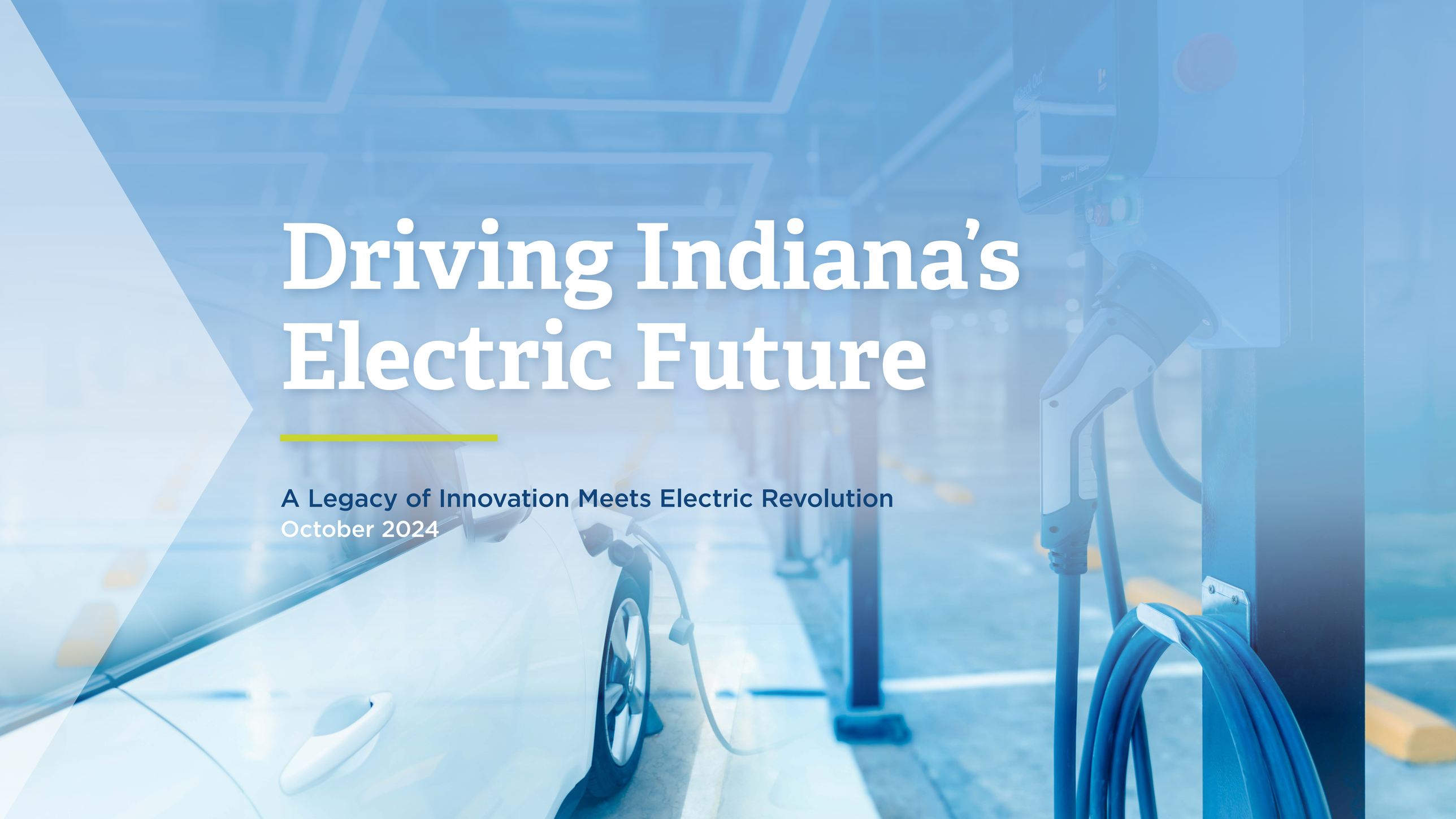


Driving Indiana's Electric Future

A Legacy of Innovation Meets Electric Revolution

October 2024

Chairman's Message

As we continue through the evolution into a new era in transportation, I am encouraged by the progress Indiana has made in positioning itself at the forefront of the electric vehicle (EV) revolution. The work of our Electric Vehicle Product Commission over the past three years has been instrumental in shaping Indiana's trajectory in this rapidly evolving industry.

Since our inception a few years back, we have witnessed the continuing shifting of the transportation manufacturing landscape. What began as a forward-looking initiative has now become a present reality, with Indiana emerging as a pivotal player in the national EV ecosystem. The numbers speak volumes: $12.9 billion in new EV-related investments, over 6,000 new jobs created, and a growing network of 201 EV-related companies across our state.

This year, we mark the journey with significant milestones. The completion of Phase 1 of a major battery manufacturing facility in Kokomo, the finalization of the business agreement and timeline for an opening of a battery plant in New Carlisle, and the continued progress of a battery component facility in Terre Haute. These are all multi-billion-dollar projects that are coming to life before our very eyes, transforming these communities into hubs of activity and immediately attracting additional investment. Traditional automotive strongholds like Columbus are reinventing themselves, with companies like Cummins leading the charge in EV technology development.

However, there is more work to be done – 2024 is merely the beginning. Bridging the skills gap, enhancing our supply chain resilience, and fostering a culture of continuous innovation and improvement are paramount. We must also ensure that the state's "infrastructure" keeps pace with the growth of the EV industry. And when I say "infrastructure", I refer to not only the power, roads and water supplies for the facilities, but other support for like housing and food for the thousands of constructions and permanent workers that are coming into these communities. As you can read in the case studies in this year's report, there is much to be learned from communities and the companies who are at the forefront of this transition.

The Commission's role in this transition cannot be overstated. We have been, and must continue to be, the connective tissue that brings together industry, academia, government, and community stakeholders. Our focus on first taking inventory, then shifting to workforce development, attracting investments, and promoting collaboration has laid a solid foundation. Now, we must build upon this, emphasizing the development of local supply chains, fostering innovation hubs, encouraging inter-city and inter-region knowledge collaboration, and ensuring that federal support is effectively leveraged to accelerate our progress.

The road ahead is electric, and Indiana is in the driver's seat. Let's continue to work together to ensure that our state remains at the forefront of this revolution, creating a sustainable, prosperous future for generations to come.

One final note - this year we also celebrate the addition of two new Commission members, Les Alexander from the Battery Innovation Center, and State Senator Stacy Donato. I look forward to working with them in the coming years to ensure the Commission's work continues seamlessly.

Members of the EV Product Commission:

Mike Maten, GM (Chairman)

Les Alexander, CEO of Battery Innovation Center (BIC)*

David Dukes, Stellantis

Danny Ernstes, UAW

Craig Kelle, Toyota

Paul Mitchell, Energy Systems Network

Rep. Mike Karickhoff, State Representative

Rep. Carey Hamilton, State Representative

Sen. J.D. Ford, State Senator

Sen. Stacey Donato, State Senator

Table of Contents

Driving Indiana's Electric Future

Driving Indiana's Electric Future

Indiana stands at the crossroads of a revolutionary transformation in the automotive industry. As the world shifts gears toward electric vehicles (EVs), the Hoosier State is poised to become the Crossroads of Electrified America.

A Legacy of Innovation Meets Electric Revolution

For generations, Indiana has been the beating heart of automotive innovation in America. Our state's rich history in auto manufacturing isn't just a point of pride—it's the foundation for our electrified future. In 2024, this legacy is supercharged with groundbreaking investments and developments that are set to reshape our industrial landscape.

