ANALYZING THE DRIVERS OF GREEN PRODUCT ADOPTION IN BANGKOK, THAILAND: A FOCUS ON ELECTRIC VEHICLES TRANSPORTATION

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Analyzing the Drivers of Green Product Adoption in Bangkok, Thailand: A Focus on Electric Vehicles Transportation

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ABSTRACT

Title : Analyzing the Drivers of Green Product Adoption in Bangkok, Thailand: A Focus on Electric Vehicles Transportation

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This study investigated the drivers of green product adoption in Bangkok, Thailand, focusing on electric vehicle (EV) adoption. The transition to EVs was seen as crucial for reducing carbon emissions and promoting environmental sustainability. This was especially important due to growing urbanization and air quality concerns in Thailand. The research explored the impact of product information availability, persuasive advertising, and the Technology Acceptance Model (TAM) on consumer decision-making.

The study aimed to assess how product information availability and persuasive advertising influenced consumer attitudes toward EVs. It also analyzed how these factors, along with TAM, affected decision-making regarding EV adoption. Additionally, the study sought to develop a model that integrated these elements to promote EV adoption in Bangkok, Thailand. Data were collected from 901 respondents with experience in driving, purchasing, or researching EVs. The data were analyzed using Confirmatory Factor Analysis (CFA), multiple linear regression, path analysis, and Structural Equation Modeling (SEM), employing SPSS version 27.0 and AMOS version 24.0.

The results showed several significant findings. Product Information Availability positively influenced Consumer Decision Making ($\beta = 0.415^{***}$). Persuasive Advertising also had a positive impact on decision-making ($\beta = 0.502^{***}$). Both factors affected

also had a positive impact on decision-making (β = 0.502***). Both factors affected decision-making through key TAM constructs. Product Information Availability influenced decision-making through Perceived Usefulness (β = 0.594***), Perceived Ease of Use (β = 0.581***), and Perceived Risk (β = 0.448***). Persuasive Advertising affected decision-making through Perceived Usefulness (β = 0.689***), Perceived Ease of Use (β = 0.685***), and Perceived Risk (β = 0.503***).

These findings highlighted the importance of clear, accessible information and targeted advertising in shaping consumer attitudes toward EV adoption in Thailand. The study provided valuable insights for academia, businesses, and policymakers. It highlighted the need for effective marketing, consumer education, and collaboration in developing EV infrastructure. The research also advocated for policies that incentivized EV adoption and expanded charging infrastructure, drawing on successful models from countries like Norway and China.

Keywords: Electric Vehicles, Green Product Adoption, Consumer Behavior, Technology Acceptance Model, EV Adoption in Thailand

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Dare Oluwatobi Adekoya
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CHAPTER 1

INTRODUCTION

The main aim of this chapter is to present the key drivers that influence the willingness of Thai consumers to embrace electric vehicles. These drivers include the accessibility of product information, persuasive advertising, and the Technology Acceptance Model (TAM). After introducing the topic, the specific research goals will be outlined, detailing the precise focus of the study. The research structure will then be thoroughly described, clarifying the theoretical and conceptual foundations that support the analysis. Lastly, the chapter will conclude with a discussion of the research definition and the significance of the study in both academic and practical contexts. The final section will emphasize the study's relevance, highlighting its potential contributions to the field and its impact on guiding policy and practice regarding electric vehicle adoption.

Statement of the problem

The global shift toward sustainable consumption has intensified interest in electric vehicles (EVs) as viable alternatives to internal combustion engine vehicles. In Thailand, although the government has introduced policy incentives and strategic frameworks to accelerate EV adoption, the actual market penetration remains relatively low. This slow uptake is particularly concerning given Thailand's role as a major automotive hub in Southeast Asia and its commitment to reducing greenhouse gas emissions (Bakhtyar, Qi, and Azam, 2023). While global success stories from countries like Norway, China, and the United States highlight how infrastructure investments, financial incentives, and public awareness campaigns have significantly advanced EV adoption (Ali et al., 2022; Li et al., 2023; U.S. Department of Energy, 2021), Thailand’s progress is hindered by a unique combination of infrastructural, socioeconomic, cultural, and behavioral barriers.

Among the most pressing challenges are the limited availability of charging infrastructure, high initial purchase costs, and persistent consumer skepticism concerning EV performance and reliability (Thananusak et al., 2017; Toolib, 2023). Additionally,

marketing and communication efforts often fail to effectively convey the advantages of EVs or address the doubts and misconceptions held by Thai consumers (Tan and Lau, 2010; Toolib, 2023). Accurate product information and persuasive advertising, two critical elements of marketing, are not being fully leveraged to influence consumer perceptions and decisions. Despite the importance of these variables, there is a noticeable lack of empirical studies that integrate them within theoretical frameworks that explain technology adoption behavior. The Technology Acceptance Model (TAM), which has been widely used to understand consumer adoption of new technologies, offers a valuable lens through which to examine EV acceptance. However, the application of TAM in the context of EV adoption in Thailand remains underexplored. Specifically, there is limited research that incorporates marketing-related constructs, such as product information and advertising appeal, into the TAM framework to assess their impact on consumer attitudes and behavioral intentions toward EVs in the Thai context (Davis et al., 1989; Venkatesh and Xu, 2012).

This research gap highlights the need for a comprehensive, context-specific analysis of the drivers of EV adoption in Thailand. Addressing this gap is essential for several reasons. First, it can provide empirical evidence on how perceptions of usefulness and ease of use, the core constructs of the Technology Acceptance Model (TAM), combined with marketing strategies, influence consumer decision-making (Yıldız and Sever, 2022). Second, the findings can inform more effective policy and marketing interventions aimed at increasing public acceptance of EVs (Tan and Lau, 2010). Third, it supports Thailand's broader environmental goals by identifying actionable strategies that promote the transition to greener modes of transportation (Gillingham, 2022; Zameer and Yasmeen, 2022). Therefore, this study seeks to critically examine the influence of product information and persuasive advertising on Thai consumers' acceptance of EVs through the lens of the Technology Acceptance Model. By doing so, it contributes to both theoretical advancement and practical knowledge, supporting stakeholders in designing targeted strategies that promote sustainable transportation and align with national and global sustainability objectives (Hardman et al., 2018; Hsu et al., 2021).

Research Objectives

1. To study the influence of product information availability, persuasive advertising and TAM on consumer attitudes towards EVs in Bangkok,Thailand.
2. To analyze the impact of product information availability, persuasive advertising, TAM on consumer decision making regarding the adoption of electric vehicles in Bangkok, Thailand.
3. To seek a comprehensive model for promoting the adoption of EVs in Bangkok, Thailand, integrating factors such as product information availability, persuasive advertising, the TAM, and to consumer decision making process.

Research Questions

1. How does product information availability, persuasive advertising and TAM influence consumer attitudes towards EVs in Bangkok, Thailand?
2. What is the impact of product information availability, persuasive advertising, and the TAM and to consumer decision making regarding the adoption of EVs in Bangkok, Thailand?
3. How can a comprehensive model integrating factors such as product information availability, persuasive advertising, the TAM, and the consumer decision making process be developed to promote the adoption of EVs in Bangkok, Thailand?

