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Green ABS Deep Dive

FAQ: Streaking Ahead - A Look Inside Green Auto ABS in China and Overseas Markets

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What's China's position in the thriving electric vehicle (EV) market relative to overseas participants? What are the differences and similarities, and prospects for green auto ABS in China and overseas markets? In our third episode of Green ABS Deep Dive series, we will answer some questions about domestic and overseas EV markets and green auto ABS and convey the logic behind our analysis of green auto ABS.

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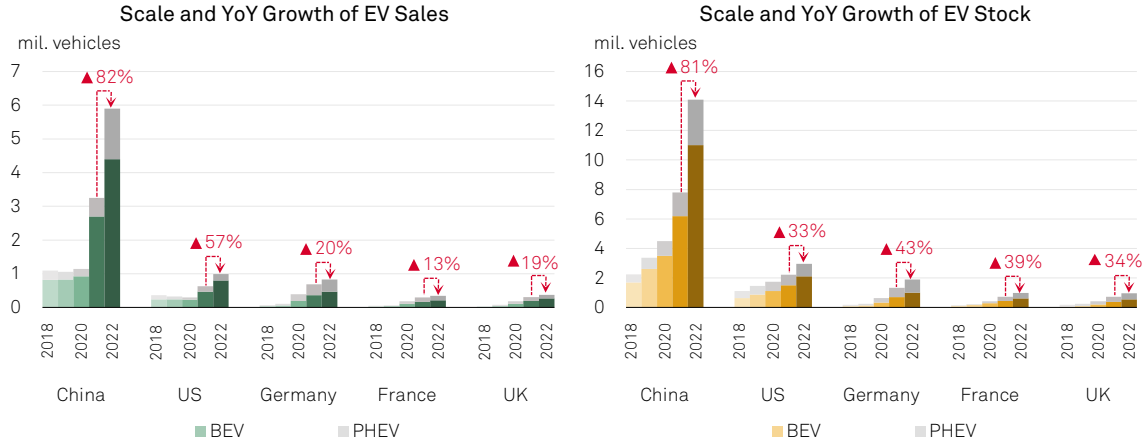
1. What's China's position in the global EV market?

Global EV market sees rapid growth, China's EV sector takes the lead. As of the end of 2022, global EV sales exceeded 10 million vehicles and overall EV stock rose to about 26 million vehicles, roughly 9 times and 8 times the figures in early 2018, respectively. Meanwhile, China's EV sales and stock came to 6 million and 14 million vehicles, respectively, nearly 10 times and 12 times the records in early 2018 and ranking the top in the global market. Such momentum has been sustained in 2023. We expect China's EV market to continue growing in 2024 and maintain its leading position among all countries.

Chart 1

EV Market Overview of Selected Countries

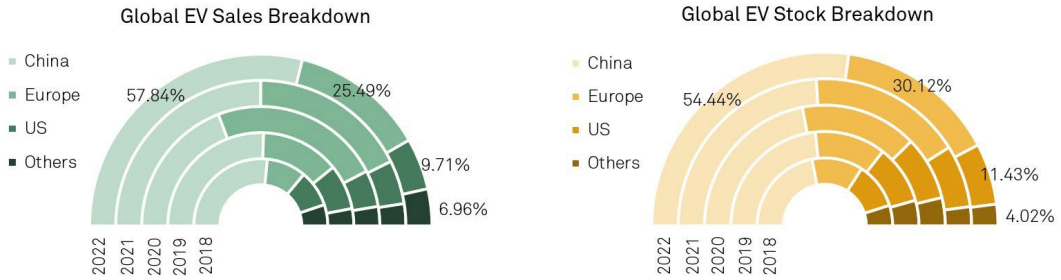


Note 1: The chart only includes the five largest countries in terms of EV stock in 2022, in descending order from left to right.
Note 2: For the purpose of this commentary, EVs refer to electric passenger vehicles and only include battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs).
Source: International Energy Agency (IEA), compiled by S&P Global (China) Ratings.

Global EV market share is disproportionately distributed, with China's share expanding consistently. Amid the strong wave of global EV market expansion, China's EV sector has gotten on the fast track, accounting for more than 50% of global market share in terms of sales and stock. The US and Europe follow the lead, with Germany, France and the UK taking the top three places in the Europe, making up 15% in aggregate of global EV sales and stock. In our view, China's market share should continue expanding in 2024, and EV markets in other countries and regions would keep developing, despite the low likelihood of catching up with China in the short term.

