# Stellantis and Factorial Energy validate next-gen solid-state battery promising breakthrough EV performance



Automaker Stellantis and Massachusetts-based startup Factorial Energy have taken a significant leap forward in electric vehicle (EV) technology with the validation of a next-generation solid-state battery. This breakthrough is poised to enhance the industry's performance metrics significantly, boasting qualities that Stellantis describes as capable of unlocking "absurd levels of performance." The announcement follows Stellantis's $75 million investment in Factorial in 2021 and marks a pivotal moment in their collaborative efforts.

The recent advancements in solid-state batteries reflect a growing consensus view that this technology could be the linchpin for future electric vehicle performance and safety. Unlike conventional lithium-ion batteries, which use liquid electrolytes, solid-state batteries employ solid or gel-like materials that confer enhanced stability, reducing the risk of short circuits or dangerous overheating. The validated cells from Stellantis possess an energy density rated at 375 watt-hours per kilogram, eclipsing the industry average of 200-300 Wh/kg. This superior performance not only promises faster charging times—up to 90% in just 18 minutes—but also advantages in energy retention, particularly in colder climates, as noted in the official announcement.

The implications of this technology extend well beyond mere performance metrics. An essential characteristic of the new polymer-based design focuses on stabilising the battery's anode, which is crucial for efficiency during charging. As CEO of Factorial Energy, Siyu Huang, observed, the lighter battery packs could save up to 200 pounds per vehicle—all of which can translate into potential weight reductions of up to 2,000 pounds when adjusted for structural support and cooling enhancements. A lighter vehicle is inherently more efficient, allowing for increased range and reduced operational costs for consumers.

While the benefits are substantial, the path to widespread adoption is tempered by challenges. Lack of economies of scale means solid-state batteries currently carry a higher production cost. However, Huang expressed cautious optimism that scaling operations could drive prices down, making these innovative batteries viable for mass production. Stellantis aims to integrate this technology into a demonstration fleet of its Dodge Charger Daytona by 2026, which signals serious intent to move from validation to real-world applications.

Stellantis is not alone in its pursuit of solid-state technology. Other automotive giants such as Honda have disclosed plans to explore similar advancements, mentioning a focus on doubling EV driving ranges through solid-state batteries by the late 2020s. Honda's president of R&D highlighted that this technology could fundamentally change the EV landscape, potentially yielding an increase in driving range of over 2.5 times by 2040. Meanwhile, Toyota is collaborating with Idemitsu to develop stable, crack-resistant solid-state batteries, targeting commercialisation by 2027 or 2028. Such partnerships signify a broader industry trend towards innovation in the battery arena, underlining that even as companies race for supremacy, collaboration will be key to overcoming engineering hurdles.

The competitive landscape is indeed intensifying, with the market seeing increasing investments targeting battery technology. For instance, Idemitsu plans to construct a lithium sulphide plant that will support the next generation of Toyota’s EVs, which, alongside other collaborations, aims at reducing battery costs to rival traditional lithium-ion alternatives.

In addition to manufacturers’ pursuits, the enthusiastic embrace of hydrogen energy and various alternative technologies at events like CES 2024 reveals that the automotive industry is exploring a multi-faceted approach to cleaner transportation. Automakers are not merely awaiting the solid-state battery revolution; they are concurrently investing in other emerging technologies to ensure that they remain competitive.

In summary, the partnership between Stellantis and Factorial Energy represents a significant milestone in the shift towards more advanced and efficient electric vehicles. The advancements in solid-state battery technology promise a future where electric vehicles are not only more efficient but also safer and more accessible to consumers. As other automotive giants engage in similar pursuits, it becomes increasingly clear that the road to the next generation of electric vehicles will be paved with collaboration, investment, and a shared commitment to innovation that will define the industry for years to come.

## Reference Map:

* Paragraph 1 – [[1]](https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/), [[2]](https://www.stellantis.com/en/news/press-releases/2025/april/stellantis-and-factorial-energy-reach-key-milestone-in-solid-state-battery-development)
* Paragraph 2 – [[1]](https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/), [[3]](https://www.reuters.com/business/autos-transportation/honda-hopes-double-ev-driving-range-with-solid-state-batteries-rd-chief-says-2024-11-21/)
* Paragraph 3 – [[1]](https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/), [[4]](https://apnews.com/article/25a2e066e568c1dd15cbdf007d292c74), [[5]](https://www.reuters.com/business/energy/japans-idemitsu-build-lithium-sulphide-plant-help-support-toyotas-ev-plans-2025-02-27/)
* Paragraph 4 – [[1]](https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/), [[6]](https://apnews.com/article/7d825a33d810a9b29ebf260404fe81cf)
* Paragraph 5 – [[1]](https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/), [[7]](https://www.ft.com/content/2c6a71d3-522b-46d5-8897-d88a664b9c7a)