Backgrounds of the study

The transport sector is undergoing a significant change as it moves toward electric vehicles, prompted by the need to address environmental issues and lessen dependence on fossil fuels. This shift represents a worldwide movement towards sustainable practices, influenced by innovations in technology, encouraging governmental policies, and a growing awareness among consumers about environmental matters. As nations across the globe emphasize the importance of sustainability, buyers are increasingly opting for ecofriendly options, with electric vehicles becoming a favored solution to combat the negative effects linked to traditional transportation methods. In the last ten years, electric vehicles have seen impressive global growth, driven by various elements like technological

improvements, government support, and rising environmental consciousness among the public. Countries that lead in the adoption of electric vehicles, such as China, the United States, and several European nations, have played a major role in the rise of electric vehicle market share. The International Energy Agency (IEA) reports that in 2021, electric vehicles represented about 4. 6% of all vehicle sales globally, showing a notable rise compared to earlier years (IEA Global EV Outlook 2021). This increase has drawn interest from both traditional car manufacturers and new players in the market, with brands such as Tesla, NIO, and Rivian striving hard for a leading position (Schmitt, Hain, and Korcaj, 2018). Moreover, tech firms like Apple and Google are looking into chances within the electric vehicle industry, which is further driving growth in the sector (Forbes, 2020). With its fast economic expansion in Southeast Asia, Thailand is set to have a key influence on the worldwide shift to electric transportation. The entry of electric vehicles into the Thai market offers an essential chance to reduce greenhouse gas emissions and promote sustainable consumption practices. Although electric vehicle sales in Thailand currently make up only a small fraction of total vehicle sales, the government's Electric Vehicle Promotion Policy (EVPP) is designed to boost growth in this area (Ministry of Energy, Thailand, 2023). With encouraging policies and investments in charging networks, Thailand seeks to establish itself as a regional center for electric mobility (Soomauroo, Blechinger and Creutzig, 2023).

As the global market share of electric vehicles is on the rise, Thailand's growth remains slower yet promising. Various government initiatives, such as developing infrastructure and offering tax incentives, have aided in the steady rise of electric vehicle usage. Over the past few years, sales of electric vehicles in Thailand have increased two to three times, indicating the rapid growth of the market. The choices and attitudes of consumers regarding electric vehicles in Thailand are greatly shaped by marketing methods that are customized to fit local tastes. The influence of peer networks and social circles is vital in spreading positive views about electric vehicles, which underscores the need for specific marketing efforts. Having access to reliable product information is crucial for

boosting consumer trust in electric vehicle technology, highlighting the necessity for better information availability across different platforms. In the competitive electric vehicle market, advertising acts as a strong instrument for promoting usage and countering consumer misconceptions and worries. Advertising strategies that are tailored to resonate with individual customer interests have the potential to enhance engagement and increase the willingness to adopt electric vehicles.

The Technology Acceptance Model (TAM) offers a framework for analyzing the attitudes and intentions of Thai consumers regarding the adoption of electric vehicles (EVs), reflecting cultural differences and economic factors (Davis, 1989). Experiences from other countries provide important lessons that can help develop tailored strategies to address challenges and promote the shift towards environmentally friendly transportation options (Turrentine and Kurani, 2007). Consequently, adopting EVs in Thailand is a key chance to boost environmental sustainability and encourage sustainable development. As the technology for EVs improves and production expenses decrease, it is anticipated that these vehicles will be available to a broader audience. Thailand's ambitious goals for the electric vehicle industry, which include building infrastructure and offering incentives for domestic manufacturing, illustrate the nation's dedication to becoming a prominent participant in the global electric vehicle market (Soomauroo, Blechinger and Creutzig, 2023).

Research Framework

This study adopts an integrated conceptual framework to explore the drivers influencing Thai consumers' decisions to adopt electric vehicles (EVs) as environmentally sustainable alternatives to traditional automobiles. The framework incorporates core theoretical constructs and empirical insights from existing literature, focusing on five interrelated dimensions: product information availability, persuasive advertising, the Technology Acceptance Model (TAM), Rogers' Diffusion of Innovations Theory, and consumer decision-making processes. Together, these dimensions form the basis for

understanding green product adoption in the Thai context, particularly in relation to electric vehicle transportation.

Product Information Availability: Access to comprehensive and transparent product information is a critical factor in influencing consumer decisions. For Thai consumers to make informed choices, information concerning technical specifications, pricing, government regulations, available charging infrastructure, and environmental impacts must be readily accessible. Prior studies have shown that such information enables consumers to compare EVs with conventional vehicles, assess affordability, and evaluate value for money. Additionally, consumer-generated content; such as reviews and testimonials, further shapes perceptions about the performance and sustainability of EVs (Elkind, 2017; Gangale et al., 2017; Fauzan et al., 2020; Zureel et al., 2019).

Persuasive Advertising: Strategically crafted advertising plays a pivotal role in shaping consumer attitudes toward EVs. Marketing messages that emphasize environmental benefits or position EV adoption as a socially responsible behavior tend to evoke positive emotional responses and increase brand trust. In contrast to emotional appeals, factual and logical messaging; highlighting cost-effectiveness, energy efficiency, and long-term value, can influence consumer perceptions and intentions by reinforcing the functional advantages of EVs (Popova, 2018; Varpio, 2018; Romanova & Smirnova, 2019; Vrtana & Krizanova, 2023).

Technology Acceptance Model (TAM): The TAM provides a robust theoretical foundation for analyzing how individuals accept and adopt new technologies such as EVs. The model emphasizes three key constructs: perceived usefulness (PU), perceived ease of use (PEU), and perceived risk uncertainties (PRU). PU reflects the belief that EVs enhance one's quality of life, for instance through energy cost savings and environmental protection. PEU refers to the simplicity and convenience associated with incorporating EVs into daily routines, such as ease of charging and compatibility with local commuting patterns. PRU encompasses consumers' concerns about performance reliability, safety, financial risks,

and technological unfamiliarity, which may act as barriers to adoption (Davis, 1989; Venkatesh & Davis, 2000; King & He, 2006; Legris et al., 2003; Venkatesh & Xu, 2012).

Diffusion of Innovations Theory: Everett Rogers' Diffusion of Innovations Theory offers a broader socio-cultural lens to understand how new technologies, such as EVs, spread through society. Key innovation characteristics; relative advantage, compatibility, complexity, trialability, and observability, affect the rate of adoption. For instance, EVs must be perceived as offering clear advantages (e.g., cost savings, environmental benefits), while also fitting seamlessly into consumers' daily lives (e.g., availability of charging stations). Trial experiences and the public visibility of successful users significantly contribute to increased adoption. Rogers also classifies adopters into five categories; innovators, early adopters, early majority, late majority, and laggards, each with distinct readiness levels. The innovation-decision process highlights a consumer's journey from awareness to adoption, shaped by interpersonal communication, peer influence, and media channels within a social system (Rogers, 2003; Rogers, Singhal & Quinlan, 2019).

Consumer Decision-Making Process: The decision to adopt an EV is influenced by an interplay of information awareness, personal motivations, and social factors. Consumers actively seek information through online platforms, peer networks, and brand comparisons. Awareness campaigns and educational initiatives enhance consumers' knowledge of EVs and shape attitudes toward sustainability. Furthermore, social influence, arising from recommendations, social norms, and media portrayals, significantly affects consumer attitudes and behavioral intentions. Final purchase decisions are determined by multiple variables, including governmental incentives, dealership experiences, financial options, and price sensitivity (Kotler et al., 2010; Hanjaya et al., 2019; Panwar et al., 2019; Mandys, 2021; Yeğin & Ikram, 2022). Understanding the dynamics of electric vehicle adoption in Thailand requires a multifaceted approach that integrates theoretical and empirical perspectives. The availability of accurate product information, the influence of persuasive advertising, and the constructs within TAM and Rogers' Diffusion of Innovations Theory

collectively provide valuable insights into consumer behavior. Tailored marketing strategies, policy interventions, and public education are essential to overcoming adoption barriers and fostering a transition toward sustainable transport. As Thailand advances toward its environmental goals, recognizing and addressing these key drivers will be fundamental to accelerating the acceptance of EVs and securing long-term environmental and economic benefits (Davis, 1989; Venkatesh & Davis, 2000; Kotler et al., 2010; Varpio, 2018; Fauzan et al., 2020; Romanova & Smirnova, 2019; Panwar et al., 2019; Mandys, 2021).

Conceptual Framework

The framework looks into the factors affecting Thai consumers' choices to buy electric vehicles (EVs). It covers independent factors such as the availability of product information, persuasive Advertising, and the Technology Acceptance Model (TAM). These factors have a direct effect on consumer decision making, which includes stages like awareness and information, the search process, social influence, and the purchase decision. By understanding these elements, it becomes easier to create focused campaigns that encourage the adoption of EVs in Thailand and promote a shift to greener transport alternatives.

