Executive Summary

Electric Vehicle Product Commission

September 30, 2022

Disruption = Opportunities

The automotive industry in Indiana is a dynamic, dense, and connective pulse of innovation rooted in generations of Hoosiers. Anchored by research, education, and training from world-class universities and colleges, the automotive industry's strength lies in its greatest tradition: modernization.

The next generation of public-private partnerships has been built to accelerate Indiana's status as a global innovation hub. Powered by a collaboration of civic leaders representing the State of Indiana, the Indiana Economic Development Corporation, manufacturers, and educational institutions, the Electric Vehicle Production (EVP) Commission is working to supercharge the automotive industry by bolstering and connecting local innovation assets, attracting innovative companies, and creating talent pathways to ensure all workers can benefit from the innovations.

The Automotive Industry initiated the beginning of a technical revolution in Indiana by cultivating research and pioneering products over the course of many decades. Although the local automotive industry boom has grown immensely recently, Hoosier leaders have been developing the culture of innovation tediously with substantial attention to detail and rising trends.

Since 1909, Indiana has grown its automotive manufacturing operations to **13 facilities, 32,600 careers, and more than 24 million square feet** of facility space. Additionally, **$1.1 Billion in total state tax revenue**[1] is generated by the automotive industry. The momentum of investment and growth in the automotive industry has only kept growing, with one of the most recent notable investments being the U.S. semiconductor manufacturer SkyWater Technology Inc.'s plans to invest $1.8 billion for a chip research and production facility in Indiana, in partnership with the state and Purdue University.

[1] *Alliance for Automove Innovation*
https://www.autosinnovate.org/resources/insights/in

“General Motors has proudly been a part of Indiana for over 85 years - since 1936. GM is committed to a zero-emissions, all-electric future driven by battery-electric technologies and has charted a path which aspires to eliminate tailpipe emissions from new light-duty vehicles by 2035. GM’s talented workforce is our greatest asset as we deliver on our plans, and GM is already making historic investments as we begin transforming our portfolio. Just recently, GM announced $491 million in investments at our Marion, Indiana metal stamping operations to prepare the facility to produce a variety of steel and aluminum stamped parts for future products, including electric vehicles.”

General Motors
Michael Maten,
Director of EV Policy and Regulatory Affairs

The Importance of Electric Vehicles to Economic Development

Like any transformative new technology, electric vehicles create a variety of potent economic development challenges and opportunities. While the electric vehicle market is still developing, it is poised to reshape industries and communities all over the world. World-class research and development, as well as a variety of partnerships and talented individuals, work together to make Indiana the perfect environment for emerging industries like the electric vehicle production industry.

The automotive industry is in the midst of a transition - replacing the Internal Combustion (ICE) engine-based cars with a new energy source – battery-powered Electric Vehicles (EV). Based on research from the EVP Commission, the possible U.S. market size for EVs goes from 1.45 million to 6 million vehicles by 2030[1], a significant opportunity, albeit highly variable, and a function of automaker choices. This shift from ICE to EV is forecasted to a corresponding decrease in the volumes of ICE and will impact the automotive industry supply chain.

[1] https://www.iea.org/reports/global-ev-outlook-2019

Supply Chain Disruption Summary

22,132
Total Manufacturing Companies in Indiana

8,053
Total Automotive Companies in Indiana

3,548
Other Automotive Companies

769
Total Unique ICE Companies

201
Total Unique EV Companies

3,535
Total ICE & EV Combined Companies

Source: Purdue University

“The speed and detailed coordination between various stakeholders in the transition to EV manufacturing and sales is amazing to see how it has unfolded.”

State Senator Jim Buck

The Magnitude of the ICE and EV Ecosystem

The diagram below shows Indiana’s ICE, combined ICE & EV, and EV statistics. The data showcases the reach of the ICE and EV ecosystem and highlights the number of companies, revenue, total employees, Production employees, and Non-Production employees.

The Hoosier Automotive Industry has all of the needed elements to thrive. In a world that is seeking definition, certainty, and a network, the EVP Commission has a clear vision for its future, unified and bold leadership, and a connected partnership. As the world demands ever-greater sources of skilled workers and investment opportunities, Indiana has its remarkable talent and speed-to-market way of doing business. As battery manufacturers and startups have announced the construction of more than 80 new gigafactories across the globe to produce lithium-ion cells and batteries[2], many more will be needed over the next decade.