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## Bibliography

1. <https://batteriesnews.com/startup-unveils-next-gen-battery-breakthrough-that-could-take-electric-vehicles-to-next-level-absurd-levels-of-performance/> - Please view link - unable to able to access data
2. <https://www.stellantis.com/en/news/press-releases/2025/april/stellantis-and-factorial-energy-reach-key-milestone-in-solid-state-battery-development> - Stellantis and Factorial Energy have successfully validated automotive-sized solid-state battery cells with an energy density of 375Wh/kg, marking a significant step towards commercial use. The FEST® technology enables fast charging from 15% to 90% in 18 minutes and operates in temperatures from -30°C to 45°C. Stellantis plans to incorporate these batteries into a demonstration fleet by 2026, aiming to enhance vehicle performance and efficiency.
3. <https://www.reuters.com/business/autos-transportation/honda-hopes-double-ev-driving-range-with-solid-state-batteries-rd-chief-says-2024-11-21/> - Honda Motor plans to double the driving range of its electric vehicles (EVs) by the late 2020s through the use of all-solid-state batteries, a new technology currently in development. These batteries are expected to significantly improve EV performance by the end of the decade and further increase driving range by over 2.5 times by the 2040s. Honda's president of R&D, Keiji Otsu, highlighted the potential of this battery technology as a transformative element for the EV industry. The company is investing 43 billion yen ($277 million) in a pilot production line in Tochigi, Japan, with support from government subsidies. This new battery technology aims to reduce battery size by 50%, weight by 35%, and cost by 25% over the next five years. Honda targets producing over 2 million EVs annually by 2030, with an objective of making 40% of its global sales from EVs and fuel cell vehicles by 2030, and 100% by 2040. Collaborations with other automakers, such as strategic partner Nissan, are being considered to advance this technology.
4. <https://apnews.com/article/25a2e066e568c1dd15cbdf007d292c74> - Toyota and Idemitsu announced a collaboration to develop and mass produce solid-state batteries, aiming for commercialization by 2027 or 2028. This partnership is significant for Toyota as it strives to enhance its electric vehicle (EV) lineup and compete with industry leaders like Tesla and BYD. Toyota plans to integrate Idemitsu's expertise in materials to create stable and crack-resistant batteries. The new batteries promise increased safety and performance over current lithium-ion batteries, which are prone to fires. The companies will focus on the development of sulfide solid electrolytes suitable for mass production. Toyota aims to offer EVs with significantly reduced charging times and plans to deliver 1.5 million EVs by expanding its lineup by 2026. This alliance represents a critical step towards advancing EV technology and strengthening cooperation between the automotive and energy sectors.
5. <https://www.reuters.com/business/energy/japans-idemitsu-build-lithium-sulphide-plant-help-support-toyotas-ev-plans-2025-02-27/> - Japan's second-largest oil refiner, Idemitsu Kosan, plans to construct a large-scale lithium sulphide plant at its Chiba refinery near Tokyo to support Toyota Motor's next-generation electric vehicle (EV) goals. This strategic move will assist in the development and commercialisation of all-solid-state batteries, which are integral for making EVs safer, more affordable, and with longer driving ranges. The plant, targeted for completion by June 2027, will cost an estimated 21.3 billion yen ($143 million) and have an annual production capacity sufficient for 50,000-60,000 EVs. Idemitsu further aims to initiate a pilot factory for solid electrolyte by the fiscal year 2025-end and ensure stable lithium supplies from overseas. The company is committed to reducing solid electrolyte costs to match those of traditional lithium-ion batteries and initially plans to supply Toyota before extending to other customers.
6. <https://apnews.com/article/7d825a33d810a9b29ebf260404fe81cf> - At CES 2024 in Las Vegas, hydrogen energy received renewed attention alongside electric vehicles. Hyundai emphasized its commitment to hydrogen-powered fuel cells and the broader goal of fostering a hydrogen society by expanding into energy production, storage, and transportation. Bosch Mobility also intends to introduce a hydrogen combustion engine this year. Both companies are encouraged by substantial investments, including $7 billion from the U.S. government for hydrogen infrastructure development. In the realm of electric vehicles, Honda unveiled its "Zero Series" concept vehicles with a focus on making EVs thin, light, and efficient. Kia introduced versatile electric vans set for production in 2025. Vietnam's VinFast presented a new electric truck concept. Additionally, the latest advancements in solid-state battery technology were discussed, with Honda planning to incorporate these batteries into its vehicles by the late 2020s. Solid-state batteries promise higher energy density, safety, and improved fuel economy. Mercedes-Benz and other automakers also showcased updates to in-car technology and partnerships with Google for integrated apps.
7. <https://www.ft.com/content/2c6a71d3-522b-46d5-8897-d88a664b9c7a> - US battery maker QuantumScape's shares surged by 52% after announcing a $130 million technology royalty payment from Volkswagen, suggesting hope for a resurgence in electric vehicle (EV) sales. Despite a slowdown in EV demand and increased competition from Chinese suppliers, the deal with Volkswagen provides significant capital for QuantumScape. The company's solid-state batteries promise longer ranges and faster charging times compared to conventional lithium-ion batteries. North America's EV sales grew by 10% in the beginning of 2024, with Ford reporting a 72% increase, highlighting ongoing interest in clean cars. However, battery makers' valuations have fallen since 2021, creating challenges for the industry despite continued optimism about the future of electric transportation.