Chart 2

Global EV Market Breakdown by Country and Region

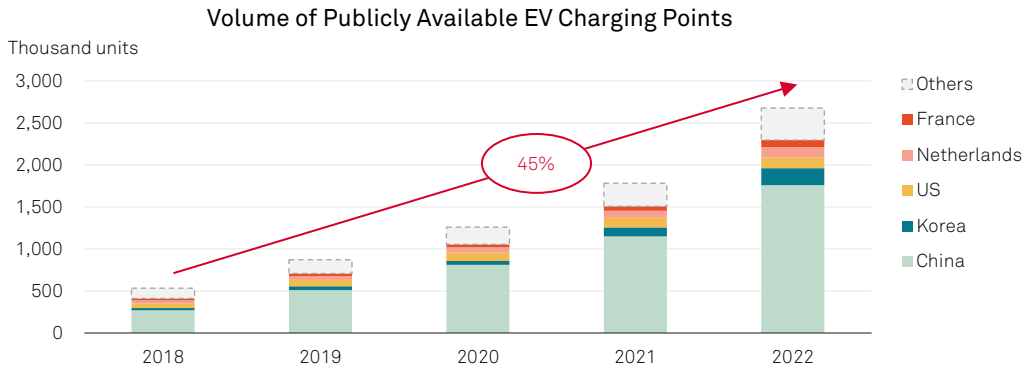


Source: IEA, compiled by S&P Global (China) Ratings.

Global charging infrastructure is growing fast and highly concentrated, supply shortfall highlights need for accelerated construction. We view the charging infrastructure shortage as a major constraint for EV market development. As of the end of 2022, there were roughly 2.7 million publicly available charging points around the world, registering a 5-year CAGR of about 45%, with most of new publicly available charging points added in China. China owns nearly 65% of overall publicly available charging points worldwide, and the European countries have 500 thousand in total, Korea about 200 thousand and the US around 130 thousand. China has built a charging infrastructure system featuring the largest number of charging points, the most extensive services, and the most diversified mix of charging facilities[1]. Broadly speaking, compared to the scale of EV stock, charging infrastructure is remarkably undersupplied in both China and overseas markets, highlighting the need for accelerated construction.

Chart 3

EV Charging Infrastructure of Selected Countries



Note: Countries are presented in descending order for each stacked bar based on the volume of publicly available charging points, including publicly available fast-charging and slow-charging points.

Source: IEA, compiled by S&P Global (China) Ratings.

[1] Guiding Opinion on Promoting the Construction of High-quality Charging Infrastructure System issued by the General Office of the State Council (No. 19 Document of 2023)

2. How do we view the development of China and overseas green auto ABS markets?

The issuance of Green Bond Endorsed Project Catalogue (2021 Edition) and China Green Bond Principles in recent years has pushed forward the consolidation of domestic green finance standards and promoted better alignment with global green finance criteria such as Green Bond Principles (GBP) and Climate Bonds Standard (CBS). Despite the lack of a universally accepted definition for green auto ABS, we observe that outstanding green auto ABS in China and overseas markets can be divided into the following three categories.

Chart 4

Green Auto ABS Classification

Source: S&P Global (China) Ratings.

For transactions with issuance proceeds to be invested in green projects, we will still focus on analyzing the credit risk characteristics of their underlying assets in our credit assessment. Given that China, Europe and the US together account for over 90% of global EV sales and stock in recent years, we primarily take green auto ABS in these countries and region as example.

The US green auto ABS market enjoys first-mover advantage. Toyota Motor Credit Corporation (TMCC) issued the world's first green auto ABS in the US market in March 2014 and has since then continued to issue four batches of green auto ABS aimed at investing in green projects. These ABS deals were backed by a blend of green and non-green assets, funds raised from which were used for financing new auto loan and lease contracts that meet specific green criteria. In February 2018, the finance arm of Tesla, Inc. (Tesla) issued its first auto lease ABS backed entirely by lease contracts for BEVs in the US market; as of the end of October 2023, Tesla had issued eight batches of green-assets-backed auto ABS in aggregate.

European green auto ABS market progresses slowly. Although Europe as a whole constitutes the second largest EV market in terms of EV sales and stock, it is still difficult for a specific European country to gather sufficient EV loans or leases domestically to securitize. The share of EV loans and leases in European auto ABS's underlying asset pool has increased recently, but no transactions have been fully backed by BEV loans or leases yet. Noteworthily, Toyota Financial Services Italia S.p.A. issued the first auto ABS backed by a mix of hybrid electric vehicle (HEV) loans (98.4% of total assets), PHEV loans and BEV loans in Europe in February 2023.

