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Electric Revolution: Divergence - Which battery makers have the best EV exposure?

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Welcome to the 2025 edition of Bernstein's **Electric Revolution** *series - our annual cross-sector look at the transformation of the EV landscape. This year's theme is divergence: while China's EV market pushes ahead with scale and innovation, the West is slowing, facing demand headwinds, policy uncertainty, and rising costs. The result? A bifurcated global EV industry, with distinct implications for OEMs, suppliers, energy players, and investors. In this note we review the relationships between OEM's and battery makers and how this is likely to impact future sales.*

CATL maintained its leading market share in 2024 at 36% (+0.5%-points), while that of LGES declined to 12% (-2.7%-points) and SDI was 4% (-1.3%-points). Although part of this is attributed to EV acceleration in China and deceleration in the west, Chinese battery cell makers are gaining market share in Europe. In **China**, the M/S of major battery cell makers was stable and CATL maintained 42% M/S. In **Europe**, CATL increased M/S to 39% (vs. 36% in 2023) gaining share from Volkswagen, Ford and Hyundai-Kia, at the expense of Korean companies. In **the US**, both LGES and SK On gained market share by 6%-points and 3%-points respectively, while CATL (Tesla) and SDI (Rivian) lost share.

CATL has the most diversified OEM customer base. Other battery makers have higher customer concentration risk, notably LGES and Tesla, SDI and BMW, SK On and Hyundai-Kia. For CATL, Tesla (16% exposure in 2024), Geely (12%), VW (11%) and BMW (6%) matter the most, but it also has a long tail of others. For LGES, Tesla (41%), VW (17%) and GM (15%) are the key customers. For SDI, BMW (43%), VW (20%) and Rivian (18%) matter the most, while SK On is highly dependent on Hyundai-Kia (49%) and Panasonic dependent on Tesla (98%).

China EV market is on track for another year of rapid growth, while ex-China Volkswagen and Hyundai-Kia which have guided to 50% EV sales growth. Leading Chinese OEMs like BYD and Geely are also expected to grow EV sales by 30-50% for FY2025. For US OEMs, the outlook is challenging with pure EV companies Tesla and Rivian giving more conservative guidance, while legacy OEMs such as Ford and GM still actively embracing the electrification. The consensus for Tesla EV sales growth this year is -3%. Among European OEMs, Volkswagen is the most positive with their target implying BEV growth of 20%-70% (45% at mid point). Hyundai Motor (which SK On is dependent on) also guided to increase its EV sales volume by 54%.

For 2025 SK On (+39%), BYD (+38%) and CATL (+23%) are expected to have the fastest battery demand growth. For CATL Volkswagen, Geely, Chery and Tesla will be vital for sales this year. Potential upside for demand is through share gain in western OEMs such as VW, but the risks lie in competition in China and OEM in-house battery supply such as Geely. For LGES, sales growth depends on Tesla and VW while there are downside risks from competition in Europe and Tesla's sales slowdown. SDI is dependent on BMW and the 18% volume growth is contingent on an EV sales rebound of Stellantis and Volkswagen. **Over the next 5 years, Korean companies could start to show better growth if the US market starts to grow and China reaches maturity**.

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BERNSTEIN TICKER TABLE

Ticker	Rating		13 May 2025 Closing Price	Price Target	TTM Rel. Perf.	Reported EPS				Reported P/E (x)		
							2024A	2025E	2026E	2024A	2025E	2026E
300750.CH (CATL)	O	CNY	258.77	340.00	21.0%	CNY	11.52	14.88	18.19	22.5	17.4	14.2
373220.KS (LGES)	M	KRW	312,000	307,000	(27.7)%	KRW	(4,353.59)	1,884.41	7,639.39	(71.7)	165.6	40.8
051910.KS (LG Chem)	O	KRW	203,000	310,000	(57.6)%	KRW	(8,826.00)	11,113	34,678	(23.0)	18.3	5.9
006400.KS (SDI)	O	KRW	170,900	250,000	(69.2)%	KRW	8,916.68	7,675.86	20,795	19.2	22.3	8.2
247540.KS (EcoPro BM)	U	KRW	98,800	88,000	(62.5)%	KRW	(991.00)	(80.00)	405.00	(99.7)	N/M	244.0
003670.KS (Posco Future M)	U	KRW	120,100	110,000	(66.0)%	KRW	(2,740.96)	158.93	1,353.97	(43.8)	755.7	88.7
002466.CH (Tianqi Lithium)	O	CNY	29.81	47.00	(32.4)%	CNY	4.45	(4.73)	1.22	6.7	(6.3)	24.5
9696.HK (Tianqi Lithium)	O	HKD	24.05	34.00	(34.4)%	CNY	4.45	(4.73)	1.22	5.0	(4.7)	18.3
ASIAX			1,364.30									

O - Outperform, M - Market-Perform, U - Underperform, NR - Not Rated, CS - Coverage Suspended

002466.CH, 9696.HK base year is 2023;

Source: Bloomberg, Bernstein estimates and analysis.

INVESTMENT IMPLICATIONS

The sales growth for battery makers in the short to medium term is largely dependent on which electric vehicles prove to be popular and which are not. For our covered companies, CATL boasts the most diversified customer base, whereas 2025 EV battery demand growth of LGES is heavily reliant on Volkswagen and Tesla. Samsung SDI sales growth will be dependent on a rebound in EV sales from European OEMs such as Stellantis and Volkswagen.

In 2024 CATL maintained its market share at 36%, while that of LGES declined to 12% (-2.7%-points) and SDI was 4% (-1.3%-points). We expect CATL to grow its EV battery sales by 25% y-o-y in 2025, followed by LGES (15%) and Samsung SDI (15%). **For 2025** both CATL and LGES are projected to experience a 23% increase in EV battery demand, followed by Samsung SDI at 18%. The Chinese EV market is expected to continue its rapid growth, while outside of China, Volkswagen and Hyundai-Kia, both of which have guided a 50% increase in EV sales this year which will benefit battery makers exposed to these companies. This trend should positively impact CATL and SK On (not covered). Korean battery cell makers face risks related to potential market share loss, particularly with European OEMs like Volkswagen. **Looking further ahead over the next 5 years**, Korean companies could start to show better growth (20-25% CAGR) if the US market starts to grow and China reaches maturity, but much depends on whether tariffs will be able to keep Chinese battery makers out of the US and the Koreans can maintain current market share.

For now CATL (Outperform, CNY340) seems like the most investable stock the sector at a P/E of 15x (with 25-30% EPS growth) and announced plans for a HK IPO as a near term catalyst. We also rate Tianqi Outperform (HKD34 for H-share and CNY47 for A-share, Outperform) on a potential lithium price recovery in 2026. For Korean stocks, the near term could remain challenging. SDI and LG Chem (both on 10x forward P/E) offer better value than LGES with much of the downside priced in now. We rate Samsung SDI (KRW250,000), and LG Chem (KRW310,000) Outperform. We rate LGES Market-Perform with a price target of KRW307,000. We rate Posco Future M (KRW110,000) and EcoPro BM (KRW88,000) Underperform.

VALUATION COMPS TABLE

EXHIBIT 1: **Global energy storage companies comparison**

Company	Price 13-May	Curcy	EV USD mn	Mkt cap USD mn	P/E 22A	P/E 23A	P/E 24E	P/E 25E	EV/Sales 22A	EV/Sales 23A	EV/Sales 24E	EV/Sales 25E	Sales Growth 23-24
LGES	312,000.0	KRW	65,668	51,235	73.0	44.3	-111.5	224.3	3.3	2.6	3.7	3.5	-31%
CATL	258.8	CNY	144,595	158,266	37.9	26.0	22.3	17.7	3.0	2.5	2.8	2.4	-10%
Samsung SDI	170,900.0	KRW	16,258	8,508	5.6	5.8	12.3	39.3	1.0	0.9	1.3	1.5	-30%
Panasonic	1,607	JPY	23,722	28,074	15.1	18.1	9.7	12.5	0.4	0.4	0.4	0.4	-11%
BYD	395.8	HKD	143,143	154,533	66.0	36.1	28.3	20.1	2.4	1.7	1.4	1.1	24%
SK Innovation	90,200	KRW	40,584	9,560	4.9	22.8	-10.1	-121.5	0.6	0.7	0.8	0.7	-12%
Gotion High Tech	23.9	CNY	11,575	5,989	120.9	64.7	51.0	32.6	3.5	2.8	2.3	1.9	21%
Farasis	13.3	CNY	2,382	2,261	-37.1	-8.9	-30.3	107.2	1.3	1.2	1.3	1.1	-11%
EVE	44.5	CNY	15,380	12,636	25.6	21.1	21.4	16.9	2.9	2.2	2.3	1.7	-1%
Sunwoda	20.0	CNY	7,923	5,127	31.1	33.4	22.3	16.8	1.1	1.1	1.0	0.9	8%
CALB	18.2	HKD	10,277	4,133	57.0	50.8	49.0	21.6	2.8	2.3	2.4	2.0	-4%

Company	LTM %	Rel LTM %	LTM High	LTM Low	GPM (%) 23A	OPM (%) 23A	ND/E 22A	ND/E 23A	EV/EBITDA 22A	EV/EBITDA 23A	EV/EBITDA 24E	EV/EBITDA 25E	23E EV/Capacity (USD M/GWh)
LGES	-47%	-46%	411,000	202,000	17%	7%	20%	40%	25.2	19.5	27.4	16.7	231
CATL	29%	18%	300	166	22%	13%	37%	-33%	22.7	15.4	12.3	10.5	336
Samsung SDI	-58%	-58%	434,691	166,436	18%	8%	6%	42%	6.0	6.2	8.8	9.6	259
Panasonic	33%	27%	1,919	987	26%	3%	21%	15%	4.6	5.0	4.5	4.1	409
BYD	89%	47%	427	203	19%	6%	-39%	-51%	26.1	15.8	10.2	8.0	421
SK Innovation	-15%	-15%	140,200	90,100	7%	3%	69%	78%	7.0	12.7	20.3	12.4	460
Gotion High Tech	26%	12%	26.1	17.6	18%	3%	70%	125%	53.8	32.7	19.9	15.7	64
Farasis	6%	-2%	16.7	8.3	4%	-12%	12%	54%	-177.7	-22.1	36.2	14.3	57
EVE	15%	6%	58.5	30.7	17%	10%	60%	38%	26.2	18.3	16.6	12.2	167
Sunwoda	32%	20%	26.4	13.5	14%	1%	52%	61%	19.6	20.0	14.5	10.9	152
CALB	21%	-2%	20.2	11.0	10%	4%	11%	67%	41.0	24.8	17.7	11.8	100

LGES, CATL, and Samsung SDI are covered by Neil Beveridge. BYD is covered by Eunice Lee. All other companies are not covered by Bernstein.
Source: Bloomberg (consensus estimates), Bernstein analysis

DETAILS

In the long run, the sales performance of battery makers depends on the cost, quality and safety of batteries manufactured. In the short to medium term however, it depends on the EV sales by OEM. Battery makers which have their batteries incorporated into fast selling EV's will grow quickly while those who are exposed to slower growing models will have less growth. In this report, we aim to highlight the potential for battery makers' 2025 demand growth and market share by answering two questions, namely: 1) Which OEMs are expected to have the fastest-growing EV sales in 2025? 2) How to view the competition among battery companies for the supply share from OEMs?

The EV battery market in 2024 was characterized by a broad trend of Chinese battery cell makers gaining market share while Japanese and South Korean battery companies lost market share. CATL remains the leading battery maker globally with 36% market share (+0.5%-points) in 2024, followed by BYD on 18% (+1.5%-points) and LGES on 12% (-2.7%-points). Although this is largely attributed to the fact that China's EV sales outperformed those in the US and Europe (for example China EV battery demand in 2024 accounted for 57% of global EV battery demand, vs. 53% in 2023), Chinese battery cell makers are also gaining share in markets outside of China, such as in Europe.

Beyond the top 3 battery cell makers are Panasonic which continues to lose market share (from 6% in 2023 to 4% in 2024), Korean battery makers (SK On and SDI) and a long list of China battery makers with a market share in the low single digits, many of which have low levels of profitability. Chinese battery makers SVOLT and Gotion were the fastest growing in 2024. BYD grew slightly faster than CATL with 36% and 26% growth respectively (vs. 24% for total xEV battery demand growth). LGES and SDI both recorded growth of 1% and -11% which was below the industry growth rate. The latest update of Mar'25 seemed to confirm that the disparity of growth is continuing.

