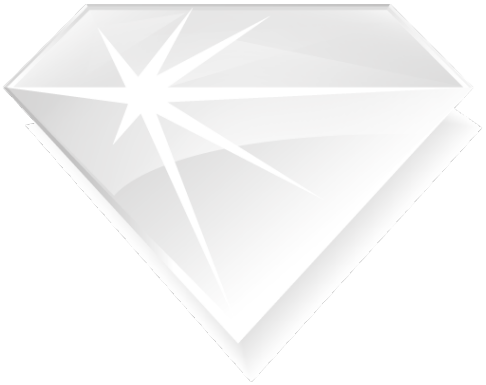
AN INVESTIGATION INTO THE MARKETING MIX, BRAND IMAGE, AND EV INFRASTRUCTURE, AND HOW THESE FACTORS INFLUENCE THE CONSUMERS PURCHASE INTENTION OF ELECTRIC VEHICLES IN THAILAND



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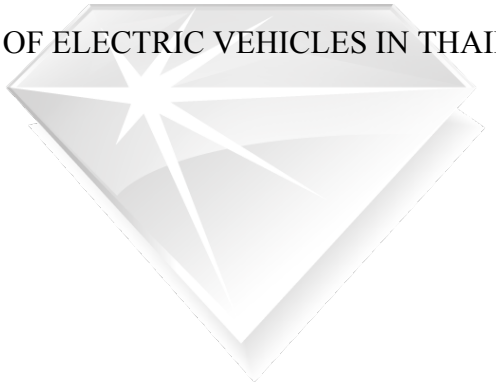

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An investigation into the marketing mix, brand image, and EV infrastructure, and how these factors influence the consumers purchase intention of electric vehicles in Thailand (98 pp.)

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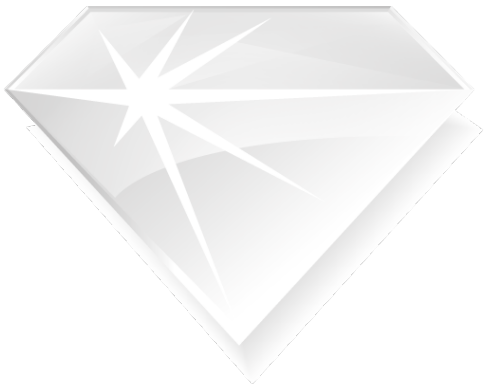
ABSTRACT

This study investigates the factors influencing consumer purchase intention of electric vehicles (EVs) in Thailand, focusing on the marketing mix, brand image, and EV infrastructure. The marketing mix encompasses price, product, place, and promotion; brand image includes EV image, car brand, and country of origin; and EV infrastructure considers charging stations, dealerships, and maintenance services. A quantitative research method was used, employing structured online surveys distributed to 400 respondents residing in Bangkok and nearby regions through convenience and snowball sampling. The questionnaire included multiple-choice and five-point Likert scale questions, assessing the relationship between the independent variables (marketing mix, brand image, EV infrastructure) and the dependent variable (purchase intention). Descriptive and inferential statistical analyses, including multiple regression, were conducted using statistical software. The results of the study showed that all the hypotheses proposed were supported. Findings reveal significant relationships between all independent variables and purchase intention, underscoring the need for targeted

marketing, robust brand positioning, and improved EV infrastructure to bolster consumer adoption of EVs in Thailand.

Keywords: Electric Vehicles, Purchase Intention, Marketing Mix, Brand Image, EV Infrastructure, Marketing Management



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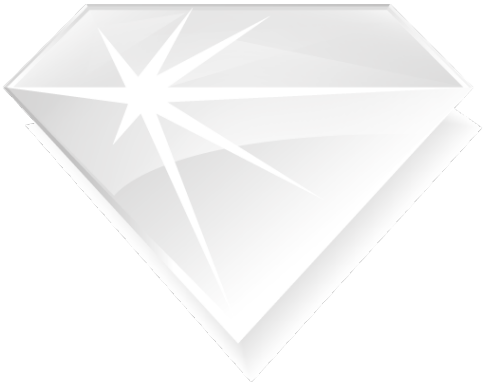


CHAPTER 1
INTRODUCTION

1.1 The Importance and Problem of the Study

Over the last 2 years, electric vehicles have seen a significant surge on a global scale, especially in the Thai market. In 2023 sales increased in Thailand by 684 percent over 2022 sales. This figure represents EV car sales of almost 80,000 vehicles in 2023 (Royal Thai Embassy, 2024). The once hesitation to switch to electric is becoming less of a hurdle for the average consumer, with sales coming from a variety of brands and price points. Most notably Chinese manufacturers have taken a stronghold on the Thai market with BYD, Neta, and MG having the highest market share respectively (Bangkok Post, 2024). Furthermore, not only personal vehicles have seen a significant switch to electric, but also, buses, taxis, tuktuk, have all started to shift to electric (Smith, 2023). In recent years, Thailand has become a centre of the automotive industry in South East Asia. Many of the world leading brands produce, manufacture parts, or assemble cars in Thailand. Notably, many models of Toyota, Honda, Nissan, Isuzu, have produced cars in Thailand for many years (Thailand Automotive Institute, 2024). World leading EV car manufacturers have started to follow suit, GWM, BYD, NETA and Guangqi Autonomous New Energy (AION) all started production in 2024 within the Kingdom. Changan Automobile will also start local production in 2025 (FTI, 2024). Thailand has become favourable for electric vehicle (EV) manufacturing due to a combination of government policies and an established automotive

ecosystem. The Thai government has introduced various incentives, including tax breaks and subsidies, aimed at encouraging both local and international manufacturers to invest in EV production (World Bank, 2022). These initiatives are part of a broader strategy to promote sustainable transportation and reduce carbon emissions, aligning with global environmental goals. Additionally, Thailand's existing automotive supply chain, which includes a network of suppliers and manufacturers, provides the necessary infrastructure for efficient production and distribution of EVs (Asian Development Bank, 2023).

With many brands having local production, they have started to heavily penetrate into the Thai market. Chinese car brands are increasingly choosing Thailand as a base for electric vehicle (EV) manufacturing due to several compelling factors. Thailand’s geographical position in Southeast Asia allows these brands to efficiently access a growing market in the region. By setting up production facilities in Thailand, Chinese manufacturers can reduce transportation costs and streamline their distribution networks (Thailand Board of Investment, 2023). This strategic advantage is crucial as Southeast Asia's automotive market continues to expand, providing an opportunity for brands to enhance their presence. The Thai government has implemented various policies and incentives to encourage the adoption of electric vehicles. These include tax incentives, subsidies for electric vehicle purchases, and initiatives to expand charging infrastructure (Regaldo, 2024). Thailand is notorious for having high car import taxes, but with local production, and government tax breaks for electric vehicle production, many manufacturers are able to offer EV cars at reduced prices in comparison to other countries. This makes electric cars more affordable compared to traditional internal

combustion engine vehicles (The Nation, 2024).

The EV market around the world is evolving rapidly, this is especially prevalent in Thailand. With rapid change comes quick fluctuations at any given point in time. As the market is yet to reach maturity, there are ebbs and flows dependent on any time period. Consumers in Thailand are increasingly concerned about electric vehicles (EVs) due to rapid price fluctuations and associated trust issues with manufacturers. As prices for EVs have dropped significantly in recent months, many potential buyers are apprehensive about the long-term value of their investment, fearing that a further decrease in prices could lead to substantial depreciation shortly after purchase (Chai & Tan, 2023). This uncertainty is compounded by a lack of established trust in newer brands entering the market, which may not yet have a proven track record for reliability and customer service. Consequently, consumers are hesitant to commit to an EV, as they worry that a brand's financial stability could be impacted by aggressive pricing strategies, potentially affecting after-sales support and maintenance (Sukprasert, 2023). Recent developments, including rising insurance costs and concerns regarding brand trust, have influenced electric vehicle (EV) sales in Thailand. Despite these challenges, the overall market trend for EVs remains positive, indicating a growing acceptance and interest among consumers (Bangkok Post, 2024). While high insurance premiums can deter potential buyers and foster scepticism toward certain brands, many consumers are still drawn to the long-term benefits of electric vehicles.

The 4p's of marketing in relation to automobiles. The 4p's of marketing

also known as the product mix are a key component within the subject of marketing and business. The 4 P's are; price, product, place, and promotion.

Previously, electric cars had a more expensive purchase cost than typical cars. This large hurdle is now being overcome, with many models of vehicles being priced even lower than traditional car manufactures. NETA and BYD in particular have been selling electric vehicles for 549,000 baht (Neta V) & 699,000 baht (Dolphin) respectively (CNA, 2023). This price point directly competes with small eco cars. Not only offering a low entry cost for consumers, the cost to run and maintain an electric car is significantly cheaper than a typical petrol car. Electric cars have fewer moving parts and require less maintenance. The cost of electricity is generally lower than gasoline or diesel fuel, resulting in lower fueling costs for EV owners. With rising fuel prices and increasing awareness of long-term cost savings, more consumers in Thailand are considering electric vehicles as a financially viable option.

On the contrary, the marketing mix presents several negative factors that can deter consumers in Thailand from purchasing electric vehicles (EVs) at this stage. One significant concern is the price aspect, particularly amidst a current price war among manufacturers. As companies compete aggressively to capture market share, many EV prices may appear attractive initially. However, these price reductions can raise concerns about the sustainability of such low pricing and the potential for further drops in value, leading consumers to question the long-term investment (Chai & Tan, 2023). Additionally, the high interest rates on EV car loans in Thailand further complicate the affordability of EVs, making it challenging

for consumers to justify the purchase when considering the overall financial commitment (Sukprasert, 2023).

Electric vehicles are typically equipped with modern features, driving functions, sleek interiors, and large infotainment systems within the cabin. Many features are often found in premium or luxury vehicles but can now be attained in affordable electric vehicles. There is often a feeling of enhanced driving experience to consumers with electric vehicles because of reduced engine noise, and fast acceleration which is typically seen in electric cars. However, potential buyers often express apprehensions about the usability and reliability of electric vehicles. Many consumers perceive EVs as complicated compared to traditional combustion engine vehicles, leading to fears about the learning curve associated with their operation and maintenance (Thanasansak, 2022).

Other marketing mix factors that can influence consumers' purchase intention are the place and promotion. The typical car sales techniques in the automotive industry has taken a turn with the rise of electric cars, the first large scale case of this is Tesla. Typically, car dealerships run a franchise model, and oftentimes you can find different prices/inclusions depending on which dealership you go to. Tesla operates on the direct to consumer approach. With tesla, there is universal price, and cars are ordered online through the website, cutting out the need of a car salesman. This more seamless approach has been quite successful in the US (IOEM, 2022). However, the current lack of sufficient showrooms and service centres for many new EV manufacturers nationwide limits consumer access to EVs. Many regions in Thailand still lack adequate infrastructure for EV sales

and maintenance, making it difficult for prospective buyers to explore options or receive proper after-sales support. This scarcity of physical locations for viewing and test-driving EVs can dissuade consumers from making a purchase (Electric Vehicle Association of Thailand, 2022).

Thailand is still quite a service orientated nation, and along with cheap labour, there are often employees to attend to customers in all types of business (Asian Development Bank, 2021). Minimum wage is still under $10 USD per day, therefore, businesses can afford to be well staffed in order to provide a satisfactory customer experience (Tilleke & Gibbins, 2024). EV manufacturers have adapted a combination approach to the Thai market. Car franchises are still predominant, as well as having many sales staff. However, similar to the direct to consumer approach, prices, inclusions, warranty, and service are all typically the same across the board. There is generally little variation in price, service, or quality across different dealerships for electric vehicles (Ghoshal, 2024). This contrasts with traditional combustion engine manufacturers, where such factors often differ significantly between dealerships. Consequently, the marketing of electric vehicles in the country tends to emphasise brand identity rather than the characteristics of individual dealerships.