China's green auto ABS market started late, but has shown strong growth trend. In September 2018, BYD International Leasing Limited issued the first green auto ABS in China, with the underlying assets and use of proceeds both relating to green projects. Thanks to the persistent growth of China's EV sector, green auto ABS issuance has skyrocketed in recent years. Funds raised from public green auto ABS are predominantly used for financing new green auto loans and leases, with a small portion aimed for repaying interest-bearing debt and replenishing liquidity. The underlying assets for public green auto ABS fully comprise new energy vehicle loans or leases. Similar to the US market, China's market currently also has ABS transactions where the underlying assets are 100% BEV loans.

3. What are the differences and similarities between green and non-green auto ABS in China and overseas markets?

Generally speaking, we think the differences between green auto ABS issued in different markets result from market-specific characteristics. For instance, transactions in overseas markets typically use swaps to hedge against interest rate risk derived from the discrepancy between fixed rate of the underlying assets and the floating rate of senior notes, whereas there is no similar mechanism currently set up in China. Currently, there is no significant difference overall between green and non-green auto ABS within the same market. Asset characteristics may differentiate marginally, while securities characteristics and credit performance are quite alike. In addition, green auto ABS in both China and overseas markets may face higher residual value risk in the short term.

Underlying assets of green and non-green auto ABS in China and overseas markets differ insignificantly. As each originator adopts different green/non-green auto financial products and securitization strategies, the characteristics of asset pool for their green/non-green auto ABS may vary, but not in a significant way.

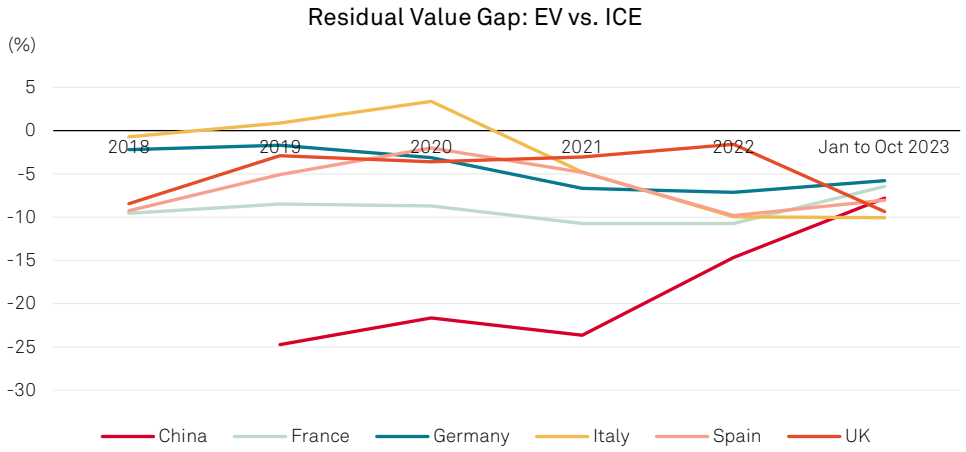
Securities characteristics of green and non-green auto ABS in China and overseas markets don't show much difference. Domestic and overseas green auto ABS tend to follow the steps of and draw on experience from securitization of internal combustion engine (ICE) auto loan in their respective market, and thus green and non-green auto ABS in the same market are quite similar in various aspects. For example, the credit enhancement for TMCC's Toyota Auto Receivables Owner Trust (TAOT) consists of a yield supplement overcollateralization amount (YSOA), overcollateralization and a reserve account, etc. for both green and non-green ABS transactions.

Credit performance of green and non-green auto ABS in China and overseas markets haven't differentiated remarkably. Given the limited EV sales scale, most domestic and overseas financial institutions haven't separated the risk control system for EV receivables from that for ICE vehicle receivables, leading to similarities in loan approval criteria, underwriting policy and arrears management for both types of receivables. Considering the limited number of green auto ABS issues and their relatively short track record of credit performance both domestically and overseas, we haven't seen significant divergence in credit performance between EV receivables and ICE vehicle receivables.