EXHIBIT 2: **Passenger EV battery installation market share: CATL maintained leading market share**

Global	2019	2020	2021	2022	2023	2024	2025
CATL	22.9%	19.4%	30.5%	33.8%	35.4%	35.9%	36.2%
BYD	8.5%	6.0%	8.8%	14.9%	16.7%	18.2%	17.7%
LGES	12.8%	26.8%	21.7%	15.2%	14.4%	11.7%	11.9%
SK On	2.2%	5.9%	5.8%	6.0%	4.8%	4.6%	5.1%
CALB	1.6%	2.7%	2.9%	3.6%	4.8%	4.5%	3.8%
SDI	4.5%	6.8%	5.1%	5.1%	4.9%	3.5%	3.6%
Panasonic	30.5%	21.2%	12.8%	7.6%	6.4%	4.2%	3.6%
Gotion	1.8%	1.3%	1.9%	2.5%	2.0%	3.2%	3.3%
SVOLT	0.0%	0.5%	1.1%	1.3%	1.2%	2.2%	2.8%
EVE	0.1%	0.6%	0.9%	1.1%	2.1%	1.8%	1.8%

* Only Lithium-based battery chemistries are included in this data set. xEVs captured in this data set includes BEV, PHEV, and HEV
Source: SNE Research, Bernstein analysis

EXHIBIT 3: **Passenger EV battery installation growth: Chinese battery makers gained the most**

Global YoY	2020	2021	2022	2023	2024	2025
SVOLT	n.a.	429%	104%	28%	124%	105%
Gotion	0%	214%	122%	15%	94%	83%
BYD	-5%	222%	185%	59%	36%	59%
SK On	258%	115%	74%	15%	17%	37%
CATL	13%	243%	88%	49%	26%	34%
EVE	1071%	256%	93%	186%	4%	31%
CALB	133%	130%	114%	89%	15%	23%
LGES	180%	76%	19%	34%	1%	16%
Panasonic	-7%	32%	1%	20%	-18%	-6%
SDI	99%	64%	70%	37%	-11%	-13%

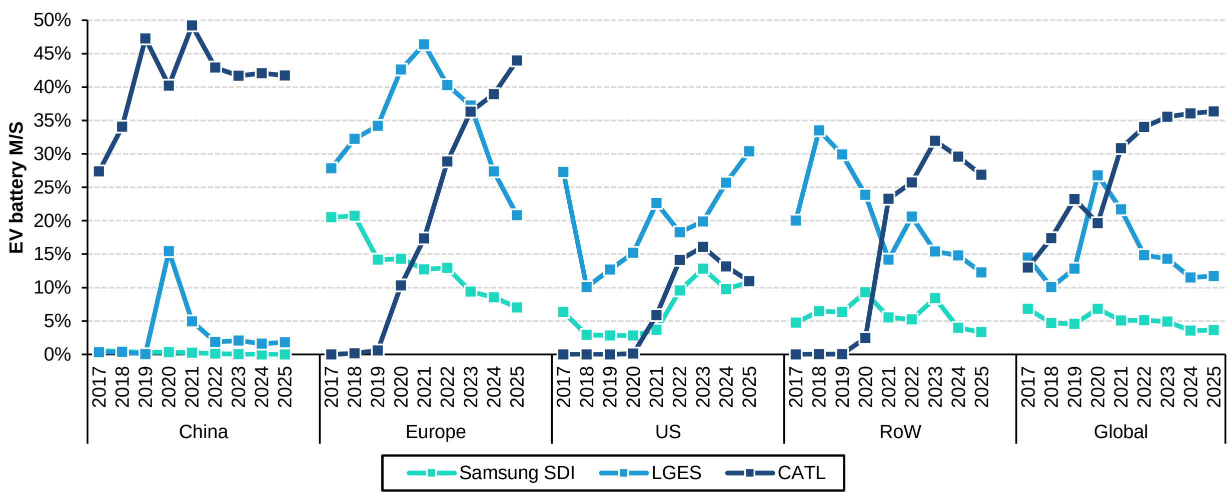
* Only Lithium-based battery chemistries are included in this data set. * xEVs captured in this data set includes BEV, PHEV, and HEV
Source: SNE Research, Bernstein analysis

MARKET SHARE ACROSS REGIONS: CHINESE ARE WINNING IN EUROPE....

CATL maintained its market share at 36% in 2024 and 36% in 3M2025. CATL once guided to increase its market share by 1%-point every year, and over the past three years it seems to be largely on track as it increased its xEV battery market share from 34% in 2022 to 36% in 2024. Despite investors' worries, CATL's market share in China was maintained at 42% in 2024 (vs. 42% in 2023). In Europe, CATL's market share has been increasing for six consecutive years and reached 39% in 2024 and 44% in 3M2025. In the US the market share of CATL declined from 16% to 13% in 2024 as Tesla decided to stop selling the Model 3 Standard Range in North America in October, which was equipped with the CATL's LFP batteries.

LGES's market share declined from 14% in 2023 to 12% in 2024 and 12% in 3M2025. With the US capacity ramping up, LGES is taking more share in the US (26% vs. 20% in 2023). However, this was offset by the loss of market share in the Europe (27% vs. 37% in 2023). In Europe, wallet shares of LGES in key customers like Volkswagen, Mercedes-Benz, and Ford all declined by double digits. Samsung SDI's market share declined from 5% in 2023 to 4% in 2024 and 4% in 3M2025. In 2024 Samsung SDI maintained its partnership with key customers like BMW and the supply share has stabilized. However, SDI's wallet share in Rivian and Stellantis declined in 2024 with increasing competition from other firms.

EXHIBIT 4: **EV battery market share for major battery makers. CATL's market share in Europe has been increasing for six consecutive years and reached 44% in 3M2025, exceeding its 42% market share in China**



Source: SNE Research, Bernstein analysis

EXHIBIT 5: **EV battery sales by battery maker and region**

2024 EV Sales (GWh)

	China	Europe	US	Other	Global
CATL	197.9	64.7	17.2	15.3	295.1
LGES	7.6	45.5	33.5	7.6	94.2
SK On	0.1	15.5	17.7	4.0	37.3
SDI	0.0	14.2	12.8	2.1	29.1
BYD	135.6	4.7	0.0	9.7	149.9
Panasonic	0.0	0.4	33.9	0.6	34.9
CALB	30.8	4.5	0.4	1.3	37.0
EVE	11.8	1.6	0.0	1.3	14.6
Gotion	19.3	0.2	1.5	5.2	26.2
Sunwoda	15.7	1.6	0.0	0.4	17.7
Other	51.7	13.3	13.6	4.1	82.7
Grand Total	470.3	166.2	130.6	51.6	818.7

Source: SNE Research, Bernstein analysis

EXHIBIT 6: **Battery maker M/S by region**

Company % of Region

	China	Europe	US	Other	Global
CATL	42%	39%	13%	30%	36%
LGES	2%	27%	26%	15%	12%
SK On	0%	9%	14%	8%	5%
SDI	0%	9%	10%	4%	4%
BYD	29%	3%	0%	19%	18%
Panasonic	0%	0%	26%	1%	4%
CALB	7%	3%	0%	3%	5%
EVE	3%	1%	0%	2%	2%
Guoxuan	4%	0%	1%	10%	3%
Sunwoda	3%	1%	0%	1%	2%
Other	11%	8%	10%	8%	10%
Grand Total	100%	100%	100%	100%	100%

Source: SNE Research, Bernstein analysis

EXHIBIT 7: **Region % of company revenue**

Region % of Company

	China	Europe	US	Other	Global
CATL	67%	22%	6%	5%	100%
LGES	8%	48%	36%	8%	100%
SK On	0%	42%	47%	11%	100%
SDI	0%	49%	44%	7%	100%
BYD	90%	3%	0%	6%	100%
Panasonic	0%	1%	97%	2%	100%
CALB	83%	12%	1%	4%	100%
EVE	81%	11%	0%	9%	100%
Guoxuan	74%	1%	6%	20%	100%
Sunwoda	89%	9%	0%	2%	100%
Other	62%	16%	16%	5%	100%
Grand Total	57%	20%	16%	6%	100%

Source: SNE Research, Bernstein analysis

In China, the market share of major battery cell makers was stable in 2024. The wallet share of CATL in some of Chinese OEMs declined but CATL maintained its 60% share in most key customers. Declines in the wallet share of OEMs such as Geely (from 70% to 54%) and SAIC (from 43% to 31%) were offset by other growing customers like Huawei AITO (+256% y-o-y and 100% supplied by CATL's batteries), Chery (+531% y-o-y and 72% supplied by CATL) and Xiaomi (78% supplied by CATL) in 2024. In

2024, the external sales of BYD's batteries in China began to accelerate, as its sharesin the battery supply to XPeng, NIO and Xiaomi all increased.

EXHIBIT 8: **In China CATL lost shares in battery supply to Geely, SAIC and Li Auto, which was offset by the demand growth from Huawei AITO and Chery**

China	Battery installation (2024, GWh)	y-o-y	Delta of wallet share of battery supplier, %						
			CATL	BYD	LGES	SDI	SK On	Panasonic	Others
BYD	123.0	23%	-	-	-	-	-	-	-
Geely	44.4	110%	-16%	-	-1%	-	-	-	16%
TESLA	41.2	9%	0%	-	0%	-	-	-	-
SAIC	25.2	23%	-12%	-	-	-	-	-	12%
GAC	24.8	-20%	1%	-	-	-	-	-	-1%
Changan	22.3	52%	-1%	-1%	-	-	-	-	2%
Li Auto	20.4	31%	-18%	-	-	-	-	-	18%
Chery	18.7	531%	62%	3%	-	-	-	-	-65%
Huawei	16.7	256%	2%	-	-	-	-	-	-2%
FDG	16.4	97%	-2%	-	-	-	-	-	2%
NIO	16.4	33%	5%	8%	-	-	-	-	-13%
VW	13.2	2%	0%	-	0%	-	-	-	-
Xiaomi	12.8	n.a.	-	-	-	-	-	-	-
Xiaopeng	12.7	17%	-1%	24%	-	-	-	-	-22%
Dongfeng	12.6	126%	-21%	-7%	-	-2%	-	-	30%
Great Wall	10.0	13%	-10%	-	-	-	-	-	10%
China FAW	7.9	33%	5%	-11%	-	-	-	-	5%
BAIC	7.0	37%	7%	-	-	-	-6%	-	-1%
BMW	6.1	-15%	-12%	-	-	-	-	-	12%
GM	3.5	-43%	-16%	-4%	0%	-	-	-	20%
Other OEMs	15.1	-26%	-7%	12%	0%	-	0%	0%	-5%
Total	**470.3**	**34%**	**0%**	**-1%**	**0%**	**0%**	**0%**	**0%**	**1%**

CATL, LGES, and SDI are covered by Neil Beveridge. BYD, Geely, SAIC, GAC, Li Auto, Great Wall, Xiaomi, Xiaopeng, and NIO are covered by Eunice Lee. VW and BMW are covered by Stephen Reitman. GM is covered by Daniel Roeska. All other companies are not covered by Bernstein.
Source: SNE Research, Bernstein analysis

In Europe, CATL, BYD and other Chinese battery cell makers gained market share in 2024, at the expense of LGES (-10%-points) and Samsung SDI (-1%-points). CATL's market share in Europe increased to 39% (+3%-points) in 2024. CATL gained wallet share in Volkswagen (from 27% to 45%), Hyundai-Kia (from 21% to 30%), Renault-Nissan (from 14% to 21%), and Ford (from 2% to 40%), but lost share in Geely Group (from 69% to 55%) and BMW (from 61% to 52%) in Europe. We believe Hungary Plant and Stellantis JV Plant will open more opportunities for CATL in Europe. For LGES and Samsung SDI, their partnership with Tesla and BMW respectively went well as the wallet shares were basically unchanged. However, LGES lost share in other OEMs such as Volkswagen (from 53% to 33%), Geely Group (from 30% to 11%), and Mercedes-Benz (from 11% to 2%).