2024: A Year of Electrifying Milestones

The year 2024 marks an inflection point for Indiana's EV industry, with several major developments solidifying our state's position as a leader in electric vehicle and component manufacturing. In Kokomo, the completion of the first StarPlus Energy battery facility, a joint venture between Stellantis and Samsung SDI, sets the stage for full-scale production to begin in 2025. This milestone is complemented by Stellantis' drive unit investment start-up in the same city, enhancing Indiana's capabilities in EV powertrain manufacturing. Meanwhile, in New Carlisle, the finalization of the General Motors and Samsung SDI joint venture EV battery project represents a significant boost to our state's EV battery production capacity. Adding to this momentum, ENTEK's announced investment to make separators in Terre Haute is expected to create 640 jobs by 2027, further strengthening Indiana's position in the EV supply chain. Beyond EV-specific developments, the state's technological prowess is bolstered n SK Hynix $3.8 billion investment in an advanced semiconductor packaging production facility located to be located in Lafayette and R&D partnership with Purdue University. This investment in microchip manufacturing is crucial for supporting the growing EV industry, as semiconductors are essential components in modern electric vehicles.

"Indiana has always been at the forefront of innovation and development in the auto manufacturing industry. We continue this journey by growing and attracting companies investing in cutting-edge EV technologies, including batteries and semiconductors."

- Paul J. Mitchell
  President & CEO
  Energy Systems Network

The EV Revolution: By the Numbers

The EV industry is accelerating at an unprecedented pace:[1]

37.49 Million — Total vehicles on the road in the U.S. 2020-2023

7% — Proportion of EVs in total light duty U.S. production

155% — Growth in EV production 2020-2023

2.28 Million — Projected EV production in the U.S. by 2028

[1] https://wardsintelligence.informa.com/

Indiana's Electric Opportunity

The Electric Vehicle Product Commission's current report highlights the significant acceleration of EV production and investment throughout Indiana. While the first two reports in 2022 and 2023 established a comprehensive baseline for understanding the EV industry landscape, this current report showcases the tangible progress being made across the state. Hoosiers are now actively engaged in daily production of critical EV components, including battery cells, various EV-specific parts, and materials. Major investments and facility expansions by both established automotive manufacturers and new entrants underscore Indiana's growing role in the EV supply chain. This report not only updates the inventory of EV facilities and workforce but also emphasizes the real-world impact of these advancements, demonstrating how Indiana is rapidly transitioning from planning to active participation in the burgeoning EV industry.

The Electric Vehicle Product Commission is now charging forward with a clear mission: to Indiana is as the leader in the EV industry. Building on the 2022 and 2023 reports, we're now focusing on:

1. Benchmarking against neighboring Midwest states
2. Analyzing the EV Battery (EVB) Ecosystem
3. Conducting an EV Workforce Analysis
4. Evaluating Funding Opportunities
5. Studying EV Manufacturing Case Studies

As we navigate this electric transition, Indiana is uniquely positioned to leverage its automotive heritage, skilled workforce, and innovative spirit to power the future of transportation.

Join us as we explore how Indiana can lead the charge in the electric vehicle revolution, creating new opportunities for growth, employment, and technological advancement in our state.

Benchmarking Indiana's EV Potential

Benchmarking Indiana's EV Potential

The electric vehicle industry is experiencing a period of unprecedented growth and transformation. Between 2020 and 2023, U.S. automotive manufacturers produced a staggering 37.5 million vehicles, with electric vehicles carving out an increasingly significant share of this total. While EVs currently represent 7% of overall U.S. vehicle production, this figure belies the sector's explosive growth. In just three years, EV production has surged by an impressive 155%, outpacing the growth of traditional vehicle manufacturing and signaling a seismic shift in the automotive landscape. This remarkable trajectory is set to continue, with projections indicating that U.S. EV production will reach 2.3 million vehicles by 2028. These numbers tell a compelling story of an industry in the midst of a revolution, with electric vehicles rapidly moving from the margins to the mainstream of American auto manufacturing. As we look to the future, it's clear that the EV sector is not just growing – it's accelerating, reshaping the automotive industry, and creating new opportunities for innovation, employment, and sustainable transportation.[2]

The Midwest: America's EV Powerhouse

The Midwest region, long revered as the heartland of American automotive manufacturing, is poised to reinvent itself as the epicenter of the electric vehicle (EV) revolution. This transformation is not just a shift in production methods; it's a renaissance that promises to rejuvenate the region's economy and cement its place at the forefront of automotive innovation for decades to come.

The foundation for this EV revolution is built on the Midwest's rich automotive heritage. An impressive 50% of U.S. auto assembly plants are located in the Midwest, a testament to the region's deep-rooted expertise in vehicle manufacturing. This existing infrastructure provides a crucial advantage as the industry pivots towards electric vehicles. These plants, with their skilled workforce and established supply chains, are primed for conversion to EV production, offering a smoother transition than building entirely new facilities from the ground up.

Already, the Midwest is making significant strides in EV manufacturing. Forty percent of EV-producing plants in the United States are located in our region. This statistic is particularly noteworthy given that the EV industry is still in its nascent stages. It demonstrates the Midwest's agility and foresight in adapting to new technologies and market demands. States like Michigan, Ohio, and Indiana are leading this charge, with major automakers and new EV startups alike choosing to establish their electric vehicle production lines in these traditional automotive strongholds.

The future looks even brighter for the Midwest's EV industry. A staggering 90% of new EV investments and jobs are expected to be concentrated in the traditional U.S. automotive belt. This projection underscores the region's competitive advantage in attracting EV-related investments. Factors contributing to this include the existing skilled workforce, robust supplier networks, supportive state policies, and the region's central location for distribution across North America.

The passage of the Inflation Reduction Act (IRA) in 2022 has served as a catalyst for this burgeoning industry. As noted by S&P Global, "Post the passage of the Inflation Reduction Act (IRA) in 2022, many U.S. electric vehicle and battery companies have announced investments of about $80 billion, expected to create around 75,000 jobs." This influx of capital and job creation is transforming the economic landscape of many Midwestern communities.

These investments are not just in vehicle assembly, but span the entire EV supply chain. We're seeing significant investments in battery production facilities, electric motor manufacturing, and charging infrastructure. For instance, GM and LG Energy Solution's joint venture, Ultium Cells, is investing billions in battery cell manufacturing facilities across the Midwest, including plants in Ohio and Michigan.

Moreover, this EV boom is attracting new players to the region. Startups like Rivian in Illinois are setting up shop alongside traditional automakers, creating a diverse and dynamic EV ecosystem. This mixture of established companies and innovative startups is fostering a culture of collaboration and competition that will drive further advancements in EV technology.

[2] https://wardsintelligence.informa.com/

The Midwest's emergence as America's EV powerhouse is not just an economic boon; it's a revival of the region's identity as the heart of American automotive innovation. As we progress further into the electric age, the Midwest is well-positioned to lead the charge, turning the rust belt into the volt belt and powering America's sustainable transportation future.

