

U.S. Autos & Mobility

EV Report Card – a reduced pool of IRA-eligible vehicles

Key takes: 1. Updated 2024 IRA guidance reduces the number of vehicles eligible for the EV tax credit; 2. Early December look - expect m/m uptick, with China continuing to lead the way; 3. Mixed 4Q EV results from NA OEMs; 4. BYD takes the BEV crown from Tesla.

Early interpretation of IRA component sourcing rules reduces EV eligibility

As we previewed in [last month's EV report card](#), the new component sourcing rules for IRA tax credit eligibility took effect on January 1st and noticeably reduced the number of eligible vehicles. As of mid January, just 13 vehicles qualify for full or partial tax credits, of which 8 are BEVs (vs. 25 EVs / 16 BEVs in 2023).

Impacts to our companies include:

• Tesla

- Model 3 SR and LR trims no longer qualify - likely due to their use of LFP batteries / Chinese made LG nickel-based batteries that fail the foreign entity of concern (FEOC) test. We had expected Tesla to make sourcing changes and requalify the vehicle with the M3 Highland refresh, yet the vehicle was launched in NA last week and as of now it appears the vehicle will not qualify.
- All Model Y trims and Model X LR retain eligibility for the full \$7,500 as these vehicles use compliant Panasonic 2170 or 18650 batteries. Interestingly, the MY24 Model Y RWD qualifies while its MY23 equivalent does not, likely implying a sourcing change was made to ensure compliance. And while Model 3 Performance qualifies, it is somewhat of a moot point as the vehicle is being phased out amid the introduction of M3 Highland.
- Cybertruck AWD (\$80k MSRP) was listed as eligible in 2023 but not yet in 2024. We believe this is due to Tesla not filing for IRA eligibility as the current launch edition vehicles are being sold for \$100k+ (>80k maximum), not because of component sourcing ineligibility.

• Ford

CORE

TSLA	EQUAL WEIGHT
U.S. Autos & Mobility	POSITIVE
Price Target	USD 260.00
Price (12-Jan-24)	USD 218.89
Potential Upside/Downside	+18.8%

RIVN	OVERWEIGHT
U.S. Autos & Mobility	POSITIVE
Price Target	USD 27.00
Price (12-Jan-24)	USD 18.06
Potential Upside/Downside	+49.5%

GM	OVERWEIGHT
U.S. Autos & Mobility	POSITIVE
Price Target	USD 37.00
Price (12-Jan-24)	USD 35.26
Potential Upside/Downside	+4.9%

F	OVERWEIGHT
U.S. Autos & Mobility	POSITIVE
Price Target	USD 14.00
Price (12-Jan-24)	USD 11.46
Potential Upside/Downside	+22.2%

U.S. Autos & Mobility

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- Mustang Mach E no longer qualifies. Usage of CATL LFP batteries on lower trims disqualifies these trims. We suspect the LG nickel batteries used in higher trims currently use non-compliant components - these models may be able to regain eligibility.
- F-150 Lightning will continue to receive the full \$7,500. Lightning batteries are nickel-based and manufactured by SK On in Georgia with compliant materials.

- **GM**

- Chevy Bolt retains eligibility for the full \$7,500, though as stated above Bolt production has been discontinued and thus sales will be limited to inventory vehicles.
- All GM Ultium vehicles (Lyriq, EV Silverado / Blazer / Equinox) lost eligibility - GM confirmed the ineligibility is temporary as the company works to source two minor components in a compliant manner. We expect GM to regain eligibility in early/mid-2024, in line with GM's timeline.
- In early-January GM announced that it would subsidize the \$7,500 credit on all vehicles that had lost eligibility. While this move should aid sales, it will add challenges to margins and potentially reduce the pace at which GM pushes on its EV volume ramps.

- **Rivian**

- Due to the \$80k purchase price maximum Rivian only has one eligible model/trim combination (R1T dual motor + large pack).
- Rivian's lowest price models (standard battery) set to launch in 2024 use LFP cells (likely made in China) and thus are ineligible for the tax credit.

A key point to note is that OEMs self-assess eligibility then submit information on qualifying vehicles to the Treasury and IRS. Certain vehicles may not show as eligible because paperwork has not been filed (i.e. Tesla Cybertruck mentioned above). We expect to receive additional clarity on eligibility over the coming weeks as the OEMs work with regulators to make determinations.

Nevertheless, the loss of tax credits stand as a headwind to US 2024 EV sales / penetration - particularly in the early months as temporary ineligibly issues are worked through.

FIGURE 1. 2024 IRA EV Tax Credit Summary

Model Year	OEM	Brand	Model/Trim	2023 Credit Amount	2024 Credit Amount
2022-2024	Ford	Ford	F-150 Lightning	\$7,500	\$7,500
2022-2023	Ford	Lincoln	Aviator Grand Touring PHEV	\$7,500	\$0
2022-2023	GM	Chevrolet	Bolt EV	\$7,500	\$7,500
2022-2023	GM	Chevrolet	Bolt EUV	\$7,500	\$7,500
2023-2024	GM	Cadillac	Lyriq	\$7,500	\$0
2024	GM	Chevrolet	Silverado	\$7,500	\$0
2024	GM	Chevrolet	Blazer	\$7,500	\$0
2024	GM	Chevrolet	Equinox	\$7,500	\$0
2022-2024	Stellantis	Chrysler	Pacifica PHEV	\$7,500	\$7,500
2022-2023	Tesla	Tesla	Model 3 (SR/LR)	\$7,500	\$0
2022-2023	Tesla	Tesla	Model 3 (P)	\$7,500	\$7,500
2022-2023	Tesla	Tesla	Model Y (All Trims)	\$7,500	\$7,500
2023	Tesla	Tesla	Model X (LR)	\$7,500	\$7,500
2024	Tesla	Tesla	Cybertruck AWD	\$7,500	\$0
2023	VW	VW	ID.4	\$7,500	\$0
2024	BMW	BMW	X5 x50 PHEV	\$3,750	\$0
2022-2023	Ford	Ford	E-Transit	\$3,750	\$0
2022-2023	Ford	Ford	Mustang Mach-E	\$3,750	\$0
2022-2024	Ford	Ford	Escape PHEV	\$3,750	\$3,750
2022-2024	Ford	Lincoln	Corsair Grand Touring PHEV	\$3,750	\$3,750
2024	Nissan	Nissan	Leaf S / SV PLUS	\$3,750	\$0
2022-2024	Rivian	Rivian	R1S Dual/Quad Motor, Large	\$3,750	\$3,750
2023-2024	Rivian	Rivian	R1T Dual/Quad Motor, Large/Max	\$3,750	\$3,750
2022-2024	Stellantis	Jeep	Wrangler PHEV	\$3,750	\$3,750
2022-2024	Stellantis	Jeep	Grand Cherokee PHEV	\$3,750	\$3,750
2023-2024	VW	Audi	Q5 PHEV	\$3,750	\$0

Note: Eligibility as of mid-January

Source: Barclays Research, US Department of Energy

Unpacking 4Q NA OEM EV deliveries

The major NA legacy OEMs and EV startups released 4Q delivery reports with mixed q/q results. We highlight several key points on the prints and other recent news.

• Tesla

- Tesla delivered ~485k units (+11% q/q), slightly exceeding ingoing expectations of ~480k. The strong 4Q performance set a new quarterly delivery record and enabled Tesla to achieve its 2023 volume target of 1.8mn units.
- Production of ~495k implied additional inventory build of ~10k units, likely placing total inventory in the 90-100k range. Continued build is concerning as we had expected inventory drawdown, though we acknowledge shipping and subsidy issues that may have negatively impacted deliveries.

- "Other Vehicles" - primarily Model S/X as Cybertruck volumes are immaterial - up 44% q/q. Following substantial price cuts to the trims in NA during 3Q, S/X likely reached their highest quarterly sales volume since 2018.

- **Ford**

- Ford EV sales were up 24% q/q and 28% y/y to ~26k units. F-150 Lightning drove 4Q sales, up 240% q/q to ~12k, as production re-ramped following 3Q factory downtime.
- Mach-E and E-Transit both saw ~20% q/q decreases, partially offsetting Lightning performance.
- In mid-December Ford cut planned 2024 F-150 Lightning production to 1.6k units/week (vs 3.2k/week prior). In early-January Ford raised MY24 prices on its lower-end trims by \$5-10k, replaced several mid-level trims with higher priced options, but also cut prices by \$5-7k on the highest-end trims. In 2024 we expect Ford to prioritize sales of higher-trimmed Lightnings at the expense of lower volumes.

- **GM**

- GM EV sales were down -3% q/q but up 20% y/y to ~19k units, decrease driven by Bolt -21% q/q.
- Slow ramp of Ultium continues. Though Ultium deliveries of 6.9k were up 63% q/q, they still represented only 36% of total GM EV sales, led by the Lyriq. The new Ultium launches in 3Q (Chevy Blazer and Silverado) collectively sold just ~900 vehicles in 4Q; GM halted sales of Blazer EV in late December due to software issues.
- Bolt continues to drive the majority of GM's EV volumes (64% in 4Q), a point of concern for 2024 EV sales as legacy Bolt production was discontinued in mid-December ahead of the upcoming 2025 Ultium-based Bolt launch.

- **Polestar**

- Polestar delivered ~12.9k units, down ~7% q/q and ~39% y/y. Though sales were lifted by the new Polestar 4 launch in China (880 vehicles), this was more than offset by Polestar 2 sales down ~14% q/q.
- Reduction in deliveries reflects Polestar's brand positioning strategy, as PSNY seeks to maintain premium reputation/pricing at the cost of lower volumes.
- Final 2023 deliveries were 55k units, below 2023 guidance 60k.

- **Rivian**

- Rivian delivered 14.0k units, down ~10% q/q and coming in just below consensus at ~14.1k. The drop was likely due to Amazon EDV order seasonality, which mgmt guided to on its 3Q EPS call.
- Strong production of 17.5k (+8% q/q and +75% y/y) demonstrates success in ramp, and drove a beat on RIVN's full-year production guide (57k vs. guide 54k). Yet RIVN's ~7k unit inventory build in 2023 leads to questions on demand resilience amid the EV slowdown. Much of the inventory build is likely attributable to EDV seasonality, but we believe R1T demand must be monitored as well.

FIGURE 2. 4Q23 EV Sales

OEM	Model	4Q23	3Q23	q/q	4Q22	y/y
Tesla	S/X	22,969	15,985	44%	17,147	34%
	3/Y	461,538	419,074	10%	388,131	19%
	Total	484,507	435,059	11%	405,278	20%
Ford	Mustang Mach-E	11,889	14,842	-20%	11,369	5%
	F-150 Lightning	11,905	3,503	240%	6,857	74%
	E-Transit	2,143	2,617	-18%	2,113	1%
	Total	25,937	20,962	24%	20,339	28%
GM	Bolt EV/EUV	12,551	15,835	-21%	16,108	-22%
	LYRIQ	3,820	3,018	27%	86	4342%
	Hummer EV	2,028	1,167	74%	72	2717%
	Brightdrop Zevo	164	35	369%	-	
	Blazer	463	19	2337%	-	
	Silverado	443	18	2361%	-	
	Total	19,469	20,092	-3%	16,266	20%
Polestar	Polestar 2	12,000	13,900	-14%	21,067	-43%
	Polestar 4	880	-		-	
	Total	12,880	13,900	-7%	21,067	-39%
Rivian	R1S/R1T, EDV	13,972	15,564	-10%	8,054	73%

Note: Tesla, Rivian, and Polestar report global sales. Ford and GM report US sales.
Source: Barclays Research, Company reports

BYD overtakes Tesla on BEV Sales

BYD posted another strong result in December with record sales of over 341k units and achieved its 3mn unit 2023 goal. BYD has long outsold Tesla in total EVs (incl. PHEVs), yet it did not surpass Tesla in pure BEV sales until 4Q23 - in 4Q BYD sold 526k BEVs vs. Tesla's 485k, though for full year 2023 Tesla still had more BEV sales at 1.8mn vs BYD at 1.6mn. Yet this isn't a major surprise as BYD overtaking Tesla has been widely expected for most of the year.

