, April 2, 2025 https://www.whitehouse.gov/fact-sheets/2025/04/fact-sheet-president-donald-j-trump-declares-national-emergency-to-increase-our-competitive-edge-protect-our-sovereignty-and-strengthen-our-national-and-economic-security/

clear support for oil and gas, the administration reinforced the dominance of internal combustion engines. This gave automakers a comfortable narrative: why invest in risky, capital-intensive electrification when the White House itself was betting on ICE? The outcome was not a revival but a retrenchment—Detroit doubling down on the very model that had already left it behind.

The contradictions were striking. Trump promised reshoring and manufacturing renewal, but his fiscal conservatism ruled out the large-scale public investment needed for supply-chain infrastructure, battery production, or semiconductor resilience. He called for jobs at home, but offered no roadmap for retraining a labor force to embrace the future of electrification. His protectionist instincts created space for Detroit to preserve the status quo, but deprived it of incentives to innovate. The result was a paradoxical industrial strategy: bold in rhetoric, timid in practice, and blind to the technological future of the auto industry.



MUNICH, GERMANY - SEPTEMBER 12: The electric car manufacturer KIA presents its concept car EV2 at the Open Space Area during the 2025 IAA Mobility in Munich, Germany. (Photo by EyesWideOpen/Getty Images)

For U.S. automakers, this amounted to an opportunity squandered. Instead of using protection as a breathing space to retool, Detroit treated it as a license to delay. The industry was given new clothes but told to walk the same old path—a policy that ensured survival in the near term but guaranteed stagnation in the long run. What was presented as a blueprint for industrial renewal became, in effect, a plan for managed decline.

Why EV Imperatives Cannot Be Ignored

Despite their contrasting approaches, both Biden and Trump faced the same underlying reality that the climate imperative is not optional, whether they acknowledge it or not. As the second largest emitter in the world, the United States cannot decouple its auto industry from its climate responsibilities. Meanwhile, the case for electrification also does not rest on climate alone. EV also offer lower lifetime operating costs while leading the industry to more intelligent mobility[49]. Clearly, other major players are embracing EV not only as a climate strategy but as a pathway to cheaper, more efficient, and technology-driven transport. After all, lofty climate ideals alone have never been enough to move any industry entirely, and what really drives adoption are the tangible advantages that make EV attractive even beyond their environmental case. For the United States, any credible industrial strategy must therefore integrate both responsibilities and opportunities: climate goals and economic competitiveness are now inseparably linked.

This is why Biden's framing of EV adoption was directionally correct, even if incomplete in execution. By tying industrial renewal to decarbonization, his administration acknowledged that the auto industry is both an economic pillar and a linchpin of U.S. climate credibility. Trump's rejection of this logic may have resonated politically with fossil fuel constituencies, but it amounted to offering the industry a path toward environmental irresponsibility and comfortable decline. A reindustrialization strategy that sidelines electrification is not a revival plan at all but an abdication, because it leaves America's automakers trapped in a market segment that global trends are already rendering obsolete.

The competitive implications are equally stark. Across Europe, Japan, Korea, and China, automakers are aligning with ever-stricter emissions standards. Their strategies differ—some lean on hybrids, others leap directly into EV—but all recognize that vehicles incompatible with climate rules will eventually lose their markets. Protectionism will not exempt U.S. automakers from this global reality.

Any serious attempt to rebuild American auto competitiveness must begin from the recognition that electrification is not a luxury or a policy preference, but the price of admission to the industry's future. Refusing to confront this reality does not buy time—it squanders it.

[49] Vehicle Technologies Office, "FOTW #1190, June 14, 2021: Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles," U.S. Department of Energy, June 14, 2021
https://www.energy.gov/eere/vehicles/articles/fotw-1190-june-14-2021-battery-electric-vehicles-have-lower-scheduled

Electrification as a Gateway to the Smart Car Future

The debate in Washington often frames the auto industry's future as a binary contest between internal combustion engines and electric vehicles. Unfortunately, that framing is already outdated. The real trajectory of global competition is toward intelligent, connected, and increasingly autonomous vehicles.

The future of modern driving will eventually become a private mobility network powered by AI as AI is becoming progressively more automated and intelligent. EV is never the endgame but only the foundation. In this case, smart and connected vehicles require far more onboard electricity to power sensors, processors, and digital services than the 12V internal combustion system can possibly generate. Without an electric platform, the integration of artificial intelligence, advanced software, and digital services that define the "smart car" cannot take hold. The United States retains unique advantages in software, semiconductors, and AI research. However, those advantages will be irrelevant in shaping a dominant future of mobility if American automakers fail to electrify their fleets. Put differently: Detroit cannot lead in the future of cars if it is still tethered to the engines of the past.

There is also an already existing bridge for American automakers to restore EV competitiveness. While the global EV race is already crowded, pathways exist for U.S. firms to carve niches through hybrids and plug-in hybrids that build toward scale. What matters is not the specific drivetrain but the recognition that ICE cannot serve as the foundation for the next era of innovation. Hybrids can offer a pragmatic transition, and battery technologies will evolve, but the direction of travel is unmistakable, and it will keep the U.S. in the competition of smarter vehicles.

Smart cars during the North American International Auto Show in Detroit, Michigan, January 9, 2017. (SAUL LOEB/AFP via Getty Images)

Biden's climate ambition and Trump's industrial revival represented two radically different approaches, but both exposed the same truth that the U.S. auto industry has no viable future without electrification. Environmental imperatives are structural constraints, and electrification is the entry point into the intelligent, connected vehicles that will define global competition. The next part explores how America's supply chains and technological bottlenecks will determine whether this recognition can be translated into industrial reality.

Part IV | Powering the Transition: Batteries Hold the Key

America's Battery Gap: Scale Without Strength

If electrification is the gateway to the future of mobility, battery is the goalkeeper. Yet in this decisive field, the United States remains a peripheral player. Despite renewed political attention and rising private investment, America's battery industry continues to rely heavily on global supply chains—above all, on China[50]. While Europe, Japan, Korea, and especially China have scaled battery production into the millions of units, U.S. output remains limited, fragmented, and dependent on foreign partners for both materials and assembly[51].

This dependence is the consequence of decades of underinvestment. American firms entered the battery race late and without the benefit of a stable domestic clean energy market to absorb production. They leaned on imports[52], joint ventures and licensing arrangements[53], leaving little incentive to build large-scale capacity at home. Recent initiatives to localize gigafactories are a step forward, but they remain years away from achieving competitiveness, and even then, they will only address a fraction of domestic demand, no more than 10% in the global share[54].

The structure of the American market compounds the challenge. Detroit's focus on heavy-duty trucks and SUVs makes the problem of battery supply even more acute[55]. Larger vehicles require larger batteries, which are not only more expensive to produce but also more technically demanding to perfect. Heavy-battery development remains at an early stage globally, with issues of weight, charging time, and cost far from resolved[56]. As a result, U.S. automakers face a paradox: their most profitable vehicle segments are the ones least compatible with the realities of current battery technology.

