



ELECTRIC VEHICLES: PAST, PRESENT, AND FUTURE

In the 1890s, William Morrison, a Des Moines, Iowa-based scientist, was the first to describe an electric automobile. Although this dates back more than a century, his invention has just recently begun to flourish, and the world is on the verge of a radical transformation. The transition to the future of mobility is being sped up by governments, companies, and customers alike, and electric vehicles (EVs) are at the center of it all.

In this article, we investigate the development of electric vehicles, as well as their recent surge in popularity, and the possible directions their future may take.

THE EMERGENCE OF ELECTRIC VEHICLES

There has been an exponential increase in globalized environmental consciousness in the preceding decades. With the evident repercussions of global warming on the planet, individuals are considering how to minimize or reduce their environmental impact. Zero carbon emissions are becoming one of the most important goals for organizations, which can only be achieved through innovative energy solutions. Electric vehicles are increasingly recognized as one of the best ways to help reach this goal.

For many, the introduction of the Toyota Prius and consumer acceptance of the vehicle represented the turning point. Released in Japan in 1997, it became the first mass-produced hybrid electric vehicle. In the last decade, the Prius has become the best-selling vehicle in its category globally due to increased fuel costs and mounting concerns about carbon emissions.

In 2006, a small Silicon Valley startup founded by Martin Eberhard, Marc Tarpennig, and Elon Musk called Tesla Motors began producing luxury electric sports cars. This was the catalyst for the industry's resurgent interest in electric vehicles, particularly among American consumers. Tesla experienced a tremendous rise in popularity, with almost [1 million vehicles](#) sold last year globally, and became a highly sought-after company.

Indeed, despite the Covid-19-induced economic collapse, EV sales and market penetration increased

in key markets in the closing stages of 2020. Similarly, because of stricter emissions standards and generous consumer subsidies, [EV adoption in Europe rose to 8%](#).

WHAT'S COMING UP FOR THE INDUSTRY

Recent environmental discussions have almost entirely centered around the termination of sales of internal combustion engine (ICE) vehicles. New regulatory targets in the European Union and the United States now aim to achieve at least a 50% EV share by 2030. Several other nations have declared accelerated timeframes for ICE sales bans and several original equipment manufacturers (OEMs) have expressed their intent to stop investing in new ICE platforms and models. In contrast, many others have already established a timetable for the end of ICE vehicle production. Manufacturers, such as Audi, have announced plans to transition their entire automotive production to electric vehicles over the next decade.

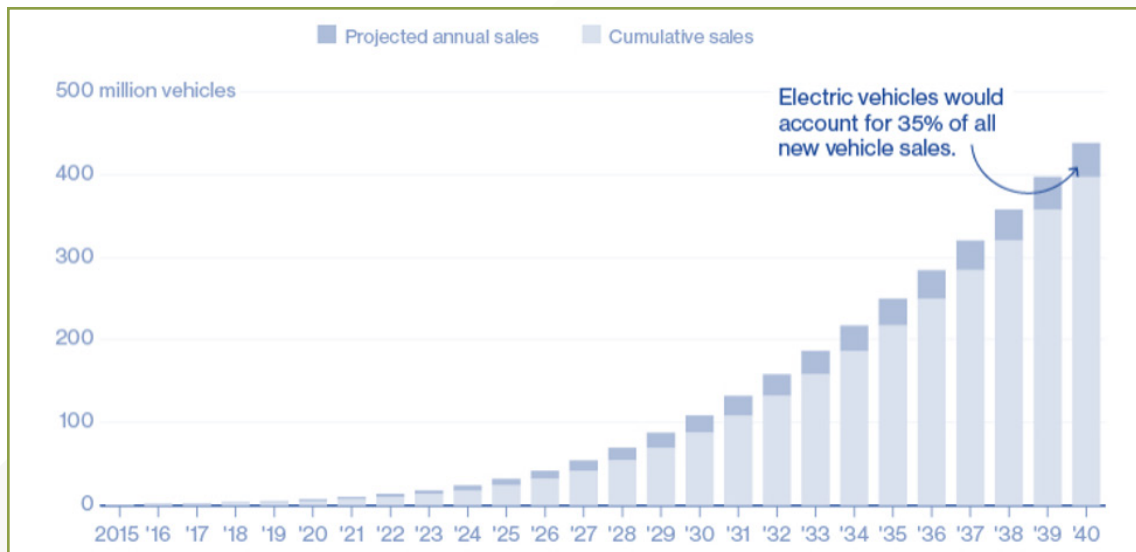


Figure 1: The rise of EVs, is predicted to account for 35% of all new vehicle sales by 2040.

Source: Bloomberg, New Energy Finance, Marklines

According to a [recent study](#) by the International Council on Clean Transportation (ICCT), converting to fuel cell electric cars will lower total lifecycle CO₂ emissions by around 65% based on the present average energy mix in Europe and by 83% with all-green power.

Interestingly, materials and manufacturing will become the main sources of emissions in an EV's life cycle once the energy supply changes and green power charging of a bigger fleet of EVs becomes feasible. Currently, manufacturing an EV emits over 80% more emissions than that of an ICE vehicle, mainly because of the battery and the larger concentration of aluminum in the automobile.

Despite where the automotive industry is definitely headed, consumers continue to express some skepticism due to early obstacles, such as where to charge electric vehicles while traveling. In response, some manufacturers and private companies have installed their own charging stations in strategic U.S. locations, but capacity and accessibility remain limited. In this framework, the Biden-Harris Administration proposed the [National Electric Vehicle Charging Network New Standards](#).

The Biden Administration has set a goal of making the United States a global leader in electric cars and achieving

zero emissions by 2050. It announced additional measures on June 9, 2022, to meet President Biden's objective of creating the first-ever countrywide network of 500,000 electric car chargers along U.S. roadways and in towns.

Together with the U.S. Department of Energy, the U.S. Department of Transportation has proposed new guidelines to make EV charging easy, dependable, and inexpensive for all Americans, including on long travels. The new standards will guarantee that everyone will be able to access the network – improving reliability, ensuring compatibility, and standardizing payment methods.

THE BOTTOM LINE

The shift of the automobile industry toward electrification will disrupt the entire supply chain and significantly alter the size of the market for automotive components. By 2030, electrification-critical components, such as batteries and electric motors, will account for approximately 52% of the market size. Such a radical change will require conventional component players to adapt swiftly to compensate for dwindling income sources.

In a nutshell, although there is still more to be done, electric vehicles are on the horizon, and we are making progress toward the goal of reducing carbon emissions from the transportation sector. This transition in the industry is occurring at a rapid pace, cutting across industry lines and bringing together participants in the energy, infrastructure, mobility, and automotive industries. Even though there are significant obstacles, there is potential for existing and new businesses to play a leadership role in the creation of new industries that generate billions of dollars per year and create thousands of new jobs.

The most significant challenge in the years to come will require the reconciliation of environmental responsibility with commercial viability through the development of forward-thinking technology and an appropriately directed transformation of mobility.



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