September 01, 2023

RESEARCH REPORT | Center American Freedom

Biden Administration and UAW Leadership Sacrifice Autoworkers' Jobs

James Sherk, Jacob Sagert, and Matthew Lobel

TOPLINE POINTS

- ★ The Biden Administration has proposed forcing U.S. automakers to primarily produce electric vehicles (EVs). EVs require fewer workers to assemble than conventional vehicles. Consequently, these regulations would eliminate tens of thousands of unionized auto-manufacturing jobs.
- ★ The United Auto Workers (UAW) has considerable political influence. However, UAW leadership has not used their influence to fight EV mandates. Instead, UAW leadership has endorsed many of the politicians and policies that are eliminating their members' jobs.
- ★ Many UAW members feel betrayed by their union. UAW leadership has put their political loyalties ahead of their members' livelihoods.

Introduction

The Biden Administration has proposed regulations that would force most Americans to buy electric vehicles (EVs). EVs require significantly fewer parts and labor to produce than gas-powered vehicles. As a result, these regulations are projected to eliminate 117,000 net auto manufacturing jobs nationwide. Job losses would be concentrated in the industrial Midwest and would affect many members of the United Auto Workers (UAW) union. Senior UAW staff candidly admit that EVs are a major risk to their members. Nonetheless, UAW leadership has done little to protect the union's members from this threat. Instead, UAW leadership has endorsed both the politicians and legislation that promote an EV "transition." UAW leadership has put their political goals ahead of their members' jobs.

Biden Administration's EV Mandate Will Eliminate Auto Manufacturing Jobs

The Biden Administration is trying to force auto manufacturers to primarily produce EVs. Under their proposed regulations, EVs would be required to account for two-thirds of U.S. car sales by 2032 (Environmental Protection Agency, 2023). EVs currently make up only about 6% of vehicle

sales (Mihalascu, 2023).[i] These regulations would thus force auto manufacturers to shift production to EVs en masse.

Absent these regulations, most Americans would not buy an EV. EVs have several downsides, including shorter ranges, higher prices, and long recharging times. As a result, they remain a niche product with limited mass-market appeal.[ii] Polls show that, given the choice, the vast majority of Americans want conventional gas-powered vehicles (Edelstein, 2022). The Biden Administration is now trying to make it much harder (and more expensive) to buy gas-powered vehicles.

This proposal threatens many auto manufacturing jobs. EVs are technologically very different from gasoline-powered vehicles. Conventional vehicles require many interconnected moving parts that convert the energy from burning gasoline into motion while processing exhaust. These parts include catalytic converters, gears, clutches, and torque converters. None of these parts are needed in electric vehicles, which consist of relatively simple motors and a battery. As a result, EVs require dramatically fewer parts than gas-powered vehicles. Ernst and Young have reported that conventional vehicles have 2,000 moving parts in their powertrains while Tesla EV drivetrains have only 17 (Canis, 2019, p. 2). EVs are expensive primarily because their batteries require costly materials (Mills, 2022, pp.7-8; Frazin, 2022). However, EVs are much simpler to assemble than conventional vehicles (Canis, 2019, p. 2). Consequently, EVs require fewer workers to produce.

Automakers such as Ford and Volkswagen report that EV manufacturing requires 30% to 40% less labor than gas-powered vehicles (United Auto Workers, 2020, p. 13; Bushey, 2022). Moreover, parts suppliers—not final assembly plants—employ almost three-quarters of auto manufacturing workers.[iii] Approximately one-quarter of those parts manufacturing workers produce parts for gasoline engines or powertrains and transmissions (U.S. Bureau of Labor Statistics, 2021). As UAW research director Jennifer Kelly has explained, "[t]he workers who are making engines and transmissions today, their jobs will be eliminated when we make a transition to electric vehicles" (Beene & Coppola, 2018).

