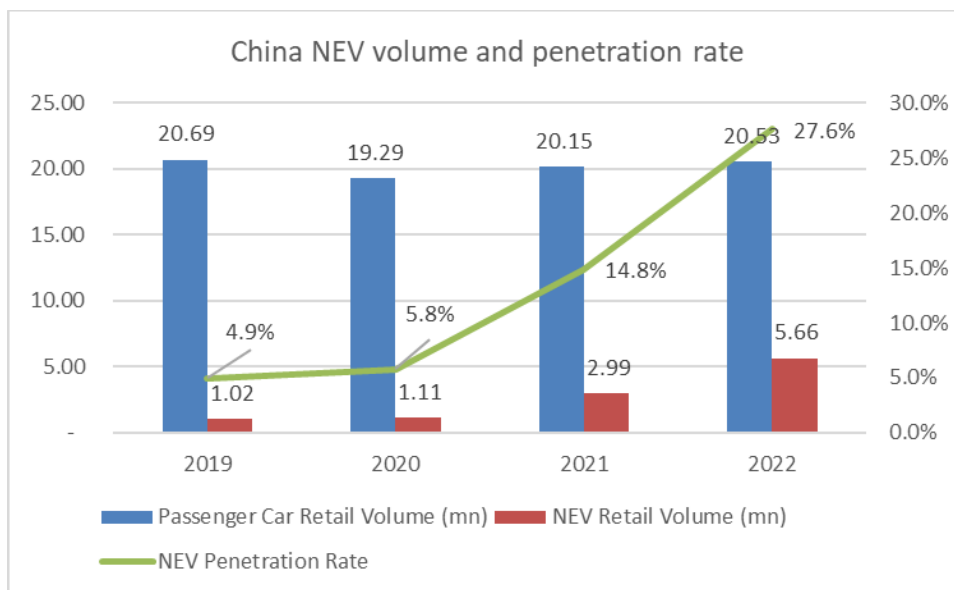


9<sup>th</sup> January 2023

**China’s new energy vehicles market - Wrap up of 2022 and outlook**

FY22 was another remarkable year for China’s new energy vehicles (NEV) market, just as the two previous years had been. China’s NEV retail volumes increased from 1.02mn units in 2019 to 5.66mn units in 2022, translating into a compounded annual growth rate of 77% over the past three years. During the same period, China’s total domestic passenger car retail volumes stabilised around 20mn-20.5mn units per year, with 2020 slightly below 20mn units under the shock of Covid. NEV penetration rate rose from less than 5% in 2019 to 27.6% in 2022.

**Figure 1. China’s NEV penetration rate**

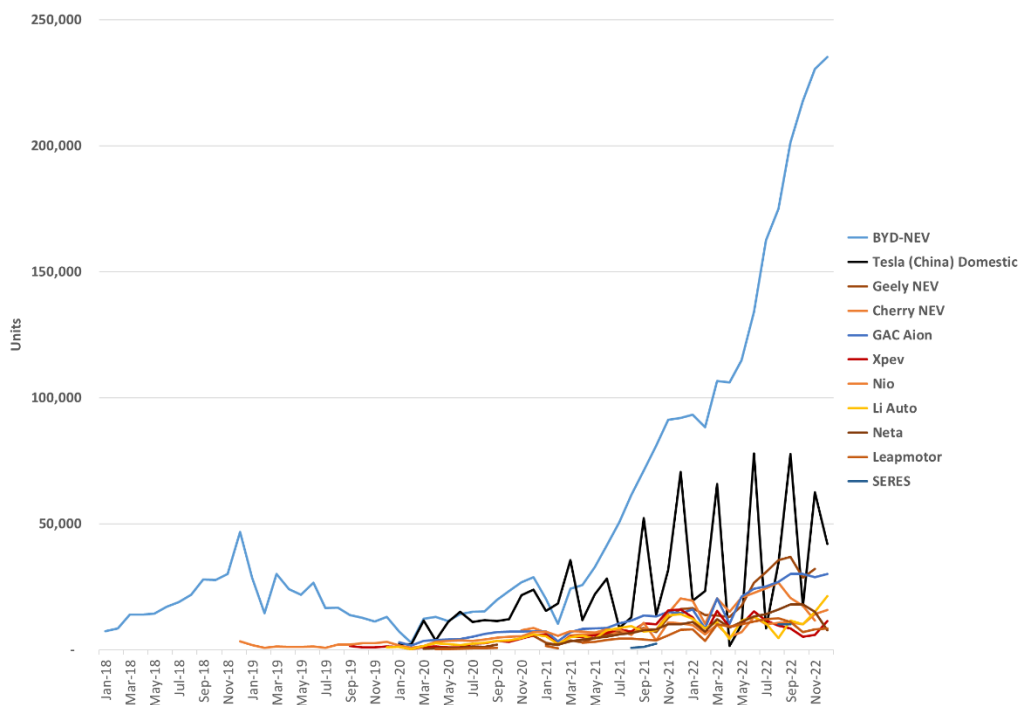


*Source: China Passenger Car Association, Wind, JK Capital*

According to retail volume data provided by the China Passenger Car Association (CPCA) for the first 11 months of 2022, BYD had a domestic market share of 31.3%, Tesla 7.9%, SAIC-GM-Wuling (the company that produces the famous Wuling miniEV) 8.0%, Geely

5.3%, GAC Aion (Guangzhou Auto) 4.8%, and Cherry 4.2%. The three pure EV players, also nicknamed the EV “new forces”, which have business models that resemble Tesla’s, i.e. Li Auto, Xpeng, and Nio each have around 2% domestic market share.