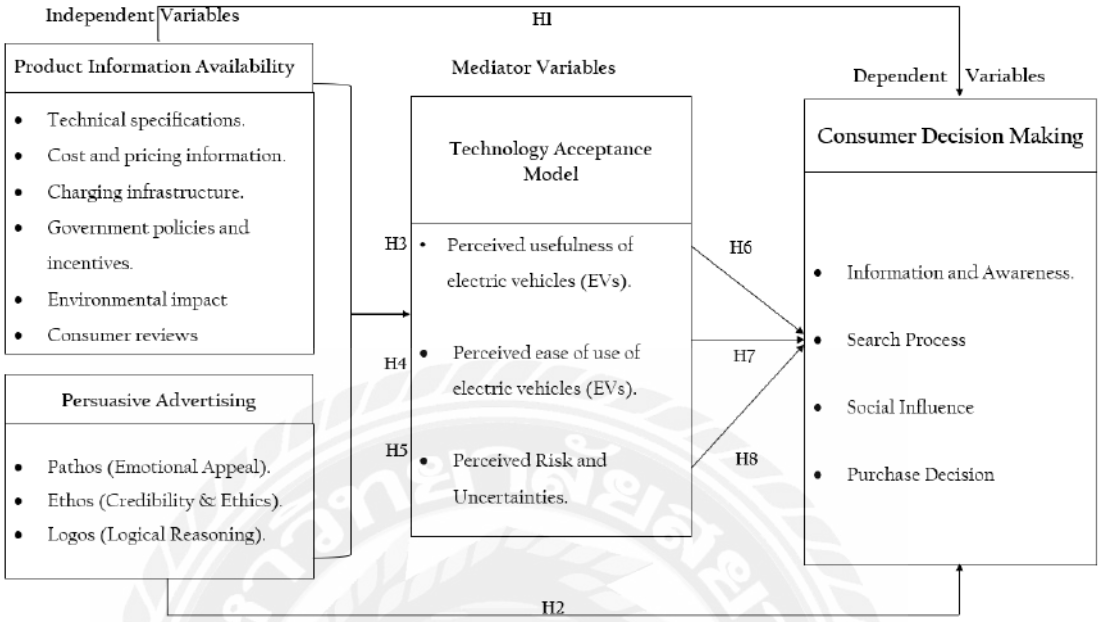

Figure 1: The research framework for analyzing the drivers of green product adoption in Thailand: a focus on EVs transportation (Varpio, 2018; Fauzan et al., 2019; Rogers et al., 2019; Romanova and Smirnova, 2019; Davis, 1989; Venkatesh and Davis, 2000; Kotler et al., 2010; Panwar et al., 2019; Fauzan et al., 2020 Mandys, 2021; Vrtana and Krizanova, 2023).

Operational Definition

Here are the definitions of key terms mentioned in the research:

Advertising: The act of spreading and promoting goods, services, or concepts to specific audiences by a recognized sponsor using different media platforms. Its objective is to enhance awareness, change perceptions, and encourage preferred actions, aiming to inform, persuade, and shape consumer habits.

Air Pollution: The existence of harmful or excessively high levels of gases, particles, and biological components in the air. Air pollution can negatively impact the environment, ecosystems, and people's health.

Adoption Rates: Refers to the percentage of consumers who decide to buy or utilize electric vehicles instead of conventional internal combustion engine cars. Adoption rates show how well electric vehicles are accepted and how widespread they are in the market.

Automobile Brands: Firms or producers that manufacture and sell cars under a specific brand name or logo. These brands signify unique identities, product ranges, and reputations within the automotive sector, affecting how consumers view and choose based on aspects like performance, design, trustworthiness, and brand legacy.

Brand Impression: The general view or image that consumers hold about a specific brand, incorporating factors like quality, dependability, innovation, and social accountability.

Brand Perception: This term describes how consumers view and understand a brand's identity, image, and standing based on their personal experiences, interactions, and the marketing messages they receive. It includes what customers believe, how they feel, and their attitudes towards a brand, which covers ideas about its quality, dependability, value, and genuineness.

Brand Reputation: This concept involves the overall perception, respect, and acknowledgment a brand holds among consumers, stakeholders, and the broader public. Several aspects, such as the brand's visibility, how well it performs in the market, customer contentment, corporate practices, and media representations, all shape the trust and loyalty that consumers feel toward the brand.

Charging Infrastructure: This term points to the system of charging stations or locations where electric vehicles can receive electricity. The presence and ease of access to charging infrastructure play a vital role in boosting consumer trust and readiness to adopt electric vehicles, especially for journeys over long distances.

Climate Change: This refers to a long lasting alteration in local or global climate trends, frequently linked to human activities such as industrial work, deforestation, and emissions of greenhouse gases. Tackling climate change calls for collaboration to address the severe environmental, social, and economic issues it poses.

Consumer Preferences: This term encompasses the individual choices, tastes, and inclinations people have about products, services, brands, or experiences. Various elements, including personal values, needs, perceptions, and previous experiences, influence these preferences.

Corporate Social Responsibility (CSR): These are actions taken by businesses to incorporate social and environmental factors into their practices and relationships with stakeholders.

Dependability: This refers to the characteristic of being reliable, steady, and trustworthy. It is often linked to brands or products that regularly fulfill or surpass what customers expect.

Digital Era: This is the current time marked by the extensive use of digital technology, including the internet, social media, smartphones, and data analysis, which help with communication, business activities, and sharing information.

Endorsements: These are public shows of support, agreement, or recommendations for a specific product, service, or brand, usually coming from key figures, such as celebrities, specialists, or organizations.

Energy Efficiency: This indicates the amount of useful energy produced compared to the total energy input needed for a certain job or process. Electric vehicles tend to be more energy efficient than traditional gasoline powered cars since they can convert a greater percentage of stored energy into movement.

Environmental Benefits: These are positive results or advantages linked to actions, products, or methods that promote the safeguarding or preservation of the environment.

Environmental Consciousness: This describes people's awareness, concern, and dedication to environmental issues, including climate change, pollution, depletion of resources, and loss of biodiversity.

Ethos: It serves as a strong instrument in marketing, aimed at creating trust and reliability between businesses and their customers. This approach can successfully involve buyers and foster enduring loyalty to the brand.

Financial Savings: These are reductions in expenses achieved through effective management of resources, new technologies, or changes in behavior.

Global Comparative Studies: These are research efforts that examine and contrast events, laws, or traditions across various nations or areas to find similarities, differences, and lessons. They provide important insights on the best methods, challenges, and chances for tackling shared issues or reaching common goals on a global level.

Government Incentives: These are policies and programs created by government bodies to promote the use of electric vehicles through financial rewards, tax benefits, subsidies, and regulations. The aim of these incentives is to make electric vehicles more affordable and appealing to buyers, thus speeding up their acceptance and presence in the market.

Green Products: Items or services that are created, marketed, or manufactured in ways that reduce harm to the environment or support sustainability efforts.

Greenhouse Gas Emissions: This term describes the emission of gases like carbon dioxide, methane, and nitrous oxide into the air, mainly due to human actions like fossil fuel combustion. Electric vehicles are praised for reducing these emissions compared to standard cars, which helps in the fight against climate change.

Information Campaigns: Planned efforts to spread knowledge and increase consumer awareness concerning electric vehicles. These campaigns make use of various communication methods like advertisements, educational resources, and community events to inform people about the benefits and characteristics of electric vehicle technology.

Innovation: This refers to the process of generating, developing, and executing new ideas, technologies, or methods that lead to better products, services, or business practices. In the world of cars, innovation may include improvements in electric driving systems, battery advancements, selfdriving capabilities, and connectivity options that enhance electric vehicles' functionality and attractiveness.

Instructional Materials: These are educational tools like pamphlets, guides, videos, and tutorials aimed at helping consumers understand electric vehicles better, including their features, how to use them, maintenance needs, and how to charge them. The purpose of these materials is to simplify complicated ideas and give consumers the knowledge needed to make smart choices.

