

HIGH RISK & LOW PAY

Hazardous Conditions and Low Wages Show Standards Must Be Raised at Battery Cell Plants Getting Billions in Taxpayer Dollars



A Case Study of Ultium Cells Lordstown



TABLE OF CONTENTS

Executive Summary	2
Full Report	5
I. The Perils and Promise of Ultium Cells Lordstown and EV Manufacturing	6
II. Ultium’s Low-Road Strategy Leads to High Risks for Workers	8
III. The Chemical Hazards in an EV Battery Cell Plant	11
IV. The UAW-GM Contract Offers Model Solutions to Ultium’s Safety Problems	13
V. Tallying EV Taxpayer Subsidies & How We Can Spend Them Wisely	14
VI. CONCLUSION: A Just Transition to EVs	15
References	16

EXECUTIVE SUMMARY

I. The Perils and Promise of Ultium Cells Lordstown and EV Manufacturing

The American auto industry is a vital source of manufacturing jobs in communities across the country. It employs roughly 2 million workers.¹ The industry's ongoing move toward electric vehicles (EVs) is driving an unprecedented shift in this critical manufacturing sector.

Automakers globally are planning to invest \$1.2 trillion in EVs, batteries, and key minerals by 2030.² In the United States, the federal government is boosting the domestic EV industry with subsidies that could total \$220 billion by 2031.³

Will the U.S. government's massive investment in EV production spur the creation of high-quality union jobs that build prosperous communities? Or will those billions be used to supercharge corporate profits while subjecting workers to hazardous conditions and substandard pay?

This case study of Ultium Cells Lordstown shows there is a real danger that hundreds of billions in taxpayer dollars will subsidize an EV industry that underpays and endangers workers.

Ultium is a joint venture of General Motors and LG Energy Solution. Its

Lordstown, Ohio, plant makes the battery cells that power GM's growing EV fleet. Ultium's Lordstown plant could qualify for tax credits worth more than \$1 billion a year.⁴

Despite this potentially massive subsidy, Ultium offered workers a starting wage of just \$16.50 an hour when it opened in the summer of 2022. Even after seven years, workers would make just \$20 an hour. Troublingly, Ultium workers have also reported serious health and safety problems at the plant.

Facing hazardous conditions and low pay, the Lordstown workers organized with the UAW and voted 710 to 16 to join the union. **Ultium's Lordstown workers are showing there's a better way forward for EV manufacturing in America. A way that maintains the same strong pay and safety standards that UAW members have won at Big Three plants across the country.**

II. Ultium's Low-Road Strategy Leads to High Risks for Workers

Since opening, Ultium's Lordstown plant has been cited multiple times by the Occupational Health and Safety Administration (OSHA). This report includes a rundown of those OSHA citations as well as first-hand accounts from workers of injuries they've suffered. Those accounts include:

- A quality inspector had to flee her station when toxic fumes filled her work area. She also notes **she is “blowing black stuff out of [her] nose”** every day after work.
- A production maintenance tech was **sprayed in the face with toxic electrolyte** when a machine failed to alert workers there was a defect in one of the battery cells.
- A former worker in the plant’s anode production side saw **so many hazards in the plant he decided to leave Ultium after only six months. Management has repeatedly remarked to the union that high turnover is a serious issue at the plant.** Some workers estimate annual turnover at the plant is running over 50 percent.

III. The Chemical Hazards in an EV Battery Cell Plant

An EV battery is a dense collection of lithium-ion electrochemical cells. The Lordstown facility manufactures cells that are assembled into batteries elsewhere. Each cell consists of a positive cathode, a negative anode, and a liquid solution in the middle called an electrolyte.⁵ **Chemicals in the cathode, anode and the electrolyte can be extremely hazardous.**

- A chemical called N-Methylpyrrolidone (NMP) is used to manufacture the cathode. **Acute exposure may damage unborn children,** cause respiratory tract irritation, skin irritation, nausea, headache, dizziness and diarrhea.⁶
- In manufacturing the anode, the company uses a product called Lucan BT1003M. More than 95 percent of it consists of carbon nanotubes, which can cause **germ cell mutations and cancer.**⁷

- One ingredient in the plant’s electrolyte is called “Additive” and is reported to be 0 to 10 percent of the product. No chemical abstract number is reported for the “Additive,” making it **impossible to independently verify its hazards** or lack thereof.

IV. The UAW-GM Contract Offers Model Solutions to Ultium’s Safety Problems

The UAW-GM National Agreement has a number of provisions for dealing with chemical hazards like those described above. It provides for a hazardous material control committee that has the authority to prevent chemicals from coming into the workplace and, where certain hazardous materials are necessary for production, to plan for their use as safely as possible before they enter the workplace

The UAW-GM contract provides for participation in health and safety by workers or their representatives at all levels of the company from the shop floor to the national level. The agreement provides for appropriate health and safety training that allows all participants to serve in their roles with maximum effectiveness. The language provides a process for identifying and reporting hazards, including a complaint procedure that allows workers to bring issues to their union representatives, who can call them to the attention of the company.

The union’s contract language provides for greater protection than that provided by agencies such as OSHA. Among the hazards addressed are chemical hazards, noise, ergonomic hazards, hazardous energy (controlled by locking out power), amputation hazards, and working alone. The UAW-GM national agreement is a highly

successful model for protecting safety that could be applied at Ultium Cells Lordstown and other battery cell manufacturers.

V. Tallying EV Taxpayer Subsidies & How We Can Spend Them Wisely

Ultium’s low-road approach to EV technology is particularly troubling given the billions of taxpayer dollars that support it and the EV industry.

