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## Rechargeable Batteries (OVERWEIGHT)

### Dialogue with the market #54: CATL Super Tech Day and sodium-ion batteries

- CATL hosted its Super Tech Day event on Apr 21.
- It unveiled Shenxing Gen-3 ultra-fast charging batteries and enhanced Freevoy hybrid batteries.
- Growing anticipation of sodium-ion battery commercialization for EVs has been driving momentum across the related value chain.

#### WHAT'S THE STORY?

**Introduction:** In this 54th report in our Dialogue with the Market series, we analyze CATL's battery strategy and implications as presented at its Super Tech Day 2026. As CATL solidifies its leadership in the EV and ESS battery markets, the event has reignited discussion on how Korean manufacturers can differentiate themselves to global customers. More than a technology showcase, the event sent a decisive message: sodium-ion batteries are on the cusp of commercialization—forcing investors to reconsider the future competitiveness of lithium-ion systems.

**CATL Super Tech Day 2026—Innovation and commercialization:** During its Tech Day 2025, CATL showcased a series of its latest battery technology innovations—eg: 1) its state-of-the-art LFP battery with superfast charging<sup>1)</sup>; 2) its sodium-ion power battery with improved performance; and 3) its dual-battery system (which incorporates self-forming anode technology). This year, the Chinese battery giant refined those offerings: the Shenxing 3.0 now charges faster, while the Qilin 3.0 pushes range boundaries even further. For EREV and PHEVs, the company unveiled three new variants of its second-generation Freevoy battery—and for the first time, disclosed its “Super Hybrid Technology,” which integrates multiple chemistries at the material level, not at the pack level.

*(Continued on the next page)*

#### CATL: Key takeaways from ‘Tech Day 2025’ and ‘Super Tech Day 2026’

Category	Technology/ brand	Tech Day 2025 (Apr 21, 2025)	Super Tech Day 2026 (Apr 22, 2026)
Charging	Shenxing	2nd Generation 520 km range in 5 min (4C-5C)	3rd Generation Full charge in 6 min 27 sec (10C-15C)
Range	Qilin Condensed	Development direction outlined	1,500 km single-charge range
Sodium-ion	Naxtra	175 Wh/kg sodium-ion battery unveiled	Mass production; deployed in actual vehicles (e.g., GAC Aion)
EREV/PHEV	Freevoy	1st Generation 400 km pure EV range	2nd Generation 600 km pure EV range

Source: CATL, Media, Samsung Securities

1) Samsung Securities, Rechargeable Batteries (NEUTRAL) - Dialogue with the market #34: CATL's Tech Day (Apr 25, 2025)

Most notably, it confirmed that sodium-ion batteries will be applied to EVs as early as 2Q26, with full-scale manufacturing scheduled by year-end. This timeline highlights the potential of the sodium-ion battery value chain and the long-term growth prospects of lithium-ion technology.

### Shenxing 3<sup>rd</sup>-gen high-speed charging battery



Source: Car News China

### Shenxing 3<sup>rd</sup>-gen ultra-fast charging performance



Source: Car News China

**Issue 1: Shenxing Gen-3–Ultra-high-speed charging enabled by ultra-low internal resistance technology:** At the event, CATL emphasized that it has significantly improved charging speed through its proprietary "ultra-low internal resistance" control technology. It stressed that with the technology, it has achieved an internal resistance of 0.25 mΩ (50% lower than industry average), significantly reducing heat generation during charging<sup>1</sup>, enabling both faster charging and extended cycle life. The company highlighted that its third-generation Shenxing battery, equipped with this technology, can achieve a full charge (10% to 98%) in just 6 minutes and 27 seconds, while retaining over 90% of its capacity after 1,000 ultra-fast charging cycles. It also revealed that the battery can reach a 35% charge in as little as one minute. To address winter charging challenges, CATL said that it introduced its self-heating pulse technology, which heats the battery internally to enable high-speed charging in low-temperature conditions regardless of the charger used. The company stated that even at -30°C, the vehicle can be charged to 90% in just nine minutes.

