

Electric Vehicles: A deep dive in the technology that is the future of the Auto industry

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Abstracts

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SUMMARY

Almost conclusively now, electric vehicles appear to have won the power train argument in the automotive industry and car manufacturers from all over the world have made significant promises to deliver only hybrid and electric vehicles in the future.

From automotive shows to the world's cities, new models and ideas are being tested and the general public whilst being broadly reticent at first, is now beginning to accept the idea of battery powered chargeable vehicles. Whilst the industry waits for consumer adoption levels to really boom, manufacturers are gearing up for a serious fight to establish a position in what will undoubtedly become the main automotive market.

The leaders of a few years ago now have significant new challengers and are having to fight harder for sales than ever before. Huge new challenges are becoming obvious as the world tries to establish exactly how it will power and build all these new vehicles. There is a new heavy demand for the rare earth materials that electric vehicles need and some concerns about the environmental implications of replacing the global fleet with this technology.

One country that is not being overly cautious about this change is China and it has ploughed ahead to the point where its manufacturers are now dominant in the electric vehicle industry. Within the next decade a point will arrive where electric vehicles will outsell traditional combustion engine vehicles, but in order for that to happen and it not be a charging and technical disaster many things must change.

KEY HIGHLIGHTS

In the global EV market there have been some companies that have jumped on EV technology and run with it from an early stage and companies like Nissan and Tesla have capitalized on being bold and first to market.

However in early 2018 the market is proving to be much more fluid than ever before and as new models come to market and more big automotive players start to get serious with their EV products, it is changing the leaderboard from month to month.

A number of factors are starting to come together which should eventually propel EV sales so that they stop being niche and start becoming ubiquitous, but the market is not quite there yet.

However, when it comes, players will have to be ready with compelling products or they risk trying to survive on dwindling internal combustion engine vehicle sales alone whilst their customers are taxed heavily for buying them.

Despite the very ambitious targets that have been set by governments and automotive manufacturers all over the world, how to transition the global fleet onto electric vehicles is still very far from being clear.

There is a wide array of charging technologies and solutions range from service station fast chargers to on road chargers. However, as yet, there are very few countries even close to a complete solution on the scale that will allow the global fleet to be transferred over.

A number of innovative startup companies are working on solutions to the problem but this could be a very limiting factor on the progress of the industry and big money is needed to role out charging infrastructure that will cover entire countries, both in terms of the places to charge and the power distribution networks.

Much of the attention placed upon the development of EVs has been focused upon the fast-charging, full-electric-vehicle (FEV), but that concept remains in the future and

requires several major technical breakthroughs before a cheap, reliable and almost instantly chargeable electric vehicle emerges from a major manufacturer.

Hybrid cars have been in development for some time; being ahead in the development race means hybrid technology represents the immediate future of EV technology.

Attracting large research and development budgets, hybrid cars are increasingly becoming mainstream and offer solutions to the problems currently afflicting FEVs.

SCOPE

Examine who the main players are in the EV industry and who are the emerging new players

Look at the challenges faced by the industry and how likely these are to be overcome

See the countries that are really pushing ahead with the technology and why

Analyze the future of the industry, who the winners and losers are and what the competition looks like

REASONS TO BUY

What are the most important EV models on sale?

What companies are going to become dominant?

Why are hybrids so important in EV tech?

What does the future of the industry look like?

What do governments need to do to encourage growth?

How far away are we from the expected EV boom?

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Executive Summary

Electric vehicles: Market leaders will constantly change

Electric vehicles: Infrastructure is one of the biggest problems to solve

Hybrid cars represent immediate future of electric vehicles

Among enthusiasm for electric vehicles lurks threats to future development

China due to cement dominant position in EV global market

Electric vehicles: the market leaders will constantly change

EV sales have been growing well but will soon explode

The leaders have typically taken big risks to get where they are

The position of the previous market leaders is looking increasingly precarious

Nissan's Leaf perhaps wasn't as desirable as it was hoped

Tesla is suffering under the burden of mass manufacturing

Tesla is being challenged by new and powerful market entrants

The scariest new entrants of all will be from China

Electric vehicles: Infrastructure is one of the biggest problems to solve

Implementing a global infrastructure is going to be very difficult

Infrastructure is going to be a huge problem in the UK

Each country's charging needs are different and there is no one solution

Ubitricity's lamp post charging idea might really help in dense European cities

Battery Swapping is a technology that has been explored but recently fallen away

Petrol service stations have been identified as a key way that EV fleets could be charged

Inductive road charging is likely an extremely expensive option

Smart Grids will need to be implemented quickly and on a huge scale

Hybrid cars represent immediate future of electric vehicles

Hybrid vehicle technology development is beating development in both petrol and electric

Plug-in hybrid technology is middle ground in race to mass production electric vehicles

Advances in hybrid powertrains contrast electric vehicles in state of readiness

Hybrid energy well placed to take advantage of industry need to reduce fuel costs
threats to future development could harm EV enthusiasm

Dependence on China for rare earth elements is causing leading companies to search for alternatives

Environmental impact of electric vehicles is still substantial - improvements need to be made

Internal combustion development is not dead and could yet be around for decades to come

Failure to create a coherent used electric car market is holding back widespread take-up

China due to cement dominant position in EV global market

Chinese market is dominant and is expected to become bigger

Chinese government rules are propelling domestic development but are not without problems

Changing rules on foreign involvement will help China develop new generation of electric vehicles

Race for raw materials is led by China, granting a substantial global competitive advantage

Helped by leading status in EVs, China could become leading car exporter

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