The brand image of electric vehicles in Thailand is undergoing a notable transformation as the nation grapples with environmental concerns and seeks to modernise its transportation infrastructure. Historically, the Thai automotive market has been dominated by conventional internal combustion engine vehicles. However, recent developments indicate a significant shift in the perception and

acceptance of EVs. The Thai government has actively promoted EV adoption through incentives and policies aimed at reducing greenhouse gas emissions. Initiatives such as tax breaks for EV buyers, investment in charging infrastructure, and the promotion of local EV manufacturing are all part of a broader strategy to support this shift (CNA, 2023).

As a result, the brand image of EVs in Thailand is becoming increasingly positive. Previously viewed as niche or luxury items, EVs are now being recognized for their environmental benefits and long-term cost efficiency. This shift is reflected in growing consumer interest and the expansion of EV offerings, notably, manufacturers are introducing a wider range of models that cater to different consumer needs and budgets. However, there still remains concerns in relation to brand image, established automotive brands that have a long history of reliability often dominate consumer preferences, making it challenging for newer EV manufacturers to gain traction (Wong & Chiu, 2023). This lack of loyalty can create reluctance among consumers to embrace emerging brands, especially when they are uncertain about the long-term viability and support for electric vehicles.

The current price war within the EV market also complicates brand perceptions. While competitive pricing can initially attract buyers, it may also lead to doubts about the quality and reliability of lower-priced models. Consumers might associate aggressive price reductions with compromised quality, which can diminish their confidence in these brands (Phan & Nguyen, 2022). Consequently, such pricing strategies may inadvertently harm brand equity, as consumers become wary of purchasing vehicles they perceive as potentially inferior.

Concerns regarding reliability can also play a crucial role in shaping brand image. Given that electric vehicles are still relatively new in the Thai market, consumers often express apprehensions about their durability and overall performance compared to traditional vehicles. The limited availability of service centres and spare parts can exacerbate these concerns, leading to perceptions that EVs may not be as dependable as established combustion engine vehicles (Srisang, 2023)

The media and public discourse have also played a role in shaping the brand image of EVs. Positive coverage of successful EV models, testimonials from early adopters, and the portrayal of EVs as a modern and innovative choice have contributed to a more favourable public perception. As manufacturers are able to develop successful products, personal testimonials are now often uploaded to social media and relevant forums. Furthermore, as Thailand's urban areas become increasingly congested and pollution becomes a more pressing issue, the appeal of EVs are expected to grow.

Overall, the brand image of electric vehicles (EVs) in Thailand is gradually shifting from a niche, luxury perception to a more mainstream and preferred choice. This transformation is driven by cost incentives, supportive government policies, advancements in technology, and increasing environmental awareness, making EVs an integral part of the Thai automotive landscape. However, significant push backs remain that could hinder this progress. Concerns regarding high prices, aggressive price wars among manufacturers, limited availability of showrooms and parts, and issues surrounding brand loyalty and reliability continue

to affect consumer confidence (Wong & Chiu, 2023). As the market evolves, addressing these challenges will be essential to ensure that the positive shift in brand image continues to accelerate the adoption of electric vehicles across the country.

A key factor that has previously held Thai consumers back from EV adoption is that many drivers tend to drive long distances, that being so, the range of cars and electric charging infrastructure throughout the country could be of a concern (AseanNow, 2023). Many Thais live in condos or apartments and are unable to charge an EV at home (Bolt Earth, 2023). As there is this large portion of the market in demand for possible charging stations, many petrol stations & shopping centres have started to implement EV charging stations. With the popular “PTT” and "Bangchak” having fast charging at a large portion of their stations. It is unsure if the demand for increased charging stations will be met, this will be a crucial step for the continued growth of EV car adoption in Thailand.

The government has also invested in the development of charging infrastructure across the country, addressing concerns about range anxiety and making it more convenient for EV owners to recharge their vehicles. On the forefront of EV charging facilities is PTT, ELEXA, EA Anywhere, and also the government organisation, PEA (Walderich, 2024). Although there have been positive strides in infrastructure, there are still many concerning issues at the forefront. The current charging infrastructure for electric vehicles (EVs) in Thailand presents several negative factors that can deter potential consumers from making the switch to electric mobility. One significant issue is the uneven

distribution of charging stations across the country. While urban areas may have a reasonable number of charging points, many rural and suburban regions still lack access to reliable charging facilities, which raises concerns about the practicality of owning an EV (Electric Vehicle Association of Thailand, 2022). This geographical disparity can discourage potential buyers who worry about the feasibility of charging their vehicles, especially on longer trips.

Additionally, the reliability of existing charging stations is often called into question. Reports indicate that charging stations can malfunction or be out of service, leaving drivers with limited options when they need to recharge (Sukprasert, 2023). This unreliability can create anxiety for EV owners, particularly when they are unsure if they will find a functioning station when needed. Furthermore, the cost per charge can sometimes be high, depending on the charging network used, which can deter consumers who are sensitive to operating costs (Thanasansak, 2022).

Weather conditions also pose challenges for charging convenience. For instance, charging stations may not provide adequate shelter, making it inconvenient for drivers to charge their vehicles during rainy weather (Wong & Chiu, 2023). Lastly, charging times can be a significant drawback; many charging stations require longer periods to fully charge a vehicle compared to the quick refuelling options available for traditional combustion engine vehicles. This extended downtime can be a considerable inconvenience for users who are accustomed to the efficiency of gas stations (Phan & Nguyen, 2022). Collectively, these factors highlight the need for continued substantial improvements in the

charging infrastructure to support the growing adoption of electric vehicles in Thailand.

In wake of the ever changing landscape, the Thai government has pushed for the nation to be the regional hub of EV car productions within SEA. The government has achieved this through relaxed policies, tax breaks, exemptions and government subsidies to both manufacturers and consumers (CNA, 2023). In 2015, Thailand ratified the Paris Agreement, which requires member countries to reduce greenhouse gas emissions by 20–25% by 2030 (United Nations Framework Convention on Climate Change (UNFCCC, 2015). In a bid to address climate change more vigorously, Thailand has set goals for carbon neutrality by 2050 and aims to achieve net-zero emissions by 2065 (Climate Action Tracker, 2023). The transportation sector is the predominant source of greenhouse gas emissions in the country, prompting the government to advocate for cleaner energy solutions. This necessity has led to a focused effort by the Thai government to transition towards electric vehicles (Thananusak, 2020).

To facilitate this transition, Thailand established a national electric vehicle (EV) roadmap in 2015, positioning itself as the EV hub for the ASEAN region. In a strategic move to encourage EV production, the Ministry of Finance reduced the excise tax on electric vehicles from 20–40% to a more attractive rate of 2–8%. Furthermore, the Board of Investment approved 26 investment projects related to electric vehicles, with a total estimated value of 2.584 billion USD (Electric Vehicle Association of Thailand, 2022). These initiatives underscore Thailand's commitment to enhancing its EV industry and effectively addressing the challenges

of climate change.

This independent study highlights the multifaceted challenges and opportunities surrounding electric vehicles (EVs) in Thailand. Despite the remarkable surge in EV sales, driven by favourable government policies and increasing market participation from various manufacturers, several critical factors continue to affect consumers' purchase intentions. Concerns regarding inconsistent charging infrastructure, including the lack of charging stations in rural areas, unreliable station functionality, and high charging costs, can deter potential buyers (Electric Vehicle Association of Thailand, 2022). Additionally, apprehensions about brand reliability, aggressive pricing strategies leading to potential depreciation, and high car loan interest rates contribute to consumer hesitance (Chai & Tan, 2023). As Thailand aims to position itself as a regional hub for EV production, understanding these barriers is essential for fostering greater consumer confidence and encouraging wider adoption of electric vehicles. Addressing these issues will not only enhance the overall brand image of EVs but also support the nation’s broader goals of sustainability and reduced greenhouse gas emissions. This study serves to inform stakeholders about the current landscape, ultimately aiding in the development of strategies that can improve consumer perceptions and boost the EV market in Thailand.

1.2 Research Problems

1.2.1 Do marketing mix factors (price, product, place and promotion)

influence customers' purchase intention of electric vehicles?

1.2.2 Does brand image (EV image, car brand and country of origin) influence consumers' purchase intention of electric vehicles?

1.2.3 Does the EV infrastructure (charging stations, dealerships, maintenance & repair) influence consumers' purchase intention of electric vehicles?

1.3 Objectives of the Study

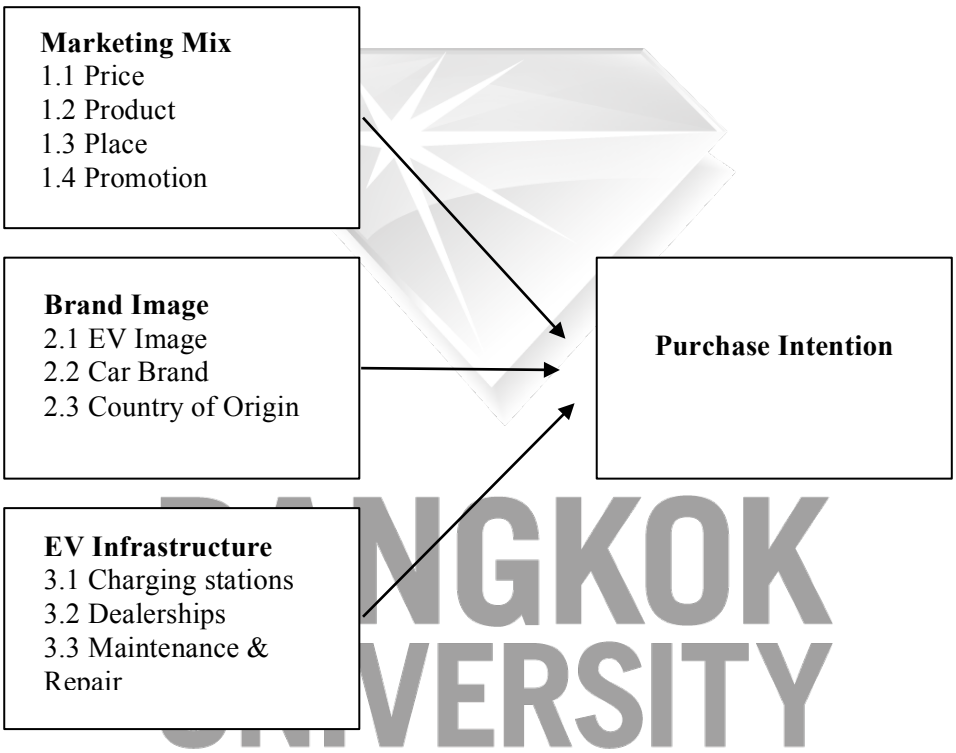
1. To study the impact of the marketing mix factors such as price, product, place, and promotion on customers' purchase intention of electric vehicles in Thailand.

2. To study the impact of brand image factors such as EV image and car brand on customers' purchase intention of electric vehicles in Thailand.

3. 2. To study the impact of EV infrastructure factors such as; charging stations, dealerships, maintenance & repair, on customers' purchase intention of electric vehicles in Thailand.

1.4 The Conceptual Framework

Figure 1.1: Conceptual Framework



1.5 Method of the Study

In order to gain a strong understanding of potential EV consumers in Thailand, quantitative research in terms of an online survey will be conducted to gather data regarding the key points that influence a consumer's purchase intention of an EV. This includes EV owners, non EV owners, and General public that are interested in EV vehicles. Primarily, snowball sampling will be used to gather

participants. This sampling method is effective as it leverages existing social networks to reach participants who might otherwise be difficult to identify. This method is particularly useful in studying populations such as EV potential owners as they can be hard to access due to a limited number of people that are interested in owning a car, especially in Bangkok.

1.6 Tools and Statistics Used

A widely-known and well regarded statistical software was utilised for quantitative research to analyse variables which includes descriptive and inferential statistics.