Indiana's Place in the EV Landscape

While California currently leads in EV production, thanks largely to Tesla, the Midwest is rapidly gaining ground. Here's where Indiana stands:

5% of total U.S. auto manufacturing establishments

11% of total U.S. auto manufacturing jobs

588 auto manufacturing establishments

117,882 employees in the auto manufacturing sector

The Labor Landscape

Understanding the workforce is crucial for EV industry growth. Here's how Indiana compares against its neighbors:

State	Worker Shortage Index	Job Openings	Unemployed Workers	Labor Force Participation Rate	Unemployment Rate	Quit Rate	Hire Rate
Indiana	0.97	140,000	136,000	63.5%	4.0%	2.6%	3.5%
Illinois	1.0	342,000	342,000	64.4%	5.2%	1.8%	3.7%
Kentucky	0.65	147,000	96,000	57.6%	4.7%	2.9%	3.5%
Michigan	1.14	193,000	221,000	61.3%	4.4%	2.1%	3.0%
Ohio	1.01	260,000	264,000	62.1%	4.5%	2.4%	3.7%

Table 2.1: U.S. Labor Shortage Statistics
Source: BLS June 2024

Key Insights

Workforce Availability: With 97 workers available per 100 job openings, Indiana has the second-lowest worker shortage among benchmarked Midwest states.

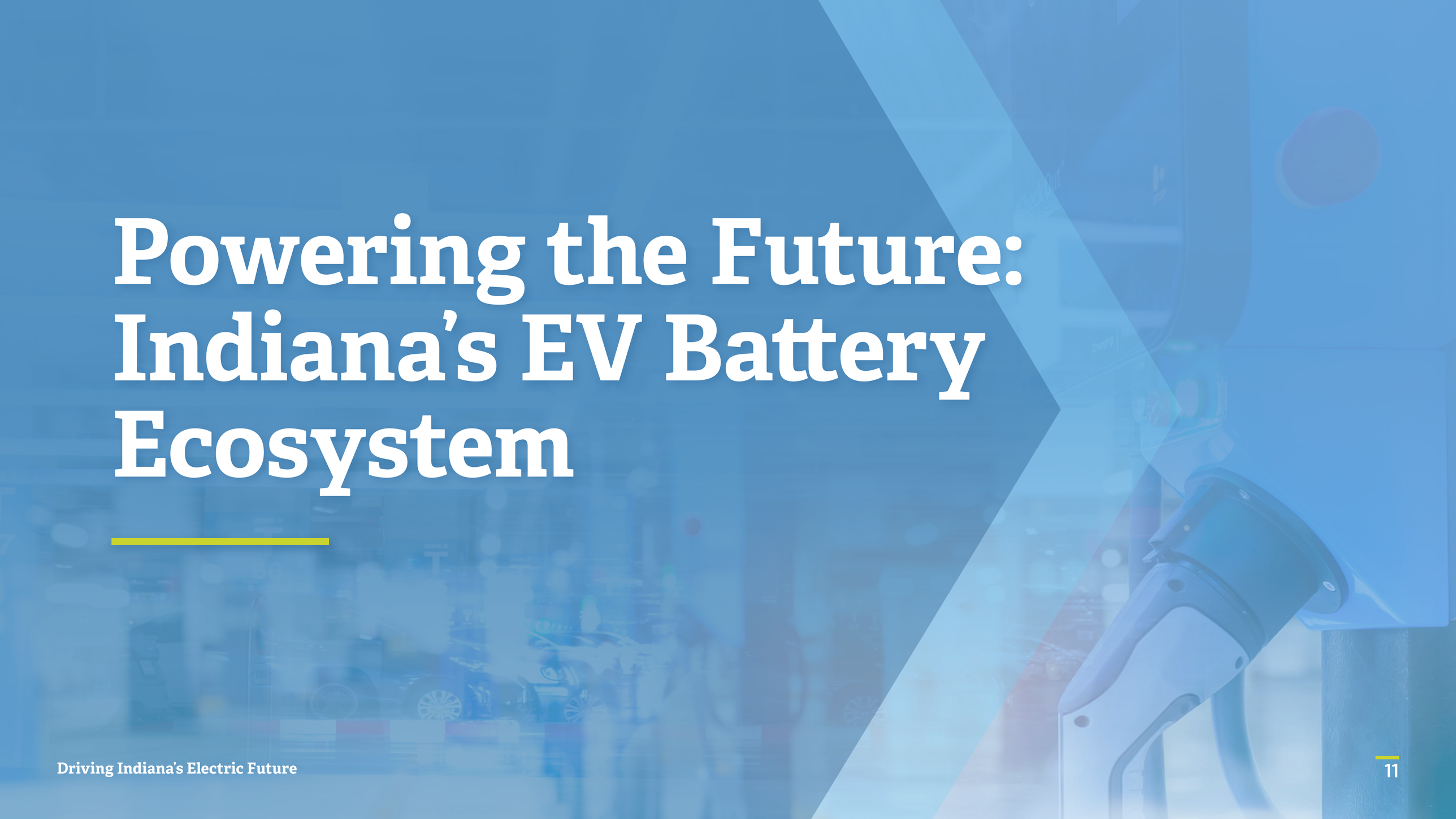
Dynamic Job Market: Indiana boasts a higher hire rate and the second-highest quit rate in the Midwest, indicating a dynamic and mobile workforce.

Growth Opportunity: Indiana already has a strong presence in EV manufacturing, with several operational plants producing electric vehicles and components. The state's robust automotive manufacturing base has successfully pivoted to include EV production, demonstrating Indiana's adaptability and commitment to leading in the evolving automotive industry. Moreover, the recently announced investments are set to significantly expand Indiana's EV manufacturing capabilities, promising to elevate the state's role in the EV revolution to new heights. These upcoming facilities, alongside existing operations, will solidify Indiana's position as a key player in the national and global EV supply chain.

Investment Attraction: There's room for improvement in attracting EV investments to the state. A targeted approach, focusing on what businesses need, can help Indiana secure its place in the EV future.

As we move forward, these benchmarks provide valuable insights for shaping Indiana's strategy in the EV industry. By leveraging our strengths and addressing our challenges, we can position Indiana can be a leader in the electric vehicle revolution.

Powering the Future: Indiana's EV Battery Ecosystem



As we accelerate into the electric age, the battery ecosystem becomes the heartbeat of the EV industry. Indiana is uniquely positioned to become a powerhouse in this critical sector. As the automotive sector shifts toward electrification, it is critical to assess Indiana's existing EV production facilities and their capacity to scale. According to recent data, there are key players in the state making significant investments in this sector, including major automakers and parts suppliers, ensuring that Indiana remains competitive on a national scale.

The Battery Revolution

The shift from Internal Combustion Engines (ICE) to Electric Vehicles (EV) is more than just a change in propulsion—it's a complete reimagining of the automotive supply chain.

Indiana's Battery Landscape

Indiana's battery landscape is rapidly evolving, positioning the state as a key player in the electric vehicle (EV) revolution as evidenced by these key statistics:

201 Unique EV companies in Indiana

9,816 Employees in EV-specific roles

9,031 Production employees in the EV sector

785 Non-production employees in the EV sector

These numbers tell a compelling story of Indiana's commitment to the EV industry. With 201 unique EV companies, the state is fostering a diverse and robust ecosystem that spans the entire EV supply chain. The presence of nearly 10,000 employees in EV-specific roles underscores the sector's significant economic impact and job creation potential.

The breakdown between production and non-production employees (9,031 and 785, respectively) highlights the industry's focus on manufacturing while also indicating a growing need for roles in research, development, engineering, and management. This balance is crucial for building a sustainable and innovative EV sector that can compete on a global scale.