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[50] Ben Taulli, et al, "The Devil is in the Details: Minerals, Batteries, and US Dependence on Chinese Imports," Council on Strategic Risks, May 30, 2025 https://councilonstrategicrisks.org/2025/05/30/the-devil-is-in-the-details-minerals-batteries-and-us-dependence-on-chinese-imports/

[51] "Global Supply Chains of EV Batteries," IEA, July 2022 https://iea.blob.core.windows.net/assets/961cfc6c-6a8c-42bb-a3ef-57f3657b7aca/GlobalSupplyChainsofEVBatteries.pdf

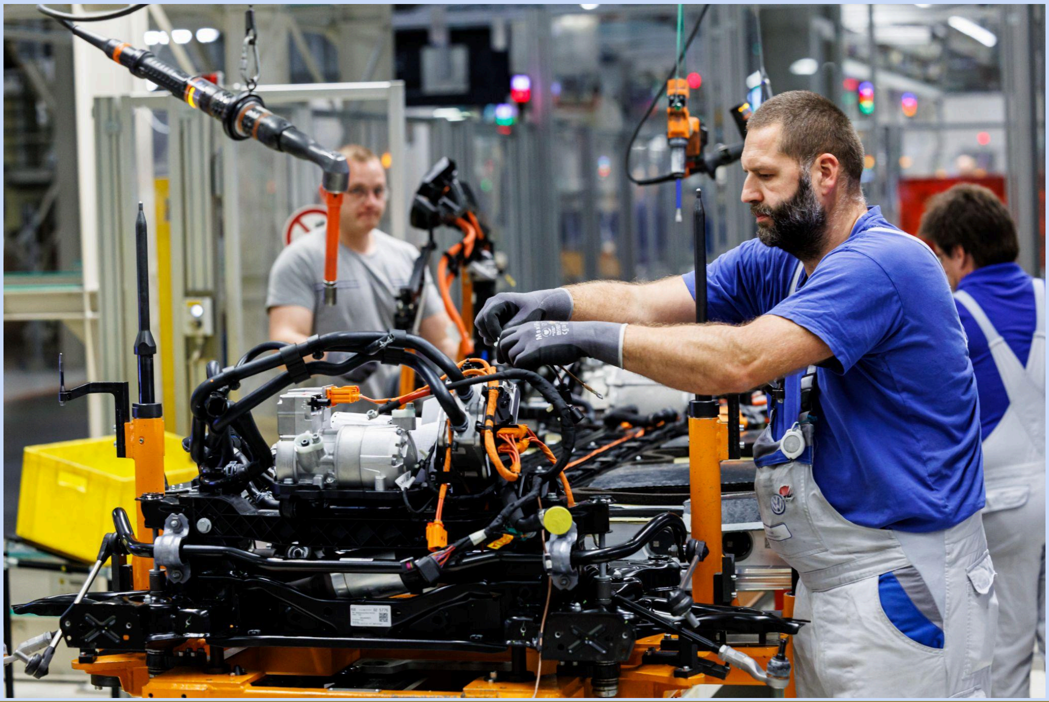
[52] Nora Eckert, "GM to Import EV Batteries from China's CATL, Source Says," Reuters, August 7, 2025 https://www.reuters.com/business/autos-transportation/gm-import-ev-batteries-chinas-catl-source-says-2025-08-07

[53] Amada Mayoral, "U.S. Challenges in EV Battery Production," Coalition for a Prosperous America, June 9, 2022 https://prosperousamerica.org/wp-content/uploads/2022/06/CPA-Batteries-Policy-Paper-Web-1.pdf

[54] "2025 EVs and Battery Supply Chains Issues and Impacts," The Oxford Institute for Energy Studies, April 2025 https://www.oxfordenergy.org/wpcms/wp-content/uploads/2025/04/OEF-144.pdf

[55] Chris Busch, "Fast-Falling Battery Prices Boost Economic Benefits Expected from Heavy-Duty Vehicle Electrification," Energy Innovation Policy & Technology LLC, Feburary 2024 https://energyinnovation.org/wp-content/uploads/Fast-Falling-Battery-Prices-Boost-Economic-Benefits-Expected-from-Heavy-Duty-Vehicle-Electrification.pdf

[56] Kevin Knehr, et al, "Cost Analysis and Projections for U.S.-Manufactured Automotive Lithium-ion Batteries," Argonne National Laboratory, January 2024 https://publications.anl.gov/anlpubs/2024/01/187177.pdf



ZWICKAU, GERMANY - OCTOBER 13: Workers assemble a drive unit with battery of an Volkswagen's ID.3 electric car on a production line. (Photo by Jens Schlueter/Getty Images)

This mismatch underscores the central weakness of America's battery position. The issue is not that U.S. firms lack access to technology because lithium-ion batteries are widely available, and American companies have strong research capacity in next-generation chemistries. The problem is scale: without mass production, costs remain high, learning curves remain flat, and domestic producers cannot compete with foreign suppliers who benefit from integrated ecosystems and vast consumer markets. America's battery gap is thus not a technological shortfall but a structural one, rooted in insufficient capacity and compounded by a market strategy at odds with the direction of global electrification.

Lithium as the Default, Not the Solution

For all the headlines about breakthrough chemistries and next-generation designs, lithium-ion batteries remain the backbone of global electrification. They powered more than 95 percent of EVs sold worldwide in 2023, and global demand for EV batteries exceeded 750 GWh that year, up from just 60 GWh in 2015[57]. Costs have plummeted accordingly: studies estimate average pack prices fell from $1,160 per

[57] "Trends in Electric Vehicle Batteries," IEA, 2024 https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-vehicle-batteries

kWh in 2010 to $139/kWh in 2023[58], with some Chinese LFP packs already below $100/kWh[59].

America's dilemma does not stem from a lack of viable technology. The issue is that U.S. automakers never built the capacity to deploy lithium-ion at scale. Asian and European producers did. China invested early, creating a vertically integrated ecosystem from mineral refining to recycling. By 2024, it accounted for 77 percent of global battery cell production and over 90 percent of cathode and anode processing[60]. Korea's LG Energy Solution, SK On, and Samsung SDI now collectively control over 15 percent of global EV battery supply, while Japan's Panasonic over 4% share through its Tesla partnership[61]. Europe, meanwhile, hardwired scaling into regulation, backing gigafactories with long-term emissions targets. U.S. firms, by contrast, hesitated—pursuing incremental research, licensing foreign technology, and deferring large-scale commitments until demand was certain.

By the time consumer appetite surged, the cost gap was entrenched. BYD, CATL, and LG were already producing at volumes measured in hundreds of gigawatt-hours, bringing unit costs far below what new U.S. entrants could achieve. Even today, most American gigafactory projects remain under construction, with effective capacity years away. It will take years for the U.S. to reach self-reliance of lithium batteries, while other countries will be exploring the uncharted territory for new battery upgrades in the meantime. The result is that catching up now requires not just capital but overcoming a decade of lost learning curves.

Detroit's market strategy compounds the problem. A 2025 Ford F-150 Lightning carries a pack exceeding 90 kWh, while weighs more than double that of a typical Chinese compact EV[62]. GMC's Hummer EV tips the scales at over 9,000 pounds with a 200 kWh battery[63], so heavy that it adds thousands of dollars to production costs and raises safety and charging-time concerns. Globally, heavy-battery configurations remain experimental, with no country having solved the trade-offs of weight, performance, and affordability. U.S. automakers thus face a paradox: their most profitable models are least compatible with the current state of battery technology that is both overweight and outdated.

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[58] "Lithium-Ion Battery Pack Prices Hit Record Low of $139/kWh," BloombergNEF, November 26, 2023 https://about.bnef.com/insights/clean-energy/lithium-ion-battery-pack-prices-hit-record-low-of-139-kwh/

[59] "Lithium-Ion Battery Pack Prices See Largest Drop Since 2017, Falling to $115 per Kilowatt-Hour," BlommbergNEF, December 10, 2024 https://about.bnef.com/insights/commodities/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/

[60] "Trends in Electric Vehicle Batteries," IEA, 2024 https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-vehicle-batteries

[61] "Japanese and South Korean Battery Giants Fail to Escape 80/20 Rule, What Makes Chinese Rivals Dominate Global EV Battery Market?," Shanghai Metal Market, August 20, 2025 https://www.metal.com/en/newscontent/103489078

[62] Deyarman Ford, "2025 Ford F-150 Lightning Specs & Performance," Deyarman, February 21, 2025 https://www.deyarmanford.com/2025-ford-f-150-lightning-performance/

[63] Jim Motavalli, "Massive EV Batteries Deliver Big Range—and Tons of Curb Weight," Autoweek, March 16, 2022 https://www.autoweek.com/news/a39449944/problem-with-ev-battery-weight/

“Ford F150” by crash71100, Public Domain Dedication (CC0)

Some hope that alternative solid-state, sodium-ion, or other next-generation chemistries will leapfrog lithium. However, commercialization remains distant. Toyota, the most aggressive solid-state backer, does not expect mass-production vehicles before 2030[64]. CATL and BYD are piloting sodium-ion cells, but volumes are negligible compared to mainstream lithium packs[65]. Betting U.S. competitiveness on unproven chemistries is risky at best and irresponsible at worst, especially when global rivals are driving down costs today through lithium-ion scaling.

