

Company Report

Transportation & Logistics



## China's Volkswagen (or Toyota) poised to go global

December 29, 2023

### INVESTMENT SUMMARY

- We believe there are so many positives going for BYD that it will be its own game to lose;
- Amid the world's transition to clean energy vehicles, BYD's mid-of-the-road positioning, strong engineering background in both Internal Combustion Vehicles (ICE) and battery technology, and long brand track record will allow it to assume the role of Volkswagen or Toyota in the Electronic Vehicle (EV) era;
- The US-led protectionism and the rise of Huawei-affiliated EV brands will uniquely help BYD to compete at home with the best and transfer the learnings outwards as a trusted bridge to the world;
- We initiate BYD with a BUY rating and a TP of HK\$350.

### Research Team



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NA|Chinese New Economy • Initiation

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## BYD Company Limited (SEHK: 1211)

### A sure bet in the electrification of global auto industry

- BYD's mid-of-the-market positioning, similar to Volkswagen and Toyota, means it can capture the largest denominator between China and the world;
- Too many positives are going for BYD, including advanced home market, leading battery, EV/ICE dual DNA, private enterprise and global brand;
- We initiate BYD with BUY rating and TP of HK\$350.

### BYD will enter a sweet spot in the next few years

Thanks to novelty effect and technology innovations, average selling price (ASP) of EV has been trending up, helping BYD's margins. In the meantime, BYD's low-to-mid-tier customer base care more about robustness, durability and price than Internet-Of-Things (IOT) integration, Autonomous Driving Service (ADS) and intelligent cockpit (IC), providing a continuous driver for sales. Lastly, global protectionism is widening China's EV lead, necessitating a bridging car brand of which BYD suits to fill the best.

### Battery technology innovation benefits in-house player

In-house battery has become the latest trend of EV makers to differentiate among crowded competition and stagnant demand. BYD is uniquely positioned in capturing industry's transition to Semi-Solid-State (SSSB) and All-Solid-State-Batteries (ASSB) with capacity. In-house battery also allows BYD to integrate battery cell, package and chassis into engineering designs.

### Smartphone market rebound in 2024 will help BYDE

We expect the global smartphone market to rebound after declining for eight straight years. Further, we expect Huawei to reclaim some of its lost shares. BYDE as outsourcing partner for both Huawei and Apple shall benefit. BYD's comprehensive relationship with Huawei can help both to prosper in EV.

### Shares trade at a historical discount

Both BYD and BYDE are trading near their historical lows in terms of PE band. We initiate BYD with a BUY rating and TP of HK\$350.

### Summary financial data

Highlights	2021A	2022A	2023E	2024E	2025E
Revenues (RMB mn)	216,142	424,061	582,330	725,504	985,458
Operating profit (RMB mn)	8,362	28,522	39,686	55,157	65,342
EPS (RMB)	1.06	5.71	10.79	16.41	20.36
P/E	178	33	17	11	9
Free cash flow yield (%)	7.4%	9.8%	NM	3.2%	13.4%
EPADS (USD)	0.15	0.80	1.51	2.30	2.85

Source: Bloomberg, Blue Lotus (as of December 29, 2023)

BUY

UR

SELL

Target Price: HK\$ 350

Current Price: HK\$ 205.2

RIC: (SEHK: 1211)

BBG: 1211 HK

Market cap (HK\$ mn)

604,853.2

Average daily volume (HK\$ mn)

1,684.60

Shares out/float (mn)

1,098/1,009

Source: Bloomberg, Blue Lotus (as of December 29, 2023)

### Key Changes

	New	Old	Diff
BLRI Recommendation	BUY	-	-
BLRI Target Price	HK\$350	-	-
2023E EPADS (USD\$)	1.51	-	-
2024E EPADS (USD\$)	2.30	-	-
2025E EPADS (USD\$)	2.85	-	-

Source: Blue Lotus (as of December 29, 2023)

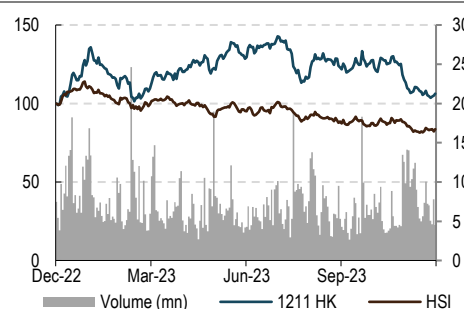
Exchange: USD/RMB=7.15

### BLRI vs. The Street

No. of Bloomberg Recommendations	39
Target price vs. Bloomberg mean	3.8%
1-year-fwd EPS vs. Bloomberg mean	1.0%
Bloomberg recommendation	4.79

Source: Bloomberg Recommendation, Blue Lotus (1=SELL,5=BUY) (as of December 29, 2023)

### Price performance and volume data



Source: Bloomberg, Blue Lotus (as of December 29, 2023)

### Research team



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Blue Lotus Capital Advisors Limited

All prices are those current at the end of the previous trading session unless otherwise indicated. Prices are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is sourced from Bloomberg, Blue Lotus Capital Advisors Limited and subject companies. Consensus forward estimates are used in analysis. Past performance is not indicative of future results. Investors should consider this report as only a single factor in making their investment decision.