Emerging Ecosystem Highlights

Indiana's EV landscape is dotted with key players that are driving innovation and growth across the state:

Kokomo:

- Stellantis and Samsung SDI Joint Venture: This joint venture is investing $2.5 billion to build a world-class battery manufacturing facility. The plant will produce electric vehicle battery cells and modules, employing 1,400 workers.

Newberry

- Battery Innovation Center: The Battery Innovation Center is involved in battery research, development, and testing. It serves as a hub for battery technology innovation and supports the broader EV ecosystem in Indiana.

Indianapolis:

- Allison Transmission: Develops and manufactures commercial-duty propulsion solutions, including electric hybrid and fully electric propulsion systems.
- Cirba Solutions: Involved in battery recycling, part of the battery lifecycle management.
- EnPower: Focuses on battery technology, specifically mentioned as investing $22.8 million in Indianapolis.

Terre Haute:

- ENTEK: ENTEK is investing $1.5 billion in Terre Haute to produce lithium-ion battery separators, a critical component in EV batteries.

New Carlisle:

- General Motors and Samsung SDI Joint Venture: This joint venture is investing $3 billion to build an electric vehicle battery cell plant, contributing to GM's EV production capabilities.

Fishers:

- ReElement: ReElement is involved in battery recycling and materials recovery, particularly focusing on rare earth elements and critical minerals used in EV batteries.

These investments and operations demonstrate Indiana's growing role in various aspects of the EV supply chain, from battery production and component manufacturing to recycling and innovation.

Figure 3.1: Indiana's EV Battery Ecosystem

Each of these locations represents a vital node in Indiana's EV network. ENTEK in Terre Haute is the only US-producer of "wet-process" lithium ion battery seperator materials, while the Stellantis and Samsung SDI joint venture in Kokomo is set to become one of the largest EV battery manufacturing facilities in the country. The General Motors and Samsung SDI EV battery manufacturing plant in New Carlisle will be of similar scale when completed.

The Battery Innovation Center in Newberry serves as a crucial hub for research, development, and testing, fostering collaboration between industry and academia. In Indianapolis, companies like Allison Transmission are leveraging their automotive expertise to develop EV propulsion systems, while Cirba Solutions and EnPower are advancing battery technology and recycling efforts.

ReElement in Fishers is at the forefront of sustainable practices, focusing on critical materials recycling for EV batteries. This diverse ecosystem demonstrates Indiana's comprehensive approach to EV development, covering everything from battery production to recycling and innovation.

From ICE to EV: A Competency Shift

The transition from Internal Combustion Engine (ICE) to Electric Vehicle (EV) production requires a significant shift in workforce competencies. Indiana is proactively addressing this challenge by adapting its workforce skills:

ICE Competencies	EV Competencies
Gear machining	Power electronics
Welding	Software development
Heat treat operations	Battery technology
Machine tool technology	Cybersecurity
Assembly of tight tolerance components	Smart manufacturing
	Cell manufacturing
	Recycling
	Testing, Validation, and Safety

Table 3.2: ICE and EV Workforce Skill Competencies

This shift represents more than just a change in skills; it's a fundamental transformation of Indiana's manufacturing landscape. Traditional mechanical skills like gear machining and welding are being complemented by expertise in power electronics and software development. The importance of heat-treat operations in ICE manufacturing is giving way to a critical need for battery technology knowledge in the EV sector.

Additionally, the increasing complexity and connectivity of EVs are driving demand for cybersecurity skills to ensure vehicle safety and data protection. The concept of smart manufacturing is becoming central to EV production, requiring workers to be adept at operating advanced, interconnected production systems.

Indiana's educational institutions and workforce development programs are rising to meet this challenge. Partnerships between industry and academia are creating tailored training programs to equip workers with these new competencies. Companies are investing in upskilling their existing workforce, while also attracting new talent with expertise in these emerging fields.

This competency shift is not just about maintaining Indiana's competitiveness in the automotive sector; it's about positioning the state at the forefront of the global EV revolution. By successfully navigating this transition, Indiana is creating a workforce that is not only adapted to the present needs of the EV industry but is also prepared for its future evolution.

As Indiana continues to invest in its EV ecosystem and workforce development, it is laying the groundwork for a thriving, sustainable EV industry that will drive economic growth and technological innovation for decades to come.

Battery Supply Chain Opportunities

Indiana stands poised to capitalize on numerous opportunities within the burgeoning battery supply chain ecosystem. With over 80 new gigafactories announced globally, our state has the potential to attract major cell manufacturers, leveraging our strategic location and existing automotive expertise. Our strong manufacturing base also positions us well to develop robust capabilities in battery material processing, tapping into a critical aspect of the EV supply chain. As the EV market matures, battery recycling and repurposing will become increasingly crucial, presenting Indiana with the opportunity to lead in this emerging field of second-life applications. Furthermore, by harnessing the power of our world-class universities, Indiana can establish itself as a hub for cutting-edge battery innovation and research and development. However, to fully realize these opportunities, we must address several key challenges. Workforce development stands as a primary concern, requiring focused efforts to retrain our skilled ICE workers for the specialized roles in EV and battery production. We must also prioritize supply chain localization, working diligently to attract and nurture local suppliers for essential battery components. Additionally, ensuring adequate power supply and distribution for battery manufacturing facilities will be crucial to support this growing industry. By proactively addressing these challenges while pursuing the rich opportunities before us, Indiana can secure its position as a leader in the EV battery supply chain, driving economic growth and technological innovation in our state.

Indiana's rich automotive heritage, combined with our emerging strengths in EV technology, positions us uniquely in the battery ecosystem. By focusing on workforce development, attracting key investments, and fostering innovation, we can ensure that Indiana not only participates in the EV revolution but leads it.

As we build this new ecosystem, we're not just creating batteries—we're energizing Indiana's economic future.

Workforce: Powering the EV Revolution: Indiana's Workforce

Workforce: Powering the EV Revolution: Indiana's Workforce

As we shift gears towards an electrified future, our greatest asset is our people. Indiana's workforce stands at the forefront of this transformation, ready to drive the EV industry forward. The transition from ICE to EV is expected to impact employment, especially in industries traditionally dependent on internal combustion components. However, Indiana's workforce remains adaptable, and training initiatives will be essential to ensure a smooth transition. As highlighted in a Purdue University study, up to 30% of automotive jobs may shift due to electrification, emphasizing the need for retraining in EV-specific skills such as battery production and power electronics.

The Current Landscape

Indiana's automotive workforce is a powerhouse of talent and experience:

137,519 Employees in combined ICE & EV companies

40,175 Employees in ICE-specific companies

9,816 Employees in EV-specific companies

Bridging the Skills Gap

The transition from internal combustion engines (ICE) to electric vehicles (EV) is ushering in a transformative era for Indiana's workforce, presenting both challenges and unprecedented opportunities. Many of the jobs that will be created in the next five to 10 years do not exist today. Additionally, most of the existing jobs that will remain will be altered in some way by the new technology. This profound shift necessitates a reimagining of our workforce development strategies to ensure Hoosiers are well-equipped for the jobs of tomorrow. The Battery Innovation Center (BIC) in Newberry, Indiana has trained over 1200 people in the last five years in support of career transition (53%) and growth in the EV industry (47%). There are wide range of skilled and unskilled labor needed to support the industry. These positions range from advanced degreed engineers and scientist to plant floor operators. New manufacturing brings new manufacturing techniques and adaptive training techniques are being incorporated at Indiana universities and community colleges to meet this demand. The BIC training program is evolving from R&D (materials, cell construction, tests) to manufacturing (safety, quality, data analytics).

