SECTOR
UPDATE

2026. 7. 23

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Rechargeable Batteries (OVERWEIGHT)

Dialogue with the market #58: China commercializes sodium-ion ESS battery

- CATL last week said it had won its first European order for TENER Sodium, its sodium-ion battery brand designed for energy storage systems (ESS).
- While sodium-ion batteries are expected to take a single-digit market share, the LFP batter prices have been declining rapidly.
- Korean firms' competitiveness in the US ESS market is unlikely to be unaffected.

WHAT'S THE STORY?

Introduction: In this report, we examine China's push to commercialize sodium-ion batteries in the ESS (energy storage system) sector, and the resulting market implications. CATL has long promoted its sodium-ion technology through Tech Day events, initially targeting the automotive market with its Naxtra brand for vehicle-starting and -propulsion. In June, it unveiled TENER Sodium, its first sodium-ion brand tailored for ESS. Just a few weeks after the launch, the company secured its first order in Europe, marking a significant milestone and underscoring CATL's strategic push to expand sodium-ion technology beyond niche applications into mainstream energy storage. As the market evolves, it is worth assessing how this shift may reshape the competitive landscape and what lessons it holds for Korea's rechargeable-battery industry.

CATL: Sodium-ion battery technology-based EV & ESS strategy

	Naxtra	TENER Sodium
Form	Cell, pack	ESS (complete system)
Application	EVs / Mobility	ESS
Key value	Low-temp performance, extended range	High capacity, ultra-long life
Announced	Apr 2025	Jun 2026
Commercialization strategy	- First sodium-ion EVs to launch mid-2026: Changan Nevo A06, GAC Aion, Li Auto - Global supply to begin Jun 2027	- MOU signed with European ESS provider (Jul 2026) - First ESS deliveries in China (Sep 2026)

Source: Electrek, company data, ZDNet, Samsung Securities

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CATL's commercial push for TENER Sodium in the ESS market: On Jun 22, CATL unveiled its new ESS-focused sodium-ion battery brand, TENER Sodium, at Intersolar Europe in Munich. In less than a month, it announced an MOU (Jul 16) with Dutch renewable energy company Alfen to deploy a 5 GWh ESS across Europe—marking the new brand's first major European order. When TENER Sodium was unveiled, CATL outlined a phased rollout: commercial system deliveries to Chinese customers are set to begin in Sep 2026, with a target of 1 GWh cumulative shipments by year-end. Global expansion is scheduled to start in Jun 2027. This timeline is notably faster than that of Naxtra, CATL's sodium-ion brand for EVs, which took roughly 18 months from launch to initial commercial deployment. The accelerated pace for TENER Sodium reflects strong alignment with China's domestic policy support for ESS adoption.

Sodium-ion batteries' market share outlook—from 1% to 8% in ESS by 2035: According to BNEF, sodium-ion batteries' share of global ESS capacity is projected to grow from 1% in 2025 to 8% by 2035. The technology offers compelling advantages in thermal stability—performing well in both high- and low-temperature environments—and boasts longer cycle life than conventional LFPs, making it technically suitable for stationary storage. However, sodium-ion's lower energy density necessitates more cells and larger system footprints to achieve equivalent capacity, offsetting material cost advantages. As a result, their total system cost remains competitive with, but not clearly superior to, LFP batteries. Moreover, current production scale is limited, meaning cost advantages over LFP—already the dominant ESS chemistry—are not yet materializing.

Sodium-ion technology is likely to gain wider adoption in environments where lithium prices rise, thanks to the abundance of its raw materials. Rather than replacing lithium-ion batteries, it is more likely to serve as a hedging solution that complements the weaknesses of LFP batteries.

