

## **Ahead of Time: Tracing the History of Electric Vehicles**

*By Vandana Nair and Ankith Hebbar*

With vehicle electrification picking up pace, the winds of change are sweeping the automotive industry. Electric vehicles (EVs) have become the buzzword in the climate space today, playing an important role in emission reduction and in achieving net-zero targets worldwide. Although EVs may seem to be a new-age technology, they indeed have a long-standing history. Here, we take a closer look at the historical twists and turns that shaped the electric mobility sector.

### ***The beginning (1800s–early 1900s)***

The era of EVs dawned in 1838, when Robert Anderson in Scotland built an electric carriage. Other inventors like Thomas Davenport and Andreas Floken may have also contributed to this technology. France and England were the first to use electric propulsion in the late 1800s, which competed with steam- and petrol-powered vehicles in the 1900s.

### ***The rise and fall (1920s–1960s)***

EVs had an edge over fossil-fuel vehicles owing to a lack of vibrations, noise, or starting problems. With the nascent road network that existed back then, EVs were suitable to cover low travel distance and thus became popular, making up a third of all vehicles plying in the US by 1900. EV production peaked in 1912. However, its growth faced an unexpected setback in the 1920s, as the road network connecting cities in the US expanded and increased travel distances. Further along, internal combustion engine (ICE) vehicles started gaining popularity with the discovery of crude oil in Texas and the electric starter and Henry Ford's innovation in the mass industrial production of automobiles that made ICE vehicles cheaper than EVs. Eventually, EVs began to lose their appeal and gradually disappeared from the streets by 1935, with no production until the 1960s.

### ***The greener era (1960s–2000s)***

As the clouds of oil dependence and vehicular emissions loomed over most nations, alternate fuel vehicles gained renewed interest. Several segments in the automotive sector undertook initiatives to convert existing vehicles to electric and build new ones. Some [prominent examples](#) include Battronic Truck Corporation and Sebring Vanguard that produced commercial electric trucks, buses, and cars and US Electricar and Solectria Corporation that converted existing vehicles to electric ones.

EVs, built from scratch or converted from existing vehicles in the 1960s–1990s, employed lead acid batteries and DC series motors. At the turn of the century, the market gave way to models having nickel metal hydride, sodium sulphur batteries, and lithium-ion batteries owing to better battery capacities and performance. A few models built in the late 1990s and early 2000s used brushless DC motors (BLDC) and permanent magnet synchronous motors (PMSM). EVs built using these battery and motor technologies continue to rule the roost in today's market.

In the days to come, heavy-duty segments such as trucks, buses, construction vehicles, and aviation are also expected to be electrified at a large scale. The scientific community across the globe is pouring in relentless and untiring efforts for the development of battery technologies

such as metal-air, sodium-ion, and solid-state batteries as well as and charging technologies like wireless and inductive charging. EV models with novel motor technologies such as axial flux, reluctance, and in-wheel motors are likely to proliferate in the near future. The government, academia, and industry should work hand in glove with each other for vehicle electrification to pick up pace and drive the world towards a greener and sustainable tomorrow.

*The authors work in the area of Green Mobility at the Center for Study of Science, Technology and Policy (CSTEP), a Bengaluru-based think tank.*