Perhaps the most important subsidy is the Inflation Reduction Act’s 45X Advanced Manufacturing Production Tax Credit (PTC), *Analysts have estimated that the 45X PTC alone could provide between \$150 billion and \$200 billion in tax credits for the industry.*⁸

If public subsidies come without conditions that establish high-road industry-wide standards, automakers will take the low-road approach of replacing safer, quality union jobs in internal combustion engine (ICE) powertrain plants with low-road jobs in the new EV powertrain sector. Public investments in the EV supply chain must come with standards that promote, not undermine, high-road domestic manufacturing.

VI. CONCLUSION: A Just Transition to EVs

The EV transition must be a just transition. We cannot allow a race to the bottom for America’s working families. The UAW fully supports the transition to a more climate-friendly auto industry, and we are convinced that it can be done without making workers pay the price.

In a just transition to EVs, jobs in the battery plants that will power this transition must be as good or better than current jobs building internal combustion engine vehicles and components. Unfortunately, there

are serious problems regarding the transition’s impact on workers. Not only are hourly wages in EV battery plants much less than in existing powertrain facilities, there are significant concerns that their health and safety practices fall far short of the unionized auto industry’s standards.⁹

Automakers and their battery partners have a responsibility to apply the same industry-leading health and safety programs to their battery operations that they use in unionized automotive plants.

By adopting standards along the lines of the UAW’s Big Three National Agreements throughout the electric vehicle supply chain, we have the opportunity to set the bar high for this new auto powertrain. Most, if not all, of the health and safety concerns found at Ultium’s Lordstown plant could be avoided by applying standards negotiated in our UAW contracts.

There will be tens of thousands of workers in battery plants in the near future. Establishing best practices at these plants now will set a high bar throughout the industry. Workers across the supply chain, from mining and mineral processing through final assembly of EVs, will be dealing with many hazards similar to those faced by workers at Ultium in Lordstown. Ramping up EV production to reduce climate impacts must not result in spreading dangerous manufacturing practices to communities across the country. **All EV workers deserve robust protections and a voice in making their jobs safer.**



A Case Study of Ultium Cells Lordstown

Hazardous Conditions and Low Wages Show Standards Must Be Raised at Battery Cell Plants Getting Billions in Taxpayer Dollars

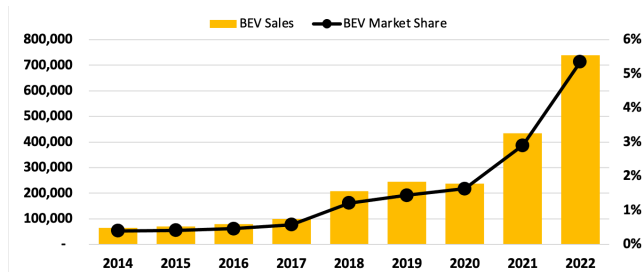


FULL REPORT

I. The Perils and Promise of Ultium Cells Lordstown and EV Manufacturing

The auto industry has announced ambitious electrification targets. Starting from very low volumes, electric vehicles (EVs) are increasing as a portion of U.S. light vehicle sales and market share. They reached over 5 percent of market share for the first time in 2022.¹⁰ In the next few years, consumers will have more EV options than ever before, as major automakers launch EVs in popular segments and nameplates. Sales will be further boosted by consumer incentives, manufacturing subsidies, improved charging infrastructure, and automaker regulatory requirements.

Battery Electric Vehicle Sales & Market Share in the United States



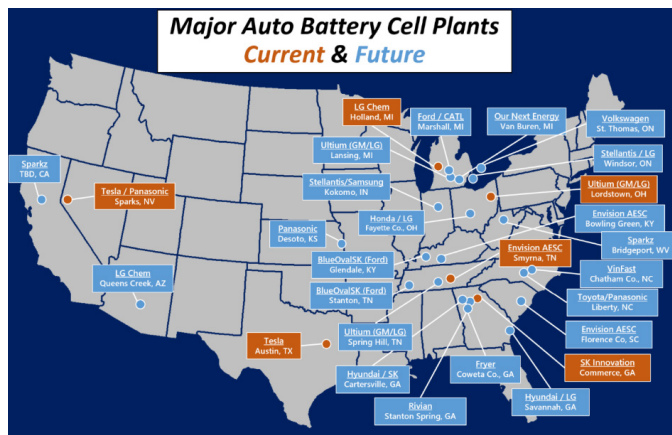
Data Source: Wards Intelligence¹¹

In order to power these vehicles, there will be a corresponding increase in battery cell plants. Battery demand for EVs is expected to grow rapidly over the next decade. Automakers and their battery partners are investing billions to establish battery supply chains to meet this demand. Driven by demand and generous subsidies, over 20 major automotive battery cell plants in 14 states have been announced or have begun production. Each plant is typically a multi-billion-dollar investment with 1,000 to 3,000 workers.¹² In addition to the anticipated EV battery plants, numerous battery cell plants are planned for energy storage or other non-automotive applications.

Ultium Cells is a joint venture between General Motors and LG Energy Solution.

Lordstown is the first of three announced Ultium plants in the United States and one of just a handful of large-scale EV battery cell plants currently operating in this country. These plants are at the forefront of a wave of industry investment in domestic battery cell production that will reshape auto powertrain manufacturing across the country.

The upsurge in EV battery investment has been driven by generous public subsidies contained in the U.S. Inflation Reduction Act (IRA). (For a detailed accounting of EV subsidies, see Section V of this report, “Tallying EV Taxpayer Subsidies & How We Can Spend Them Wisely.”)



Data Source: UAW Research Department¹³

Plant Background and Context

The Ultium Cells plant in Lordstown, Ohio, is the first of the company’s three announced battery plants, with the others being in Spring Hill, Tenn., and Delta Township, Mich. These plants are the first in a wave of new domestic battery cell production plants across the United States.