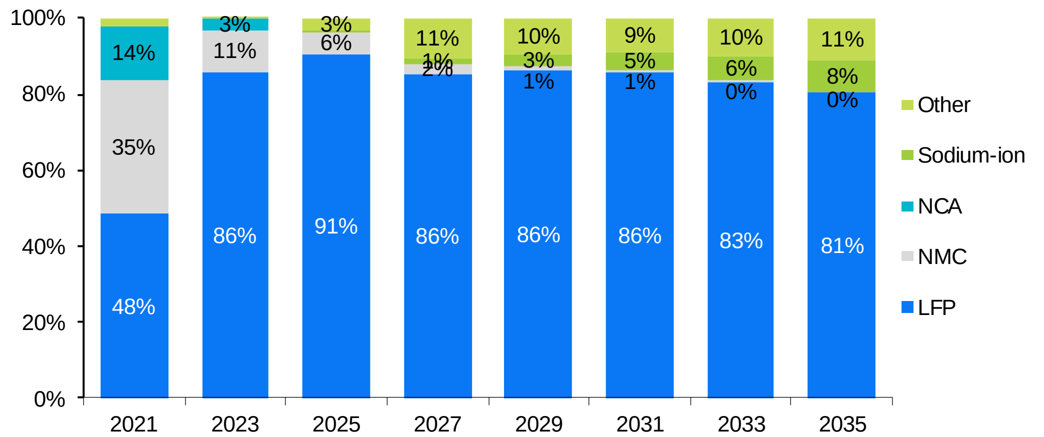
In China, a 50 MW/100 MWh sodium battery ESS pilot project began operations in Hubei in Jul 2024, signaling entry into the commercialization phase. More recently, CATL signed a three-year supply agreement worth 60 GWh with global ESS provider HyperStrong, marking its formal entry into GWh-scale commercial deployment.

BESS: Key technology

Performance metric	Sodium-ion	LFP	NCM
Energy density (Wh/kg)	175	180-210	250-300
Manufacturing cost	Lowest (-30% vs LFP)	Low	High (Ni, Co content)
Performance at -20°C	Excellent (>92%)	Poor (60-70%)	Moderate (75-80%)
Life cycle	>10,000 cycles	2,000-4,000 cycles	1,000-1,500 cycles

Source: RD World, Chozan, ArabWheels, Samsung Securities

ESS battery technology mix outlook based on gigawatt-hours



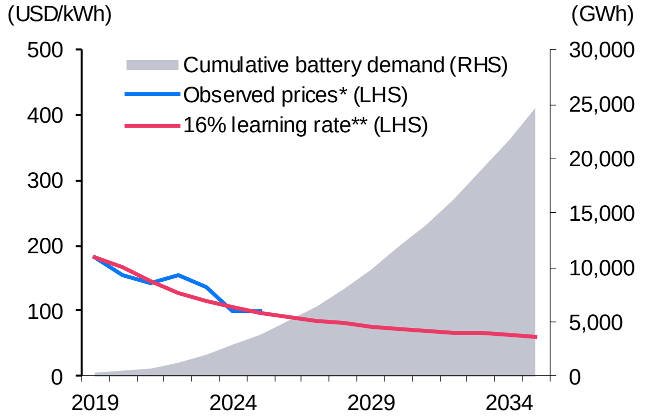
Source: BNEF

LFP holds 90%+ market share in ESS, through learning curve-driven price declines: In the electrochemical energy storage (or battery) market, LFP batteries command over 90% market share, driven by their cost competitiveness and the massive supply chains of Chinese manufacturers. BNEF projects that LFP will remain the dominant battery chemistry in the ESS market through 2035, given its lower cost and longer cycle life compared to ternary batteries. Additionally, as LFP cell sizes continue to increase, energy density at both the pack and system levels has been steadily improving, further reinforcing LFP's market leadership.

As the ESS market rapidly shifts toward LFP chemistry, ESS pack prices are declining faster than those for EV batteries. While EV battery pack prices fell to USD99/kWh in 2025 (a 16% decline since 2019), ESS pack prices dropped more sharply—by 24% over the same period—to USD70/kWh. This is attributable to greater standardization in ESS pack design and system architecture, as well as oversupply from China, the core source of LFP materials and cells.