### Shenxing 3<sup>rd</sup>-Gen battery: Ultra-fast charging performance

Metric	Charging Time
10% → 35%	1 minute
10% → 80%	3 minutes 44 seconds
10% → 98%	6 minutes 27 seconds
10% → 98% at -30°C	9 minutes

Source: CnEVPost

**Issue 2: Freevoy Gen-2–Hybrid battery technology at the material level:** Following the introduction of Freevoy in 2024 and its dual-power architecture (LFP + sodium-ion) in 2025, CATL has now launched Freevoy Gen-2 as a comprehensive solution for extended-range EVs. Three variants are offered: LFP-only, LFP+NCM, and ternary lithium. All deliver a pure electric range of 500–600 km. The standout innovation is the “super-hybrid technology”—a first-of-its-kind approach that blends LFP

<sup>1</sup> CATL notes that for every 10°C increase in temperature, the internal reaction rate of the battery approximately doubles, leading to a sharp reduction in service life.

and NCM materials at the particle level, not just the cell or pack level. Leveraging the olivine structure of LFP, the homogeneous mixing of LFP and NCM particles achieves an energy density of 230 Wh/kg, increasing driving range by 15–20% compared to standard LFP batteries under identical pack weight.

CATL said that Freevoy Gen-1, with its 400 km pure electric range and 4C charging capability, led the EREV market into the era of large-capacity batteries, noting that in 2025, over 95% of EREV vehicles with pure electric range exceeding 300 km used Freevoy batteries. At last year’s event, the company emphasized its AB battery system, which combined lithium-ion and sodium-ion batteries as separate modules. This year, with the unveiling of Freevoy Gen-2, the focus has shifted to a novel approach: blending LFP and NCM cathode materials at the particle level within a single lithium-based system. Freevoy Gen-2 is also interpreted as a strategic move to strengthen its dominance in the EREV market by increasing the pure electric driving range ceiling to 600 km.

**CATL: EREV/PHEV dedicated battery, Freevoy 2<sup>nd</sup>-Gen – three variants**

Variant	Core technology	Pure EV range	Target market
LFP	LFP single-system	500 km	Entry-level family vehicles
Super hybrid (LFP + NCM)	Uniform particle-level blend of LFP and NCM chemistries*	15-20% improvement over standard LFP	General hybrid vehicles
Ternary	NCM single-system	600 km	Luxury and off-road vehicles

Note: \* The “Super Hybrid” technology achieves an energy density of 230Wh/kg by homogeneously blending LFP and NCM materials at the particle level.

Source: Car News China, Auto Tech News, CnEVPost, Samsung Securities analysis

**Issue 3. Growing prospects for commercializing sodium-ion batteries in EVs:** After last year’s unveiling of the ‘Naxtra’ brand of sodium-ion batteries, which achieved energy density close to that of LFP lithium batteries, vehicle models equipped with these batteries are expected to hit the market starting in 2Q. In China, Changan plans to introduce sodium-ion batteries across its brand lineup by mid-year, while GAC Aion is preparing to launch vehicles equipped with CATL’s Naxtra batteries in 2Q. CATL claims that sodium-ion batteries offer better performance in cold temperatures and longer lifespan than lithium-ion batteries, while achieving energy density nearly on par with LFP. As a result, production costs are estimated to be 30% lower than LFP batteries, and CATL suggests that sodium-ion batteries could move beyond lab-stage experiments and potentially capture up to 40% of the global EV market.

**CATL: Sodium-Ion battery-equipped EVs – upcoming launches**

Brand	Launch	Battery Feature	Notes
Changan	Mid-2026	Naxtra	World’s first mass-produced sodium-ion battery passenger vehicle
GAC Aion	Q2 2026	Techrans II-based pack (45 kWh)	CATL’s first sodium-ion battery partner for PVs in 2Q26
Li Auto	2026	Lithium-sodium hybrid	First premium brand to adopt hybrid lithium-sodium chemistry

Source: CATL, Media, Samsung Securities

**CATL: Sodium-Ion battery – key characteristics**

	Category	Key Features
Key Features	Energy density	175 Wh/kg
	Life Cycle	Up to 10,000 cycles
	Safety	No thermal runaway under cutting or external impact
Target Applications	Starting battery	Trucks: 24V system, operating range: -40°C to +70°C
	Auxiliary power (for EVs)	General vehicles: 24V, 8-year life cycle
	Traction Support	Enhances driving range in low-temperature environments