There is no question that it is critical for automotive manufacturers (OEMs) to develop multiple supply relationships and partnerships with battery specialists. The mobilization efforts to electrification will inevitably bring disruption to many parts of the supply chain. Historically for OEMs, developing and producing ICE powertrains have been part of how brands differentiate themselves. The eventual phasing out of ICE parts significantly disrupts many manufacturing and engineering jobs. As EV powertrains have fewer components, many existing suppliers will be forced to shift their production to align with market needs. But electrification, and especially the battery supply chain, represent one of the most significant growth opportunities across the automotive industry. The new manufacturing ecosystem, supply paradigms, and business connections will play a large role in defining the next generation of the automotive value chain.

[2]*Electric Vehicle Supply Chain Analysis, March 2021, p. 9*

	Unique ICE	Unique EV	Combined ICE & EV
Companies	769	201	3,535
Employees	40,175	9,816	137,519
Prod. Emp.	36,961	9,031	126,517
Non-Prod. Emp.	3,214	785	11,002

Opportunities

The opportunities and challenges with the complex shift from ICE to EV are interconnected. Many of the jobs that will be created in the next five to 10 years do not exist today. Additionally, of the existing jobs that will remain, most will be altered in some way by the new technology. The challenge is to identify which blend of global trends and Indiana assets will offer the right platform to amplify the industry of the future. Furthermore, Indiana's current top production occupations are at extremely high risk for impact. Adding to that, across the nation, more people are expected to retire than enter the workforce over the next 10 years. The ingredients of these obstacles are interrelated, therefore the solution must be comprehensive and systematic.

Propulsion System Competencies: ICE

- Gear machining
- Welding
- Carrier machining
- Shaft machining
- Heat treat operations
- Spline rolling forming
- Deburring
- Case/Housing machining
- Assembly of tight tolerance components
- Leak testing
- Test stands
- Casting operations
- Block machining
- Valve body machining
- Pump housing machining

- **Machine Tool Technology**
- **Welding Technology**
- **Industrial Technology**

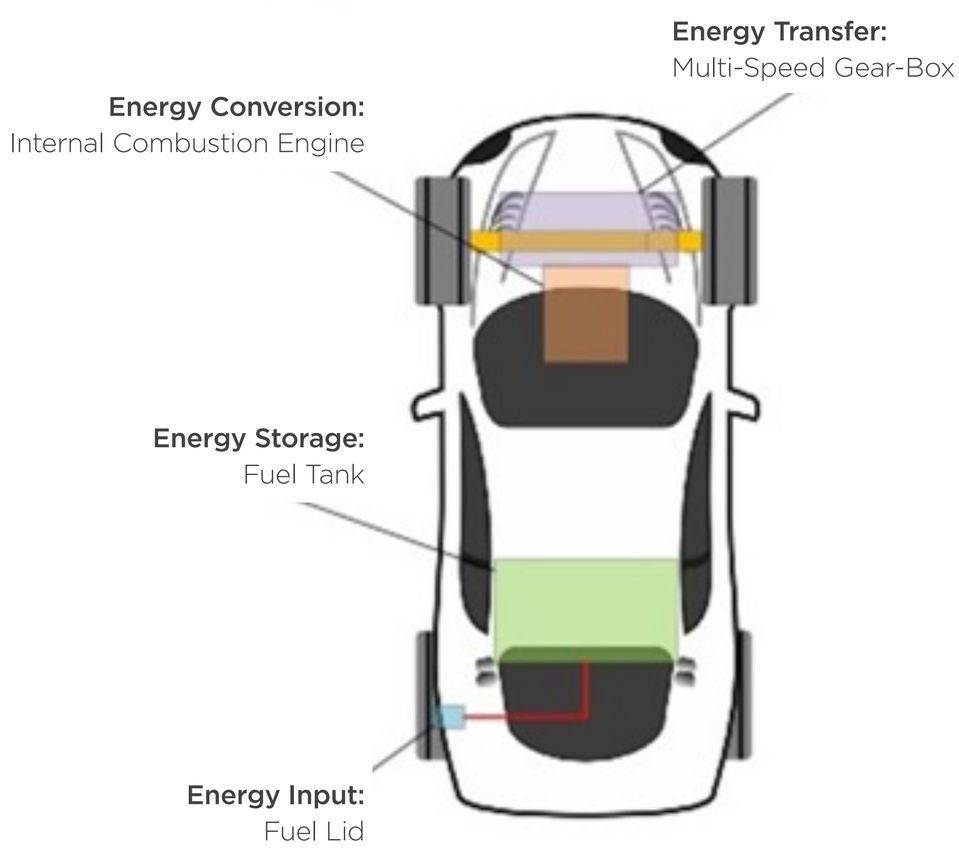

Image Source: EVP Commission

Propulsion System Competencies: EV

- Gear machining
- Welding
- Carrier machining
- Shaft machining
- Heat treat operations
- Spline rolling forming
- Deburring
- Case/Housing machining
- Assembly of tight tolerance components
- Leak testing
- Test stands
- Casting operations
- Block machining
- Valve body machining
- Pump housing machining
- Control Modules
- Software
- Computer Aided
- Cyber Security