Looking forward, we expect BYD to continue leading the industry in BEV sales. BYD currently has a clear lead in low cost models (ex: BYD Seagull ~\$11k vs Model 3 ~\$34k in China), greatly increasing its potential customer base. Tesla will likely remain the clear number two, though we note that Tesla will not have a "low-cost" entry unit until the Model 2 in the back half of the decade and that even the Model 2 at \$25k will not be price-competitive in some of BYD's segments/markets.

November EV penetration - Another record high, though regional y/y weakness appears

November global EV sales penetration (as a % of new car sales) was 18.5%, up ~220bps on a y/y basis and ~110bps m/m. The November penetration result marked a new all-time high, driven by strength in China and Europe, and raised YTD '23 penetration to ~15.5%, up ~2.4pts y/y.

China was the strong point of the November print, while Europe saw significant y/y penetration declines and the US was down slightly m/m.

- China once again had the highest EV penetration rate among the major global regions at 39.8% in November - yet another all-time high. China penetration rose ~220bps m/m, mostly attributable to BEV sales (up ~160bps m/m).
- Europe EV penetration increased to 20.8% in November, though still below the 2023 high-point of ~23.9% in August, which benefited from a pre-buy in advance of subsidy

expirations. Notably, European EV penetration was down ~190bps y/y from 22.7% in November 2022 due to subsidy roll-offs at the end of 2022 - we expect December to see an even more significant y/y decline. PHEV continues to be a drag to 2023 Europe EV penetration, with November PHEV down ~190bps y/y vs BEV flat.

- US EV penetration declined ~10bps m/m to 9.8%, but YTD 2023 continues to be well above full year 2022 (up ~200bps y/y). US BEV penetration dropped ~10bps m/m from last month's record high to ~8.2%, yet on a positive note remained above 8% for just the second month ever.

China continues to dominate global EV share, accounting for 59% of EV unit sales volume in YTD 2023, with Europe at 23%, and the US at 10%. Compared to full-year 2022, US leads market share improvement at +100bps while China is flat and Europe is -250bps. While Chinese and European sales are higher on an absolute basis this year, their respective shares have come down slightly as the US and RoW have gained ground.

December early look - expect a m/m uptick

Looking ahead to December, EV penetration rates are tracking to a slight m/m uptick when aggregating across the major regions, likely holding global EV penetration in the 18-19% range. Europe and the US should see modest gains while China holds flat.

The early look at Europe implies a LSD % gain in m/m EV uptake, based upon reported data from key markets.

- December EV penetration in Germany was ~30%, up from ~26% in November, but down sharply y/y from 55% in December 2022. Germany EV penetration has underperformed y/y since September (corp. car subsidy expiration) and the December result is no surprise. PHEV penetration was down ~1500bps y/y as PHEV subsidy expiration elevated sales in Dec'22, and BEV penetration was down ~1000bps y/y likely due to the abrupt cancellation of the EV subsidy in mid-December which eliminated the pull-forward of sales that had been expected.
- In the UK, December EV penetration was ~28%, up from ~26% in November though down from ~39% in December 2022. Unlike Germany, the ~1100bps UK drop off was more related to delivery lumpiness (specifically Tesla with mkt share down 880bps y/y) than subsidies.
- In France, December EV penetration was ~30%, flat from November but up from ~25% in December 2022. December continues to be seasonally strong for European EV penetration, but to a lesser extent in 2023 given the softer subsidy environment.

Early data from the US indicates 10.0% EV penetration in December up ~60bps m/m (relative to Wards' measure of EV penetration) and ~90bps above the YTD pace. Tesla's end of quarter delivery push was likely a key driver of this increase, especially with Model 3 SR/LR sales as these vehicles were set to lose the \$7,500 IRA tax credit starting in 2024. Other vehicles losing the IRA credit such as Ford Mach-E and GM Ultium vehicles likely also contributed to the sales pull forward.

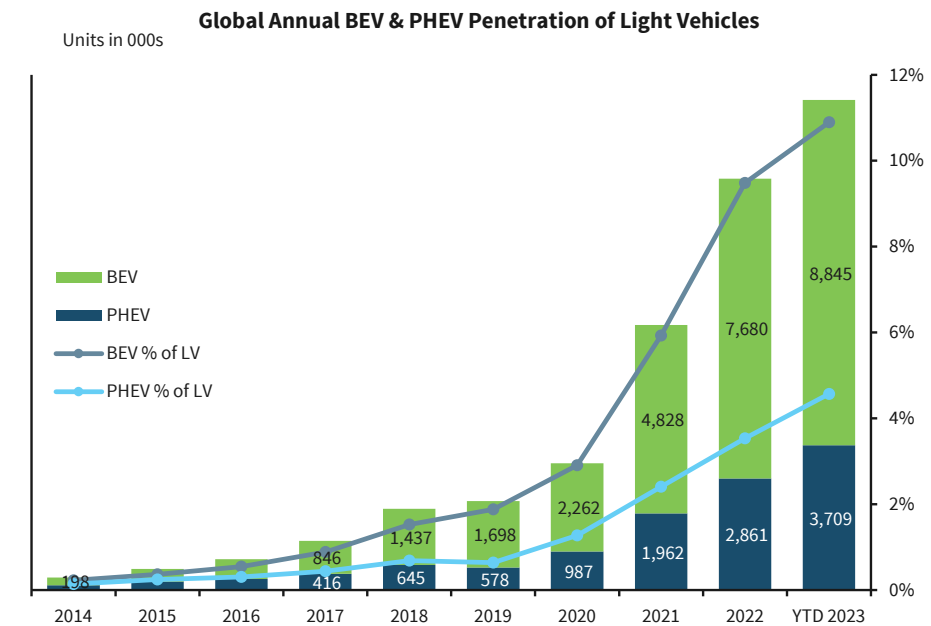
Based on CPCA and company data, we expect China EV penetration to remain flattish. Our colleagues covering China Technology noted in a recent report¹ that December deliveries for the EV companies they cover (BYDDF, LI, NIO, XPEV) were relatively strong m/m, with Li Auto (+23% m/m, +137% y/y), followed by market leader BYD (+13% m/m, +45% y/y), Nio (13% m/m, +14% y/y), and Xpeng (flat m/m, +78% y/y). CPCA reported December retail NEV sales were

¹ <https://live.barcap.com/go/publications/link?contentPubID=FC2771708>

945k (up 12% m/m) placing EV penetration at 40.2%, slightly below 40.4% in November, likely due to increased ICE sales from year-end ICE inventory discounting.

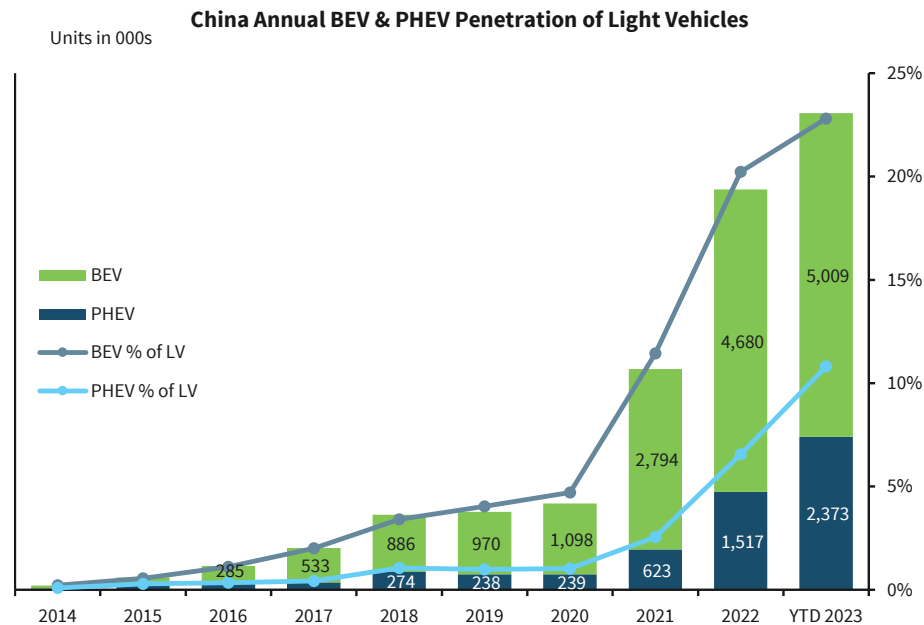
Key EV Charts

FIGURE 3. Global EV uptake



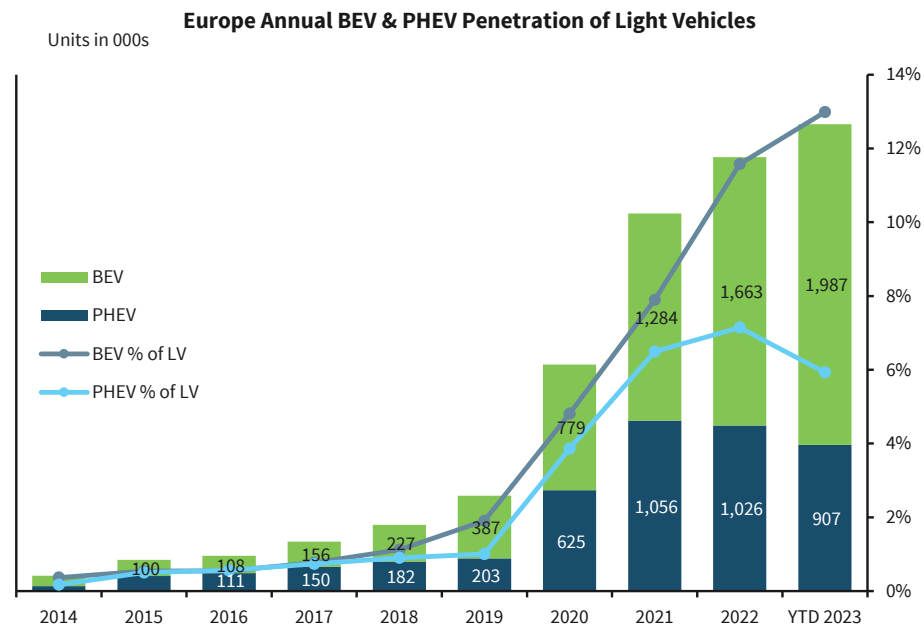
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 4. China EV uptake



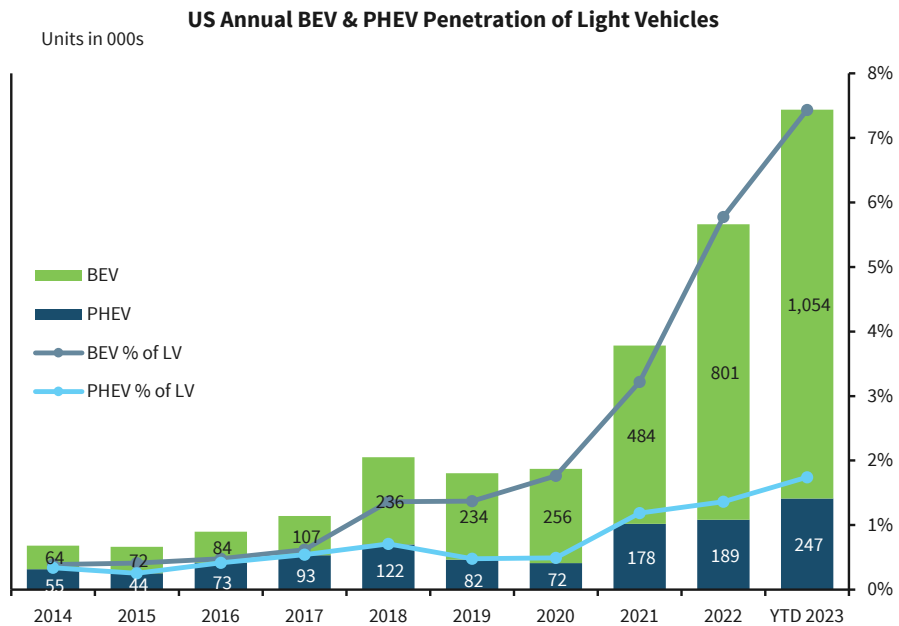
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 5. Europe EV uptake



