

Power Outrage:

**Will Heavily Subsidized Battery Factories
Generate Substandard Jobs?**

The logo consists of the words "GOOD", "JOBS", "FIRST", and ".ORG" stacked vertically in a bold, sans-serif font. The text is dark teal and is centered within a white square background.

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Executive Summary

Under a provision of the Inflation Reduction Act, some factories making batteries for electric vehicles will each receive **more than a billion dollars per year** from the U.S. government, with no requirement to pay good wages to production workers. Thanks to the Advanced Manufacturing Production Credit, also called 45X for its section in the Internal Revenue Code, battery companies will receive tax credits that they can use, sell, or cash out.

The 45X program alone will cost taxpayers over **\$200 billion in the next decade**, far more than the \$31 billion estimated by Congress's Joint Committee on Taxation, according to a Good Jobs First analysis. On top of 45X and other federal incentives, factories manufacturing electric vehicles and batteries have also been promised **\$13 billion in state and local economic development incentives** in just the past 18 months.

What do local communities get from companies in exchange for public money? The Biden administration says the IRA will create "[good-paying union jobs](#)," but the federal tax credit has no job quality requirements for permanent jobs and doesn't mandate companies pay market-based wages or benefits.

Good Jobs First did the math for five recently announced battery factories. Here's what we learned:

- Total subsidies will range from **\$2 million to \$7 million per job**.
- Average annual wages, as announced, will be below the current national average for production workers in the automotive sector.
- The 45X credit **alone** is large enough to cover each facility's initial capital investment cost and wage bill for the first several years of production.

For example, Ford Motor's new \$3.5 billion battery plant in Marshall, Michigan, will be eligible for an estimated \$6.7 billion in federal 45X tax credits. State and local governments have already awarded it an additional \$1.7 billion in subsidies. The company has promised to create 2,500 new jobs that it says will pay an average annual wage of just **\$45,000 a year**, while reaping subsidies of **\$3.4 million per job**.

As plans for these facilities are finalized, we recommend a set of policy actions to set the country's emerging EV-battery industrial complex on the path to ["high road"](#) employment:

- Executive agencies should adopt the [U.S. Employment Plan \(USEP\)](#) when federal agencies purchase electric vehicles. USEP is a framework for soliciting and evaluating public contract bids through the lens of hiring equity and job quality.
- The federal government should require companies seeking federal subsidies and contracts to disclose past labor and occupational health and safety violations and certify regulatory compliance among subcontractors and suppliers.
- State and local governments should require subsidy recipients to pay wages equal to or greater than market-level wages and enforce "clawback" provisions if companies fail to deliver promised jobs or investment.
- Workers and communities should demand Community Benefits Agreements (CBAs) with battery makers. Negotiated when local governments make plans to aid new or expanding companies, these CBAs should include firm commitments on job quality and wages, local hiring, state of the art workplace safety, and toxic emissions monitoring.

Key Findings: Millions in Subsidies per Job at Battery Plants Paying Low Wages

Five recently announced EV battery plants, all to begin production in the next two to three years, well illustrate the astounding scale of public money set to flow to battery makers in the next decade.

The IRA’s Advanced Manufacturing Production Credit, the “45X credit,” is expected to pay the seven companies building these plants *over \$1 billion per year per facility* in federal corporate income tax credits, amounting to several billions of dollars for each facility by the time the credit is phased out in 2033.

On top of that, states and local governments have larded on millions, in some cases billions, more in subsidies. These megadeals take a variety of forms, often including multiple tax breaks, grants, and public spending on site readiness and infrastructure improvements.

Company name(s)	Location	Investment	Est. value of 45X credit	State and local subsidies	New jobs	Per job subsidy	Avg. annual wages
LG and GM	Spring Hill, TN	\$2.6 billion	\$13.1 billion	\$60 million	1,700	\$7.7 million	\$45,760
LG and Honda	Jeffersonville, OH	\$3.5 billion	\$9.1 billion	\$306 million	2,200	\$4.3 million	\$46,500
Ford Motor	Marshall, MI	\$3.5 billion	\$6.7 billion	\$1.7 billion	2,500	\$3.4 million	\$45,000
Panasonic	DeSoto, KS	\$4 billion	\$6.8 billion	\$1.28 billion	4,000	\$2 million	\$50,000
SK On and Hyundai	Cartersville, GA	\$5 billion	\$6.7 billion	\$641 million	3,750	\$2 million	\$53,000

Note: Value of 45X credit estimated by multiplying \$35 by facility annual battery capacity. Facility assumed to operate at full capacity for every year after opening. Estimate accounts for credit phase-out over 2030-32.