- **Machine Tool Technology**
- **Welding Technology**
- **Industrial Technology**
- **Smart Manufacturing/Digital Integration**

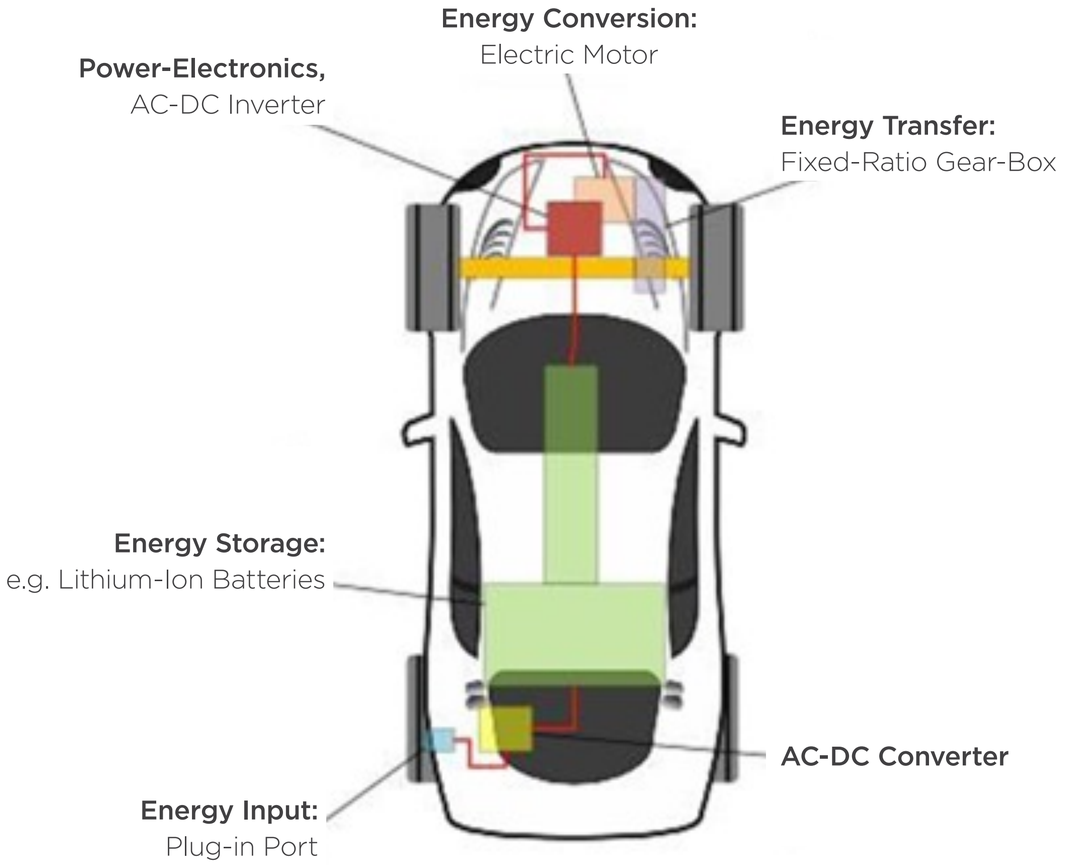

Image Source: EVP Commission

Recent successes can be used as catapults to planning for the future of EV work, resulting in **$6.9 Billion in investment in 2022 to date** with an impending $2 Billion project in negotiations.

Emerging Ecosystem

Anderson: EnerDel
Bedford: General Motors
Columbus: Cummins
Fishers: ReElement
Fort Wayne: General Motors
Greensburg: Honda and LG
Indianapolis: Allison Transmission
Indianapolis: Cirba Solutions
Indianapolis: EnPower
Kokomo: Green Cubes
Kokomo: Stellantis and Samsung SDI JV
Marion: General Motors
Newberry: Battery Innovation Center
Newberry: Underwriters Laboratory (UL BEST)
Princeton: Toyota
South Bend: Former AM General
Union City: Workhorse Motor Works
Indiana (location TBD): InoBat and Ideanomics

The EVP Commission believes the path forward is paved with

- Driving innovation to boost business and industry supply chain development
- Investing in robust education and workforce training assets for catalyst projects
- Nurturing collaboration and engagement with industry stakeholders
- Embracing and pursuing the opportunity for enhanced EV supply chain business attraction

Electric Vehicle Product Commission

Stay Live and Up to Date on the EV Products Commissions work at

www.iedc.in.gov/program/electric-vehicle-product-commission/overview