

## Thai Consumers' Decision to Use Electric Vehicles and the Government Policies

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### Article Information:

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**Keywords:**  
Consumers' Decision  
Government Policies  
Electric Vehicle (EV)

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### Article History:

Received : February 11, 2022  
Revised : February 27, 2022  
Accepted : March 3, 2022

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### Article Doi:

<http://dx.doi.org/10.22441/indikator.v6i2.14805>

### Abstract

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*This paper aimed to analyze the importance of government policies and the decision to use Electric Vehicles (EV) for Thai consumer. The paper comparing those who use Electric Vehicles to those tend to use soon. Primary data was obtained from questionnaire. The sample size was 415 comprising 224 of those who use EV and 191 of those tend to use EV soon. Methodology employed the t statistics for hypotheses testing between these two groups. The government policies in this study included import tariff reduction, special privileged for EV users and subsidy and or rebate for EV buyers. Among these government policies, both EV users and intended EV users concerned the most importance in the reduction of import tariff and for the hypothesis test showed that these two-sample group emphasized not significantly different in these policies. The policy makers should implement the reduction on import tariff as soon as possible.*

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## INTRODUCTION

In Thailand, most vehicles still use fossil fuel engine. Internal Combustion Engine (ICE) is the main to drive the energy source and causes carbon dioxide; consequently, it leads to the global warming crisis. Both government and private sector has been concerned about the environmental problems. Government has implemented a new campaign to encourage people to use Electric Vehicle (EV), the alternative energy substituted for fossil fuel.

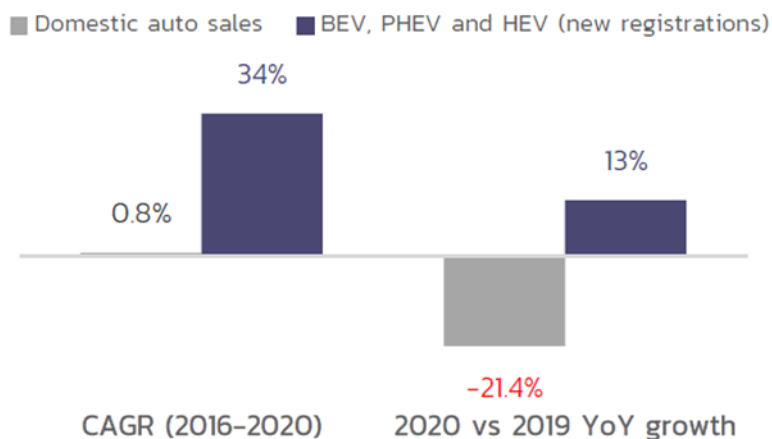
According to International Energy Agency (IEA) stress that the government's promotion of electric vehicles in many countries has resulted in global car sales in 2012 reaching 113,000 and expects to increase around 20 million cars worldwide. In Thailand, Electric vehicles have been sold for more than nine years. Additionally, in 2009, the Energy Policy and Planning Office (EPPO) has promoted using Electrical Vehicle under the Energy Conservation Plan with the purpose of using plug-in hybrid electric vehicles (PHEV) and Battery Electric Vehicle (BEV) 1.2 million vehicles by 2036 (Department of alternative energy development and efficiency, 2017). Both the state enterprises and private sectors have begun to study and demonstrate using EV, for instance, Petroleum Authority of Thailand (PTT), Electricity Generating Authority of Thailand (EGAT) and Bangchak Corporation Public Company (BCP) have used electric vehicles within the organization for transporting the document, shuttle bus, etc.

Thai government try to promote people to use EV and put EV measures in a national agenda. The Prime Minister spoke at the 21st session of the United Nations Conference on Climate Change in Paris, France that Thailand will reduce greenhouse gas emissions by 20-25 percent by 2030, to promote friendly renewable energy instead of fuel in the country's transportation system, including innovations in electric vehicles or the modern automotive industry, which is one of the 10 targeted industries that the government strongly promotes EV

will be the first wave to revolutionize the automobile industry. The second wave is self-driving unmanned vehicle. Thailand is in the beginning stage of development and the transition from using the fossil fuel engines to electric vehicles. In Thailand the electric vehicles have to import so consumers have to pay for high price and the limited supporting facilities for EV.

Due to the pandemic of COVID-19, in 2020 the new car sale in Thailand reduced by 21.4 percent but the electric vehicle sale continued to grow by 13 percent (Figure 1). However, 90 percent of newly registered electric vehicles were hybrid cars that are not classified in electric vehicle internationalization. This reflects the interest in electric vehicles of Thai consumers.

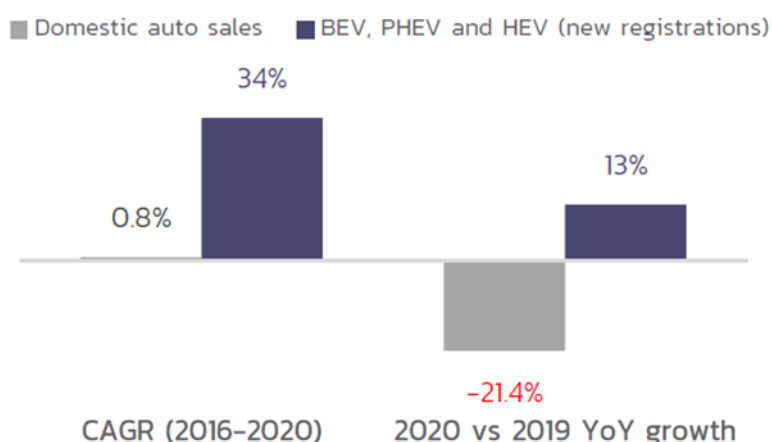
Figure 1. The Expansion of the EV market in Thailand



Source: KKP Research, 2021

From the ASEAN-China Free Trade Agreement, electric cars continuously imported from China into Thailand. The agreement between ASEAN and China was signed in 2005 before EV technology to be known. The tariff exemption on imports and exports between them under the “Other Vehicles” category (HS code: 870390) has been in effect since 2010, while the normal tariff is 80 per cent on all imported electric vehicles. Completely Built-Up (CBU) from China does not have to pay customs duty from the exemption in “Other Vehicles” category. (Figure 2).