# BYD Company Limited: Financial Summary

Fiscal year ends-31-Dec

## Exhibit 1. Income statement

(RMB mn)	2022A	2023E	2024E
Total sales/revenues	424,061	582,330	725,504
COGS	(351,816)	(470,259)	(582,050)
Gross profit	72,245	112,071	143,455
Gross margin	17.0%	19.2%	19.8%
Selling expense	(15,061)	(23,646)	(28,586)
Administrative expense	(10,007)	(14,027)	(16,182)
R&D expenses	(18,654)	(34,713)	(43,530)
EBIT (operating profit)	28,522	39,686	55,157
Operating margin	6.7%	6.7%	7.6%
Interest income	1,830	2,579	3,422
Interest expense	(1,316)	(1,736)	(1,756)
Other non-operating inc. & exp.	(7,956)	(2,405)	1,276
Pre-tax profit	21,080	38,124	58,098
Income taxes	(3,367)	(5,433)	(8,639)
Net profit / (Loss)	17,713	32,691	49,459
Net margin	4%	6%	7%
Net profit attributable to ordinary shareholders	16,622	31,365	47,725
EPS, basic (RMB)	5.71	10.79	16.41
EPS - fully diluted (RMB)	5.71	10.77	16.39

Source: BYD Company Limited (as of December 29, 2023)

## Exhibit 2. Balance sheet

(RMB mn)	2022A	2023E	2024E
Cash & Cash Equivalents	51,182	44,611	59,745
Receivables	48,105	68,323	87,817
Inventories	79,107	105,746	130,892
Other current assets	62,409	63,417	78,010
Total current assets	240,804	282,097	356,465
Net PP&E/Fixed assets	131,880	208,132	288,748
Net intangibles	26,361	36,402	47,885
Deferred tax assets	3,686	5,317	6,456
Other long-term assets	91,130	104,610	87,311
Total non-current assets	253,057	354,462	430,400
Total assets	493,861	636,558	786,865
Payables	307,871	406,850	492,591
Short-term debt and current portion of long-term debt	12,535	995	1,219
Other current liabilities	12,939	17,943	22,532
Total current liabilities	333,345	425,788	516,342
Long term debt	7,594	12,594	12,594
Other long-term liabilities	31,533	6,088	6,786
Total non-current liabilities	39,126	18,681	19,380
Total liabilities	372,471	444,469	535,721
Total common equity	111,030	180,402	240,041
Total liabilities and equity	493,861	636,558	786,865

Source: BYD Company Limited (as of December 29, 2023)

## Company Description

BYD operates in the four core fields of Electronics, Automobile, New Energy and Rail Transit, having expanded from a company that once only produced and sold rechargeable batteries. BYD is the largest EV maker and the third largest vehicle battery maker in the world. In 2022, BYD sold 178.2k units electric PVs globally, capturing 17% of global market share and grew to 21% in C1H23. In 2022, BYD's passenger vehicle export grew 307% YoY to 2.2% of total.

## Industry View

China's new energy vehicle sales volume increased by 221% in 2022 due to stabilized government NEV subsidy, and we expect the growth to reach 58% in 2023, driven by new products, price cuts and expanding infrastructure. In 2022, China vehicle export grew 57% YoY to 2.53mn.

## Exhibit 3. Cash flow statement

(RMB mn)	2022A	2023E	2024E
Net income	17,713	32,691	49,459
Depreciation and amortization add-back	19,702	28,746	41,514
Change in working capital	124,515	48,444	38,757
Interest expense	1,316	1,736	1,756
Other operating cash flow items	6,126	(174)	(4,698)
Cash flow from operations	161,417	109,038	128,064
Purchases of PPE	(95,917)	(105,856)	(96,001)
Additions to other intangible assets	(11,262)	(11,647)	(14,510)
Increase in prepaid land lease payments	8,096	(3,107)	(2,418)
Increase in derivative financial instruments	86	-	-
Other investing cash flow items	(21,599)	-	-
Cash Flow from Investing Activities	(120,596)	(120,609)	(112,930)
Proceeds from issue of shares	-	-	-
Proceeds from bank loans, net	(19,671)	5,000	-
Other financing cash flow items	182	-	-
Cash Flow from Financing Activities	(19,489)	5,000	-
Effect of forex changes, net	610	-	-
Cash at beginning of the year	49,820	51,182	44,611
Cash at the end of the year	51,182	44,611	59,745

Source: BYD Company Limited (as of December 29, 2023)

See the last page of the report for important disclosures



## Recent Reports

December 27<sup>th</sup>, 2023: [Blue Lotus Logistics Sector Update]: **Overseas e-commerce brews new logistics players**

December 22<sup>nd</sup>, 2023: [Blue Lotus Entertainment Sector Update]: **Yet another short-term pain, long term gain**

December 20<sup>th</sup>, 2023: [Coupang Inc. (CPNG US, SELL, TP US\$14.1) Target Price Change]: **Farfetch may glitter, but it isn't gold**

December 20<sup>th</sup>, 2023: [Trip.com (TCOM US, SELL, TP US\$29) Reinitiation]: **Trouble in the prized asset...Reinitiate w/ SELL**

December 19<sup>th</sup>, 2023: [Meituan (3690 HK, BUY, TP HK\$118) Company Update]: **Why ByteDance's purchase of Eleme is a bad idea?**

December 19<sup>th</sup>, 2023: [Vipshop (VIPS US, BUY, TP US\$18.1) Target Price Change]: **Discount offerings remain hot given cold consumption**

December 18<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **Latest developments in short video point to possibilities**

December 15<sup>th</sup>, 2023: [KE Holdings Inc. (BEKE US, BUY, TP US\$24.5) Target Price Change]: **Policy stimulus drive up near term sales**

December 15<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **December's CEW shows China still wants peaceful rise**

December 13<sup>rd</sup>, 2023: [Zai LAB (ZLAB US, SELL, TP US\$20) Target Price Change]: **Two positive news drove up 2024 growth target**

December 7<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **Solid companies starting to rise from the ashes**