Industry analysts across the ideological spectrum agree that EV mandates will eliminate many auto manufacturing jobs.[iv] For example, the left-wing Economic Policy Institute (EPI) estimated that, without substantial government intervention and subsidies, 75,000 auto manufacturing jobs would disappear if EVs rose to 50% of U.S. vehicle sales (Barrett & Bivens, 2021). The Biden Administration's even stricter new proposed mandate—two-thirds of all vehicles sold by 2032—will cost even more jobs.

The America First Policy Institute used data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages to model net national auto manufacturing job losses from EV mandates (Sagert & Sherk, 2023). Table 1 shows estimated auto manufacturing job losses—in both final assembly and parts manufacturing—for different levels of EV growth.[v]

U.S. Auto Manufacturing Job Losses if Electric Vehicle Market Share Rises to:				
	Motor Vehicle Assembly	Gas Engines & Parts	Transmission & Power Train Parts	Total Job Losses
20%	9,612	8,539	9,283	27,434
50%	29,638	26,327	28,623	84,589
67%	40,986	36,407	39,582	116,976

SOURCE: Author's calculations using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages. See the Methodological Appendix for details.

If EVs rise to half of U.S. vehicle sales—the goal of the Biden Administration's original policy—the model estimates almost 85,000 existing auto-manufacturing jobs will be lost. This is similar to EPI's estimated 75,000 manufacturing jobs lost at 50% EV market share. The model also shows the Biden Administration's proposed stricter EV mandate will cost tens of thousands more jobs than its original policy. If EV sales rise to two-thirds of the market—the proposed new requirement—then 117,000 existing auto-manufacturing jobs will be eliminated.[vi]

These job losses will be particularly concentrated in the Midwest (Massachusetts Institute of Technology, 2022, pp. 21-22).[vii] The tri-state region of Indiana, Michigan, and Ohio is the heartland of U.S. automobile production, particularly for gas-powered vehicles, transmissions, and related parts manufacturing. More than two-fifths of U.S.-built vehicles and three-fifths of U.S.-built transmissions are manufactured in these three states (Massachusetts Institute of Technology, 2022, p. 2). These states account for 43% of U.S. autoworkers, including more than 70,000 workers who produce parts for motor vehicle powertrains, transmissions, or gasoline engines (U.S. Bureau of Labor Statistics, 2021).[viii]

EV Push Threatens UAW Members' Jobs

Auto manufacturing job losses will particularly affect the United Auto Workers. The UAW represents about 150,000 auto workers at Ford, General Motors, and Stellantis (Boak, 2023). The union also represents many workers at auto parts companies. UAW analysts have concluded that an EV transition will eliminate many of these jobs. UAW research director Jennifer Kelly has publicly warned that "electric, to me, is where the real risk is to our membership" (Dawson et al., 2019).

These job losses have already begun. The major automakers have begun transitioning to EVs in anticipation of the forthcoming regulations. Stellantis, owner of multiple well-known car brands, including Fiat, Chrysler, and Jeep, recently laid off 1,350 UAW workers at its Jeep plant in Belvidere, Illinois, because of "increasing cost related to the electrification of the automotive market" (Dreibelbis, 2022).[ix] Stellantis has also offered incentives for 3,500 hourly workers to quit

as a part of the EV transition (Krisher, 2023). General Motors has also set a goal of cutting $2 billion from operating costs by the end of 2024 (Institute for Energy Research, 2023).

Some new jobs will be created at new EV facilities, but these jobs will do little for UAW members. EV job growth has been—and will likely continue to be—concentrated in the South, which has relatively low union density. Four of the top five states for EV assembly and battery plant investment are southern right-to-work states (Cheng & Diaz, 2023). Unsurprisingly then, two-thirds of jobs created in new EV facilities are also in the South (Kuykendall, 2023). Georgia alone has attracted three of the top six projects by planned investment and the top two by planned jobs. This includes a Hyundai and SK On joint venture that is projected to amass a $5 billion investment and create 3,500 jobs (Spector, 2023). Practically speaking, few UAW members will be able to move to the South to get the new EV jobs.

An EV mandate will eliminate tens of thousands of UAW members' jobs. It directly threatens the livelihoods of many UAW members.