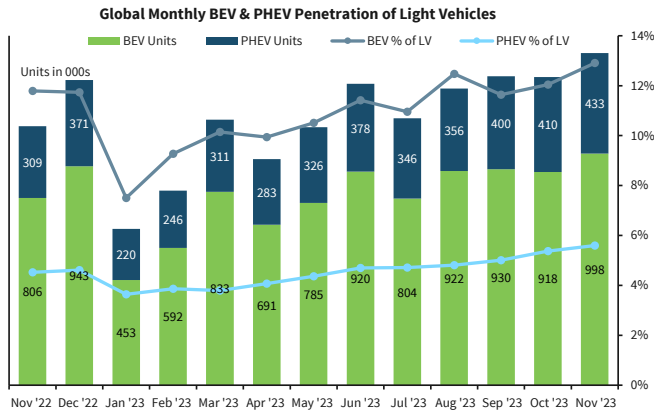
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 6. US EV uptake



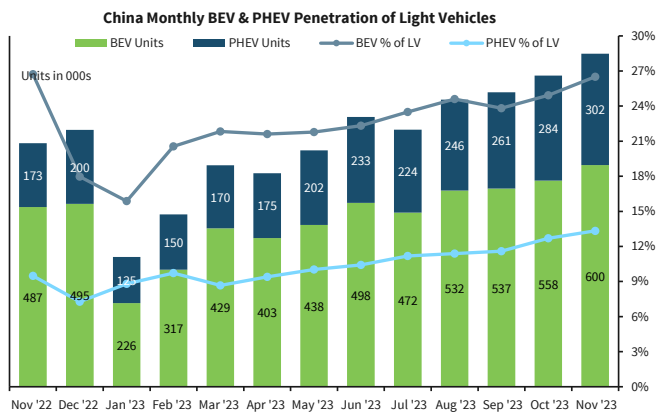
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 7. Global monthly EV uptake



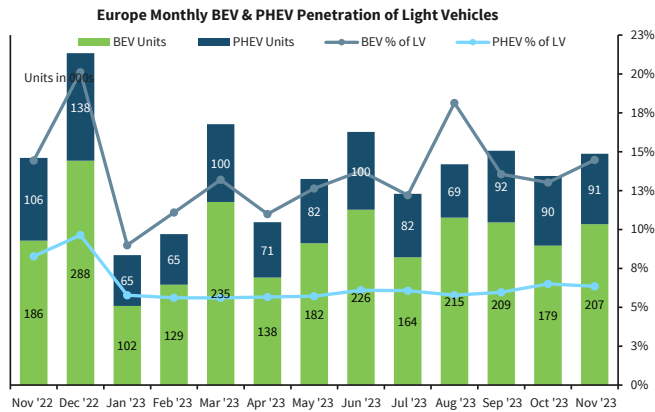
Source: EV-Volumes

FIGURE 8. China monthly EV uptake



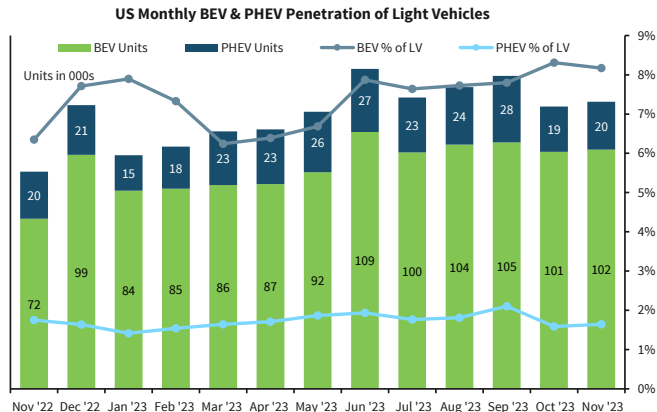
Source: EV-Volumes

FIGURE 9. Europe monthly EV uptake



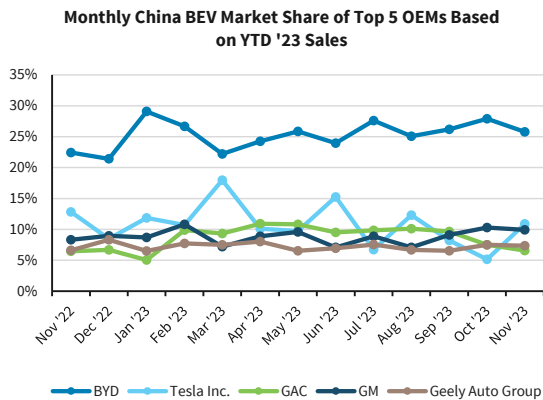
Source: EV-Volumes

FIGURE 10. US monthly EV uptake



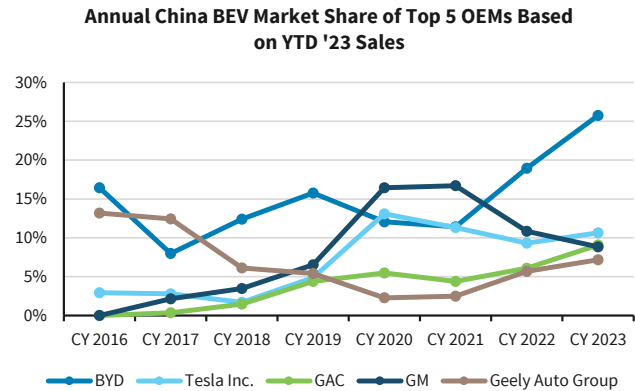
Source: EV-Volumes

FIGURE 11. Top OEMs by China BEV market share (Monthly)

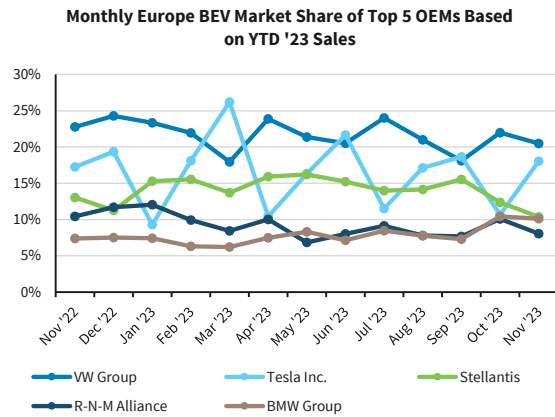


Source: EV-Volumes

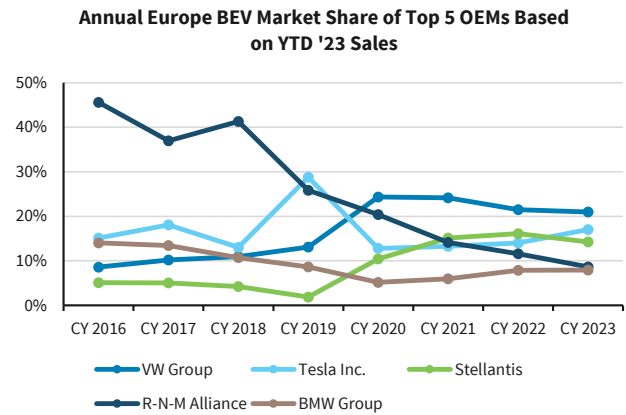
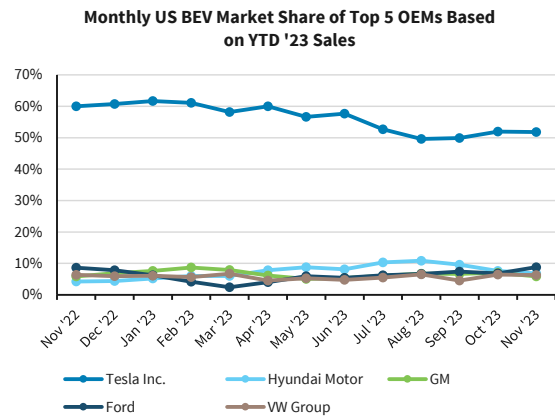
FIGURE 12. Top OEMs by China BEV market share (Annual)



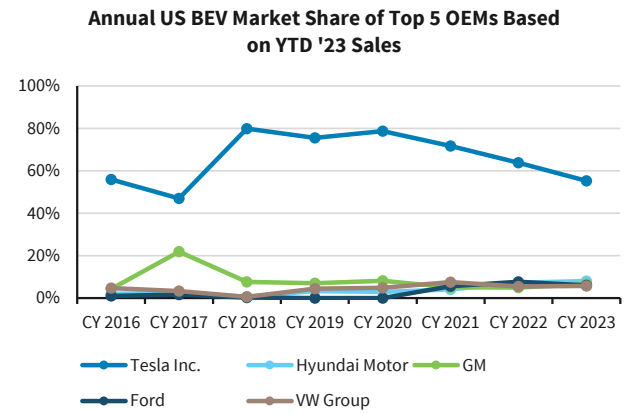
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 13. Top OEMs by Europe BEV market share (Monthly)

Source: EV-Volumes

FIGURE 14. Top OEMs by Europe BEV market share (Annual)Note: YTD 2023 is based on results through November
Source: EV-Volumes**FIGURE 15. Top OEMs by US BEV market share (Monthly)**

Source: EV-Volumes

FIGURE 16. Top OEMs by US BEV market share (Annual)Note: YTD 2023 is based on results through November
Source: EV-Volumes**FIGURE 17. BEV market share of top 5 OEMs in China based on YTD '23 sales**

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	China	BEV	BYD	25.8%
2	China	BEV	Tesla Inc.	10.6%
3	China	BEV	GAC	9.1%
4	China	BEV	GM	8.8%
5	China	BEV	Geely Auto Group	7.2%
Total	China	BEV	Other OEMs	38.5%

Note: YTD 2023 is based on results through November
Source: EV-Volumes**FIGURE 18. Top-selling BEV models in China based on YTD '23 sales**

China				
Rank	Make Model	Nov '23	2023 YTD	Mkt Share
1	Tesla Model Y	49,920	396,382	7.9%
2	BYD Dolphin BEV	35,246	307,986	6.1%
3	BYD Yuan Plus / Atto-3 BEV	25,761	307,691	6.1%
4	Wuling HongGuang Mini BEV	24,027	213,890	4.3%
5	Aion Y BEV	22,640	213,324	4.3%
6	BYD Seagull BEV	44,603	212,652	4.2%
7	Aion S / Aion S Plus BEV	12,195	206,155	4.1%
8	Wuling Bingo BEV	22,772	139,054	2.8%
9	Tesla Model 3	15,399	131,292	2.6%
10	Changan Lumin BEV	14,943	124,937	2.5%
Total	Industry	599,993	5,009,141	

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 19. BEV market share of top 5 OEMs in Europe based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	Europe	BEV	VW Group	21.0%
2	Europe	BEV	Tesla Inc.	17.0%
3	Europe	BEV	Stellantis	14.3%
4	Europe	BEV	R-N-M Alliance	8.7%
5	Europe	BEV	BMW Group	7.9%
Total	Europe	BEV	Other OEMs	31.1%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 20. Top-selling BEV models in Europe based on YTD '23 sales