December 5<sup>th</sup>, 2023: [Miniso Group (MNSO US, BUY, TP US\$31) Company

## Investment Cases at a Glance

### Why is it a Buy

- **BYD will be the winner of EV (Electronic Vehicle) consolidation in China:** We estimate CR5 of China's EV industry (BEV+PHEV) has risen from 58% in C1Q17 to 68% in C3Q23. Crackdown on cheating scams, phase-out of subsidies, and Tesla's entry filtered out short-term players and products, leaving market shares to products with merits. As a result, BYD's market share rose from 15-20% to 30-35% during this period. We expect China's CR5 at its steady state to consist of BYD, Huawei-affiliated-brands, Tesla, Li, and GAC with BYD's market share stabilizing at 1/3 as EV marching towards full replacement of ICE;
- **In-house battery will be increasingly recognized as a strength, giving BYD an edge at a time of disruptive battery technology changes:** Battery technology is at a critical juncture where BEV (Battery Electronic Vehicle) is overtaking ICE (Internal Combustion Engine) in all aspects of usage aspects, including (1) All-Solid-State-Battery (ASSB) and Semi-Solid-State-Battery (SSSB), (2) Cell-To-Pack (CTP) and Cell-To-Chassis (CTC), (3) specific technologies to mitigate battery's shortcomings against ICE, like heat pump and fast charging, etc.. The rapid evolution of technology at this critical juncture requires close-knit collaboration between battery makers and car makers. BYD will enjoy a unique advantage by having both in house;
- **In depth knowhow in both ICE and powertrain optimization gives BYD an edge:** BYD as an ICE maker accumulated years of experience in fine tuning the ICE powertrain for optimized performance, particularly in fuel economy. For example, its Hybrid Electronic Vehicle (HEV) technology is more fuel efficient than Li Auto's Range Extended Electronic Vehicle (REEV). On the other hand, BYD as a battery maker accumulated years of experience in fine tuning battery powertrain for optimized performance, particularly in terms of electricity economy. As a result, BYD enjoys technology advantage against both new EV startups and traditional ICE makers, from a hardware perspective;
- **BYD can bridge the gap between China and ROW in EV evolution:** From an industry policy perspective, China is modelling EV after telecommunication in Korea at the beginning of the century, using the Chinese market as a testing ground for new technologies and standards. In the meantime, protectionism globally and lack of infrastructure is widening the gap between China and Rest Of the World (ROW) in EV state of the art. This necessitates a global vendor to bridge the gap. BYD is so far the most suitable for this role;
- **BYD's technology leadership in prismatic LFP battery gives it unique edge and growth potential:** We hold the view that prismatic battery (BYD and CATL) has longer growth trajectory than cylindrical battery (Tesla) as a battery option because it separates spatial efficiency from heat dissipation, allowing engineering optimization on both dimensions independently. BYD's long focus on Lithium Iron Phosphate (LFP) also yields its advantages in safety, cost,

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**Update]: Management reassured future growth prospects**

December 4<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **2024 High Conviction: Two scenarios towards year end**

November 30<sup>th</sup>, 2023: [Meituan (3690 HK, BUY, TP HK\$118) Target Price Change]: **Deeply cultivate domestic while wait for overseas**

November 30<sup>th</sup>, 2023: [Bilibili Inc. (BILI US, SELL, TP US\$9) Target Price Change]: **Niche player faces market saturation**

November 29<sup>th</sup>, 2023: [PDD Holdings (PDD US, BUY, TP US\$165) Target Price Change]: **PDD and Temu growth tailwinds will continue**

November 28<sup>th</sup>, 2023: [Futu Holdings (FUTU US, SELL, TP US\$46) Rating Change]: **Run out of growth momentum, downgrade to SELL**

November 27<sup>th</sup>, 2023: [Miniso Group (MNSO US, BUY, TP US\$31) Company Update]: **Opportunity for a reposition has come to fore**

November 27<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **Heightened geopolitical risk tempers 2024**

November 27<sup>th</sup>, 2023: [Blue Lotus Transportation Sector Update]: **Huawei's R&D & marketing alignment makes it stronger**

November 24<sup>th</sup>, 2023: [Baidu, Inc. (BIDU US, BUY, TP US\$157) Target Price Change]: **C4Q/2024 ads upswing bridge gap to the future**

November 23<sup>rd</sup>, 2023: [Kuaishou (1024 HK, BUY, TP HK\$78) Target Price Change]: **Refined operation supports sustainable growth**

November 22<sup>nd</sup>, 2023: [Meituan (3690 HK, BUY, TP HK\$128) Target Price

toxicity, temperature tolerance, etc., and thus candidacy for energy storage solutions not only for power battery, but also for renewable energy storage;

- **BYD can co-exist with Huawei as dominant forces in the Chinese EV market:** While BYD does compete against Huawei-affiliated car brands, it targets different customers at the present time. BYD can also act as a component supplier and EMS to Huawei;
- **BYD as a private enterprise with scale gives it advantage in exports:** BYD's share in China's EV export climbed from 11% in C4Q22 to 30% in Oct/Nov23, catching up with Tesla China's. We view the global EV market to also go through the same evolution from subsidy-driven to price-driven to full-ICE replacement-driven, allowing makers with product merit to gain share. We further believe BYD as a private enterprise gives it advantage to gain share in the export market over SOE's like GAC, SAIC and BAIC;
- **Market rebound and share gain in smartphones can help BYDE's business:** We expect global smartphone market growth to rebound from (5.7)% in 2023 to 1.6% YoY in 2024 and China smartphone market to rebound from (5.1%) to 2.1% YoY. We expect revenue of BYDE to grow 28% YoY in 2024, accelerating from 20% YoY in 2023. Further positives include contracts of Huawei smartphone outsourcing and market share gain from Foxconn;
- **Power storage represents a future growth opportunity for BYD:** In 2022, renewable energies of solar and wind contributed 7.5% of the world's energy consumption, up from just 3.9% five years ago (*Source: BP*). Both solar and wind require extensive energy storage infrastructures to connect to the power grid. Battery is an indispensable energy storage solution because it is both terrain-independent and infinitely scalable. BYD chooses to focus on system integration of battery energy storage solutions outside of China and captured 1/3 of global market share in 2022 (*Source: CNESA*). In the long run we expect BYD to benefit from global growth in energy storage as 1-2 hour worth of renewable energy generation shall be included for each renewable power generation facility in the form of batteries to enable connection to the grid.
- **Valuation:** Trading at 11x 2024 PE for BYD and 10 x 2024 PE for BYDE, both are near their historical lows. We believe now is a good buying opportunity.