In this evolving landscape, several key skills have emerged as critical for the EV era. Battery technology stands at the forefront, with expertise in advanced energy storage systems becoming increasingly vital. Power electronics, the backbone of EV powertrains, requires a deep understanding of electrical systems and control mechanisms. Software engineering has become indispensable as EVs essentially become computers on wheels, requiring sophisticated programming and system integration skills. Advanced manufacturing techniques, including automation and robotics, are reshaping production lines, demanding workers adept at operating and maintaining these high-tech systems, systems, while making the manufacturing environment safer than ever before. Additionally, as vehicles become more connected, cybersecurity skills are crucial to protect these rolling data centers from potential threats.

Recognizing the magnitude of this transition, Indiana is charging ahead with comprehensive strategies to equip our workforce for the EV revolution. The state is implementing a multi-faceted approach to workforce development, starting with standardized education and training. This initiative aims to integrate EV-related education at all levels, from primary schools to higher education, ensuring a pipeline of talent familiar with EV concepts from an early age. Programs like the Electric Vehicle Product Commission's recommendations for solid foundations to recruit, retrain, and retain EV workers are being put into action, creating pathways for both new entrants and existing workers in the automotive sector.

Industry-based training and certification form another crucial pillar of Indiana's workforce development strategy. The state is emphasizing continuous professional development through industry-based training, certifications, and apprenticeships. Collaborations between educational institutions and industry leaders are fostering programs that provide hands-on experience with the latest EV technologies. For instance, partnerships like those between Ivy Tech Community College and companies such as Cummins are creating tailored programs to upskill workers in EV-specific competencies.

Furthermore, Indiana is conducting ongoing labor market analysis to ensure that workforce development programs align with actual job demands in the EV sector. This data-driven approach allows for agile adjustments to training programs, ensuring that the skills being taught match the rapidly evolving needs of the industry. The state is also leveraging federal funding and programs, such as the Electric Vehicle Infrastructure Training Programs (EVITP), to provide comprehensive training for the installation of EV infrastructure.

Indiana's commitment to workforce development is further exemplified by initiatives like the Indiana Advanced Electric Vehicle Training and Education Consortium (I-AEVtec) and GoEVIN. These programs are dedicated to fostering EV adoption, education, and training across the state, creating a robust ecosystem of knowledge and skills specific to the EV industry.

As we navigate this electric transition, Indiana's proactive and comprehensive approach to workforce development positions the state not just to adapt to the changing automotive landscape, but to lead it. By focusing on developing key skills, providing standardized education, fostering industry partnerships, and continuously analyzing labor market needs, Indiana is building a workforce ready to power the future of mobility and drive our state's economy into a new era of innovation and prosperity.

Key Skills for the EV Era

1. Battery Technology
2. Power Electronics
3. Software Engineering
4. Advanced Manufacturing Techniques
5. Cybersecurity

EV Job Market Insights

Automotive manufacturing is a critical industry throughout North America, directly supporting nearly 775,000 jobs within the US. The Midwest region holds the highest employment levels supported by automotive manufacturing, with roughly 1.5 million jobs supported by the industry in Indiana, Michigan, Ohio and Wisconsin. The labor income brought to Indiana as a result of employee compensation in the region shows that other industries are supported by automotive manufacturing output.[3]

$5.1B Earnings (2023)

$4.7B Property Income (2023)

$601.2M Taxes (2023)

$10.4B Total GRP (2023)

An analysis of open positions in Indiana's EV industry reveals:

- High demand for previous auto industry experience
- Non-degree positions average a $33 hourly wage, up from $25 in 2022
- Degree-required positions average $75,000 per year
- Majority of positions prioritize experience over certificates
- High demand for electrical proficiency and certifications (OSHA 10, 30, and NFPA70E)

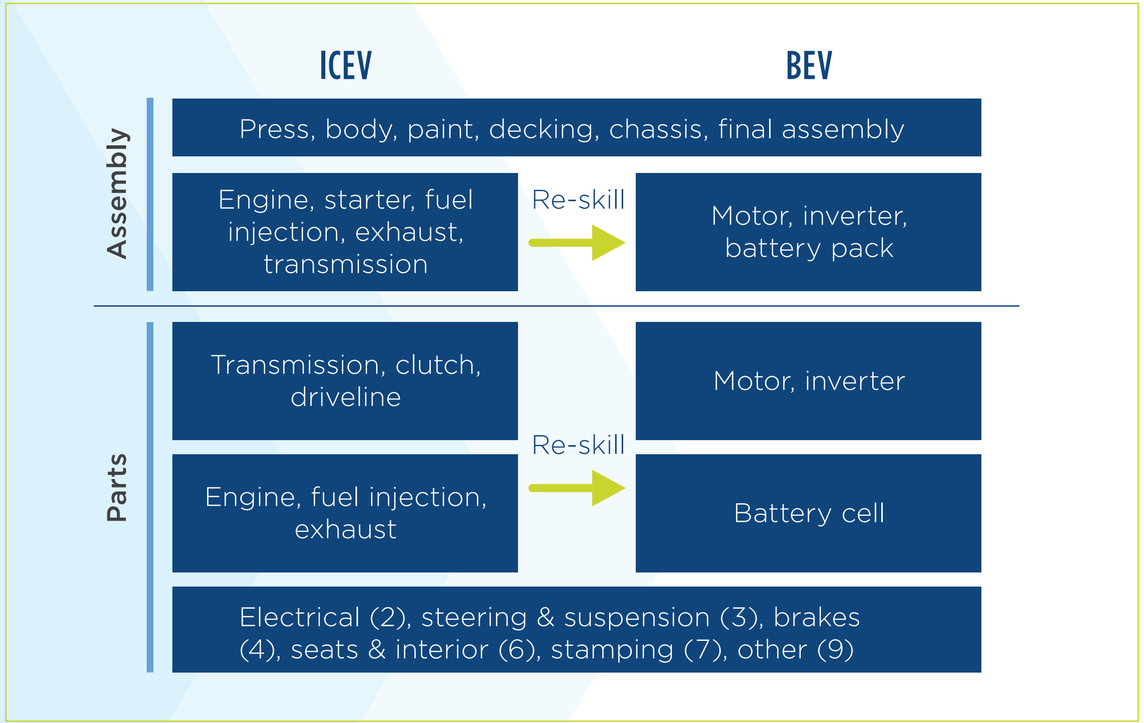
Studies show that EV industry development increase labor opportunities in the market:[4]

- Reskilling workers is critical to achieve labor parity with ICE vehicle assembly
- BEV labor requirements are virtually the same as ICE labor requirements (about 1% less)
- Investment in manufacturing technology development in the EV manufacturing supply chain will add complexity and durability to the EV transition, generating more labor demand
- ICE vehicles are less complex than their EV counterparts

[3] https://www.cargroup.org/wp-content/uploads/2024/08/CAR-LV-Mfg-Econ-Contribution-Analysis-MBS-2024.pdf

[4] https://www.nature.com/articles/s41467-024-52435-x

Figure 4.1: Transitioning from ICE to BEV production will create shifts in the types and quantities of jobs in assembly and parts manufacturing



Indiana has 461 automotive manufacturing employers competing for talent within the state, including OEMs, Tier 1 suppliers and automotive maintenance. The top job titles reflect the state's workforce demand including: automotive technicians, production team members, and auto body technicians. Demonstrating the importance of re-skilling the automotive workforce from ICE to EVs, the automobile and light-duty motor vehicle manufacturing sector saw over 117,000 job transitions in 2024.[5]

[5] https://www.nature.com/articles/s41467-024-52435-x

Strategies for Workforce Development

Indiana's rich automotive heritage, combined with our emerging strengths in EV technology, positions us uniquely to lead the charge in workforce development. By focusing on upskilling our existing workforce, attracting new talent, and fostering innovation, we can ensure that Indiana not only participates in the EV revolution but leads it.