Logos: It involves using reasoning and data to back up your opinions. This is where facts, studies, and a person's natural reasoning skills are important.

Market Insights: Data, trends, and analyses gathered from research that offer important knowledge about market changes, consumer habits, and industry movements. This information assists companies and organizations in making educated choices and forming effective strategies to satisfy customer demands and reach their objectives.

Market Share: This is the proportion or percentage of total sales or usage in a particular market that is occupied by electric vehicles. Market share shows how competitive and popular electric vehicles are compared to other kinds of vehicles in the automotive sector.

Media Attention: This indicates the degree of coverage, visibility, or exposure a subject, event, or issue receives across different types of mass media, which includes news, television, internet platforms, and social networks.

Media Depictions: These are representations of specific subjects, events, or issues in various types of mass media that can influence public views, beliefs, and opinions through storytelling, imagery, and messaging.

Nonprofit Groups: These are organizations or associations that exist primarily to benefit the public or promote a specific cause, such as protecting the environment, supporting sustainability, or advocating for clean transportation. Nonprofit organizations are essential in promoting the use of electric vehicles, raising awareness, and assisting consumers, lawmakers, and industry members.

Pathos: This is a method of persuasion that seeks to connect with the audience's emotions and feelings. It aims to stir emotional reactions and create bonds with the audience through storytelling, evocative language, and compelling narratives.

Policy Implications: This refers to the possible effects or outcomes of research findings on the creation, execution, or progress of policies. They offer insights to decisionmakers on how to tackle specific issues or challenges identified through research.

Product Features: A product's qualities, features, and functions impacting its use, performance, and value.

Promoting EV Adoption: Encouraging widespread electric vehicle use as a transportation option is the aim of these actions.

Public-Private Collaborations: Government and private sector partnerships tackle EV adoption and deployment challenges and possibilities. Both sectors combine resources and skills to reach shared goals faster.

Purchase Decisions: Consumers choose products or services based on price, quality, brand, and personal preferences.

Reliability: A product or service consistently and dependably performs its intended function under various circumstances.

Research Studies: Systematic investigations gathering information, analyzing data, and drawing conclusions about events, behaviors, or trends using scientific methods.

Running Costs: EV operating costs include electricity, maintenance, and repairs. Lower running costs are a major EV advantage.

Social Influence: People's thoughts, feelings, and actions are shaped by others in their social circles.

Social Responsibility: Individuals, organizations, and institutions ethically act to benefit society, promoting environmental protection and community involvement.

Sustainable Development: Meeting current needs without harming future generations' ability to meet theirs, balancing economic, social, and environmental factors for long-term wellbeing.

Sustainable Transportation: Transportation methods minimizing environmental harm, conserving resources, and promoting social and economic fairness, reducing fossil fuel use and greenhouse gas emissions, and encouraging alternatives like public transit.

Technological Advancements: Technology improvements increase efficiency, performance, or function, creating new solutions.

Total Cost of Ownership (TCO): A vehicle's entire lifecycle costs including purchase price, fuel, maintenance, insurance, and depreciation. TCO analysis helps consumers compare EV and conventional vehicle long-term finances.

Trust: Consumer confidence in a brand or product's reliability and integrity.

User-friendly Online Platforms: Easy to use websites give consumers access to EV information, resources, and tools like vehicle comparisons, charging station finders, and cost calculators for better decision making.

Word of mouth Marketing (WOM): Informal communication like conversations, reviews, or social media posts spreads product or service information, recommendations, or endorsements among consumers.

The Contribution of the Study

This research is important as it could offer valuable insights into the adoption of green products, especially electric vehicles, in Thailand and their implications for promoting sustainable consumption practices. This study holds significance for several reasons:

1. **A contribution to the idea of sustainable development.**

Thailand's path to sustainable progress greatly depends on moving towards greener transportation options, especially with the increase in electric vehicle (EV) use. As a nation that is developing quickly and facing environmental issues such as air pollution and greenhouse gases, Thailand can gain significantly by encouraging the use of EVs. The shift to electric cars is likely to lead to a major decrease in carbon emissions and other harmful pollutants found in traditional gasoline and diesel vehicles, which supports Thailand's efforts to fight climate change and enhance air quality. In addition, promoting EV use can improve energy independence by lowering the need for imported fossil fuels and supporting the growth of local renewable energy resources like solar and wind energy. The widespread introduction of EVs also has the potential to drive innovation and economic

advancement in Thailand's automotive sector and related fields, allowing the country to emerge as a frontrunner in sustainable transport technology. With targeted investments in EV production, research, and development, Thailand can seize the global interest in EVs, leading to the creation of new job prospects and nurturing a business friendly atmosphere that promotes environmental sustainability and economic growth.

2. **Perspectives and Challenges:**

This research provides important insights for Thai policymakers about how well existing laws and policies support the use of electric vehicles (EVs). By examining what affects consumer choices and how quickly EVs are being adopted, policymakers can evaluate current programs and find ways to make them better. This evaluation can help in improving current policies or in designing new initiatives that address obstacles to EV adoption, such as insufficient charging stations or high upfront costs. Moreover, the research aids in creating broader sustainable transportation plans that include EVs along with other transportation options, such as cycling and public transport. Using the findings from this study for long-term planning can further assist Thailand in moving towards sustainable transportation, including working with industry partners and international collaborators to share knowledge and apply best practices. In the end, the study enables policymakers to encourage EV adoption and work towards sustainable transportation objectives in Thailand.

3. **Market information for business stakeholders:**

It is important for those in the industry, like marketers and car manufacturers, to understand what Thai consumers want in electric vehicles. By knowing what features are favored, what performance is expected, and how much consumers are willing to spend, companies can adjust their products to align with Thai market needs. For example, if studies show that Thai buyers prioritize range and affordability, manufacturers should concentrate on creating electric vehicle models that offer competitive prices and extended battery life for these buyers. Additionally, industry professionals need to understand how

consumers feel and the challenges they face in adopting these vehicles to effectively tackle problems and seize opportunities within the Thai market. Customized communication and educational initiatives can help clear up common misunderstandings and fears about electric vehicles, thus boosting consumer acceptance. By promoting the environmental benefits in their marketing and targeting specific audiences according to their preferences, industry participants can support the growth of electric vehicle adoption in Thailand. Furthermore, findings from research can steer innovation and development within the electric vehicle sector, allowing makers to focus on features that appeal to Thai consumers. Insights gained can also guide investments in infrastructure related to electric vehicles, such as placing charging stations strategically in urban areas or along key transportation routes, to aid the expanding electric vehicle market in Thailand. In summary, a deep understanding of consumer desires and viewpoints, combined with targeted marketing strategies and infrastructure support, can enhance the acceptance of electric vehicles in Thailand and help achieve the country's sustainability goals in transportation.

4. **Edutainments and Awareness for Consumers:**

Promoting the adoption of electric vehicles (EVs) in Thailand relies heavily on educating consumers and raising awareness. Many potential users do not fully understand the benefits, infrastructure, and technology connected to EVs, which slows down widespread acceptance. Misunderstandings and a lack of adequate information cause uncertainty among customers. To tackle this situation, effective marketing strategies are essential. Marketers should create specific campaigns that inform consumers about the advantages of electric vehicles, like savings on costs and positive impacts on the environment, using research findings. To correct misunderstandings about EVs and reach a wide audience, various communication methods should be utilized. Activities such as test drives and educational workshops can give consumers direct experience and insights related to electric vehicles. Additionally, ensuring consumer rights are highlighted in these educational and entertainment efforts is vital. People have the right to receive impartial and

accurate information about electric vehicles so they can make well informed choices. These initiatives can help eliminate obstacles to EV adoption and foster greater acceptance of electric vehicles in Thailand, thus aiding the country's shift towards sustainable transport solutions by enhancing consumer knowledge and awareness regarding EVs.