**What are the key catalysts for the next 3-6 months**

- **Improving sales of newly launched mid-to-high-end models:** BYD introduced several mid-to-high end models, such as *Equation Leopard* (Outdoor SUV, Rmb250-350K) in C1Q23, *Yangwang* (Premium outdoor SUV, >Rmb1mn) in C3Q23 and *Denza D9* (MPV, Rmb300-450K) in C3Q22, emphasizing on robustness, durability, comfort and price. Out tracking suggests sales volumes have steadily climbed up for *Yangwang* and *Equation Leopard* brands and *Denza D9* has solidified its position ahead of the launches of Li's *MEGA* and XPeng's *X9*. Healthy sales of mid-to-high-priced models can prove to the market that

Change]: **Douyin's near-term impact is overrated... BUY**

November 21<sup>st</sup>, 2023: [Xiaomi Inc. (1810 HK, SELL, TP HK\$12.6) Earnings Review]: **Mi 14 success does not alter overall headwinds**

November 20<sup>th</sup>, 2023: [NetEase, Inc. (NTES US, BUY, TP US\$138) Target Price Change]: **Raise TP for upcoming and highly anticipated titles**

November 20<sup>th</sup>, 2023: [Kanzhun Ltd. (BZ US, SELL, TP US\$14.5) Target Price Change]: **Growth target cannot justify high valuations**

November 17<sup>th</sup>, 2023: [Tencent Music (TME US, BUY, TP US\$9.7) Rating Change]: **Unique content unlocked paying potential**

November 17<sup>th</sup>, 2023: [JD Health (6618 HK, BUY, TP HK\$52) Target Price Change]: **A COVID hiccup but environment is turning positive**

November 17<sup>th</sup>, 2023: [Atour Lifestyle (ATAT US, BUY, TP US\$37.5) Target Price Change]: **Brand value brings premium sales**

November 17<sup>th</sup>, 2023: [Alibaba (BABA US, SELL, TP US\$72) Rating Change]: **The casualty of era...Downgrade to SELL**

November 17<sup>th</sup>, 2023: [XPeng Inc. (XPEV US, SELL, TP US\$9) Rating Change]: **Strategic options may come late and uncertain (Corrigendum)**

November 16<sup>th</sup>, 2023: [Blue Lotus Multi-Platform Sector Update]: **Key JD categories will grow again in 2024**

November 16<sup>th</sup>, 2023: [Tencent (700 HK, BUY, TP HK\$432) Target Price Change]: **More sustained growth doesn't mean slow growth**

November 14<sup>th</sup>, 2023: [Blue Lotus Sector Update]: **Two elections drive US-China re-engagement**

BYD can withstand the assault of Huawei-affiliated EV brands for the dominance of the Chinese market;

- **Continuing export growth in non-US markets:** In 2022, the US market accounted for 17% of the world's passenger vehicle (PV) market while China 33%. Outside of US and China, India (5.4%), Japan (5.1%), Germany (3.5%), ASEAN (3.3%), Brazil (2.4%), UK (2.3%), France (2.3%), Korea (2.0%) and Canada (1.9%) together constituted 28% of the world's market. ASEAN, Latin American and Europe are thus BYD's top priority markets with still ample room for penetration.

### Where can we be wrong

- **BYD loses its market leadership in China:** In C3Q23, BYD's unit share in China's EV market was 35%, comprising of 27% in BEV and 51% in PHEV. BYD faces two (potential) competitions: Huawei-affiliated cars now and Xiaomi in the future. Both Huawei and Xiaomi are smartphone makers excelling on ADS, IOT and IC. We believe ADS, IOT and IC are only relevant to mid-to-upper price segment customers and will remain so in the foreseeable future. We forecast BYD to capture 1/3 of China's and 1/5 of the world's EV market share at its steady state. This hypothesis cannot be true if BYD loses its market leadership in China. Currently Xiaomi holds the biggest wild card;
- **Japanese, German, Korea or American ICE makers make successful transition to EV:** BYD's investment case rests on its gaining market share against ICE car makers, especially Japanese carmakers as their consumer value propositions overlap with BYD's. So far this has proven to be the case. Unit share of non-Chinese brands in China's EV market stood at 14.4% in C3Q23, far below their market share in ICE. Yet we cannot rule out one or more of non-Chinese car makers successfully make a transition to EV. If so our forecast for BYD will be in jeopardy;

### What can change our view?

- **Mid-to-low price point EV buyers pay increasing attention to ADS, IOT and IC:** Currently the attraction of Huawei-affiliated brands, selling ADS, IOT and IC, are confined to the mid-to-upper price segment or young, trendy populations. However, due to intensive competition, some EV makers like XPeng, Xiaomi and Zeekr are trying to bring upper market feature to the low-price segment. Such endeavours, if successful, can threaten BYD's market position in China;
- **Xiaomi successfully established itself in EV:** We keep a close eye on Xiaomi, as it has far greater resources than early rivals and has a reputation to bring down industry gross margins. If it can combine Huawei's ADS/IOT/IC with BYD's robustness, durability and price across a broad product line, Xiaomi can successfully establish itself and take share from both Huawei and BYD;
- **One or more Japanese, German, Korean or American ICE maker successfully adapted to the Chinese EV market:** We see a broad-scaled exit of global carmakers from China but the exit isn't even. Within each group