The Lordstown plant threatens to start a troubling trend — one in which the transition to EVs results in a dramatic erosion of working conditions in the auto industry. A stone’s throw from the Ultium Cells plant sits the old GM Lordstown Assembly plant. GM Lordstown operated for over fifty years, providing safe,

stable employment and retirement for thousands of workers. On November 26, 2018, GM announced it “unallocated,” or closed, the plant. That closure came the same year GM earned over \$10 billion in profits in North America. The plant wasn’t closed because of demand, quality, or profit, but rather GM’s decision to starve the plant of product. Earlier in the year, GM had decided to produce the next generation Chevy Blazer in Coahuila, Mexico, rather than Lordstown.

After the closure, UAW members were left with a difficult decision, to either move their families — sometimes hundreds of miles away — to work at another GM facility, retire early, or quit.¹⁴

The impact on the community was devastating, with one study estimating the plant closure removed over \$250 million dollars in labor income and nearly \$13 million in taxes from the community.¹⁵

A little over a year after announcing the closure of GM’s Lordstown plant, GM announced its joint-venture with LG,¹⁶ and in May 2020 the new battery plant broke ground in Lordstown.¹⁷ The community was excited by the prospect of GM reinvesting in the region and eventually creating over 1,500 jobs. Later in 2020, Ultium began hiring workers,¹⁸ and roughly hit its anticipated schedule of producing cells in October 2022.

Today, GM once again employs over a thousand workers in the Mahoning Valley through its Ultium Cells joint venture. But these are very different jobs than the ones that left just four years earlier. For starters, rather than earning the roughly \$32 an hour GM workers would have earned if the Lordstown plant had remained open, Ultium workers earn roughly half as much, just \$16.50 an hour. Even after seven years, production workers are currently slated to top out at \$20 an hour. Ironically, despite these abysmal wages, these jobs are far more technical than the internal-combustion

engine (ICE) jobs they replaced and are far more dangerous.

Workers were frustrated by the plant’s low pay, hazardous conditions, and lack of structure, and they immediately sought a union voice on the job. After months of organizing, they held a “card signing party” on August 17, 2022, that made it overwhelmingly clear workers wanted change. By noon, 56 percent of Ultium workers had signed authorization cards. By the end of the week, a super-majority of workers had signed.¹⁹ On October 31, after the company refused to voluntarily recognize the union, the UAW filed for an election with the National Labor Relations Board (NLRB). When the two-day election began on December 7, there were 779 eligible voters. The final vote count was 710 “Yes” to 16 “No,” a nearly unanimous endorsement of the union.²⁰

II. Ultium's Low-Road Strategy Leads to High Risks for Workers

Here are case studies of three of the many Ultium workers with direct experience of hazardous conditions in the Lordstown plant.

Sprayed with Toxic Electrolyte in the Face

"I had burns in my throat. I had some burns on my face. I had a bloody nose for a couple days."

-Gavin Currey, Production Maintenance Technician

INCIDENT: Currey was working in the Lordstown plant's de-gas area. That's where a machine extracts the toxic electrolyte that is a byproduct of battery cell production. The machine punctures the cell, extracts the gas, and seals the cell. If the extraction process fails, the machine is supposed to give a warning that electrolyte is still present in the cell. On the day of Currey's incident, the machine didn't issue a warning that the extraction process had failed on a cell. When Currey was checking a hole in the cell that should have been sealed, he was sprayed in the face with the toxic electrolyte.

DATE: May 4, 2023

WORKER STATEMENT: When I grabbed the cell, it went poof right in my face. I was wearing the correct PPE [Personal Protective Equipment], but that is just safety glasses. We really should have a PAP [Powered Air Purifying Respirator] hood for that job, but we don't.

After I was gassed, for a second, I couldn't breathe. I couldn't say anything, I couldn't tell the worker closest to me what had happened. I was groggy, dizzy. I had a hard time standing while we waited for security to arrive. The response from security was very poor. They brought a gurney, but they weren't properly trained on how to use it. They brought it at chest height, but there was no way I could climb up onto it. Then they released it and it collapsed. I had to stand there three minutes.

When they got me on the gurney, they had trouble getting it through the plant. The egress is not good. A lot of poles, beams, trash bins. They kept hitting the gurney into things. I don't know how long it took to get me out of the plant, but it was a while. If it was a life-or-death situation, that could have been the deciding factor.

I had burns in my throat. I had some burns on my face. I had a bloody nose for a couple days. The thing I worried about more than myself was that they were going to screw over the operators and never fix the machine. It wasn't effectively programmed to give a warning. And they never properly taught the operators how to work it. The way Ultium breaks down the jobs, they aren't well defined. There's not a good operating procedure. With that machine, they need more camera coverage, so you can see everything that's going on. When you're handling something that toxic, you need to see what you're getting into.

After I was injured, Ultium didn't give me paid time off (PTO) to recover. They forced me to use my own PTO. I was lucky. I was injured on my second shift out of three. So even though I was off work from the 4th until the 11th, I only had to use up three days of my PTO.

I feel better now, but I don't know what the long-term effects might be. The company hasn't told me and there's been no real follow up.

Low-Quality Protection for Quality Inspectors

“I come home every day and I’m blowing black stuff out of my nose.”

–Mandy McCoy, Quality Inspector, Ultium Cells Lordstown

INCIDENT: McCoy works in the room where battery cells undergo quality inspections. Workers estimate that the room is a bit bigger than a basketball court. McCoy was there when an engineer dropped waste from another department into an uncovered garbage can in the room. The toxic gas it emitted was so powerful that one worker nearby almost immediately started vomiting. The fumes were so intense that workers in the entire room had to evacuate.

DATE: May 18, 2023

WORKER STATEMENT, MANDY MCCOY: When it happened, I had a headache and I was nauseous. I had the option to go home, but I knew they weren’t going to pay us. I chose to stay because I like my money. But a woman who was close to the can, she couldn’t stop vomiting. They came and got her in an ambulance. Her doctor wouldn’t let her come back. She was off for two weeks without pay. Another girl who got sent home, she didn’t get paid either.

