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Battling Tesla with Battery-as-a-service

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NIO is selling its EVs without a battery to gain market share. But can it overcome the big boys in a cutthroat market?

In a January 2022 newsletter, auto-tech advisory firm ZoZoGo reported the following numbers for electric vehicles (EV) sales in China for 2021:

- BYD: 594,000
- Wuling Mini EV: 378,000
- Tesla: 240,000
- NIO: 91,430

While NIO's numbers are far below those of market leader BYD – in which Warren Buffett's Berkshire Hathaway has an eight percent stake – the smaller manufacturer has a potentially winning trick up its sleeve: Battery-as-a-service (BaaS)

BATTERY SWAPPING AND BAAS

Battery swapping in the EV industry is not a new concept. Tesla attempted it in 2013 by introducing a swapping station where consumers could drive in to get their batteries replaced. American consumers were not impressed, preferring home chargers and conveniently available public charging stations. Tesla dropped this approach eventually, as it did not make business sense to build stations when consumer demand was minimal.

Battery swapping had also been tested out in China before NIO adopted it, but to little success. Other than the US\$500,000 needed to build a single station, they were mostly found in big cities, and EV owners can only swap batteries at their own brand's station because swapping stations were not standardised.

In 2020, NIO started offering subscription plans for its battery services, which would allow consumers to buy its vehicles without the battery. The company realised that by removing the battery, it could reduce the purchase price of its vehicles by nearly US\$11,000, bringing it to a similar price bracket as fuel-run cars. Perhaps more importantly, it allowed the firm to enjoy the subsidies that had been extended by the Chinese authorities in April 2020 to EVs priced below US\$46,400 (CNY 300,000) if they supported battery swapping.

In the subscription plan, buyers would pay a monthly fee of US\$152 (CNY 980) to lease a battery and could use free charging and swapping services as part of the BaaS subscription.

Consumers can swap their batteries in three to five minutes, compared to a 45-minute recharge at a charging station. By July 2021, NIO had installed 301 battery-swapping stations across China, with plans to complete 3000 swapping stations globally by 2025.

IT'S ALL ABOUT THE BATTERY

Despite this, NIO faced a formidable competitor in the form of Tesla. Elon Musk's company operates four factories worldwide – including one in Shanghai – as of 2020, producing over 500,000 vehicles. NIO operated only one, churning out some 90,000 units.

Tesla's network of 6,000 supercharging stations in China, which each cost between US\$100,000 to US\$175,000 to build, made charging its vehicles a more accessible option than NIO's. However, analysts argue that these numbers were not enough for its customers, with owners in high density areas often dealing with long lines. The average 45-50 minutes' charging times only making matters worse.

While NIO's BaaS strategy is attracting media attention, the evolution of battery technology from lithium-ion ones to lithium-iron phosphate and other technologies could fundamentally change the game. Vehicle range could extend to 400 miles or more between charges, and enable batteries to last as long as a million miles.

NIO's battery swapping strategy of setting up battery swapping infrastructure and swapping stations was expensive, which needed to fulfil long-term needs of consumers to make business sense. With the battery technology advancing so quickly, swapping stations might not remain relevant over the long term. Amidst such strategic concerns, would it make more sense for NIO to halt its battery-swapping infrastructure and focus on the battery technology itself? What other strategies could NIO explore to compete with the EV giant Tesla?

This is an adapted version of the SMU Case, "[NIO: Battling Tesla with Battery as a Service](https://cmp.smu.edu.sg/case/5166)". To see the full case, please click on the following link: <https://cmp.smu.edu.sg/case/5166>" at the end of the article.

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