

General Motors: Which Road to Electrification?

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A strategy case for MBA students and working professionals

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The choice

In late January 2024, General Motors (GM) was investing in a broad battery-electric vehicle (BEV) portfolio and its Ultium architecture while continuing to sell what the company described as profitable internal-combustion trucks and SUVs. Its public strategy emphasized an all-electric future. Yet its latest U.S. sales release showed that the Chevrolet Bolt EV and EUV still accounted for most of GM's reported electric-vehicle volume, even as the company prepared to scale newer models.

For this case, assume you are advising a hypothetical GM strategy committee preparing its next product-planning cycle. GM has not announced or disclosed that it is considering a U.S. hybrid or plug-in-hybrid program. Your assignment is to decide what strategic direction to recommend: keep the transition centered on Ultium BEVs, or authorize a targeted evaluation of conventional hybrids (HEVs) and/or plug-in hybrids (PHEVs) as a possible bridge. If you recommend an evaluation or program, specify where to focus, what must be learned before committing, and how to preserve the ability to change course. The decision is hypothetical; no private meeting, proposal, or management intention is implied.

This case uses only information public by **29 January 2024, 11:59 p.m. ET**. GM's 30 January 2024 earnings release and all later information are outside the case.

A portfolio in transition

GM described Ultium as a dedicated EV propulsion architecture intended to support multiple brands, vehicle sizes and styles. In November 2022, the company set a target of more than one million units of annual North American EV capacity in 2025 and a low-to-mid-single-digit adjusted EBIT margin for its North American EV portfolio in 2025 before clean-energy credits. These were management targets, not achieved production capacity or results, and they did not disclose the economics of any individual vehicle.

In its 2023 U.S. sales presentation, GM reported 75,883 EV sales, 93% above 2022. The Chevrolet Bolt EV/EUV accounted for 62,045 of those sales, up 63%. Subtracting Bolt volume from total EV sales gives **13,838 other GM EVs implied by subtraction**. GM did not report that residual as Ultium sales, and it should not be treated as a precise measure of deliveries from a particular architecture. The sales figures are units, not orders, revenue, profit, or evidence of the reasons a customer chose one vehicle.

GM's January 2024 presentation listed plans to scale several newer BEVs, including the Cadillac LYRIQ, Chevrolet Blazer EV and Silverado EV, GMC HUMMER EV, and upcoming Equinox EV and Escalade IQ. Execution would require investment and attention across product launches, battery supply, manufacturing and software. A broader portfolio might expand customer choice and use cases; it could also increase coordination demands while the new architecture scaled.

The Bolt created a less binary question. In July 2023, GM announced that it would bring back a next-generation Bolt using Ultium and Ultifi technologies. The company said this approach would require significantly lower engineering expense and capital investment than an all-new program; it did not disclose the amount, timing or full vehicle details. GM executives also made customer-loyalty and conquest claims in the release. Those statements are attributed management claims, not independent demand evidence. The announcement suggests that product continuity and platform transition could coexist, but it says nothing about an HEV or PHEV plan.

Competing market signals

The vehicle market did not offer a simple answer. Ford reported 34,861 U.S. hybrid sales in the third quarter of 2023, up 41.4%, and 20,962 BEV sales, up 14.8%, calling both records. Toyota's public strategy described a region-specific, multi-pathway approach while also planning substantial next-generation BEV investment. Toyota North America reported 657,327 "electrified" vehicles in 2023, a category that includes hybrids, plug-in hybrids and BEVs. Those figures cannot be compared directly with GM's EV-only total, and competitor volumes do not reveal relative profitability or whether hybrid sales displaced another model.

GM's own disclosure gave reasons to consider more than one explanation for the sales mix. The company described Ultium models as launching or scaling and cited supply-chain and logistics challenges as manageable in its third-quarter filing. It also characterized pricing and demand as strong. These management statements do not identify whether product availability, price, charging access, customer preferences, or other factors explain the mix. Publicly available data do not provide GM-specific model margins, demand curves, order cancellations, hybrid-conversion costs, or the engineering and plant capacity a second powertrain would require.

What research can-and cannot-say

Three studies help organize the decision, but none forecasts GM's returns.

Gallagher and Muehlegger (2011) study quarterly sales for 11 hybrid models across U.S. states from 2000 through 2006. Their fixed-effects analysis relates hybrid adoption to tax incentives, fuel prices, fuel savings and other factors. A \$1,000 state tax incentive is associated with about 5% higher hybrid sales in their preferred specification. The authors test alternative measures and samples, including periods affected by production constraints. Their study concerns early hybrids and historical policy settings; its estimate is not a GM price elasticity, launch forecast, or evidence of profitability.