Indiana's electric vehicle (EV) industry is experiencing rapid year-over-year expansion, underpinned by a robust and multifaceted workforce development initiative. This comprehensive approach aims to equip Hoosiers with the skills, training, and experience necessary to drive the successful deployment and growth of EV technology across the state.

At the heart of Indiana's strategy is a commitment to standardized education and training. The state is taking a long-term view by integrating EV-related education at all levels of the educational system, from primary schools to higher education institutions. This foresighted approach ensures that the future workforce enters the job market with a solid foundational understanding of EV technology and its wide-ranging applications, creating a pipeline of talent ready to innovate and excel in the evolving automotive landscape.

Complementing this foundational education is a strong emphasis on industry-based training and certification. Recognizing that the EV sector's rapid evolution demands continuous skill development, Indiana has fostered an ecosystem of professional development programs. These include specialized training courses, industry-recognized certifications, and apprenticeship opportunities. Such initiatives are crucial in building and maintaining a skilled workforce capable of adapting to the EV industry's dynamic demands, ensuring that Indiana's workers remain at the cutting edge of automotive technology.

Underpinning these educational and training efforts is an ongoing commitment to labor market analysis. Indiana's policymakers and educational institutions are continuously studying the state's labor market dynamics to ensure that workforce development programs and policies align closely with the actual job demands in the EV sector. This data-driven approach allows for agile adjustments to training programs, ensuring they evolve in tandem with the industry's growth and changing needs.

Several key programs and initiatives stand out in Indiana's EV workforce development landscape:

- **Indiana Advanced Electric Vehicle Training and Education Consortium (I-AEVtec):** This consortium brings together the state's leading technical universities and colleges to play a pivotal role in EV workforce preparation. I-AEVtec's comprehensive educational offerings range from Certificates and Associate degrees for vehicle technicians to advanced BS and MS degree programs for design and manufacturing engineers. The consortium's foresight extends to public safety, offering a specialized Certificate program focused on electric vehicle safety for emergency responders.
- **GoEVIN:** Dedicated to fostering EV adoption and education across Indiana, this initiative serves as a linchpin in the state's strategy to accelerate EV deployment. By focusing on increasing awareness and providing education on EV technology, GoEVIN is helping to create a more informed and EV-ready populace, critical for the industry's growth.
- **Indiana Department of Workforce Development (DWD) and Rapid Recovery Initiative:** In an innovative partnership with 180 Skills, this program offers up to 100,000 Hoosiers free access to an online library of courses aimed at enhancing general employability skills. This initiative is particularly valuable for individuals looking to transition into Indiana's burgeoning manufacturing industry, including the rapidly expanding EV sector.
- **Electric Vehicle Infrastructure Training Programs (EVITP):** Supported by federal funding, EVITP stands as North America's most comprehensive training program for EV infrastructure installation. This program is vital in ensuring that electricians and other professionals involved in Electric Vehicle Supply Equipment (EVSE) installation are thoroughly trained to meet the industry's exacting standards and customer expectations.

These programs, working in concert, create a robust ecosystem for EV workforce development in Indiana. From creating awareness and basic skills to providing advanced technical training and safety education, the state is taking a holistic approach to prepare its workforce for the EV revolution.

As the EV industry continues to evolve and expand, Indiana's comprehensive workforce development strategy positions the state to not just meet the current demands of the sector, but to anticipate and shape its future. By fostering a skilled, adaptable, and innovative workforce, Indiana is laying the groundwork to become a leader in the EV industry, driving economic growth and technological advancement in the years to come.

Powering the Future: Indiana's EV Ecosystem

As we accelerate into the electric age, understanding the intricate web of the EV ecosystem is crucial. The electric vehicle industry introduces new dynamics to the automotive supply chain, requiring a shift from traditional internal combustion engine parts to EV-specific components like batteries, electric motors, and power electronics. Indiana's current manufacturing infrastructure presents both challenges and opportunities in this regard.

Indiana must expand its EV-specific manufacturing capabilities to bolster supply chain resilience while attracting key suppliers from outside the state. With the potential to lead in battery production and assembly, Indiana can become a critical hub for the entire EV supply chain, from raw material processing to final product assembly.

The state must also address potential bottlenecks in the EV supply chain, such as the availability of semiconductors and battery components, which have impacted global production. Proactive strategies to mitigate these risks include developing partnerships with international suppliers and incentivizing local production through targeted economic development programs.

The Billion-Dollar Charge

The EV industry is experiencing an unprecedented surge in investment:[6]

$85B Total investment in EV manufacturing, batteries, and chargers in the U.S. (2020-2022)

$36B Investment in electric vehicle manufacturing

$48B Investment in battery production

> **"The electric vehicle battery is the most significant component of an electric vehicle, accounting for as much as 50% of the vehicle's overall value."**

[6] https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/14/fact-sheet-president-bidens-economic-plan-drives-americas-electric-vehicle-manufacturing-boom/

The EV Battery Value Chain: From Raw Materials to Recycling

The lifecycle of an electric vehicle (EV) battery is a testament to modern engineering and sustainable design. This journey, from raw materials to recycling, involves multiple intricate stages, each crucial to the battery's performance, longevity, and environmental impact. Let's explore this complex process:

1. Component Production: Anode, cathode materials, binders, electrolytes, and separators
2. Cell Production: Assembly of single cells (12 cells = 1 module)
3. Module Production: Configuration of cells with electromagnetic management
4. Pack Assembly: Installation of modules with power, charging, and temperature management systems
5. Vehicle Integration: Installation of the battery pack into the vehicle structure
6. Use: In-vehicle battery lifetime
7. Reuse and Recycling: Deconstruction, cleaning, and material recycling

DID YOU KNOW?

1 module generates 2-3 kWh energy, providing 3.5-4.5 miles of range.

Indiana's EV Battery Ecosystem: A Closer Look

Indiana's journey into the electric vehicle revolution is marked by significant progress and promising potential, particularly in the realm of EV battery manufacturing. As we examine the state's position in this rapidly evolving landscape, we see a picture of strategic growth and targeted investments, coupled with opportunities for further development.

In the EV battery manufacturing ecosystem, Indiana currently shows its greatest strength in module-pack manufacturing, with nine companies operating in this crucial sector. This concentration reflects the state's traditional automotive manufacturing expertise successfully pivoting to meet the demands of the EV age. However, the ecosystem analysis reveals areas ripe for growth and investment. While Indiana has made inroads in electrode and cell manufacturing with one company and has established a presence in the critical area of recycling and repurposing with another, there are notable gaps in the supply chain. The absence of companies focusing on raw materials, battery-grade materials, and other battery components presents both a challenge and an opportunity for the state.

Despite these gaps, Indiana is making remarkable strides in attracting EV-related investments. The state has successfully drawn nine new EV-related establishments, a testament to its business-friendly environment and strategic focus on the EV sector. These new ventures represent a substantial influx of capital, with total investments reaching an impressive $12.9 billion. This significant financial commitment is expected to create 6,242 new jobs, signaling a boost to the state's economy and workforce. These figures underscore Indiana's commitment to positioning itself as a key player in the EV industry, not just regionally, but on a national scale.