That was bad, but every day you wonder if this is okay. In quality, there’s different tests you have to do. You have to tear down the cell. You’re tearing down multiple samples every day. It makes a mess and all you’re wearing is one of those papery masks. It’s not an N95, it’s not even as good as a surgical mask. I come home every day and I’m blowing black stuff out of my nose.

You’ll ask them, what’s this stuff made of? Do you know if this is safe? Do you know what the long-term effects of this are? And they’ll say, oh, you can look in the SDS [Safety Data Sheet] book. But that doesn’t tell you about your hazard. There’s just no culture of safety.

Too Many Hazards to Stay at Ultium

“We’ve had a couple of fires inside, battery cells exploding. We had piping in a machine on the cathode side blow up.”

–Dominic Giovanonne, Former Ultium Worker

MULTIPLE INCIDENTS: Giovanonne worked on the anode side of Ultium Cells Lordstown from August 2022 to April of this year. In his area, a fuse panel had been improperly modified and presented a fire hazard. In other areas, there were fires and cells that exploded. He and his co-workers reported safety and quality concerns to management, but they weren’t addressed. Frustrated with the lack of response and concerned for his safety, Giovanonne left Ultium.

WORKER STATEMENT: In my department, we had a fuse panel that people had taken fuses out and put pieces of full-sized copper in the place of the fuse. So when it overheated, instead of it tripping, it started to smoke, and the power continued. If it would have caught fire, the sprinkler system would have kicked on. Then you’d have water flowing on to electric that has no way to break power. You’d have people

standing in a pool of water that's electrified.

We've had a couple of fires inside, batteries exploding. We had piping in a machine on the cathode side blow up. We had several incidents in there that could have been very traumatic. We'd been reporting issues to management about quality and machinery safety, but it wasn't getting fixed. If we would have had a health and safety union rep inside the shop, we could have gone to that rep, not just management. It's another line of defense to fix issues and get them resolved.

I think the general consensus of the employees there is they don't feel comfortable. They don't feel that it's safe or even producing something that is worth putting out.

Now that I'm away from it, I'm worried about everybody else. My son works there, so I'm wondering day to day what's going to happen. You know, is he going to make it home tomorrow? He's young, he's trying not to walk out on a job before he has something else that he can fall back on. He's only in his early twenties, so this is his first big job. So he has to build up skills. If there were different circumstances, I would be happy that he stayed. But the fear of something going wrong in there is a big thing on a parent.

Six UAW Members Suspended for Refusing an Unsafe Assignment

In addition to the incidents above, six UAW members from Ultium's Electrode department were suspended after they objected to an unsafe assignment. They were exercising their right to refuse dangerous work due to lack of showers or wash stations to remove NMP from their bodies, should they be exposed. They explained to the company they were willing to work, but not in that unsafe area. A shower has now been installed in the Electrode department, but they have not been allowed to return to work.

Health & Safety Incidents at Ultium Cells Lordstown

- May 17, 2022 – OSHA investigation results in initial citation of two serious violations, and one other violation.²¹
- July 5, 2022 – OSHA investigation leads to two citations: one for improper exit routes; the other for failing to maintain required safety data sheets in the workplace. OSHA later deleted the citations and dropped \$14,500 in fines after an informal settlement.²²
- July 9, 2022 – WKBN reported the hospitalization of an employee of a contractor at the facility due to an injury that occurred the day before. The worker was caught between a moving cart and a fixed column during the machine commission process.²³
- July 25, 2022 – WFMJ reported several incidents of concern at the facility including a 19-year-old transported to the hospital after receiving an electrical shock and another worker transported to a hospital with complaints related to possible chemical exposure.²⁴ Resulted in an OSHA investigation on July 26, 2022.²⁵
- August 18, 2022 – Ultium and various construction companies are cited for hazard communication violations.
- August 22, 2022 - OSHA conducting air monitoring at Ultium Cells plant after evacuation.²⁶

OSHA 300 Injury and Illness Log

An examination of the OSHA 300 log at the Lordstown facility for the first five months of 2023 reveals something quite shocking. In that short period of time, twenty-two people suffered OSHA recordable injuries or illnesses, more than four per month. This does not count injuries and illnesses that did not reach the reporting threshold. In addition, under-reporting of OSHA-recordable injuries and illnesses is common.²⁷ Hence, it is quite possible that there were more than twenty-two injuries and illnesses that should have been recorded. Equally striking is that 200 days of work were missed due to OSHA-recordable injuries and illnesses. That is 40 days each month. Moreover, employees spent 318 days on work restrictions or transferred to another job due to injury or illness — more than 60 days per month.

III: The Chemical Hazards in an EV Battery Cell Plant

An EV battery is a dense collection of lithium-ion electrochemical cells. The Lordstown facility manufactures cells that are assembled into batteries elsewhere. Each cell consists of a positive cathode, a negative anode; and a liquid solution in the middle, called an electrolyte.²⁸ Chemicals in the cathode, anode and the electrolyte can be extremely hazardous.

