

# Electric Revolution

Georgia is quickly becoming the hub for a completely new automotive industry.

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Many More Jobs: Jerry Silvio, chair of the Joint Development Authority of Jasper, Morgan, Newton and Walton counties, with a Rivian truck. Beyond the tree line is where the Rivian plant is set to be constructed. Photo: Gregg McGough

A remarkable and deliberate shift occurred in Georgia's automotive industry over the past five years and accelerated in the last 24 months. Seemingly almost out of nowhere, an entire electric vehicle (EV) ecosystem began to flourish.

Since 2020, the state has announced more than 20 EV-related projects, from original equipment manufacturers (OEMs) to suppliers that include lithium-ion battery (LIB) manufacturers and recyclers, green hydrogen producers, providers of EV charging infrastructure solutions, seat manufacturers and engine parts providers. All told, these projects will invest more than \$13.54 billion in the state and create close to 18,000 jobs.

This incredible growth can be traced to the state's response to the OEMs' ambitious electrification timelines, says Pat Wilson, commissioner of Georgia's Department of Economic Development. "Manufacturers are setting goals," says Wilson. "Cadillac being 100% electric by 2028, Kia introducing a new model EV every year for the next nine years, Ford with the [electric] F-150 Lightning – all these companies set these aggressive goals and then you have the supply chain that generally did not exist in the U.S."

More than 75% of the nation's lithium-ion battery supply comes from China, along with more than 80% of anodes and more than 55% of cathodes – essential components in battery construction. "This entire value chain of electrification doesn't exist in the U.S.," Wilson says. "To meet these electrified goals of the OEMs, we're having to start from scratch and create the entire supply chain." It helps that Georgia stepped up and continually invested in its logistics network – interstates, rail and ports – so both the physical infrastructure and process efficiencies combined to create a first-class business location.

"The Port of Savannah is the most efficient port in the U.S.," says Wilson. "Getting your raw materials into the port and out of your plant in the form of a product is going to be quicker in Georgia than it is many other places." And he points to investments in workforce development, as well, especially the state's innovative Quick Start program.

"All things being equal, if you've got a great site, a great business climate, what puts you over the top will be workforce – and not only being able to find the people, but train the people," Wilson says. "Georgia started the Quick Start program in 1968. To have the foresight to say we're going to listen to the business community to [train] Georgians for the jobs that are not only available today but will be available in the future, that was very forward-thinking. It's the secret sauce that's given us the leg up in many instances."

That leg up has led to some exciting wins. The ventures getting the most buzz right now are the two EV manufacturing plants: Hyundai Motor Group announced in May that it will open a \$5.54 billion facility dedicated to making EV cars and batteries at the 2,923-acre Bryan County megasite. Combined with non-affiliated Hyundai suppliers that are expected to invest another \$1 billion, 8,100 jobs will be created in coastal Georgia. And in the much-discussed December 2021 announcement, EV maker Rivian Inc. revealed its plans to invest \$5 billion to build a manufacturing facility at the 2,000-acre East Atlanta megasite (Stanton Springs North) developed by the Joint Development Authority (JDA) of Jasper, Morgan, Newton and Walton counties. The Rivian project will include technology centers to support company R&D.

For years, the JDA had hoped for a high-tech or pharmaceutical firm to land in its site along the I-20 corridor.

“My reaction was that we just rang the gold bell,” says Jerry Silvio, chair of the JDA. “This investment means a lot of jobs. I believe it’s 7,500 direct and about 8,000 or so indirect [jobs] that would come from first- and second-tier suppliers to the campus.”

According to economic modeling projections done by the state, those 15,000-plus jobs will generate more than \$1 billion in labor income annually.

“That will have meaning,” Silvio says. “As those dollars ripple through the community, or the region or the state, it’s going to create or support other jobs.”

Rivian received nearly \$1.5 billion in tax breaks and other incentives including free land and improvements, substantial highway improvements, a Quick Start training center and customized recruitment and training programs. Many of the inducements are contingent on the company creating 80% of the promised jobs and investment by the end of 2028 and maintaining them through 2047 or being subject to claw-back provisions.

The project sparked its share of controversy. A vocal group raised a number of concerns, from loss of quality of life to environmental issues. But the deal moved forward. Silvio says the local community will begin reaping the benefits of Rivian’s investment as early as 2023 in the form of payment in lieu of taxes (PILOT) fees generated for 25 years. After that time, the company will pay taxes based on the value of its real and personal property.