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November 9<sup>th</sup>, 2023: [KE Holdings Inc. (BEKE US, BUY, TP US\$24.5) Target Price Change]: **Steady recovery with catalysts for market share gain**

November 9<sup>th</sup>, 2023: [Tencent (700 HK, BUY, TP HK\$425) Target Price Change]: **International game and advertising drove results**

November 8<sup>th</sup>, 2023: [ACM Research Inc. (ACMR US, BUY, TP US\$30) Earnings Review]: **Korea and US are the next battlefields**

November 8<sup>th</sup>, 2023: [Li Auto Inc. (LI US, BUY, TP US\$47) Target Price Change]: **Li's MEGA can change the MPV landscape**

November 8<sup>th</sup>, 2023: [Blue Lotus Lodging Sector Update]: **Dividend from supply shortage can continue into 2024**

consolidation does occur, which leads to stronger, albeit fewer competitors to stay in China's market. A legacy, non-Chinese ICE maker successfully adapting the Chinese market will become a formidable competitor worldwide, in our view.

## Operating Metrics

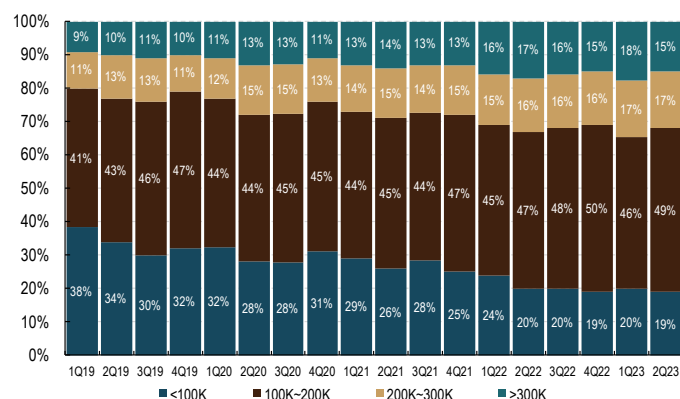
Exhibit 4. Quarterly revenue table

RMB mn	3Q23	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2023E	2024E
Mobile handset components, assembly service and other products	32,368	33,198	30,284	34,222	41,294	42,354	116,656	148,154
Automobiles and related products, and other products	126,831	129,599	118,022	135,677	152,213	171,017	465,253	576,929
<b>Automobile(PV)</b>	<b>106,570</b>	<b>117,274</b>	<b>105,594</b>	<b>120,875</b>	<b>135,266</b>	<b>153,671</b>	<b>405,476</b>	<b>515,407</b>
EV Sales (unit)	772,768	865,687	773,675	887,962	989,565	1,125,409	2,811,726	3,776,611
ASP (RMB k)	143.0	142.0	136.5	136.1	136.7	136.5	144.2	136.5
<b>Renewable energy</b>	<b>5,275</b>	<b>5,275</b>	<b>5,258</b>	<b>5,258</b>	<b>6,582</b>	<b>6,582</b>	<b>21,436</b>	<b>23,680</b>
<b>Revenue of power battery</b>	<b>472</b>	<b>2,677</b>	<b>1,228</b>	<b>554</b>	<b>3,466</b>	<b>1,926</b>	<b>5,716</b>	<b>7,174</b>
External sales of power battery(GWh)	0.67	3.77	1.69	0.76	4.65	2.58	8.01	9.69
ASP (RMB/Wh)	0.71	0.71	0.72	0.72	0.75	0.75	0.71	0.74
Revenue of 3C battery and energy storage	4,803	2,599	4,030	4,704	3,116	4,656	15,720	16,506
Others	105	105.	105.	105.	105.	105	421	421
<b>Total revenue</b>	<b>159,303</b>	<b>162,902</b>	<b>148,411</b>	<b>170,005</b>	<b>193,612</b>	<b>213,476</b>	<b>582,330</b>	<b>725,504</b>

Source: BYD Company Limited, Blue Lotus (as of December 29, 2023)

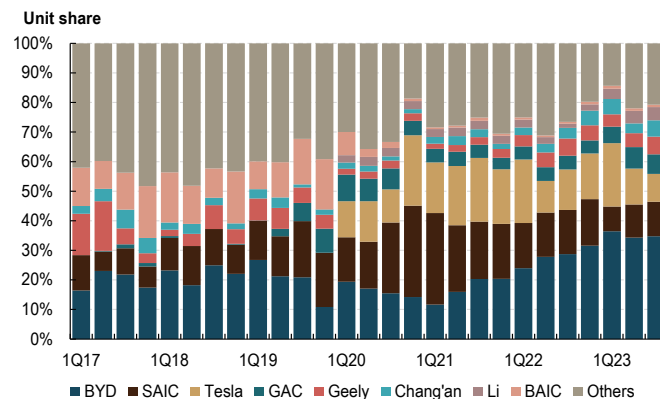
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**Exhibit 5. Unit market share by price segments, Chinese auto**



Source: Landroads, Blue Lotus (as of December 29, 2023)

**Exhibit 6. Key players in China's EV space and their shares**



Source: CPCA, Blue Lotus (as of December 29, 2023)