In manufacturing the cathode, the company uses a chemical called N-Methylpyrrolidone, or NMP. According to the facility's Safety Data Sheet (SDS), NMP may damage unborn children. Acute exposure may cause respiratory tract irritation, coughing, eye irritation, skin irritation, red skin rashes, nausea, headache, vomiting, dizziness, diarrhea, and/or abdominal cramps.²⁹

In manufacturing the anode, the company uses a product called Lucan

BT1003M, more than 95 percent of which consists of carbon nanotubes (CNT). The Safety Data Sheet indicates that the remainder of the product consists of impurities. According to the SDS, the product can cause germ cell mutations and cancer.³⁰ Unfortunately, the SDS, which is prepared by LG, the product manufacturer and one of Ultium's parent companies, fails to mention that the National Institute for Occupational Safety and Health (NIOSH) has a recommended exposure limit for Carbon Nanotubes of 1 $\mu\text{g}/\text{m}^3$, an infinitesimally small amount.³¹

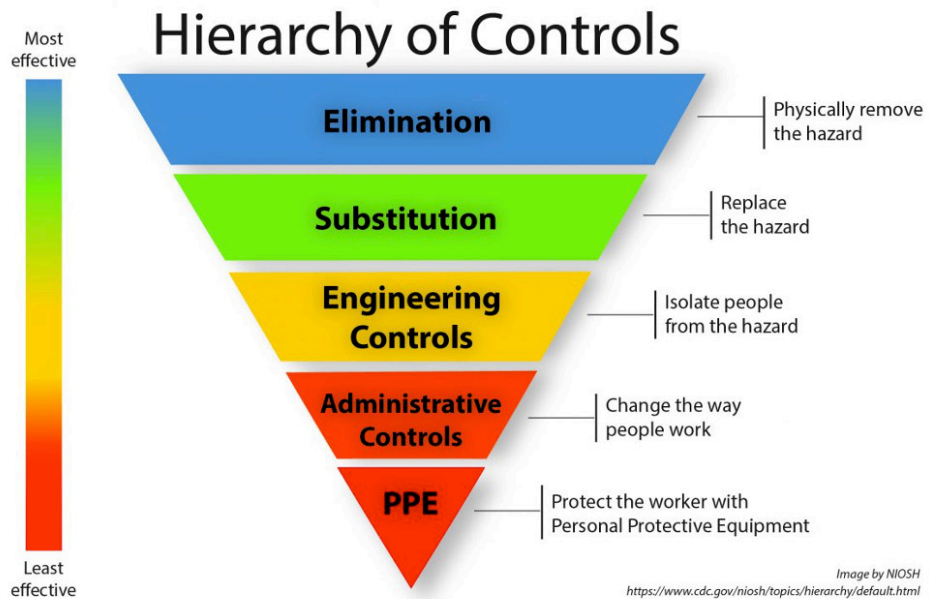
The SDS³² for the electrolyte indicates no name in English other than "Electrolytes for Lithium-ion Battery." The SDS identifies four ingredients by name: Ethylene carbonate (EC), Ethyl methyl carbonate (EMC), Lithium hexafluorophosphate (LiPF_6), and 1,3-Propanesultone (PS). In addition, it refers to one ingredient simply as "Additive" and reports that the "Additive" is 0 to 10 percent of the product. No chemical abstract (CAS) number is reported for the "Additive," making it impossible independently to verify its hazards or lack thereof. According to the SDS, the electrolyte is flammable and must be kept away from flames, sparks and heat. It causes severe skin burns and serious eye damage, may cause nausea, vomiting, diarrhea, may cause respiratory irritation, may cause an allergic skin reaction, and can damage kidneys through prolonged or repeated exposure. The severe skin burns, serious eye damage and respiratory irritation are due to the fact that LiPF_6 reacts with water, including the moisture on human skin and eyes and in the human respiratory tract, to release hydrofluoric acid,

phosphoric acid and lithium fluoride.³³

In addition, the SDS informs the reader that "This substance is regulated under a TSCA Section 5(e) Consent Order" but provides no information about the content of that order. The order was negotiated behind closed doors between Ultium and the EPA. There was no worker or union involvement in establishing exposure limits for the electrolyte. Increasingly, chemicals to which workers are exposed in the EV supply chain are going to be regulated by the New Chemicals Program under the Toxic Substances Control Act (TSCA). The procedure for establishing these rules must be changed. New chemical regulation under TSCA must be done on a transparent basis with full participation of workers and their representatives. The same rules must cover all employers and all workers.

Hierarchy of Controls

The hazardous chemicals in the Ultium Cells Lordstown facility should be managed using the hierarchy of controls (see chart below³⁴), which prioritizes eliminating the use of the most hazardous materials and/or substituting safer materials to the extent feasible. When those options have



been exhausted, engineering controls should be used to achieve maximum feasible exposure reductions. After that, additional risk should be reduced with administrative and work practice controls. Finally, personal protective equipment should be used as a last resort.

IV. The UAW-GM Contract Offers Model Solutions to Ultium's Safety Problems

The UAW-GM National Agreement has a number of provisions for dealing with chemical hazards like those described above. It provides for a hazardous material control committee that has the authority to prevent chemicals from coming into the workplace and, where certain hazardous materials are necessary for production, to plan for their use as safely as possible before they enter the workplace. The contract commits the company to control chemical exposures to the levels specified in Threshold Limit Values (TLVs®) published by the American Conference of Governmental Industrial Hygienists (ACGIH®). These levels are considerably more protective than OSHA. The contract provides for regular air sampling and participation by the union in conducting that air sampling. It provides for the development of safe-use instructions for chemicals, which are easier to read and follow than the information in safety data sheets. It provides for the review and maintenance of process exhaust ventilation. In the case of the six members who were suspended, the contract provides a procedure for refusing dangerous work that would get the union and management involved in addressing the underlying issue long before anyone received a suspension.

What happened to Gavin Currey, as described in Section II, is an example

of a flawed lockout procedure. In a safe facility, machines are locked out before a worker gets in harm's way to fix a problem. The machine failed to warn Currey that there was a hazard in the form of an improperly sealed cell. He could not have known that he needed to lock it out. Even though there was a malfunction in the machine that produced the defective cell that injured Currey, it was not properly locked out. The UAW-GM National Agreement has language that addresses lockout and hazardous energy control. The language says "Where an employee is exposed to potential injury from expected machine energy/motion, the exposure must be eliminated. If the exposure cannot be eliminated, the machine will be locked out. Each location will maintain an effective Lockout-Energy Control program which will apply to all employees."