“[Rivian’s] first payment of \$1.5 million in 2023 is 18 times the existing taxes on that same 2,000 acres,” Silvio says. “There’s an intergovernmental agreement between the four counties and Social Circle, where the money is divided up and distributed between the entities based on their original investment in the development.” On average, about 60% of those funds will be redistributed to the local school systems, he says.

He points to the experience in Burke County with the construction of Plant Vogtle. Although the nuclear power plant is six years behind schedule and costs have increased from \$14 billion to \$30 billion, Silvio notes that Burke County has realized benefits. “When they started receiving the money paid by Southern Company, suddenly there was a bypass road put in, new schools, a fire station,” Silvio says. “They got the necessities of life updated or added to their community profile. I suspect that similar results will happen in these four counties, and that’s a good thing.”

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## Building Batteries

One of the first big automotive electrification players wasn’t an OEM at all. SK Battery America finalized its \$1.67 billion deal to build two EV battery production plants in Jackson County in 2019. The company invested an additional \$940 million in 2020 and began production in January 2022.

“SK views itself as a foundational member of Georgia’s fast-growing EV ecosystem,” says Timothy Jeong, CEO of SK Battery America. “SK On, the headquarters of SK Battery America, is now one of the top five makers of EV batteries in the world, and SK Battery America, located in Georgia, is playing a critical role in the electrification of America.”

He says the state’s location, logistics network and support from technical colleges and universities made Georgia an appealing location.

“SK Battery America is in the early stages of a research project with Georgia Tech to advance all-solid-state batteries – a type of battery that could lead to even longer driving ranges in a more compact battery,” Jeong says. “As the EV ecosystem evolves, we look forward to exploring other collaborations where we can combine our expertise across U.S. and Korea teams.”

Cal Wray, president of Augusta Economic Development Authority, says German-owned Aurubis, building a \$340 million multimetal smelter and recycling plant, was similarly drawn to the workforce offered by the Augusta region.

“We have one of the largest technical colleges in the country – Augusta Technical College [ATC] has roughly 4,000 students,” says Wray. “You have a great economic development mindset at ATC and a new president who has a manufacturing mindset. And you have a community of manufacturers in Augusta.”

Many of the metals reclaimed from circuit boards – primarily copper – are used in EV manufacturing. The Aurubis project is set to create 125 middle-skill jobs in phase 1, with more expected over time. The company broke ground in mid-June and should be operational in the first quarter of 2024.

A big piece of the EV ecosystem involves reducing, reusing and recycling materials as much as is possible. Enter Ascend Elements, investing \$43 million to open its first commercial-scale battery-recycling plant in Covington, east of Atlanta. The project has the capacity to process 30,000 metric tons of lithium-ion batteries and scrap annually – the equivalent of 70,000 vehicle batteries each year. The batteries will be recycled into a powdery substance called “black mass,” which contains the lithium, cobalt, nickel, manganese and graphite to make new batteries.

“These active materials are really the heart of lithium-ion batteries,” says Roger Lin, vice president of global marketing and government relations at Ascend Elements. “They are the most valuable materials in the lithium-ion battery supply chain, and our process takes that black mass and turns it back into active material more efficiently than any other technology in operation today.” The materials Ascend creates go directly back into lithium-ion battery gigafactories, which produce batteries on a massive scale. “It really is a closing of the loop. We’re taking it from grave to cradle, so to speak,” he says.

Ascend will process battery scrap from SK Battery and may soon find itself with other customers as well.

“We are talking to all major auto makers and battery manufacturers in the country, especially those in the Southeast that have operations around Covington,” says Lin. “We’re confident that

the proximity to those facilities [and] the efficiency of our processes will make them part of our supply chain in the future.”

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## Crucial Charging Capabilities

One thing is certain: All the EV investment in the world is useless without the infrastructure to charge vehicles. Limited public and private

charging infrastructure is available statewide but in November 2021, Congress passed the Bipartisan Infrastructure Law which included \$7.5 billion to fund the National Electric Vehicle Infrastructure (NEVI) Formula Program. These funds will assist states in creating a network of EV charging stations along designated “alternative fuel corridors,” particularly along the interstate highway system. Each state must submit an EV infrastructure deployment plan before they can access their share of NEVI funds. State plans are due by August 1, 2022.