Source: CATL, Samsung Securities

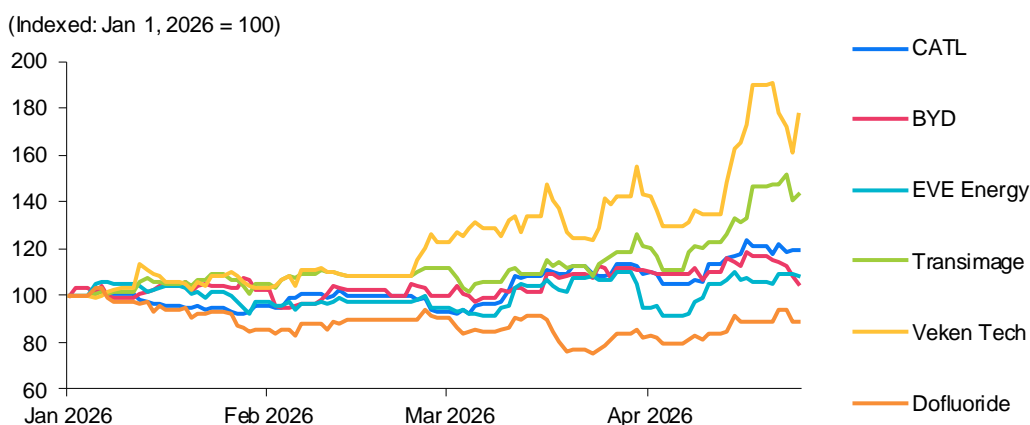
The push toward commercializing sodium-ion batteries is also boosting stock prices across the related value chain, especially among mid-cap companies with market caps around KRW1.5t. One such company, Veken Tech—which produces both lithium-ion and sodium-ion batteries—began full-scale production of sodium-ion batteries in 2023. Its stock has surged 76% ytd, driven by news that it has built a 2 GWh production capacity and activated a dedicated sodium-ion battery factory. Another mid-cap company, Transimage, has also seen its stock rise 43% over the same period. In addition to its IT components business, Transimage manufactures its own cathode, anode, and electrolyte materials for sodium-ion batteries. Having added 10 GWh to its existing 4.5 GWh capacity last year, the company is positioned to see a rising share of sales from sodium-ion battery-related products.

**Key listed players in China’s Sodium-Ion battery value chain**

Company	Stock code	Product / features	Production capacity & commercialization status
CATL	(300750 SZ)	Naxtra: Energy density of 175 Wh/kg	Mass production planned for Q4 2026; to be deployed in EVs from Changan and others in 2026
BYD	(002594 SZ, 03750 HK)	FinDreams-based batteries for small EVs and ESS	Planned annual capacity of 30GWh
EVE Energy	(300124 SZ)	ESS-focused sodium-ion batteries	Plans to deploy ESS batteries in 2026
Transimage	(002866 SZ)	Vertically integrated cell and anode/cathode materials	Phase 1: 4.5 GWh; Phase 2: Additional 10 GWh expansion underway
Veken Tech	(600152 SS)	3C digital and small-power applications	2 GWh currently in operation
Dofluoride	(002407 SZ)	NaPF6 electrolyte	Established large-scale supply system

Source: Media, Samsung Securities

**China’s Sodium-Ion battery value chain: Stock performance in 2026**



Source: Bloomberg, Samsung Securities

**Implications for rechargeable battery industry:** Due to China's anti-involution policies and rising prices of lithium and other metals<sup>2</sup>, the cost of EV and ESS cells in China has been increasing. In this context, CATL's latest event reaffirms its commitment to commercializing sodium-ion batteries, which are less exposed to price volatility of expensive metals such as lithium, nickel, and cobalt. In the past, sodium-ion batteries were mainly targeted at niche markets—such as vehicle starter batteries or ESS applications—because of their strengths in low-temperature performance and long lifespan. But now, CATL is aiming to expand their use into the main power source for EVs. This shift means sodium-ion batteries could soon compete directly with lithium-ion batteries, especially LFP and mid-nickel types, in the mid- and low-price EV segments. For Korea's rechargeable battery industry, enhancing competitiveness in the mid- and low-price EV segment is increasingly necessary, and the potential expansion of sodium-ion batteries in the ESS market also warrants careful monitoring.

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<sup>2</sup> Samsung Securities, Rechargeable Batteries (OVERWEIGHT) - April: Earnings season and metal price hikes (Apr 3, 2026)

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