EXHIBIT 9: **In Europe CATL gained shares in most automakers, while LGES and SDI lost shares**

Europe	Battery installation (2024, GWh)	y-o-y	Delta of wallet share of battery supplier, % CATL	BYD	LGES	SDI	SK On	Panasonic	Others
VW	37.2	7%	19%	-	-20%	-4%	6%	0%	-
TESLA	26.3	-11%	1%	0%	1%	-	-	-2%	0%
BMW	16.5	18%	-10%	-	-	1%	-	-	9%
Geely	14.8	42%	-14%	-	-20%	-	-	-	34%
Stellantis	14.3	-8%	0%	9%	-4%	-8%	-	-	3%
Mercedes-Benz	13.9	15%	-2%	-	-10%	-	0%	-	12%
Hyundai Kia	11.0	-8%	9%	-	-1%	-	-8%	-	-
Renault-Nissan	8.9	7%	7%	-	4%	-	-	-	-11%
SAIC	5.0	-32%	0%	-	-	-	-	-	0%
Ford	4.1	26%	38%	-	-37%	-8%	8%	-	-
BYD	3.4	213%	-	-	-	-	-	-	-
Toyota	3.2	45%	-1%	-	-	-	-	-	1%
Initiative	2.1	54%	-	-	-	-	-	-	-
TATA	1.9	80%	0%	-	-17%	17%	-	-	-
Xiaopeng	0.7	301%	-2%	-	-	-	-	-	2%
Honda	0.7	378%	23%	-	-	-	-	-	-23%
Other OEMs	2.2	-28%	-13%	2%	1%	0%	0%	3%	8%
Total	**166.2**	**6%**	**3%**	**2%**	**-10%**	**-1%**	**1%**	**0%**	**6%**

CATL, LGES, and SDI are covered by Neil Beveridge. BYD, Geely, SAIC, and Xiaopeng are covered by Eunice Lee. VW, BMW, Mercedes-Benz, and Renault are covered by Stephen Reitman. Stellantis and Ford are covered by Daniel Roeska. Nissan, Toyota and Honda are covered by Masahiro Akita. All other companies are not covered by Bernstein.
Source: SNE Research, Bernstein analysis

In the US, both LGES and SK On gained market share, while Panasonic, CATL and SDI lost share. LGES increased its market share by 6%-points helped and SK On increased by 3%-points, largely down to success with Hyundai and Ford. In 2024 LGES increased share with Hinda and took about 7% of Tesla's battery supply share from CATL, although it lost some share of Hyundai Kia and Ford to SK On. In the US, the market share of CATL declined from 16% to 13% in 2024 as Tesla decided to stop selling the Model 3 Standard Range in North America in October, which was equipped with the CATL's LFP batteries. SDI lost shares in Rivian to Chinese Gotion and Panasonic lost shares in Tesla to its in-house battery cells supply.

EXHIBIT 10: **In the US, LGES gained shares in the battery supply to Tesla and SK On gained shares in Hyundai and Kia, as well as Ford**

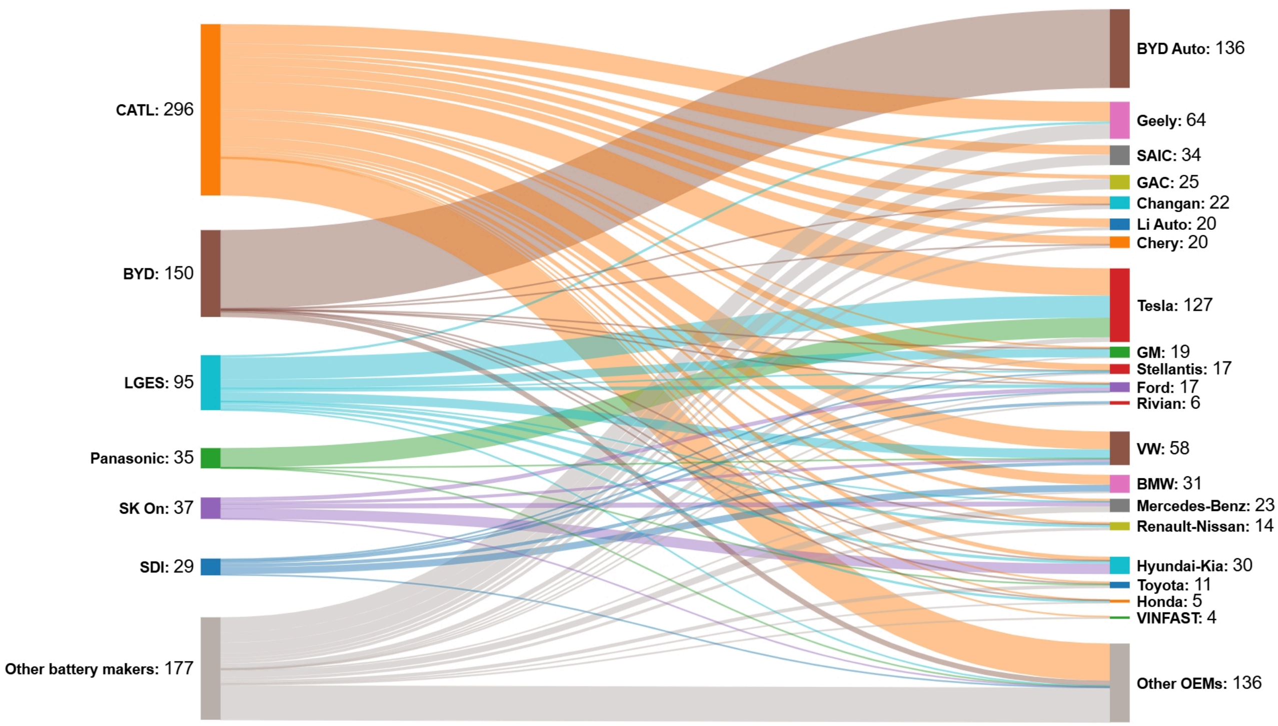
The U.S.	Battery installation (2024, GWh)	y-o-y	Delta of wallet share of battery supplier, % CATL	BYD	LGES	SDI	SK On	Panasonic	Others
TESLA	51.7	0%	-8%	-	7%	-	-	-15%	15%
GM	14.4	99%	-	-	-	-	-	-	-
Hyundai Kia	12.9	52%	4%	-	-14%	-	10%	-	-
Ford	12.4	57%	7%	-	-22%	0%	15%	-	-1%
Rivian	6.7	10%	-	-	-	-22%	-	-	22%
BMW	5.6	7%	-5%	-	-	5%	-	-	1%
VW	5.5	-16%	10%	-	1%	2%	-13%	-	-
Toyota	3.6	52%	1%	-	-	-	-	-	-1%
Honda	3.6	n.a.	-	-	100%	-	-	-	-100%
Mercedes-Benz	3.1	-27%	-20%	-	0%	-	8%	-	12%
Renault-Nissan	2.9	49%	1%	-	-	-	-	-	-1%
Geely	2.3	-16%	25%	-	-39%	-	-	-	14%
Stellantis	2.2	-9%	9%	-	-1%	-8%	-	-	-
SUBARU	1.1	33%	1%	-	-	-	-	-	-1%
LUCID	0.8	13%	-	-	-49%	-51%	-	100%	-
Other OEMs	2.1	125%	27%	-	3%	-23%	0%	-	-8%
Total	**130.6**	**20%**	**-3%**	**-**	**6%**	**-3%**	**3%**	**-12%**	**8%**

CATL, LGES, and SDI are covered by Neil Beveridge. BYD and Geely are covered by Eunice Lee. VW, BMW, Mercedes-Benz, and Renault are covered by Stephen Reitman. GM, Rivian, Stellantis and Ford are covered by Daniel Roeska. Nissan, Toyota, SUBARU and Honda are covered by Masahiro Akita. All other companies are not covered by Bernstein.
Source: SNE Research, Bernstein analysis

PARTNERSHIP WITH OEM'S

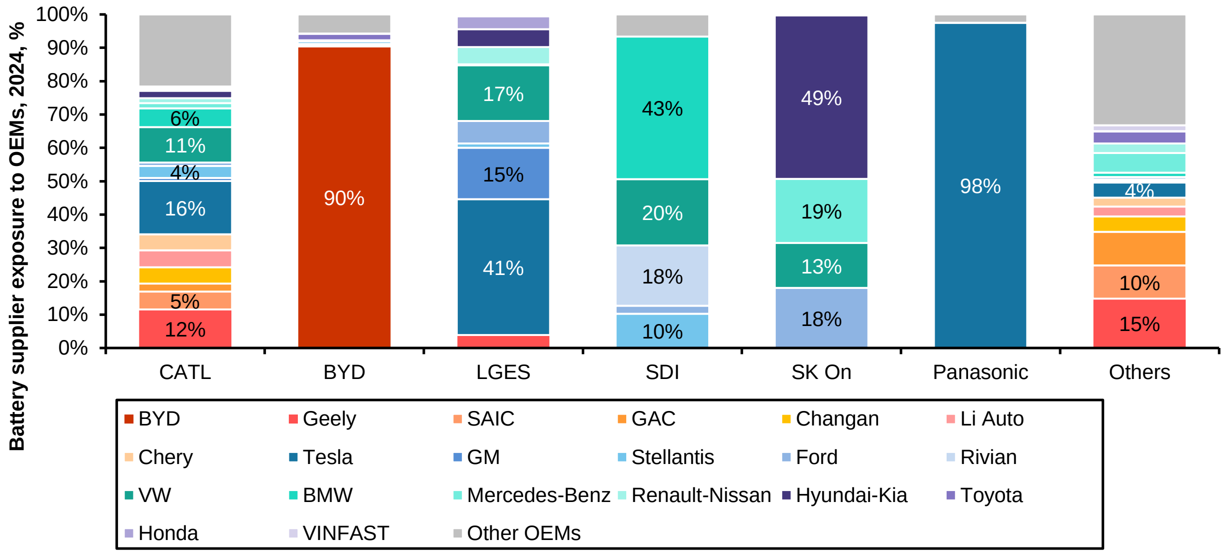
The global relationship between OEMs and battery makers continues to evolve over time. CATL continues to dominate the EV battery markets with the most diversified customer base across domestic OEMs (Exhibit 12) and global OEMs. Korean battery makers have important relationships with European OEMs (Green), while LGES and Panasonic are more reliant on the US OEMS (Blue). Notable relationships in the market are that between Tesla and Panasonic, although Tesla is now building its own capacity and also diversifying supplies with CATL (in China) and LGES (in Europe) also providing batteries. SK On has a strong relationship with Hyundai which has provided a strong EV product offering to the market. In the US, SK On has a partnership with Ford to expand capacity under the BlueOval SK JV, while LGES has a partnership with GM to produce battery under the Ultium Cells JV. BYD continues to be an exclusive provider of batteries to the BYD Group although it is looking to sell to other OEMs.

EXHIBIT 11: **EV battery supply between battery cell makers and OEMs (in GWh, 2024)**



Source: SNE Research, SankeyMATIC, Bernstein analysis

EXHIBIT 12: **CATL has the most diversified customer base and other notable relationships in the market are that between LGES and Tesla (41% exposure), SDI and BMW (43%), SK On and Hyundai-Kia (49%), as well as Panasonic and Tesla (98%)**



Source: SNE Research, Bernstein analysis

Unique relationships between OEMs and battery makers will drive differentiated growth depending on how successful their end customers are. For CATL, Tesla (16% exposure), Geely (12%), VW (11%) and BMW (6%) matter the most, but it also has a long tail of others. For LGES, Tesla (41%), VW (17%) and GM (15%) are the key customers. For SDI, BMW (43%), VW (20%) and Rivian (18%) matter the most, while SK On is highly dependent on Hyundai-Kia (49%) and Panasonic dependent on Tesla (98%).

EXHIBIT 13: **Battery supplier exposure to OEMs**

Battery supplier exposure to OEMs, 2024, %	CATL	BYD	LGES	SDI	SK On	Panasonic	Others	Total
BYD	-	90%	-	-	-	-	-	**17%**
Geely	12%	-	4%	-	-	-	15%	**8%**
SAIC	5%	-	-	-	-	-	10%	**4%**
GAC	2%	-	-	-	-	-	10%	**3%**
Changan	5%	0%	-	-	-	-	5%	**3%**
Li Auto	5%	-	-	-	-	-	3%	**2%**
Chery	5%	0%	-	-	-	-	3%	**2%**
Tesla	16%	-	41%	-	-	98%	4%	**16%**
GM	1%	0%	15%	-	-	-	0%	**2%**
Stellantis	4%	1%	1%	10%	-	-	0%	**2%**
Ford	1%	0%	7%	2%	18%	-	0%	**2%**
Rivian	-	-	-	18%	-	-	1%	**1%**
VW	11%	-	17%	20%	13%	0%	-	**7%**
BMW	6%	-	-	43%	-	-	1%	**4%**
Mercedes-Benz	2%	-	0%	-	19%	-	6%	**3%**
Renault-Nissan	1%	0%	5%	-	-	-	3%	**2%**
Hyundai-Kia	2%	0%	5%	-	49%	-	-	**4%**
Toyota	1%	2%	-	-	-	0%	4%	**1%**
Honda	0%	0%	4%	-	-	-	0%	**1%**
VINFAST	0%	-	-	-	-	-	2%	**0%**
Other OEMs	22%	6%	1%	7%	0%	2%	33%	**16%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: SNE Research, Bernstein analysis

Looking at it the other way, for Tesla, CATL, Panasonic and LGES are the most important battery relationships. If Tesla were able to become vertically integrated in battery supply (which we doubt), this would clearly be a negative for these companies, with Panasonic the most exposed. For VW and Geely, CATL and LGES are the most important relationships, while for BMW, CATL and SDI matter the most.