5. Global Comparative Evaluation:

This analysis looks into how Thailand is working to encourage the use of green products, especially electric vehicles (EVs), by studying successful examples from other nations like China, the United States, Norway, and the Netherlands. By recognizing shared patterns and effective methods used around the world, researchers aim to shed light on the challenges and possibilities Thailand has in promoting sustainable consumption and transportation. Insights gained can help policymakers, industry leaders, and researchers to explore various methods and adjust suitable strategies, such as forming partnerships, investing in infrastructure, providing financial incentives, running awareness campaigns, and making regulatory changes. Collaborating with other countries and sharing knowledge allows Thailand to adopt valuable practices, supporting its move toward a greener transportation system and tackling issues efficiently. Promoting EV use in Thailand is in line with global efforts aimed at environmental sustainability, aiding larger projects focused on sustainable transport and consumption. Insights gathered from research enable industry players to make educated choices and innovate in the EV field, encouraging market growth and sustainability. By applying lessons from international experiences, Thailand can address challenges, boost economic development, and play a role in global efforts to tackle climate change and enhance environmental sustainability.

CHAPTER 2

LITERATURE REVIEW

This chapter examines different aspects that are essential for grasping how consumers behave when it comes to adopting EVs. To begin with, the existing literature highlights the importance of having product information accessible, which includes details on technical specifications, pricing, charging facilities, government incentives, assessments of environmental impacts, and consumer feedback. Additionally, it analyzes the impact of persuasive advertising, focusing on aspects like emotional appeal (Pathos), ethics and trustworthiness (Ethos), and logical arguments (Logos). Moreover, the review looks into the Technology Acceptance Model (TAM) as well as Everett Rogers' Diffusion of Innovations Theory, both of which offer insights into how consumers view and adopt new technologies such as EVs. It covers perceived usefulness (the advantages of EVs), perceived ease of use (the ease of incorporating EVs into everyday life), and perceived risks (the uncertainties and concerns surrounding the adoption of EVs). Examples of these risks include worries about battery range, performance, and the availability of charging stations. If these perceived risks are not addressed, they may impede the acceptance of EVs.

Lastly, the chapter evaluates the elements that affect consumers' decision making regarding EV adoption in Thailand. Beginning with information and awareness, the understanding of EV features by consumers plays a key role in their willingness to adopt. Research highlights how awareness campaigns can shape positive attitudes toward environmentally friendly products. When searching for information, consumers rely on online resources to assess aspects such as environmental advantages and government incentives. Social factors, including suggestions from peers and media impact, are also crucial in influencing consumer perceptions of green products. During the buying phase, elements like government incentives and price significantly affect consumer choices. Recognizing these factors offers valuable insights into promoting the use of EVs in Thailand.

Green Products: EV Adoption

Ecofriendly items, often called green products, are made and marketed with the aim of minimizing their negative impact on the environment throughout their existence (Bösch and Elsland, 2020). There is a growing interest in adopting environmentally friendly items, specifically electric vehicles (EVs), to lessen environmental harm and reduce reliance on fossil fuels. It is essential for policymakers, manufacturers, and marketers to fully understand the factors that influence consumers' choices to embrace these ecofriendly products. The National Oceanic and Atmospheric Administration (NOAA) reported that January 2020 was the warmest January ever recorded globally. This data stresses the alarming reality of global warming, which is directly tied to greenhouse gas emissions from human actions (Climate Central, 2020). According to research from the World Resource Institute, road transport accounts for 11.9% of global greenhouse gas emissions, mainly due to fossil fuel use in cars. This suggests there is potential to cut worldwide emissions by 11.9% through fully electrifying all transport methods and achieving a completely decarbonized energy mix (Ritchie and Roser, 2020). Electric vehicles are driven by electric engines powered by rechargeable batteries. Importantly, EVs don’t produce tailpipe emissions, meaning they don’t release pollutants directly into the air, and they are quieter than conventional vehicles with combustion engines (US Department of Energy and Office of Energy Efficiency and Renewable Energy, 2020). Moreover, EVs do away with the need for fuels derived from petroleum. Since the government of Thailand is actively encouraging EV usage as part of its ecological strategy, it is vital to explore the main factors that affect this adoption. A rising number of individuals around the world are becoming interested in green products due to increasing worries about environmental sustainability and the necessity to lower carbon emissions. Electric vehicles are a type of green product that holds promise for reducing the ecological footprint of transportation. Most research on EVs happens in developed countries, with the USA at the forefront, followed by Germany and the UK (Kumar and Alok, 2019; Li, Tong, Xing and Zhou, 2017). Emerging markets like

China, India, and Malaysia are experiencing a rise in EV studies. However, there remains a considerable gap in the research concerning EV adoption in developing countries compared to those that are developed, which indicates that further inquiry is needed in this domain (Adnan, Nordin, Rahman, 2017; Wujin, Meeja, Mee Song and Park, 2019; Li, Wang, Chen, and Wang, 2020). Electric vehicles mark a significant progress in sustainable transportation among green products. These vehicles operate on electric engines powered by energy storage devices like rechargeable batteries, which lessen or entirely remove the need for traditional fossil fuels (Koojaroenprasit and Pumpinyo, 2022). There are three main types of EVs: Battery Electric Vehicles (BEVs), Plugin Hybrid Electric Vehicles (PHEVs), and Hybrid Electric Vehicles (HEVs). While plugin hybrid electric vehicles (PHEVs) combine a combustion engine with an electric motor and battery, BEVs are fully powered by batteries. HEVs feature an electric motor along with a combustion engine, with the electric motor mainly aiding the engine to boost fuel efficiency. In the automotive field, EVs play a crucial role in enhancing ecofriendly transport and lowering greenhouse gas emissions. Research shows that adopting electric vehicles could lead to significant reductions in air pollution and lessening the harmful environmental results of transportation (Horton, Schnell, Peters, Wong, Lu, Gao, Zhang and Kinney, 2021). Furthermore, EVs contribute to energy security and resilience by decreasing dependence on fossil fuels and fostering energy variety. In conclusion, electric vehicles represent a significant category of ecofriendly products that have the ability to transform the automotive industry and encourage environmental sustainability. To promote the acceptance of electric vehicles and advance sustainable transport programs, it is important to understand the different types of EVs and their benefits. (Zhuang, 2020; Pamidimukkala, Kermanshachi, Rosenberger and Hladik (2023); Ahmad, Chaveeesuk and Chaiyasoonthorn (2024); Zaino, Ahmed, Alhammadi and Alghoush (2024).

Product Information Availability

Gaining access to detailed product information is crucial for shaping consumer perceptions and preferences toward ecofriendly options like electric vehicles (EVs). Lee and Kim (2019) highlight the significance of accurate technical details in steering customer choices. For instance, when evaluating EVs, potential buyers often consider aspects such as battery life, charging duration, power output, and energy efficiency. Consequently, to enable customers to make well informed choices, it is vital to offer clear and precise technical data. Efforts to distribute information about EVs have been made in Thailand, but it still falls short compared to countries like Norway. Yang (2019) notes that Norway has created comprehensive databases that supply exact EV specifications, enhancing consumer understanding and awareness. The presence of straightforward information is likely to assist Norwegian buyers in making informed choices and embracing EVs. In Thailand, increasing access to and transparency of technical specifications can foster consumer engagement and support informed decision making. In this regard, strategies such as establishing centralized databases or online platforms for sharing EV information, similar to those implemented in Norway, could be beneficial (IEA, 2021). Furthermore, initiatives aimed at educating consumers about the importance of technical specifications and how they correlate with individual needs and preferences may also facilitate the uptake of green products in Thailand (Chen and Ma, 2024; Purwanto and Purna, 2024).