**Exhibit 7. Vendor and country market share, power battery**

New installation by GWh	2018	2019	2020	2021	2022
CATL (China) (宁德时代)	23%	28%	23%	33%	37%
LGES (Korea)	7.5%	11%	23%	20%	14%
BYD (China) (比亚迪)	12%	9.4%	6.5%	8.8%	14%
Panasonic (Japan)	21%	24%	18%	12%	7.3%
Samsung SDI (Korea)	3.5%	3.7%	5.6%	4.8%	4.7%
SK On (Korea)	0.8%	1.8%	5.2%	5.7%	5.4%
CALB (China) (中创新航)	0.7%	1.3%	2.3%	2.7%	3.9%
Gotion (China) (国轩高科)	3.2%	2.7%	1.7%	2.2%	2.7%
Sunwoda (China) (欣旺达)	0.1%	0.5%	0.7%	0.9%	1.8%
Farasis (China) (孚能科技)	1.9%	1.0%	0.6%	0.8%	1.4%
Other Chinese	7.1%	6.8%	4.2%	3.1%	3.3%
Other non-Chinese	19%	10%	9.0%	6.3%	5.4%
<b>Chinese vendor as total</b>	<b>48%</b>	<b>49%</b>	<b>39%</b>	<b>51%</b>	<b>64%</b>
<b>Chinese market as global</b>	<b>57%</b>	<b>53%</b>	<b>43%</b>	<b>46%</b>	<b>50%</b>

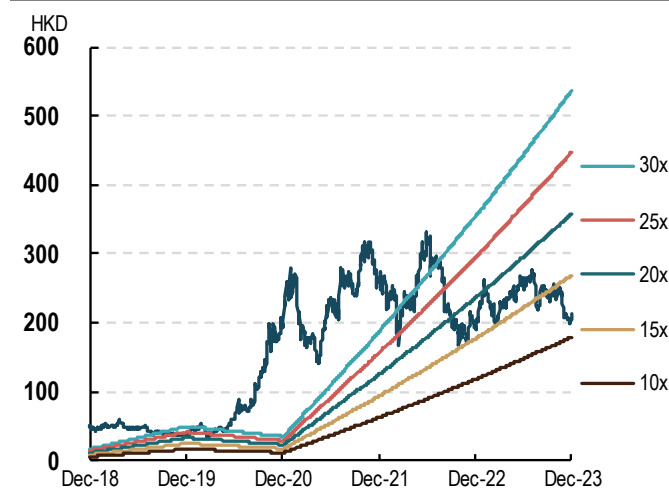
Source: SNE, GGII, Blue Lotus(as of December 29, 2023)

**Exhibit 8. Export market share of Chinese EV makers**

	Tesla	BYD	SAC	DFM	Hozon	Skyworth
4Q22	36%	11%	20%	7.9%	2.0%	1.1%
1Q23	41%	11%	25%	4.8%	4.2%	0.7%
2Q23	35%	14%	21%	10%	2.3%	0.8%
3Q23	29%	25%	17%	4.1%	1.5%	1.8%
Oct/Nov 23	30%	30%	16%	1.5%	2.2%	1.8%

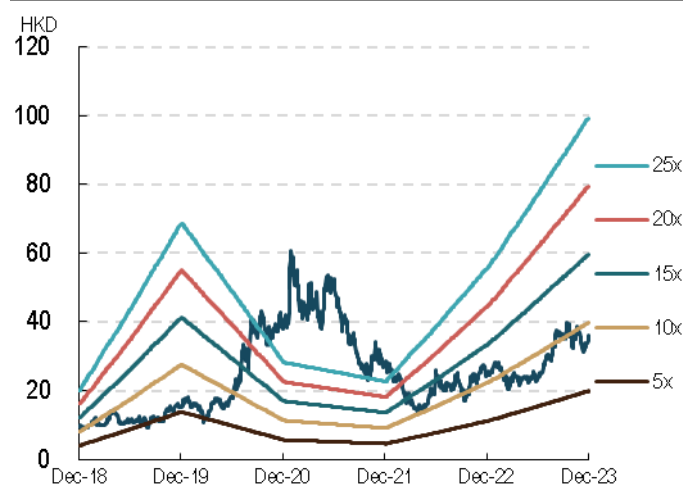
Source: CPCA, Blue Lotus (as of December 29, 2023)

**Exhibit 9. PE Band of BYD**



Source: Bloomberg, Blue Lotus (as of December 29, 2023)

**Exhibit 10. PE Band of BYD Electronic**

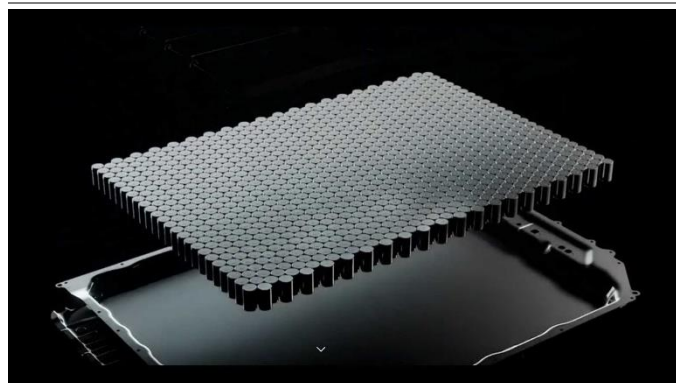


Source: Bloomberg, Blue Lotus (as of December 29, 2023)

See the last page of the report for important disclosures



**Exhibit 11. Tesla's cylindrical battery (Panasonic, LG, Eve, CATL, Gotion)**



Source: Tesla, Blue Lotus (as of December 29, 2023)

**Exhibit 12. CATL and BYD's prismatic battery (Samsung SDI, Gotion, Eve, CALB)**



Source: BYD, Blue Lotus(as of December 29, 2023)

