

# **Toyota solid state battery energy density**





## Overview

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The bulk of Toyota's new focus is on achieving improvements to lithium-ion batteries in the energy density, cost competitiveness and charging speeds. Their new Performance lithium-ion batteries will achieve about a 491-mile range, and their future High-Performance lithium-ion batteries will reach.

Reports revealed that when incorporated into a battery, it's expected to have 2x more energy density than lithium-ion batteries. The cathode material for all-solid-state fluoride-ion batteries (FIBs) delivers a reversible capacity of approximately 550 mAh/g. That's more than double the 120-250.

EV range doubled: Toyota's solid-state battery cathode beats lithium in energy density Researchers focused on copper nitride ( $\text{Cu}_3\text{N}$ ) as a cathode material for all-solid-state fluoride-ion batteries. Researchers, in collaboration with Toyota Motor Corporation, have worked on a new type of cathode.

According to a report published in Jan 2025, researchers, in collaboration with Toyota, found that using a new type of cathode material, copper nitride ( $\text{Cu}_3\text{N}$ ), for all-solid-state fluoride-ion batteries (FIBs), could increase the EV range by twofold.  $\text{Cu}_3\text{N}$  exhibits a high reversible capacity of.

Solid state batteries promise greater energy density, higher electric range, and faster charging that puts refueling time on-par with a gas-powered vehicle. Scientists, researchers, and automakers have spent decades trying to crack the code on their commercialization, but so far no EVs have them.



In a groundbreaking collaboration with Toyota Motor Corporation, researchers have unveiled a revolutionary cathode material for all-solid-state fluoride-ion batteries, promising to double the energy density of electric vehicle batteries and potentially transform the future of sustainable. Is Toyota launching a solid-state battery technology for electric vehicles?

Toyota has unveiled groundbreaking solid-state battery technology for electric vehicles, offering higher energy density, compact design, and faster charging times, potentially revolutionizing the EV landscape.

Can Toyota produce solid-state batteries at scale?

Toyota is collaborating with Panasonic through their joint venture, Prime Planet Energy & Solutions, to produce solid-state batteries at scale. However, challenges remain: Material Sourcing: Solid electrolytes are difficult and expensive to produce. Durability Testing: Solid-state cells must withstand real-world road and climate conditions.

Will Toyota make a solid state battery in 2027?

Toyota's 745-mile Solid-state Batteries: Everything We Know So Far Toyota has plans to bring 745-900 mile solid-state batteries to market by 2027. The company has filed over 1,000 solid-state battery patents. Toyota has been quietly working on developing and perfecting a solid-state battery for its fleet of upcoming EVs for many years.

Will Toyota EVs have solid-state batteries?

Toyota envisions EVs equipped with solid-state batteries boasting ranges of over 700 miles and rapid 10-minute charging. Safety also improves, as solid-state batteries lack flammable liquid components. But Toyota isn't alone in this race.

Does Toyota have a solid state battery?

Toyota is one of many automakers trying to commercialize solid state batteries. In November 2022, Honda announced a new polymer fabric that would get around the longevity problem. It plans to release an EV with a solid state battery by the end of the decade.

How many solid-state battery patents does Toyota have?

Toyota holds far more solid-state battery patents than other automakers. Over



the past three years, Toyota registered over 8,000 solid-state battery patents. Many are assigned jointly with Idemitsu. Hyundai, Kia and Honda are actively researching solid-state battery innovation.



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### 2x EV range: Toyota's solid-state battery cathode beats lithium energy

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### Toyota Touts Solid State EVs With 932-Mile Range, 10-Minute

Solid state batteries promise greater energy density, higher electric range, and faster charging that puts refueling time on-par with a gas-powered vehicle.



### [Toyota Solid-State Battery Cars: 2025 Rollout Plan](#)

What Are Solid-State Batteries? Solid-state batteries replace the liquid or gel-form electrolyte found in traditional lithium-ion batteries with a solid electrolyte. This advancement brings ...

### Toyota Solid-State EV Batteries: Timeline, Costs, And ...

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[Toyota's Breakthrough in Solid-State Batteries](#)

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**Toyota Doubles EV Range Overnight: Revolutionary Solid-State ...**

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### [Toyota's Solid-State Battery on EV Industry](#)

The industry landscape showcases some impressive solid-state technologies, boasting incredible performance metrics, remarkable energy densities, heightened safety features, scalable manufacturing, and straightforward ...



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### [Toyota Solid-State Battery: The Next Big Thing for EVs](#)

Toyota's patent (US20230299337A1) discusses a solid-state battery design with low restraining pressure, enhancing energy density. The positive electrode layer utilizes composite particles ...



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