EXHIBIT 14: **Wallet share of battery makers. CATL is the largest battery supplier for most OEMs, while LGES is the largest for GM and Honda, and SDI is the largest for Rivian**

Wallet share of battery supplier, 2024, %	CATL	BYD	LGES	SDI	SK On	Panasonic	Others	Total
BYD	-	100%	-	-	-	-	-	100%
Geely	53%	-	6%	-	-	-	41%	100%
SAIC	47%	-	-	-	-	-	53%	100%
GAC	29%	-	-	-	-	-	71%	100%
Changan	63%	2%	-	-	-	-	36%	100%
Li Auto	74%	-	-	-	-	-	26%	100%
Chery	72%	4%	-	-	-	-	24%	100%
Tesla	37%	-	30%	-	-	27%	6%	100%
GM	15%	0%	81%	-	-	-	4%	100%
Stellantis	64%	7%	7%	18%	-	-	4%	100%
Ford	17%	0%	38%	4%	40%	-	1%	100%
Rivian	-	-	-	78%	-	-	22%	100%
VW	54%	-	27%	10%	9%	0%	-	100%
BMW	53%	-	-	39%	-	-	7%	100%
Mercedes-Benz	20%	-	1%	-	32%	-	47%	100%
Renault-Nissan	30%	0%	34%	-	-	-	36%	100%
Hyundai-Kia	22%	1%	17%	-	60%	-	-	100%
Toyota	16%	26%	-	-	-	0%	58%	100%
Honda	25%	1%	71%	-	-	-	3%	100%
VINFAST	20%	-	-	-	-	-	80%	100%
Other OEMs	47%	6%	0%	1%	0%	1%	44%	100%
Total	36%	**18%**	**12%**	**4%**	**5%**	**4%**	**22%**	**100%**

Source: SNE Research, Bernstein analysis

While most of the battery gigafactories are independently built and operated by battery cell makers, some are established in the form of joint ventures, which is more popular in the US given the generous AMPC credits. While Panasonic/Tesla dominates the US market today, the major Korean battery makers are expected to take significant market share given LGES's JVs with GM, Stellantis and Honda, SK On with Ford and Hyundai, and SDI with Stellantis and GM. Overall, battery manufacturers with greater JV exposure are likely in a better position to achieve higher sales given integration with OEMs.

Automakers that have chosen to aggressively expand their own battery cell production capacity include Tesla (128GWh by 2030), VW (166GWh), and Geely (136GWh). While this could be a negative for its battery suppliers like CATL, LGES and Panasonic, there are uncertainties regarding whether the expansion can proceed as scheduled or how much announced capacity will come online eventually.

EXHIBIT 15: **2030 JV related/OEM in-house battery production capacity**

Battery maker capacity, GWh (JV related/in-house, 2030)	CATL	BYD	LGES	SDI	SK On	Panasonic	Others/ In-house	Total
BYD	-	728	-	-	-	-	-	**728**
Geely	27	-	-	-	-	-	136	**163**
SAIC	44	-	-	-	-	-	20	**64**
GAC	15	-	-	-	-	-	36	**51**
Changan	25	-	-	-	-	-	-	**25**
Li Auto	-	-	-	-	-	-	-	**-**
Chery	-	-	-	-	-	-	22	**22**
Tesla	-	-	-	-	-	46	128	**174**
GM	-	-	131	36	-	-	-	**167**
Stellantis	50	-	45	67	-	-	-	**162**
Ford	20	-	-	-	129	-	-	**149**
Rivian	-	-	-	-	-	-	-	**-**
VW	-	-	-	-	-	-	166	**166**
BMW	-	-	-	-	-	-	10	**10**
Mercedes-Benz	-	-	-	-	-	-	-	**-**
Renault-Nissan	-	-	-	-	-	-	61	**61**
Hyundai-Kia	-	-	30	-	35	-	-	**65**
Toyota	-	-	-	-	-	-	41	**41**
Honda	-	-	40	-	-	-	20	**60**
VINFAST	-	-	-	-	-	-	-	**-**
Other OEMs	-	-	-	-	-	16	-	**16**
Total	**181**	**728**	**246**	**103**	**164**	**62**	**640**	**2,124**

Source: Company announcements, Bernstein analysis and estimates

WHICH OEM IS GROWING THE FASTEST?

In 2024 China xEV battery demand grew by 34% y-o-y, followed by the US (+20%) and Europe (+6%), and the battery demand growth of OEMs also shows the similar regional differences.

BYD (136GWh in 2024, +28% y-o-y): The internal battery demand for **BYD** accounted for 90% of its total battery sales. Top-selling models of BYD include Song DM (675K units, +33% y-o-y), Seagull (450K units, +63% y-o-y) and Yuan EV (268K units, -18% y-o-y).

Tesla (128GWh in 2024, +1% y-o-y): Tesla is the largest customer for **CATL** (16% exposure), **LGES** (41%) and **Panasonic** (98%). Globally Model Y sales volume decreased by 4% y-o-y to 1169K units, and Model 3 increased by 1% y-o-y to 535K units.

BMW (32GWh, +8% y-o-y): BMW is the largest customer for **Samsung SDI** (43% exposure). BMW has a wide range of EV products on sale with the top 3 models being i4 (73K units, -5% y-o-y), iX1 (56K units, +20% y-o-y) and i3 (48K units, -12% y-o-y). The sales volume of BMW i5 (launched in 2023) was 41K units in 2024, +546% y-o-y.

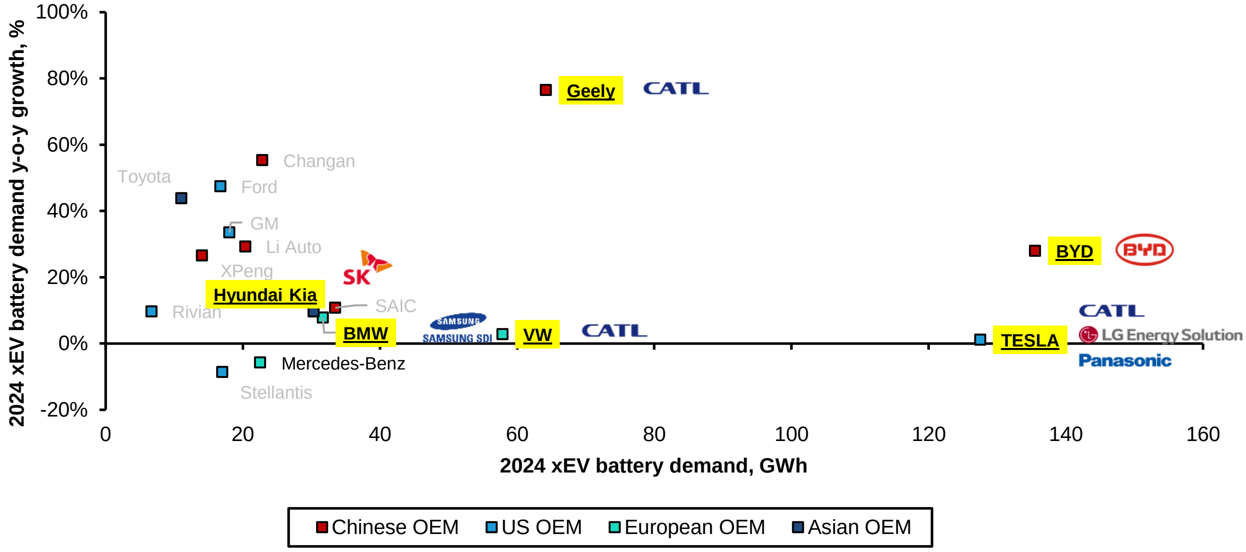
Hyundai-Kia (30GWh, +10% y-o-y): Hyundai-Kia is the largest customer for **SK On** (49% exposure). About 60% of its EV sales are from 4 models, IONIQ 5 (102K units, +2% y-o-y), NIRO (74K units, -19% y-o-y), EV6 (66K units, -16% y-o-y) and Kona (63K units, +2% y-o-y).

Volkswagen (58GWh in 2024, +3% y-o-y): VW Group has a relatively diversified battery supply structure, with 54% from CATL, 27% from LGES, 10% from SDI and 9% from SK On. VW is the second largest battery supplier for LGES (17% exposure) and Samsung SDI (20% exposure), and the third largest for CATL (11%). In 2024 top-selling models of VW group include ID.3 (151K units, +2% y-o-y), Audi Q4 e-tron (106K units, +0% y-o-y) and ID.4 (92K units, -26% y-o-y).

For other OEMs, **Geely** grew its battery demand by 77% y-o-y in 2024 to 64GWh and the momentum seems to continue in 2025 as its total EV sales volume surpassed Tesla in Jan'25 and ranked the second to BYD. In our view CATL will be one of the beneficiaries as Geely is the second largest customer for CATL (12% exposure). Both **GM (18GWh, +34% y-o-y)** and **Ford (17GWh, +47% y-o-y)** delivered a decent battery demand growth which contributed to the sales growth of LGES (15%

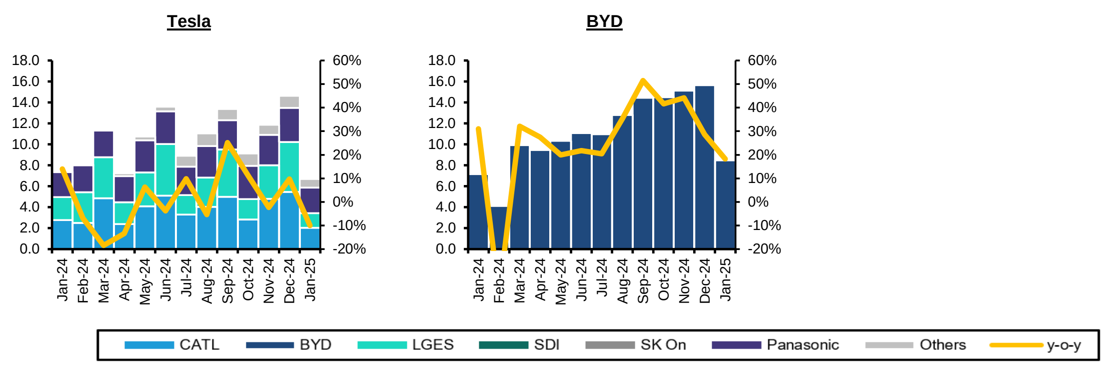
exposure to GM) and SK On (18% exposure to Ford), respectively.

EXHIBIT 16: **The slowdown of western OEMs vehicle sales was a drag on battery shipments of LGES (Tesla), SDI (BMW) and Panasonic (Tesla)**



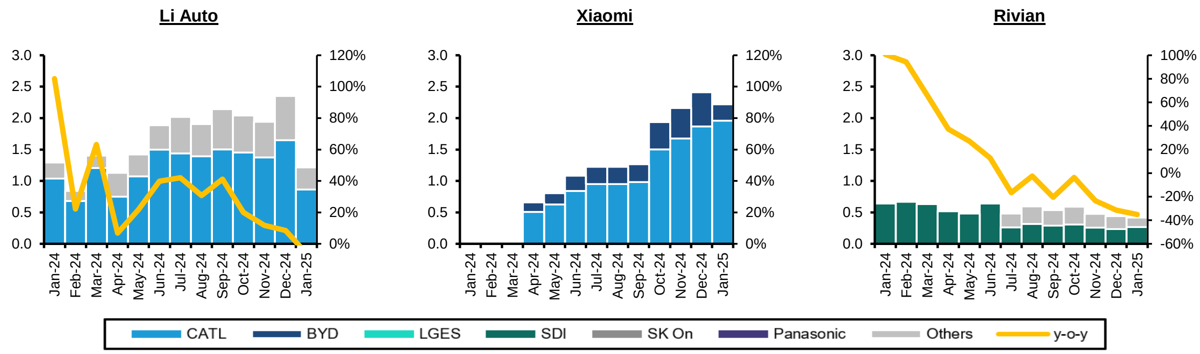
Source: SNE Research, Bernstein analysis

EXHIBIT 17: **Tesla and BYD monthly battery demand (GWh) and y-o-y growth. Tesla xEV battery demand +1% y-o-y to 128GWh and BYD +28% to 136GWh**



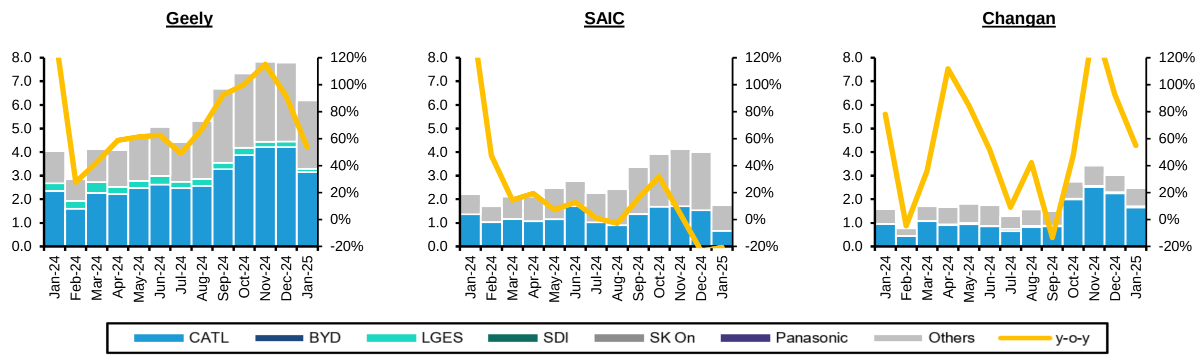
Source: SNE Research, Bernstein analysis