The reality is unavoidable: lithium batteries are not a stopgap, they are the foundation of global electrification for the next decade. For the United States, the challenge is not to invent a miracle alternative, but to scale the existing technology, adapt it to a market dominated by oversized vehicles, and secure upstream materials to sustain production. Treating lithium as temporary risks leaving America even further behind while others consolidate their lead on the proven backbone of the EV revolution.

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[64] James Gilboy, “Toyota Only Plans to Make Enough Solid-State Batteries for 10,000 Cars in 2030,” The Drive, November 21, 2025 https://www.thedrive.com/news/toyota-only-plans-to-make-enough-solid-state-batteries-for-10000-cars-in-2030
[65] “The Dilemma of Lithium Batteries: Can Sodium-Ion Batteries Provide the Solution?,” Shanghai Metal Market, April 20, 2025 https://www.metal.com/en/newscontent/103287094

Rethinking Supply Chain Risks: Batteries Are Not Rare Earths

In Washington's policy debates, it has become increasingly common to conflate the risks of reliance on China for rare earths with the risks of reliance on China for batteries[66]. This framing is politically convenient but analytically misleading. Rare earths and batteries are not the same problem, and treating them as interchangeable obscures the real sources of U.S. vulnerability.

To begin with, batteries are not built on rare earths. The critical inputs for lithium-ion batteries are cobalt, nickel, lithium, and graphite—not neodymium or dysprosium. Rare earths are usually only central to permanent magnets used in motors than to the batteries themselves. America's dependence on Chinese batteries does not stem from China's resource dominance, but from gaps in the U.S. supply chain that faces insufficient refining capacity[67], underdeveloped downstream industries, and the lack of scale in domestic manufacturing. Although it is true that China holds certain advantages in raw materials processing and battery cells component producing[68],these advantages should never serve as an excuse for U.S. inaction, since such processing and component manufacturing are technologies that any country can, in principle, develop with sufficient investment.

Second, the diversification potential for battery raw materials is far greater than often acknowledged. Lithium, cobalt, and nickel can be sourced from countries such as Chile[69], the Democratic Republic of Congo, and Indonesia. What the United States lacks is not access to resources but the ability to process them competitively and to integrate them into cost-efficient manufacturing. The vulnerability lies in America's failure to invest in downstream infrastructure, not in an unavoidable reliance on China.

If there is a genuine "choke point" to be found, it lies more in permanent magnets for motors than in batteries. China does place export controls on magnets through licensing and end-use declarations for security reasons.[70] Yet even here, technological alternatives are emerging. Tesla has already produced non-permanent-magnet solutions[71], and Japanese and German firms are actively

[66] "Manchin Questions Witnesses on Ending Reliance on China for Critical Minerals," Senate Committee on Energy & Natural Resources, September 28, 2023 https://www.energy.senate.gov/2023/9/manchin-questions-witnesses-on-ending-reliance-on-china-for-critical-minerals

[67] "The Battery Cell Component Opportunity in Europe and North America," McKinsey & Company, April 18, 2024 https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-battery-cell-component-opportunity-in-europe-and-north-america

[68] CME Group, Bloomberg L.P., "Stable Crude Oil Prices, Increasing Refinery Margins in Third Quarter of 2025," U.S. Energy Information Administration, October 6, 2025 https://www.eia.gov/todayinenergy/detail.php

[69] Elisa Alonso, et al, "World Minerals Outlook—Cobalt, Gallium, Helium, Lithium, Magnesium, Palladium, Platinum, and Titanium Through 2029," U.S. Geological Survey Scientific Investigations Report 2025–5021, March 11, 2025, Ver. 1.1, March 14, 2025 https://pubs.usgs.gov/publication/sir20255021/full

[70] "Announcement No. 18 [2025] of the Ministry of Commerce and the General Administration of Customs — Decision on Imposing Export Controls on Certain Medium and Heavy Rare Earth Items (original text in Chinese)," Ministry of Commerce of The People's Republic of China, April 4, 2025 https://www.mofcom.gov.cn/zwgk/zcfb/art/2025/art_9c2108ccaf754f22a34abab2fedaa944.html

[71] Vandana Rallabandi, "How to Build EV Motors without Rare Earth Elements," IEEE Spectrum, July 2, 2024 https://spectrum.ieee.org/ev-motor

developing motor designs that avoid rare earth dependence altogether[72]. This underscores that even where China does hold a strong position, the risks are neither absolute nor unmanageable.

In short, the idea that China can "strangle" U.S. electrification by leveraging rare earth dominance does not withstand scrutiny in the battery sector. The real challenge is America's own underinvestment in refining, manufacturing, and scaling capacity. Until these structural gaps are addressed, U.S. policy risks misdiagnosing the problem—focusing on symbolic supply risks while avoiding the hard work of industrial renewal.

Beyond Materials: Market Readiness and Design Gaps

Nevertheless, even if the United States were to secure abundant supplies of lithium, nickel, and cobalt, its battery challenge would remain unresolved. Because the problem is not only materials but also the ecosystem in which batteries are designed, produced, and deployed. Three dimensions stand out: infrastructure, consumer acceptance, and vehicle design.

First, the infrastructure gap constrains demand. Charging networks remain sparse and unevenly distributed, particularly outside of coastal urban centers. Studies show that most of EV infrastructure growth occurred where they already existed[73], and rural and low-income communities remain underserved. Without reliable access to fast charging, consumers hesitate to commit to EVs, which in turn dampens the incentive for automakers to expand battery production.

Second, consumer acceptance lags behind political ambition. While early adopters have embraced EVs, confidence in such a transformative product takes time to build, as most consumers instinctively resist disruptive change before gradually recognizing its benefits. Mainstream consumers would remain wary of cost, range anxiety, and resale value. Subsidies can soften these concerns but cannot eliminate them when the underlying market ecosystem does not provide reassurance. In this context, Detroit's heavy reliance on SUVs and trucks compounds the problem. These vehicles require larger batteries, making them more expensive and less accessible to price-sensitive buyers, widening the gap between what consumers want and what the industry is offering.

[72] Daniel O'Connor, "Japan's Proterial Unveils Heavy Rare Earth-Free EV Magnet-A Real Breakthrough or Hype?," Rare Earth Exchanges, July 23, 2025
https://rareearthexchanges.com/news/japans-proterial-unveils-heavy-rare-earth-free-ev-magnet-a-real-breakthrough-or-hype/
[73] "Distribution of EV Charging Infrastructure Across US is Unequal and Not Improving, First-time Nationwide Study Finds," Institute for Global Sustainablity, January 15, 2025
https://www.bu.edu/igs/2025/01/15/distribution-of-ev-charging-infrastructure-across-us-is-unequal-and-not-improving-first-time-nationwide-study-finds/

Third, product design reflects a deeper misalignment. Whereas Asian and European automakers have focused on smaller, affordable EVs that align with infrastructure realities and consumer budgets, U.S. firms continue to bet on oversized vehicles. This strategy may sustain short-term profits but undermines the scaling of batteries by failing to build the mass-market base necessary for learning curves and cost reduction. Without a competitive presence in the compact car market, U.S. automakers deprive themselves of the very market segments that would allow battery production to reach scale.

Taken together, these factors reveal that America's battery weakness is not simply about missing materials or technologies. It is about the absence of a supportive ecosystem—where infrastructure, consumer readiness, and product strategy reinforce one another. Until the U.S. aligns these elements, its battery sector will remain trapped in a cycle of dependency and underperformance, regardless of how many raw materials it secures.