Source: Author’s calculations based on company press releases, earnings calls, news clips, and Subsidy Tracker data. See Appendix A for details.

Adding together federal, state, and local support yields subsidies ranging from \$2 million to \$7 million per job. And those are *undercounts* given that some forms of state and local support remain undisclosed and more federal money is [inbound](#).

Meanwhile, early indications are that all five plants will be offering sub-market wages for production workers.

The nationwide [average hourly wage](#) for production workers in the U.S. automotive sector is \$28.41 an hour, or \$59,093 a year for a full-time worker. That’s more than expected average wages at any of these facilities, which are already biased upward by the inclusion of higher-paid supervisory and managerial workers in the facility’s employment total.

Production workers at General Motors and LG’s new joint venture battery plant in Warren, Ohio are expected to make a paltry [\\$16.50 an hour](#) to start, up to \$20 an hour after *seven years*.

At such low wages, the 45X credit on its own is enough to completely cover these companies' capital investment costs *and* their total wage bill for the first several years of production, while still leaving them with money left over to pay for other operating costs (or [stock buybacks](#)).

Introduction: Lift-Off Time for Electric Vehicles and Batteries

Globally, 10 million EVs were [sold](#) in 2022, accounting for one out of every seven new car sales. That's up from just one in 20 two years earlier.

This surge in EV sales has been equally dramatic in the United States, rising from 294,000 vehicles sold in 2020 to nearly a million in 2022. The Biden administration has [called](#) for half of all new car sales to be electric by 2030, which the International Energy Agency [projects](#) the country is on track to achieve.

To keep up with rising demand, U.S.-based automakers have begun rolling out a host of new all-electric models: the Chevrolet Silverado and Cadillac Lyriq from General Motors, the Mustang Mach-E and F-150 Lightning from Ford, the Ram 1500 REV from Chrysler, and the Semi from Tesla.

Chrysler, a brand owned by the multinational Stellantis, has already announced it intends to offer a fully electric vehicle lineup by 2028 and General Motors is aiming to do the same by 2035. Ford, which led the U.S. in all forms of vehicle sales in the first quarter of 2023, is pushing EV sales more aggressively so far in Europe.

Several foreign-based automakers, who already assemble half of all new cars built in the United States, have also announced expansions or new stand-alone facilities for EV production, including Volkswagen in Chattanooga, Tenn.; BMW in Spartanburg, S.C.; Nissan in Canton, Miss.; Toyota in Georgetown, Ky.; and Hyundai in Bryan County, Georgia.

Hot on the heels of these household names, several EV-focused upstarts are also expanding at a rapid clip. Rivian and Lucid, both based in California, have completed assembly facilities in Illinois and Arizona, respectively, and Rivian is slated to build a second factory in Georgia. By 2025, Vietnam-based Vinfast aims to start production at its new assembly facility in Chatham County, N.C.

While Tesla has dominated U.S. EV sales to date, it is facing many new competitors, most of them with deep pockets and brand-name recognition.

Unlike Internal Combustion Engines, Automakers Don't Make Batteries In-House

Like internal combustion engines in conventional vehicles, batteries are the highest value-added component in EV production. Battery manufacturing capacity in North

America is set to [increase](#) more than tenfold over the next decade, but U.S. technology won't be driving this change. Instead, much of this planned expansion is being created by joint ventures between global automakers and seasoned battery makers based in East Asia.

BlueOvalSK, LLC is Ford's joint battery making venture with SK On. General Motors is partnering with LG Energy Solutions under the banner of Ultium Cells LLC and recently announced another joint venture with Samsung. All three battery makers are headquartered in South Korea. Foreign automakers Honda and Hyundai are also partnering with LG and SK On for their new U.S. operations. Tesla's battery "gigafactory" in Nevada is a partnership with Panasonic.

These companies and others have collectively pledged to [invest](#) more than \$130 billion in new U.S. electric vehicle and battery production, but that's hardly the only credit they'll be claiming for their part in this seismic industrial transformation.

Inflation Reduction Act's 45X Tax Credit: Likely to Cost At Least \$200 Billion

The Advanced Manufacturing Production Credit, also referred to as "45X" after its section in the Internal Revenue Code, is one of a bevy of new and expanded [tax benefits](#) in the Inflation Reduction Act (IRA). Altogether, the bill represents the biggest surge of public investment ever in the United States' renewable energy transition and the electrification of the country's transportation sector.

