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3 Drivers of China's Booming Electric Vehicle Market

by [Chengyi Lin](#) January 03, 2024



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Summary.

More than half of the electric vehicles (EVs) on roads worldwide are found in China. In 2022, new EV sales in China grew by 82%, and the country provided 35% of global EV exports. While the U.S., Norway, and other Scandinavian nations were early adopters of EVs, and Germany and Japan have long been automotive powerhouses, their EV markets have lagged in mass market adoption compared to China. How did China get to this point? What can companies looking to scale up their innovations learn from their approach? This article outlines three key reasons for the growth of China's EV sector: experimenting in adjacent industries, encouraging operational solutions, and doubling down on core technology.

When it comes to the electric vehicle (EV) market, China is leading the charge ahead of traditional automotive juggernauts like Germany and Japan. China's new EV sales increased by 82% in 2022, accounting for nearly 60% of global EV purchases. This greatly surpasses that of the U.S., Norway, and other Scandinavian nations that were early adopters of EVs.

According to a report by the International Energy Agency, more than half of the electric cars on roads worldwide are found in China. The country was also responsible for 35% of global EV exports in 2022. In fact, Chinese automaker BYD sold more electric vehicles than Tesla in Q4 2023.

How did China get to this point? What did Chinese car makers do differently, and what can companies looking to scale up their innovations learn from their approach? A sizable internal market and favorable government policies set the stage for this significant rise. However, other nations have implemented similar policies, yet haven't been as effective in accelerating mass market EV adoption.

This article outlines three key reasons for the growth of China's EV sector: experimenting in adjacent industries, encouraging operational solutions, and doubling down on core technology.

Experiment in Adjacent Industries

China began its EV drive later than the U.S. While both countries had similar policies to incentivize companies and consumers, Chinese companies did not play the game directly.

Tesla CEO Elon Musk leveraged the media to position the brand as a pioneer in EV, which helped them break into the California market and quickly draw a strong national and global following. Instead of taking a similar “big banner” approach, directly targeting the auto industry, Chinese automakers BYD and Geely remained under the radar and quietly experimented in their early stages. They kickstarted their EV development by focusing on adjacent industries — namely, electric buses and motorcycles. These products are less visible than cars, yet present unique challenges that are ripe for automakers to address. What they learned by tackling these challenges ultimately contributed to their EV manufacturing strategy.

For instance, buses are heavier and carry more passengers than commercial sedans. Additionally, most buses are operational for about 18 hours each day. They therefore have greater battery power and storage requirements. And more powerful batteries take longer to charge. By targeting an adjacent industry, BYD began pushing the boundaries of battery technology as early as 2009. BYD featured electric buses as its entry product into North American markets. It first sold electric buses as fleet vehicles in 2013, before supplying them to the Los Angeles Metro system in 2015. BYD electric buses are now also prevalent in South American markets.

Geely operates within another adjacent industry that presents different challenges: motorbikes, which require lighter and more portable batteries than cars. Experimenting in this area allowed the company to become a leading battery producer.

Taking an indirect path, these two Chinese companies have become EV giants by innovating on the two extremes of battery technology, which is core to EV production.

Encourage Operational Solutions

The second reason China’s EV market has soared is that early innovators recognized the operational challenges that EVs presented and worked collaboratively with local groups to find solutions. Government policy may aim to accelerate the adoption of new technologies like EVs, but such innovations often introduce operational hurdles.

For example, many European countries such as the Netherlands were quick to encourage EV adoption by implementing registration tax incentives and rebates. However, research found that interest in purchasing full EVs remained very low among taxi drivers. A possible explanation for this lack of uptake could be operational challenges of full EVs, including the short driving range and long charging time. These concerns have tended to overshadow the environmental benefits and other strengths of EVs, such as having a quieter engine and not requiring regular oil or battery changes.

How did China overcome these operational hurdles? In 2009, China’s government put in place a similar policy, to subsidize the purchase of hybrid and electric cars and buses in 10 cities. According to the policy, the per unit subsidies for passenger cars ranged from RMB4,000 (roughly \$500 in U.S. currency) to RMB60,000 (roughly \$8,000). But China went beyond subsidies.

In these 10 major cities, such as Beijing and Xi’an, Chinese EV producers worked closely with taxi companies to devise operational solutions that would improve core

battery technologies. For example, EV companies didn't merely map out the locations for charging stations; more importantly, they tested various scheduling options for battery charging that matched the current performance level of fully electric and hybrid vehicles.

