

Electric Vehicles: Threats to future development could harm EV enthusiasm

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Abstracts

Electric Vehicles: Threats to future development could harm EV enthusiasm

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

A fundamental problem with the promised future of electric vehicles replacing the century old internal combustion engine is much of the current technology relies upon the amazing properties yielded by rare earth elements. Dysprosium and neodymium have become vital to the manufacture of electric motors - both elements are required for the manufacture of high performing magnets. Environmental concerns about highly damaging mining techniques used to extract such elements from rock aside; China operates what has been termed 'soft monopoly' on the sale of rare earth elements. Most of the global output comes from China, creating a dangerously high dependence upon a solitary source. History has already revealed Beijing to be willing to stockpile and control outflows.

Electric vehicles have been able to cultivate an image of environmental sustainability due to the absence of pollutants being pumped into the atmosphere every time a vehicle is in use. Yet even in the relatively recent past critics were able to point out a number of problems with the environmentally friendly image the likes of the Toyota Prius were predicated on. Not only were many zero-emissions cars considerably more expensive than ICE counterparts, but usability restricted the purposes for which such vehicles could be used for. In 2007 Chris Domorro reported in The Recorder Online that the Prius was the source of some of the worst industrial pollution in North America and required more energy to make than a Hummer. Over the course of the lifetime of the car (from manufacture to end-of-use) the Prius was said to be more polluting than a Land Rover Discovery.

A leading selling point of electric vehicles is that they are colossally more energy efficient than vehicles powered by internal combustion engines. Expectations are that once the cost of buying and running an EV falls to the approximate level of conventional cars, sales will rise accordingly. But that belief rests upon the assumption that improvements in use of petrol in ICE cars will only marginally improve. Views describing the death of ICE vehicles vary radically. Toyota has publicly stated internal combustion will only exist as part of a hybrid system in a small number of vehicles; John Heywood, a professor of mechanical engineering at the Massachusetts Institute of Technology, predicts that in 2050, 60% of light-duty vehicles will still have combustion engines. Pure electric vehicles, he estimates, will only comprise 15% of new sales by the same point.

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?

Contents

Overview

Catalyst

Summary

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

Conclusions

EV technology is not without supply and environmental problems

Appendix

Further Reading

Ask the analyst

About MarketLine

Disclaimer

List Of Tables

LIST OF TABLES

Table 1: Total global sales of electric vehicles 2009 to 2016

List Of Figures

LIST OF FIGURES

Figure 1: Global precious metal production 2010 to 2016 (tons)

Figure 2: Toyota Prius

Figure 3: Mazda Skyactiv X engine simulation

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