Europe				
Rank	Make Model	Nov '23	2023 YTD	Mkt Share
1	Tesla Model Y	19,126	239,430	12.0%
2	Tesla Model 3	17,524	90,837	4.6%
3	VW ID.4 BEV	5,422	75,411	3.8%
4	Skoda Enyaq BEV	8,901	70,370	3.5%
5	MG 4 / Mulan BEV	6,716	65,702	3.3%
6	Audi Q4 e-tron BEV	7,121	64,013	3.2%
7	Fiat 500 BEV	4,604	59,014	3.0%
8	VW ID.3 BEV	4,213	58,877	3.0%
9	Dacia Spring BEV	5,492	55,576	2.8%
10	Volvo XC40 BEV	5,275	47,798	2.4%
Total	Industry	207,134	1,990,242	

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 21. BEV market share of top 5 OEMs in US based on YTD '23 sales

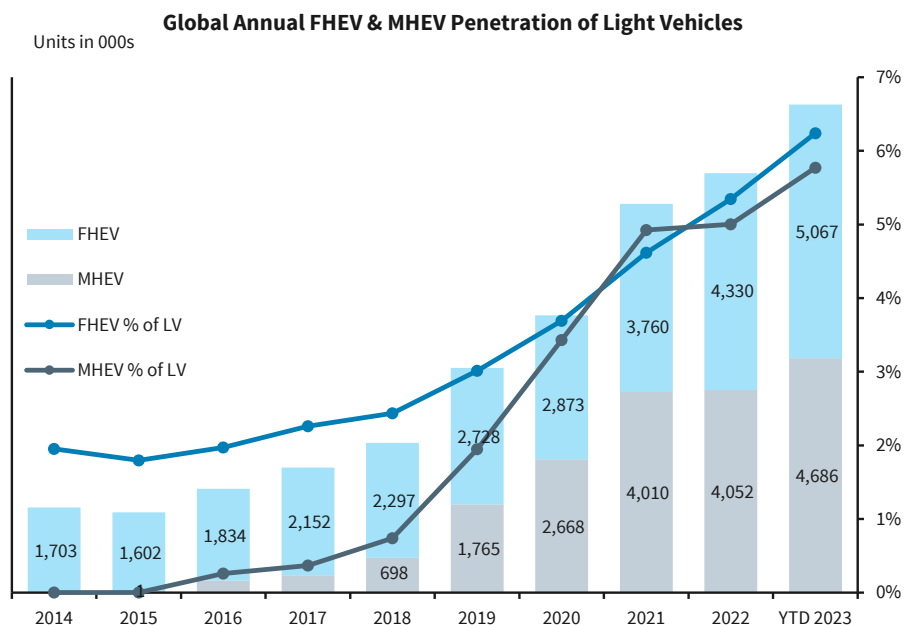
Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	USA	BEV	Tesla Inc.	55.3%
2	USA	BEV	Hyundai Motor	8.0%
3	USA	BEV	GM	6.6%
4	USA	BEV	Ford	5.9%
5	USA	BEV	VW Group	5.7%
Total	USA	BEV	Other OEMs	18.5%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 22. Top-selling BEV models in US based on YTD '23 sales

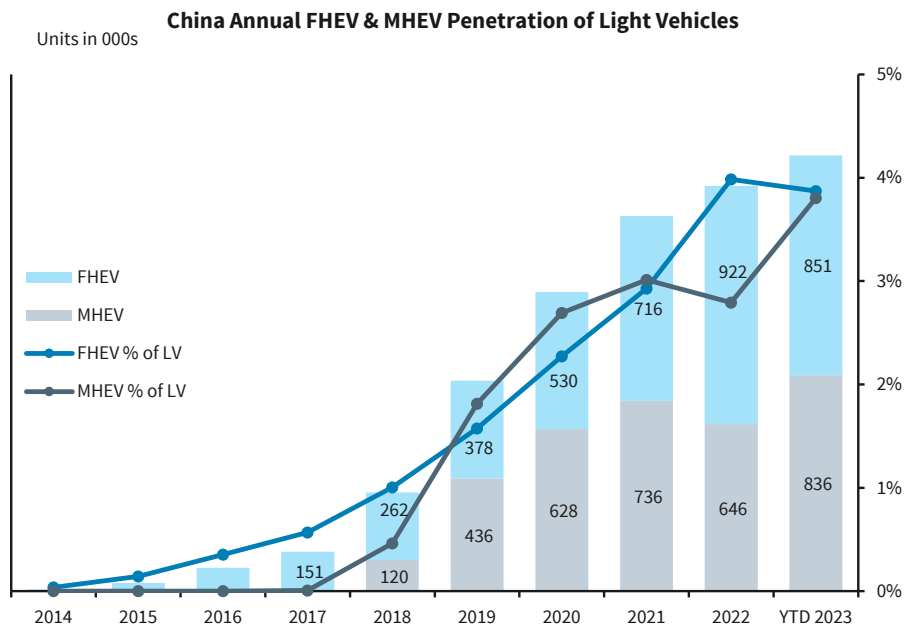
USA				
Rank	Make Model	Nov '23	2023 YTD	Mkt Share
1	Tesla Model Y	32,500	346,853	32.9%
2	Tesla Model 3	16,500	201,460	19.1%
3	Ford Mustang Mach-E BEV	4,294	35,908	3.4%
4	Chevrolet Bolt EUV BEV	2,840	35,409	3.4%
5	Hyundai Ioniq 5 BEV	2,372	30,657	2.9%
6	VW ID.4 BEV	3,099	30,513	2.9%
7	Chevrolet Bolt BEV	1,048	23,093	2.2%
8	Tesla Model X	2,500	22,260	2.1%
9	BMW i4 BEV	2,107	20,977	2.0%
10	Ford F-150 Lightning BEV	4,393	20,365	1.9%
Total	Industry	101,531	1,054,360	

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 23. Global hybrid uptake

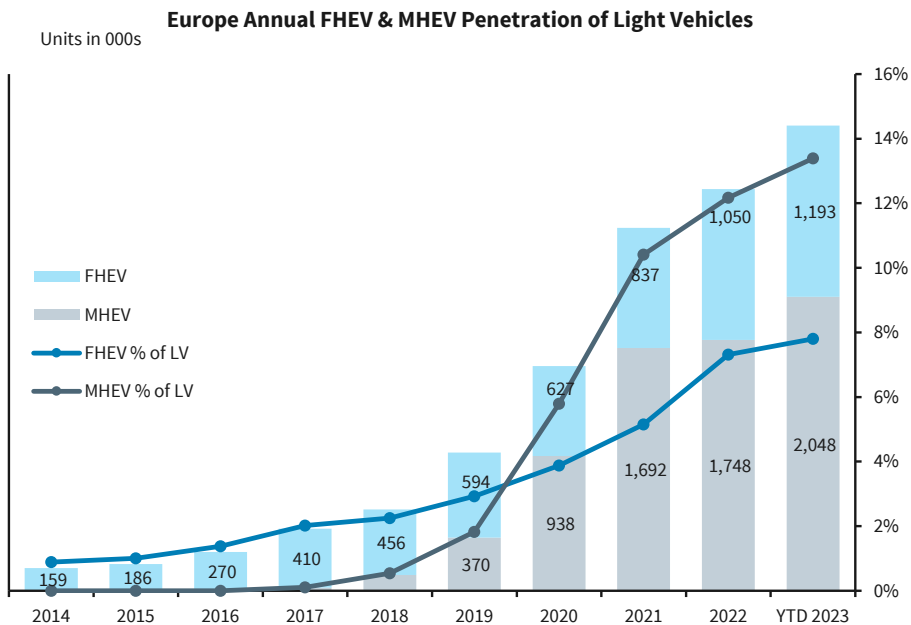
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 24. China hybrid uptake



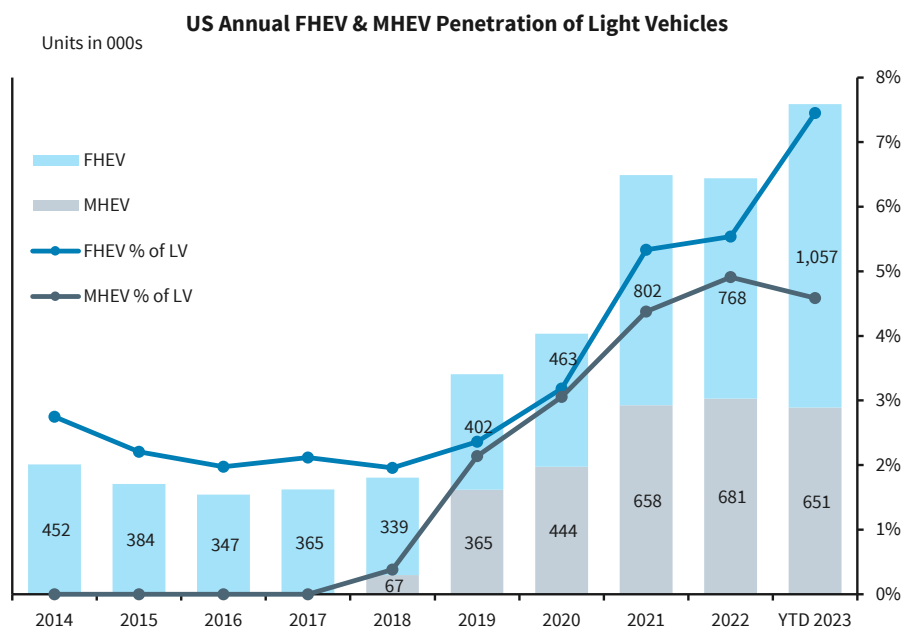
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 25. Europe hybrid uptake



Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 26. US hybrid uptake



Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 27. PHEV market share of top 5 OEMs in China based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	China	PHEV	BYD	53.9%
2	China	PHEV	Li Auto (CH) Automotive)	13.7%
3	China	PHEV	Changan Automobile Gro	6.4%
4	China	PHEV	Great Wall Motors	5.7%
5	China	PHEV	Geely Auto Group	5.4%
Total	China	PHEV	Other OEMs	14.9%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 28. Total EV market share of top 5 OEMs in China based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	China	BEV + PHEV	BYD	34.8%
2	China	BEV + PHEV	Tesla Inc.	7.2%
3	China	BEV + PHEV	Geely Auto Group	6.6%
4	China	BEV + PHEV	GM	6.5%
5	China	BEV + PHEV	GAC	6.4%
Total	China	BEV + PHEV	Other OEMs	38.5%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 29. PHEV market share of top 5 OEMs in Europe based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	Europe	PHEV	VW Group	19.0%
2	Europe	PHEV	Stellantis	14.9%
3	Europe	PHEV	BMW Group	13.4%
4	Europe	PHEV	Mercedes-Benz Group	12.6%
5	Europe	PHEV	Geely-Volvo Car Group	9.6%
Total	Europe	PHEV	Other OEMs	30.5%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 30. Total EV market share of top 5 OEMs in Europe based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	Europe	BEV + PHEV	VW Group	20.4%
2	Europe	BEV + PHEV	Stellantis	14.5%
3	Europe	BEV + PHEV	Tesla Inc.	11.7%
4	Europe	BEV + PHEV	BMW Group	9.6%
5	Europe	BEV + PHEV	Mercedes-Benz Group	8.5%
Total	Europe	BEV + PHEV	Other OEMs	35.3%

Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 31. PHEV market share of top 5 OEMs in US based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	USA	PHEV	Stellantis	46.0%
2	USA	PHEV	Toyota Motor Corp.	14.9%
3	USA	PHEV	Hyundai Motor	9.2%
4	USA	PHEV	BMW Group	8.8%
5	USA	PHEV	Geely-Volvo Car Group	7.8%
Total	USA	PHEV	Other OEMs	13.3%