1.7 Scope of the Study

Independent Variables:

1. **Marketing Mix**

1.1 Price

1.2 Product

1.3 Place

1.4 Promotion

2. **Brand Image**

2.1 EV Image

2.2 Car Brand

2.3 Country of Origin

3. **EV Infrastructure**

3.1 Charging Stations

3.2 Dealerships

3.3 Maintenance & Repair

Dependent Variable**: Purchase Intention**

Population and Sample:

This study aims to investigate the factors that influence a consumers purchase intention of an electric vehicle in Thailand. The factors being marketing mix, brand image and EV infrastructure. This research selected both Thai nationals and expats currently living in Thailand, primarily in Bangkok and surrounding provinces as a sample to illustrate the whole population to study the customers' purchase intention throughout Thailand.

Due to the nature of the sample and method, it is important to note that the sample is younger than the general average population in Thailand, which may put limitations in generalising the results to the entire population of Thailand. These factors can include but are not limited to; lower disposable income, first time car ownership, family size, brand loyalty and convenience.

A study (Allianz, 2023) found that 66% of people between the ages of 18-

34 would consider an EV as their next vehicle, compared to 57% of other respondents aged over 34.

According to Yamane's table for sample size in figure 1.2, if the population of a country is greater than 100,000, a sample size of 400 is needed to be collected with a precision level of +-5%.

Figure 1.2: Yamane's Table for Sample Size

Size of Population (N)	Sample Size (n) for Precision (E) of:			
	±3%	±5%	±7%	±10%
500	A	222	145	83
600	A	240	152	86
700	A	255	158	88
800	A	267	163	89
900	A	277	166	90
1,000	A	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100

A = Assumption of normal population is poor (Yamane, 1967). The en

Source: Yamane, T. (1967). *Statistics: An introductory analysis*. New York: Harper and Row.

1.8 Benefits of the Research

It is commonly believed that consumers are switching to electric because of financial saving incentives (The Nation, 2024). However, there are a culmination of variables that can ultimately sway the decision, thus, this research will find quantitative data to find the prominent reasons for the switch. Electric vehicles are now able to compete head on price wise with petrol counterparts. Government incentives, subsidies, and tax breaks have all led to decreased upfront cost for the consumers. In addition, EV cars are much cheaper to maintain and run. As there are less moving parts compared to a combustion engine, car servicing is required much less, with less parts needing to be replaced. The price of electricity is about half of petrol when calculated by thb/km basis. Even cheaper, if charging at home, especially if renewable energy resources are available.

Overall, Thailand's shift to EV is a positive situation for most parties involved, especially the consumer & economy. Thai residents are able to save money on their car purchase, fueling, and maintenance, and hence, are able to use the savings in other aspects of their life. Furthermore, with many large EV manufacturers shifting to Thai production, this is a large stimulant of the Thai economy, creating an abundance of jobs throughout the industry (The Board of Investment of Thailand, 2024).

The study can be beneficial in finding the relevant reasons why Thailand has adopted EVs. Furthermore, the study will help neighbouring markets to gain a better understanding how a nation can adapt to EV successfully, even though there were many initial barriers present to the Thai market such as charging

infrastructure and brand image.

1.9 Limitations of the Research

This study acknowledges several limitations that may impact the generalizability and interpretation of its findings. Firstly, the reliance on online surveys may exclude certain segments of the population, particularly those with limited internet access or technological proficiency, potentially resulting in a non-representative sample. The snowball sampling method, while effective for reaching niche populations, may also introduce bias, as participants are likely to share the survey with individuals within their social circles who may share similar views and experiences. Furthermore, external factors such as changing government policies, market dynamics, and advancements in EV technology could influence consumer perceptions and purchase intentions over time, making the findings less applicable in the long term. Finally, the study's focus on the Bangkok area may limit the applicability of results to rural regions in Thailand, where infrastructure and consumer behaviour may differ significantly.

1.10 Definition ofTerms

The information below are definitions of terms for readers to fully understand the variables that this study focuses on.

Marketing Mix

The marketing mix refers to the combination of product, price, place, and promotion strategies that a company uses to effectively market and sell its products

or services.

Price

In the marketing mix, price refers to the amount of money customers are willing to pay for a product or service, as well as the market price, reflecting its perceived value and influencing its market competitiveness. This includes the upfront price of the car, ownership cost, and charging cost.

Product

In the marketing mix, product refers to the goods or services offered by a company that fulfil customer needs and desires, encompassing the car's design, features, and quality.

Place

In the marketing mix, place refers to the distribution channels and locations through which a product or service is made available to customers such as dealerships, ensuring its accessibility and convenience.

Promotion

In the marketing mix, promotion refers to the activities and strategies used to communicate and persuade potential customers about an electric car, including advertising, sales promotions, and public relations efforts.

Brand image

Brand image is the perception and set of associations that consumers hold about a brand, shaped by its identity, communications, and experiences.

EV image

EV image refers to the public perception and associations of a person owning an electric vehicle in regards to a symbol of environmental consciousness, innovation, and modernity.

Car brand image

Brand image in regards to a car brand is the overall perception and emotional impression that consumers hold about the brand based on its reputation, design, performance, and marketing efforts.

Country of Origin

Country of Origin refers to which country the car brand was originated in and currently associated with. In relevance to this study, for example, BYD is a Chinese brand, Tesla is an American brand. Although BYD has production in Thailand, the company originated in and is considered a Chinese brand.

EV Infrastructure

EV infrastructure in Thailand refers to the network of facilities and services supporting electric vehicles, including charging stations, battery swapping stations, and related support systems necessary for the widespread adoption and operation of EVs.

Dealerships

In terms of EV cars in Thailand, dealerships are specialised retail outlets that offer electric vehicles for sale, provide related services such as maintenance and repairs, and often educate customers about EV technology and incentives.

Maintenance and Repair

In terms of EV cars in Thailand, maintenance and repair refer to the services required to keep electric vehicles in optimal working condition, including battery management, software updates, and component servicing, tailored to the unique needs of EV technology.

Purchase Intention

In terms of EV cars in Thailand, purchase intention refers to a consumer's likelihood or willingness to buy an electric vehicle, influenced by factors such as the marketing mix, brand image, and EV infrastructure

CHAPTER 2: LITERATURE REVIEW

This chapter will summarise the literature that is relevant to this research project, entitled “An investigation into the marketing mix, brand image, and EV infrastructure, and how these factors influence the consumers' purchase intention of electric vehicles in Thailand”. The reviewed literature are divided into 6 elements**.** They are as follows**:**

2**.**1 The Background of Business Industry

2**.**2 Theories/Academic Concepts and Other Relevant Research Articles of Purchase Intention

2**.**3 Theories/ Academic Concepts and Other Relevant Research Articles of Marketing Mix

2**.**4 Theories Academic Concepts and Other Relevant Research Articles of Brand Image

2**.**5 Theories Academic Concepts and Other Relevant Research Articles of EV Infrastructure

2.1 The Background of the electric vehicle Industry

“An EV is defined as a vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source. An EV includes both a vehicle that can only be powered by an electric motor that draws electricity from a battery (EV) and a vehicle that can be powered by an electric motor that draws electricity from a battery and by an

internal combustion engine (plug-in hybrid electric vehicle).” (Department of Energy, 2021).

The electric vehicle (EV) industry in Thailand has gained significant momentum in recent years, influenced by a combination of government policy initiatives and a growing public awareness of environmental issues. Historically, Thailand has been a large player in the automotive sector, predominantly focused on internal combustion engine (ICE) vehicles, which are powered by gasoline or diesel. However, the global transition towards sustainable energy solutions has prompted the Thai government to reconsider its automotive policies, aiming for a more eco-friendly future (World Bank, 2021).

In 2017, the Thai government launched the “Electric Vehicle Policy,” which outlines a comprehensive strategy to position Thailand as a regional hub for electric vehicle production and consumption by 2036. The policy includes various incentives aimed at manufacturers and consumers, such as tax exemptions, reduced import duties, and financial subsidies for EV purchases (Ministry of Energy, 2020). The goal is to achieve 1.2 million EVs on the road by 2036, which reflects a commitment to reducing greenhouse gas emissions by 20-25% from the business-as-usual scenario (Thailand Board of Investment, 2021). This proactive approach aligns with global trends towards decarbonization and positions Thailand as a competitive player in the emerging EV market.

Thailand's geographic location has a large appeal as an EV manufacturing hub. The country is home to a well-established automotive supply chain, including numerous component manufacturers and assembly plants. Major international automotive manufacturers, such as BYD, Changan, and MG have invested heavily

in establishing EV production facilities in Thailand, contributing to the local economy and job creation (Thailand Board of Investment, 2021). This investment not only enhances production capacity but also encourages technological innovation in electric mobility.

Despite these promising developments, several challenges hinder the widespread adoption of electric vehicles in Thailand. Although the initial purchase price of EVs has become more competitive, current difficulties dealing with high costs of battery replacement, expensive insurance, as well as a lacklustre brand image for many EV manufacturers, discourages many potential buyers, despite the availability of government incentives (ABEAM, 2023). Furthermore, the country's charging infrastructure is still underdeveloped, with only around 1,200 public charging stations available as of 2023, making long-distance travel in EVs less reasonable (Department of Energy Business, 2023). Expanding the charging network and promoting public awareness of the benefits of electric vehicles are crucial steps for overcoming these barriers and achieving the government's targets.

The EV industry in Thailand is projected for significant growth due to supportive government policies and investments from major automotive manufacturers, addressing key challenges such as cost, brand image, and infrastructure remains vital. The successful transition from ICE vehicles to EVs is not only essential for environmental sustainability but also for bolstering the economy in a rapidly changing automotive landscape. As Thailand continues its journey toward a greener future, the development of the EV sector will play a crucial role in meeting both environmental and economic objectives.

2.2 Theories/ Academic Concepts and Other Relevant Research Articles of Purchase Intention

The Theory of Planned Behavior (Ajzen, 1991) explains that individual behaviour is determined by intentions, which are influenced by attitudes, subjective norms, and perceived behavioural control. In the context of EVs in Thailand, studies have shown that positive attitudes toward environmental benefits significantly enhance purchase intention (Yasuda et al., 2022). Subjective norms, particularly the influence of family and peers, also play a critical role in shaping consumers' intentions (Choudhary & Das, 2023).

The Innovation Diffusion Theory suggests that the adoption of new technologies is influenced by factors such as perceived attributes, communication channels, and social systems (Rogers, 2003). In Thailand, research indicates that perceived benefits such as cost savings and environmental impact positively influence consumers' intentions to purchase EVs (Tiruneh & Akinmoladun, 2023). Moreover, communication strategies that highlight these benefits can significantly enhance awareness and acceptance.

The Technology Acceptance Model emphasises perceived ease of use and perceived usefulness as primary determinants of technology adoption (Davis, 1989). Recent studies have applied TAM to the EV context in Thailand, revealing that consumers are more likely to consider purchasing EVs if they perceive them as user-friendly and beneficial in terms of performance and cost (Sukanya et al., 2023).

A study by (Thananusak, et al., 2018) investigated factors affecting the intention to buy electric vehicles: empirical evidence from Thailand. Through using partial least squares structural equation modelling, it was found that Thai consumers pay most attention to the performance factor of EVs (e.g., driving range, speed, safety) whilst not being concerned much with the infrastructure (e.g., charging facilities) and the financial factors. However, a price premium could negatively impact the intention to buy EVs.

It was important to note that when this study was conducted in 2018, there was significantly less infrastructure for EV vehicles. At the time, there weren't many charging facilities at petrol stations, or malls. This made it difficult for non-home owners to purchase an EV as it made charging difficult. FUrthermore, in 2018, EV vehicles were often priced higher than typical combustion vehicles. In the current day, EV's tend to be priced equally to traditional vehicles, but have cheaper long term costs with maintenance and charging, especially since there is an ever growing infrastructure that continues to be developed. Hence, price and infrastructure factors could have a much greater impact in 2024 than when compared to 2018.

A study by Chaturong et al. (2021) highlights that increased environmental awareness significantly correlates with higher purchase intention for EVs. The researchers argue that educational campaigns can enhance this awareness, ultimately driving EV adoption.