“Out of the \$5 billion, we were allocated about \$135 million,” says Jannine Miller, director of planning for the Georgia Department of Transportation (GDOT) and leader of Georgia’s EV infrastructure deployment plan effort.

The federal regulations call for charging infrastructure every 50 miles, to include four high-powered (150 kilowatt) charging stations capable of operating simultaneously, with stations no more than one mile off the access point or the interstate. They highlight the advisability of public-private partnerships.

“These are sensible regulations,” she says. “They match up well to the market – where customers will want to access charging and where small businesses want to provide DC fast charging [the highest level of EV charging].”

How will this work? Miller and the planners still aren’t sure yet. Hypothetically, they could go to an exit in Dublin off I-16 where charging capability might exist (say, at a restaurant or gas station) that doesn’t meet the federal guidelines and bring in a utility partner to upgrade the charging infrastructure.

“We would partner with them to deploy the dollars,” she says. “It’s likely they’ve never dealt with federal money, [while] that’s our expertise.”

Issues ranging from cybersecurity to who maintains the charging infrastructure must be worked out. Miller’s list of stakeholders is 85-deep, and they are being consulted as the plan is being developed. “There is much to be determined,” she says. “We’ll know a lot more five months from now.”

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## Infrastructure Innovation

Innovation is a critical component of the EV ecosystem. One reason Georgia is on the forefront of the EV industry is because places like The Ray in Newnan and the Curiosity Lab in Peachtree Corners are hubs for electrification research.

The Ray recently released a data-driven analysis of truck movement patterns that it hopes will assist state DOTs, including Georgia's, with developing EV infrastructure plans. The report used in-cab data gathered by following truck movements along two routes: I-20 from Dallas, Texas, to Atlanta and from Savannah to the Atlanta airport.

"We need to be planning infrastructure for medium and heavy-duty trucks that will be either battery electric or hydrogen fuel cell," says Allie Kelly, executive director of The Ray. "We need to be thinking about high-powered, EV charging stations for battery-electric, heavy-duty [vehicles] and we need to be thinking about hydrogen infrastructure to supply fueling stations for the future hydrogen fuel cell trucks." Hydrogen fuel cell trucks run on electricity created by combining hydrogen and oxygen. They are zero-emission vehicles, emitting only warm air and water vapor.

With 16 available chargers in its town center, Peachtree Corners has the largest DC fast-charging site for electric vehicles in metro Atlanta. In March, the Curiosity Lab, the city-owned and operated technology lab, received a \$495,000 federal grant to build a mobility hub that will serve as a testing location for EV infrastructure.

"Our place is a facilitator of infrastructure," says Brandon Branham, assistant city manager and chief technology officer of Peachtree Corners and director of the Curiosity Lab. "We're trying to stay ahead of the movement so that as consumers do adopt [electric vehicles], Peachtree Corners is EV friendly."

The message is clear: EV industry watchers should fasten their seatbelts. Especially in Georgia.

"We're seeing a major shift, a literal once-a-generation shift, in transportation technology," says James Chen, vice president of public policy for Rivian. "Up until now, technology improvements have been evolutionary and built on the same technology – the internal combustion engine – [for] gas-powered vehicles. For the first time, we're seeing a complete paradigm shift in how we're looking at technology in the transportation arena. We're going to a completely new power-train structure. This is not evolutionary, this is revolutionary. Because we are shifting an entire industry, the real benefit to Georgia is being on the forefront of this – in terms of jobs, of being seen as a technology leader, bringing up the economy of the entire state. It's bringing high-tech, cutting-edge jobs for this century and the one beyond."

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## EV Projects in Georgia

Since 2020 These projects account for more than \$13.54 billion in investment and the creation of nearly 18,000 jobs.

- Hyundai Sungwoo Solite

- Kubota Manufacturing of America Corp.
- EnChem Co Ltd
- SK Innovation (Now “SK On”)
- GEDIA
- EcoPro
- Teklas
- Kirchhoff Automotive
- Duckyang
- LioChem
- Rivian
- Wonbang Tech
- Hyundai TranSys Seating Systems
- PLUG POWER
- Aurubis Stolberg GmbH & Co. KG
- Ascend Elements
- Aspen Aerogels, Inc.
- Hyundai Motor Group

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