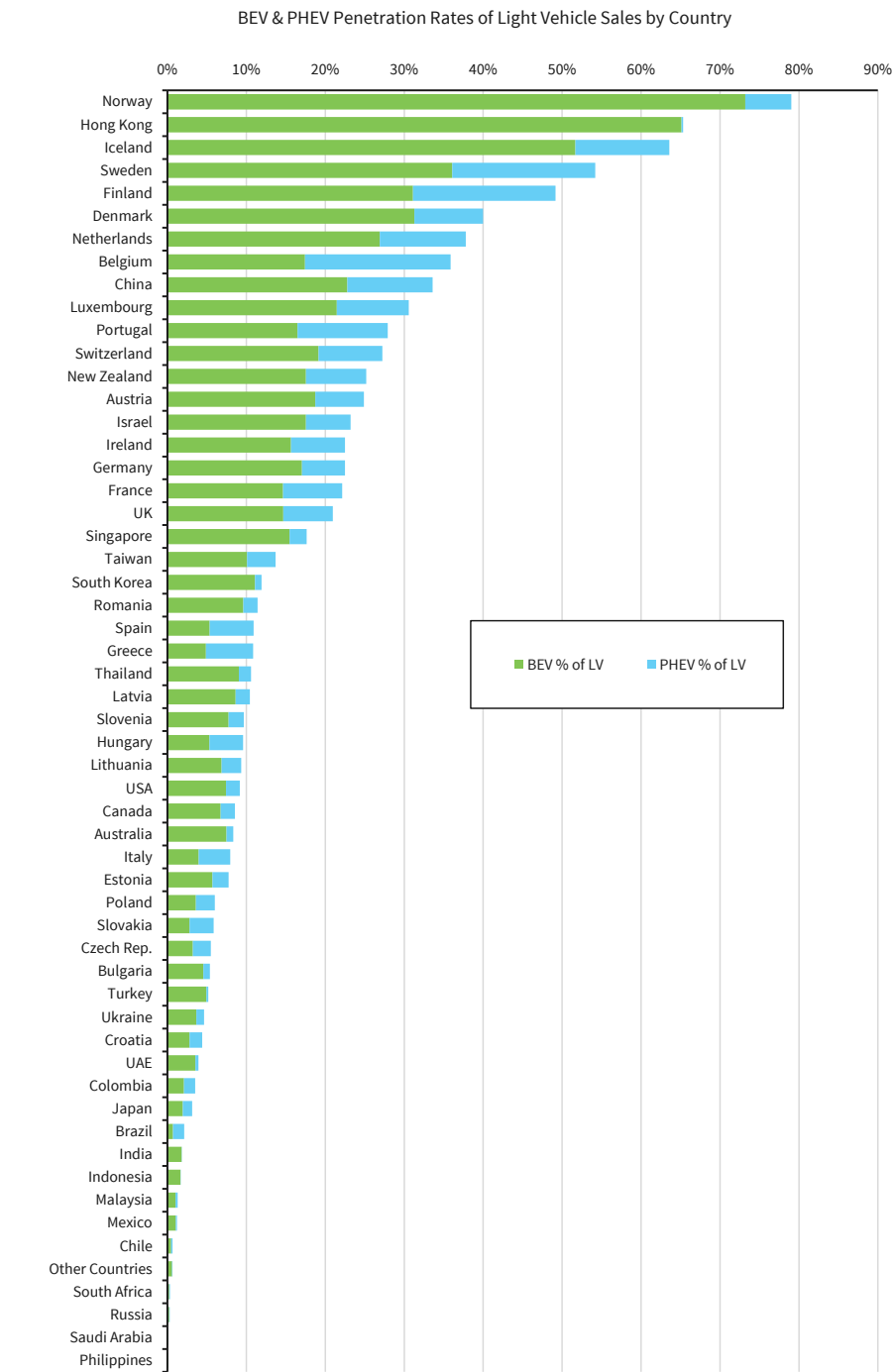
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 32. Total EV market share of top 5 OEMs in US based on YTD '23 sales

Rank	Sales Country	Propulsion	OEM Group	2023 YTD
1	USA	BEV + PHEV	Tesla Inc.	44.8%
2	USA	BEV + PHEV	Stellantis	8.7%
3	USA	BEV + PHEV	Hyundai Motor	8.2%
4	USA	BEV + PHEV	Ford	5.6%
5	USA	BEV + PHEV	GM	5.3%
Total	USA	BEV + PHEV	Other OEMs	27.3%

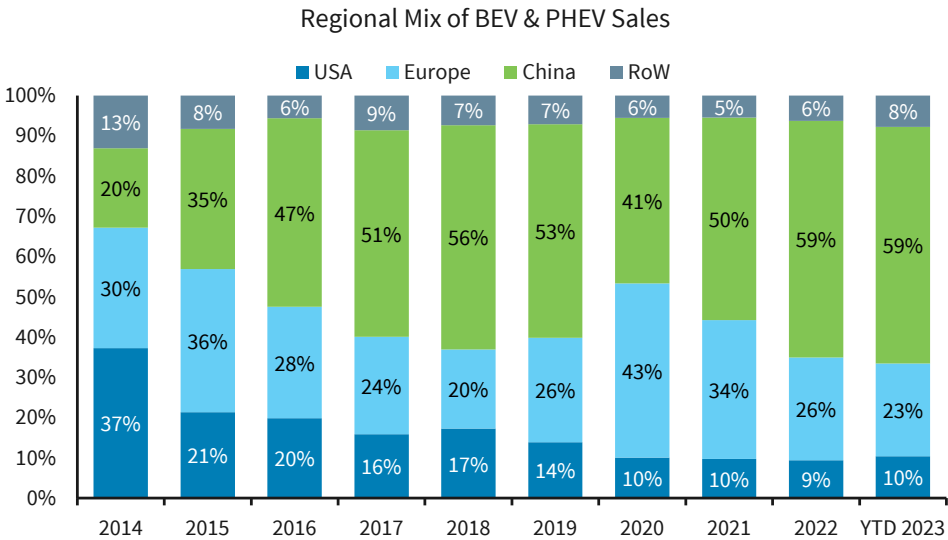
Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 33. EV penetration around the globe through November 2023



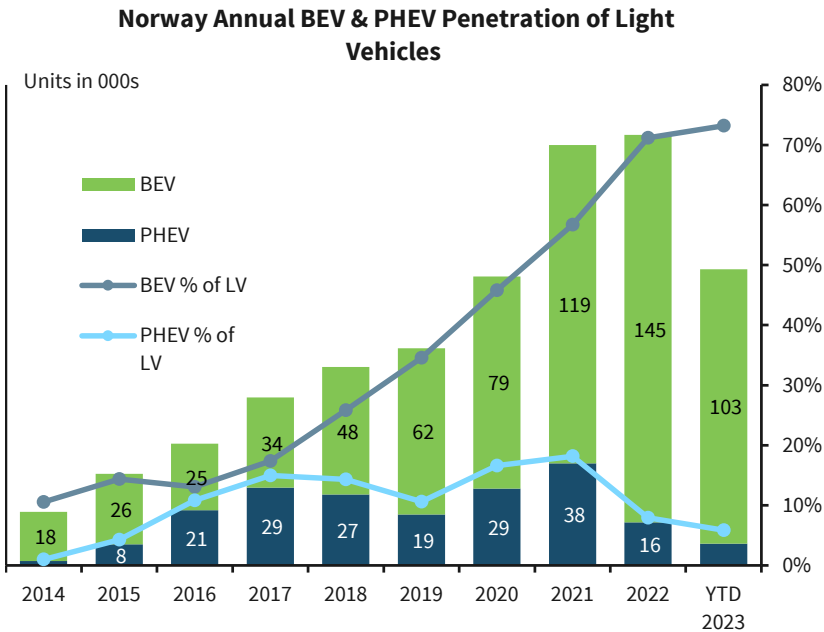
Source: EV-Volumes

FIGURE 34. Breakout of EV sales



Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 35. Norway remains key example of EV uptake



Note: YTD 2023 is based on results through November
Source: EV-Volumes

FIGURE 36. US IRA summary features

Inflation Reduction Act (IRA) Overview	
- Amended the Clean Vehicle Credit to require that final assembly of electric vehicle must be completed in North America	
- Removed the previous manufacturer sales cap that phased out credit eligibility once 200k qualifying vehicles had been sold by OEM	
- Detail regarding qualifying requirements expected in Mar. '23, potentially enabling greater credits for certain vehicles until the guidance is issued	
Purchase Qualifications	
- Must be bought or leased new with a minimum traction battery of 7kWh	
- MSRP must not exceed \$80,000 for SUVs/trucks and \$55,000 for cars. Used vehicle sale price may not exceed \$25,000	
- Used vehicles must be at least 2 years old and have not been claimed for a tax credit previously	
- Income restrictions: new vehicle \$150k (Single), \$300k (Married); used vehicle \$75k (Single), \$150k (Married)	
% of Value Requirements	
- Critical Minerals (must be extracted or processed in the US / free-trade agreement partner, or recycled in NA): 40% by 2023 to 80% by 2027. Starting in 2025 critical minerals cannot be sourced f	
- Battery Components (must be manufactured or assembled in North America): 50% by 2023 to 100% by 2029	
- Starting in 2024 for battery components and 2025 for critical materials, respective inputs cannot be sourced from Foreign Entities of Concern - defined roughly as companies that are (1) incorporated or headquartered in, (2) >=25% directly or indirectly controlled by the government of, or (3) contracting or licensing technology without certain rights over operations from, several countries including China.	
Consumer Credit	
- Total New Vehicle Credit: \$7,500 (battery component credit & critical materials credit \$3,750 each)	
- Used vehicle credit: lesser of \$4,000 or 30% of vehicle price	

Source: Barclays Research, Internal Revenue Service Guidelines (IRS.Gov)

FIGURE 37. Select European Countries EV Incentives

Europe EV Incentives	
France	Bonus for a new BEV or FCEV: <ul style="list-style-type: none">• €5k for households if vehicle ≤ €47k• €3k for legal persons if vehicle ≤ €47k
	Scrappage scheme for a second-hand or new BEV or FCEV of ≤ €47k: up to €6k, based on income
	New incentives beginning January 2024 granting up to €7k based on household income, with more stringent rules around EV carbon footprint
Netherlands	Subsidy scheme (SEPP) for individuals to buy/lease a small or compact BEV car, new or used
	Purchase tax exemption for zero-emission cars until 2024 Motor Vehicle Tax exemption for zero-emission cars and 50% Motor Vehicle Tax for PHEVs until 2024
Norway	As of January 1, the 25% VAT exemption on the purchase of new electric vehicles applies only to the first 500k Norwegian kroner of the price EVs pay maximum 70% of the total amount on toll roads

Source: ACEA, European Commission, Automotive News Europe

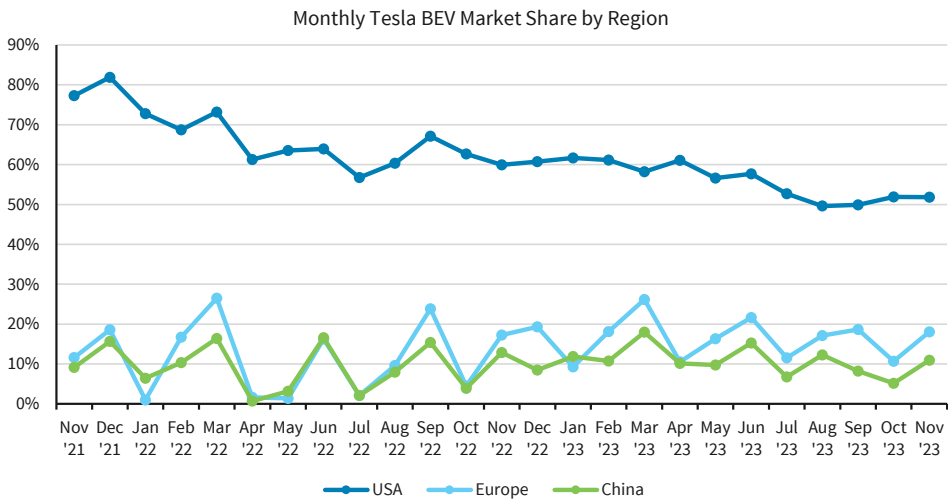
FIGURE 38. Vehicles qualifying for the consumer EV credits in Inflation Reduction Act on the standards for 2023 vs. tightened 2024 standards

