

THE INFLUENCING FACTORS THAT ENHANCE THE INTENTION OF USE OF  
ELECTRIC CARS IN MALAYSIA

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This report submitted in partial fulfilment of the requirement for the Bachelor Degree in  
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## DECLARATION

“I hereby declared that this report entitles  
*The Influencing Factors that Enhance the Intention of Use of Electric Cars in Malaysia*  
is mine except for the quotations summaries that have been duly acknowledged”

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## **DEDICATION**

*Special dedication of this grateful moment to my..*

***Beloved Parents***

***Loving Family Members***

*That always loves me,*

***My friends, my colleagues***

***And all faculty members***

*For all your care, support and believe in me.*

*Thank you.*

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## ABSTRACT

Nowadays, Nowadays there are millions of cars on the road in the world today and this prove that the success of automobile industry becoming more widespread and earn a spot in the worldwide market penetration. For challenging world today, automobile industry has to move towards the high technology and keep moving in the commercialization of their industry and make their product most success from the other competitors. Through the appearance of new technology related to the automobile, automobile industry especially the industry that manufacture the electric cars might no longer really rely through the traditional way of performing their technology in order to dominate and survive as well as grow. In this case study, the aim is to examine the influencing factors that enhance the use of electric cars in Malaysia because it still faces several hurdles and restrictions to dominate the market such as when it needs to compete with all-diesel and petrol powered cars emerged. The quantitative method was chosen which is questionnaire in order to prove on the influencing factors that enhance the use of electric cars in Malaysia. Besides, electric cars will become one of the advance technologies in automobile industry compared to conventional cars. This is proved by introducing some solutions to help maintain grid reliability include using smart grid technologies that charge vehicles during off-peak hours, allowing a utility to limit charging when demand is high and increasing electric rates during peak hours and lowering them at night. As a conclusion, the research shows that the adoption of technology which is electric cars can replace the higher use of fossil fuel. Thus, it also has the potential of significantly reducing the city pollutions by having zero tail pipe emissions.

## **ABSTRAK**

*Pada masa kini terdapat berjuta-juta kereta di jalan raya di dunia dan ini membuktikan bahawa kejayaan industri kereta menjadi lebih meluas dan mendapat tempat dalam penembusan pasaran di seluruh dunia. Untuk dunia yang mencabar hari ini, industri automobil perlu bergerak ke arah teknologi tinggi dan terus bergerak dalam mengkomersilkan industri mereka serta menghasilkan produk yang memberi kejayaan mereka dari pesaing yang lain. Menerusi kemunculan teknologi baru yang berkaitan dengan kereta, industri automobil terutamanya industri yang mengeluarkan kereta elektrik mungkin tidak lagi benar-benar bergantung kepada cara tradisional dalam melaksanakan teknologi mereka untuk menguasai dan bertahan serta berkembang. Dalam kajian kes ini, tujuannya adalah untuk mengkaji faktor-faktor yang mempengaruhi peningkatan penggunaan kereta elektrik di Malaysia kerana ia masih menghadapi beberapa halangan dan sekatan menguasai pasaran seperti apabila ia perlu bersaing dengan semua-diesel dan petrol kereta berkuasa muncul. Kaedah kuantitatif dipilih di mana kaedah soal selidik digunakan untuk membuktikan faktor-faktor yang mempengaruhi peningkatan penggunaan kereta elektrik di Malaysia. Selain itu, kereta elektrik akan menjadi salah satu teknologi yang canggih dalam industri kereta berbanding kereta konvensional. Ini dibuktikan dengan memperkenalkan beberapa penyelesaian untuk membantu mengekalkan kebolehpercayaan grid termasuk menggunakan teknologi grid pintar untuk menghadkan caj apabila permintaan adalah tinggi dan peningkatan kadar elektrik pada waktu puncak dan menurunkan mereka pada waktu malam. Kesimpulannya, kajian ini menunjukkan bahawa penggunaan teknologi yang merupakan kereta elektrik boleh menggantikan penggunaan yang lebih tinggi daripada bahan api fosil. Oleh itu, ia juga mempunyai potensi untuk mengurangkan dengan ketara pencemaran bandar dengan melepaskan sifar pencemaran.*



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**LIST OF SYMBOLS**

ICE	=	Internal Combustion Engine.
EV	=	Electric Vehicle
BEV	=	Battery Electric Vehicle
TAM	=	Technology Acceptance Model
EVs	=	Electric Vehicles
CO <sub>2</sub>	=	Carbon Dioxide
R & D	=	Research and Development
PU	=	Perceived Usefulness
PEoU	=	Perceived Ease of Use
PE	=	Perceived Enjoyment
Sig	=	Significance
N	=	Number of Sample
%	=	Percentage
R	=	Correlation Coefficient

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## **Chapter 1**

### **INTRODUCTION**

#### **1.1 Research Background**

Electric car is an alternative fuel car that uses electric motors for propulsion, instead of usual propulsion methods such as the internal combustion engine (ICE) or scientifically is a car that is propelled by one or more electric motors using electrical energy stored in storage device energy, such as batteries. Electricity can be used as a transportation fuel to power battery electric vehicle (EV). EV store electricity in batteries or other energy storage devices.