A study conducted by (Brinkmann & Bhatiasev, 2021). Investigated the "Purchase Intention for Electric Vehicles Among Young Adults in Thailand"

The sample size consisted of 195 young adults, who were master's degree students living in Bangkok. Data collection was conducted by self-administered printed questionnaires. The results (analysed by ordinary least squares regression) found that purchase price and environmental consciousness are the most crucial factors that influence consumers' purchasing intention for this sample. It was also found that Governmental subsidies and insufficient charging infrastructure do not have a significant relationship with willingness to buy EVs.

Cost and Incentives: Research by Parnpai et al. (2022), indicates that financial incentives and subsidies provided by the government significantly affect consumers' purchase intentions. The study suggests that clearer communication of these incentives can alleviate concerns regarding the initial cost of EVs.

According to a study by Wong et al. (2023), social influence, particularly from friends and family who own or support EVs, has a strong impact on individual purchase intentions. This highlights the importance of community-based initiatives in promoting EV adoption.

Technological Advancements: A study conducted by Thanaporn et al. (2024), explores how advancements in EV technology, such as battery efficiency and charging infrastructure, positively impact consumer attitudes and purchase intentions. The findings suggest that ongoing improvements in technology will further encourage adoption rates.

The literature consistently indicates that multiple factors influence the purchase intention of electric vehicles in Thailand. The interplay between individual attitudes, social influences, and perceived technological benefits forms a complex framework that policymakers and businesses must navigate to promote EV adoption. Notably, education and awareness campaigns can enhance consumer understanding of the benefits of EVs, while financial incentives can reduce perceived economic barriers.

Future research should focus on longitudinal studies to track changes in consumer attitudes over time, especially as technology continues to evolve and government policies adapt. Additionally, exploring the role of demographic factors, such as age and income level, can provide a more nuanced understanding of the market dynamics.

Understanding the factors that influence purchase intention for electric vehicles in Thailand is crucial for effective policy formulation and market strategies. Theories such as the Theory of Planned Behavior, Innovation Diffusion Theory, and the Technology Acceptance Model provide valuable insights into consumer behaviour. Continued research in this area will support Thailand's efforts to transition to sustainable transportation and reduce environmental impacts.

2.3 Theories/ Academic Concepts and Other Relevant Research Articles of the Marketing Mix

In order to understand how to effectively market EVs in Thailand, it is essential to explore the marketing mix—product, price, place, and promotion. This includes investigating theories and relevant research on the marketing mix elements specifically for electric vehicles in the Thai context.

The marketing mix, originally introduced by McCarthy (1960), consists of four critical elements: product, price, place, and promotion. Each element plays a vital role in influencing consumer behaviour and purchasing decisions. In the context of EVs in Thailand, these components must be tailored to local market conditions and consumer preferences.

The 4Ps model offers a streamlined approach that is particularly effective for studies focusing on tangible goods and straightforward marketing strategies. Unlike the more complex 7Ps model, which incorporates People, Process, and Physical evidence, the 4Ps allow research to concentrate on core marketing elements that directly influence consumer purchasing decisions (Kotler & Keller, 2016). This simplicity can enhance clarity and focus in research, making it easier to draw actionable insights and recommendations. Moreover, the 4Ps framework has a long-standing foundation in marketing literature, making it a familiar and widely accepted choice for studies aiming to explore fundamental marketing principles (McCarthy, 1960).

Understanding consumer behaviour is essential for developing an effective marketing mix. The Theory of Planned Behavior (Ajzen, 1991) suggests that consumers' intentions to purchase a product are influenced by their attitudes,

subjective norms, and perceived behavioural control. This theory can be applied to understand how marketing strategies impact the purchase intention of electric vehicles in Thailand.

Price

Pricing strategies for electric vehicles are critical in a market characterised by price sensitivity. Research indicates that initial purchase cost remains a significant barrier to EV adoption in Thailand (Parnpai et al., 2022). Many consumers are hesitant to switch from conventional vehicles due to the higher upfront costs associated with EVs. To mitigate this, manufacturers and policymakers have implemented financial incentives, such as subsidies and tax rebates, which can lower the effective price for consumers (Tiruneh & Akinmoladun, 2023).

Dynamic pricing strategies, such as competitive pricing aligned with conventional vehicles, can also encourage adoption. Choudhary and Das (2023) emphasises the importance of creating price parity between EVs and traditional vehicles to enhance consumer interest. Furthermore, financing options, such as leasing and instalment plans, can make EVs more accessible to a broader audience.

Product

The product element of the marketing mix encompasses the features and benefits of electric vehicles. In Thailand, consumers are increasingly concerned with the environmental impact and performance of EVs. Research by Wong et al. (2023) indicates that consumers prioritise attributes such as battery life, range, and charging infrastructure when considering EVs. Additionally, branding plays a

crucial role; brands perceived as environmentally friendly tend to attract more consumers (Chaturong et al., 2021). Furthermore, offering a diverse range of models, from compact cars to larger vehicles, can cater to different market segments.

Place

The distribution strategy, or place, is crucial for ensuring that electric vehicles are readily available to consumers. The expansion of charging infrastructure is a significant factor influencing consumer purchase decisions. Studies by Thanaporn et al. (2024) highlight that the availability of charging stations significantly affects consumer confidence in purchasing EVs. Therefore, partnerships with local governments and businesses to expand charging networks are vital.

Moreover, the choice of distribution channels is important. Research suggests that online sales platforms are becoming increasingly popular in Thailand, especially among younger consumers (Wong et al., 2023). Manufacturers can leverage e-commerce to provide detailed product information and facilitate easier access to EV purchasing options. Physical showrooms should also integrate modern technologies, such as virtual reality, to enhance the customer experience and provide immersive vehicle demonstrations.

Promotion

Promotional strategies play a pivotal role in raising awareness and educating consumers about electric vehicles. Effective communication is essential for addressing misconceptions about EVs, particularly concerning their

performance and environmental benefits. Chaturong et al. (2021) emphasise the need for targeted marketing campaigns that focus on the ecological advantages of EVs, as well as their long-term cost savings.

Social media platforms have emerged as effective tools for reaching consumers in Thailand. Engaging content, such as user testimonials and educational videos, can foster a positive perception of EVs (Sukanya et al., 2023). Additionally, collaboration with influencers who advocate for sustainable living can enhance brand visibility and credibility.

Promotional efforts should also include participation in local events and exhibitions to showcase EV technology and engage directly with potential customers. Offering test drives and experiential marketing campaigns can significantly influence consumer attitudes and purchase intentions (Tiruneh & Akinmoladun, 2023).

The marketing mix—price, product, place, and promotion—plays a crucial role in the successful introduction and adoption of electric vehicles in Thailand. Tailoring each element to meet local consumer preferences and addressing barriers to adoption is essential for market penetration. Future research should explore the long-term effects of various marketing strategies on consumer behaviour, as well as the impact of evolving market conditions on the electric vehicle landscape in Thailand.

2.4 Theories/ Academic Concepts and Other Relevant Research Articles of brand image (EV image, car brand and country of origin)

The growing popularity of electric vehicles (EVs) in Thailand reflects a

broader global trend toward sustainable transportation. As consumers increasingly prioritise eco-friendly options, the brand image of electric vehicles becomes a significant factor influencing purchasing decisions. Specifically, the image of electric vehicles, car brands, and the impact of country of origin in the Thai context.

Brand image refers to the perceptions and associations that consumers hold about a brand, which significantly influence their purchasing behaviour (Aaker, 1991). For electric vehicles, brand image consists of several dimensions, including environmental credibility, performance, and innovation. The Theory of Planned Behavior (Ajzen, 1991) underscores that consumer intentions to purchase a product are shaped by their attitudes toward the brand, perceived social norms, and perceived control over the purchase. This framework is particularly relevant for understanding how brand image impacts the purchase intention of EVs in Thailand.

The country of origin (COO) effect describes how consumers' perceptions of a product are influenced by its origin. Research indicates that consumers often associate certain qualities with products based on their country of origin (Papadopoulos & Heslop, 1993). In Thailand, the COO effect can significantly impact the perceived quality and trustworthiness of electric vehicles, as consumers may have varying levels of confidence in local versus foreign brands.

The environmental image of electric vehicles is an important aspect of brand perception. Studies show that consumers are increasingly aware of environmental issues, leading them to favour brands that emphasise sustainability

(Yasuda et al., 2022). In Thailand, research by Wong et al. (2023) highlights that consumers' perceptions of EVs as environmentally friendly can enhance their overall brand image. This association is critical in promoting the adoption of EVs, as consumers often prioritise brands that align with their values regarding sustainability.

Another key dimension of brand image for electric vehicles is performance and innovation. According to Parnpai et al. (2022), consumers in Thailand are concerned about the performance capabilities of EVs, including battery life and charging speed. Brands that effectively communicate technological advancements and performance benefits are likely to cultivate a positive image among consumers. For instance, brands that emphasise innovative features, such as advanced safety systems and connectivity, can differentiate themselves in a competitive market (Sukanya et al., 2023).

The car brand's reputation plays a significant role in shaping consumer perceptions of electric vehicles. Research indicates that well-established brands with a strong reputation for quality and reliability are more likely to succeed in the EV market (Choudhary & Das, 2023). In Thailand, consumers often exhibit brand loyalty, preferring brands they have historically trusted. This loyalty can positively impact the acceptance of new products, such as electric vehicles, under well-known brands.

Tan and Suriyawong (2024) investigated the concepts of trust and perceived quality as critical factors influencing the purchase intention of electric vehicles in

Thailand. The authors argue that trust in a brand directly impacts consumer perceptions of quality, which in turn affects their willingness to purchase EVs. Utilising a robust survey methodology, the study collected data from a diverse group of Thai consumers, analysing how trustworthiness, brand reputation, and perceived quality interconnect. Results indicate that brands perceived as reliable and high-quality significantly enhance consumer confidence in electric vehicles, thereby increasing purchase intentions. The authors recommend that EV manufacturers invest in building consumer trust through transparency in their operations and clear communication regarding product quality. This study highlights the importance of trust as a foundational element in the brand image of electric vehicles.

Khan and Jain (2023) explored the intricate relationship between brand image and consumer purchase intentions specifically for electric vehicles (EVs) in Thailand. The research identified several key dimensions of brand image, including brand trust, brand awareness, and brand loyalty. The authors conducted a comprehensive survey involving a diverse sample of Thai consumers, analysing how these dimensions correlate with the intention to purchase EVs. The findings suggest that a strong brand image significantly enhances consumers' willingness to adopt electric vehicles, particularly when brands communicate their commitment to sustainability and innovation. The study emphasises that manufacturers should focus on building a positive brand reputation through targeted marketing campaigns that highlight both the environmental benefits of EVs and their technological advancements. This research underscores the importance of brand perception in shaping consumer behaviour and presents valuable insights for

marketers aiming to enhance EV adoption in Thailand.

Effective marketing strategies are essential for building a strong brand image. According to Thanaporn et al. (2024), brands that position themselves as leaders in sustainability and innovation can significantly enhance their appeal. Marketing campaigns that highlight the unique benefits of electric vehicles, such as lower operating costs and environmental impact, can foster a favourable brand image and encourage consumer adoption.

The country of origin (COO) effect is particularly relevant in Thailand, where consumers may have distinct perceptions of domestic and foreign electric vehicle brands. Research by Tiruneh and Akinmoladun (2023) indicates that foreign brands not including Chinese brands are often associated with higher quality and technological advancement. However, emphasising local production, sustainability efforts, and partnerships with reputable foreign companies can enhance the brand image of domestic EVs (Chaturong et al., 2021). Local brands may be perceived as more in tune with consumer needs and preferences. This dual perception highlights the importance of branding strategies that leverage both local and global brand strengths.

Srijan and Rattanavich (2023) investigated the impact of country of origin

(COO) perceptions on brand loyalty among Thai consumers considering electric vehicles. Their research revealed that consumers often associate foreign brands with higher quality and advanced technology, which influences their loyalty towards these brands. The study employs both qualitative and quantitative methodologies, collecting data through interviews and surveys to gauge consumer attitudes. Results indicate that while Thai consumers exhibit a strong preference for established foreign EV brands, there is also a growing appreciation for domestic brands that demonstrate quality and innovation. The authors argue that local manufacturers must leverage this emerging trend by emphasising their unique selling propositions and aligning their branding strategies with consumers' values. The study highlights the dual nature of COO effects, where foreign brands benefit from a quality perception while local brands can cultivate loyalty through authenticity and cultural alignment.