Model Year	OEM	Brand	Model/Trim	2023 Credit Amount	2024 Credit Amount
2022-2024	Ford	Ford	F-150 Lightning	\$7,500	\$7,500
2022-2023	Ford	Lincoln	Aviator Grand Touring PHEV	\$7,500	\$0
2022-2023	GM	Chevrolet	Bolt EV	\$7,500	\$7,500
2022-2023	GM	Chevrolet	Bolt EUV	\$7,500	\$7,500
2023-2024	GM	Cadillac	Lyriq	\$7,500	\$0
2024	GM	Chevrolet	Silverado	\$7,500	\$0
2024	GM	Chevrolet	Blazer	\$7,500	\$0
2024	GM	Chevrolet	Equinox	\$7,500	\$0
2022-2024	Stellantis	Chrysler	Pacifica PHEV	\$7,500	\$7,500
2022-2023	Tesla	Tesla	Model 3 (SR/LR)	\$7,500	\$0
2023-2024	Tesla	Tesla	Model 3 (P)	\$7,500	\$7,500
2023	Tesla	Tesla	Model Y (RWD)	\$7,500	\$0
2024	Tesla	Tesla	Model Y (RWD)	\$7,500	\$7,500
2023-2024	Tesla	Tesla	Model Y (LR/P)	\$7,500	\$7,500
2023-2024	Tesla	Tesla	Model X (LR)	\$7,500	\$7,500
2024	Tesla	Tesla	Cybertruck AWD	\$7,500	\$0
2023	VW	VW	ID.4	\$7,500	\$0
2024	BMW	BMW	X5 x50 PHEV	\$3,750	\$0
2022-2023	Ford	Ford	E-Transit	\$3,750	\$0
2022-2023	Ford	Ford	Mustang Mach-E	\$3,750	\$0
2022-2024	Ford	Ford	Escape PHEV	\$3,750	\$3,750
2022-2024	Ford	Lincoln	Corsair Grand Touring PHEV	\$3,750	\$3,750
2024	Nissan	Nissan	Leaf S / SV PLUS	\$3,750	\$0
2023-2024	Rivian	Rivian	R1S Dual/Quad Motor, Large	\$3,750	\$3,750
2023-2024	Rivian	Rivian	R1T Dual/Quad Motor, Large/Max	\$3,750	\$3,750
2022-2024	Stellantis	Jeep	Wrangler PHEV	\$3,750	\$3,750
2022-2024	Stellantis	Jeep	Grand Cherokee PHEV	\$3,750	\$3,750
2023-2024	VW	Audi	Q5 PHEV	\$3,750	\$0

Source: Barclays Research, US Dept. of Energy

Key Tesla Charts

FIGURE 39. Tesla share trends



Source: EV-Volumes

FIGURE 40. Tesla sales by region & model, annually

Make Model	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	2023 YTD
Tesla Model S	49,996	51,060	55,267	50,412	27,743	21,810	23,188	37,667	20,656
Tesla Model X	214	25,256	46,796	49,532	39,204	32,799	1,754	29,036	35,149
Tesla Model Y	-	-	-	-	-	79,725	410,982	771,297	1,085,580
Tesla Model 3	-	-	1,766	146,056	300,292	365,176	500,386	476,470	472,080
Total by Model	50,210	76,316	103,829	246,000	367,239	499,510	936,310	1,314,470	1,613,465

Sales Country	CY 2015	CY 2016	CY 2017	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	2023 YTD
Americas	26,229	49,617	53,799	198,029	197,090	224,455	385,147	557,921	630,546
USA	24,219	47,119	50,139	188,870	176,695	201,639	346,623	511,429	582,613
Canada	2,010	2,498	3,478	9,026	19,775	21,340	35,460	41,820	39,612
Other Americas	-	-	182	133	620	1,476	3,064	4,672	8,321
Europe	16,925	16,254	28,241	29,667	111,771	99,642	170,128	233,059	339,336
Germany	1,582	1,904	3,332	1,904	10,710	16,693	39,717	69,463	59,481
UK	1,470	2,303	4,487	3,016	13,145	24,767	35,553	54,622	44,054
Netherlands	1,891	2,149	3,317	8,610	30,911	8,967	4,154	4,855	17,035
Norway	4,039	3,481	8,460	8,614	18,798	8,737	20,397	21,287	23,640
France	708	944	1,388	1,252	7,442	7,372	26,445	29,199	53,469
Switzerland	1,556	1,701	2,022	1,460	6,055	6,042	6,483	8,667	7,643
Sweden	996	1,125	1,283	1,220	6,194	4,924	8,080	9,182	18,572
Denmark	2,736	176	98	95	2,734	4,720	3,427	3,008	18,171
Italy	134	240	482	464	2,451	3,802	6,043	5,594	15,373
Austria	492	717	900	473	2,966	3,229	4,702	5,252	7,830
Belgium	820	859	1,151	882	3,698	2,980	3,180	4,795	14,657
Spain	10	55	387	326	2,051	1,467	3,208	4,596	11,461
Portugal	13	29	64	407	1,979	1,413	1,508	2,616	8,140
Other Europe	478	571	870	944	2,637	4,529	7,231	9,923	39,810
China	3,692	8,377	14,829	15,061	47,051	147,090	320,863	440,968	532,778
RoW	3,364	2,068	6,960	3,243	11,327	28,323	60,172	82,522	110,805
South Korea	-	2	303	587	2,430	11,826	17,821	14,571	15,449
Australia	600	450	1,300	1,565	4,205	3,430	12,198	19,597	43,924
Other RoW	2,764	1,616	5,357	1,091	4,692	13,067	30,153	48,354	51,432
Global Total	50,210	76,316	103,829	246,000	367,239	499,510	936,310	1,314,470	1,613,465

Note: YTD 2023 is based on results through November

Source: EV-Volumes

FIGURE 41. Tesla sales by region & model, quarterly

Make Model	Q3 '21	Q4 '21	Q1 '22	Q2 '22	Q3 '22	Q4 '22	Q1 '23	Q2 '23	Q3 '23
Tesla Model S	9,230	11,390	10,539	9,781	8,777	8,570	4,724	6,905	5,720
Tesla Model X	33	360	4,156	6,377	9,893	8,610	5,981	12,389	10,301
Tesla Model Y	115,815	156,765	167,833	147,056	207,970	248,438	280,104	299,277	312,772
Tesla Model 3	116,745	139,920	127,645	91,870	117,253	139,702	131,938	147,443	106,383
Total by Model	241,823	308,435	310,173	255,084	343,893	405,320	422,747	466,014	435,176

Sales Country	Q3 '21	Q4 '21	Q1 '22	Q2 '22	Q3 '22	Q4 '22	Q1 '23	Q2 '23	Q3 '23
Americas	103,641	125,167	125,324	129,166	141,294	162,137	164,579	179,456	167,631
USA	92,250	111,273	114,051	116,782	129,078	151,518	154,143	167,040	156,580
Canada	10,551	12,911	10,200	11,314	11,030	9,276	8,169	10,008	8,649
Other Americas	840	983	1,073	1,070	1,186	1,343	2,267	2,408	2,402
Europe	47,296	54,986	59,560	26,207	53,549	93,743	94,609	93,249	94,948
Germany	12,201	13,743	14,408	3,851	19,699	31,505	20,654	15,528	15,023
UK	8,079	12,705	15,547	5,747	10,924	22,404	13,355	12,785	13,589
Netherlands	999	2,191	560	531	889	2,875	4,483	4,738	4,613
Norway	7,869	6,187	5,068	2,984	4,559	8,676	9,474	7,376	4,424
France	5,964	7,370	8,481	3,263	4,499	12,956	12,827	14,352	13,639
Switzerland	1,931	2,289	1,959	2,270	2,162	2,276	1,568	2,745	2,235
Sweden	2,234	2,749	3,133	2,372	1,442	2,235	4,683	6,284	5,372
Denmark	1,011	1,336	1,011	332	824	841	5,225	5,193	4,546
Italy	1,748	1,160	1,367	1,184	1,216	1,827	4,547	3,967	3,241
Austria	1,124	965	1,433	933	1,823	1,063	2,713	2,182	1,844
Belgium	900	858	1,708	516	839	1,732	4,471	3,739	3,875
Spain	1,012	862	1,413	727	1,139	1,317	2,077	3,230	2,927
Portugal	402	477	550	500	572	994	2,097	2,011	2,017
Other Europe	1,822	2,094	2,922	997	2,962	3,042	6,435	9,119	17,603
China	73,823	115,632	107,621	90,016	121,712	121,619	137,900	159,480	141,223
RoW	17,063	12,650	17,668	9,695	27,338	27,821	25,659	33,829	31,374
South Korea	4,659	1,540	2,702	4,044	6,286	1,539	1,302	2,429	5,315
Australia	3,900	2,100	4,417	236	9,380	5,564	10,407	15,170	12,420
Other RoW	8,504	9,010	10,549	5,415	11,672	20,718	13,950	16,230	13,639
Global Total	241,823	308,435	310,173	255,084	343,893	405,320	422,747	466,014	435,176

Source: EV-Volumes

FIGURE 42. Tesla sales by region & model, monthly

Make Model	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23
Tesla Model S	2,115	4,494	1,437	1,147	2,140	1,652	1,947	3,306	1,413	1,772	2,535	1,580	1,727
Tesla Model X	2,376	4,116	1,675	1,675	2,631	2,627	3,102	6,660	2,751	3,391	4,159	3,150	3,328
Tesla Model Y	101,619	102,173	53,722	80,700	145,682	73,707	93,193	132,377	75,699	115,715	121,358	78,235	115,192
Tesla Model 3	47,423	63,330	37,995	36,051	57,892	38,303	40,146	68,994	33,747	46,593	26,043	31,989	54,327
Total by Model	153,533	174,113	94,829	119,573	208,345	116,289	138,388	211,337	113,610	167,471	154,095	114,954	174,574

Sales Country	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23
Americas	47,043	63,896	54,177	55,196	55,206	54,919	55,920	68,617	55,917	55,586	56,128	59,243	59,637
USA	43,326	60,342	51,875	51,928	50,340	52,120	52,049	62,871	52,900	51,450	52,230	52,250	52,600
Canada	3,199	2,966	1,899	2,489	3,781	2,338	3,069	4,601	2,548	3,256	2,845	6,500	6,286
Other Americas	518	588	403	779	1,085	461	802	1,145	469	880	1,053	493	751
Europe	32,043	55,846	9,480	23,394	61,735	14,452	29,869	48,928	18,953	36,918	39,077	19,127	37,403
Germany	10,819	17,501	4,241	7,710	8,703	2,420	5,265	7,843	3,904	6,903	4,216	3,353	4,923
UK	6,025	16,368	579	2,283	10,493	1,813	3,439	7,533	3,141	4,021	6,427	2,677	1,648
Netherlands	137	2,726	591	725	3,167	758	1,264	2,716	755	1,988	1,870	1,085	2,116
Norway	3,220	5,405	21	1,551	7,902	977	2,949	3,450	220	1,704	2,500	678	1,688
France	5,753	5,413	741	3,376	8,710	1,824	4,012	8,516	2,717	5,365	5,557	3,262	9,389
Switzerland	797	1,448	124	195	1,249	460	912	1,373	452	793	990	305	790
Sweden	551	1,641	225	518	3,940	742	2,477	3,065	492	1,716	3,164	721	1,512
Denmark	428	379	499	1,051	3,675	932	1,431	2,830	830	1,297	2,419	780	2,427
Italy	1,108	689	326	1,311	2,910	740	1,477	1,750	207	2,128	906	908	2,710
Austria	506	490	373	853	1,487	410	848	924	366	880	598	339	752
Belgium	332	1,227	610	814	3,047	870	997	1,872	1,237	1,508	1,130	1,108	1,464
Spain	649	600	357	672	1,048	318	1,160	1,752	744	1,456	727	755	2,472
Portugal	541	421	230	877	990	282	867	862	496	1,167	354	256	1,759
Other Europe	1,177	1,538	563	1,458	4,414	1,906	2,771	4,442	3,392	5,992	8,219	2,900	3,753
China	62,493	41,926	26,843	33,923	77,134	40,795	42,714	75,971	31,741	65,328	44,154	28,735	65,440
RoW	11,954	12,445	4,329	7,060	14,270	6,123	9,885	17,821	6,999	9,639	14,736	7,849	12,094
South Korea	1,334	199	2	42	1,258	114	424	1,891	118	696	4,501	2,840	3,563
Australia	2,189	2,266	3,313	3,516	3,578	3,676	4,476	7,018	3,934	3,309	5,177	1,988	3,939
Other RoW	8,431	9,980	1,014	3,502	9,434	2,333	4,985	8,912	2,947	5,634	5,058	3,021	4,592
Global Total	153,533	174,113	94,829	119,573	208,345	116,289	138,388	211,337	113,610	167,471	154,095	114,954	174,574