EXHIBIT 18: **EV start-ups monthly battery demand (GWh) and y-o-y growth. Li Auto xEV battery demand +29% y-o-y to 20GWh and Rivian +10% to 7GWh. The battery demand of Xiaomi SU7, launched in 2024, reached 13GWh**



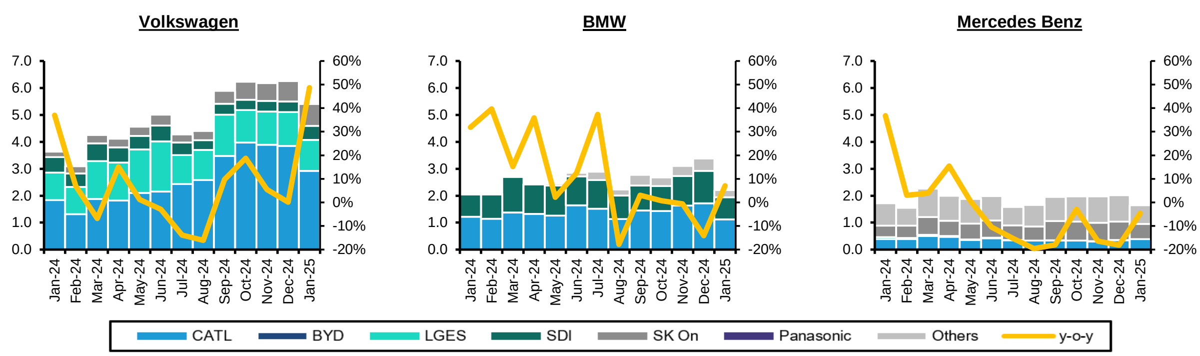
Source: SNE Research, Bernstein analysis

EXHIBIT 19: **Chinese legacy OEMs monthly battery demand (GWh) and y-o-y growth. Geely xEV battery demand increased by 77% to 64GWh, followed by SAIC (33GWh, +11%) and Changan (23GWh, +55%)**



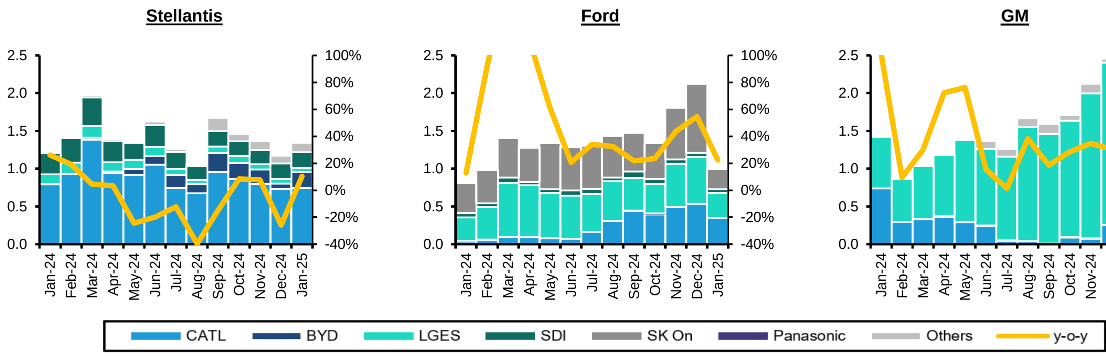
Source: SNE Research, Bernstein analysis

EXHIBIT 20: **European legacy OEMs monthly battery demand (GWh) and y-o-y growth. Volkswagen xEV battery demand increased by 3% to 58GWh, followed by BMW (32GWh, +8%) and Mercedes-Benz (23GWh, -6%)**



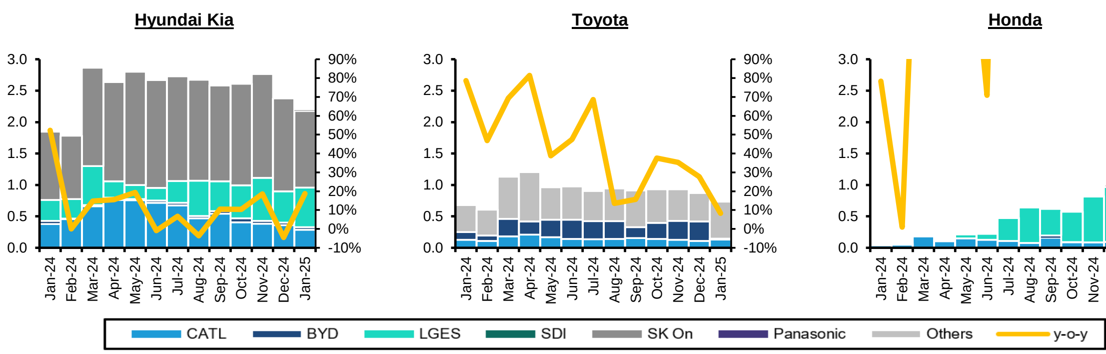
Source: SNE Research, Bernstein analysis

EXHIBIT 21: **The US legacy OEMs monthly battery demand (GWh) and y-o-y growth. GM xEV battery demand increased by 34% to 18GWh, followed by Ford (17GWh, +47%) and Stellantis (17GWh, -9%)**



Source: SNE Research, Bernstein analysis

EXHIBIT 22: **Asian legacy OEMs monthly battery demand (GWh) and y-o-y growth. Hyundai xEV battery demand increased by 10% to 30GWh, followed by Toyota (11GWh, +44%) and Honda (5GWh, +232%)**



Source: SNE Research, Bernstein analysis

2025 OUTLOOK: SK ON, BYD AND CATL TO LEAD THE GROWTH

For 2025 we expect another 30% total battery demand growth, as a function of robust China EV sales growth on strong orders book in 2H24 (+20%), recovery of Europe EV demand (+30%) driven by stricter CO2 emissions standard, although recently European Commission seeks to grant car manufacturers more time to meet EU CO2 emission standards. For the US EV sales, we expect a 10% y-o-y growth this year given the potential removal of Clean Vehicle Credits.

Chinese OEMs: The targets from OEMs area largely inline with our expectation. While Chinese OEMs do not have a guidance for the EV sales, China recorded a yearly increase of 35% for the first two months of the year. Leading Chinese OEMs like BYD and Geely are also expected to grow at a 35-40% level. The narrative should be a positive for Chinese battery makers like CATL and BYD.

US OEMs: For the US, 2025 outlook are divergent as pure EV companies like Tesla and Rivian are more conservative, while the legacy OEMs like Ford and GM are still actively embracing the electrification. Tesla expects the vehicle business to return to growth in 2025 and the Bloomberg consensus for its EV sales this year is 1.73MM units (-3% y-o-y). However, Tesla's sales in the first two months of 2025 were notably weak as its new car registrations were lower y-o-y by around 20% ex-China and the retail sales in China also declined by 14% y-o-y despite >30% China EV growth. The slowdown of Tesla EV sales will be a negative for CATL (16% exposure to Tesla), LGES (41%) and Panasonic (98%).

European OEMs: For European OEMs, Volkswagen is the most aggressive one in terms of the EV adoption this year. In its 2024 earnings presentation, Volkswagen guided the BEV share to increase to 10-14% in 2025. Compared with 8.3% in 2024, this implies a y-o-y growth of 20%-70% (45% at mid point). CATL, LGES and Samsung SDI all have meaningful shares of battery supply to VW and should be beneficiaries. On the other hand, the guidance from BMW and Mercedes-Benz are less optimistic.

BMW expects the share of all-electric vehicles in deliveries will increase slightly in 2025 compared to 2024. However, its first NEUE KLASSE vehicle, the BMW iX3, will debut in September 2025, spearheading over 40 new models by 2027. This means near-term risks for the growth potential of Samsung SDI which has 43% battery sales from BMW.

Japanese and South Korean OEMs: Hyundai Motor guided to increase its EV sales volume by 54% y-o-y to 336K units in 2025, and SK On will be the major beneficiary of this as it has around half of battery sales from Hyundai-Kia group. SK On also guided to double-digit sales growth in 2025 which would be driven by North America. For Toyota, it has expected its BEV +PHEV sales volume to increase by 70% y-o-y to 519K units in FY2026 (12 months ended Mar'26).

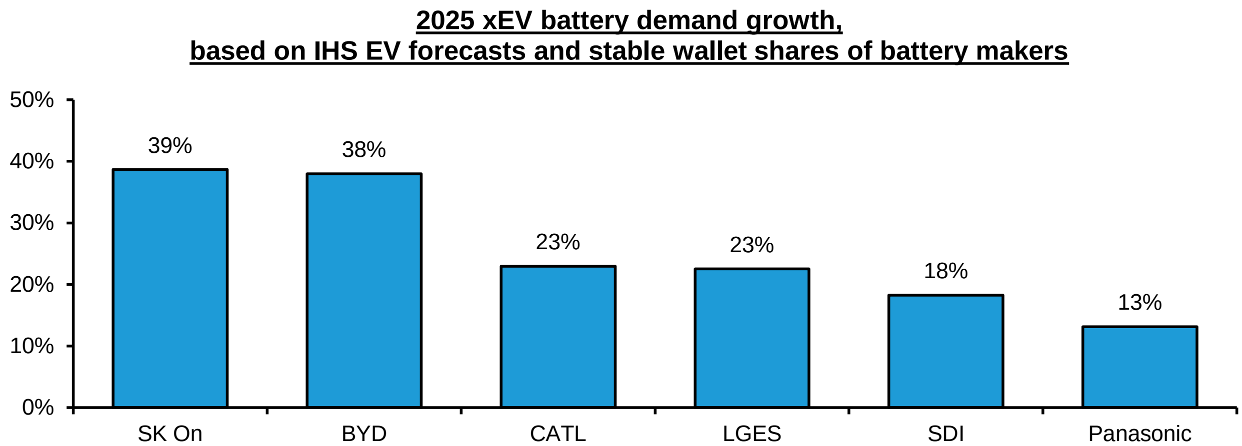
EXHIBIT 23: **What major OEMs target for EV sales in 2025 and the implications for battery demand**

Auto Group	Battery Suppliers and Exposure to OEM (%)*						2024 EV Sales (SNE)		2025 Outlook
	CATL	BYD	LGES	SDI	SK On	Panasonic	K units	y-o-y	
BYD		90%					4,131	43%	It is expected by Bernstein Asia Auto Team that the total EV sales of BYD will increase by 34% y-o-y in 2025 to reach 5.69MM units.
Geely	12%						1,318	63%	It is expected by Bernstein Asia Auto Team that the total EV sales of Geely (Geely, Geometry, Zeekr, Lynk, Galaxy and Livan) will increase by 41% y-o-y in 2025 to reach 1.25MM units.
Tesla	16%		41%			98%	1,789	-1%	Tesla 2024 earnings presentation: "With the advancements in vehicle autonomy and the introduction of new products, we expect the vehicle business to return to growth in 2025. The rate of growth will depend on a variety of factors, including the rate of acceleration of our autonomy efforts, production ramp at our factories and the broader macroeconomic environment." Bloomberg estimates for number of vehicles sold range between 1.70MM units to 2.10MM units, and the consensus based on 28 estimations is 1.73MM untis (-3% y-o-y).
Stellantis							473	-17%	For 2025, Stellantis has not publicly disclosed a specific EV sales target for the US or globally. However, they plan to expand their EV lineup with models like the Dodge Charger EV and Jeep Wagoneer S, which should boost sales. Their Dare Forward 2030 plan aims for global BEV sales of 5MM units by 2030, with 100% BEV sales in Europe and 50% in the US by that year.
Ford					18%		234	30%	Ford 2024 earnings call: "We expect a loss of $5 billion to $5.5 billion for Ford Model e, holding losses stable year-over-year. While continued industry pricing pressure remains, we plan to materially increase our global volume driven by the full-year impact of European launches and we significantly increased investment in our battery facilities and next-generation products, which are just two years away."
GM			15%				203	3%	In 2024 earnings presentation, GM targeted EV wholesales of around 300K units in 2025, which represents a y-o-y growth of c. 50%.
Rivian				18%			56	17%	In 1Q25 earnings presentation, Rivian guided to selling 40K and 46K vehicles in 2025, representing a y-o-y decrease between -23% to -11%.
Volkswagen	11%		17%	20%			1,000	0%	Volkswagen delivered 745K units of BEV and 270K units of PHEV in 2024 and BEV share was 8.3%. In 2024 earnings presentation, Volkswagen guided the BEV share to increase to 10-14% in 2025, implying a y-o-y growth of 20%-70% (45% at mid point).
BMW				43%			534	1%	BMW expects the share of all-electric vehicles in deliveries will increase slightly in 2025 compared to 2024. However, its first NEUE KLASSE vehicle, the BMW iX3, will debut in September 2025, spearheading over 40 new models by 2027.
Mercedes-Benz					19%		407	-4%	In Feb'25, Mercedes-Benz guided xEV Cars share to increase to 20-22% of total sales by 2025 (vs. 19% in 2024), and xEV Vans share to increase to 8-10% by 2025 (vs. 5% in 2024).This is expected to increase its total xEV deliveries by c. +10% y-o-y.
Hyundai Kia					49%		530	2%	Hyundai Motor 2024 earnings call: "For the 2025 EV sales guidance, compared to this year, the volume will increase from 218,000 to 336,000 which is 53.7% increase."
Toyota							271	33%	Toyota expects its BEV+PHEV sales volume to increase by 70% y-o-y to 519K units in FY2026 (12 months ended Mar'26).