The United States' battery challenge cannot be reduced to Chinese dominance or raw material shortages. The real obstacles lie in America's own industrial structure: late entry, insufficient scaling, a market skewed toward oversized vehicles, and an ecosystem that fails to support electrification. Rare earths may dominate headlines, but they are a distraction from the deeper truth that U.S. automakers and policymakers alike have avoided: without confronting domestic capacity limits and aligning product strategy with technological realities, the United States will remain dependent on others for the most critical component of the future auto industry.

The lesson is clear. America's battery weakness is a bottleneck of its own making, and no amount of external blame can resolve it. Overcoming this constraint requires investment in scale, rethinking market design, and building the infrastructure that allows batteries to move from a specialty product to a mass-market foundation. Until then, the gap will persist—and with it, the risk that the United States cedes leadership in the very technologies that will define the next generation of mobility.

Part V | America's Technological Edge: The Auto Race is Still Open

AI Leadership as a Strategic Asset

If America's auto industry has faltered in electrification, it retains an undeniable advantage in the domain that will ultimately define the future of mobility: artificial intelligence. The global race for the smart car is, at its core, a race to integrate AI into vehicles at scale—optimizing safety, efficiency, and user experience through continuous data-driven learning. In this arena, the United States holds assets that no competitor can easily replicate.

The U.S. leads in the development of advanced machine learning algorithms, supported by world-class universities, cutting-edge research labs, and a vibrant startup ecosystem. In 2024, American institutions produced over 40 percent of the world's top-cited AI publications, more than Europe and China combined[74]. On the corporate side, U.S. firms dominate the frontier of large-scale model training: OpenAI, Google DeepMind (U.S. division), and Anthropic are setting benchmarks in generative AI, reinforcement learning, and simulation—all techniques directly translatable to autonomous mobility. The depth of U.S. research talent is equally notable. Surveys estimate that over 40 percent of globally employed top-tier AI researchers are based in the United States, though the number is consistently dropping as China rapidly catching up in recent years[75].

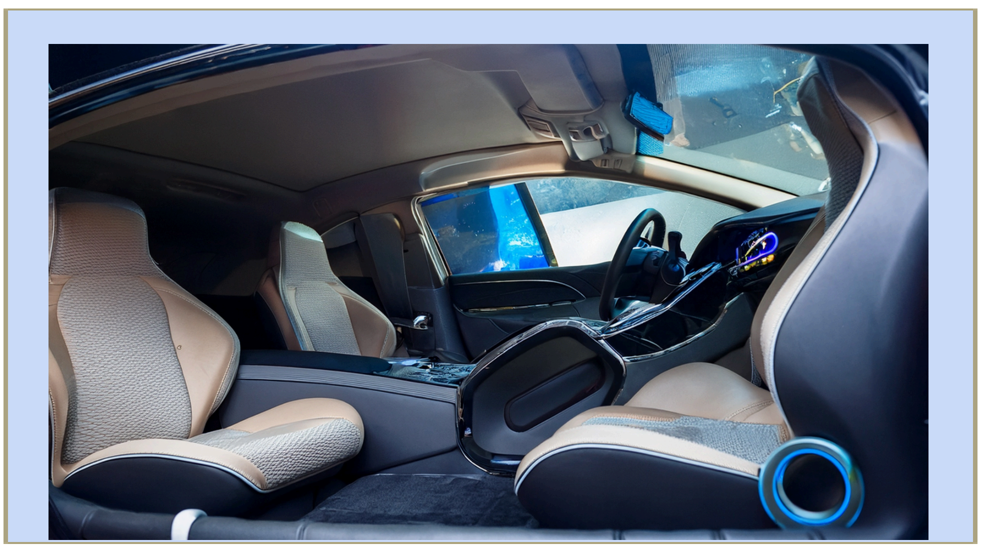

Image AI Generated

[74] "Artificial Intelligence Index Report 2025," Stanford University Human-Centered Artificial Intelligence, 2025 https://hai.stanford.edu/assets/files/hai_ai_index_report_2025.pdf
[75] Trelysa Long, "AI Is Powering the US Economy, But Who's Powering AI?," Information Technology & Innovation Foundation, April 7, 2025 https://itif.org/publications/2025/04/07/ai-is-powering-the-us-economy-but-whos-powering-ai/

What sets the U.S. apart is not just technical strength, but the ability to iterate rapidly. Breakthroughs in model architectures—transformers for perception, multimodal systems for sensor fusion—are being adapted into automotive R&D cycles with remarkable speed. While Asian and European rivals excel at hardware integration, U.S. firms leverage their software-first advantage to set benchmarks for how vehicles “think” rather than just how they are powered.

For policymakers and industry leaders of today, the auto race is not just about batteries. Batteries may provide the power, but intelligence will define the product. America’s AI leadership offers a strategic lever to reshape global automotive competition, and a pathway for Detroit to regain ground on the strength of what it does best.

Chips and Semiconductors: The Hidden Backbone

If artificial intelligence represents the brain of the smart car, semiconductors are its nervous system. No amount of advanced algorithms can function without the chips that power data processing, enable connectivity, and manage vehicle operations in real time. Here, too, the United States retains a decisive—if sometimes underappreciated—advantage.

American firms dominate chip architecture, design, and high-performance computing. NVIDIA controls more than 80 percent of the global AI accelerator market[76], and its automotive-grade GPUs underpin Tesla’s Full Self Driving computer as well as partnerships with Mercedes-Benz and Hyundai. Qualcomm’s Snapdragon Ride platform is now validated in over 60 countries worldwide[77], enabling sensor fusion, infotainment, and driver-assistance. Intel’s Mobileye subsidiary supplies vision processors for ADAS in more than 150 million cars globally, making it the quiet market leader in automotive perception[78]. While physical manufacturing is concentrated in Asian foundries such as TSMC and Samsung, the intellectual property and design blueprints are overwhelmingly drafted in Silicon Valley.

The implications for autos are profound. Vehicle electrification requires a wholesale reconfiguration of electronics. Battery management systems, inverters, and safety controllers all depend on sophisticated chips; advanced driver-assistance and autonomy demand orders of magnitude more computing power. A modern EV

[76] Kif Leswing, “Nvidia Dominates The AI Chip Market, But There’s More Competition Than Ever,” CNBC, June 2, 2024 https://www.cnbc.com/2024/06/02/nvidia-dominates-the-ai-chip-market-but-theres-rising-competition-.html
[77] “Qualcomm and BMW Group Unveil Groundbreaking Automated Driving System with Jointly Developed Software Stack,” Qualcomm, September 5, 2025 https://www.qualcomm.com/news/releases/2025/09/qualcomm-and-bmw-group-unveil-groundbreaking-automated-driving-s
[78] A reference of autonomous driving and the application of AI to AV development: https://www.mobileye.com/technology/

contains over 3,000 semiconductors, double the content of a conventional ICE car[79]. As cars evolve into rolling computers, demand for processing capacity is projected to triple by 2030, with automotive semiconductors forecast to become a $147 billion market by the end of the decade[80].

This advantage, however, highlights America's dependency gap. The auto industry's experience during the 2020–2022 semiconductor shortage, when U.S. automakers were forced to cut production by over 7 million vehicles globally and lost an estimated $210 billion in revenue, showed how fragile supply chains can be when design leadership is not matched by manufacturing resilience[81]. Detroit's assembly lines were idled not because of a lack of demand, but because microcontrollers from overseas suppliers were unavailable. This vulnerability has spurred policy responses: the 2022 CHIPS and Science Act[82], which allocates $52 billion to expand domestic semiconductor production, including auto-grade chips and later on, the Trump administration's America's AI Action Plan[83] and tariffs on imported semiconductors from firms not moving production to the U.S.[84]

WASHINGTON, DC - SEPTEMBER 10, 2025: White House Office of Science and Technology Policy Director Michael Kratsios testified about "America's AI action plan." (Photo by Chip Somodevilla/Getty Images)

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[79] "Why The Automotive Future is Electric," McKinsey & Company, September 7, 2021 https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/why-the-automotive-future-is-electric

[80] "Dialysis Market Size, Share & Industry Analysis, By End User (Dialysis Centers & Hospitals and Home Care) 2025-2032", Fortune Business Insights, September 29, 2025, https://www.fortunebusinessinsights.com/dialysis-market-102367

[81] Gerry Simons, "How Have the Struggles of the Auto Industry Affected the West Michigan Economy?", Seideman Business Review, Volume 28, Issue 1, Article 7, Winter 2022 https://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1268&context=sbr#:~:text=The%20COVID-19%20pandemic%20disrupted,not%20limited%20to%20chips%20though.