Source: EV-Volumes

FIGURE 43. Tesla US sales by model, monthly

Make Model	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23
Tesla Model S	1,900	2,350	900	1,000	1,000	1,000	900	1,390	1,000	1,250	1,350	1,150	1,100
Tesla Model X	2,200	2,600	1,350	1,500	1,410	1,500	2,100	2,600	2,100	2,200	2,400	2,600	2,500
Tesla Model Y	20,277	30,420	30,005	31,228	31,430	30,800	30,507	33,053	32,900	32,000	31,430	31,000	32,500
Tesla Model 3	18,949	24,972	19,620	18,200	16,500	18,820	18,542	25,828	16,900	16,000	17,050	17,500	16,500
Total by Model	43,326	60,342	51,875	51,928	50,340	52,120	52,049	62,871	52,900	51,450	52,230	52,250	52,600

Source: EV-Volumes

FIGURE 44. Tesla China production and sales (retail & export), annually & quarterly

Tesla China Data										CY 2021	CY 2022
Make Model	Q3 '21	Q4 '21	Q1 '22	Q2 '22	Q3 '22	Q4 '22	Q1 '23	Q2 '23	Q3 '23		
Wholesales											
Model 3	72,142	85,242	76,684	39,034	58,601	81,455	75,340	84,635	59,991	272,972	255,774
Model Y	61,096	92,855	105,490	73,549	129,716	146,336	153,982	162,582	162,526	200,131	455,091
Mix: Model 3	54%	48%	42%	35%	31%	36%	33%	34%	27%	58%	36%
Mix: Model Y	46%	52%	58%	65%	69%	64%	67%	66%	73%	42%	64%
Total Wholesales	133,238	178,097	182,174	112,583	188,317	227,791	229,322	247,217	222,517	473,103	710,865
China Production											
Model 3	67,590	84,938	75,456	39,504	61,402	86,291	69,648	84,222	62,175	279,882	262,653
Model Y	61,474	94,340	103,431	75,725	136,010	148,850	148,891	159,546	165,095	205,953	464,016
Mix: Model 3	52%	47%	42%	34%	31%	37%	32%	35%	27%	58%	36%
Mix: Model Y	48%	53%	58%	66%	69%	63%	68%	65%	73%	42%	64%
Total China Production	129,064	179,278	178,887	115,229	197,412	235,141	218,539	243,768	227,270	485,835	726,669
Exports											
Model 3	45,236	46,103	43,065	8,744	23,471	56,038	32,558	37,244	36,544	122,082	131,318
Model Y	14,343	15,935	30,809	14,564	44,270	50,134	59,335	53,297	46,349	30,278	139,777
Mix: Model 3	76%	74%	58%	38%	35%	53%	35%	41%	44%	80%	48%
Mix: Model Y	24%	26%	42%	62%	65%	47%	65%	59%	56%	20%	52%
Total Exports	59,579	62,038	73,874	23,308	67,741	106,172	91,893	90,541	82,893	152,360	271,095
China Retail											
Model 3	26,906	39,139	33,619	30,290	35,130	25,417	42,782	47,391	23,447	150,890	124,456
Model Y	46,753	76,920	74,681	58,985	85,446	96,202	94,647	109,285	116,177	169,853	315,314
Mix: Model 3	37%	34%	31%	34%	29%	21%	31%	30%	17%	47%	28%
Mix: Model Y	63%	66%	69%	66%	71%	79%	69%	70%	83%	53%	72%
Total China Retail	73,659	116,059	108,300	89,275	120,576	121,619	137,429	156,676	139,624	320,743	439,770
Y/Y										CY 2021	CY 2022
Wholesales											
Model 3	111%	48%	45%	-38%	-19%	-4%	-2%	117%	2%	102%	-6%
Model Y			542%	147%	112%	58%	46%	121%	25%		127%
Total Wholesales	290%	209%	163%	22%	41%	28%	26%	120%	18%	249%	50%
China Production											
Model 3	82%	29%	23%	-40%	-9%	2%	-8%	113%	1%	1	0
Model Y		14065%	480%	134%	121%	58%	44%	111%	21%	30824%	125%
Total China Production	248%	170%	126%	17%	53%	31%	22%	112%	15%	222%	50%
Exports											
Model 3			172160%	-72%	-48%	22%	-24%	326%	56%		8%
Model Y					209%	215%	93%	266%	5%		362%
Total Exports			295396%	-24%	14%	71%	24%	288%	22%		78%
China Retail											
Model 3	-21%	-32%	-36%	-5%	31%	-35%	27%	56%	-33%	0	0
Model Y			355%	98%	83%	25%	27%	85%	36%		86%
Total China Retail	116%	102%	56%	45%	64%	5%	27%	75%	16%	137%	37%

Source: ThinkerCar

FIGURE 45. Tesla China production and sales (retail & export), monthly

Tesla China Data													
Make Model	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23
Wholesales													
Model 3	31,193	20,046	25,148	22,990	27,202	26,783	27,215	30,637	20,324	18,843	20,824	24,951	23,999
Model Y	69,098	35,750	40,903	51,412	61,667	49,059	50,480	63,043	43,961	65,316	53,249	47,164	58,433
Mix: Model 3	31%	36%	38%	31%	31%	35%	35%	33%	32%	22%	28%	35%	29%
Mix: Model Y	69%	64%	62%	69%	69%	65%	65%	67%	68%	78%	72%	65%	71%
Total Wholesales	100,291	55,796	66,051	74,402	88,869	75,842	77,695	93,680	64,285	84,159	74,073	72,115	82,432
China Production													
Model 3	32,549	21,488	21,345	20,493	27,810	30,088	26,694	27,440	22,741	21,330	18,104	28,547	32,331
Model Y	56,105	37,293	36,925	51,839	60,127	54,859	51,762	52,925	57,604	59,502	47,989	54,959	58,471
Mix: Model 3	37%	37%	37%	28%	32%	35%	34%	34%	28%	26%	27%	34%	36%
Mix: Model Y	63%	63%	63%	72%	68%	65%	66%	66%	72%	74%	73%	66%	64%
Total China Production	88,654	58,781	58,270	72,332	87,937	84,947	78,456	80,365	80,345	80,832	66,093	83,506	90,802
Exports													
Model 3	21,124	7,507	12,489	14,593	5,476	13,587	15,761	7,896	12,533	5,266	18,745	22,678	8,372
Model Y	16,674	6,363	26,719	25,886	6,730	22,299	19,426	11,572	20,329	14,199	11,821	20,811	8,556
Mix: Model 3	56%	54%	32%	36%	45%	38%	45%	41%	38%	27%	61%	52%	49%
Mix: Model Y	44%	46%	68%	64%	55%	62%	55%	59%	62%	73%	39%	48%	51%
Total Exports	37,798	13,870	39,208	40,479	12,206	35,886	35,187	19,468	32,862	19,465	30,566	43,489	16,928
China Retail													
Model 3	10,069	12,539	12,659	8,397	21,726	13,196	11,454	22,741	7,791	13,577	2,079	2,273	15,627
Model Y	52,424	29,387	14,184	25,526	54,937	26,760	31,054	51,471	23,632	51,117	41,428	26,353	49,877
Mix: Model 3	16%	30%	47%	25%	28%	33%	27%	31%	25%	21%	5%	8%	24%
Mix: Model Y	84%	70%	53%	75%	72%	67%	73%	69%	75%	79%	95%	92%	76%
Total China Retail	62,493	41,926	26,843	33,923	76,663	39,956	42,508	74,212	31,423	64,694	43,507	28,626	65,504
Y/Y	Nov '22	Dec '22	Jan '23	Feb '23	Mar '23	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23
Wholesales													
Model 3	20%	-34%	-5%	-5%	5%	4752%	124%	16%	63%	27%	-34%	-17%	-23%
Model Y	158%	-12%	23%	59%	55%	5010%	152%	20%	179%	5%	3%	14%	-15%
Total Wholesales	90%	-21%	10%	32%	35%	4916%	142%	19%	128%	9%	-11%	1%	-18%
China Production													
Model 3	13%	-24%	-28%	-11%	23%	611%	137%	14%	102%	7%	-40%	-11%	-1%
Model Y	100%	-3%	-4%	60%	83%	741%	132%	13%	110%	5%	-7%	-1%	4%
Total China Production	56%	-12%	-14%	31%	59%	690%	134%	13%	108%	6%	-19%	-5%	2%
Exports													
Model 3	21%	3914%	-47%	-25%			93%	1307%	8%	-54%	4428%	-17%	-60%
Model Y	358%	10871%	58%	87%	11117%		37%	2743%	151%	-54%	131%	-23%	-49%
Total Exports	79%	5561%	-3%	22%	20243%		58%	1911%	66%	-54%	454%	-20%	-55%
China Retail													
Model 3	17%	-58%	324%	82%	-17%	2291%	190%	-12%	849%	301%	-93%	-19%	55%
Model Y	127%	-27%	-13%	37%	38%	2688%	429%	-1%	209%	64%	-11%	83%	-5%
Total China Retail	97%	-41%	39%	46%	17%	2543%	333%	-5%	271%	88%	-44%	66%	5%

Source: ThinkerCar

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Ford Motor (F, 12-Jan-2024, USD 11.46), Overweight/Positive, A/CD/CE/D/E/J/K/L/M/N

General Motors (GM, 12-Jan-2024, USD 35.26), Overweight/Positive, A/CD/CE/D/E/J/K/L/M/N

Rivian Automotive Inc. (RIVN, 12-Jan-2024, USD 18.06), Overweight/Positive, A/CD/CE/D/FA/FB/J/L

Tesla, Inc. (TSLA, 12-Jan-2024, USD 218.89), Equal Weight/Positive, A/CD/CE/D/J/K/L/M

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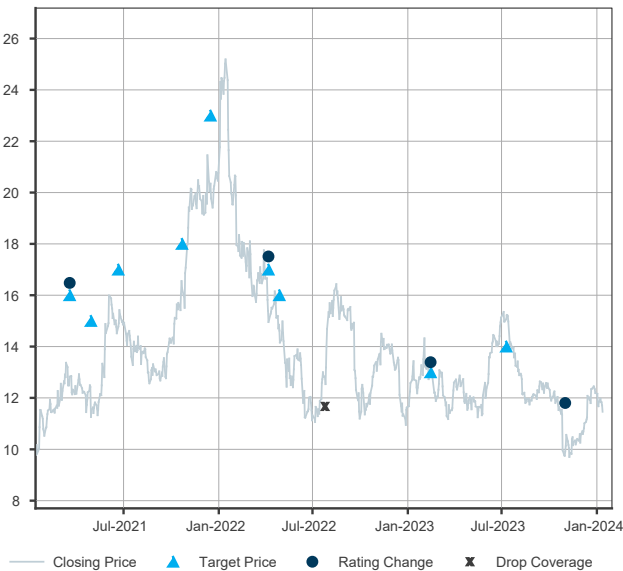
Stock Rating: **OVERWEIGHT**

Industry View: **POSITIVE**

Closing Price: **USD 11.46** (12-Jan-2024)

Rating and Price Target Chart - USD (as of 12-Jan-2024)

Currency=USD



Source: IDC, Barclays Research

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Publication Date	Closing Price*	Rating	Adjusted Price Target
01-Nov-2023	9.75	Overweight	
10-Jul-2023	14.98		14.00
14-Feb-2023	12.97	Equal Weight	13.00
19-Jul-2022	11.96	Coverage Dropped	
28-Apr-2022	14.85		16.00
07-Apr-2022	15.39	Equal Weight	17.00
16-Dec-2021	20.19		23.00
22-Oct-2021	16.28		18.00
21-Jun-2021	14.78		17.00
29-Apr-2021	11.26		15.00
19-Mar-2021	12.83	Overweight	16.00

On 16-Jan-2021, prior to any intra-day change that may have been published, the rating for this security was Equal Weight, and the adjusted price target was 9.00.

