China's New Energy Vehicle

Understanding the Market, Policy & Consumers

by YALE ZHANG

2014 and 2015 were stunning years for the New Energy Vehicle (NEV) development in China. In 2014, China produced nearly 85,000 plug-in hybrids and EVs, which is 265% higher than in 2013. In 2015, the production volume hit 379,000 units, rocketing by 345%. In 2016, the volume grew further 35% up to 510,000 units.

China's global rank of the NEV market increased from number four in 2013 to number two in 2014, right after the US. One year later, China jumped to number one, far higher than the US market size of 123,000 units. In 2016, China's NEV volume has outpaced more than double of the rest of the whole world.

Notably, this type of growth, especially the leap forward in 2015 was not the result of natural market demand, instead, policy and subsidy played major roles in this hike.

In January 2017, the NEV sales decreased by 50% year-on-year, an alarming signal that NEV market may become shaky when subsidies begin fading.

The Policy Carrots

In China, NEVs are defined as plug-in hybrids and EVs (including battery EVs and fuel cell EVs), whereas full-hybrid cars, like the Toyota Prius, are not regarded as NEVs and therefore are not eligible for subsidy around the world.

The State Council released an Energy Conservation and New Energy Vehicles Plan on 18th April 2012, which stated the target for the number of electric and plug-in hybrid vehicles in operation should have reached 500,000 units by 2015, and by 2020 it should rise to five million units.

China's new energy vehicle development formally began in 2009, when China started the pilot project *Ten Cities, Thousand Vehicles*. That year, the central government first selected ten cities as pilot cities while in late 2010, the list was expanded to over 25 cities. By the end of 2012, the NEV volume was targeted at 30,000 units.

This three-year pilot project, which is called *Stage-1 NEV Demonstration* can hardly be defined as successful, since most of the cities were not interested in spending their local funds to subsidize NEVs made elsewhere. In a very difficult manner, the targeted 30,000 units was eventually met, mostly due to the push by the central government in the second half of 2012.

With this far-from-perfect experience, the central government did not immediately launch Stage-2 demo project until September 2013. From that time on, 88 cities were selected to purchase nearly 330,000 units by the end of 2015.

More than 50% of those 88 cities have issued local policies to subsidize individual consumers, mostly by matching the central government subsidy amount. Thus, EV subsidies reached nearly RMB110,000, and PHEV reached about RMB65,000.

On top of the direct subsidy, central government decided to waive the 10% vehicle purchase tax of NEV from September 2014 onwards. This makes total subsidy value almost 40-45% of most NEVs retail prices.

Additionally, large cities with license plate control policies, such as Beijing, Shanghai, Shenzhen and Hangzhou all give free license plates to NEVs, a value of about RMB50,000-90,000 respectively based on which city you live in. With this additional benefit, the total subsidy ratio would hit 60-65% of the NEV retail prices.

Although charging facilities are still far from being sufficient, the large subsidy amount, and more importantly, a free license plate, motivates individual consumers to purchase NEVs. Since 2014, the individual demand of PHEVs boomed, now accounting for nearly 75% of total PHEV sales, although individual demand of EV is much more moderate, accounting for less than 30% of EV sales.

Even with such high subsidies from the central government, similar to Stage-1, local cities are not keen in purchasing non-local NEVs using local city budget. Again, similar to Stage-1, the second half of 2015, local cities were reluctantly busy with reaching their assigned targets. The sales of Q42015 alone accounted for more than 50% of the targeted 379,000 units for that year.

The Problem with Policy Carrots

Although the US and Japan also subsidize NEVs, they control the ratio of subsidy against retail prices between 10% and 25%, while China's subsidy ratio of 40-65% is much higher, resulting in unreasonable NEVs retail pricing by some OEMs. In general, China's NEV retail prices are 30-50% higher than the NEV prices in the US or Japan market.

Due to the high subsidies in China, there was rampant subsidy fraud in coastal regions. The MIIT and Ministry of Finance jointly started investigations in early 2016, and already punished more than ten companies related to cheating. This explained why there were many rental companies emerging from nowhere in 2014 and 2015, purchasing large amount of EVs in 2015. These "rental companies" were often established by car makers, who first sold EVs to its own rental companies or a related third party, and after getting the subsidy, disassembled the EVs and took back the battery for the next round of "EV manufacturing."

With too many fraud cases, the government realized that they cannot make an industry grow into a mature business only through subsidizing, therefore the Chinese government is determined to phase out the subsidy by the end of 2020. With the 2016 subsidy amount as a base, the 2017 to 2018 subsidy will only be 80% of that in 2016, and the subsidy between 2019 and 2020 will only be 60% of that in 2016. In addition, the central government decided there will be no third stage pilot project.

Since current NEV sales are mostly achieved by policy stimulus, OEMs will have much bigger pressure to reduce their costs after the government's subsidy reduction. OEMs need to be on their own by end of 2020. Those who priced their EV too high will lose market share, while those who can reduce costs in the coming five years will quickly gain market share.

Unfortunately, most OEMs are not responding quick enough to lower their costs and prices, instead, it seems that they would rather peel as much as they can from the current NEV pricing strategy. For instance, BYD's Qin was RMB189,800 in 2014, but in 2016, BYD did not lower the Qin's price, instead, it increased the price to RMB209,800.

But why are OEMs not as enthusiastic as they act? The answer is simple: because the government gave out too many carrots, but no sticks. In other words, they gave them the incentive (carrot) but didn't enforce the restrictions by moving the incentives further forward (stick).

The Policy Stick

The main stick so far is fuel efficiency limits of passenger cars, or Chinese version Café. By the end of 2020, average fuel consumption of traditional car of an OEM will be 5L/100 km, while that of energy-saving vehicles should be 4.5L/100 km.