Technical Specifications

Technical specifications play a pivotal role in shaping consumer perceptions and decisions regarding the adoption of electric vehicles (EVs), particularly in developing nations like Thailand. These specifications encompass battery efficiency, driving range, charging speed, motor performance, durability, safety features, and digital connectivity, each significantly influencing how consumers evaluate the practicality and reliability of EVs in daily life. A primary consideration is driving range, as concerns about battery depletion remain a major barrier to adoption (Helmers and Marx, 2012; Koniak et al.,

2024). Thanks to advancements in battery technology, many modern EVs now offer ranges between 400 and 500 kilometers per charge, alleviating range anxiety. However, Bangkok's unique traffic environment, characterized by frequent congestion and stop-and-go conditions, demands batteries that can perform efficiently under such circumstances. The type of battery and its thermal management system are especially critical in hot climates. Technologies such as Lithium Iron Phosphate (LFP) and emerging solid-state batteries are increasingly favored for their superior heat tolerance, extended lifespan, and safety features (Alkhalidi et al., 2024; Jiang et al., 2022). To ensure consistent performance across Thailand's varied climate, many EVs are now equipped with advanced cooling systems that protect batteries from overheating and degradation. Charging speed and compatibility also strongly influence consumer confidence. Modern DC fast charging technology enables EVs to reach 80% charge in under 30 minutes, while the rollout of 350 kW ultra-fast chargers promises even greater convenience (Rizwan et al., 2022; Zope, Swami et al., 2024). To support widespread adoption, Thailand must expand its fast-charging infrastructure and promote the standardization of charging systems across brands. In addition to range and charging capabilities, vehicle performance and safety features are critical. Many EVs now include regenerative braking, Advanced Driver Assistance Systems (ADAS), and real-time diagnostics, which not only enhance driving safety but also improve energy efficiency (Sanguesa et al., 2021; Mohd Khalid and Khuman, 2022). However, these features are often limited to premium models, creating a technological gap for consumers considering more affordable options.

Connectivity features are increasingly important, particularly among younger urban consumers. Functions such as mobile app control, over-the-air (OTA) updates, and real-time vehicle monitoring enhance user experience and build trust in EV technology (IEA, 2023). These digital tools make EVs more interactive and appealing to tech-savvy drivers in Bangkok. Local environmental challenges; such as seasonal flooding, high humidity, and poor road conditions, further highlight the need for durable vehicle designs. To ensure reliability, manufacturers must consider elevated battery casings and sealed components

that can protect vital electronics from water damage (Gökçek et al., 2022).

Finally, adherence to ASEAN technical standards and international EV quality benchmarks will be essential for building consumer trust and attracting foreign investment. Emphasizing certification programs, safety evaluations, and performance testing can help position Thailand as a competitive player in the global EV industry (Soomauroo, Blechinger, & Creutzig, 2020). In summary, technical specifications are far more than features, they are fundamental enablers of reliability, consumer confidence, and market viability. Tailoring these specifications to address local conditions will be crucial for accelerating EV adoption and advancing Thailand's journey toward sustainable urban transportation.

Cost and Pricing Details

Certainly, the price of electric vehicles plays a crucial role in their global acceptance. Government subsidies and pricing strategies are essential for encouraging the use of EVs, as highlighted by Liu, Zhao, Hao, and Liu (2023). Yet, despite these efforts, the initial expense of EVs remains higher compared to traditional vehicles, even with Thailand's initiatives like tax breaks and financial support to promote EV use, according to Manutworakit and Choocharukul (2022). This price difference creates a significant barrier to adoption, particularly for those with limited financial means. Unlike Thailand, China has taken bold steps to provide substantial subsidies for EVs, which have greatly narrowed the cost gap between electric and gasoline powered cars, according to Dong and Liu (2020). As a result of these subsidies, EVs have become more affordable and attractive to Chinese consumers. Moreover, Dong and Liu (2020) emphasize the effectiveness of China's subsidy initiatives in boosting demand and cultivating a robust market for electric vehicles. To tackle the affordability problem and foster the use of EVs in Thailand, policymakers might explore new tax policies. For instance, they could introduce fresh financial incentives for electric vehicle buyers or expand current subsidy programs to reduce the initial expenses of EV ownership, as noted by the IEA (2021). Furthermore, increasing access to

financing options and nurturing a strong market for secondhand EVs could enhance the affordability and availability of these vehicles for consumers (Ding, Chen, Feng and Cheng, 2024).

Charging Infrastructure

The widespread acceptance of electric vehicles is greatly influenced by the presence of charging stations, which are crucial for alleviating fears about range and enhancing consumer confidence. Research conducted by Mohd and Khuman (2022) highlights the significant role that charging infrastructure has in facilitating the use of electric vehicles and addressing customer worries regarding range limitations. However, despite notable initiatives, Thailand faces challenges in developing charging networks, particularly in rural regions where access to charging stations remains limited, as indicated by Thananusak, Rakthin, Tavewatanaphan, and Punnakitikashem (2017). The lack of an extensive charging infrastructure presents a significant barrier to the uptake of electric vehicles, as potential users may find charging cumbersome or be anxious about depleting battery power during trips. In contrast, nations like the Netherlands have made impressive strides in establishing comprehensive charging infrastructure, resulting in a significant rise in electric vehicle adoption, according to Kubli (2022). The Netherlands offers electric vehicle owners reliable and accessible charging options throughout the nation, supported by a vast array of charging stations, including public charging accesses, fast charging locations, and private charging units. Thailand could benefit from adopting practices similar to those in the Netherlands, focusing on developing a solid infrastructure for charging to accelerate the uptake of electric vehicles. Approaches such as providing incentives for the setup of charging stations, fostering public and private collaborations to build charging facilities, and implementing smart grid technologies to enhance the efficiency of the charging network could be explored (IEA, 2020). Furthermore, investing in advanced charging technologies like wireless charging and rapid charging stations could enhance the attractiveness of electric vehicles while addressing users' concerns about convenience and

time related to charging (Mohd and Khuman, 2022). By taking effective steps to improve the availability and accessibility of charging infrastructure, Thailand can create a supportive environment for the widespread acceptance of electric vehicles, helping to meet its climate and sustainability objectives (Zhao, Gao and Cheng, 2023; Udaiyakumar, 2024).

Government Policies and Incentives

Government incentives and regulations greatly influence consumer behavior regarding ecofriendly products, particularly electric vehicles (EVs). Research by Schnell, Peters, Wong, Lu, Guo, Zhang, Kinney, and Horton (2021) highlights how financial incentives and policy measures shape the trends in EV adoption. These regulations often aim to alleviate challenges such as high upfront costs and insufficient infrastructure, motivating consumers to choose EVs instead of conventional vehicles. The Thai government has implemented a variety of policies and incentives to promote EV usage. According to Koojaroenprasit and Pumpinyo (2022), these include tax breaks, rebates, and subsidies for EV purchases, along with programs to develop charging infrastructure and aid research and development in the EV sector. Nevertheless, factors such as limited awareness, infrastructure gaps, and consumer preferences could hinder the effectiveness of these initiatives in promoting widespread EV adoption. A comparison with countries like Norway offers useful insights into how comprehensive incentive systems can affect EV market penetration. Norway is leading the world in EV adoption, with electric cars making up a large share of new vehicle sales. This achievement is partly due to an extensive set of incentives, including generous tax breaks, discounted tolls, free parking, and access to bus lanes for EVs, as reported by Preedakorn, Butler, and Mehnen (2023). These incentives have effectively lowered the total cost of owning an EV and encouraged consumers to transition from traditional vehicles. To boost EV use in Thailand, policymakers should consider enhancing and expanding the existing incentive programs. This could involve increasing the scope and amount of tax benefits, introducing additional financial incentives like grants for building EV charging stations, and establishing nonmonetary incentives such

as reserved parking and access rights. Additionally, initiatives aimed at raising public awareness, providing education and training on EV technology, and fostering cooperation among government agencies, businesses, and educational institutions could strengthen incentive programs and accelerate the shift towards sustainable transportation options, as noted by IEA (2020).