* Only show numbers of key OEM customers for battery cell makers (>10% for CATL and >15% for others)
Source: Company data, SNE Research, Bernstein analysis

Below we analyze the xEV battery demand growth of cell makers based on IHS data of OEM production volume forecasts. We use the production volume to approximate the EV sales volume of each OEM, and do not consider the battery size growth in this analysis. Another key assumption is that battery cell makers will maintain their wallet shares in OEM customers, while as mentioned above we found that Chinese battery makers are gaining shares in Europe which could offer more upside for CATL. Overall, SK On (+39% y-o-y), BYD (+38%) and CATL (+23%) are expected to see the fastest battery demand growth in 2025, followed by LGES (23%), Samsung SDI (+18%) and Panasonic (+13%).

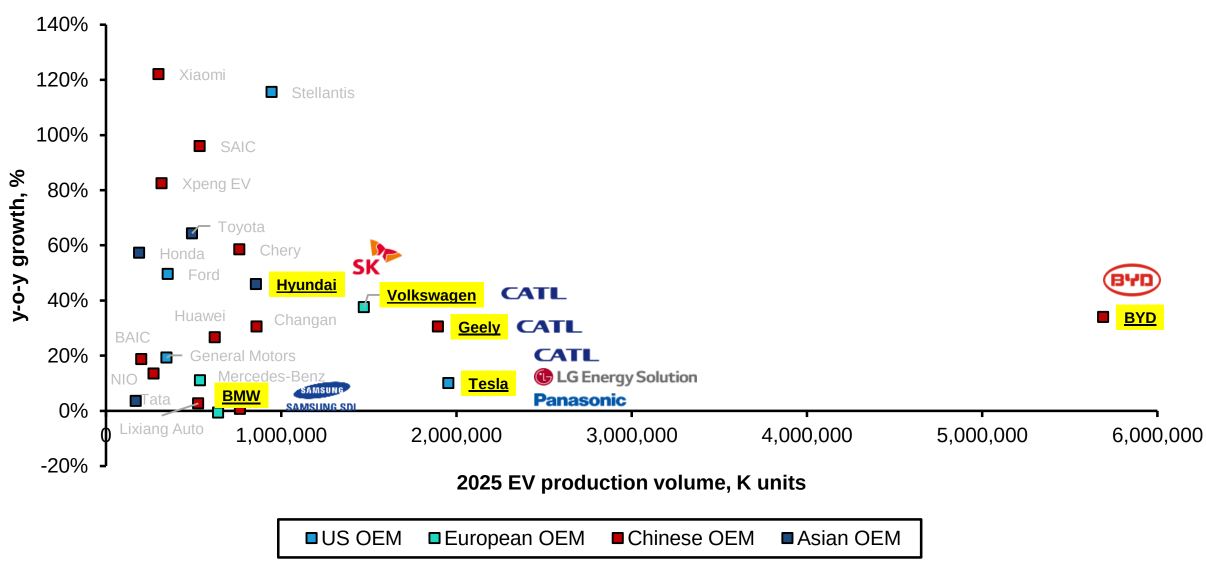
EXHIBIT 24: **Based on IHS data, SK On, CATL and BYD are expected to see the fastest battery demand growth in 2025, followed by LGES, Panasonic and Samsung SDI**



BYD 2025 EV production volume from Bernstein Asian Auto Team sales estimate. We expect that Xiaomi's production volume will reach 300K units in 2025.
Source: IHS, Bernstein analysis

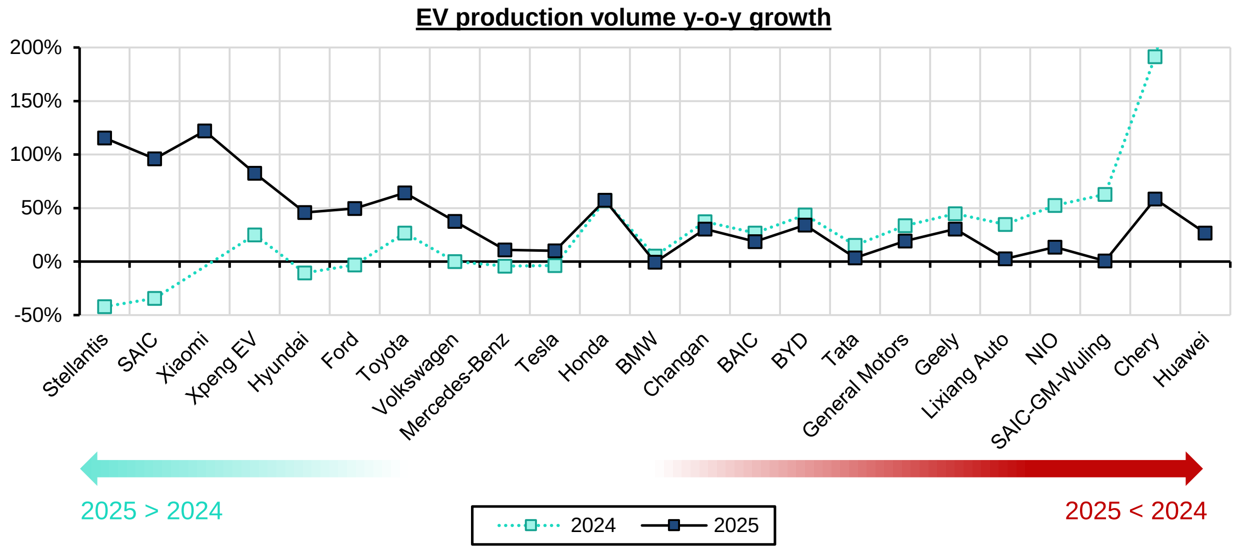
Below Exhibit 25 shows IHS forecasts for EV production volume among global major OEMs. IHS expects Tesla's EV production volume to increase by 10% y-o-y, VW and BMW to grow by 38% and -1% respectively, and Hyundai-Kia to increase by 46% in 2025. This is largely inline with companies' guidance. In Exhibit 26, IHS data shows that the EV production volume of Stellantis, SAIC, XPeng and Hyundai are expected to accelerate in 2025 while it expects the growth of Chinese OEMs like Huawei AITO, Chery and SAIC-GM-Wuling to slow down in 2025.

EXHIBIT 25: **IHS expects Tesla's EV production volume to increase by 10% y-o-y, VW and BMW to grow by 38% and -1% respectively, and Hyundai-Kia to increase by 46% in 2025**



BYD 2025 EV production volume from Bernstein Asian Auto Team sales estimate. We expect that Xiaomi's production volume will reach 300K units in 2025.
Source: IHS, Bernstein analysis

EXHIBIT 26: **IHS data shows that the EV growth of Stellantis, SAIC, XPeng and Hyundai are expected to accelerate in 2025**



BYD 2025 EV production volume from Bernstein Asian Auto Team sales estimate. We expect that Xiaomi's production volume will reach 300K units in 2025.
Source: IHS, Bernstein analysis

Below Exhibit 27 and Exhibit 28 show how we calculate the growth in demand for battery manufacturers based on the EV production volume of OEMs.

EXHIBIT 27: **Based on IHS data, CATL xEV battery demand is expected to grow by 23% y-o-y in 2025, mainly driven by Geely, VW and Chery. BYD is expected to grow by 38% y-o-y**

	2024 xEV battery demand		2024 wallet share in OEM		2025 IHS prod' volume growth	Implied 25' xEV battery demand*
	GWh	y-o-y	%	Δ	y-o-y	GWh
CATL						
TESLA	47	-2%	37%	-1%	10%	52
Geely	34	47%	53%	-11%	30%	45
VW	31	36%	54%	13%	38%	43
BMW	17	-9%	53%	-10%	-1%	17
Huawei/Seres	17	263%	100%	2%	27%	21
SAIC	16	-15%	47%	-14%	26%	20
Li Auto	15	4%	74%	-18%	3%	15
Changan	14	53%	63%	-1%	31%	19
Chery	14	4672%	72%	63%	58%	22
NIO	13	42%	77%	5%	13%	14
Others**	77	17%	19%	-1%	23%	95
CATL Total	**295**	**26%**	**36%**	**0%**	**23%**	**363**
BYD						
BYD***	136	28%	100%	0%	34%	181
Xpeng	3	N.A.	22%	22%	82%	6
Toyota	3	88%	26%	6%	64%	5
Xiaomi****	3	N.A.	22%	N.A.	122%	6
Stellantis	1	N.A.	7%	7%	116%	3
Others**	4	38%	1%	0%	38%	6
BYD* Total**	**150**	**36%**	**18%**	**2%**	**38%**	**207**

* Assume that the overall battery size remains unchanged and each battery manufacturer's wallet share in OEM remains the same. ** Assume that "Others" battery demand growth is in line with that of cell makers' total demand. *** BYD 2025 EV sales volume estimates from Bernstein Asian Auto Team. **** Assume Xiaomi's sales volume to reach 300K units in 2025.

Source: IHS, SNE Research, Bernstein analysis

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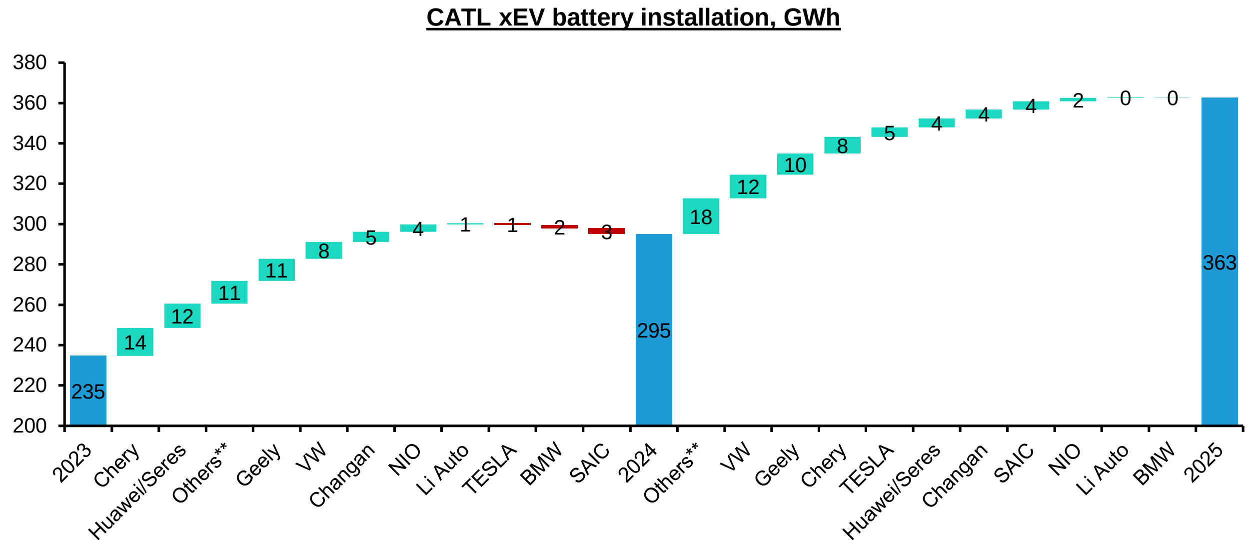
EXHIBIT 28: **SK On xEV battery demand is expected to grow by 39% y-o-y in 2025, followed by LGES (+23%), SDI (+18%), and Panasonic (+13%)**