To hit this target, the industry needs to produce around 7% NEVs of total passenger cars produced in 2020, or around two million units of total 26 million car sales. With the current pricing structure and lower subsidies, it is less likely that consumers are willing to buy that many NEVs in 2020.

On 1st May 2013, China's government issued the *Passenger Vehicle OEM Average Fuel Consumption Accounting Method*. It defined the punishment of OEMs in case they fail to meet the standards. Thus, OEMs will be fined up to RMB12,000 for each vehicle they produce that does not meet the requirements. So, if a car maker produces one million vehicles, the fine will be around RMB ten billion. Obviously, this penalty seems to be too strict and unrealistic.

Since then, four updates and modifications have been imposed, including the introduction of a credits trading system into the auto industry and a gradual reduction of the punishment. Even now no one really knows how this policy should be enforced.

The whole industry believes that the government cannot punish every firm, since too many cannot meet the given standards.

For the time being, it seems like the stick is not big enough!

The Consumers

To better understand NEV consumers, KPMG China and AutoForesight have conducted a joint research concerning the needs of current and future Chinese NEV

owners and potential NEV buyers in Q4-2016.

Motivation and Rationality

70% of Chinese NEV owners and potential buyers have an average need for mobility of up to 40km/day. The share for weekends are a bit lower at 65%. Primary use of electric vehicles is for commuting to workplaces. The research found that for both groups, their perception on electric vehicles is that they – compared to Internal Combustion Engine (ICE) cars – are more economic and environmental friendly, followed by the fact that state subsidies are an important factor to buy/own an EV, especially in dense cities with license plate quotas.

The motivations for purchasing an electric vehicle are manifold. **While owners claim that they benefit the most from free car license plates paired with state subsidies,** the potential buyers believe that the lower maintenance costs, the environmental protection, followed by the free license plate aspect are the key drivers to purchase an EV.

However, classical concerns on NEV remain. Particularly the battery range and technology, the slow speed of battery charging, as well as the availability of charging pole infrastructure are seen as the main drawbacks of owning an electric vehicle. Currently, the majority of NEV owners are primarily charging their cars at home or at their work places (if charging infrastructure is provided). However, 45% of the current NEV owners are still willing to buy another NEV, demonstrating customers' belief in the future of NEV.

Both, Chinese NEV owners and potential owners have similar expectation concerning the drive range. Over 70% expect the range of an EV to be at 350 km, since that would sufficiently cover their mobility needs. Regarding the battery charging time, more than 53% of NEV owners would accept a charging time of up to four hours (potential owners 73%), while the majority of NEV owners (84%) expect a maximum fast charging time within one hour (potential owners 61%).

Brand Awareness and Preference

As the Chinese government is encouraging customers to buy locally produced NEV brands through tax incentives, subsidies, and free license plates, it is not a surprise that most sales come from domestically produced NEVs. According to a customer survey, Chinese brand awareness and preference are especially strong for BYD, Roewe and BAIC. Interestingly, the major foreign brand that features brand recognition (but only for potential customer) is Tesla, which is ranked right behind BYD and Roewe. Following the brand awareness, product quality and professional service are the other two reasons EV owners purchased their vehicles. Also for potential customers, the brand awareness is a key factor, followed by industry leadership in the NEV field and the maturity of their EVs technology.

Beyond EV

The Chinese society, especially their younger consumers, embrace new technologies that ease everyday life, e.g. mobile banking, social media, and e-commerce. Since convenience is a key factor, NEV owners and especially potential owners are evolving new expectations towards what an NEV should include in the future. Foremost, semi and/or fully autonomous features should be included in every NEV. From autopilot to parking assistant to other ADAS features, all are ranked high amongst both customer groups. 49% of NEV customers would expect NEVs to have autonomous driving Level 3 (eyes-off), 32% expect Level 2 (hands-off), while a robust 68% of potential customers expect both, Level 2 and 3 of autonomous driving included in their future NEV. Both groups agreed that Level 3 would highly improve the quality of mobility and thus improvements to life quality overall.

NEV owners and potential owners have quite a positive attitude towards the sharing economy when it comes to electric vehicles. Although 65% of all respondents would use a sharing service, most of them acknowledged that they would still want to own their own car.

The China Perspective

With the EV getting traction in the Chinese market and gaining more acceptance in the society as a real alternative to traditional ICE vehicles, Chinese consumers raise the bar of expectations on how EVs should fulfil their mobility needs. Of course, Chinese consumers realize that technology still needs a lot of improvements in order to provide safety and quality.

However, they have a very clear concept of how EVs should be for themselves, but also for society. In a nutshell, EVs should not only meet their mobility needs of commuting and reasonable charging speed, but should also be environmental friendly and revolutionize the way future mobility will shape the society and equip them with advanced technology (autonomous and sharing). Furthermore, it should bring new life style to its users.

Short Term Solution, Not a Long-term Strategy

Even though consumers are always practical and willing to pay a fair cost for new technology and environment protection purposes, yet they definitely will not purchase any costly NEV when there is no subsidy at all.

Besides, subsidies cannot become a car maker's excuse to keep the NEV product price at high level for too long. Relying on government subsidies and fleet purchases is only a short-term solution, not a long-term strategy.

The key here is, after giving out too many carrots, the government may shift to holding out a stick and force the OEMs to follow the market rules. Though no one knows how big this stick will be, it will still pressure OEMs to reduce their costs quicker. If electric vehicle prices can be reduced to 30-50% higher in comparison to a same sized traditional car, there is no need to worry about achieving the 7% target set for NEV sales by 2020. Otherwise, it will be difficult to even maintain 2016 volume by 2020.

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