

Tesla in the 2020s: Moment of Truth for the “Master Plan”

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The smooth lines of dozens of Tesla Model 3 electric cars filled the parking area outside Tesla’s factory in Fremont, California, where they waited to be delivered to customers. Tesla had just announced it had sold over 180,000 cars throughout the first quarter of 2021, a 109% increase over the same period in 2020.¹

Founded in 2003 and headed by Elon Musk, who was as admired as he was controversial, in less than 20 years Tesla had gone from selling just a few hundred electric cars—contracting out the majority of the manufacturing work—to selling over half a million in 2020,² and boasting manufacturing capacity on three continents. Tesla was now the undisputed leader of the electric vehicle (EV) market, surpassing automotive giants like Volkswagen, Ford, Toyota and Daimler. Moreover, in January 2021, Tesla achieved a market cap of \$800 billion, turning it into the most valuable automotive company in the world, even though its total sales were much lower than the competition.³ Was this investor confidence fully warranted?

Now, however, Tesla was facing a rocky road. Xiaomi, the Chinese consumer electronics giant, had just announced an investment of \$10 billion in developing low-cost electric cars, with the goal of launching its first model in 2023⁴. Xiaomi was joining a growing list of competitors: the big OEMs^a, which were trying to make up for lost ground with Musk’s company; tech companies like Apple and Google, which were trying to enter an automotive market that was becoming more and more digitalized; and new startups like Nio and Lucid, which were trying to follow Tesla’s road to success.

^a Original Equipment Manufacturer (OEM), was a manufacturer that sold automobiles under its own brand (i.e. Ford, Volkswagen, Toyota).

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Moreover, this competition threatened to aggravate existing supply issues. Key parts like batteries or semiconductors were increasingly becoming harder to procure, as manufacturers rushed to launch cars with better performance and advanced features. Tesla was also facing new technological challenges, like those derived from developing autonomous cars. There, Tesla's advantage was still unclear.

In 2006, Musk had published what he had called "the master plan" (revised in 2016), the business strategy that intended to make Tesla the leader in sustainable mobility and energy generation. Until now, Tesla had reached all the milestones. Would Tesla be able to bring the plan to fruition during the decade that had just started? Or was it necessary to revise the strategy?

The Automotive Industry

The Industry in the 2020s

In 2020, the automotive industry manufactured 77 million vehicles, a 15% drop versus 2019. This decrease was in large part caused by the Covid-19 pandemic, which had severely impacted both demand and manufacturing capacity. This impact, however, had been geographically uneven (see **Table 1**). Nonetheless, the automotive market had been stagnant during the previous years, even dropping slightly from its 2017 peak. That year, 97 million motor vehicles had been produced all over the world.

Table 1
Motor Vehicle Production (2019-2020)

Region	2020	2019
Europe	16,921,311	21,579,464
	-21.6%	
America	15,690,215	20,148,849
	-22.1%	
Asia-Pacific	44,289,900	49,333,841
	-10.2%	
Africa	720,156	1,113,651
	-35.3%	
Total	77,621,582	92,175,805
	-15.8%	

Source: Prepared by the authors based on OICA. "Overview | [Www.oica.net](https://www.oica.net/)." [Www.oica.net](https://www.oica.net/). Accessed May 28, 2021. <https://www.oica.net/production-statistics/>.

The crisis generated by the pandemic had hit an industry that had already been transformed in the aftermath of the Great Recession of 2008. Between 2007 and 2009, global automotive production fell about 15% and nearly 50% in the US market.⁵ This drop put several historic manufacturers (like the US "Big Three"—Ford, GM and Chrysler) on the verge of bankruptcy, forcing a concentration of the industry and a search for lower costs. For example, Fiat merged with Chrysler to create FCA in 2014, followed by a 50/50 merger with the French giant PSA in 2019 (completed at the beginning of 2021).⁶ Meanwhile, China became the world's largest automobile manufacturer in 2009,⁷ thanks to its low costs but also to a burgeoning internal market.



The Players

The main players of the automotive industry were the OEMs, which manufactured and sold motor vehicles under their own brands. In 2020, Japanese manufacturer Toyota became the world's top OEM per units sold, pushing German automaker Volkswagen to second place (see Exhibits 1, 2 and 3 for a list of the world's largest OEMs at the end of 2020.)

Automobile manufacturing was a complex activity, requiring large capital investments. Building a large modern automotive factory could cost around \$1-1.5 billion.⁸ With the passing of the years, automobiles had become more and more sophisticated, adding new features in safety (like ABS brakes and airbags), comfort (like onboard entertainment systems and ADAS), and performance (like electronic fuel injection systems). Thus, a modern automobile could be made up of 30,000 different parts,⁹ many of them highly sophisticated. Accordingly, in addition to capital, manufacturers required access to very specialized know-how, and substantial logistics and organizational capabilities. Efficient manufacturing methodologies such as Just-in-Time^b (JIT) required close coordination between all the participants in the production chain.

Historically, manufacturers had progressively contracted out the manufacturing of more parts of the automobile, creating complex supply chains. Generally, the OEM only retained the general design of the vehicle, its final assembly and the manufacturing of some key components like the engine. Meanwhile, the remaining parts were supplied by external manufacturers. Those could be either Tier 1, which provided finished parts to the OEM; Tier 2, which provided Tier 1s with parts and subassemblies; and Tier 3, which supplied processed raw materials. Automotive suppliers were not just expected to manufacture parts, but were also responsible for designing and servicing them. At the beginning of the 2020s, the growing demand for features tied to information technologies and the “connected car,” was adding pressure to both OEMs and suppliers to acquire new capabilities in this field.

Given the large capital investments required, scale was of utmost importance. For example, it was estimated that an automotive factory built in China (a low-cost country) had to produce 200,000 vehicles/year in order to be profitable.¹⁰ Thus, automobiles with short production runs were difficult to make profitable. Even luxury brands—which had larger margins—had often been acquired by large automotive groups. The 2008 recession had accelerated the globalization of the industry, searching for even larger economies of scale. Car models were now being designed around “platforms” manufactured at a global level, that were in turn customized to the tastes of each local market. This meant that supply lines had to have a global reach, and geographically limited players—either OEMs or suppliers—were in danger of being displaced by global players.

Concerning sales, automobiles had traditionally been sold through specialized dealers, which often had exclusive contracts with a single OEM. These dealers often also provided after-sales service, and other customer services such as facilitating loans to finance the purchase.

After-sales service and repair were performed either by the OEMs and their partners, or by third parties—the latter often at a lower cost. The maintenance and repair of motor vehicles usually carried higher margins than manufacturing, and the competition for that business could be very strong.

^b JIT was a manufacturing methodology developed by Toyota during the 1970s. It required that all products entering or leaving a factory made it “just in time”, that is, just as they were needed and only in the required quantities. This reduced costs, since it eliminated the need to maintain large inventories of both parts and finished products inside a factory.