	2024 xEV battery demand		2024 wallet share in OEM		2025 IHS prod' volume growth	Implied 25' xEV battery demand*
	GWh	y-o-y	%	Δ	y-o-y	GWh
LGES						
TESLA	38	10%	30%	2%	10%	42
VW	16	-29%	27%	-12%	38%	22
GM	15	98%	81%	26%	19%	17
Ford	6	-11%	38%	-25%	50%	10
Hyundai Kia	5	3%	17%	-1%	46%	7
Others**	14	-15%	2%	-1%	23%	17
LGES Total	**94**	**1%**	**11%**	**-3%**	**23%**	**115**
SK On						
Hyundai Kia	18	0%	60%	-5%	46%	27
Mercedes-Benz	7	7%	32%	4%	11%	8
Ford	7	135%	40%	15%	50%	10
VW	5	33%	9%	2%	38%	7
BAIC	0	-85%	1%	-6%	19%	0
Others**	0	23%	0%	0%	39%	0
SK On Total	**37**	**17%**	**5%**	**0%**	**39%**	**52**
Panasonic						
TESLA	34	-20%	27%	-7%	10%	37
LUCID	1	N.A.	100%	100%	135%	2
Toyota	0	N.A.	0%	0%	64%	0
VW	0	N.A.	0%	0%	38%	0
Others**	0	N.A.	0%	0%	13%	0
Panasonic Total	**35**	**-18%**	**4%**	**-2%**	**13%**	**40**
SDI						
BMW	12	16%	39%	3%	-1%	12
VW	6	-20%	10%	-3%	38%	8
Rivian	5	-14%	78%	-22%	-8%	5
Stellantis	3	-37%	18%	-8%	116%	6
TATA	2	150%	41%	16%	4%	2
Others**	1	-73%	0%	0%	18%	1
SDI Total	**29**	**-11%**	**4%**	**-1%**	**18%**	**34**

* Assume that the overall battery size remains unchanged and each battery manufacturer's wallet share in OEM remains the same. ** Assume that "Others" battery demand growth is in line with that of cell makers' total demand. *** BYD 2025 EV sales volume estimates from Bernstein Asian Auto Team. **** Assume Xiaomi's sales volume to reach 300K units in 2025.
Source: IHS, SNE Research, Bernstein analysis

CATL grew its xEV battery installation to 295GWh in 2024 (+26% y-o-y) and is expected to increase by 23% to 363GWh in 2025 based on IHS data. In 2024, key customers that contributed to CATL's growth included Chery (+14GWh), Huawei AITO (+12GWh), Geely (+11GWh) and Volkswagen (+8GWh). SAIC (-3GWh) was a drag in 2024 mainly due to the share loss of CATL. In 2025 key customers for CATL's EV battery sales growth include Volkswagen, Geely, Chery and Tesla. As for the supply shares among OEMs, we highlight the upside from VW (CATL's share in VW increased to 54% in 2024, +13%-points) but downside from Geely as it is actively expanding its in-house battery supply.

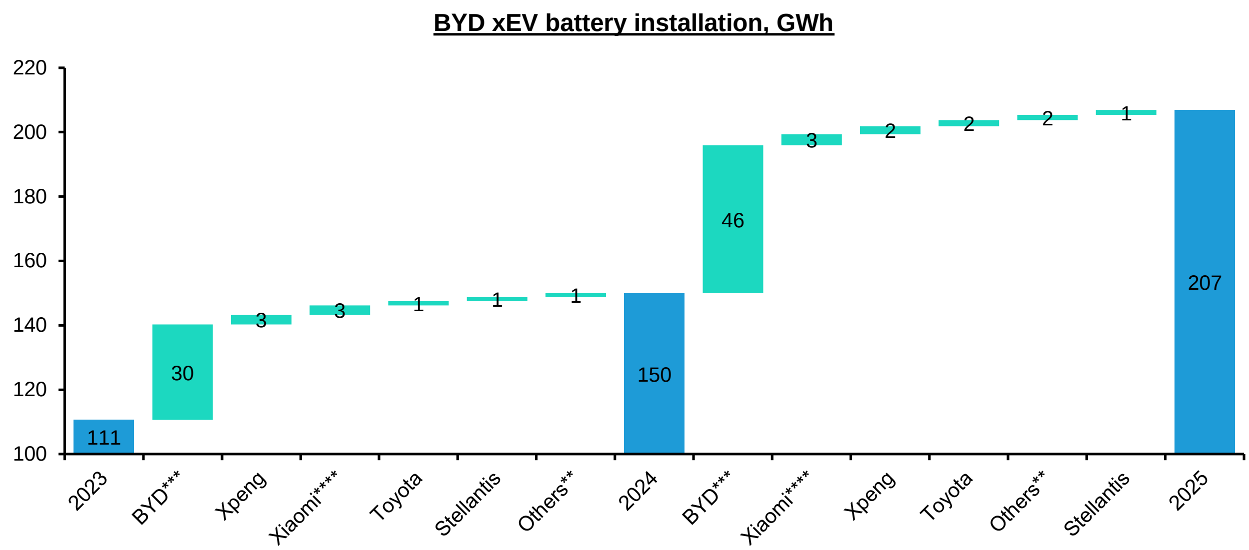
EXHIBIT 29: **CATL xEV battery growth breakdown by OEM customers. Key customers to watch in 2025 are VW, Geely, Chery and Tesla**



** Assume that 2025 "Others" battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

BYD grew its xEV battery installation to 150GWh in 2024 (+36% y-o-y) and is expected to increase by 38% to 207GWh in 2025 based on IHS data. In 2024, external battery sales accounted for 10% of BYD's total battery demand, but it accounted for 25% of its battery demand growth last year. BYD started to supply its LFP batteries to some popular EV models like Xiaomi SU7 and XPeng MONA 03. For 2025, IHS data indicate high grwoth potential for its key customers like Toyota, XPeng and Stellantis.

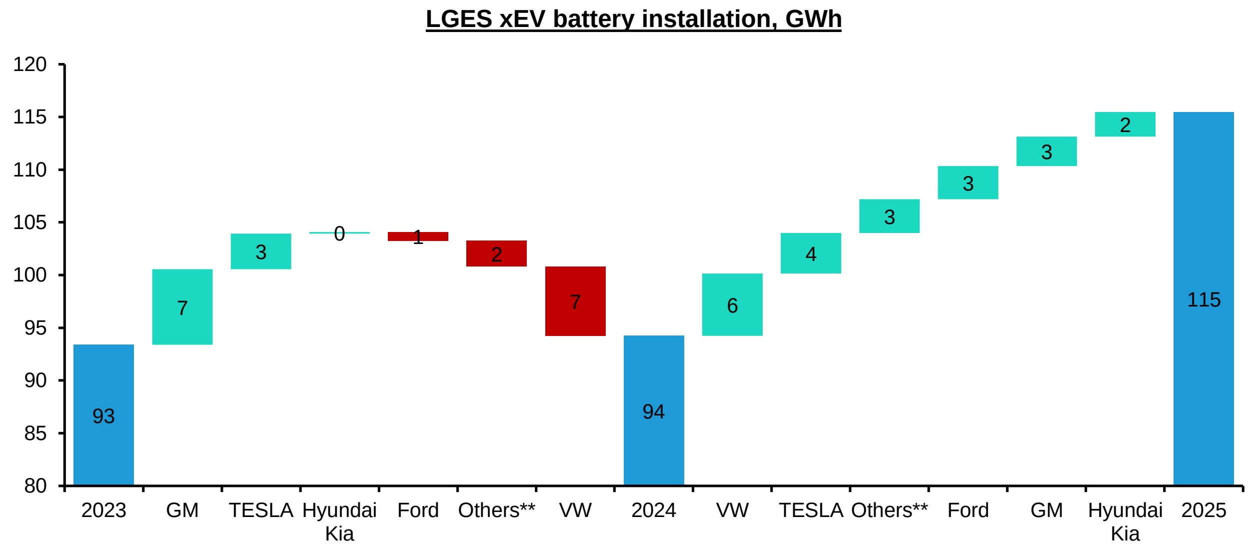
EXHIBIT 30: **BYD xEV battery growth breakdown by OEM customers. External battery sales are becoming more meaningful (around 20% of total battery demand growth in 2025)**



** Assume that 2025 "Others" battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

LGES grew its xEV battery installation to 94GWh in 2024 (+1% y-o-y) and is expected to increase by 23% to 115GWh in 2025 based on IHS data. In 2024, the growth of LGES battery demand mainly came from GM (+7GWh) and Tesla (+3GWh), and LGES gained the supply shares to both of them in the US. However, the growth was partially offset by the share losses in Volkswagen (mainly replaced by CATL) and Ford (mainly replaced by SK On). For 2025, the growth of LGES will still depend on Volkswagen and Tesla while there are risks of competition in Europe and Tesla's sales slowdown.

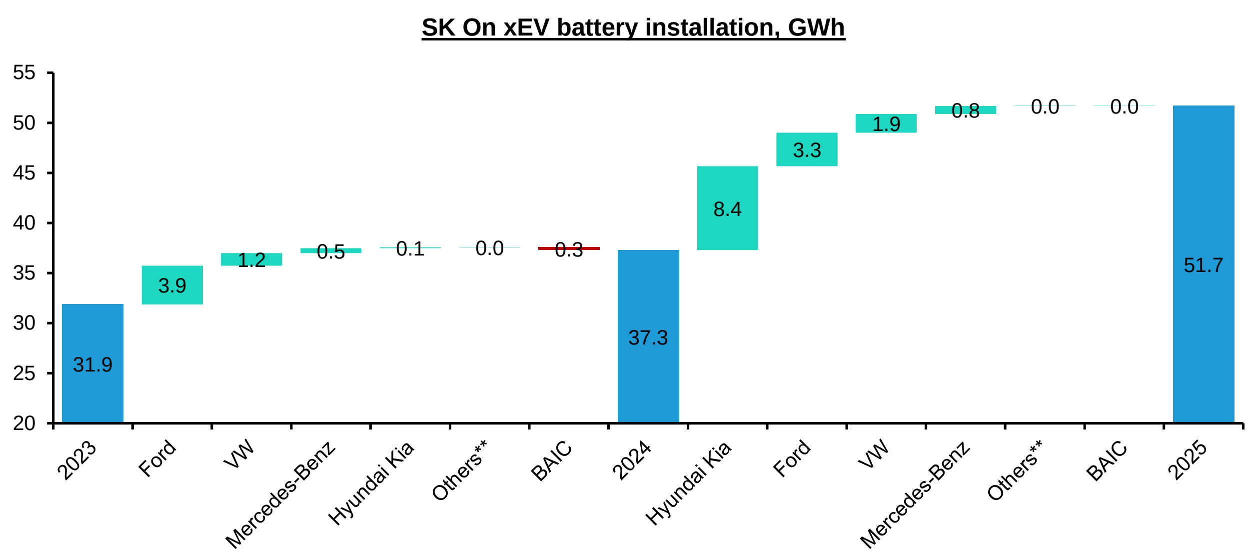
EXHIBIT 31: **LGES xEV battery growth breakdown by OEM customers. LGES lost 20%-points shares supply to VW in 2024. 2025 demand growth will be highly dependent on VW and Tesla**



** Assume that 2025 "Others" battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

SK On grew its xEV battery installation to 37GWh in 2024 (+17% y-o-y) and is expected to increase by 39% to 52GWh in 2025 based on IHS data. In 2024, the battery demand growth was driven by Ford (+4GWh) and its 2025 battery demand growth will be mainly driven by both Hyundai-Kia (+8GWh) and Ford (+3GWh). SK On has JV plants with both Ford and Hyundai-Kia to be commissioned in 2025 which indicates the upside for it to gain supply shares in these two key customers.