In other instances as well, Ultium workers have expressed frustration with poorly placarded machines and inadequately described lockout procedures. Failure of safety devices and/or programmable logic circuits has been a problem as well.

The health and safety language in the UAW-General Motors national agreement originated in 1973 when the union and the company first added a Memorandum of Understanding on Health and Safety. The current language of the memorandum states that it "has provided an excellent framework for the joint efforts in health and safety within General Motors. Since [1973], many potential hazards have been reduced or eliminated. The Local Joint Health and Safety Committees (LJHSCs) and Plant and Divisional Review Boards, provided for in the Memorandum of Understanding, are effective at resolving most health and safety concerns within plants."

The agreement provides for participation

in health and safety by workers or their representatives at all levels of the company from the shop floor to the national level. The UAW-GM contract assigns responsibility for dealing with issues at progressively higher levels. It provides for appropriate health and safety training that allows all participants to serve in their roles with maximum effectiveness. The language provides a process for identifying and reporting hazards, including a complaint procedure that allows workers to bring issues to their union representatives, who can call them to the attention of the company. The language calls for regular safety observation tours by plant personnel from the union and management. It provides for audits by trained union and management representatives under the direction of a National Joint Committee for Health and Safety, whose members are appointed by union and management in equal numbers. The agreement provides for specific procedures to make sure that hazards are not neglected once they have been identified. Under the agreement, measures taken to address hazards are jointly devised by worker and management representatives. All of this helps to ensure that solutions maximize both safety and the efficient and profitable operation of the company. It produces a sense of ownership and mutual respect.

In addition to procedures for managing workplace health and safety, the national agreement includes language to address specific hazards. This language provides for greater protection than that provided by agencies such as OSHA. Among the hazards addressed are chemical hazards, noise, ergonomic hazards, hazardous energy (controlled by locking out power), amputation

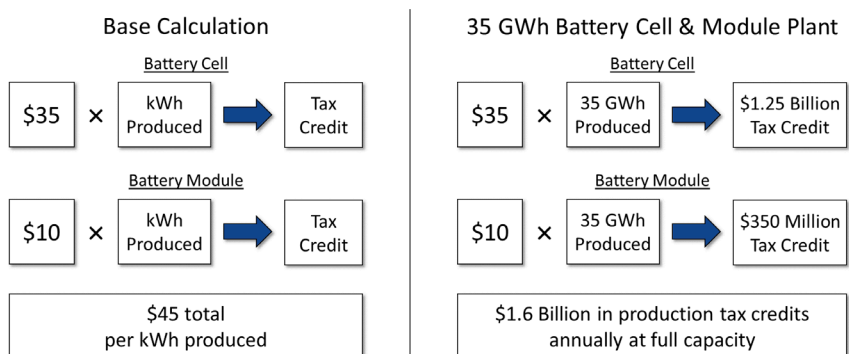
hazards, and working alone. Moreover, the agreement includes procedures for joint participation in the design of new equipment and technologies to eliminate hazards before introduction into the workplace. It provides for procedures to ensure that planned, predictive, and preventative maintenance happens as needed.

The UAW-GM National Agreement is a highly successful model for protecting safety in the workplace. The UAW-Ford and UAW-Stellantis agreements are similar. Ultium and other joint ventures should apply the standards in these models.

V. Tallying EV Taxpayer Subsidies & How We Can Spend Them Wisely

Since the passage of the Inflation Reduction Act (IRA) in 2022, announced battery factories in the United States have increased by nearly 60 percent.³⁵ Perhaps the most important subsidy is the IRA's 45X Advanced Manufacturing Production Tax Credit (PTC), which is projected to generate billions in tax credits each year for automakers and their battery partners. The 45X PTC provides tax credits of \$35/kwh for battery cells and \$10/kwh for battery modules produced domestically. For an average EV with around 100 kwh in battery capacity, this results in \$4,500 in battery production tax credits per vehicle.³⁶

Value of 45X Tax Credits



When applied to large scale battery manufacturing, the 45X PTC will result in billions in tax credits per year for manufacturers. With tax credits of \$35 per kwh, the 45X PTC can generate \$35 million in tax credits per GWH of battery production. Based on industry investment announcements, a typical major EV battery plant will ramp up to capacity of 30 GWH in annual battery production. A battery cell plant like Ultium Cells Lordstown, which will have over 35 GWH in annual capacity, could generate \$1.25 billion in tax credits for cell production in a single year.³⁷

Analysts have estimated that the 45X PTC could provide between \$150 billion and \$200 billion in tax credits for the industry, depending on the scale of EV demand and its ability to ramp up battery production.³⁹

For each major automaker, the subsidy will be substantial. For example, when describing the impacts of the IRA to investors, Ford CEO Jim Farley said, “The first opportunity is our largest, the battery production tax credit of about \$45 per kilowatt hour. From ’23 to ’26, we estimate a combined available tax credit for Ford and our battery partners could total more than \$7 billion with large step-up in annual credits in ’27 as our JV battery plants ramp up to full production.”⁴⁰ And Tesla’s CFO Zach Kirkhorn told investors the company expected the credits to be worth “\$150 million to \$250 million per quarter” this year.⁴¹

VI. CONCLUSION: A Just Transition to EVs

In a just transition to EVs, jobs in the battery plants that will power this transition must be as good or better than current jobs building ICE vehicles and components. Unfortunately, there are troubling signs regarding the transition’s impact on workers. Not only

are hourly wages in EV battery plants much less than in existing powertrain facilities, there are significant concerns that their health and safety practices fall far short of the unionized auto industry’s standards.⁴²

Fortunately, addressing job quality and health & safety concerns in the emerging EV industry does not require reinventing the wheel. Through decades of collective bargaining, the unionized auto industry has a well-established set of robust health and safety programs that protect workers from hazards and provide for worker participation. These programs have been enshrined in collective bargaining agreements.