Figure 2. The Expansion of the EV market in Thailand



Source: KKP Research, 2021

**LITERATURE REVIEW**

Trinn Panson (2019) The objective of this study was to study the attitude of car users on their intention to use electric cars. Data from a sample of car users was collected in Bangkok by questionnaire based on the Technology Acceptance Model (TAM). Results from 401 samples of car users reveal that each variable in the proposed model significantly impacts the intention to use. Results from the confirmatory factor analysis indicate that the observed variables correspond with the latent variables. In terms of causal structural relationships, the proposed model is fairly in harmonious with the empirical data. In addition, the intention to use electric cars is directly influenced by attitudes toward using, perceived ease of use, perceived usefulness, price acceptance and social norm. Such a relationship is statistically significant at 0.01 level. Their effects (coefficients) from the models are 0.527, 0.405, 0.403, 0.278. and 0.259. respectively. All causal variables co-explain 42 percent of the variance of the intention to use. Knowing and understanding these attitudinal factors that could affect the intention to use electric cars would help planners and policy makers promote and regulate appropriate policies for the target group.

Tanadej Suwanachote and Phiphat Nonthanathorn (2020) The objectives of this study were 1) to study the level of technology acceptance of electric vehicles of consumers in Bangkok 2) to study the attributes of electric vehicles that affect the purchasing decision of consumers in Bangkok and 3) to study the differences of individual factors that affect the technology acceptance of electric vehicles and the attributes of electric vehicles that affect the purchasing decision of consumers in Bangkok.

## METHOD

This research is quantitative research using questionnaire as a tool to collect data from 400 samples of residents in Bangkok. The statistics used in the data analysis consists of frequency, percentage, mean and standard deviation. Hypotheses test is done by using t-test and one-way ANOVA at a statistical significance level of 0.05. The research result shows that the samples have the technology acceptance of electric vehicles at a high level. The most level of technology acceptance is the attitude towards usage followed by usefulness perception and ease of use perception respectively. The characteristics of electric vehicles that consumers choose to buy are performance followed by brand, design, after-sales service, cost savings, safety, and suitable price respectively. From the study, the hypotheses are provided that the differences of gender and monthly income affect the technology acceptance of electric vehicles of consumers in Bangkok. Finally, the differences of age and monthly income affect the attributes of electric vehicles and the purchasing decision of consumers in Bangkok at the statistical significance level of 0.05.

This research collected the primary data by using questionnaire. Population in this study was people live in Bangkok metropolis including those who use electric vehicles and those who intend to use EV soon. Due to large and unknown number of population, W.G. Cochran (1963) was employed to calculate the sample size.

$$n = \frac{z^2}{4e^2}$$

Where n is sample size

Z is equal to 1.96 at 95 percent confidence level

e is error

$$n = \frac{1.96^2}{4(0.05)^2} = 384.16 \approx 385$$

As a result, the sample size was 385. In this paper the respondents were 415 comprising 224 of those who use EV and 191 of those tend to use EV soon.

This study was conducted by employing the t statistic to test the average mean difference of two sample groups i.e., those who use EV and those intend to use EV soon. The level of importance for government policies and supporting facilities have 5 level (5 for the most important, 4 for very important, 3 for moderate, 2 for less important, 1 for the least important, and 0 for undecided)

## RESULTS AND DISCUSSION

The sample in this study was 415, divided into 224 and 191 electric vehicle users and those who have not used them but are interested in using them soon, respectively. The majority of the respondents were male accounted for 75.9 percent, income 50,001-70,000 baht per month accounted for 38.1 percent, aged 28-37 years old accounted for 39.3 percent, Bachelor 's degree account for 62.2 percent, married accounted for 56.9 percent and self-employed accounted for 32.0 percent.

The average mean of the level of importance of government policies between the EV users and those who intend to use EV soon were shown in table 1.

**Table 1: The Level of Importance of Government Policies**

<i>Policies</i>	<i>EV users</i>		<i>Intended EV Users</i>		<i>t-test</i>
	$\bar{x}$	<i>S.D.</i>	$\bar{x}$	<i>S.D.</i>	
<i>Import tariff reduction</i>	4.21	0.95	4.25	1.17	-0.39
<i>Special privileged for EV users</i>	4.14	1.04	4.21	1.17	-0.65
<i>Subsidy and or rebate for EV buyers</i>	4.00	1.12	4.17	1.25	-1.47

**Note:**

\* significance at 10 percent level

\*\* significance at 5 percent level

\*\*\* significance at 1 percent level

## CONCLUSIONS AND SUGGESTIONS

Base on the results showed that both sample group concerned the most in import tariff reduction and both emphasized not significantly different in import tariff reduction, special privileged for EV users and subsidy and or rebate for EV buyers. Policy makers should implement the reduction in import tariff for EV as soon as possible.

Table 1 showed that both EV users and intended EV users emphasized the import tariff reduction, special privileged for EV users and subsidy and or rebate for those buying EV, respectively.

For the hypothesis test between these two sample groups conducted by t statistic, the result showed that two sample groups emphasized not significantly different in the import tariff reduction, special privileged for EV users and subsidy and or rebate for those buying EV.

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