[82] H.R.4346 - CHIPS and Science Act, U.S. Congress https://www.congress.gov/bill/117th-congress/house-bill/4346

[83] "Winning the Race: American's AI Action Plan," The White House, July 2025 https://www.whitehouse.gov/wp-content/uploads/2025/07/Americas-AI-Action-Plan.pdf

[84] Jeff Mason, et al, "Trump to Impose Tariffs on Semiconductor Imports from Firms Not Moving Production to US," Reuters, September 4, 2025 https://www.reuters.com/world/china/trump-impose-tariffs-semiconductor-imports-firms-not-moving-production-us-2025-09-05/

Still, the underlying strength is clear. Just as the 20th century was defined by Detroit's engines, the 21st century will be defined by who controls the chips. And in this crucial domain, the United States remains better positioned than any of its rivals—not by volume of wafers, but by control of the architectures and designs that make tomorrow's smart vehicles possible.

Data and Connectivity: America's Competitive Scale

If AI provides intelligence and semiconductors provide processing power, data and connectivity are the lifeblood that keeps the system alive. Smart vehicles rely on a continuous flow of information: from sensors embedded in the car, from infrastructure on the road, and from networks that connect vehicles to each other and to the cloud. In this domain, the United States holds a structural advantage rooted in its unmatched digital economy.

American firms dominate cloud computing, data management, and software services. Amazon Web Services, Microsoft Azure, and Google Cloud collectively control two-thirds of the global cloud infrastructure market, providing the backbone for storing and processing the terabytes of information generated by each connected or autonomous vehicle. Training an autonomous driving system can require 10–20 terabytes of raw data per vehicle per day when operating in full mode[85], and U.S. cloud providers are uniquely equipped to manage this scale. The co-location of cloud firms, AI developers, and automakers within the same innovation ecosystem accelerates the feedback loop between data collection, model refinement, and deployment.

Connectivity is equally critical. U.S. firms and regulators are at the forefront of defining vehicle-to-everything (V2X) standards. After the FCC reallocated the 5.9 GHz band for cellular vehicle-to-everything (C-V2X) in 2020, American telecoms began rolling out 5G-enabled corridors that enable high-speed, low-latency communication between vehicles and infrastructure[86]. Pilot programs on interstates in Michigan and Ohio now allow for real-time warnings about hazards and traffic bottlenecks. By 2025, C-V2X modules were projected to be embedded in over 70 million vehicles globally, with the U.S. serving as a leading testbed[87].

America's scale also derives from its domestic driving environment. With more than 284 million registered vehicles in 2023 across diverse climates, terrains,

[85] Paul Christianson, "Autonomous Car Machine Learning and Data Collection," Cloud Factory, September 30, 2020 https://www.cloudfactory.com/blog/autonomous-vehicle-training-conundrum
[86] "First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification," Federal Communications Commision, November 20, 2020 https://docs.fcc.gov/public/attachments/FCC-20-164A1.pdf
[87] Ryan Stanton, "$12.7M Project To Bring More Advanced Transportation Technology To Ann Arbor," Mlive, September 2, 2025 https://www.mlive.com/news/ann-arbor/2025/09/127m-project-to-bring-more-advanced-transportation-technology-to-ann-arbor.html

and regulatory regimes[88], the U.S. generates unmatched datasets for training automotive AI. This diversity matters: autonomous systems trained only in uniform urban grids or temperate climates struggle when exported abroad, whereas U.S. driving data covers snow in Minnesota, deserts in Arizona, dense cities like New York, and sprawling highways in Texas.

Beyond vehicles, U.S. digital platforms already manage massive mobility datasets. Google Maps serves over 1 billion monthly active users, while ride-hailing firms such as Uber and Lyft log billions of trips each year, capturing granular patterns in routing, traffic, and consumer behavior[89]. Logistics giants like Amazon handle tens of millions of daily deliveries, providing real-time optimization data directly relevant to vehicle autonomy and fleet management. Integrating this breadth of mobility intelligence into automotive development gives U.S. firms a competitive advantage that few rivals can replicate.

In the competition for smart vehicles, data is not simply an input—it is the foundation of continuous improvement. With unmatched cloud infrastructure, global leadership in connectivity protocols, and a uniquely diverse domestic driving environment, the United States retains a powerful edge in turning information into advantage. The challenge, however, mirrors that of AI and chips: these strengths cannot substitute for an absent industrial base. Without cars and batteries produced at scale, America's data advantage risks being stranded—powerful in theory, but underutilized in practice.

Autonomous Driving: A Field Still Open

If electrification has exposed America's weaknesses, autonomous driving highlights its enduring strengths. No other country has invested as much in testing, data collection, and commercialization trials of self-driving technology as the United States. From Silicon Valley to Detroit, a diverse ecosystem of companies—ranging from established automakers to technology firms and venture-backed startups—has turned the U.S. into the global laboratory for autonomy.

AI model, semiconductor design, and data and connectivity, these capabilities translate directly into automotive innovation. AI algorithms enable advanced driver-assistance systems (ADAS) that now come standard in most U.S. vehicles: lane-keeping, adaptive cruise control, and collision avoidance increasingly rely on perception models trained at scale. Tesla's "Full Self Driving" software has

[88] "Highway Statistics 2023," U.S. Department of Transportation, Federal Highway Administration, 2023 https://www.fhwa.dot.gov/policyinformation/statistics/2023/
[89] Nayden Tafradzhiyski, "Uber Revenue and Usage Statistics (2025)," Business of Apps, July 29, 2025 https://www.businessofapps.com/data/uber-statistics/

logged 3.6 billion real-world miles of driver-assist data as of early-2025[90], providing a feedback loop that sharpens its neural networks. Waymo's autonomous stack, refined over 20 million public miles, demonstrates how reinforcement learning and probabilistic modeling can deliver high-confidence navigation in complex urban environments[91]. Even traditional automakers such as Ford and GM are embedding predictive maintenance algorithms that use machine learning to anticipate component failures, reduce downtime, and optimize fleet efficiency[92].

The innovation is not limited to vehicles themselves. U.S. firms lead in high-definition mapping (HD Maps), critical for centimeter-level localization; in sensor fusion architectures that integrate LiDAR, radar, and vision systems; and in human–machine interfaces designed to manage driver attention and handover in semi-autonomous contexts. Partnerships with logistics companies (e.g., FedEx and Aurora), ride-hailing platforms (Uber and Lyft with Waymo integrations), and municipal governments (Phoenix, Las Vegas, Austin) have ensured that autonomy is tested not only as a technology but also as a service. This integration of technical, commercial, and regulatory experimentation gives the United States a distinctive advantage in shaping the standards and business models of autonomy.

Yet autonomy remains a field still open. No country has demonstrated a fully self-driving system that can operate seamlessly in all conditions without human oversight. China's Baidu Apollo Go and AutoX fleets have made progress, but they remain concentrated in restricted urban zones. European firms, while strong in safety engineering, lag in large-scale deployment, with fewer than 5 million cumulative test miles across the EU by 2023[93].In this sense, America's lead is real but provisional: it holds the largest datasets and the most diverse testing environments, but not yet the decisive proof of Level 5 autonomy.