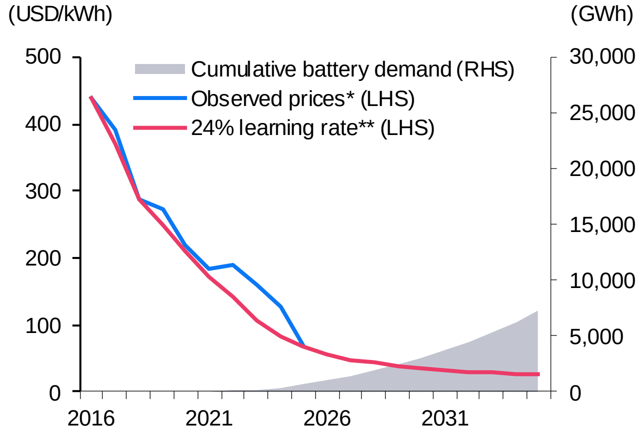
Given such a steep learning curve, it is unlikely that sodium-ion batteries will be able to compete effectively on price in the ESS market for a considerable period.

Battery prices for passenger EVs



Note: *Battery prices in real USD terms for 2025;
**Learning curve: Battery prices decline 16% each time cumulative demand doubles
Sources: BNEF, Samsung Securities

Battery prices for stationary storage



Note: *Battery prices in real USD terms for 2025;
**Learning curve: Battery prices decline 24% each time cumulative demand doubles
Sources: BNEF, Samsung Securities

CATL expands ESS portfolio with lithium- and sodium-ion dual-track strategy: CATL, which leads China's ESS cell production with 150 GWh in 2025, is differentiating itself by expanding beyond its traditional LFP-focused ESS offerings into commercial sodium-ion ESS solutions. CATL's ESS architecture is designed to be fully compatible with existing LFP infrastructure, enabling customers to switch battery chemistries without requiring system redesigns or additional certification processes. In June, CATL launched TENER Sodium, the world's first sodium-ion ESS brand to complete commercial viability validation, highlighting its ultra-long cycle life (15,000 cycles) and significantly lower risk of thermal runaway compared to lithium-based batteries—key advantages for grid stability. Meanwhile, the company has signed a three-year agreement with HyperStrong, a China-based ESS system integration solutions provider, for the supply of 60 GWh of sodium-ion ESS batteries. Production capacity is currently established at 40 GWh annually in Fujian Province, with a phased expansion plan to add 160 GWh annually in Shandong Province.

CATL: ESS battery strategy and characteristics

Company	Key developments	Features
CATL	Dual-track approach: Lithium-ion and sodium-ion	Transitioning from LFP-dominated portfolio to complement with sodium-ion ESS, maximizing system compatibility
	World's first commercially validated sodium-ion battery, TENER Sodium	15,000+ cycles (cell-level) for ultra-long lifespan; reduced risk of thermal runaway, enhancing safety
	Multi-GWh commercial contracts	Signed 3-year agreement with HyperStrong for 60 GWh of sodium-ion battery supply
	Expansion of sodium-ion cell production capacity	Planned capacity increase: 40 GWh in Fujian Province, 160 GWh in Shandong Province

Source: CATL, Media, Samsung Securities

Implications for Korea's rechargeable battery industry—competitiveness in US ESS market to be unaffected by sodium-ion batteries: CATL, the world's leading battery manufacturer, has launched a new sodium-ion battery brand for ESS, rapidly initiating sales in its domestic market and securing orders with European firms to gain a foothold in the global ESS market. However, the rise of Chinese sodium-ion batteries is unlikely to erode the competitiveness of Korean companies seeking to expand their LFP-based market share in the US ESS market. This is because the dominant driver in the US ESS market remains the need to meet tax credit requirements under the Inflation Reduction Act (IRA), which prioritizes non-Chinese supply chains.

Among Korean companies, LG Energy Solution has set up a sodium-ion battery mother line at its Ochang facility in Chungbuk Province to produce prototype samples, while advancing its development in Nanjing, China, to refine the technology and build local cost competitiveness. Having entered the Chinese-led LFP market late and struggled to gain competitiveness, Korean firms now face added pressure as Chinese companies accelerate the commercialization of sodium-ion batteries. However, without a stable domestic demand base—like China's ESS market—to support scaling up sodium-ion battery production, Korean companies are unlikely to make the aggressive investments needed to achieve meaningful price competitiveness.

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