Green auto ABS in China and overseas markets faces higher residual value risk in the short term. Compared to ICE vehicles, EVs are more reliant on carmakers' services such as charging facilities, warranty, and software upgrade. We observe that owing to the modest scale of used EV trade, considerable difficulty in EV circulation, sharp price cuts on certain new models, and technology upgrade on new models, the residual value (expressed as a percentage of the list price) of EVs is generally lower and more volatile than that of ICE vehicles in China and overseas markets, which exposes EVs to higher residual value risk. EV residual value in China has improved significantly, maintaining at around 50-55%. As a result, domestic EVs have seen their residual value gradually approaching that for ICE vehicles, with the gap narrowing rapidly from nearly -25% in 2019 to -8% as of the end of October 2023. Meanwhile, the EV residual value in overseas markets also stays lower relative to that of ICE vehicles. For instance, EV residual values in European countries are typically 5-10% lower than those of ICE vehicles. Despite a narrower gap in that rate for France, Germany and Spain 2023 to date, the gap remains above 6% for Europe in aggregate as of the end of October 2023.

Chart 5

Residual Value Gap between EVs and ICE Vehicles of Selected Countries



Note: the gap in the above paragraph is the difference between the average residual value of EVs and ICE vehicles. In particular, EVs include BEVs and PHEVs. ICE vehicles in China include mini sedans, compact sedans, mid-size sedans, full-size sedans, mini SUVs, compact SUVs, mid-size SUVs, full-size SUVs, and MPVs, while ICE vehicles in other countries include diesel-powered vehicles and gasoline-powered vehicles.

Source: S&P Global Ratings, China Passenger Car Association (CPCA), compiled by S&P Global (China) Ratings.

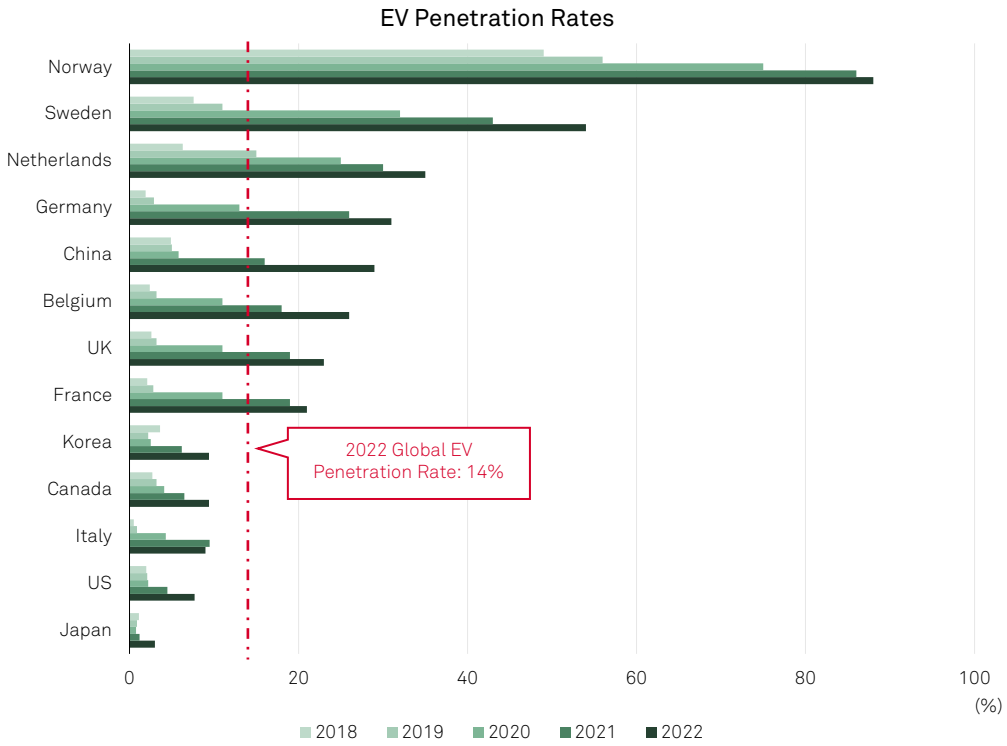
4. How do we view the development of China and overseas EV markets?

Amid the strong momentum for the EV sector in recent years, global EV penetration rose from about 2% in 2018 to 14% in 2022. Continued policy support, coupled with technology progress and infrastructure enhancement, has gradually raised customers' acceptance for EVs. We expect great upside potential for EV penetration in most countries, with EV sales and loan scale set to increase further.