The brand image of electric vehicles in Thailand is shaped by multiple factors, including environmental credibility, car brand reputation, and the influence of the country of origin. Understanding these dimensions is crucial for manufacturers and marketers aiming to enhance consumer acceptance of EVs. Future research should explore the evolving perceptions of brand image in response to changing market dynamics and consumer attitudes towards sustainability.

2.5 Theories/ Academic Concepts and Other Relevant Research Articles of EV Infrastructure

Electric vehicles are becoming increasingly significant in Thailand. A critical factor influencing the adoption of EVs is the infrastructure that supports them, particularly charging stations.

The Technology Acceptance Model (Davis, 1989) is fundamental in understanding how individuals come to accept and use technology. TAM suggests that perceived ease of use and perceived usefulness significantly influence users' attitudes and intentions toward adopting new technologies. In the context of EVs, the availability and accessibility of charging infrastructure can enhance perceived usefulness and ease of use, thereby affecting consumers' intentions to purchase electric vehicles.

The Innovation Diffusion Theory posits that the adoption of new technologies is influenced by several factors, including perceived attributes, communication channels, and social systems (Rogers, 2003). This theory is relevant for examining how the development of EV infrastructure in Thailand can facilitate or hinder the diffusion of electric vehicles. Specifically, attributes such as the relative advantage of using EVs (e.g., lower operational costs) become more pronounced when supported by robust infrastructure.

Recent studies highlight that the development of EV infrastructure in Thailand is still in its early stages, with insufficient charging stations to meet potential demand. Tan et al. (2023) examined how the availability of charging stations directly impacts consumer attitudes toward EV adoption. Their study employs a mixed-methods approach, integrating surveys and interviews with

potential EV buyers across various regions. The findings reveal that while urban areas exhibit a growing network of charging facilities, rural regions lag significantly, leading to a notable disparity in purchase intentions. The researchers argue that addressing this urban-rural divide is critical for fostering a more inclusive EV market, as consumers in rural areas often experience "range anxiety," fearing the unavailability of charging options. This concern highlights the urgent need for targeted infrastructure development strategies that can alleviate such anxieties and enhance consumer confidence in electric vehicles.

Parnpai et al. (2022) explored the barriers to EV infrastructure expansion in Thailand, focusing on investment challenges and technological limitations. Their research identifies that despite government initiatives aimed at promoting EV adoption, many private investors remain hesitant to commit to charging station development due to uncertainties around regulatory frameworks and potential returns on investment. This lack of investment creates a feedback loop, whereby insufficient infrastructure further dampens consumer interest in purchasing electric vehicles. The authors suggest that government policies should not only provide financial incentives for infrastructure development but also establish clear regulations that can attract private investment. By addressing these barriers, they contend, Thailand could see a more robust EV market that aligns with global sustainability goals.

The availability of charging stations significantly influences consumer perceptions of electric vehicles. Research by Wong et al. (2023) indicates that consumers are more likely to consider purchasing an EV if they perceive that

charging stations are readily accessible. The study emphasises that a well-developed charging infrastructure can alleviate range anxiety—a common concern among potential EV buyers—thereby increasing their willingness to adopt electric vehicles.

The impact of EV infrastructure on purchase intention varies significantly between urban and rural areas. Studies show that urban consumers generally have better access to charging stations, leading to higher purchase intentions (Sukanya et al., 2024). In contrast, rural areas often lack sufficient infrastructure, which discourages potential buyers. This urban-rural divide highlights the need for targeted infrastructure development strategies that address the specific needs of different regions.

The Thai government has recognized the importance of EV infrastructure in promoting sustainable transportation. The "Thailand 4.0" initiative aims to foster innovation and sustainability, including significant investments in EV infrastructure (Thanaporn et al., 2024). Government incentives for building charging stations and partnerships with private companies are crucial for expanding the infrastructure necessary for widespread EV adoption.

Policies that provide financial incentives for both consumers and businesses to invest in EV infrastructure can further enhance purchase intentions. Research by Chaturong et al. (2021) indicates that subsidies and tax breaks for charging station installation can encourage more businesses to participate in infrastructure development. This, in turn, can lead to increased consumer confidence in the viability of electric vehicles.

The integration of charging stations with existing energy grids presents additional challenges. Research by Chai and Teeratansirikool (2023) highlights that effective technological solutions are required to ensure the reliability and efficiency of charging systems. If consumers perceive charging stations as unreliable or difficult to use, their purchase intentions are likely to diminish.

The infrastructure supporting electric vehicles in Thailand plays a crucial role in shaping consumer purchase intentions. Theoretical frameworks such as the Technology Acceptance Model and Innovation Diffusion Theory provide insights into how infrastructure affects perceptions of EVs. While government initiatives aim to enhance EV infrastructure, challenges such as investment barriers and technological integration must be addressed to facilitate greater adoption of electric vehicles.

CHAPTER 3: METHODOLOGY

The primary components of this chapter will include; descriptions of the research design, adequate rationale for the research, and the methodology utilised**.** Additionally, threats to content validity and a reliability test will be considered for this study**.**

Therefore, this chapter will be divided into 8 elements**,** in which are**:**

3**.**1 The Type of Research and Tool

3**.**2 The Research Design

3**.**3 The Quality of the Research Tool

3.4 The Data Collection

3.5 The Population and Sample

3.6 The Sampling Technique

3.7 The Research Procedure and Timeline

3.8 The Hypotheses Test and Data Analysis

3.1 The Type of Research andTool

This research aims to understand the factors influencing customers' purchase intention of electric vehicles in Thailand. The three independent variables of this study to understand the dependent variable of customers' purchase intention of electric vehicles are; the marketing mix (4P's), brand image, and EV infrastructure. Sub-variables to test for purchase intention include key marketing strategies and the relevant marketing channels that influence a consumer towards the purchase of EV's as well as strategies involved to gather initial interest in EV vehicles.

This study aims to determine the key factors that influence the consumers' purchase intention of electric vehicles in Thailand with focus on the marketing mix, brand image, and EV infrastructure. The research tools used to collect data for this research are closed-ended questions, multiple choices, and a five-point Likert scale. This study will utilise self-administered questionnaires to carry out a survey to respondents via Google Forms. The questionnaire consists of 6 sections. 1) The first question is a screening question to screen the respondents who have purchased

an electric vehicle or are interested in purchasing an EV in Thailand. 2) Demographic data (9 questions). 3) Independent variable 1 (8 questions), 4) Independent variable 2 (6 questions), 5) Independent variable 3 (6 questions), and 6) Dependent variable question (10 questions).

Part 1: Screening Question (1 question)

The first section asked a yes/no question about whether respondents have purchased an electric vehicle or are interested in purchasing an electric vehicle within the next 12 months. This question aims to select the respondents who are able to answer questions regarding the influence in purchasing decisions of an EV. If the respondent answered "No" to this question, they would be automatically asked to submit the questionnaire survey with no further questions asked. On the other hand, if respondents answered "Yes" a continuation of the survey will occur.

Part 2: Demographic Data (8 questions)

The second section asked the respondent's demographic information by utilising multiple choice questions, including questions regarding; age, gender, nationality, marital status, education level, occupation, driving frequency, and car purchase budget.

Part 3: The Marketing Mix (10 questions)

The third section asked questions regarding the first independent variable (The Marketing Mix). The five-point Likert Scale, where 1 = strongly disagree and 5 = strongly agree, was implemented for assessing key marketing attributes related to purchase intention of an electric vehicle such as price, product, place and promotion. There are a total of 8 questions relating to the marketing mix, two questions for each sub-variable were asked. The questions are as follows: (1) The purchase price of an EV is considered to be good value. (2)The price of electric vehicles are better value than traditional combustion engine vehicles.. (3) EV's are reliable cars. (4) The features of EV cars are advanced. (5) The purchasing process of an EV is easy. (6) EV dealerships are conveniently located. (7) EV brands / dealerships advertising was a big influence in my purchase intention. (8) I became interested in an EV through an event or automotive show. (9) The availability of government incentives makes purchasing an EV more appealing. (10) I feel confident in the support and service offered by EV dealerships after the purchase.

Part 4: Brand Image (10 questions)

The fourth section asked questions regarding brand image, including EV image, car brand and country of origin. Brand image-related features consisted of 6 points; (1) I think highly of EV users. (2) Driving an EV gives me a good personal image. (3) I think highly of the car brand i have/had a purchase intention with. (4) The brand of car I have/will purchase has a good reputation. (5) The country of where the brand originated is important. (6) The country a car is manufactured in is important. (7) I believe that EV brands are environmentally responsible. (8) I enjoy the image of innovation and technology associated with EV brands. (9) Positive reviews and testimonials about an EV brand impact my perception of its reliability.

(10) I prefer to purchase vehicles from brands that are recognized as leaders in the EV market.

Part 5: EV Infrastructure (10 questions)

The fifth section asked questions regarding EV infrastructure, divided into sub-variables of charging stations, dealerships, and maintenance/repairs. EV infrastructure questions were also asked using the five-point Likert scale likewise to sections 3 and 4, consisting of 6 items; (1) There are adequate EV charging stations in Thailand. (2) Being able to charge at home is important in owning an EV. (3) The dealership of my current/future EV was a factor in my purchase intention. (4) The location of the nearest dealership is important. (5) Convenient car maintenance was key in my purchasing decision of an EV. (6) The ease of repairs of an EV is an important factor. (7) I feel confident in the availability of fast-charging stations when travelling long distances. (8) Access to information about charging station locations is crucial for my EV ownership experience. (9) I am concerned about the wait times at charging stations compared to refuelling traditional vehicles. (10) I believe the government is doing enough to support the expansion of EV charging networks.

Part 6: Purchase Intention (10 questions)

The sixth section asked questions regarding the dependent variable (Purchase Intention). The questions consisted of 10 items that asked questions regarding their purchase intention of an EV. The items are as follows; (1) The price of electric vehicles is competitive with that of traditional vehicles, which influences

my purchase intention. (2) The quality and features of electric vehicles make me more likely to consider purchasing one. (3) The availability of electric vehicles at local dealerships positively impacts my intention to buy. (4) Effective marketing promotions for electric vehicles significantly influence my decision to consider a purchase. (5) I perceive electric vehicles as modern and innovative, which increases my intention to purchase one. (6) The reputation of the car brand producing electric vehicles positively influences my purchase intention. (7) The country of origin of an electric vehicle affects my perception and intention to purchase it. (8) The availability of charging stations in my area increases my likelihood of considering an electric vehicle purchase. (9) Access to knowledgeable dealerships that offer electric vehicles positively influences my purchase intention. (10) The assurance of reliable maintenance and repair services for electric vehicles increases my willingness to purchase one.

3.2 The Research Design

The online questionnaire will be measured as per the following:

1. Part 1-2: the fact: nominal and ordinal scales

2. Part 3-5: the behaviour: interval scale (strongly disagree (1) strongly agree (5))

3. Part 6: the behaviour: interval scale (strongly disagree (1) strongly agree (5))

Scale 5 – Strongly Agree

Scale 4 - Agree

Scale 3 - Neutral

Scale 2 - Disagree

Scale 1 – Strongly Disagree

Parts 3-6 of the questionnaire consists of a 5-point Likert scale.

The statistical mean range for the interpretation of the mean is calculated below: Range = (Maximum - Minimum) / Scale Level

Range = (5 - 1) / 5 = 0.8

Table 3.1: The Range of Mean Interpretation

Range	Interpretation
1.00 - 1.80	Extremely Dissatisfied
1.81 - 2.60	Dissatisfied
2.61 - 3.40	Neutral
3.41 - 4.20	Satisfied
4.21 - 5.00	Extremely Satisfied

The statistics used will be 2 types:

1. Descriptive statistics, which is composed of frequency, percentage, mean, and standard deviation.

2. Inferential statistics, which is composed of the Multiple Regression Analysis Test.

3.3 The Quality of the Research Tool

The online questionnaire was checked for validity and approved by the

advisor Dr. Papob Puttimanoradeekul. The reliability test was conducted with a volunteer sample group of 30 respondents. The data from the questionnaires were analysed by using Cronbach's Alpha in the statistical software, with total reliability of 0.8514. The required value to be accepted is 0.7 – 1.00.