Electric cars are a variety of electric vehicle (EV) and the term “electric vehicle” refers to vehicles that use electric motors for propulsion, while “electric car” generally refers to road vehicles that are powered by electricity. Although the electric car's power source is not clear on board battery, electric cars with motors powered by energy sources other commonly referred to by different names, for example an electric car powered by a gasoline generator is a form of hybrid car and electric car powered by sunlight is a solar

car. Thus, an electric car that gets its power from the onboard battery called a battery electric vehicle (BEV). Often, the term "electric car" is used to refer to pure battery electric vehicles. Electric vehicles can include electric boats, electric cars, electric trains, electric airplanes, scooters and electric motors, electric trucks and electric spacecraft.

Electric power wheels vehicle through an electric motor which is able to provide instant torque of electric cars next to create a strong and smooth acceleration. EV batteries need to be recharged by plugging into a power source for its energy storage capacity is limited.

*“Having co-ordination is important to avoid waste of time, waste of resources and also, making sure we are not lacking or losing something important.”*

-Hossam Gaber-

According to V. Klouz et al (2002), “the development of electric vehicles offering zero emission of pollutants, constitutes a priority objectives to limit urban pollution”. Electric cars have the potential of significantly reducing city pollution by having zero tail pipe emissions. Although electricity production may contribute to air pollution, but EVs are considered zero-emission vehicles because their motors produce no exhaust or emissions.

There are millions of cars on the road in the world today, and inefficiency can affect and damage the environment. Internal combustion generator was used as a tool for decades. However, it is inefficient and byproducts that cause harm to the environment as well as to endanger any wildlife. Issues such as global warming, air quality, unburned hydrocarbons released into the atmosphere, and the entire oil reserves decline raised fears and instigated the need for a more efficient way of transportation. Electric cars are intended to serve as an alternative to this problem, where electric vehicles are more efficient and therefore less harmful to the environment.

## 1.2 Problem Statement

Nowadays, in challenging world today, automobile industry has to move towards the high technology and keep moving in the commercialization of their industry and make their product most success from the other competitions. Through the appearance of new technology and industry related to the automobile, automobile industry especially the industry that manufacture the electric cars might no longer really rely through the traditional way of performing their technology in order to dominate and survive as well as grow.

Furthermore, as one of the causes of environmental problems is caused by vehicles, the global goal is to reduce greenhouse gas emissions. In order to do so, as an alternative solution, a conventional vehicle should be replaced with another vehicle such as electric vehicle. Besides, a problem that is rapidly becoming the global era is associated with oil petrol prices. To overcome this problem, other alternative is need such as use the vehicle that uses electric motors for propulsion. However, the use of electric cars still faces several hurdles and limitations thereby impacting the strategies for enhance the intention of use of electric cars to dominate the market. In addition, the proper understanding about electric cars has not yet fully achieved and this will give the impact on the intention of use electric cars in Malaysia.

Electric cars have the potential of significantly reducing city pollution by having zero tail pipe emissions. Apart from that, understanding the influencing factors in order to enhance the intention of use of electric cars in Malaysia can encourage the industry to know what the customer requirement and exactly know the good way to organize their industry through the use of continuously technology. This is the reason why the researcher studies on the influencing factors to enhance the intention of use of electric cars and find out the factor that most contribute in order to enhance the intention of use of electric cars in Malaysia. So from this statement problem, research questions are derived.

### 1.3 Research Questions

From a prospective view of society, electric vehicles (EVs) have no tailpipe emissions. Replace conventional vehicles with electric vehicles (EVs) will help reduce greenhouse gas emissions as well as to improve roadside air quality, environmentally, a wider use of electric vehicles (EVs) also contribute to the development of the environmental industry.

According to Elsevier B. V. (2014), “results obtained clearly show that electric vehicles can contribute to the overall CO<sub>2</sub> abatement strategy in the transport sector but at the same time without an appropriate regulation (the intelligent integration of electric vehicles into the existing power grid as decentralised and flexible energy storage asset), electric vehicles could heavily impact on the daily requested electric power”. Therefore, this is one of the advantages of electric cars over conventional internal combustion engine cars, including a significant reduction of local air pollution, because they do not produce tailpipe pollutants, thus a substantial reduction in the amount of greenhouse gases and other production depends on the fuel used for generation electricity and less dependent on foreign oil.

However, the use of electric cars still faces several hurdles and limitations thereby impacting strategies for enhance the intention of use of electric cars.

With reference to this research, the research questions of the study are stated as follows:

- i. What are the relationship between the factors influence and the intention of use electric cars in Malaysia?
- ii. What are the factors that influence more to the intention of use electric cars in Malaysia?

## 1.4 Research Objectives

The objective of this research is being function as a reason of the need to do this research study. Any research or study needs to have clear objective to make sure the result will be acceptance. Here are the objectives for this study:

- i. To examine the relationship between the factors influence and the intention of use electric cars in Malaysia.
- ii. To determine the factor those influence more to the intention of use of electric cars in Malaysia.

## 1.5 Scope of research

The scope of this research study is limited only for those who have experience in using the automobile. The researcher focuses on the factors that influence the intention of use of electric cars for enhance the use of electric cars in Malaysia. Basically, elements that will be covered on this research are the influencing factors of intention the use of electric cars, the relationship between the influencing factors and the intention of use electric cars in Malaysia and lastly to find out what is the factor that influences more to the intention of use of electric cars in Malaysia. To obtain comprehensive and sufficient information, the researcher will conduct the questionnaire among the employees.

Since electric car is still faces several hurdles and restrictions to dominate the market so basically first thing that the researcher need to know the factors that influence the intention of use electric car in Malaysia by using the theory of Technology Acceptance Model (TAM). In this research, also explain the three types of factors in