Automakers and their battery partners have a responsibility to apply the same industry-leading health and safety programs to their battery operations that they use in unionized automotive plants. By adopting the standards in line with those in the UAW’s Big Three Master Agreements throughout the electric vehicle supply chain, we have the opportunity to set a high bar for this new auto powertrain. Most, if not all, of the health and safety concerns found at Ultium’s Lordstown plant could be avoided by applying UAW-negotiated Big Three industry standards.

There will be tens of thousands of workers in battery plants in the near future. Establishing best practices at these plants now will set a high bar throughout the industry. Workers across the supply chain, from mining and mineral processing through final assembly of EVs, will be dealing with many hazards similar to those faced by workers at Ultium in Lordstown. Ramping up EV production to reduce climate impacts must not result in spreading dangerous manufacturing practices to communities across the country. All EV workers deserve robust protections and a voice in making their jobs safer.

REFERENCES

- ¹ The White House, June 2021. “Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth,” p. 120: <https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf> (Accessed 7/4/2023)
- ² Reuters, October 21, 2022. “A Reuters analysis of 37 global automakers found that they plan to invest nearly \$1.2 trillion in electric vehicles and batteries through 2030”: <https://www.reuters.com/graphics/AUTOS-INVESTMENT/ELECTRIC/akpeggzqypr/> (Accessed 6/4/2023)
- ³ Benchmark Minerals. June 6, 2023. “What will be the eventual cost of the US Inflation Reduction Act?”: https://source.benchmarkminerals.com/article/opinion-what-will-be-the-eventual-cost-of-the-us-inflation-reduction-act?mc_cid=63f6a0687c&mc_eid=1013d4317b (Accessed 7/4/2023); Automotive News. June 9, 2023. “Why Section 45X is a ‘game changer’ for U.S. EV battery supply chain”: <https://www.autonews.com/manufacturing/inflation-reduction-act-may-bring-billions-us-battery-makers> (Accessed 7/4/2023)
- ⁴ UAW Research Department, Analysis of tax credit valuation based on Ultium’s estimate of eventual capacity at Lordstown. Ultium Cells, “Our Locations: Warren, Ohio”: <https://www.ultiumcell.com/our-locations/warren-oh> (Accessed 7/4/2023); Benchmark Minerals, June 6, 2023. “What will be the eventual cost of the US Inflation Reduction Act?”: https://source.benchmarkminerals.com/article/opinion-what-will-be-the-eventual-cost-of-the-us-inflation-reduction-act?mc_cid=63f6a0687c&mc_eid=1013d4317b (Accessed 7/4/2023); Automotive News. June 9, 2023, “Why Section 45X is a ‘game changer’ for U.S. EV battery supply chain”: <https://www.autonews.com/manufacturing/inflation-reduction-act-may-bring-billions-us-battery-makers> (Accessed 7/4/2023)
- ⁵ MIT Technology Review, February 17, 2023. “How does an EV battery actually work? Are lithium batteries sustainable enough to fulfill the dream of the electric-car revolution?”: <https://www.technologyreview.com/2023/02/17/1068037/how-do-ev-batteries-work/> (Accessed 6/4/2023).
- ⁶ BASF (2021). Safety Data Sheet for NMP BG - Battery Grade.
- ⁷ LG Chem, Ltd (2019). Safety Data Sheet for Lucan BT1003M.
- ⁸ Benchmark Minerals. June 6, 2023. “What will be the eventual cost of the US Inflation Reduction Act?”: https://source.benchmarkminerals.com/article/opinion-what-will-be-the-eventual-cost-of-the-us-inflation-reduction-act?mc_cid=63f6a0687c&mc_eid=1013d4317b (Accessed 7/4/2023); Automotive News. June 9, 2023. “Why Section 45X is a ‘game changer’ for U.S. EV battery supply chain”: <https://www.autonews.com/manufacturing/inflation-reduction-act-may-bring-billions-us-battery-makers> (Accessed 7/4/2023)
- ⁹ The White House, June 2021. “Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth,” p. 120: <https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf> (Accessed 7/4/2023)
- ¹⁰ Wards Intelligence. “U.S. Light Vehicle Sales.” <https://wardsintelligence.informa.com/datacenter> (Accessed 6/4/2023).
- ¹¹ Graph made by UAW Research Department with data from Wards Intelligence. “U.S. Light Vehicle Sales”: <https://wardsintelligence.informa.com/datacenter> (Accessed 7/4/2023)

¹² UAW Research Department, Analysis of corporate and press announcements of new EV manufacturing facilities.

¹³ Ibid.

¹⁴ WKBN-TV, March 9, 2021. “ ‘Umbrella of stress’ on GM staff 2 years after Lordstown plant closed”: <https://www.wkbn.com/news/local-news/umbrella-of-stress-on-gm-staff-2-years-after-lordstown-plant-closed/> (Accessed 7/4/23)

¹⁵ CSU Levin College of Public Affairs and Education, “Lordstown GM Plant Closure Economic Impact Study”: https://engagedscholarship.csuohio.edu/cgi/viewcontent.cgi?article=2594&context=urban_facpub (Accessed 7/4/23)

¹⁶ Team NEO, Undated, “Spotlight - Success Story, Ultium Cells”: <https://northeastohioregion.com/company-spotlight/ultium-cells-llc/#:~:text=In%20December%202019%2C%20GM%20and,%2C%20Ohio%2C%20creating%201%2C000%20jobs.> (Accessed 7/24/23)

¹⁷ General Motors, August 2020, “Construction of Ultium Cells LLC Battery Plant in Lordstown, Ohio Progressing on Schedule”: <https://news.gm.com/newsroom.detail.html/Pages/news/us/en/2020/jul/0729-ultium-cells.html> (Accessed 7/4/23)

¹⁸ The Business Journal, MidNovember 2020, “GM Begins Hiring Process at Ultium Cells LLC in Lordstown. Youngstown: Youngstown Publishing Company”: <https://businessjournaldaily.com/article/gm-begins-hiring-process-at-ultium-cells-llc-in-lordstown/> (Accessed 7/4/2023)

¹⁹ Personal communication: email from UAW organizer Zenia Wilson (5/30/2023).