The spotlight on Indiana's emerging EV hubs further illustrates the state's growing prominence in the EV landscape. New Carlisle is set to become a major center for EV battery production, thanks to a $3.5 billion investment by GM and Samsung SDI. This facility will boast an annual capacity of 30 GWh and is expected to create 1,700 jobs. Notably, New Carlisle already ranks fourth in Indiana for total annual net electricity generation, providing a solid infrastructure foundation for this energy-intensive industry.

Kokomo, with its strong existing automotive manufacturing presence, is poised for transformative growth. The over $3.2 billion investment by Stellantis and Samsung SDI will establish a facility with a staggering 67 GWh annual production capacity, creating 2,800 jobs. This development not only cements Kokomo's place in the automotive industry's future but also represents one of the largest EV investments in the state.

Terre Haute is emerging as another vital hub in Indiana's EV ecosystem. Entek's $1.5 billion investment is set to create 640 jobs and will have the capacity to supply components for 1.4 to 1.6 million EVs annually. This development significantly strengthens Indiana's position in the EV supply chain, particularly in the crucial area of battery components.

As Indiana navigates the transition from ICE to EV production, businesses across the state are adopting innovative solutions to stay competitive. Diversification is key, with many companies expanding into EV-related sectors such as battery manufacturing and charging infrastructure. This approach not only opens new revenue streams but also helps to future-proof businesses against the declining ICE market.

Technological innovation stands at the forefront of this transition. Indiana's manufacturers are increasingly focusing on developing safer, more efficient battery technologies. This focus not only improves the performance and appeal of EVs but also addresses critical safety concerns that are paramount in consumer adoption.

Supply chain resilience has become a priority, with efforts to reduce dependency on foreign raw materials. This strategy not only secures the supply chain against global disruptions but also aligns with national interests in developing domestic EV production capabilities. Hand-in-hand with this approach is a growing emphasis on recycling and the circular economy. Recovering and reusing raw materials from used batteries not only addresses environmental concerns but also provides a sustainable source of critical materials.

Strategic planning is crucial as companies optimize their operations to maintain profitability during this transition. This involves careful balancing of investments in new technologies and skills with the need to maintain existing ICE-related business in the short to medium term.

As Indiana continues to build its EV ecosystem, the state is poised to play a pivotal role in the future of automotive manufacturing. The combination of strategic investments, workforce development, and business innovation creates a fertile ground for the EV industry to flourish. While challenges remain, particularly in filling gaps in the battery supply chain, the momentum and commitment demonstrated by recent investments and policy initiatives suggest a bright and electric future for the Hoosier State.

Manufacturing Category	Number of Companies in Indiana
Raw Materials	1
Battery Grade Materials	1
Electrode & Cell Manufacturing	1
Module-Pack Manufacturing	9
Recycling-Repurposing	1

While Indiana shows strength in module-pack manufacturing, there is room for growth in other areas of the battery ecosystem.

Charging Up: Indiana's EV Investments

Indiana is making significant strides in attracting EV investments:

9 Number of new EV-related establishments

$12.9B Total investment attracted

6,242 Potential new jobs created

These figures demonstrate Indiana's commitment to becoming a key player in the EV industry.

Spotlight on Indiana's EV Hubs

Indiana is making significant strides in attracting EV investments:

Spotlight on Indiana's EV Hubs

New Carlisle

- $3.5 billion investment by GM and Samsung SDI
- 30 GWh annual capacity
- 1,700 expected jobs
- Ranks #4 in Indiana for total annual net electricity generation

Kokomo

- Over $3.2 billion investment by Stellantis and Samsung SDI
- 67 GWh annual production capacity
- 2,800 expected jobs
- Strong existing automotive manufacturing presence

Terre Haute

- $1.5 billion investment by Entek
- 640 expected jobs
- Capacity to supply 1.4 to 1.6 million EVs annually

Indiana's EV ecosystem is charging up, but there's still room to amp up the game. By focusing on developing our raw material and battery-grade material production, we can create a more complete and robust EV supply chain within our state.

As we continue to attract investments and create jobs in the EV sector, Indiana is positioning itself as a key player in the electric future of transportation. With our strong manufacturing base and strategic location, we're well-placed to lead the charge in the EV revolution.

Case Studies

Case Study: Ivy Tech Community College and StarPlus Energy

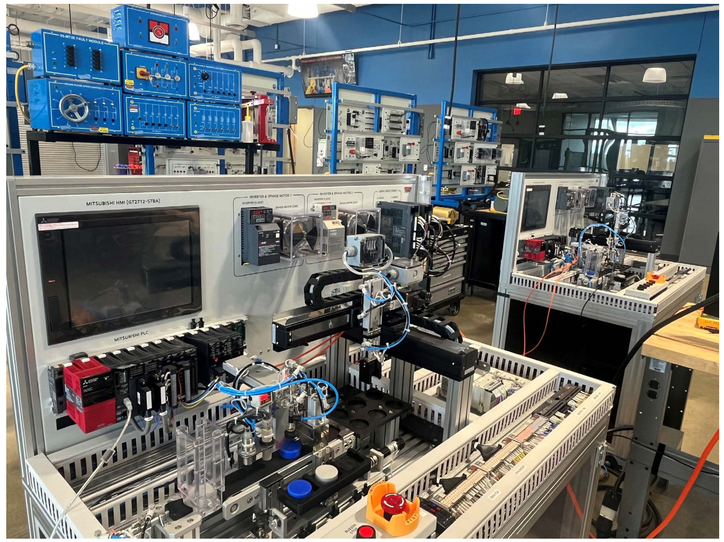
The city of Kokomo, Indiana, and Ivy Tech Community College have emerged as trailblazers in preparing for the electric vehicle (EV) revolution, particularly in response to the establishment of StarPlus Energy's EV battery module manufacturing Gigafactory. Their combined efforts showcase a comprehensive approach to workforce development, community adaptation, and cultural integration.

Ivy Tech Community College Kokomo has been at the forefront of this transition, leveraging its rich history of supporting educational needs and talent development in manufacturing. Following the May 2022 announcement of the StarPlus Energy project, Ivy Tech quickly mobilized to address the multifaceted challenges of preparing a workforce for the EV industry. The college developed a three-pronged approach: providing short- and medium-length training for newly hired skilled workers, creating high-school-to-college-to-career pathways, and offering programs for underserved populations.

The college's efforts have been marked by constant innovation and adaptation. They've secured $3.75 million in grants for equipment and training costs, engaged in extensive professional development for staff, including visits to battery plants in Korea, and developed specialized curricula for various roles within the EV battery manufacturing process. By May 2024, Ivy Tech had trained 270 StarPlus Energy employees and was planning to train an additional 160 technicians and 450-600 operators. The college is also expanding its reach, planning to host Smart Manufacturing pathways at five educational locations and a Battery Manufacturing summer camp for high school students.

Concurrently, the city of Kokomo has been working diligently to create an environment conducive to this industrial transformation. Recognizing the cultural implications of the joint venture with Samsung SDI, the city implemented a comprehensive "Korean Soft-Landing" initiative. This included the development of a Korean-language micro-website to help new arrivals acclimate to the community, and a series of cultural training sessions attended by over 500 community members. These efforts have been lauded by the IEDC Korea office as a benchmark for best practices.