UAW Leadership Has Not Fought for Their Members

The UAW has significant political influence. The union has spent tens of millions of dollars on political campaigns in recent election cycles (Open Secrets, 2023). UAW national headquarters alone spent $15 million on politics and lobbying in 2022 (U.S. Department of Labor, 2023). The union also boasts an impressive get-out-the-vote operation (Nassar, 2022). As a result, the UAW can effectively tell many Midwestern politicians—especially in Michigan—that they need to support the union's priorities to remain in office.

However, UAW leadership has not used this influence to combat the Biden Administration's planned EV transition. Instead, UAW leadership has largely acquiesced to an agenda that the union recognizes is a major threat to their members' jobs. The broader Left is firmly committed to eliminating gas-powered cars. Opposing EV mandates would mean conflict with the broad liberal coalition. UAW leadership has not been willing to do this, even to defend their members' jobs. Instead, the union has loyally endorsed left-wing candidates and policies.

In 2020, then-candidate Joe Biden campaigned on a platform of mandating and subsidizing electric vehicles (Berman, 2019). UAW leadership strongly endorsed him anyways (United Auto Workers, 2020b). In 2022, President Biden pushed the so-called Inflation Reduction Act, which spent hundreds of billions of dollars on subsidizing EV purchases (Penn Wharton Budget Model, 2023). This legislation directly financed the elimination of union jobs.

Had UAW leadership opposed the bill, they could have heavily pressured Michigan's senators to vote against it. Instead, UAW leaders issued a statement saying the union "proudly supports the Inflation Reduction Act and asks every member of Congress to vote for it" (United Auto Workers, 2022). The bill passed the Senate by a single vote.

After the Biden Administration issued its proposed EV mandate, UAW leadership issued a statement explaining that the "United Auto Workers supports the transition to a clean auto industry and has been a proud leader in the fight against climate change" (United Auto Workers, 2023a).

UAW leadership has refrained from immediately endorsing President Biden in 2024, primarily due to concerns about EVs. However, UAW leadership has also made it clear that opposition to EV mandates will not be a decisive consideration in their 2024 endorsements (United Auto Workers, 2023b; Cama, 2023).

Forcing Americans to purchase EVs will eliminate tens of thousands of UAW jobs. UAW leadership has nonetheless actively supported the politicians and policies that pose "the real risk" to their membership. They have prioritized loyalty to their political allies ahead of their members' livelihoods.

The UAW has Prioritized its Own Financial and Political Success Over Union Member Jobs

Rather than fight EV mandates, UAW leadership is using its political influence to fight for policies that benefit the UAW as an institution. The UAW has lobbied aggressively for the Protecting the Right to Organize (PRO) Act, which would largely replace secret ballot union organizing elections with a process of publicly signed cards. Such "card-check" campaigns make it significantly easier for unions to organize new members, as workers must publicly declare their choice in front of union organizers. The PRO Act also overrides state right-to-work laws and makes union dues compulsory in all states.

Unlike resistance to EVs, UAW leadership has made passing the PRO Act a "top priority" (United Auto Workers, 2021). The union views passing the PRO Act and "easing impediments to workers at non-union automakers" organizing as necessary "[t]o make EVs work for American workers" (UAW Research Department, 2021, pp. 2-3). The UAW's statement responding to the Biden Administration's proposed EV mandate also declared that "[w]e can have both economic and climate justice—and that starts by ensuring that the electric vehicle industry is entirely unionized. We look forward to working with the Biden Administration to hold the auto industry accountable to that mission" (United Auto Workers, 2023).

Passing the PRO Act would help the UAW organize new members to replace those they will lose at conventional automobile and parts manufacturing plants. Making union dues compulsory would increase union revenues. These policies would benefit the union institutionally. However, the PRO Act will not save the high-paying jobs current UAW members making gas-powered cars rely on to support their families. Few of these workers, who primarily live in the Midwest, will get jobs in new battery plants opening in the South—whether or not the PRO Act passes.