Environmental Impact

Consumer beliefs about the environmental benefits of electric vehicles play a crucial role as they impact their choices regarding the use of EVs, ultimately driving the shift toward sustainable transportation. As noted by Albrechtowicz (2023) and Guzek, Jackowski, Jurecki, Szumska, Zdanowicz and Żmuda (2024), when choosing green products like EVs, consumers often prioritize environmental considerations. Therefore, for the widespread acceptance of EVs, it is essential to understand and rectify any misconceptions that individuals may have regarding the environmental effects associated with these vehicles. In Thailand, although there is an increase in consumer awareness of the ecological advantages of EVs, research by Tang, Xu, and Wang (2022) indicates that misunderstandings about the long-term environmental impacts of these vehicles still exist. Even though the positive effects of EVs on reducing greenhouse gas emissions and air pollution compared to traditional gasoline vehicles are well known, there may still be lingering doubts or incorrect details surrounding the overall environmental footprint of EVs. It is important to address and correct these myths to enhance consumer confidence and encourage the adoption of EVs. Other countries, like Sweden, have made significant progress by conducting thorough life cycle assessments to evaluate the environmental impacts of electric vehicles. Verma, Dwivedi, and Verma (2021) highlight that such assessments are vital for providing clear and factual information to stakeholders, policymakers, and consumers. Sweden has seen higher EV adoption rates by educating consumers on the environmental advantages of electric vehicles through comprehensive environmental assessments. Thailand could benefit from similar approaches by performing

extensive evaluations of the environmental effects of EVs. By employing lifecycle assessments and additional analytical tools, decisionmakers and researchers can inform consumers more effectively about the ecological advantages of electric vehicles through accurate scientific evidence. Moreover, initiatives aimed at educating the public and raising awareness could help eliminate misconceptions and ensure the correct information is shared.

Consumer Reviews

Consumer opinions and buying choices are highly swayed by reviews and recommendations from others, especially concerning new technologies like electric vehicles (EVs). The work of Nguyen and Nguyen (2020) highlights how significant social influence is in forming views about product performance, dependability, and overall satisfaction, noting the strong effect that peers' suggestions and online feedback have on consumer actions, as noted by Kotler, Armstrong, Wong, and Saunders (2020). Although there is an increasing amount of customer feedback available about EVs in Thailand, studies show that concerns like range anxiety, charging facilities, and battery performance typically prevent potential buyer from making a decision, as stated by Tu and Yang (2019). These concerns may stem from misunderstandings regarding the capabilities and limitations of EVs or a lack of direct experience with them. By confronting these issues through open and informative customer reviews, we can dispel myths and furnish future buyers with valuable insights into the everyday realities of owning an electric vehicle. Thailand could focus on leveraging customer experiences to promote EV usage, unlike countries such as the United States, where positive reviews and endorsements from consumers have led to improved EV adoption rates, according to Chen and Ma (2024). Initiatives like electric vehicle test drives, social media owner reviews, and well organized review websites can help amplify positive experiences and reassure buyers who have uncertainties about the viability and benefits of switching to electric vehicles. Moreover, establishing a community of EV enthusiasts and early adopters can facilitate sharing

information and provide potential buyers with access to a network of support and resources. By harnessing effective word of mouth communication and promoting natural advocacy among satisfied EV users, Thailand can cultivate a culture of acceptance toward electric vehicles and accelerate the widespread adoption of ecofriendly transportation solutions. Ackaradejruangsri argues in 2012 that consumers increasingly rely on peer reviews and ratings to evaluate product quality and make informed purchase decisions. Strong positive reviews enhance a product's credibility and reliability, benefiting both its sales and brand loyalty, as noted by Reyes Menéndez, Saura, and Filipe (2019). This demonstrates the importance that online communities hold for consumers. Gurun, Nickerson, and Solomon (2020) state that affirmative feedback increases trust and reliability. Good customer reviews boost potential buyers' confidence in a good or service (Mudambi and Schuff, 2010). Both positive and negative reviews significantly influence how potential buyers perceive electric vehicles and the decisions they make about purchasing them. Understanding the effects of these reviews is crucial for stakeholders aiming to effectively foster EV adoption (Akdoğan, Durucu, and Durmaz, 2021). Positive feedback can strongly endorse the perceived benefits and attractiveness of EVs. Customers are more likely to trust favorable reviews that highlight the advantages of electric vehicles, such as reduced operating costs, lower emissions, and enhanced driving comfort, which can influence their behavioral decisions, as noted by Nguyen and Nguyen (2020). Positive impressions can help potential customers feel more confident and trusting, facilitating their adoption process and overcoming reluctance, as observed in studies by Fei, Weisstein, Song, Lei, Andersen, and Zhu (2017), and Le and Choeh (2021). In contrast, negative feedback can give rise to doubts and deter potential buyers from considering electric vehicles. Common complaints, such as limited driving range, long charging times, and concerns about battery life, can heighten anxiety around range and support misconceptions about the reliability and effectiveness of EVs, according to Tu and Yang (2019). Unfavorable evaluations can undermine trust in electric vehicle technology and may keep risk averse consumers from transitioning to electric options (Kocak, Alan, and Kabadayi, 2012; Sritharan, Zhang,

Sivarajah, 2013). However, negative reviews also present chances for improvement and learning. By analyzing the constructive criticisms raised in unfavorable reviews, manufacturers, policymakers, and other industry players can uncover opportunities for innovation and enhancement. By addressing recurring issues and consumer concerns, stakeholders can iteratively refine EV technology, infrastructure, and user experiences, leading to a higher acceptance and uptake rate. In Thailand, utilizing favorable reviews to underline the benefits of electric vehicles and mitigate the concerns highlighted in negative evaluations can be highly effective in shaping customer attitudes and driving adoption. Alongside efforts to tackle common issues and dispel myths through educational campaigns and transparent communication, actively collecting and displaying positive testimonials from satisfied EV users can help diminish the effects of negative feedback and accelerate electric vehicle adoption, as seen in studies by Reyes Menéndez, Saura, and Filipe (2019), and Casado, Sánchez, Bigné, and Smidts (2023). Therefore, it is essential to conduct a thorough examination of the factors impacting the embrace of green products, particularly electric vehicles, in Thailand. This examination should encompass various aspects, including the accessibility of product information, pricing details, charging facilities, government initiatives and incentives, environmental assessments, and customer reviews. By leveraging best practices and comparative analyses with other countries, Thailand can formulate targeted strategies to hasten the transition to sustainable mobility.

Persuasive Advertising

Advertising is more than just marketing; it's a complex tool aimed at intentionally shaping how consumers think and act (Kotler and Armstrong, 2020). Businesses use advertising thoughtfully to present the features and advantages of their goods or services to specific groups, ultimately wanting to sway their buying choices. For green products such as electric vehicles, advertising is vital for heightening consumer awareness and sparking interest in sustainable options, thus promoting ecofriendly decisions (Rosenbaum Elliot, 2015). The rising desire for sustainable solutions and growing environmental

worries have contributed to a strong push in promoting green products like electric vehicles recently (Singh and Paul, 2020). By highlighting the cost savings, ecological advantages, and technological improvements linked to electric vehicles, advertising serves as a strong method to take advantage of this trend (Sooksatra and Sanguanpiyapan, 2016). Public perception and preference can be swayed by advertisers, which ultimately leads to the increased use of green products like electric vehicles when these benefits are effectively shared (Sriram, Zhang and Sivarajah, 2013). Moreover, advertising significantly influences societal attitudes regarding environmental stewardship and sustainability (Mohr and Nevin, 1990). Advertisers can motivate action by shining a light on urgent environmental concerns and utilizing persuasive messages and visuals. For example, commercials for electric vehicles often appeal to emotions to instill a sense of environmental obligation, depicting owning an electric vehicle as a concrete way for consumers to back environmental protection initiatives (Batra and Ray, 1986). Successful advertising also hinges on establishing trust and credibility, especially for green products that demand major changes in consumer behavior or purchasing habits (Soltani-Sobh, Heaslip, Bosworth, Barnes and Yook, 2015). Advertising practices that prioritize ethics, such as true dedication to sustainability and clear communication, can strengthen a brand's trustworthiness and build consumer confidence (Chaffey and Ellis Chadwick, 2019). By ensuring that their advertising aligns with authentic environmental efforts and showing commitment to corporate responsibility, companies can boost their image and attract consumers who care about the environment (Madichie, 2010). In both Thailand and other nations, cultural, social, and economic elements affect how well advertising promotes environmentally friendly products. Thai consumers, like those in other Asian countries, generally prioritize community welfare and social responsibility (Yoo and Donthu, 2001). Therefore, Thai shoppers are inclined to react favorably to advertising campaigns that emphasize the benefits of switching to electric vehicles, such as decreasing air pollution and reliance on fossil fuels (Bryla, Chatterjee and Ciabiada, 2022). Variations in consumer behavior due to cultural, social, and economic influences can lead to differing effectiveness of persuasive