EVs equipped with the best battery technology can run for up to eight hours in the inner city. In China, taxi companies operating electric or hybrid vehicles typically have two fleets of cars — one for morning and one for evening shifts. The morning shift ends around 6–7 p.m., after the workday but before the evening rush. This enables the morning fleet to be charged after 8 p.m., avoiding the window of heavy industrial power consumption. The evening fleet returns for charging around 2–3 a.m., which is also within the period of lower power consumption for a city's grid.

This new schedule, designed jointly by Chinese EV producers and taxi companies, not only addresses the battery constraints of EVs but also helps to flatten the consumption curve of a city's power grid.

Double Down on Core Technology

European and U.S. automakers have historically had a strong foothold on the core technology for combustion engines. The Chinese auto industry fell significantly behind both regions, as well as Japan, in this area. But in 2002, Chinese automakers estimated that battery costs would comprise between 30–40% of the total manufacturing cost of a fully electric vehicle. This meant that there was a window of opportunity for newcomers to leapfrog the competition by focusing on the technology that powers this central component.

Coincidentally, the Chinese EV industry enjoys a proximity to many critical raw material supplies. For example, in 2022 China accounted for 70% of global production of rare earth, a central component for battery production. This means that Chinese battery companies control the bottleneck position of the supply chain, which can provide both positional advantages for them to develop new battery technologies and negotiation power with suppliers beyond batteries.

Indeed, Chinese companies collaborated broadly — with other automakers as well as technology companies — to strengthen their capabilities in terms of EV manufacturing.

When BYD began its EV journey, it shifted from manufacturing mobile phone batteries (it supplied both Nokia and Motorola) to manufacturing automotive batteries through Yadi Electronics, now part of BYD. Via acquisition of Qinchuan Machinery Works, a small car manufacturing company, BYD set up a new automotive division in 2002 and began making cars. BYD then collaborated with Daimler and Toyota to gain knowledge of EV manufacturing in exchange for sharing its own knowledge of battery manufacturing technologies. BYD also now works closely with Foshan Plastics Group on optoelectronics, which is the building of electronic sensors that detect and control lights. In 2018, BYD partnered with Chinese technology giant Baidu to scale up the software capability and service capacity of its EVs for the mass market. The mutually beneficial agreement equipped BYD EVs with Baidu Map and intelligent-driving software, while enabling Baidu to join BYD's open-source platform D++ and gain hardware knowledge and access to data.

Similarly, Geely set up an ecosystem that encompassed everything from low-orbit satellites to smart hardware to collect and monitor data that could potentially improve EV battery performance. They also partnered with Baidu, which builds the cloud-based software that controls their vehicles, on a joint venture (Jidu Auto) that aims to

produce intelligent EVs. Geely then acquired Australian automatic transmission manufacturer Drivetrain Systems International, which supplies Ford, Maserati, and Chrysler, among others. They further acquired Volvo and Lotus, among other automakers, and have partnered with five more — including Daimler Smart — on other joint ventures.

Through these critical partnerships and acquisitions, Chinese automakers have charged up their development of peripheral components for EVs and accelerated their go-to-market speed. This organic and inorganic approach to ecosystem building allowed BYD and Geely to quickly and effectively orchestrate complementary assets around their core focus — battery technologies — which in turn helped them emerge as two leading EV manufacturers in China.

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Chinese companies have fueled the acceleration of their country's EV sector by creating innovative solutions to both technological and operational challenges around manufacturing and adoption. They have developed a deep understanding of what's required to move this industry forward.

At the same time, despite rising EV adoption, European automakers seem to have a hard time transitioning from internal combustion engine (ICE) cars to a more balanced portfolio of ICE, hybrid, and EV. A leading automotive executive attending one of my classes commented, "Our only job is to deliver our quarterly sales numbers [of traditional cars]. Someone else is dealing with innovation and mobility in the headquarters somewhere."

The next chapter for Chinese EV companies is international expansion. It will be interesting to see whether they succeed here. Having the core ingredients — strong battery technology, a firm hold over the battery supply chain, and operational advantages — is not enough to guarantee they remain a market leader in EV production.

Ultimate success lies beyond the product itself. Chinese EV companies need to repeat the same approach outlined above to learn about the global market — from channels to competition, from consumer behavior to infrastructure. For example, both the U.S. and Europe are tightening EV subsidies to benefit only local manufacturers. Can Chinese EV companies build local manufacturing or assembly plants, too? What benefits would that bring? Many European markets are still building charging infrastructures. Can Chinese EV companies effectively participate in this process? Tesla, for example, had to collaborate with local body shops in France for EV repairs. Can Chinese EV companies build post-sales service networks in the U.S. and European markets? Experimenting with more operational solutions will surely help China drive EV adoption even further, into the global markets.

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