Except for a few European countries, most countries enjoy large headroom for EV penetration. For overseas markets, EV penetration in Europe was 21% in 2022, and certain European countries get ahead of other regions in terms of market penetration, such as Norway (88%), Iceland (70%), Sweden (54%) and Denmark (39%). Conversely, EV penetrations in Canada (9.4%), Korea (9.4%), Italy (9%), US (7.7%), Australia (5.1%) and Japan (3%) remain below the global average. **In China market**, EV penetration was less than 5% as of the end of 2018 and jumped to over 25% as of the end of 2022, marking an earlier fulfillment of the "20% by 2025" goal set in New Energy Vehicle Industry Development Plan (2021-2035). However, compared to some other countries in global perspective, China still sees great space for enhancing EV penetration.

Chart 6

EV Penetration of Selected Countries



Note 1: The chart above only includes countries that account for more than 1% of global EV stock respectively in 2022, which are presented in descending order from top to bottom based on EV penetration.
Note 2: Penetration is the country's EV sales share in the corresponding year.
Source: IEA, compiled by S&P Global (China) Ratings.

Continuous policy support and automakers' proactive strategy facilitate EV market expansion. In recent years, numerous countries have successively launched supportive policies and incentive measures, e.g. tax deduction or exemption, to boost the EV sector, and set clear goals of achieving zero emissions and banning ICEs. **Among overseas countries,** the US sets a target to make half of all new vehicles sold in 2030 zero-emissions vehicles (ZEVs), the UK, Canada and EU mandate all new vehicles to be zero emission by 2035. Specifically, Norway aims for 100% ZEV sales by 2025. **For China,** the share of incremental vehicles fueled by new and clean energy will reach around 40% by 2030[2]. In addition, automakers including Ford, Mercedes-Benz, Volvo, General Motors, Toyota and Kia have committed to phasing out ICE vehicle sales, while stepping up efforts in building EV presence.

EV acceptance is increasing thanks to technology breakthroughs and improved charging infrastructure. A wave of EV infrastructure construction is spread across the globe at present. The US plans to build a national charging network of 500 thousand charging points by 2030, and China plans to basically establish a high-quality charging infrastructure network with extensive coverage, moderate scale, sound structure, and full functions[3]. As bottlenecks surrounding safety, milage, and charging are gradually alleviated, customers' acceptance for EVs should increase as the driving experience improves considerably and EV models become more diversified.

[2] Notice on Publication of Action Plan for Carbon Dioxide Peaking Before 2030 issued by the State Council (No.23 Document of 2021)

[3] Guiding Opinion on Promoting the Construction of High-quality Charging Infrastructure System issued by the General Office of the State Council (No. 19 Document of 2023)

5. How do we view the development of green auto ABS in China and overseas markets?

Green auto ABS issuance in China and overseas markets should grow steadily. Amid robust growth in global EV sector and EV finance markets, the share of EV-related underlying assets in overall auto ABS asset pool is expected to grow further across the world, and an increasing number of new originators may tap into the green auto ABS market. In the meantime, given the enhanced clarity for "green" standards, improved information disclosure and potential stimulus for issuance and investment going forward, green auto ABS issuance should rise gradually.

Credit performance of green auto ABS in China and overseas markets may diverge. Along with the EV sector development, carmakers will introduce more EV models at various price levels to suit customers' needs. Correspondingly, financial institutions may also roll out customized financial plans targeting different customer groups. Changes in the share of each model in the asset pool and in the credit quality of car buyers could impact the credit performance of the asset pool. Moreover, we need to focus on the operating risks of EV makers, risk control capabilities and recovery methods of different originators, and borrowers' reliance on ongoing after-sale services and support provided by carmakers. These factors may result in a divergence in green auto ABS' credit performance in the future.

From a long-term perspective, residual value risk facing green auto ABS may gradually decrease. As used EV evaluation system has been set up in steps with accumulation of used EV market data, and consumer acceptance for EVs has gradually enhanced, EV residual value may become less volatile and approach that for ICE vehicles. That said, we view this as a long-term process and residual value risk is still the primary risk for green auto ABS in the short-term. Nonetheless, the higher residual value risk of EVs is typically factored in our base-case assumptions and green auto ABS usually has relatively short maturity, leading to limited impact from residual value risk. We may adjust our assumptions going forward as more transaction and historical data are available.

Related Commentaries and Research：

- 2024 China Credit Outlook
- Green ABS Deep Dive: Embracing the "New" Future – Residual Value Risk of Green Auto ABS and Used EV Market
- Green ABS Deep Dive: Turn the "Green" into "Gold" – Green Auto ABS Market Overview and Outlook
- Commentary: Understanding Our Approach to China Consumer Asset-Backed Securities
- China's Auto ABS Sector Deep Dive: 2023 Edition

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