



Entrepreneurship & Climate Change: Electric Vehicles Case Study

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Introduction

Car design, ownership and usage are major determinants of the degree of carbon emissions produced from personal transport. We assess factors influencing environmental innovation in the automotive sector and behavioral changes of transport consumers in response to climate change and related policies. We argue that the limited progress towards low-carbon transport suggests a need for more interdisciplinary analyses of mobility and greater attention to psychological, cultural and infrastructural factors affecting demand. Some of the reasons for slow adoption for electric cars are range anxiety, lack of charging infrastructure and high cost of cars. On the other hand, rising fuel prices have pushed buyers to think of more affordable vehicle options.

How entrepreneurial innovations shaped the vehicle market, focus on the electric vehicle market



In our days vehicle market and hybrid electric vehicle market, globally, have shown a startling increase compared to past decade. Recent surveys show that in Europe that the rate of produced and sold electric vehicles has increased by 65% in China, by 155% in Europe and accordingly by 96% in USA. It is evident that companies, acknowledging the growing demand for electric

vehicles, have shifted their R & D departments and their production's functions into relative innovations. Of course, the majority of the governments have made public pledges for reducing emissions, forced, in a way, entrepreneurialism to invest in constant innovations, contributing to environmental protection and for infrastructures.

This urge does not only monopolize the electric car industry but also advance for the sustainable transportation, which also is fundamentally responsible for the pollution of the environment. On the other hand, identifying entrepreneurial profile, during time, it has clearly proven that invention and innovation are strategic priorities leading to economic changes and vice versa. Strong brand names have thrived only because they had predicted the new era and had presented agility to follow the new trends or even create them. Thus, businesses having as major target their sustainability and improving their financial status and profitability are considered as leaders to any innovation.

Consequently, entrepreneurial innovations and vehicle market are strictly related as both of them erase and prescribe the today and the tomorrow. Electric vehicles are part of environmental protection nevertheless, they could only be produced by the capitals of the market which are

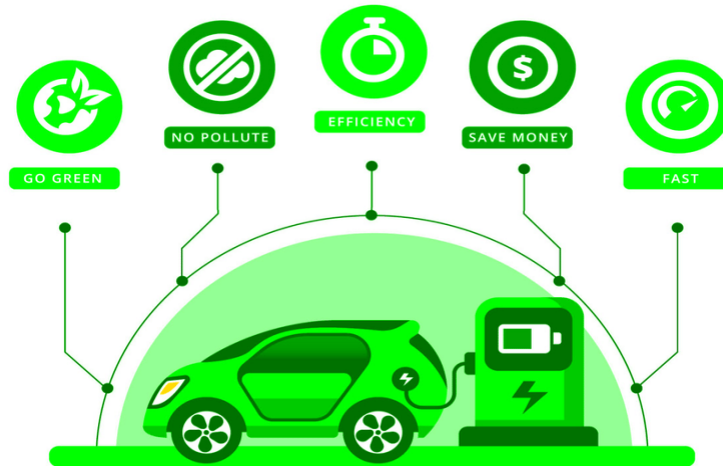
products of sub environments; and the environment is affected of factors which are beyond the control of the business (STEP) social, technological, economical, legal and political. And this is a never end process which demands constant improvements.

Disadvantages of electric cars

It is an undeniable fact that throughout the years governments and the world as a whole have been trying to work towards reducing environmental pollution by implementing a variety of methods, one being using electric cars. Although electric cars provide plenty positive effects towards reducing pollution there are some concerns regarding their adaptation.

To begin with one of the biggest deterrents of worldwide adaptation is the pricing. Electric cars compared to petrol powered cars are way too expensive and harder to get for the average person. Furthermore, one of the biggest issues regarding the production of the car is its battery, millions of electric car batteries will retire on the next decade. These batteries require large amounts of raw materials, including lithium, nickel and cobalt – mining for which has climate, environmental and human rights impacts – they also threaten to leave a mountain of electronic waste as they reach the end of their lives. Although there are talks about implementing recycling and giving these batteries a second life, there is nothing to show for yet making this a timebomb.

Another point worth mentioning is the lack of charging infrastructure. EVs can go around 400 km on single charge and, therefore, a charging station is required at regular intervals. Lastly the maintenance cost of an electric car is lesser than that of a conventional vehicle. However, spare parts are hard to find making the delivery and production of electric cars slower and can cost the owner dearly. Taking into consideration all the above electric cars need to address a variety of problems before they can be adopted on a global scale and yield the best returns regarding their environmental footprint and value they provide to the owner.



Advantages of electric cars

During the last few years electric cars have become quite mainstream. They have several advantages compared to conventional vehicles. Internal combustion engines need fossil fuels to run which are quite costly in comparison to electric cars which require less money. Moreover, driver is searching for a low-maintenance option, an electric car is a great option. First, charging an electric vehicle requires around 40% less electric energy, therefore it is less expensive than the cost of a similar sized vehicle using petrol. Therefore, a vehicle powered by electricity is much more cost effective and energy efficient than internal combustion engines. Furthermore, electric vehicles are comprised of less mechanical parts, so they are cheaper to maintain in comparison to internal combustion engines. The main part of an electric vehicle is its battery and its sassy. Moreover, electric cars are often more spacious since they do not have an engine compartment in the front.