UAW leadership is willing to accept policies that threaten its members livelihoods, so long as they are coupled with policies that protect the union's finances.

UAW Members Feel Betrayed

Many rank-and-file workers feel betrayed by the UAW. Workers at a Stellantis/Chrysler assembly plant in suburban Detroit spoke to the press after the company announced the elimination of 3,500 hourly jobs as part of its EV transition. The workers expressed "disgust and anger" over the UAW's complicity in the job losses:

- "These cuts are in preparation for the EVs. They are giving multimillion bonuses to [Stellantis CEO] Tavares and offering workers with 25 years less than $3,000 a year for all they made for this company. The UAW is in bed with management."
- "What are we paying the UAW for? They're supposed to represent us, but they don't."
- "They're already laying off 240 at this plant and at the same time bringing in 100 TPTs [temporary part-time workers]. They're doing it to save money … The UAW doesn't fight for us, it fights for the company" (White, 2023).

Workers at the assembly plant have formed the Warren Truck Rank-and-File Committee (WTRFC) to defend their jobs. The Committee has released a statement explaining that:

> We are building the WTRFC in solidarity with our fellow autoworkers at other Big Three plants and at the auto parts plants … because the UAW is working for management instead of us …
>
> [The announced job losses are] just the tip of the iceberg. All the auto companies plan to close plants and cut tens of thousands of jobs as part of their transition to electric vehicle production. Instead of defending us and fighting the companies with us, the UAW is keeping this information from us even though half the jobs in industry could be cut (Warren Truck Rank-and-File Committee, 2023).

Many UAW members feel their union is not looking out for them. Considering the abundance of evidence that has emerged over the past several years, this widespread member sentiment is entirely justified.

Conclusion

Most Americans want to buy conventional automobiles. However, the Biden Administration is advancing regulations that would force automakers to primarily produce electric vehicles. This mandate would eliminate nearly 120,000 auto manufacturing jobs nationwide—including tens of thousands of union jobs in the Midwest. UAW leadership recognizes this threat to their members' livelihoods. Nonetheless, the union has not used its influence to fight the government-imposed "transition" to electric vehicles. Instead, the union's leaders have endorsed both politicians and policies that promote EVs. UAW leadership has put their political allies ahead of protecting their members' livelihoods.

Works Cited

Barrett, J. & Bivens, J. (2021, September 22). *The stakes for workers in how policymakers manage the coming shift to all-electric vehicles*. Economic Policy Institute. https://www.epi.org/publication/ev-policy-workers/

Beene, R. & Coppola, G. (2018, July 19). Electric vehicles seen imperiling US jobs, UAW. *Transport Topics*. https://www.ttnews.com/articles/electric-vehicles-seen-imperiling-us-jobs-uaw-says?itx%5bidio%5d=5856017&ito=792&itq=7d3aa1df-ab57-4b41-adf2-d079d9c1a42f

Berman, B. (2019, December 21). 2020 Democratic candidates: where each stands on electric cars. *Electrek.* https://electrek.co/2019/12/21/2020-democratic-candidates-where-each-stands-on-electric-cars/

Boak, J. (2023, August 14). Biden says auto workers need "good jobs that can support a family" in union talks with carmakers. *Washington Post*. https://www.washingtonpost.com/politics/2023/08/14/biden-uaw-autoworkers-ev-unions/d512b2f6-3ac1-11ee-aefd-40c039a855ba_story.html

Bushey, C. (2022, November 15). Ford chief warns electric vehicles require 40% less labour. *Financial Times*. https://www.ft.com/content/b7196893-614b-428f-9e7b-6c743ce8ec7d

Cama, T. (2023, July 20). Trump vows to undo Biden's electric vehicle policies. *Politico*. https://www.politico.com/news/2023/07/20/trump-biden-ev-policies-00107437

Canis, B. (2019, February 8). *Electrification may disrupt the automotive supply chain*. Congressional Research Service. https://sgp.fas.org/crs/misc/IF11101.pdf