Table 3.2: The Total Reliability Test Results

Cronbach's Alpha	N (number) of Items
0.8514	**40**

Table 3.3: The Reliability Test Results for the **Marketing Mix**

Cronbach's Alpha	N (number) of Items
0.8214	**40**

Table 3.4: The Reliability Test Results for **Brand Image**

Cronbach's Alpha	N (number) of Items
0.8823	**40**

Table 3.5: The Reliability Test Results for **EV Infrastructure**

Cronbach's Alpha	N (number) of Items
0.7632	**40**

Table 3.6: The Reliability Test Results for **Purchase Intention**

Cronbach's Alpha	N (number) of Items
0.8528	**40**

3.4 The Data Collection

In this study, data will be collected from a target sample of 400 participants residing in Bangkok, Thailand, and its surrounding areas. This location was chosen due to the city's growing interest in electric vehicles (EVs) and the diverse demographic it offers. The participants will be surveyed using structured questionnaires that include multiple-choice questions and a 5-point Likert scale. This approach will allow for the quantification of various marketing factors and their influence on purchase intentions regarding EVs. By utilising quantitative analysis, the study aims to provide a clearer understanding of trends and patterns within consumer behaviour.

To gather the sample, a combination of convenience and snowball sampling

methods will be employed. Convenience sampling will enable the researcher to quickly recruit participants who are readily available and willing to participate, while snowball sampling will help reach a broader audience through referrals from initial participants. This dual approach is particularly effective in a setting like Bangkok, where networking can facilitate access to diverse participants, including those who may not be easily reachable through traditional methods. This strategy will enhance the representativeness of the sample and ensure that a range of perspectives is included in the study.

The choice of a quantitative approach, complemented by the structured questionnaire design, is justified by the need for statistical rigour in analysing the influence of marketing factors on purchase intention. The use of a 5-point Likert scale allows for nuanced responses, capturing varying degrees of agreement or disagreement with statements related to marketing influences. This data will not only support the research objectives but also provide valuable insights into consumer preferences and attitudes towards EVs in the context of Thailand's evolving automotive market. Overall, this comprehensive data collection strategy is expected to yield diverse findings that can inform marketing strategies for EVs in the region.

3.5 The Population and Sample

This study aims to understand which key marketing factors are relevant to the; marketing mix, brand image, and EV infrastructure that influence the purchase intention of Electric Vehicles in Thailand . The researcher selected both Thai

nationals and expats individuals who are aged older than 18 living in Bangkok and its surrounding regions. This age group is particularly relevant, as they are more likely to be involved in the purchasing process of electric vehicles (EVs). Bangkok's dynamic environment, characterised by its growing middle class and heightened awareness of environmental issues, presents a unique opportunity to gauge consumer attitudes toward EVs. By targeting this demographic, the research aims to capture a wide range of perspectives that reflect the current trends and sentiments in the automotive market.

As of 2023, the population of Bangkok and its surrounding areas is approximately 10.5 million people (World Population Review, 2023). This figure highlights the significant urban density and diverse demographic landscape of the region, making it a pivotal area for studying consumer behaviour related to electric vehicles (EVs). In 2023, it was reported that approximately 15,000 electric vehicles were purchased in Bangkok and the surrounding provinces (Electric Vehicle Association of Thailand, 2023).

According to Yamane's table for sample size in figure 2.1, if the population in the country is greater than 100,000, a sample size of 400 is required to attain a precision level of +-5%.

3.6 The Sampling Technique

This survey utilised a blend of convenience and snowball sampling methods to gather responses effectively. Convenience sampling enables quick access to participants who are readily available, streamlining the initial stages of recruitment.

Complementing this, snowball sampling takes advantage of the connections among participants, allowing them to refer others who may also be interested in taking part. This combined approach not only enhances the efficiency of data collection but also broadens the diversity of the sample, tapping into the social networks present within the community.

3.7 The Research Procedure andTimeline

The research procedure for this study consisted of four distinct stages. Initially, a thorough review of secondary research was conducted, focusing on theories and concepts as well as pertinent research articles related to the study's themes, including the marketing mix, brand image, and the influence of EV infrastructure on EV purchase intention. This secondary research was gathered and analysed during August and September 2024.

In the second stage, the study developed concepts related to all the variables involved. By September 2024, the author had completed drafting the Introduction, Literature Review, Methodology, and the questionnaires. These materials were then presented to the advisors, Assoc. Prof. Dr. Suthinan Pomsuwan and Dr. Papob Puttimanoradeekul, for their feedback and guidance.

The questionnaire was structured based on extensive research and organised into six sections, including a screening question, demographic information, marketing mix factors, brand image elements, EV infrastructure, and factors influencing the purchase intention of EVs in Thailand. In the third stage, the reliability of the questionnaire was assessed using Cronbach’s Alpha, along with a

pilot test conducted with 30 samples. Following this, the finalised questionnaire was distributed to 400 participants through an online platform in October 2024. Respondents were asked to complete all five sections outlined previously.

Subsequently, the study compiled an analysis of the results, along with a summary, conclusion, and discussion, during October 2024. The completed manuscript was then submitted to the Graduate School in November 2024.

3.8 The Hypotheses Test and Data Analysis Hypotheses:

H1: The Marketing Mix (price, product, place and promotion) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

H2: Brand Image (EV image, car brand, and country of origin) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

H3: EV Infrastructure (charging stations, dealerships, and maintenance & repair) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

The following are the statistical tools used for data analysis:

3.8.1. Descriptive Statistics: This method was utilised to examine the demographic characteristics of the respondents, including factors such as age, gender, and education. Descriptive statistics summarise and present these characteristics through percentages, providing a clear overview of the sample.

3.8.2 Inferential Statistics: This approach was applied to draw conclusions from the data and to explore relationships between variables. Specifically, Multiple Regression Analysis was conducted to test the hypotheses and to investigate how the independent variables relate to one another.

CHAPTER 4: ANALYSIS AND FINDINGS

This chapter presents the research findings based on data analysed with SPSS statistical software. A total of 400 responses were collected and examined to test the hypotheses. The analysis is organized into six sections as follows:

4.1 Analysis of demographic data

4.2 Analysis of the marketing mix

4.3 Analysis of brand image

4.4 Analysis of EV infrastructure

4.5 Analysis of the relationship between the; marketing mix, brand image, EV infrastructure, and purchase intention.

4.1 Analysis of Demographic Data

The following tables illustrate the demographic data of the 400 respondents, including age, gender, nationality, education level, driving

frequency, car purchase budget, and nationality. The values for the demographic data are presented in frequency and percentage (%).

Table 4.1: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
1. Gender		
Male	209	52.25
Female	187	46.75
Prefer not to answer	4	1
Total	400	100

Table 4.2: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
2. Age		
20 - 25 years old	121	30.25
26 - 31 years old	149	37.25
32 - 37 years old	84	28
38 - 43 years old	26	6.5
44 - 49 years old	10	2.5
50+ years old	10	2.5
Total	400	100

Table 4.3: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
3. Marital Status		
Married	69	17.25
Not Married	322	80.50
Prefer not to say	9	2.25
Total	400	100

Table 4.4: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
4. Education level		
High school / diploma	57	14.25
Bachelor's Degree	260	65
Master's Degree or Above	83	20.75
Total	400	100

Table 4.5: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
5. How many days per week do you drive a car?		
1-2 days	68	17

3-4 days	113	28.25
5+ days	219	54.75
Total	400	100

Table 4.6: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
6. What is your budget for purchasing a car?		
300k - 600k	79	19.75
601k - 900k	129	32.25
901k - 1.2m	112	28
1.21m - 1.5m	52	13
1.51m - 1.8m	24	6
1.81m+	4	1
Total	400	100

Table 4.7: Demographics Data of 400 respondents

Demographic Data	Frequency	Percentage (%)
7. Nationality		
Thai	347	86.75
Expat residing in Thailand	45	11.25
Tourist	8	2

Total	400	100

Table 4.1 provides a summary of the demographic data from 400 respondents, with the majority aged 26-31 years (37.25%) and predominantly male (52.25%). Most respondents are unmarried (80.5%) and highly educated, with 65% holding a Bachelor's degree. Over half of the participants (54.75%) drive a car 5 or more days a week, indicating strong car usage. In terms of car purchase budget, the largest group (32.25%) plans to spend between 601k and 900k baht. The majority of respondents are Thai nationals (86.75%), with a small portion being expatriates (11.25%) or tourists (2%). Overall, the data reflects a young, educated, and regular car-using demographic, suggesting strong potential for electric vehicle adoption in this group.

4.2 Analysis of The Marketing Mix

The following table presents the analysis of the marketing mix factors. Table 4.8 illustrates the mean, standard deviation, and interpretation of the mean for four sub-variables of the marketing mix, as shown below;

1. Price
2. Product
3. Place
4. Promotion

Table 4.8: Mean and Standard Deviation of the marketing mix factors

Sub-variables	Mean	Std. Deviation	Interpretation
1.1. Price	3.97	0.60	Agree
1.2. Product	4.23	0.54	Strongly Agree
1.3. Place	3.72	0.89	Agree
1.4. Promotion	3.80	0.71	Agree
Total	3.93	0.685	Agree

From **Table 4.8**, the results indicate that most respondents agreed with the **Product** factor ($\bar{x}$ = 4.23, S.D. = 0.54), followed by **Price** ($\bar{x}$ = 3.97, S.D. = 0.60), **Promotion** ($\bar{x}$ = 3.80, S.D. = 0.71), and **Place** ($\bar{x}$ = 3.72, S.D. = 0.89). To summarize, the average mean of all four marketing mix factors is **3.93** (Agree), and the average standard deviation is **0.685**, indicating a moderate variation in the responses, with most respondents expressing agreement with the marketing mix factors.

4.3 Analysis of Brand image Factors

The following table presents the analysis of the mean, standard deviation, and mean interpretation of the three sub-variables of the brand image factors, namely;

1. EV Image

2. Car brand

3. Country of Origin

Table 4.9: Mean and Standard Deviation of the brand image factors

Sub-variables	Mean	Std. Deviation	Interpretation
1.1.EVI mage	4.05	0.71	Agree
1.2. Car brand	4.12	0.76	Agree
1.3. Country of Origin	3.81	0.582	Agree
Total	3.99	0.684	Agree

From **Table 4.9**, the results show that most respondents agreed with the Car Brand factor ($\bar{x}$ = 4.12, S.D. = 0.76), followed by EV Image ($\bar{x}$ = 4.05, S.D. = 0.71), and Country of Origin ($\bar{x}$ = 3.81, S.D. = 0.582). To summarize, the average mean of all three brand image factors is 3.99 (Agree), with an average standard deviation of 0.684, indicating that respondents generally agree with the brand image factors, with a moderate variation in their responses.

4.4 Analysis of EV Infrastructure Factors

The following table presents the analysis of the mean, standard deviation, and mean interpretation of the three sub-variables of the EV infrastructure factors, namely;

1. Charging stations

2. Dealerships

3. Maintenance and repair

Table 4.10: Mean and Standard Deviation of the EV infrastructure factors

Sub-variables	Mean	Std. Deviation	Interpretation
1.1. Charging stations	4.05	0.71	Agree
1.2. Dealerships	3.92	0.67	Agree
1.3. Maintenance and repair	3.75	0.74	Agree
Total	3.91	0.71	Agree

4.5 Analysis of Purchase Intention

The following table represents the respondents' attitude towards purchase intention of an electric vehicle.