**Exhibit 13. Solid state battery product announcements**

Developer	Battery tech	Country	Energy density (Wh/kg)	Range per charge (km)	Fully charge in minutes	OEM partners	Date of announcement
Toyota	Sulfide ASSB	Japan	~500	1,200	10	Toyota	June, 2023
CATL	Condsd. matter SSSB	China	500	~1,500	NA	NA	April, 2023
EVE	Oxide SSSB	China	330	NA	NA	NA	December, 2022
Talent (太蓝)	Oxide SSSB	China	350-400	NA	10	NA	December, 2022
BYD	Sulfide ASSB	China	400	>1000	NA	BYD	November, 2022
WeLion	Oxide SSSB	China	360	1,000	NA	NIO, Geely	November, 2022
NASA	Sulfide ASSB	USA	500	NA	NA	Nissan	October, 2022
Farasis	Oxide SSSB	China	330	1,000	25	Mercedes, GAC, Geely, DFM	September, 2022
SVOLT	Sulfide ASSB	China	350-400	>1000	NA	GWM	July, 2022
Solid Power	Sulfide ASSB	USA	390	NA	20	BMW, Ford	June, 2022
Gotion	Oxide SSSB	China	360	1000	NA	HiPhi, GWM	May, 2022
SES	Oxide SSSB	Singapore	417	>800	NA	GM, Hyundai	November, 2021
Qingtao	Oxide SSSB	China	368	1,083	NA	SAIC, BAIC, GAC, NETA V	September, 2021
Ganfeng	Oxide SSSB	China	350	1,000	NA	SERES, VW, DFM, GAC, SG	July, 2021
QuantumScape	Sulfide ASSB	USA	400	NA	20	VW	December, 2020
ProLogium ( 辉能)	Oxide ASSB	Taiwan	383	NA	NA	Mercedes, FEV, FAW, VinFast	August, 2020

Source: Company data, Blue Lotus (as of December 29, 2023). ASSB=All-Solid-State-Battery, SSSB=Semi-Solid-State-Battery

**Exhibit 14. Critical EV minerals and their geographic resources, 2022**

(k ton)	Lithium		Cobalt		Nickel		Manganese		Graphite	
	Production	Reserve	Production	Reserve	Production	Reserve	Production	Reserve	Production	Reserve
Australia	61	7,900	5.9	1,500	160	21,000	3,300	270,000	0.5	NA
Indonesia	NA	NA	10	600	1,600	21,000	NA	NA	NA	NA
Bolivia	NA	21,000	NA	NA	NA	NA	NA	NA	NA	NA
Argentina	6.2	20,000	NA	NA	NA	NA	NA	NA	NA	NA
US	NA	12,000	0.8	69	18	370	0	NA	0	NA
Chile	39	11,000	NA	NA	NA	NA	NA	NA	NA	NA
Ex-French colonies	NA	3,000	135	4,113	190	7,100	5,200	61,000	110	25,000
China	19	6,800	2.2	140	110	2,100	900	280,000	850	52,000
Russia	NA	1,000	8.9	250	220	7,500	NA	NA	15	14,000
Philippines	NA	NA	3.8	260	330	4,800	NA	NA	NA	NA
Canada	0.5	930	3.9	220	130	2,200	NA	NA	15	NA
Brazil	2.2	250	NA	NA	83	1,600	400	270,000	87	74,000
Cuba	NA	NA	3.8	500	NA	NA	NA	NA	NA	NA
South Africa	NA	NA	NA	NA	NA	NA	7,200	640,000	NA	NA
Turkey	NA	NA	2.7	36	NA	NA	NA	NA	2.9	90,000
<b>Total</b>	<b>130</b>	<b>98,000</b>	<b>165</b>	<b>8,300</b>	<b>3,300</b>	<b>100,000</b>	<b>2,000</b>	<b>1,700,000</b>	<b>1,300</b>	<b>330,000</b>
<b>China as world</b>	<b>15%</b>	<b>6.9%</b>	<b>1.3%</b>	<b>1.7%</b>	<b>3.3%</b>	<b>2.1%</b>	<b>4.5%</b>	<b>16%</b>	<b>65%</b>	<b>16%</b>
<b>Production/Reserve</b>	<b>0.13%</b>		<b>2.0%</b>		<b>3.3%</b>		<b>0.11%</b>		<b>0.39%</b>	

Source: USGS, Blue Lotus (as of December 29, 2023), \*Congo, Madagascar, Morocco & Côte d'Ivoire.

**Exhibit 15. Global Battery EV (BEV) unit and share**

(mn)	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23
BEV units	1.51	1.61	2.15	2.63	1.94	2.15
Tesla (US)	21%	16%	16%	15%	22%	22%
BYD (China)	9.5%	11%	12%	12%	14%	16%
GAC (Aion)	2.9%	3.5%	3.9%	3.5%	4.0%	6.0%
Volkswagen (Germany)	3.6%	4.2%	4.3%	4.5%	3.9%	4.7%
SAIC (WL & MG)(China)	7.4%	6.8%	9.5%	13%	5.6%	5.9%
Hyundai (Korea)	2.7%	2.7%	2.5%	2.3%	3.2%	3.6%
BMW (Germany)	2.2%	2.0%	2.0%	2.5%	2.9%	3.6%
Mercedes (Germany)	NA	NA	NA	NA	2.6%	2.8%
Kia (Korea)	2.5%	2.5%	2.0%	1.4%	2.1%	2.0%
Audi (Germany)	NA	NA	NA	NA	NA	1.9%
<b>Chinese in top 10</b>	<b>45%</b>	<b>50%</b>	<b>61%</b>	<b>61%</b>	<b>41%</b>	<b>41%</b>
<b>Top 10 as total</b>	<b>57%</b>	<b>54%</b>	<b>59%</b>	<b>59%</b>	<b>62%</b>	<b>68%</b>