Cheng, M., & Diaz, C. (2023, June 29). Why America's biggest EV projects are in southern states. *Quartz.* https://qz.com/why-america-s-biggest-ev-projects-are-in-southern-state-1850588290

Dawson, C., Naughton, K. & Coppola, G. (2019, September 27). Auto workers fear EVs will be job killers. *Automotive News.* https://web.archive.org/web/20191115233649/https:/www.autonews.com/manufacturing/auto-workers-fear-evs-will-be-job-killers

Dreibelbis, E. (2022, December 12). Jeep halts production at Illinois plant due to high EV costs, axes 1,350 Employees. *PCMAG*. https://www.pcmag.com/news/jeep-halts-production-at-illinois-plant-due-to-high-ev-costs-axes-1350

Dua, R. & Bansal, P. (2021, June 16*). Once consumers adopt an electric vehicle, do they go back?* King Abdullah Petroleum Studies and Research Center. Instant Insight. https://www.kapsarc.org/research/publications/once-consumers-adopt-an-electric-vehicle-do-they-go-back/

Edelstein, S. (2022, January 11). Study: Two-thirds of Americans don't want an EV yet, and half won't pay extra for electrified. *Green Car Reports*.

https://www.greencarreports.com/news/1134702_americans-dont-want-ev-yet-half-wont-pay-extra-for-electrified

Environmental Protection Agency. (2023, April 12). *Biden-Harris Administration proposes strongest-ever pollution standards for cars and trucks to accelerate transition to a clean-transportation future.* EPA Press Office. https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strongest-ever-pollution-standards-cars-and

Executive Order 14037, 86 FR 43583. (2021, August 10). https://www.federalregister.gov/documents/2021/08/10/2021-17121/strengthening-american-leadership-in-clean-cars-and-trucks

Frazin, R. (2022, August 18). Here's why many electric vehicles are so expensive. *The Hill.* https://thehill.com/policy/3607123-heres-why-many-electric-vehicles-are-so-expensive/

Grzelewski, J. (2020, November 2). In the shift to EVs, some worry workers could suffer. *GovTech.* https://www.govtech.com/fs/transportation/In-the-Shift-to-EVs-Some-Worry-Workers-Could-Suffer.html

Institute for Energy Research. *Ford loses on its electric vehicle sales; lays off workers*. (2023, May 10). IER. https://www.instituteforenergyresearch.org/renewable/ford-loses-on-its-electric-vehicle-sales-lays-off-workers/

Krisher, T. (2023, April 26). Carmaker Stellantis is offering staff buyouts as it tries to cut 3,500 hourly workers in response to the "increasingly competitive global market. *Fortune.* https://fortune.com/2023/04/26/stellantis-buyouts-cars-cutting-jobs-competitive-market-ev-shift/

Kuykendall, K. (2023, May 11). *EV manufacturing race: Which US states are taking an early lead?* S&P Global. https://www.spglobal.com/marketintelligence/en/mi/research-analysis/ev-manufacturing-race-which-us-states-are-taking-early-lead.html

Levin, T. (2022, August 23). Ford is slashing thousands of jobs as it goes electric. Experts say a tidal wave of layoffs will rock the industry as it undergoes a seismic shift. *Yahoo News*. https://www.yahoo.com/now/going-electric-could-cost-auto-105500604.html
Lewis, M. (2023, May 9). 45% of US car dealers won't sell you an EV – here's what's going on. *Electrek.* https://electrek.co/2023/05/09/us-car-dealers-evs/

Massachusetts Institute of Technology. (2022, March). *Electric vehicles: The 21st-century challenge to automotive manufacturing communities*. The Roosevelt Project. MIT Center for Energy and Environmental Policy Research. https://energyjustice.indiana.edu/doc/2022-the-roosevelt-project-industrial-heartland-case-study.pdf

Mihalascu, D. (2023, February 20). EVs made up 5.6 percent of US car market in 2022 driven By Tesla. *InsideEV*s. https://insideevs.com/news/653395/evs-made-up-5point6-percent-of-overall-us-car-market-in-2022-driven-by-tesla/