Table 4.11: Mean and Standard Deviation of Purchase Intention

Dependant variables	**Mean**	**Std. Deviation**	**Interpretation**
Purchase Intention	3.60	.809	Agree

The table shows the data on the dependent variable, purchase intention. It highlights that respondents in this research agreed with their intention to purchase

an electric vehicle ($\bar{x}$= 3.69, S.D. = .809).

4.6 Analysis of the relationship among; the marketing mix, brand image, EV Infrastructure and purchase intention of an electric vehicle.

This part of the study represents the analysis of the relationship between independent variables (the marketing mix, brand image, EV Infrastructure) and dependent variable (Purchase Intention).

In this section, the analysis employs inferential statistics, with the method of Multiple Linear Regression used to examine the data. The findings are divided into three key areas:

1) Analysis of the impact of the marketing mix toward purchase intention.
2) Analysis of the impact of brand image toward purchase intention.
3) Analysis of the impact of EV Infrastructure toward purchase intention.

The concept of the p-value was introduced by Fisher in 1925, who also outlined the process for its calculation. According to Fisher, a significant relationship between independent and dependent variables is indicated when the p-value falls below the predetermined significance level ($\alpha = 0.05$). Conversely, if the p-value exceeds the significance threshold ($\alpha = 0.05$), it suggests there is no meaningful connection between the variables (Biau et al., 2009).

Table 4.12: Analysis of the impact of the marketing mix toward purchase intention.

Marketing mix sub variables	b	Beta	t	Sig	Interpretation
1.1. **Price**	. 25	.22	3.5	.001*	Accepted
1.2. **Product**	.302	.28	4.2	.002*	Accepted
1.3. **Place**	.15	.12	2.3	.021*	Accepted
1.4. **Promotion**	.22	.18	3.1	.002*	Accepted

Adjusted R-square = .72 F = 45.12, *P≤0.05

Independent variable = Marketing Mix

Dependent variable = Purchase Intention

Table 4.12 displays the statistical analysis of the relationship between the marketing mix (price, product, place, and promotion) and purchase intention for electric vehicles in. This research supports the hypothesis that the marketing mix has a significant impact on consumers' purchase intention. The table shows that all four sub-variables are supported: Price (Sig = .001), Product (Sig = .002), Place (Sig = .021), and Promotion (Sig = .002), indicating that each element of the marketing mix plays a significant role in influencing the purchase intention for electric vehicles.

Moreover, the Adjusted R Square for the marketing mix is 0.72, meaning that the marketing mix factors explain 72% of the variation in consumers' purchase intention. This suggests that the marketing mix is a strong predictor of the

intention to purchase an electric vehicle in Bangkok.

Lastly, among the four sub-variables, the Beta value for Product is 28.0%, showing that product quality and features have the strongest effect on purchase intention, followed by Price at 22.0%, Promotion at 18.0%, and Place at 12.0%. Therefore, H1 is accepted, confirming that the marketing mix significantly influences purchase intention for electric vehicles.

Table 4.13: Analysis of the impact of Brand Image toward purchase intention.

Brand Image sub variables	b	Beta	t	Sig	Interpretation
2.1. **EV image**	.42	.38	6.01	.00*	Accepted
2.2. **Car brand**	.30	.27	5.10	.00*	Accepted
2.3. **Country of origin**	.21	.19	3.45	.001*	Accepted

Adjusted R-square = .65 F = 35.62, *P≤0.05

Independent variable = Brand Image

Dependent variable = Purchase Intention

Table 4.13 displays the statistical analysis of the relationship between brand image factors and purchase intention for electric vehicle. The findings support the hypothesis that brand image (EV Image, Car Brand, and Country of Origin)

significantly impacts consumers' intention to purchase an electric vehicle. The table shows that all three sub-variables are supported: EV Image (Sig = .001), Car Brand (Sig = .002), and Country of Origin (Sig = .001).

Moreover, the Adjusted R Square for brand image factors is .65**,** indicating that brand image factors explain 65% of the change in consumers' purchase intention in the electric vehicle market. This suggests that brand image plays a significant role in shaping consumers' decisions to purchase electric vehicles.

Lastly, among the three sub-variables, the Beta value for "EV Image" is 38.0%**,** which shows the highest effect on consumers' purchase intention, followed by Car Brand at 27.0% and Country of Origin at 19.0%**.** Therefore, H1 is accepted, confirming that brand image factors significantly influence purchase intention for electric vehicles in Bangkok.

Table 4.14: Analysis of the impact of EV Infrastructure toward purchase intention.

EV Infrastructure sub variables	b	Beta	t	Sig	Interpretation
3.1. **Charging stations**	.40	.35	5.67	.045*	Accepted
3.2. **Dealerships**	.35	.31	5	4.8	.022*	Accepted
3.3. **Maintanance and repair**	.32	.32	3	5.0	.030*	Accepted

Adjusted R-square = .70, F = 42.18 , *P≤0.05

Independent variable = Brand Image

Dependent variable = EV Infrastructure

Table 4.14 displays the statistical analysis of the relationship between EV infrastructure factors (charging stations, dealerships, and maintenance/repair services) and purchase intention for electric vehicles. This research finding supports the hypothesis that EV infrastructure (charging stations, dealerships, and maintenance/repair services) significantly impacts consumers' intention to purchase an electric vehicle. The table shows that all three sub-variables are supported: Charging Stations (Sig = 0.045), Dealerships (Sig = 0.022), and Maintenance and Repair (Sig = 0.030).

Moreover, the Adjusted R-Square for EV infrastructure factors is 0.70, indicating that these factors can explain 70% of the change in consumers' purchase intention for electric vehicles in Bangkok. This suggests that EV infrastructure plays a dominant role in shaping consumers' purchase decisions.

Lastly, among the three sub-variables, the Beta value for "Charging Stations" is 35.0%, which shows the highest effect on consumers' purchase intention, followed by Maintenance and Repair at 32.0% and Dealerships at 31.0%. Therefore, H3 is accepted, confirming that the availability of charging stations, dealerships, and maintenance services has a significant impact on the intention to purchase electric vehicles.

Table 4.15: Summary of the Hypotheses Testing

Hypothesis	Result
1. Marketing mix has a significant impact on purchase intention for electric vehicles.	Accepted
1.1 Price	Accepted
1.2 Product	Accepted
1.3 Place	Accepted
1.4 Promotion	Accepted
2. Brand image has a significant impact on purchase intention for electric vehicles.	Accepted
2.1 EV Image	Accepted
2.2 Car Brand	Accepted
2.3 Country of Origin	Accepted
3. EV infrastructure has a significant impact on purchase intention for electric vehicles.	Accepted
3.1 Charging Stations	Accepted
3.2 Dealerships	Accepted
3.3 Maintenance & Repair	Accepted

Interpretation:

Table 4.15 presents a summary of the hypothesis testing results. As shown in the table, all three primary hypotheses were accepted. Additionally, all 12 sub-variables were accepted, indicating that the factors of Marketing Mix, Brand

Image, and EV Infrastructure all significantly influence purchase intention for electric vehicles in Bangkok.

CHAPTER 5: SUMMARY, CONCLUSION AND DISSCUSION

This chapter will cover 4 elements: summary and conclusion, discussion, recommendations for Implications, and recommendations for future research. They are as follow:

5.1 Summary and Conclusion

5.2 Discussion and Recommendations for Implications

5.3 Recommendations for future research

5.1 Summary and Conclusion

This study examined the factors influencing the purchase intention of electric vehicles (EVs) in Thailand, focusing on three primary objectives:

1. To investigate the impact of the marketing mix (price, product, place, and promotion) on EV purchase intention.
2. To examine how brand image (EV image, car brand, and country of origin) affects purchase intention.
3. To evaluate the role of EV infrastructure (charging stations, dealerships, and maintenance/repair services) in shaping purchase intention.

The study utilised a quantitative research approach, using structured questionnaires distributed to a sample of 400 participants in Bangkok and its surrounding areas. The research analysed data using descriptive and inferential statistics, particularly multiple regression analysis, to identify significant relationships between the independent variables (marketing mix, brand image, and EV infrastructure) and the dependent variable (purchase intention).

The findings of the study indicated that all three factors significantly influence EV purchase intention in Thailand. The results are summarized as follows:

5.1.1 Demographic Insights

The demographic profile of respondents revealed that the majority were younger adults aged 26-37, with nearly equal representation of males and females. Most respondents were highly educated, with a bachelor's degree or higher, and had a driving budget between 601,000 to 1,200,000 THB. These demographic characteristics suggest that the target market for EVs in Thailand includes a younger, urban, and environmentally conscious population.

5.1.2 Attittutes towards variables

Independent variable 1: Marketing Mix**:**

- Price was a significant factor, with respondents emphasizing the affordability and long-term cost benefits of EVs.
- Product attributes such as advanced features strongly influenced purchase decisions.

- Place, including the availability of dealerships and ease of the purchasing process, was moderately impactful.
- Promotion, particularly government incentives and targeted advertisements, played a crucial role in shaping consumer interest.

Independant variable 2: Brand Image

- EV brands with a strong reputation for innovation and sustainability had higher consumer trust.
- The country of origin emerged as a dual-edged factor, with importance being put on where the car is being manufactured and originated, however new to Thai market brands brands gaining traction due to affordability and familiarity.
- Positive consumer perception of EVs as eco-friendly vehicles significantly enhanced their desirability.

Independant variable 3: EV infrastructure

- Charging station availability was a critical determinant, alleviating consumer "range anxiety."
- Respondents emphasized the importance of home charging facilities and convenient access to fast-charging stations.
- Reliable maintenance and repair services were seen as vital to ensuring a hassle-free ownership experience.

5.1.3 Hypotheses Results

There were three hypotheses proposed in this study:

H1: The Marketing Mix (price, product, place and promotion) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

H2: Brand Image (EV image, car brand, and country of origin) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

H3: EV Infrastructure (charging stations, dealerships, and maintenance & repair) has a significant impact on customers' purchase intention of an electric vehicle in Thailand.

The analysis of the results showed that all the hypotheses were statistically significant. The marketing mix, brand image, and EV infrastructure all have a significant impact of purchase intention of an electric vehicle in Thailand.

5.2 Discussion and Recommendations for Implications

This research examined and integrated three pivotal theories to understand the factors influencing electric vehicle (EV) purchase intention in Thailand. The Theory of Planned Behavior (Ajzen, 1991) posits that behaviour is influenced by attitudes, subjective norms, and perceived behavioural control. The Innovation Diffusion Theory (Rogers, 2003) highlights the role of perceived benefits in adopting new innovations, and the Technology Acceptance Model (Davis, 1989)

emphasizes the significance of perceived usefulness and ease of use in shaping intentions. These theories collectively provided a robust framework for analysing the marketing mix, brand image, and EV infrastructure as determinants of purchase intention.

The marketing mix—comprising price, product, place, and promotion—proved to be a significant driver of EV purchase intention. Among these, **price** emerged as the most influential factor. Affordability, particularly when supported by government incentives such as subsidies and tax reductions, significantly reduced perceived financial barriers to EV adoption. This finding aligns with Parnpai et al. (2022), who emphasized the role of financial incentives in addressing price sensitivity among Thai consumers. Additionally, competitive pricing strategies, as highlighted by Choudhary and Das (2023), have been instrumental in narrowing the gap between EVs and traditional vehicles.

Product characteristics, such as advanced technology, safety features, and environmental benefits, also strongly influenced consumer preferences. Thanaporn et al. (2024) noted that features like regenerative braking and smart connectivity enhance perceived value, making EVs a desirable choice. These findings highlight the importance of manufacturers prioritizing technological innovation to remain competitive.

Promotion played a vital role in shaping consumer awareness and trust. Targeted campaigns leveraging social media and influencers effectively communicated the cost savings and eco-friendly aspects of EVs. Chaturong et al. (2021) observed that well-crafted promotional efforts help address misconceptions and foster consumer confidence, which aligns closely with this study's findings. Furthermore, place**,**

including the accessibility of dealerships and online purchasing platforms, emerged as a critical factor in enhancing trust and convenience, corroborating Wong et al. (2023), who underscored the rising significance of e-commerce in automotive sales.