**Figure 2. China NEV monthly retail sales volume by brand**



Source: China Passenger Car Association, company filings, JKC Research

Note 1: Tesla’s monthly sales volume in China market is seasonally bumpy for the reason that the capacity of Tesla Shanghai’s gigafactory supports both China and global ex-US demand. Typically, for the first two months of any quarter, 60-70% of the cars produced in Tesla Shanghai gigafactory are exported. Only in the third month will more than 95% of the cars produced be used to fulfill China’s domestic orders.

Note 2: BYD stopped manufacturing combustion engine cars in March 2022 to focus exclusively on plug-in hybrid cars and pure electric cars (with a volume breakdown approximately half and half).

Retail sales of NEV have grown so much over the past three years that many may have forgotten how difficult the situation was for NEV players in China up until 2019. This is the year when Tesla's stock price fell to \$11.80 (adjusted for stock splits) while NIO, at that time the only publicly listed Chinese EV "new force", reached its record low stock price of \$1.19 as the company was running a real risk of going bankrupt. Xpeng and Li Auto, the other two famous Chinese EV "new forces", were desperately seeking funding in the primary market to survive.

A review of the Chinese government's policies towards NEVs over the years helps understand the legendary turnaround of 2020-2022 and the situation as it stands today. There were both smart moves and not-so-smart ones. But overall, the Chinese government could be seen as being among the most successful globally in promoting the transition from internal combustion engine vehicles to electric vehicles:

- April 2009 is when China launched its first NEV subsidy scheme. In the following years, most of the government NEV subsidies went to urban buses, taxis, and official cars. At that time the EV battery technology only allowed a maximum range of around 100km. As China did not have any first mover advantage in hybrid power technology, Chinese policymakers decided to focus their efforts on battery technology with the aim to develop a pure EV industry.
- In 2015 and 2016, a loophole in the government NEV subsidy policies was exploited by many car makers, especially those producing mid-sized electric buses. Total subsidies from both central government and local governments added up to RMB600,000, covering more than the production cost of mid-sized electric buses. Such loopholes allowed car makers to produce and sell low-quality buses while pocketing hefty government subsidies.
- This abuse of subsidies finally led Chinese policymakers to revise their NEV policies in 2017 and start focusing on advanced technology. It was announced that NEV subsidies provided by the Chinese government would be cut year after year, and finally terminated by 2020. Since then, the deadline had been extended to the end of 2022 to buffer the impact of the Covid pandemic. Large subsidies were provided instead to the battery supply chain operators.

- At the same time as the government cut EV subsidies for car purchasers, Chinese policymakers incentivised the domestic EV car industry by accelerating the localisation of entire EV supply chains through targeted subsidies. One key decision was to let Tesla build a gigafactory in Shanghai in January 2019. Since then, A-share listed suppliers of EV car makers saw their business grow exponentially, including battery makers such as CATL, now the largest EV battery maker in the world, specialized aluminum chassis makers such as Ningbo Tuopu or climate control management system makers such as Zhejiang Sanhua Intelligent Controls.

The mass production of Tesla Gigafactory in Shanghai brought in fresh air to hundreds of auto component suppliers in southeastern provinces of China and helped establish a holistic EV supply chain. Auto component makers saw larger revenues and better profits, which quickly incentivized the entire auto sector to grow its manufacturing capacity. Today the sector is enjoying a virtuous cycle of economies of scale and share gains from foreign competitors.

As domestic auto supply chain companies evolved from producing single components to supplying entire sets of hardware/software solutions, the cost of producing an electric car and the time it takes to develop a new one have been reduced significantly to a self-sustainable level that no longer justifies the disbursement of subsidies.

Even though purchasers of electric cars no longer benefit from direct subsidies from the government, the EV industry of China is now in the position to grow stronger without government intervention despite short term macro headwinds.

The self-sustainability of China's EV industry can best be demonstrated with BYD. The company that was known for making value-for-money electric cars enjoyed a huge success in 2021-2022 with its self-developed plug-in hybrid electric platform and pure battery platform that focused on the EV mass market (price point lower than RMB300,000). BYD is now venturing into the top end of the market with the launch of a new brand, *Yang Wang* (meaning "look up to" in Chinese), and a price point greater than RMB1mn. *Yang Wang* will launch two models - U8 which is an off-road SUV and U9 which is a high-performance supercar.

While there are many features about the two new luxury models, the most hardcore technology about U8 and U9 is the 4 wheel-drive (4WD) powertrain. Each wheel of U8

and U9 is to be controlled by a separate motor, giving the EV unprecedented traction, agility and safety. Although BYD is not the first to adopt this 4WD technology, it is likely to be the first time it is applied to an electric vehicle in mass production.

**Figure 3. U8, an off-road SUV under BYD's Yang Wang brand**



**Figure 4. U9, a high-performance supercar under BYD's Yang Wang brand**



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