Mills, M. (2022, August). *The "energy transition" delusion: A reality reset.* Manhattan Institute. https://media4.manhattan-institute.org/sites/default/files/the-energy-transition-delusion_a-reality-reset.pdf

Nassar, J. (2022, November 10). *Nassar: Union canvassing paid off in the mid-term elections*. America's Workforce Union Podcast. https://awf.labortools.com/listen/nassar-union-canvassing-paid-off-in-the-mid-term-elections

Penn Wharton Budget Model. (2023, April 27). *Update: Budgetary cost of climate and energy provisions in the Inflation Reduction Act*. University of Pennsylvania. https://budgetmodel.wharton.upenn.edu/estimates/2023/4/27/update-cost-climate-and-energy-inflation-reduction-act#:~:text=Summary

Powell, S., Lynch, M., & Houchois, P. (2022, March). *EVs - A skeptic's view*. Jeffries University. https://javatar.bluematrix.com/pdf/N8T7PT0N

Scheiber, N. (2022, December 9). Workers at E.V. battery plant in Ohio vote to unionize. *New York Times.* https://www.nytimes.com/2022/12/09/business/economy/ev-battery-union.html

Sagert, J. and Sherk, J. (2023, July 13). *Proposed EV mandate would eliminate 117,000 auto manufacturing jobs*. [White Paper] America First Policy Institute. Proposed EV Mandate Would Eliminate 117,000 Auto manufacturing jobs

Spector, J. (2023, June 8). The South is building the most vibrant EV and battery hub in the US. *Canary Media.* https://www.canarymedia.com/articles/clean-energy-manufacturing/the-south-is-building-the-most-vibrant-ev-and-battery-hub-in-the-usOpen Secrets. (2022). *United Auto Workers Profile: Totals*. https://www.opensecrets.org/orgs/united-auto-workers/totals?cycle=A&id=d000000070

United Auto Workers. (2020a, January). *Taking The High Road: Strategies For A Fair EV Future*. https://region1d.uaw.org/system/files/ev-white-paper-revised-january-2020-final.pdf

United Auto Workers. (2020b, April 21). *UAW Endorses Joseph Biden for President of The United States of America.* https://uaw.org/uaw-endorses-joseph-biden-president-united-states-america/

United Auto Workers. (2021, April 26). *Pass the PRO Act -- NOW!*. https://uaw.org/pass-pro-act-now/

United Auto Workers. (2022, August 5). *UAW Statement in Support of Inflation Reduction Act.* https://uaw.org/uaw-statement-support-inflation-reduction-act/

United Auto Workers. (2023a, April 12). UAW Statement On New Emissions Rules Proposed By The Environmental protection Agency. https://uaw.org/uaw-statement-new-emissions-rules-proposed-environmental-protection-agency/

United Auto Workers. (2023b, May 2). *Talking points on President Biden and EV's*. aboutblaw.com. https://aboutblaw.com/7LLUAW Research Department. (2021, March).

"*Making EVs Work for American Workers*." United Auto Workers. https://uaw.org/wp-content/uploads/2021/03/2021-UAW-EV-Update-1.pdf.

U.S. Bureau of Labor Statistics. (2021). *Quarterly Census of Employment and Wages.* https://www.bls.gov/cew/data.htm

U.S. Department of Labor. (2023). *Form LM-2 Labor Organization Annual Report*. Office of Labor-Management Standards. https://olmsapps.dol.gov/query/orgReport.do?rptId=865078&rptForm=LM2Form

Warren Truck Rank-and-File Committee. (2023, April 23). *Unite to fight job cuts and concessions! Build the Warren Truck Rank-and-File Committee!* [Statement] https://www.wsws.org/en/articles/2023/04/24/eeql-a24.html

White, J. (2023, April 26). As Stellantis moves to cut 3,500 jobs, workers livid at UAW collusion. *World Socialist Website*. https://www.wsws.org/en/articles/2023/04/27/sxrm-a27.html

[i] One company—Tesla—accounts for almost two-thirds of EV sales (Mihalascu, 2023). Non-union Tesla dominates the EV market; a shift to EVs almost certainly means sales—and jobs—will be switching to Telsa.