²⁰ International Union, UAW, December 9, 2022, UAW Statement on Ultium Organizing Victory: <https://uaw.org/uaw-statement-ultium-organizing-victory/> (Accessed 6/4/2023).

²¹ OSHA: https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1596122.015 (Accessed 7/4/23)

²² OSHA: https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1605547.015 (Accessed 7//4/23)

²³ WKBN.com, July 9, 2022, “Worker hospitalized after injury at Ultium Cells in Lordstown”: <https://www.wkbn.com/news/local-news/worker-hospitalized-after-injury-at-ultium-cells-in-lordstown/> (Accessed 7/4/2023).

²⁴ WFMJ.com, July 25, 2022. “OSHA aware of incidents and workplace accident at Ultium Cells”: <https://www.wfmj.com/story/46954866/osha-aware-of-incidents-and-workplace-accident-at-ultium-cells> (Accessed 7/4/2023).

²⁵ OSHA: https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1610250.015 (Accessed 7/4/23)

²⁶ WFMJ.com, August 17, 2022, “OSHA conducting air monitoring at Ultium Cells plant after evacuation Tuesday”: <https://web.archive.org/web/20220818222411/https://www.wfmj.com/story/47108965/osha-conducting-air-monitoring-at-ultium-cells-plant-after-evacuation-tuesday> (Accessed 7/4/23)

²⁷ Journal of Safety Research, Fagan, K. M., & Hodgson, M. J., 2017, 60, 79-83. “Under-recording of work-related injuries and illnesses: An OSHA priority.”

²⁸ MIT Technology Review, Sisson P., February 17, 2023. “How does an EV battery actually work? Are lithium batteries sustainable enough to fulfill the dream of the electric-car revolution?” . <https://www.technologyreview.com/2023/02/17/1068037/how-do-ev-batteries-work/> (Accessed 6/4/2023).

- ²⁹ BASF (2021). Safety Data Sheet for NMP BG - Battery Grade.
- ³⁰ LG Chem, Ltd (2019). Safety Data Sheet for Lucan BT1003M.
- ³¹ US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH, 2013). Current Intelligence Bulletin 65: Occupational Exposure to Carbon Nanotubes and Nanofibers. DHHS (NIOSH) Publication No. 2013-145. <https://www.cdc.gov/niosh/docs/2013-145/pdfs/2013-145.pdf?id=10.26616/NIOSH PUB2013145> (Accessed 6/5/2023)
- ³² Huizhou Capchem Chemicals Co., Ltd. (2022). Safety Data Sheet for Electrolytes for Lithium-ion Battery. (WI-14-30-3327) Product Code: E1A 4 3 C.
- ³³ European Chemical Agency (ECHA): <https://echa.europa.eu/registration-dossier/-/registered-dossier/13201/5/2/3#:~:text=Description%20of%20key%20information,and%20degradation%20report%2C%202011> (Accessed 7/4/2023)
- ³⁴ NIOSH: <https://www.cdc.gov/niosh/topics/hierarchy/default.htm> (Accessed 6/5/2023)
- ³⁵ UAW Research Department, Analysis of corporate and press announcements of new EV manufacturing facilities.
- ³⁶ UAW Research Department, Analysis of tax credit valuation; Benchmark Minerals. June 6, 2023. “What will be the eventual cost of the US Inflation Reduction Act?”: https://source.benchmarkminerals.com/article/opinion-what-will-be-the-eventual-cost-of-the-us-inflation-reduction-act?mc_cid=63f6a0687c&mc_eid=1013d4317b (Accessed 7/4/2023); Automotive News. June 9, 2023. “Why Section 45X is a ‘game changer’ for U.S. EV battery supply chain”: <https://www.autonews.com/manufacturing/inflation-reduction-act-may-bring-billions-us-battery-makers> (Accessed 7/4/2023)
- ³⁷ UAW Research Department, Analysis of tax credit valuation based on Ultium’s estimate of eventual capacity at Lordstown. Ultium Cells, “Our Locations: Warren, Ohio”: <https://www.ultiumcell.com/our-locations/warren-oh> (Accessed 7/4/2023)
- ³⁸ Ibid.
- ³⁹ Benchmark Minerals. June 6, 2023. “What will be the eventual cost of the US Inflation Reduction Act?”: https://source.benchmarkminerals.com/article/opinion-what-will-be-the-eventual-cost-of-the-us-inflation-reduction-act?mc_cid=63f6a0687c&mc_eid=1013d4317b (Accessed 7/4/2023); Automotive News. June 9, 2023. “Why Section 45X is a ‘game changer’ for U.S. EV battery supply chain”: <https://www.autonews.com/manufacturing/inflation-reduction-act-may-bring-billions-us-battery-makers> (Accessed 7/4/2023)
- ⁴⁰ Ford Motor Company. October 26, 2022. “Third Quarter 2022 Earnings Conference Call,” p. 4: https://s201.q4cdn.com/693218008/files/doc_financials/2022/q3/Ford-Q3-2022-Earnings-Call-Transcript.pdf (Accessed 7/4/2023)
- ⁴¹ The Motley Fool. January 25, 2023. “Tesla (TSLA) Q4 2022 Earnings Call Transcript”: <https://www.fool.com/earnings/call-transcripts/2023/01/26/tesla-tsla-q4-2022-earnings-call-transcript/> (Accessed 7/4/2023)
- ⁴² The White House, June 2021. “Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth,” p. 120: <https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf> (Accessed 7/4/2023)



opeiu494/afl-cio