

Electric vehicles: the race for the mass market

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The car industry is definitely turning to developing and marketing electric vehicles. Worldwide, the investment already announced is around \$90 billion, and it is forecast to continue growing. It is also expected that big car manufacturers will have dozens of new electric models on sale to the public in the next few years. At first glance, the enthusiasm created by zero emissions models contrasts sharply with a market share of barely 1%. However, the investment that is flowing in is in fact a reflection of what can be expected in the future.

A future marked by a pressing need to combat climate change. The transport sector is responsible for one-third of the carbon dioxide emissions into the atmosphere. Therefore, the world's leading economies are taking steps to promote the development and purchase of electric vehicles, preferably powered by clean energy. The measures include tax incentives, stricter fuel consumption standards, subsidies for research and development, investment in charging infrastructure, and clear goals for totally or partially replacing sales of petrol and diesel cars, among others.

Among the countries that have taken transport electrification most seriously is China, currently the biggest market for electric cars. Recently, the Chinese government proposed to encourage the mass adoption of these vehicles through tax incentives, on the demand side, and production quotas, on the supply side. The aim is to introduce around 7 million units by 2025, seven times more than the number currently on the roads around the world. China would then become the major power in the development and marketing of zero emissions vehicles. It is therefore not surprising that in recent years the big car companies have been seeking to position their versions of electric vehicles in China and to create strategic alliances with local companies.

Another key factor in the trend towards transport electrification is technology. The many years and resources invested in research and development have resulted in a drop in the cost of lithium ion batteries, from \$800/kWh in 2010 to \$300/kWh in 2016, which currently makes up about 40% of the retail price, before taxes. The experts agree that the cost of these batteries could fall to below \$100/kWh by the beginning of the next decade, which would boost unit sales overall.

Some of the most recent models have an autonomy of 320 km per charge, enough to increase consumer confidence in this technology. In addition, charging times have now been reduced and the number of stations, both public and private, has expanded. As batteries and charging stations cease to be a problem, consumers will be better able to evaluate other features of electric models, such as the fact that they have fewer components, which leads to lower maintenance costs, and the fact that they can run for 5 to 10 times more kilometres than an internal combustion engine.

Due to their low cost of maintenance and high durability, electric vehicles are vital for the development of shared mobility and mobility as a service. At the same time, the electrification of transport will grow with the appearance of self-driving vehicles. Although their generalised use will take a number of decades, due to their technical complexity and legal implications, it is very probable that the new robot vehicles will be

electric.

Lastly, the major challenge for car companies in the short term is to mass-produce electric vehicles profitably. This challenge will require a considerable amount of innovation, not only in the area of batteries but also in other key aspects, such as design, the procurement of consumables and assembly processes. Since electrifying the vehicle fleet will not happen overnight, car companies will have to produce petrol, diesel, hybrid and electric vehicles in combination, and efficiently, in the coming years.

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