[ii] The Deloitte 2022 Global Automotive Study found that 69% of Americans prefer their next car purchase to be a gas-powered vehicle, 5% prefer an entirely battery-powered car, and 22% prefer a hybrid vehicle. Range and price concerns were particularly important factors for respondents who prefer gas-powered vehicles; most Americans (53%) indicated they would not pay more for an electric vehicle (Edelstein, 2022). A recent survey of car dealerships also found that 45% of dealerships reported they would not sell EVs under any circumstances (Lewis, 2023). After purchasing an EV, a significant proportion of drivers switch back to conventional vehicles. One study found that one-fifth of California EV owners returned to purchasing gas-powered vehicles, primarily because of the inconvenience of charging EVs (Powell et al., 2022, p. 39). Another survey looked at all Americans—not just Californians—who purchased a new vehicle in 2017. That study found that about half of EV owners chose not to buy another EV when they bought a new car. Respondents indicated that range, recharging time, and reduced performance in cold weather were key reasons for switching back to gas-powered vehicles (Dua & Bansal, 2021, p. 3).

[iii] Data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages shows that 219,000 employees worked in automobile and/or light-duty motor vehicle manufacturing facilities in 2021, while 539,000 workers were employed in motor vehicle part manufacturing facilities.

[iv] Brett Smith, director of technology at the Center for Automotive Research, explained "[t]he industry is going through a transition unlike anything we've ever seen. There's a pretty strong chance that there will be fewer people building these cars, fewer people building the parts to these cars, and that will create challenges in some automotive communities" (Levin, 2022).

[v] This table is taken from Table 2 of Sagert and Sherk (2023). That report includes a methodological appendix that explains the details of these calculations.

[vi] Roughly two-thirds of those job losses will come from parts manufacturers. The remaining third will be in final assembly positions.

[vii] Lawrence Burns, former vice president for research and development at General Motors, told reporters, "If you play this out in a five to 10-year time frame, employment ramifications for states like Michigan and regions like southeast Michigan and northwest Ohio are really going to be a big deal" (Grzelewski, 2020).

[viii] According to data from the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, vehicle manufacturing employment in the tristate area and in the U.S. as a whole, including both employees on primary assembly lines and employees in parts production in 2021 consists of the following: Indiana 19,959 (Motor Vehicle Assembly), 58,792 (Vehicle Parts Manufacturing), 78,751 (Total Auto Manufacturing Employment); Michigan 44,120 (Motor Vehicle Assembly), 121,774 (Vehicle Parts Manufacturing), 165,894 (Total Auto Manufacturing Employment); Ohio 17,002 (Motor Vehicle Assembly), 66,641 (Vehicle Parts Manufacturing), 83,643 (Total Auto Manufacturing Employment); Total U.S. 218,619 (Motor Vehicle Assembly), 538,945 (Vehicle Parts Manufacturing), 757,564 (Total Auto Manufacturing Employment).

[ix] Stellantis is indefinitely suspending operations at the Jeep Cherokee plant in Belvidere, Illinois, due to the high costs associated with developing electric vehicles (Dreibelbis, 2022). This decision will result in 1,350 employees losing their jobs starting from February 28. The closure is attributed to various factors, including the microchip shortage, but the company emphasized that the increasing costs related to automotive electrification pose the most significant challenge. Electric vehicles have higher production costs compared to gas-powered cars, mainly due to the expensive minerals used in their batteries. The UAW expressed their disapproval of the decision and vowed to fight back,

criticizing the timing of the announcement just before the holidays. The UAW also pointed out that the transition to electrification presents opportunities and highlighted the government incentives received by companies such as Stellantis to transition to clean energy (Dreibelbis, 2022).