The city has also been proactive in addressing the logistical challenges posed by this rapid industrial growth. When faced with a housing shortage for the influx of construction workers and new employees, Kokomo conducted a full housing study and reached out to developers, securing commitments for approximately 900 multifamily units to be constructed



over two years. The city has also been working to meet the dietary needs of the new workforce, encouraging the establishment of Korean restaurants and the expansion of international food options in local grocery stores.

The impact of these efforts extends beyond the immediate EV industry. A recent study showed that the tourism and travel industry in Howard County, where Kokomo is located, contributed $252.2 million to the economy in 2023, up from $149.2 million in 2019. The industry created 1,960 jobs in 2023, with over one-third in high-wage occupations.

This case study of Kokomo and Ivy Tech Community College demonstrates the power of a coordinated, community-wide approach to industrial transformation. By addressing workforce development, cultural integration, housing, and even culinary needs, they have created a model for other communities facing similar transitions in the evolving landscape of the automotive industry.

Spotlight on Cummins: Powering the Transition

As Indiana charges into the electric future, Cummins Inc., headquartered in Columbus, Indiana since 1919, exemplifies how a traditional engine manufacturer can successfully pivot to lead in the zero-emissions future. With its global workforce of 75,500, including over 10,000 in Indiana, Cummins is driving the energy transition through its Destination Zero strategy, offering a diverse portfolio from advanced diesel to electric and hydrogen technologies.

At the forefront of Cummins' zero-emissions efforts is Accelera by Cummins, launched in 2017 to focus on batteries, electrified power systems, electrolyzers, and fuel cells. Accelera positions Cummins to provide tailored BEV powertrains and components for North American markets, leveraging the company's extensive experience and market presence. Cummins' strategy involves offering a complete portfolio of high-voltage electrified components and full system powertrain integration, with plans to localize cell manufacturing in the US through a joint venture with PACCAR and Daimler.

Cummins' commitment to Indiana's EV future is evident in its significant investments and workforce development initiatives. In July 2024, the company secured a $75 million grant from the U.S. Department of Energy, which it matched, to convert 360,000 sq. ft. of its Columbus Engine Plant (CEP) for zero-emissions component production. This $150 million project will create approximately 250 new full-time jobs and transition nearly half of the 1.42 million sq. ft. facility to zero-emissions manufacturing. The electric powertrains produced at CEP are projected to reduce greenhouse gas emissions by 104 million metric tons of CO2 by 2030.

Investing in Indiana's EV Future

Cummins is making significant investments in Indiana to support its EV transition:

$75M federal grant awarded to convert Columbus Engine Plant for zero-emissions components

$75M matching investment from Cummins

360,000 sq. ft. of existing manufacturing space to be converted

250 new full-time jobs anticipated

104M metric tons of CO_2 emissions reduction expected by 2030

Workforce Development: Powering the People

Cummins is investing heavily in training its workforce for the EV transition:

Partnership with Battery Innovation Center (BIC) for energy storage training

1,296 total employees trained

645 employees trained in at least 50% of all BIC courses

$760,000 invested in training

$160,000 invested in research and development/testing

Community Investment: Charging Up the Next Generation

Cummins is committed to preparing the community for the EV future:

$300,000 to expand the Columbus Robotics program

$250,000 to provide access to “A World in Motion” SAE curriculum

$300,000 to create new STEM studios

$300,000 to pilot youth apprenticeships in Indiana

Key Insights for Indiana's EV Industry

Key Insights for Indiana's EV Industry

1. **Diversification is Key:** Companies like Cummins are expanding their portfolio to include a range of power solutions, from advanced diesel to electric and hybrid powertrains.
2. **Investment in Infrastructure:** Significant investments in converting existing facilities for EV production demonstrate the industry's commitment to the transition.
3. **Workforce Development is Crucial:** Extensive training programs and partnerships with educational institutions are essential for building a skilled EV workforce.
4. **Community Engagement:** Investing in STEM education and youth programs helps create a pipeline of future talent for the EV industry.
5. **Sustainability Focus:** The EV transition is not just about new technology, but also about reducing environmental impact and meeting sustainability goals.
6. **Leveraging Existing Strengths:** Companies are building on their traditional expertise while pivoting to new technologies.
7. **Partnerships are Essential:** Collaborations between industry, educational institutions, and government bodies are driving innovation and workforce development.

The insights from industry leaders like Cummins paint a picture of an exciting, albeit challenging, road ahead for Indiana's EV industry. As we navigate this transition, it's clear that success will depend on a combination of strategic investments, workforce development, community engagement, and a commitment to sustainability.

Indiana's strong manufacturing base, coupled with the innovative spirit of companies like Cummins, positions our state to be a leader in the EV revolution. By embracing these insights and continuing to adapt and innovate, Indiana can power the future of mobility and drive economic growth in the electric age.

Recommendations

As Indiana accelerates into the electric vehicle era, a comprehensive approach is needed to ensure the state's leadership in this transformative industry. Drawing lessons from innovative companies like Autocar and Cummins, we can outline a roadmap for Indiana's EV success.

- Continue to Attract EV Investments: Offering competitive incentives and streamlining processes for EV-related businesses will position Indiana as an attractive destination for EV manufacturing.
- Continue to Invest in Infrastructure to support Manufacturing and Workforce: Developing battery plants, technology hubs, and expanding EV charging networks are crucial for supporting the growing EV ecosystem. Getting power, water, and roads to these facilities, along with infrastructure to house and feed people is critical to continue investment momentum
- Enhance Supply Chain: Now that cell plants are beginning to produce, it is critical to develop local suppliers for EV components and recycling to creating a resilient, localized supply chain will reduce dependencies and boost the local economy.
- Foster Innovation Hubs: Strengthen collaborations with universities and create incubators for EV startups to drive technological advancements and attract talent. A critical focus must be bridging the gap between R&D and low-volume production to accelerate product commercialization. By providing targeted support and resources during this "valley of death" phase, we can significantly increase the rate at which groundbreaking EV technologies move from concept to commercial reality, thereby boosting the industry's overall competitiveness and innovation potential.

- Develop and Attract a Skilled Workforce: Expand EV-specific training programs to facilitate the transition of the incumbent workforce while creating robust pathways for new talent. This dual approach includes developing a strong pipeline of future workers and attracting fresh talent to the industry. Highlight the appeal of the clean energy sector to draw in diverse, skilled individuals. By bridging the gap between traditional auto manufacturing skills and new EV technologies, we can ensure a comprehensive, adaptable labor force ready to meet the evolving demands of this attractive and growing industry.
- Promote Collaboration and Lessons Learned Across All Stakeholder Groups: Encouraging knowledge sharing among manufacturers, fostering better communication between industry, academia, and government at local and state levels, and actively pursuing regional collaboration with neighboring states will ensure that issues are foreseen and solutions are shared across geographical and industry boundaries. This multi-state approach will amplify efforts and create a deeper, more lasting impact on the manufacturing landscape.
- Leveraging Federal Support: To maximize Indiana's potential, companies should actively pursue federal grants for EV projects, engage in collaborative ventures, and align state initiatives with federal EV and clean energy goals. This approach provides financial support and ensures Indiana's EV industry develops in harmony with national objectives. The state can play a role here by broadly communicating the opportunities (and deadlines) and importantly offering resources to companies to assist in developing strategies and applications.

Driving Indiana's Electric Future