[90] Sarah Lee-Jones, "Tesla's Full Self-Driving Surpasses 3.6 Billion Miles Driven," Tesla North, March 28, 2025 https://teslanorth.com/2025/03/28/teslas-full-self-driving-surpasses-3-6-billion-miles-driven/
[91] A reference of how automatic learning could help improve automated driving in a complex environment: https://waymo.com/intl/zh-cn/waymo-driver/#:~:text=Driving%20situations%20can%20involve%20hundreds,the%20blink%20of%20an%20eye.
[92] A reference of how sensor and data processing could help reinforce automated driving experience: https://digitaldefynd.com/IQ/ford-using-ai-case-study/#:~:text=Equipment%20Downtime:%20Unexpected%20breakdowns%20not,to%20analyze%20the%20sensor%20data.
[93] Anja Huber, et al, "Autonomous Vehicles: The Future of European Transport?," Mckinsey & Company, June 23, 2025 https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/autonomous-vehicles-the-future-of-european-transport

“Self driving car” by Christine + Hagen Graf, CC BY 2.0

The message is clear. In autonomy, the United States is ahead, but the finish line is not in sight. Whether this early lead becomes a durable advantage will depend on Detroit’s ability to integrate these technologies into vehicles manufactured at scale and competitive in global markets. If not, America’s leadership risks being confined to research labs and pilot projects, rather than becoming the basis of a globally competitive auto industry.

The Unfinished Link: Scale in Autos and Batteries

America’s advantages in artificial intelligence, semiconductors, data infrastructure, and autonomous driving are real—and in many ways unmatched. These strengths explain why the race for the smart car is far from decided, even if the U.S. trails its competitors in electrification. Yet none of these advantages can translate into lasting industrial leadership without the missing link: scale in automobiles and batteries.

Technological leadership must be embedded in products that consumers can buy, use, and trust. Without sufficient EV production, even the most advanced AI models or autonomous systems remain trapped in pilot projects. Without a robust domestic battery industry, chip and software innovations cannot be deployed at scale. In effect, America’s technology edge floats above an incomplete industrial base, powerful in theory but underleveraged in practice.

This tension underscores the paradox of America's position. On one hand, the U.S. has the potential to leapfrog competitors in the transition from EVs to intelligent vehicles, leveraging strengths that few others can match. On the other, its lack of manufacturing scale risks leaving these strengths stranded, unable to shape global standards or secure competitive advantage. Unless Detroit can align its production capacity with its technological frontier, the United States will struggle to convert innovation into influence.

For this reason, the path forward requires more than subsidies or protectionism. It requires a transitional strategy that acknowledges current capacity gaps while preserving the momentum of technological leadership. Bridging this divide will mean finding a viable middle ground—one that allows U.S. automakers to scale production, build consumer confidence, and prepare the industrial base for the intelligent vehicles of the future. In that context, hybrid technologies may offer not just an interim solution, but a necessary bridge between today's industrial limits and tomorrow's competitive landscape.

The U.S. leads in AI, chips, data, and autonomy—domains that will define the future of smart vehicles. These strengths ensure that America has not yet lost the competition; on the contrary, it retains the capacity to shape the next era of mobility. But until these technological advantages are embedded in scaled automotive and battery production, they remain unrealized potential. The next stage of the debate, therefore, turns to the role of hybrids: how they may serve as a bridge between America's technological frontier and its industrial base, enabling Detroit to translate innovation into competitiveness.

Part VI | Hybrid Transition as America’s Strategic Pathway

Building on Detroit’s Existing Strengths

If America is to regain momentum in the auto transition, the best way is to begin from where its industrial strengths already lie. Hybrid vehicles (HEV) offer precisely this kind of pragmatic bridge: an evolution rather than a revolution. Unlike the Biden administration’s push for full-scale electrification, which demands massive investment, high political risk, and a sudden restructuring of industrial capacity, hybrids leverage the assets Detroit already possesses.

The technical requirements for HEV are modest relative to pure EV. American automakers have decades of accumulated expertise in ICE, and HEV does not discard this foundation. Instead, they only add two components that are not distant from America's technological reach: electric drive systems and compact batteries. The result is a product that combines existing ICE production lines with incremental electrification, minimizing disruption while enabling progress.

This incrementalism is not a weakness. Instead, it is to maximize comparative advantage. By improving what Detroit already does well rather than demanding a wholesale leap into unfamiliar territory, HEV lowers both financial and political barriers to transition. They allow automakers to preserve and even add new employment, reuse production infrastructure, and adapt supply chains gradually. In effect, HEV aligned industrial modernization with institutional continuity, offering Detroit a path to reindustrialization without the existential risks of an “all-in” EV gamble.

“RIVIAN” by Mussi Katz, Public Domain Dedication (CC0)

Accelerating Reindustrialization and Electrification

Hybrids serve as a catalyst to advance the current administration's broader reindustrialization agenda. Unlike pure EV, which requires an immediate and disruptive overhaul of the entire auto supply chain, HEV integrates electrification into existing structures. This allows the industry to modernize without collapsing its own foundations, aligning industrial renewal with political and economic stability.

At the macro level, hybrids reinforce America's drive toward electrification across multiple sectors. By introducing electric components into millions of vehicles, HEV stimulates demand for compact batteries, electric motors, and charging stations—critical building blocks for a more electrified economy. This demand also will not overwhelm the still-developing U.S. sectors, because hybrid vehicles require only modest battery sizes, less charging infrastructure, and lower-power motors compared to full EV, which will nudge these industries toward incremental scaling. Over time, the spillover effects can strengthen upstream mining, midstream refining, and downstream assembly, creating the basis for more ambitious electrification later.

From a policy perspective, HEV is uniquely positioned to align climate objectives with reindustrialization goals. They demonstrate measurable reductions in emissions while maintaining employment in legacy production lines, reducing the political resistance that has plagued EV-only approaches. In this way, hybrids offer a midway that does not pit climate imperatives against economic security but binds them together.

Moreover, compared to ICE cars, HEV is more suited to help lay the groundwork for the industry's next frontier—AI-driven intelligent mobility. Hybrids can also provide the necessary electrical architecture to enable the integration of advanced software and connected services, moving U.S. automakers faster toward the smart-car future that defines the true endgame of global competition. This gradualist approach mirrors the broader logic of reindustrialization: build capacity step by step, anchored in real demand, rather than impose a top-down transformation that risks collapse.

Environmental Benefits Without the Shock

Just recently, President Trump dismissed climate change as "the greatest con job ever perpetrated on the world" during his U.N. General Assembly speech.[94] That kind of rhetoric may appeal to skeptics, but it flies in the face of the observable reality that climate change is inflicting economic, environmental, and health

[94] Valerie Volcovici, "Trump Tells UN that Climate Change Is 'Greatest Con Job' Globally," Reuters, September 23, 2025 https://www.reuters.com/sustainability/cop/trump-tells-un-that-climate-change-is-con-job-2025-09-23/

damages as already noted earlier. Emissions reduction is not ideological but existentially necessary.

NEW YORK, NEW YORK - SEPTEMBER 23: U.S. President Donald Trump speaks during the 2025 United Nations General Assembly in New York City. (Photo by Michael M. Santiago/Getty Images)

From this perspective, hybrids provide a truly meaningful path to emissions reduction without imposing the disruptive costs of full electrification. Evidence from global markets shows that even partial electrification can generate substantial improvements in fuel efficiency and carbon performance.[95] As transportation remains to be one of the largest contributors to greenhouse gas emissions, the environmental gains from hybrids are transformative.

The logic is straightforward: hybrids reduce tailpipe emissions by relying on electric drive for part of a vehicle's operation, cutting fuel consumption significantly compared to traditional ICE cars. Studies show that HEV can lower average fuel use by 39.3% on highways and by 58% in city driving[96], effectively doubling fuel efficiency and avoiding roughly two tons of gasoline consumption per vehicle per year. Such gains translate directly into meaningful reductions in carbon emissions.