It is evident, that electric vehicles are less harmful to the environment than conventional vehicles since they produce zero emissions. Zero emissions can be achieved by powering an electric vehicle via solar panels which are solely powered via solar energy. As previously mentioned, electric cars produce zero emissions by exhaust, since they do not have one.

Therefore, it is evident that if more and more people start using electric vehicles positive externalities will be created. Positive externalities: better air quality which results in less carbon dioxide related health problems, such as lung cancer. Alternatively, another benefit of electric vehicles powered by electricity, is that they produce zero sound caused by exhaust, therefore less noise pollution. Furthermore, it is evident that non-hybrid electric vehicles are more friendly to the environment than conventional vehicles, according to the Environmental Protection Agency (EPA), because they “emit zero tons of CO₂ and other greenhouse gases”.

Another crucial factor is vehicle performance. Electric cars do not have a gear shift, so it is much easier to accelerate than internal combustion cars and the reason for that is that they only have one shift, and this is called “drive”. For example, the model S Plaid by Tesla is the faster accelerating commercial car ever produced doing a 0-60mph in 2.3 seconds. As time goes by, a great deal of people is bending towards electric vehicles which results in a greater charging network. “There exist 20,000 charging locations in the UK offering over 32,000 individual charging points and these numbers are growing at an ever-increasing rate”.

Another very important factor are government subsidies. The government wants to achieve zero net emissions at city centers, so they subsidize new electrical vehicles which aid both the consumer and the society simultaneously, by giving grants to citizens to buy electric vehicles.



Compare and contrast electric vs gas powered cars in every sector, safety, range, acceleration, quality

As we have explained above, electric and petrol cars look alike from the outside. The major difference, is that EV are powered by electricity and gasoline cars use gasoline to fuel the car. Nevertheless, other differences exist in terms of safety, range, acceleration and quality

To begin with, the silence engine does not mean that EV's lack speed and performance. Compared to gas cars, EVs accelerate faster because they can provide a full force to drive the vehicle forward(torque), as a result of having instant acceleration. However, EVs run on a single-speed gear, which offers a lower top speed than multi-gear gas-powered cars.

The range of EV is indeed a concern for potential buyers, as they fear that they will not be able to reach the limits of gas-powered cars. Nevertheless, all new EVs models already match the average performance of gasoline car Therefore, while the average petrol cars can reach an average of 480 km, most electric models have a sufficient range of 250-450 km on a single charge.

In addition, safety is an important issue which should be mentioned in order to understand the difference between these two types of cars. Lithium-ion batteries if damaged, can result in fires, but have much less risk of explosion compared to petrol ones. That is why, electric vehicle batteries are

surrounded by a protective cooling shell, which is filled with a coolant liquid and there is a network, which limit any possible damage of malfunction.

The last area that someone might spot a difference is if electric vehicles are actually better for the environment. Although the lithium battery manufacturing process generates harmful emissions, it has been shown that EVs produce lower emissions than over gas-powered vehicles. Moreover, clearly because are powered by energy, driving them is more environmentally friendly than using gas cars.

Future research suggestions & Limitations

FUTURE OF ELECTRIC VEHICLE



The electric vehicles should establish in our mindset as the new era but the initiative as process should mandate for every country whose valuable purpose is to promote and accelerate Inclusive and Sustainable Industrial

Development in developing countries and economies in transition by contributing to poverty reduction, economic, growth, and sustainable development.

Suggestions

Entrepreneurial innovations should be launched, in order to produce solutions on how to disassemble dead batteries

- R & D should discover resolutions on how to extract valuable metals at scale
- R & D should invent ways of transforming those batteries that are no longer able to run electric vehicles into storing power, generated by solar or windfarms. This initiative could displace toxic lead-acid batteries
- The legislation of any country should be mandate, regulating sweeping changes to both private and public sector. In addition, the legislation should provide remarkable grants to those who are compliant and accordingly huge penalties to those who break the laws.
- Circular economy principles should be part of all levels of trainings, for children and adults
- Every country should be able to reduce their total waste

Limitations

- The extra weight of the batteries produces more particle pollution compared to petrol or diesel vehicles
- Most studies focus on average driving and average electricity generation which is ideal for urban driving, due to traffic limitations, however there are no specifications or metrics for higher speeds.
- This global shift in electric vehicles won't reduce the global phenomenon of heating which supercharges extreme weather conditions
- It is not yet designed and studied the retirement of millions of electric car batteries, which are a potential time bomb.
- The few countries, along with the private sector, have installed well-functioning recycling industries neither they have consolidated and scaled up their circular economy activities.

Conclusion

To conclude, it is aimed to understand how a set of conditions proven to be generally conducive for entrepreneurial success in climate change adaptation are shaped over time through the interactions of public and private actors. Projects will be well advised to deliberately take the time to reflect on the diverging and converging framing attempts of their network players. Planning and implementation of regional climate change adaptation requires new, integrated governance arrangements that often involve public and private actors. Although entrepreneurship is widely considered an important part of such arrangements, little is known about the conditions that enable it, and its actual role is under-researched.

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