Source: Bloomberg, Barclays Research

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Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Downside risks to our Overweight rating include: 1.) Sharper cycle pressures than anticipated; 2.) EV pressure worse than anticipated, including challenged margins and share pressures, particularly to the extent that EV pricing is challenged by lower-cost competitors; 3.) Missteps in self-help initiatives and the continuation of quality issues.

General Motors (GM / GM)

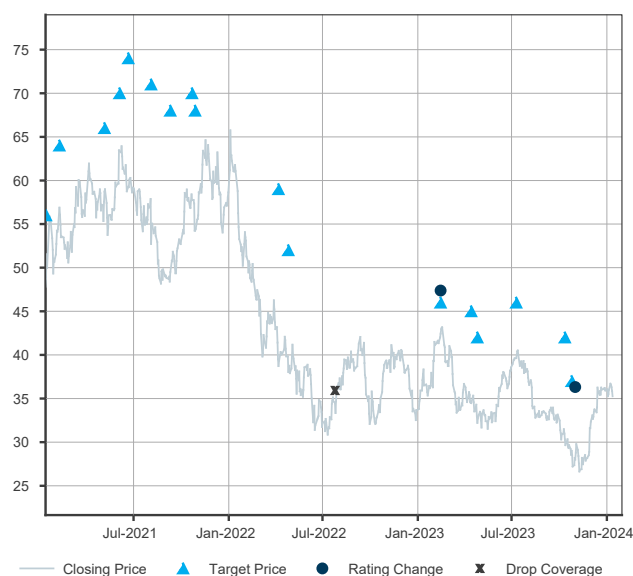
Stock Rating: **OVERWEIGHT**

Industry View: **POSITIVE**

Closing Price: **USD 35.26** (12-Jan-2024)

Rating and Price Target Chart - USD (as of 12-Jan-2024)

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
01-Nov-2023	28.20	Overweight	
25-Oct-2023	28.56		37.00
12-Oct-2023	30.98		42.00
10-Jul-2023	39.61		46.00
26-Apr-2023	32.91		42.00
14-Apr-2023	34.62		45.00
14-Feb-2023	42.43	Equal Weight	46.00
19-Jul-2022	32.62	Coverage Dropped	
26-Apr-2022	38.04		52.00
07-Apr-2022	39.50		59.00
28-Oct-2021	54.24		68.00
22-Oct-2021	57.77		70.00
10-Sep-2021	49.49		68.00
04-Aug-2021	52.72		71.00
21-Jun-2021	59.30		74.00
04-Jun-2021	63.37		70.00
06-May-2021	58.72		66.00
08-Feb-2021	56.88		64.00

On 16-Jan-2021, prior to any intra-day change that may have been published, the rating for this security was Overweight, and the adjusted price target was 56.00.

Source: Bloomberg, Barclays Research

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Valuation Methodology: We value GM on a sum-of-the-parts (SoTP) basis for 2024, underpinned by our estimate of Automotive EBITDA (including Cruise and corp. costs, but excluding equity income), with separate valuations for GM's China JV operations, GMF, and its stake in Cruise. This brings us to a total enterprise value which we adjust for net debt to reach an equity value. Our Overweight rating and \$37 Price Target is based upon our estimate for \$15.2bn in '24 Automotive EBITDA at a 1.7x multiple (roughly in-line with that of Ford), as well our estimates for the '23 tangible book value of GMF (\$14.6bn), an \$2bn valuation of GM's stake in Cruise (GM ownership stake at ~80%), and \$600mn of China equity income at a 4.0x multiple (in-line with that of China auto peers).

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Downside risks to our Overweight rating include:

1.) Sharper cycle pressures than anticipated; 2.) EV pressure worse than anticipated, including challenged margins and share pressures; 3.) FCF pressures amid EV transition.

Rivian Automotive Inc. (RIVN / RIVN)

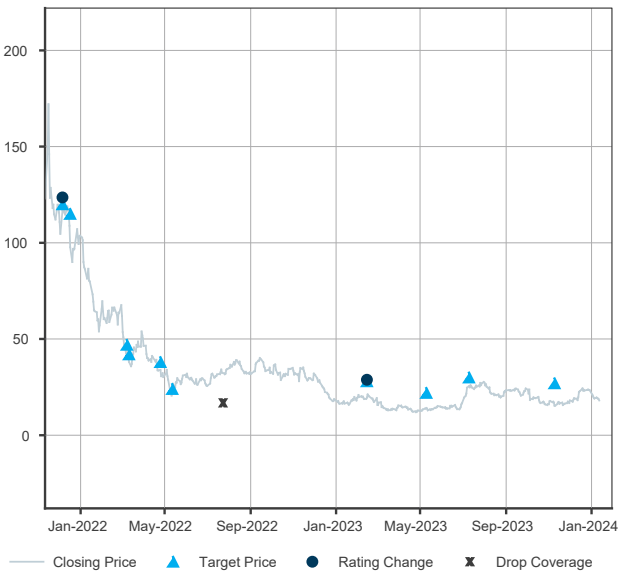
Stock Rating: **OVERWEIGHT**

Industry View: **POSITIVE**

Closing Price: **USD 18.06** (12-Jan-2024)

Rating and Price Target Chart - USD (as of 12-Jan-2024)

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
09-Nov-2023	17.00		27.00
10-Jul-2023	24.70		30.00
10-May-2023	13.86		22.00
14-Feb-2023	19.49	Overweight	28.00
19-Jul-2022	31.80	Coverage Dropped	
12-May-2022	24.30		24.00
25-Apr-2022	33.90		38.00
11-Mar-2022	38.05		42.00
08-Mar-2022	42.21		47.00
17-Dec-2021	97.70		115.00
06-Dec-2021	116.78	Equal Weight	120.00

Source: Bloomberg, Barclays Research

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Valuation Methodology: We use a 20% discount rate (over 7 years) and a 17x Base Case EPS to generate our Overweight rating and \$27 Price Target. Further, the wide range of potential 2030 outcomes for RIVN from 1.1mn units sold at the high end to ultra low-volume at the low end leads to our Upside and Downside scenario cases having values of \$75 and \$7, respectively. Our use of a 20% discount rate reflects the risk inherent to RIVN's process for scaling its operations to mass volume, increasingly robust competition, higher interest rates, and what is likely to be a need for an incremental capital raise. Our 17x 2030 EPS multiple reflects RIVN's status as a premium US EV pure play, with a solid opportunity for additional growth in the years to come, alongside optionality related to software features becoming a lucrative business in consumer vehicles.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Risks to our Overweight rating include: 1.) Continued margin pressure / cash burn amid a challenged ramp of production; 2.) Elevated competition amid a rush of new EV models; 3.) A dilutive equity raise, which could pressure the stock; 4.) Continued rate hikes by the Fed, pressuring stocks with long-dated narratives.

Tesla, Inc. (TSLA / TSLA)

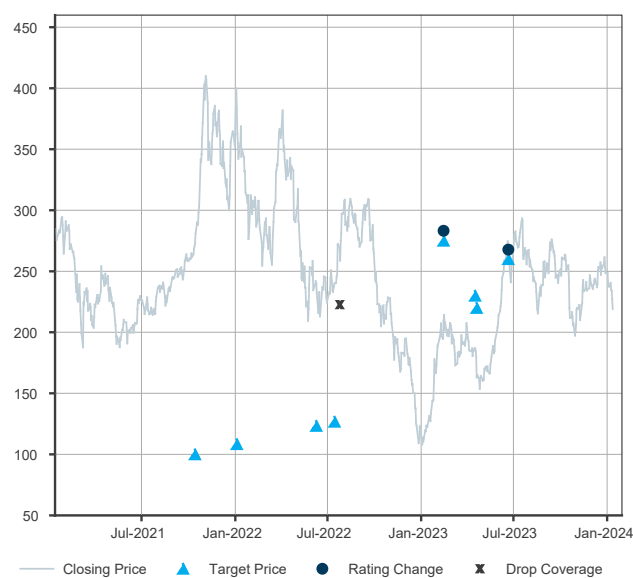
Stock Rating: **EQUAL WEIGHT**

Industry View: **POSITIVE**

Closing Price: **USD 218.89** (12-Jan-2024)

Rating and Price Target Chart - USD (as of 12-Jan-2024)

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
21-Jun-2023	274.45	Equal Weight	260.00
20-Apr-2023	180.59		220.00
17-Apr-2023	185.00		230.00
14-Feb-2023	209.25	Overweight	275.00
19-Jul-2022	240.55	Coverage Dropped	
15-Jul-2022	240.07		126.67
09-Jun-2022	232.23		123.33
04-Jan-2022	383.20		108.33
14-Oct-2021	272.77		100.00

On 16-Jan-2021, prior to any intra-day change that may have been published, the rating for this security was Underweight, and the adjusted price target was 76.67.

Source: Bloomberg, Barclays Research

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Valuation Methodology: We value TSLA using a probability-weighted scenario analysis of 2030, reflecting the potential binary outcomes for the stock. We forecast a model case, and then flex the results into bull/bear and uberbull/uberbear scenarios, each of which generating an independent earnings estimate. From there we assign an EPS multiple and discount rate, deriving a share price for each scenario. Finally, we assess the probability of each earnings / share price scenario under a base case, upside case, and downside case, generating a probability-weighted average target price under each case. This process, using a 7% discount rate (over 7 years) and a 27x base case EPS multiple, generates our Equal Weight rating and \$260 price target. Further, the wide range of potential 2030 outcomes for TSLA from 11mn units sold at the high end to 3mn at the low end leads to our upside and downside scenarios of \$450 and \$125, respectively. Our use of a 7% discount rate reflects relatively de-risked path to 2030 for TSLA, at least compared to its new-entrant EV peers. Our 27x 2030 EPS multiple reflects TSLA's status as the premium global EV pure play, albeit with a slowing growth profile due to its scale at that point. Our base case multiple also reflects the optionality within TSLA related to upside potential from the successful transition of FSD to L4 capabilities, as well as inflection of meaningful software/services recurring revenue.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Upside risks include: 1) Continuation of momentum-driven rally and broader AI/tech outperformance; 2) Announcements of breakthroughs in delivery of FSD and/or Dojo; 3) An earlier/quicker-than-expected ramp of the Cybertruck; 4) An uptick in 4680 cell volume production progress. Downside risks include: 1) Continued demand weakening that requires larger-than-expected incremental price cuts; 2) A longer-than-expected holding of interest rates and/or incremental rate increases by the Federal Reserve challenging the long-dated narratives of TSLA; 3) A sharp reversion of AI-related and tech stock outperformance; 4) Regulatory action towards TSLA Autopilot/FSD; 5) Increasing competition from EV offerings of legacy OEMs and fellow new-entrants creating TSLA share losses or prompting incremental price cuts

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