These improvements stem not only from partial electrification but also from EV-derived technologies such as regenerative braking, idle start-stop systems, and

[95] Yuhan Huang, et al, "Fuel Consumption And Emissions Performance under Real Driving: Comparison between Hybrid And Conventional Vehicles," Science of The Total Environment, April 1, 2019 https://www.sciencedirect.com/science/article/abs/pii/S0048969718352422

[96] Ye Zhang, et al, "Fuel Consumption of Hybrid Electric Vehicles under Real-World Road And Temperature Conditions," Transportation Research Part D: Transport and Environment, May 2025 https://www.sciencedirect.com/science/article/abs/pii/S1361920925001014

higher overall energy efficiency. For example, regenerative braking alone can recover up to 60–70% of kinetic energy otherwise lost in deceleration[97], making it a practical tool for reducing oil dependence while maximizing the utility of the fossil fuels that remain in use.

Moreover, even when the grid mix that is used to charge the HEV still relies on fossil fuels, HEV benefits from the higher thermal efficiency of centralized power plants compared to millions of individual engines. Conventional gasoline cars convert fuel to motion at only about 20% efficiency[98], whereas most U.S. power plants achieve 36% or higher[99]. This means hybrids can deliver more miles per unit of carbon emitted. Over time, wider hybrid adoption could also potentially expand electricity demand, creating durable market incentives for new power generation and grid upgrades. There is a great chance that the overall share of clean energy in the U.S. grid mix will rise in this case, even if only partially.

In this way, hybrids demonstrate that emissions reduction and industrial continuity are not mutually exclusive. They offer the United States a way to deliver real climate progress without the economic shocks that have historically derailed ambitious energy transitions.

Meeting Consumer Expectations

The success of any automotive transition depends not only on technology and policy but also on consumer behavior. In this respect, hybrids are uniquely well-suited to America's market realities. They offer an accessible bridge for drivers who remain skeptical of fully electric vehicles, combining the familiarity of ICE cars with the benefits of electrification.

For consumers, the appeal of hybrids rests on three factors: cost, experience, and trust. First, hybrids deliver measurable savings at the pump. The fuel savings that cut carbon emissions also translate directly into lower household gasoline costs, which lower operating costs for regular American families who are usually sensitive to energy prices.

Additionally, hybrids improve the driving experience. Electric assistance provides smoother acceleration, quieter operation, and the introduction of smart

[97] Jeff Shepard, "How are the efficiency and benefits of regenerative braking measured in EVs?," EV Engineering Infrastructure, November 27, 2024
https://www.evengineeringonline.com/how-are-the-efficiency-and-benefits-of-regenerative-braking-measured-in-evs/
[98] Prajwal Chinthoju, et al, "Understanding The Complete Efficiency Picture of Electric Vehicles," EV Reporter, June 3, 2025
https://evreporter.com/understanding-the-complete-efficiency-picture-of-electric-vehicles/
[99] Prajwal Chinthoju, et al, "Understanding The Complete Efficiency Picture of Electric Vehicles," EV Reporter, June 3, 2025
https://evreporter.com/understanding-the-complete-efficiency-picture-of-electric-vehicles/

features that make the vehicle feel more advanced than a conventional car—and this is only a first step toward even greater intelligence as vehicles continue to evolve.

Third, hybrids inspire greater consumer confidence precisely because they do not demand a complete behavioral shift. Unlike EV, hybrids do not require drivers to rely on an underdeveloped charging network or to adapt to range limitations. They fit seamlessly into existing habits, providing reassurance to buyers whose vehicles are older and whose driving patterns are oriented toward traditional cars. This makes hybrids particularly attractive in a U.S. market where average vehicle age is high and where cultural attachment to ICE remains strong.

In effect, hybrids match technological progress with consumer pragmatism. They acknowledge that electrification is inevitable but present it in a form that minimizes risk for both drivers and manufacturers. By offering efficiency, performance, and familiarity in a single package, hybrids reduce the psychological and financial barriers to adoption, accelerating market penetration far more effectively than policies that attempt to force a rapid switch to EVs.

For Detroit, this consumer alignment is critical. A strategy that alienates the mainstream market will fail, regardless of technological sophistication. Hybrids, by contrast, offer a product that consumers want, not just one that policymakers prescribe. That distinction could make the difference between a stalled transition and a sustainable pathway forward.

Infrastructure and Energy Transition with Cushion

Perhaps the greatest strength of hybrids lies in their ability to align industrial transition with infrastructural reality. As mentioned before, unlike EV that depend on a widespread and reliable charging network, HEV can deliver environmental and economic benefits even in the absence of fully developed infrastructure. This makes them an attractive option for a country where charging stations remain unevenly distributed and where consumers are reluctant to rely on networks that do not yet exist at scale.

In fact, HEV indirectly encourages the buildout of charging infrastructure. Considering the lower operating cost of electricity, HEV owners are more likely to develop an incentive to use charging facilities where available. This incremental demand can support the gradual spread of charging stations, creating a feedback loop in which infrastructure expands organically in response to consumer behavior rather than being imposed from above. In this sense, HEV acts as a bridge not just for automakers but also for the energy sector, smoothing the path toward broader electrification.

HEV also provides a cushion for America's fossil fuel economy. By improving efficiency and reducing oil consumption without eliminating it, HEVs avoid the disruptive "zero-sum" dynamic of building one industry while killing another overnight, which is one of the largest defects of Biden's IRA. This eases political opposition, preserves employment in legacy sectors, and allows a more orderly reallocation of resources. In effect, hybrids create a transition pathway that is evolutionary rather than revolutionary, tempering disruption while still moving decisively toward a lower-carbon future.

This flexibility is critical. It means that Detroit can pursue electrification without alienating consumers, destabilizing energy markets, or overburdening infrastructure. It also means that the U.S. can align its industrial and environmental strategies without triggering the economic shocks that have historically undermined ambitious transitions. Hybrids thus represent not only a technological option but a political compromise: a way to advance electrification at a pace the market and the infrastructure can support.

The U.S. does not have the luxury of waiting for perfect conditions before acting, nor can it afford the risks of betting everything on an abrupt EV transition. Hybrids provide the middle ground: a strategy that buys time, builds capacity, and prepares Detroit to rejoin the global competition from a position of strength. The next question, however, is how this strategy aligns with global dynamics—especially as other major economies pursue their own paths to electrification.

Part VII | Industrial Revival in a Protectionist Era

Accepting Protectionism as a Reality, Not a Strategy

The United States cannot ignore the reality that its auto industry is now operating under a protectionist framework. Tariffs, subsidies, and reshoring incentives—hallmarks of the Trump administration's industrial policy—have redefined the competitive landscape.[100] For all their tension with free-market principles, these measures reflect the political and economic pressures of an industry that has fallen behind. Protectionism, in this sense, is less a well-calculated strategy than a symptom of industrial weakness.

For American automakers, the critical mistake would be to treat protectionism as a permanent shelter. Tariffs may keep foreign competition at bay for a time, but they do nothing to resolve Detroit's underlying capacity trap. Without scaling production, modernizing technology, and restructuring inefficient business models, the industry will remain uncompetitive once those barriers are tested. Protectionism without effective domestic strategy is a chronic poison, and it is never a cure.

The good news for Detroit is that current policies definitely offer breathing room. U.S. automakers must use this window not to preserve the status quo but to prepare for change. That means viewing protectionism not as a greenhouse in which inefficiency can flourish, but as a temporary scaffold supporting deeper reforms. Unless Detroit leverages this period to build capacity, improve technology, and integrate electrification, the U.S. auto industry will emerge from its protectionist cocoon weaker, not stronger.

Using Hybrids to Solve the Capacity Trap

Protectionism offers only temporary breathing space, and its purpose is to give the industry time to address its lack of scale. Here, HEV offers not just a technological option but a strategic tool for overcoming the capacity trap that has defined Detroit's decline.