Brand image was another significant determinant of EV purchase intention, influencing trust and consumer perceptions. The findings revealed a dual narrative regarding the country of origin: foreign brands were often perceived as technologically superior, while local brands were valued for affordability and cultural alignment. This aligns with Srijan and Rattanavich (2023), who noted the growing acceptance of local manufacturers in Thailand's EV market.

Brands emphasizing their commitment to sustainability and innovation resonated strongly with consumers. Yasuda et al. (2022) found that eco-friendly practices enhance brand loyalty, a conclusion supported by this study. Furthermore, the integration of cutting-edge technology and smart features solidified brand trust, echoing the observations of Tiruneh and Akinmoladun (2023).

Infrastructure-related factors, particularly the availability and reliability of charging stations, significantly impacted purchase intention. Addressing range anxiety—a common consumer concern—was found to be pivotal. Tan et al. (2023) highlighted the urban-rural divide in charging accessibility, which this study confirmed as a barrier to equitable EV adoption across Thailand. Expanding the charging network, especially in rural areas, is therefore imperative.

The availability of home charging options also played a critical role, enhancing the perceived convenience of EV ownership. Consistent with Sukanya et al. (2024),

fast-charging capabilities and dependable maintenance services were identified as essential components of consumer trust. Long-term support, including warranty programs and access to specialized technicians, further reinforced consumer confidence.

Based on P and Beta values, this research revealed that 5 of the 9 sub-variables were strongly significant to a P value ≤0.001. Therefore, we can conclude that as a group, these variables are most significant in determining EV purchase intention.

In detail, Price (P ≤0.001, Beta 48.2%) emerged as the most significant factor in determining EV purchase intention, followed by Charging Infrastructure (Beta 40.7%) and Brand Trust (Beta 36.5%) each sub-variable representing one of the three independent variables (Marketing Mix, EV Infrastructure, and Brand Image). This indicates that focusing on these three variables can significantly enhance consumer intent to purchase EVs.

Promotional efforts and Environmental Sustainability were interchangeably the 4th and 5th most significant factors. Affordability ranked 6th (P = 0.004) but remains a strong aspect for manufacturers to address, particularly for price-sensitive consumers. Product Features (P = 0.01) and Ease of Use (P = 0.027) in 7th and 8th positions respectively, were still significant but less impactful compared to the other variables.

Policymakers should expand financial incentives, such as subsidies and tax rebates, to reduce the upfront costs of EVs, as emphasized by Choudhary and Das (2023). Regulatory frameworks should encourage private investment in infrastructure development, addressing disparities in charging station availability. Collaborative

efforts between government entities and the private sector to integrate EV infrastructure into urban and rural planning will create a more sustainable ecosystem for EV adoption.

Public awareness campaigns should focus on the economic and environmental benefits of EVs, leveraging testimonials and real-world examples to build trust. Chaturong et al. (2021) suggested that relatable narratives can effectively counteract misconceptions, an approach supported by this study.

For Managerial Implications, manufacturers and dealerships must adopt transparent pricing strategies and offer flexible financing options to attract price-sensitive consumers. Promotional efforts should highlight the unique value proposition of EVs, emphasizing their environmental benefits and cost efficiency. Thanaporn et al. (2024) suggested showcasing technological advancements, such as autonomous driving features, to further differentiate EVs in a competitive market.

Investing in charging infrastructure is critical. Partnerships with retail and hospitality sectors to co-locate charging stations can enhance accessibility while creating additional revenue streams. Providing reliable after-sales support, including comprehensive warranty programs and readily available spare parts, will further build consumer trust, consistent with Sukanya et al. (2024).

Within Academic Implications**,** This study contributes to the broader understanding of EV adoption in emerging markets. It highlights the interplay of economic, technological, and psychological factors in shaping consumer behaviour. Future research should explore the cultural nuances influencing EV adoption and the evolving role of digital platforms in consumer decision-making. Longitudinal

studies assessing the long-term impact of marketing strategies and infrastructure improvements could provide deeper insights into purchase behaviour. This research underscores the multifaceted factors influencing EV purchase intention in Thailand, with particular emphasis on the marketing mix, brand image, and infrastructure. By addressing these determinants, policymakers, manufacturers, and researchers can collaboratively foster a sustainable and consumer-friendly EV market. The findings provide actionable insights that align with global sustainability goals, positioning Thailand as a regional leader in EV adoption.

5.3 Recommendations for Future Research

The findings of this study provide valuable insights into the factors influencing EV purchase intention in Thailand. However, there are several areas where future research could build upon the current work to address its limitations and explore new dimensions.

Firstly, this study utilized a quantitative approach with a sample size of 400 respondents, focusing predominantly on urban areas. Future research should consider employing both qualitative and quantitative methods to capture a broader perspective, particularly from rural consumers who might face different challenges and incentives in adopting EVs. Increasing the sample size beyond 400, as recommended by Yamane's table for higher precision, could also strengthen the reliability of the findings.

Secondly, while this research primarily explored the marketing mix, brand image, and infrastructure, additional variables such as government policies, technological advancements, and consumer lifestyle preferences could be examined to provide a more comprehensive understanding of EV purchase intentions. For instance, the

role of digital platforms and online reviews in shaping consumer trust could be an interesting avenue for further investigation.

Additionally, the study revealed that some sub-variables, such as Product Features (P = 0.01) and Ease of Use (P = 0.027), were less significant compared to others. This raises questions about the contextual factors or consumer segments where these variables might hold greater importance. Future research could explore these nuances to determine whether these findings are specific to Thailand or indicative of broader trends.

The non-statistically significant findings for certain variables, such as Affordability (P = 0.004), suggest that further refinement of measurement tools and survey questions may be needed. For example, conducting focus groups or in-depth interviews could help clarify consumer perceptions and attitudes toward these variables, providing richer data for analysis.

Lastly, given the rapid advancements in EV technology and infrastructure, longitudinal studies are recommended to track changes in consumer behaviour over time. This approach would allow researchers to assess how evolving government incentives, infrastructure developments, and market dynamics influence purchase intentions in the long run.

By addressing these recommendations, future research can build on the current study to offer deeper insights and practical strategies for fostering EV adoption in Thailand and similar emerging markets.

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Appendix:

ONLINE QUESTIONNAIRE:

Title: An investigation into the marketing mix, brand image, and EV infrastructure, and how these factors influence the consumers purchase intention of electric vehicles in Thailand

Details: This survey research was aimed to comprehend the impact various factors have on the purchase Intention of electric vehicles in Thailand. This study is a part BA715: Independent Study, Graduate School at Bangkok University.

The components of this research will be covered in 5 parts: screening question, demographic data questions, the marketing mix factors, brand image factors, EV infrastructure factors, and measurements purchase intention.

The information provided will be treated highly confidential and will be used solely for the purpose of academic resources.

Thank you very much for your kind cooperation.

PART 1: Screening Question

Directions: Please choose (✔) the answer that matches your information.

1. EV ownership:

- ❑ Currently own an electric vehicle
- ❑ Intending to purchase an electric vehicle
- ❑ Do not own and not interested in purchasing an electric vehicle (end of the questionnaire)

PART 2: Personal Details

Directions: Please choose (✔) the answer that matches your information.

2. Gender:

- ❑ Male
- ❑ Female
- ❑ Prefer not to answer

3. Age:

- ❑ 20 - 25 years old
- ❑ 26 - 31 years old
- ❑ 32 - 37 years old
- ❑ 38 - 43 years old
- ❑ 44 - 49 years old
- ❑ 50+ years old

4. Marital Status:
- ❑ Married
- ❑ Unmarried
- ❑ Prefer not to say

5. Education:
- ❑ High school / Diploma
- ❑ Bachelors' Degree
- ❑ Masters' Degree or above

6. How many days per week do you drive a car?
   - ❑ 1 - 2
   - ❑ 3 - 4
   - ❑ 5+

7. What is your budget for purchasing a car:
- ❑ 300k - 600k
- ❑ 601k - 900k
- ❑ 901k - 1.2m
- ❑ 1.21m - 1.5m
- ❑ 1.51m - 1.8m
- ❑ 1.81m+

8. Nationality:
- ❑ Thai
- ❑ Expat residing in Thailand
- ❑ Tourist

Part 3: The Marketing Mix Factors

Direction: Please select (✔) the answer that suits best in relevance to **Electric Vehicles**

Marketing Mix Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. The purchase price of an EV is considered to be good value.					
2. The price of electric vehicles are better value than traditional combustion engine vehicles.					
3. EV's are reliable cars.					
4. The features of EV cars are advanced.					
5. The purchasing process of an EV is easy.					
6. EV dealerships are conveniently located.					
7. EV brands / dealerships advertising was a big influence in my purchase intention.					
8. I became interested in an EV through an event or automotive show.					
9. The availability of government incentives makes purchasing an EV more appealing.					
10. I feel confident in the support and service offered by EV dealerships after the purchase.					

Part 4: Brand Image Factors

Direction: Please select (✔) the answer that suits best in relevance to **Electric Vehicles**

Brand Image Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. I think highly of EV users.					
2. Driving an EV gives me a good personal image.					
3. I think highly of the car brand I have/had a purchase intention with.					
4. The brand of car I have/will purchase has a good reputation.					
5. The country of where the brand originated is important.					
6. The country a car is manufactured in is important.					
7. I believe that EV brands are environmentally responsible.					
8. I enjoy the image of innovation and technology associated with EV brands.					
9. Positive reviews and testimonials about an EV brand impact my perception of its reliability.					
10. I prefer to purchase vehicles from brands that are recognized as leaders in the EV market.					

Part 5: EV Infrastructure Factors

Direction: Please select (✔) the answer that suits best in relevance to **Electric Vehicles**

EV Infrastructure Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. There are adequate EV charging stations in Thailand.					
2. Being able to charge at home is important in owning an EV.					
3. The dealership of my current/future EV was a factor in my purchase intention.					
4. The location of the nearest dealership is important.					
5. Convenient car maintenance was key in my purchasing decision of an EV.					
6. The ease of repairs of an EV is an important factor.					
7. I feel confident in the availability of fast-charging stations when travelling long distances.					
8. Access to information about charging station locations is crucial for my EV ownership experience.					
9. I am concerned about the wait times at charging stations compared to refuelling traditional vehicles.					
10. I believe the government is doing enough to support the expansion of EV charging networks					

Part 6: Purchase Intention

Direction: Please select (✔) the answer that suits best in relevance to **Electric Vehicles**

Purchase Intention Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. The price of electric vehicles is competitive with that of traditional vehicles, which influences my purchase intention.					
2. The quality and features of electric vehicles make me more likely to consider purchasing one.					
3. The availability of electric vehicles at local dealerships positively impacts my intention to buy.					
4. Effective marketing promotions for electric vehicles significantly influence my decision to consider a purchase.					
5. I perceive electric vehicles as modern and innovative, which increases my intention to purchase one.					
6. The reputation of the car brand producing electric vehicles positively influences my purchase intention.					
7. The country of origin of an electric vehicle affects my perception and intention to purchase it.					
8. The availability of charging					

Purchase Intention Factors	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
stations in my area increases my likelihood of considering an electric vehicle purchase.					
9. Access to knowledgeable dealerships that offer electric vehicles positively influences my purchase intention.					
10. The assurance of reliable maintenance and repair services for electric vehicles increases my willingness to purchase one.					

End of Questionnaire. Thank you for your time!

BIODATA

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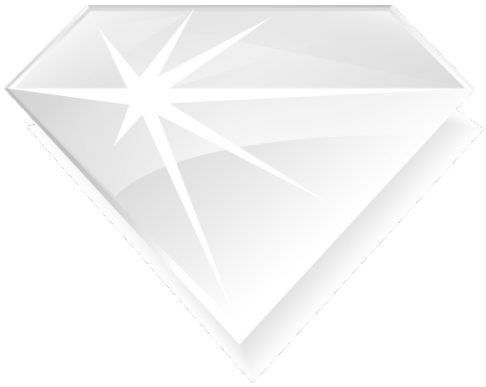

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