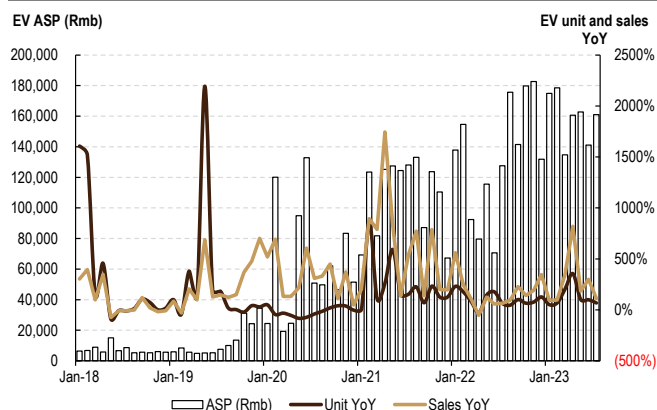
Source: TrendForce, Blue Lotus(as of December 29, 2023)

**Exhibit 16. Global Plug-Hybrid EV (PHEV) unit and share**

(mn)	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23
PHEV units	0.49	0.58	0.71	0.95	0.71	0.88
BYD	29%	30%	39%	37%	37%	37%
Li Auto (China)	6.5%	5.0%	3.8%	4.8%	7.3%	10%
BMW	10%	8.8%	5.9%	6.0%	5.8%	4.3%
Mercedes	9.3%	5.5%	6.7%	6.1%	5.6%	4.0%
Volvo (China)	7.7%	5.9%	3.5%	4.5%	5.2%	4.6%
Jeep (US)	3.2%	4.1%	2.9%	3.2%	3.8%	4.0%
Kia	2.5%	2.7%	2.9%	2.9%	3.0%	2.6%
Denza*	NA	NA	NA	NA	2.8%	3.4%
Volkswagen	4.3%	4.0%	4.2%	2.3%	2.5%	2.2%
Toyota (Japan)	4.9%	3.4%	2.5%	2.1%	2.5%	2.9%
Great Wall (China)	NA	NA	NA	NA	NA	2.3%
<b>Chinese in top 10</b>	<b>54%</b>	<b>65%</b>	<b>70%</b>	<b>68%</b>	<b>67%</b>	<b>74%</b>
<b>Top 10 as total</b>	<b>80%</b>	<b>70%</b>	<b>76%</b>	<b>70%</b>	<b>76%</b>	<b>75%</b>

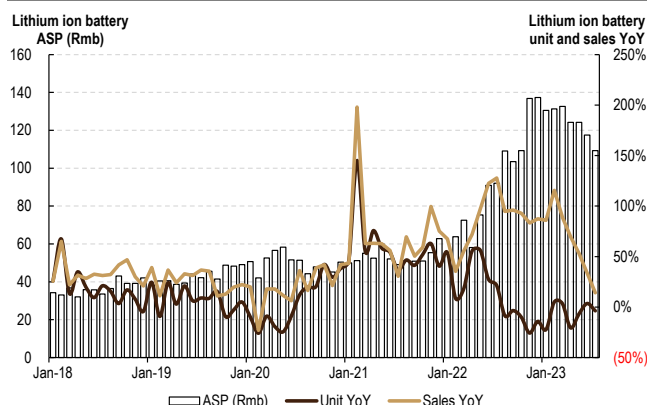
Source: TrendForce, Blue Lotus (as of December 29, 2023), \*JV of BYD and Mercedes, market share is divided 50-50

**Exhibit 17. China EV export, monthly**



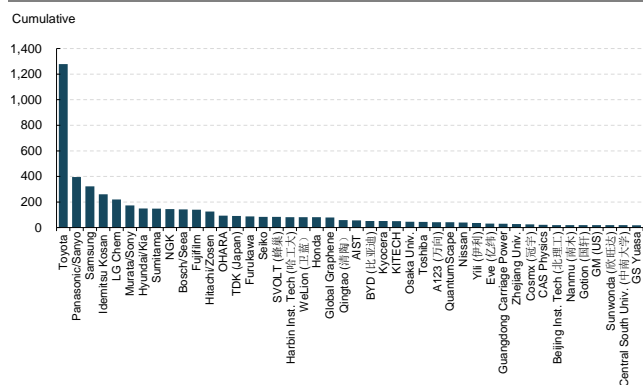
Source: China Customs, Blue Lotus (as of December 29, 2023)

**Exhibit 18. China lithium-ion battery export, monthly**



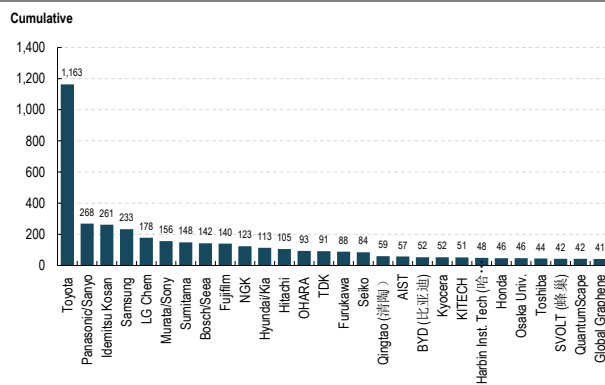
Source: China Customs, Blue Lotus(as of December 29, 2023)

**Exhibit 19. Solid state battery patent family landscape, 2023**



Source: Knowmade Consulting, Blue Lotus (as of December 29, 2023)

**Exhibit 20. Solid state battery patent family landscape, 2021**



Source: Knowmade Consulting, Blue Lotus(as of December 29, 2023)

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