



**GM'S ALL-ELECTRIC FUTURE, POWERED BY ULTIUM BATTERIES:**  
**How our all-new modular EV architecture and Ultium battery system**  
**will deliver a full lineup of EVs for all customers.**



**General Motors will help put everyone in an EV with its unique combination of cutting-edge technology, manufacturing experience and scale.**

- Vehicles built from the Ultium system could offer GM-estimated driving ranges of up to 400 miles on a full charge with 0 to 60 mph<sup>1</sup> acceleration as low as 3.0 seconds and have battery options from 50 to 200 kilowatt hours.
- GM's Ultium cells, arranged in different combinations of flexible modules and battery packs, can provide the energy for every segment on the road today, from performance vehicles to work trucks, with less than one quarter of the propulsion combinations currently used for internal combustion engines.
- Drive units mostly designed and manufactured in-house will support front-wheel, rear-wheel, all-wheel and performance all-wheel drive applications.

<sup>1</sup>GM estimate

**Space-efficient packaging that maximizes room for passengers and cargo.**

- GM’s new Ultium batteries are expected to have some of the highest nickel and lowest cobalt content in a large format pouch cell.
- GM’s industry-first almost completely wireless battery management system reduces the physical wires between battery modules by up to 90 percent for production electric vehicles.
- GM’s joint venture with LG Chem to develop and mass-produce battery cells is expected to drive cell costs below \$100 per kWh.

**A unique, low-cost battery chemistry and easy-to-manufacture design.**

- In North America, GM EVs will be powered by rectangular, pouch-style battery packs that are simple, lightweight and space-efficient.
- GM’s ability to stack long pouch cells vertically or horizontally in modules is unique in the industry.

It allows for a lower cabin floor where it matters most, yielding more interior room than some comparable EVs that use cylindrical cells in battery packs with a uniform height.

- The battery pack allows engineers to deliver vehicles with an optimized weight distribution and a lower center of gravity for outstanding ride and handling.

**A unique manufacturing partnership.**

- GM EV battery cells will be mass-produced at a \$2.3 billion joint venture plant that GM and LG Chem are constructing in Lordstown, Ohio.
- The plant, which will be about the size of 30 football fields, will have annual capacity of more than 30 gigawatt hours and room for expansion.
- The joint venture is expected to create more than 1,100 new, good-paying jobs.

**New technologies under development to improve charging, cycling, range, cost and battery life include:**



Our Ultium battery cells feature a state-of-the-art Nickel Cobalt Manganese Aluminum (NCMA) chemistry, which was designed to reduce the cobalt content in our batteries by more than 70 percent.



We have enabled the reuse or recycling of 100 percent of returned batteries, and we will keep doing so.



We apply a comprehensive battery and high-voltage safety strategy and development process to every EV we make, supported by a dedicated high-voltage battery safety team.



GM will be the first automaker to use an almost completely wireless battery management system. The system will be a primary driver of GM’s ability to ultimately power many different types of EVs from a common set of battery components.