Springel (2021) models Norwegian BEV purchases and charging-station entry from 2010 to 2015. Using a structural demand and station-entry model estimated jointly, the study finds that vehicle adoption and charging availability reinforce one another. In its Norway-specific counterfactual, an initial dollar of charging-station subsidy generated 2.16 times as many additional BEV purchases as a dollar of vehicle-price subsidy; the relative effectiveness changed as spending increased. The model assumes, among other things, contemporaneous consumer response to the charging network and high/full subsidy pass-through, and its counterfactual

excludes manufacturer product responses. It is not a GM demand or margin estimate, and it does not compare GM hybrids with BEVs.

Bohnsack and coauthors (2020) use a qualitative archival study of 13 incumbent automakers from 2006 to 2015. They describe regulation and broader institutional pressures as shaping incumbent EV activity, while firms differed in their motives and commitments. The work helps frame both the strategic value and potential rigidity of a technology commitment. It relies on public and retrospective evidence and does not test which 2024 GM product portfolio creates more value.

Regulation and operating context

At the cutoff, two U.S. regulatory horizons differed in status. NHTSA's Corporate Average Fuel Economy standards for model years 2024-2026 were final. EPA had proposed performance-based emissions standards for model year 2027 and later vehicles. EPA's analysis showed one modeled compliance pathway in which EVs could represent 67% of light-duty and 46% of medium-duty sales in 2032. Those percentages were agency scenario projections, not a required GM sales mix, a final rule, or a customer-demand forecast. A portfolio decision therefore faced both near-term requirements and uncertainty about future standards and compliance options.

Exhibits

Exhibit 1. GM-reported U.S. vehicle sales

Measure	2023	Change vs. 2022	Status
Total GM U.S. vehicle sales	2,594,698	+14.1%	Reported by GM
Total GM EV sales	75,883	+93%	Reported by GM
Chevrolet Bolt EV/EUV sales	62,045	+63%	Reported by GM
Other GM EVs	13,838	-	Derived: total EVs less Bolt EV/EUV; not a separately reported Ultium figure

Sources: GM, “U.S. Q4 and Full-Year Sales: GM Delivers Another Year of Firsts,” 3 Jan 2024, release and presentation. The sales totals are deliveries as reported by GM; they do not disclose customer funnel, model profitability, or powertrain-specific margins.

Exhibit 2. Competitor evidence available by the cutoff

Evidence	What it shows	What it does not show
Ford Q3 2023 U.S. hybrid sales: 34,861 (+41.4%); BEV sales: 20,962 (+14.8%)	Hybrids and BEVs both had material sales in Ford's portfolio	Comparative contribution, substitution, or GM's attainable sales
Toyota 2023 U.S. “electrified” sales: 657,327	Toyota sold vehicles across a broader electrified category	A like-for-like comparison: the category includes HEV/PHEV/BEV, unlike GM's EV-only total
Toyota's stated regional multi-pathway strategy and BEV plans	A rival publicly described multiple technology pathways alongside BEV investment	Proof that Toyota's economics, capabilities or strategy transfer to GM

Exhibit 3. Decision alternatives to evaluate

1. **Concentrate on Ultium BEVs:** prioritize product launches, scale, battery supply, manufacturing execution and charging-related customer barriers; continue the already disclosed ICE transition portfolio.
2. **Evaluate a focused HEV option:** investigate one or more segments/use cases where a non-plug-in hybrid might meet customer or compliance needs while BEVs scale.
3. **Evaluate a focused PHEV option:** investigate segments where electric driving and liquid-fuel range might complement one another, while accounting for charging needs and dual-powertrain complexity.

Options 2 and 3 are hypothetical alternatives for analysis, not programs GM disclosed at the cutoff. The case provides no contract terms, engineering cost, launch schedule, volume target, customer response or margin for either.

Assignment

Prepare a recommendation to the hypothetical strategy committee. State whether GM should maintain a BEV-centered plan or authorize further HEV/PHEV evaluation, and explain:

1. Which evidence best supports your view, and which evidence remains ambiguous?
2. What is the likely strategic benefit and cost of preserving a second powertrain path while Ultium scales?
3. Which segment, customer use case, or geography-if any-should be evaluated first, and why?
4. What company-specific evidence would you require before moving from evaluation to program commitment?
5. What staged decision gates would preserve flexibility without assuming undisclosed economics?

Sources

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