For battery makers, the value of the 45X credit varies by component and kilowatt hours (kWh) of storage manufactured: \$35 per kWh for battery cells, \$10 per kWh for modules, and \$45 per kWh for battery modules without cells.

To power an EV, individual battery cells are gathered in frames, called modules, to protect them from temperature extremes and damage. Modules are then assembled in packs for installation in the vehicle.

As an example, Ford's F-150 Lightning has a standard range battery capacity of 98 kWh. Assuming both the cells and modules are assembled in the same facility, electrifying one truck will yield about \$4,400 in federal tax credits.

Based on announced investments in new domestic battery manufacturing capacity over the next decade, the 45X program stands to cost the federal government over \$200 billion in foregone tax revenue by the time it fully phases out in 2033, blowing initial [cost estimates](#) out of the water.

How the 45X Tax Credit Works and Can Be Monetized

Federal corporate income tax credits are dollar-for-dollar reductions in a company's federal income tax liability. Normally, if a company has a tax credit that exceeds its tax bill, it will carry over the unused part of the credit and use it against its tax obligation in the next year. It may take several years to use up the credit.

However, 45X credits are both transferable and eligible for direct pay, allowing companies to rapidly [monetize](#) their benefits.

Transferability means that recipients can sell all or some of their credits to other companies looking to reduce their tax bill, even if the buyer would not have been eligible for the credit in the first place. The cash payment the seller receives is then excluded from their taxable income.

The IRA also includes a novel direct pay option to enable tax-exempt and governmental entities to benefit from its various tax subsidies. (Non-profit and governmental entities don't pay federal income tax, but 45X can pay them in cash.) Three credits, including 45X, also allow for-profit businesses to avail themselves of this option. Direct pay means 45X recipients may receive a cash payment of their tax credit value for the first five years they claim the credit.

Both features mean that the costs of lower federal tax revenue and new cash payouts will likely be felt within a couple years of when companies start ramping up production at their new facilities.

States and Localities Handing Out Lavish Battery Subsidies Too

As Good Jobs First documented in an October 2022 [study](#), *Will Electric Vehicles Create Budget Potholes for the States?*, and in a year-end round-up [blog post](#), "2022: A Mega-Year for Megadeals," state and local governments are on a record-setting streak of subsidy awards in excess of \$1 billion per project, mostly going to EV and battery factories.

Nothing in the IRA precludes companies from seeking and getting these massive state and local subsidies, nor does it set any upper limits on the level of per-job subsidies a company can receive for a particular project.

Our Subsidy Tracker database lists 19 EV- and battery-related [megadeals](#) in 2022 and 2023 to date. Altogether, they total \$13 billion. Many of these subsidy packages also contain multiyear local property tax abatements of undisclosed value.

Public support takes many forms in these megadeals beyond conventional tax breaks, grants, and loans. Michigan is spending \$660 million on land acquisition and site preparation to make way for [Ford's](#) BlueOval Battery Park. Queen Creek, Arizona designated [LG's](#) facility there a Foreign-Trade Zone, slashing the company's real property tax bill by over 70%. Georgia plans to construct a new \$62.5 million facility to train workers bound for [Hyundai's](#) EV assembly and battery complex.

Last year's study also highlighted the conspicuous lack of job quality standards in many of these state and local megadeals. [Panasonic](#), for instance, secured \$829 million in state support for its battery plant in Kansas without making any commitments as to the wages it will pay or even the number of jobs it will create.

Union Contracts: The Best Assurance of Good Job Quality

The 45X credit is a major missed opportunity to ensure the benefits of the EV transition are justly shared with the workers and communities building America's fossil-free economy.

To be sure, several of the law's key programs like the 48C Advanced Energy Project tax credit and the Clean Electricity Production and Investment tax credits do [include](#) provisions offering sizable bonuses to companies that pay prevailing construction wages, work with registered apprenticeships, and source inputs from domestic suppliers. But the 45X tax credit offers no such bonuses, and like all credits in the IRA, it is silent on the quality of the *permanent production jobs*.

In the absence of any statutory requirements, workers can of course still fight for the high wages and safe working conditions they deserve through union representation and collective bargaining. But securing union recognition and a first contract won't be easy.

The United Auto Workers is already [sounding the alarm](#) that unionized U.S. automakers' are using their joint ventures to try to avoid paying battery plant workers the higher wages that members receive through the UAW's master contracts.