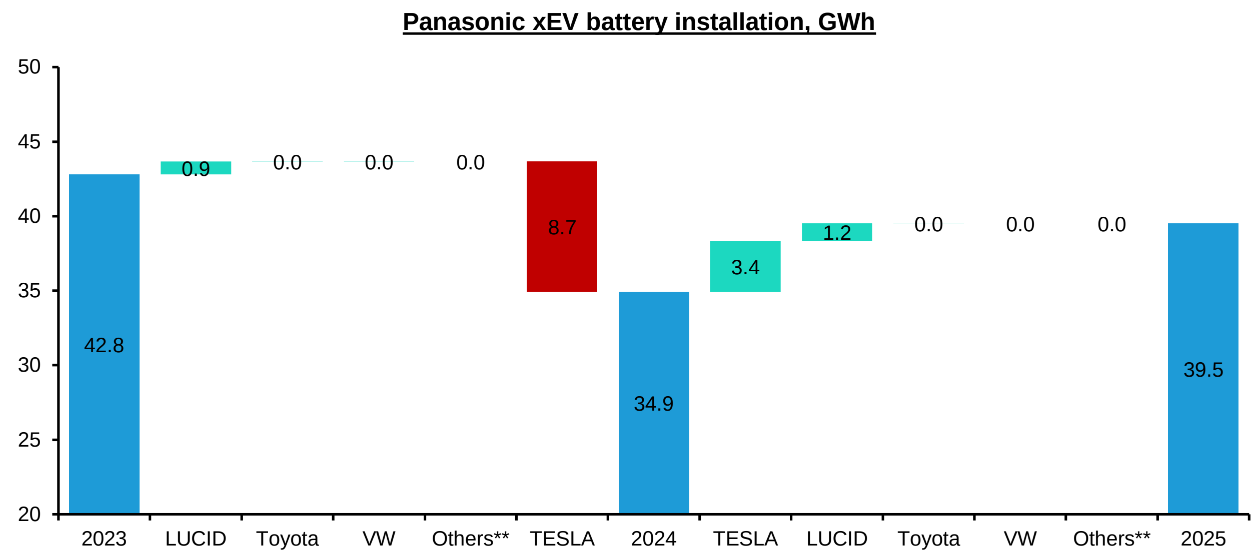
EXHIBIT 32: **SK On xEV battery growth breakdown by OEM customers. The battery demand growth of SK On in 2025 mainly depends on Hyundai and Ford**



** Assume that 2025 "Others" battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

The xEV battery installation of Panasonic was 35GWh in 2024 (-18% y-o-y) and is expected to increase by 13% to 40GWh in 2025 based on IHS data. The growth of Panasonic's battery business can be almost entirely attributed to the growth of Tesla and the wallet share delta. Tesla EV battery demand declined by 1% y-o-y in 2024 but Panasonic lost shares in its supply to Model 3 (-4%-points and LGES gained shares) and Model Y (-5%-points and Tesla itself gained shares).

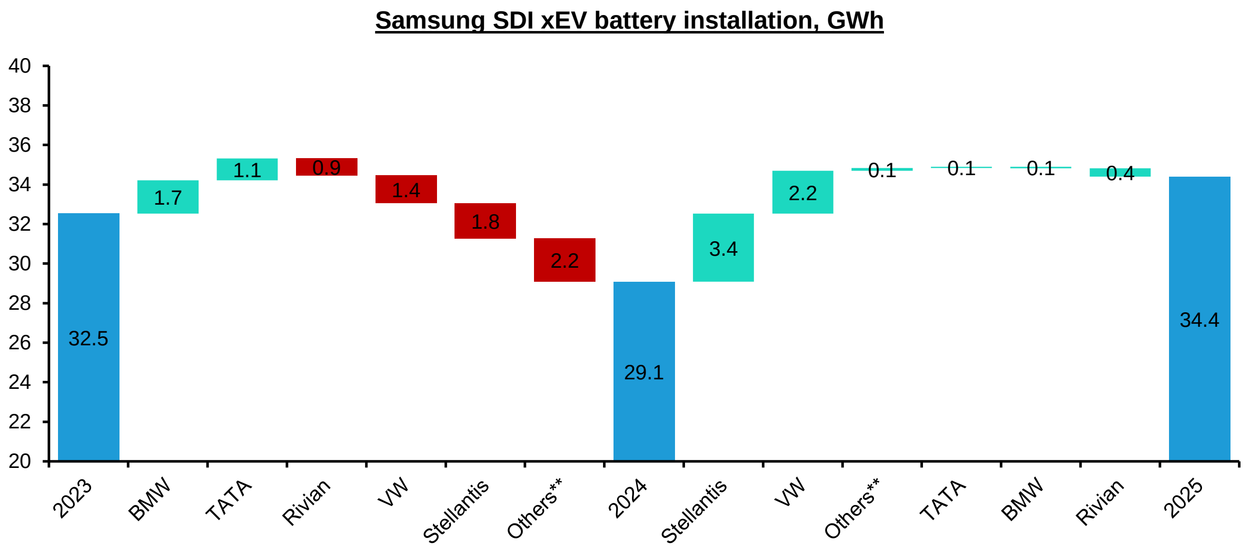
EXHIBIT 33: **Panasonic xEV battery growth breakdown by OEM customers. Panasonic lost 15%-points shares supply to Tesla (replaced by Tesla itself) in 2024**



** Assume that 2025 “Others” battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

The xEV battery installation of SDI was 29GWh in 2024 (-11% y-o-y) and is expected to increase by 18% to 34GWh in 2025 based on IHS data. The battery demand growth from BMW (+2GWh) and TATA (+1GWh) were offset by declined in Vinfast, Stellantis, Volkswagen and Rivian. 2025 growth of SDI will call for the EV sales rebound of European OEMs like Stellantis and Volkswagen which is risky. For Stellantis, its EV sales declined by 17% y-o-y in 2024 and has not publicly disclosed a specific EV sales target for the US or globally for 2025. For Volkswagen, SDI will also be faced with intensified competition from Chinese rivals.

EXHIBIT 34: **Samsung SDI xEV battery growth breakdown by OEM customers. Based on IHS data, the battery demand growth of SDI in 2025 mainly depends on Stellantis and VW while its largest customer BMW have limited upside**

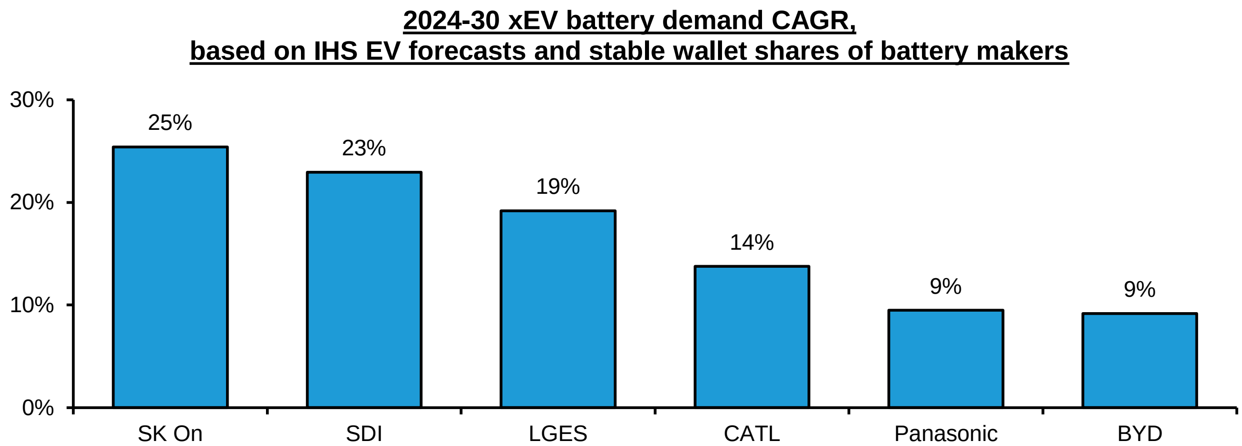


** Assume that 2025 "Others" battery demand growth is in line with that of cell makers' total demand
Source: IHS, SNE Research, Bernstein analysis

FIVE-YEAR OUTLOOK FOR GROWTH – BETTER FOR KOREANS?

Based on forecast EV sales and current share of wallet we can project future sales for each company over the next 5 years. These numbers will change and are dependent on (a) the growth rate of each OEM over the next 5 years and (b) the change in the share of wallet, which will also likely change over the next 5 years are battery makers adjust suppliers. What is noticeable is that Korean battery makers are forecast to grow more quickly than their Chinese peers. This reflects faster sales growth of US OEM's selling EV's over the next 5 years relative to China, which is reaching maturity with 50% penetration. Whether the US market takes off, is clearly a major question and whether Chinese battery makers will be fully excluded from this market remains unclear. We think it possible that China could play a bigger role than currently expected, particularly if US-China trade relations ease. However, at face value it does indicate that sales for non-Chinese battery makers should improve. For companies such as CATL, we expect that growth in sectors other than EV (ESS, trucks, data centers) will become increasingly important and will also supplement to the growth.

EXHIBIT 35: **Based on IHS data, Korean battery cell makers are expected to see the fastest battery demand growth until to 2030, followed by CATL, Panasonic and BYD**



Assume that the overall battery size remains unchanged and each battery manufacturer's wallet share in OEM remains the same
Source: IHS, SNE Research, Bernstein analysis

EXHIBIT 36: **Based on IHS data, CATL xEV battery demand is expected to grow at a CAGR of 14% from 2024 to 2030, mainly driven by VW, Geely and Chery. BYD is expected to grow at a CAGR of 9%**

	2024 xEV battery demand		2024 wallet share in OEM		2024-30 IHS prod' volume growth	Implied 2030' xEV battery demand*
	GWh	y-o-y	%	Δ	CAGR	GWh
CATL						
TESLA	47	-2%	37%	-1%	7%	73
Geely	34	47%	53%	-11%	12%	67
VW	31	36%	54%	13%	26%	125
BMW	17	-9%	53%	-10%	13%	34
Huawei/Seres	17	263%	100%	2%	5%	23
SAIC	16	-15%	47%	-14%	11%	30
Li Auto	15	4%	74%	-18%	3%	18
Changan	14	53%	63%	-1%	16%	36
Chery	14	4672%	72%	63%	20%	43
NIO	13	42%	77%	5%	12%	25
Others**	77	17%	19%	-1%	14%	167
CATL Total	**295**	**26%**	**36%**	**0%**	**14%**	**640**
BYD						
BYD	136	28%	100%	0%	4%	168
Xpeng	3	N.A.	22%	22%	22%	10
Toyota	3	88%	26%	6%	46%	28
Xiaomi***	3	N.A.	22%	N.A.	50%	33
Stellantis	1	N.A.	7%	7%	37%	8
Others**	4	38%	1%	0%	9%	7
BYD Total	**150**	**36%**	**18%**	**2%**	**9%**	**254**

* Assume that the overall battery size remains unchanged and each battery manufacturer's wallet share in OEM remains the same. ** Assume that "Others" battery demand growth is in line with that of cell makers' total demand. *** Xiaomi's sales volume estimated by Bernstein
Source: IHS, SNE Research, Bernstein analysis

EXHIBIT 37: **SK On xEV battery demand is expected to grow at a CAGR of 25% over the next six years, followed by SDI (+23%), LGES (+19%), and Panasonic (+9%)**

	2024 xEV battery demand		2024 wallet share in OEM		2024-30 IHS prod' volume growth	Implied 2030' xEV battery demand*
	GWh	y-o-y	%	Δ	CAGR	GWh
LGES						
TESLA	38	10%	30%	2%	7%	59
VW	16	-29%	27%	-12%	26%	63
GM	15	98%	81%	26%	24%	54
Ford	6	-11%	38%	-25%	33%	35
Hyundai Kia	5	3%	17%	-1%	24%	18
Others**	14	-15%	2%	-1%	19%	41
LGES Total	**94**	**1%**	**11%**	**-3%**	**19%**	**270**
SK On						
Hyundai Kia	18	0%	60%	-5%	24%	66
Mercedes-Benz	7	7%	32%	4%	20%	21
Ford	7	135%	40%	15%	33%	37
VW	5	33%	9%	2%	26%	20
BAIC	0	-85%	1%	-6%	16%	0
Others**	0	23%	0%	0%	25%	0
SK On Total	**37**	**17%**	**5%**	**0%**	**25%**	**145**
Panasonic						
TESLA	34	-20%	27%	-7%	7%	53
LUCID	1	N.A.	100%	100%	44%	8
Toyota	0	N.A.	0%	0%	46%	0
VW	0	N.A.	0%	0%	26%	0
Others**	0	N.A.	0%	0%	9%	0
Panasonic Total	**35**	**-18%**	**4%**	**-2%**	**9%**	**60**
SDI						
BMW	12	16%	39%	3%	13%	25
VW	6	-20%	10%	-3%	26%	23
Rivian	5	-14%	78%	-22%	28%	24
Stellantis	3	-37%	18%	-8%	37%	20
TATA	2	150%	41%	16%	22%	6
Others**	1	-73%	0%	0%	23%	3
SDI Total	**29**	**-11%**	**4%**	**-1%**	**23%**	**100**

* Assume that the overall battery size remains unchanged and each battery manufacturer's wallet share in OEM remains the same. ** Assume that "Others" battery demand growth is in line with that of cell makers' total demand. *** Xiaomi's sales volume estimated by Bernstein
Source: IHS, SNE Research, Bernstein analysis

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The Bernstein brand has three categories of ratings:

- Outperform: Stock will outpace the market index by more than 15 pp
- Market-Perform: Stock will perform in line with the market index to within +/-15 pp
- Underperform: Stock will trail the performance of the market index by more than 15 pp

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Market-Perform (Bernstein Brand) Neutral (Autonomous Brand)	HOLD	387	34.96%	67	17.31%
Underperform	SELL	147	13.28%	19	12.93%

* These figures represent the number and percentage of companies in each category to whom affiliates of Bernstein and Autonomous provided investment banking services.
As of April 9, 2025. All figures are updated quarterly.

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