As discussed previously, HEV combines Detroit's accumulated strengths in ICE production with modest additions in electric drive systems and compact

[100] Thibault Denamiel, "The "Stacking" Effect of the Trump Administration's Auto Tariffs," Center for Strategic & International Studies, April 1, 2025 https://www.csis.org/analysis/stacking-effect-trump-administrations-auto-tariffs

batteries. Detroit should waste no time in transitioning its declining assets in ICE car manufacturing to HEV production, while also actively calling for government support for a smooth transition period that changes U.S. consumer preferences towards HEV. The HEV manufacturers should also remind them of a clear aim at catching the lead in combining America's leading advantage in AI with auto production.

The financial system is another underutilized asset. U.S. capital markets remain among the most sophisticated in the world, capable of funding consolidation, restructuring, and innovation at scale. By using protectionist breathing room to restructure through mergers and acquisitions, Detroit can emulate the experience of other industrial sectors—and indeed lessons from China—where eliminating inefficient producers and concentrating resources in stronger firms has been essential to restoring competitiveness. Hybrids provide a natural platform for such restructuring: they require scale to be profitable, and they reward efficiency in both manufacturing and supply chains.

Competing Globally Through Asymmetry

If Detroit is to regain relevance in the global marketplace, it cannot simply chase its competitors down the same path. China, Japan, Korea, and Europe have already invested heavily in mass-market EV, achieving economies of scale that the U.S. is unlikely to replicate in the near term. Attempting to compete head-to-head in this segment would be both costly and self-defeating. Instead, America's advantage lies in leveraging hybrids as a platform for asymmetric competition.

Hybrids allow U.S. automakers to capitalize on their strongest assets: brand recognition, engineering in large vehicles, and integration with advanced digital technologies. American consumers—and by extension many overseas markets—continue to associate Detroit brands with durability, size, and performance. By embedding electrification into this tradition through HEVs, automakers can offer products that are distinct rather than imitative, carving out a market niche where their reputation provides a natural advantage.

Asymmetric competition also extends to design and pricing. By using HEVs to bridge traditional vehicles with intelligent features—AI-assisted driving, data integration, and connectivity—U.S. firms can position hybrids as smarter, more affordable, and more reliable alternatives to early-stage EVs. This plays to America's technological strengths while exploiting gaps in consumer confidence that still constrain EV adoption worldwide. Crucially, hybrids can be priced lower than premium EVs while still delivering meaningful efficiency gains, giving them broader appeal in price-sensitive markets.

This approach would also sharpen U.S. competition with other hybrid producers. At present, only a handful of global brands dominate the hybrid segment, leaving space for U.S. automakers to enter with differentiated products. By combining brand prestige with intelligent features, Detroit could build a "second wave" of hybrid competitiveness, one that both strengthens its international position and provides the scale needed to sustain domestic reindustrialization.

Moving Beyond the "China Rare Earth Phobia"

Debates in Washington often portray China's dominance in rare earths as an existential constraint on America's automotive future. However, this framing overstates the problem and risks giving Detroit a convenient excuse to avoid tackling its own structural challenges.

In the context of new energy vehicles, rare earth applications fall into two distinct categories. The first is permanent magnets for motors—a real issue but one already discussed earlier in this report. The second is the use of high-end rare earths in advanced technologies such as control chips and electronic systems. The latter does present a genuine area of concern. Yet even here, its impact should not be overstated. The United States has remained the global leader in artificial intelligence despite heavy reliance on these materials. While rare earth supply chains do matter for semiconductor manufacturing, they never fundamentally block America from leveraging its technological advantages. In this sense, rare earths are indeed a bargaining chip in U.S.–China relations, but it is not a decisive constraint.

Moreover, automotive applications differ from the most sensitive national security domains of the semiconductor industry. Until the escalation of trade tensions in April 2025, automotive chips were only marginally affected by Chinese export restrictions.[101] This suggests that cars are not a priority target for Beijing's rare earth leverage. Even if future frictions were to create disruptions, such issues would fall within the scope of bilateral trade negotiations, not the core industrial challenges of the U.S. auto sector. For automakers, the appropriate response is to lobby for more stable and predictable U.S.–China trade relations—not to treat rare earths as an insurmountable obstacle to industrial renewal.

[101] "Automakers Look for Alternatives to China's Control of Rare Earth Magnets," Institute for Energy Research, June 12, 2025 https://www.instituteforenergyresearch.org/international-issues/china-tightens-mineral-controls-automakers-look-for-alternates/

Breaking the Cycle of Oversecuritization

The instinct to frame every industrial challenge as a matter of national security has become a defining feature of U.S.–China competition. While understandable in an era of geopolitical tension, this reflex has serious costs: it distorts policy priorities, crowds out investment in actual industrial upgrading, and entrenches a cycle of confrontation that serves neither economic nor technological progress.

The auto industry illustrates this dynamic vividly. Instead of focusing on solving production bottlenecks in batteries, scaling hybrids, or accelerating the application of AI in intelligent vehicles, debates in Washington too often revolve around the specter of "strategic dependence" on China for raw materials. This emphasis on external threats over internal capacity locks the U.S. into a reactive posture, where securitization substitutes for strategy.

The real contest with China is not over who can restrict the other's access to minerals but over who can lead in the integration of AI, chips, and data into industrial applications. In this respect, America retains significant advantages. Yet these strengths risk being wasted if resources are diverted into defensive measures rather than offensive innovation. By securitizing inputs rather than empowering industries, the U.S. undermines its own capacity to compete on the very frontier that matters most.

Breaking this cycle requires a shift in perspective. National security concerns must be distinguished from industrial policy, and the two must be allowed to operate on their own terms. Where genuine choke points exist—such as advanced semiconductors for intelligent vehicles—they warrant resilience and diversification. But in most areas, the priority should be on enabling scale, fostering consolidation, and supporting technological application. Only then can America move from playing defense against imagined vulnerabilities to playing offense in shaping the future of mobility.

Oversecuritization may provide short-term political cover, but it is no substitute for building an industrial base capable of sustained innovation. For Detroit, and for Washington, the message is clear: strength in autos will come not from securitizing commodities but from translating technological potential into scaled, competitive products.

Conclusion: Toward a Virtuous Cycle of Competition

The dilemmas facing America's auto industry will not be resolved by tariffs, subsidies, or securitized narratives alone. Protectionism may be a temporary necessity, but it is not a development strategy. The path forward lies in using this breathing space to rebuild industrial capacity, modernize technology, and restore competitiveness on terms that align with long-term global trends.

Hybrids provide a practical bridge. They allow Detroit to scale production without overextending its fragile battery sector, to align consumer preferences with climate goals, and to create space for the application of America's technological advantages in AI, chips, and data. By leveraging hybrids strategically—not as a detour but as a foundation—the U.S. can rebuild the industrial base necessary to compete in the next stage of mobility.

At the same time, policymakers must resist the temptation to frame every industrial challenge as a matter of national security. Oversecuritization of supply chains distracts from the real work of reindustrialization and feeds a cycle of confrontation that weakens rather than strengthens U.S. competitiveness. A more constructive approach is to focus on industrial upgrading, selective resilience in critical technologies, and international competition through differentiated strengths rather than defensive postures.

A Tesla Model S Bluefire at the Tesla Service Center in Bern, Switzerland. (Source: UnSplash)

If the U.S. succeeds in aligning protectionist buffers with productive reform, hybrids with capacity rebuilding, and technology leadership with scaled deployment, it can escape the trap of decline and enter a new phase of competitive renewal. In doing so, it would not only stabilize its own auto industry but also help create the conditions for a healthier global competition—one defined less by zero-sum security fears and more by technological progress and industrial vitality.

The choice is clear. America can either continue to drift between defensive protectionism and securitized anxieties, or it can pursue a virtuous cycle in which capacity, technology, and strategy reinforce each other. Only the latter will allow Detroit to reclaim its place in shaping the future of mobility.

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