Ultium Cells—GM's joint venture with LG—forced a union vote at its battery plant in Warren, Ohio last year after refusing to recognize the UAW through card check.

Ultimately, workers there were nearly unanimous in their [support](#) for union representation, but the episode is a likely portent of fights to come.

Moreover, many new battery plants will be wholly owned by foreign automakers like Nissan and Volkswagen that operate non-union assembly plants in the U.S. Workers at Tesla, Lucid, and Rivian, relative newcomers in the U.S. auto sector, also lack a union contract.

Policy Recommendations

Having failed to bake permanent-job quality standards into the IRA, the federal government still has options to help ensure the legislation meets its dual ambitions of reviving domestic manufacturing *and* improving outcomes for American workers.

Short of more comprehensive reforms to federal labor law, like the [Protecting the Right to Organize \(PRO\) Act](#), executive agencies can wield considerable influence over private sector activity through their discretion over procurement decisions.

To that end, more should embrace the [U.S. Employment Plan \(USEP\)](#) for public purchasing. This proven model is a framework for soliciting and evaluating public contract bids through the lens of hiring equity and job quality. Because the USEP encompasses subcontractors and suppliers, federal agencies buying electric vehicles should structure their evaluation system to incentivize higher job quality standards all along the EV supply chain.

They should also require bidders to disclose past labor and occupational health and safety violations and to certify regulatory compliance among their subcontractors and suppliers. The U.S. Department of Agriculture was lauded last year for proposing such a rule change, but its implementation has since [languished](#). Ultimately the only sure way to prevent serial labor law violators from winning plum federal contracts will be through legislative change, like the [amendments](#) proposed during negotiations last year over the National Defense Authorization Act.

States and local governments can also leverage their purchasing power in this way, but rather than trying to improve job quality after the fact, they should simply demand more from battery makers seeking economic development subsidies in the first place.

Wage requirements for future subsidy recipients should be set relative to market wages and vary by occupation to prevent managers and executives from artificially inflating the facility-wide average wage. To hold companies to these commitments,

all tax credits and exemptions, grants, and loans, should be performance-based and clawbacks scrupulously enforced.

In the face of state and local inaction, workers and communities should seek Community Benefits Agreements with battery makers to address their concerns and win additional commitments. Community representatives typically negotiate these agreements with companies directly and anything can be on the table. In addition to addressing the quality of permanent jobs, CBAs can also include local hiring requirements, company spending on local amenities, and toxics emissions monitoring.

While there's still time to set the country's emerging EV-battery industrial complex on the path to ["high road"](#) employment, America can't afford to miss the on-ramp.

Appendix A: Methodology

The estimated total cost of the 45X credit - \$200 billion – was calculated by multiplying existing and announced U.S. battery production capacity by \$35 per kWh for every year until 2032. Capacity figures were drawn from a 2022 report by Argonne National Laboratory and assumed to be constant from 2030 to 2032.

The information presented in the table of five announced battery plants is drawn from publicly available sources, including Good Jobs First's Subsidy Tracker database, which is based upon government announcements and records.

Megadeal entries within Subsidy Tracker for LG and GM ([Ultium Cells](#)), [LG and Honda](#), [Ford](#), [Panasonic](#), and [SK On and Hyundai](#) report capital investment figures, the anticipated number of new jobs, wage rates, and the value of disclosed state and local subsidies. Since its inclusion in the database, Ultium has [announced](#) that it intends to invest an additional \$275 million in its Spring Hill plant, increasing the anticipated employment total there by 400 jobs.

To calculate the estimated total value of the 45X tax credit at each facility first required gathering the production capacity at each site in GWh and its anticipated completion data (sources linked):

- [LG and GM \(Ultium\)](#): 50 GWh, opening 2023
- [LG and Honda](#): 40 GWh, opening 2025
- [SK On and Hyundai](#): 35 GWh, opening 2025
- [Ford Motor](#): 35 GWh, opening 2026
- [Panasonic](#): 30 GWh, opening 2025

Using this information, the production capacity at each facility was multiplied by the baseline battery cell rate of \$35 per kWh for every year that the facility is expected to be in operation until 2030. That year, the value of the credit falls to \$26.25 per kWh, then \$17.50, and finally \$8.75 before phasing out completely in 2033. The sum of each year's credit value between when the plant is expected to open and 2033 is the estimated credit value used in the table.

Subsidy per job is calculated as the sum of the 45X credit value and state and local subsidies divided by the number of projected new jobs at the facility.