advertising around the globe (Yoo and Donthu, 2001). In today's digital landscape, marketers reach consumers through both online and offline methods. Digital advertising channels, like social media, search engines, and websites, provide interactive and targeted options that let marketers tailor messages according to user preferences and actions (Chaffey and Ellis Chadwick, 2019). Meanwhile, traditional advertising platforms, including print media, television, and outdoor billboards, still play a crucial role in building brand awareness and tapping into new markets, especially in areas with low digital skills and internet availability (Rosenbaum Elliot, 2015). Word of mouth marketing is a powerful way to influence how consumers view products and their buying behaviors. When considering product options, buyers frequently depend on recommendations from friends, family, and online ratings (Brown and Reingen, 1987). Supportive word of mouth from early adopters or eco-conscious advocates can facilitate the acceptance of electric vehicles in Thailand by generating social confirmation and inspiring others to select environmentally friendly travel options (Bryla et al., 2022). Therefore, advertising functions as a complex tool capable of influencing consumer thoughts and actions, especially in the marketing of green products like electric vehicles. By recognizing the cultural, societal, and economic characteristics of their target audiences, advertisers can create engaging campaigns that connect with consumers and promote the adoption of sustainable products (Sun, Yuan and Zhang, 2022; Sayd, Nazarudin and Seubelan, 2025).

Pathos: Emotional appeal of messages

An essential part of successful advertising is Pathos, which taps into emotions to connect with customers on a deeper level and influence their beliefs and behaviors. Campaigns that rely on emotional appeal seek to forge a strong bond with their intended viewers by stirring feelings such as joy, fear, nostalgia, or compassion. In promoting electric vehicles (EVs), advertisers implement pathos to highlight the ecological benefits of adopting EVs and appeal to buyers' sense of environmental duty (Batra and Ray, 1986). For example, in the United States, advertisements may feature touching narratives about

families enjoying clear air and stunning landscapes thanks to their electric cars, fostering feelings of hope and optimism for an ecofriendly future (Soltani-Sobh, Heaslip, Stevanovic, Bosworth and Radivojevic, 2015). Likewise, emotional messages focusing on the importance of lowering carbon emissions and safeguarding natural environments are very persuasive in shaping consumer choices in environmentally aware nations like Norway (Dahlstrand and Biel, 1997). However, in Thailand, the effectiveness of pathos in electric vehicle advertising is shaped by the local culture. Despite differences in social norms and values from Western countries, environmental awareness is growing in Thailand. The principles of Buddhism, which prioritize harmony with the environment and compassion for all living beings, affect the views on environmental protection in the country (Singh and Paul, 2020). As a result, commercials in Thailand may highlight the relationship between humans and nature, stirring feelings of care and responsibility toward environmental conservation. Additionally, Thailand's unique environmental challenges, such as air pollution in cities like Bangkok, provide a distinct context for promoting electric vehicles. Advertisements may stress the immediate advantages of EVs in lessening air pollution and enhancing public health, appealing to customers' wishes for cleaner, healthier living spaces (Bhovichitra and Shrestha, 2022). By tailoring their messages to reflect specific environmental issues and resonate with local cultural values, advertisers can effectively harness pathos to promote EV adoption in Thailand. (Trivedi and Kishore, 2020; Hasan, Eldabi, RafiulShan, Cao and Kasemsarn, 2021).

Ethos: Credibility and Trustworthiness

Utilizing moral and authoritative expressions, ethos serves as a powerful persuasive strategy in marketing, essential for building trust and credibility with the intended audience. To strengthen the trustworthiness of an electric vehicle brand, advertising frequently highlights reliable endorsements from respected environmental groups or offers persuasive testimonials from consumers (Mohr and Nevin, 1990). This tactic seeks to influence consumers' buying choices by assuring them of the product's dependability, quality, and

connection to their core values. Advertisements featuring endorsements from established organizations like the European Environment Agency or the Environmental Protection Agency can greatly boost the credibility of electric vehicle brands, especially in areas such as the United States and Europe, where there is strong consumer faith in environmental organizations and regulatory agencies (Heyvaert, Coosemans, Van and Macharis, 2015). Additionally, enhancing the credibility of electric vehicle advertising in these areas can also involve endorsements from influential figures noted for their strong environmental activism (Modi, Bhattacharya and Basak, 2020). On the other hand, ads that emphasize the ethical dedication of electric vehicle makers to sustainability efforts can significantly shape how consumers view them and their willingness to buy, particularly in Thailand, where social responsibility and trust are highly valued (Sooksatra and Sanguanpiyapan, 2016). Promotions highlighting efforts by electric vehicle manufacturers to lower carbon emissions, support renewable energy, and foster environmental conservation in Thailand are likely to appeal positively to Thai consumers (Javanmardi, Hoque, Tauheed and Umar, 2023). Furthermore, marketers might need to apply additional strategies in developing markets like Brazil or India, where there is widespread doubt about corporate messages, to build credibility and trust with consumers (Verma and Dwivedi, 2021; Winjobi and Kelly, 2021). As suggested by Higueras and Singh (2023), this could involve embracing an honest and clear way of explaining the environmental impacts of electric vehicle production and manufacturing methods, while also establishing community involvement initiatives that tackle local residents' concerns related to sustainability and social responsibility.

Logos: Logical Reasoning of Informing

In advertising, the use of logos aims to convince people of the benefits or superiority of a product by supplying factual information, statistics, or logical reasoning. This method is especially effective in promoting EVs, as it showcases the real advantages of owning an EV, including savings on finances, lower emissions, and government incentives. For instance, ads frequently underline the long-term financial gains of owning an EV in areas

like the US and Europe, where buyers are showing more concern about fuel costs and environmental sustainability. Evidence showing the reduced lifetime expenses of owning an EV compared to standard gasoline vehicles, which includes savings on fuel and upkeep, creates a strong argument for potential buyers. Moreover, offering factual details about the positive environmental impacts of EVs, like decreased air pollution and greenhouse gas emissions, appeals to eco-conscious consumers in these regions. Advertising that focuses on logos can effectively encourage consumers in Thailand to view EVs as suitable alternatives to traditional cars, especially as increasing fuel costs and environmental regulations spark interest in green transportation options. Ads that compare the long term financial and ecofriendly advantages of EVs over conventional vehicles, particularly regarding fuel savings and lowered emissions, can shape the logical decision making of consumers. Additionally, promoting government initiatives and incentives that support EV adoption, such as tax reductions, rebates, and infrastructure growth, can make EVs more appealing to Thai buyers. Moreover, addressing prevalent misconceptions about EVs, such as worries about range and limited charging stations, through logically based ads can help ease consumers' concerns and foster trust in adopting EVs. Providing reliable information about improvements in EV technology, the growing number of charging points, and the availability of EV models with extended ranges can further reassure consumers and stimulate the adoption of EVs. Therefore, advertising based on logos is key in persuading consumers to consider EVs as attractive and viable transportation choices. By presenting factual data about the financial and environmental advantages of EVs, tackling common fears, and highlighting government incentives, marketers can effectively shape consumer views and promote the adoption of EVs. To conclude, marketing plays a vital role in advancing ecofriendly products like electric vehicles, influencing consumer perceptions, and speeding up the movement towards sustainable transport. Advertisers can skillfully use persuasive methods such as pathos, ethos, and logos to highlight the economic, social, and environmental advantages of EVs. However, successful marketing strategies must be ethical, culturally aware, and customized to the tastes of target audiences across various

countries, including Thailand. While pathos appeals to shared emotions, cultural distinctions and environmental situations shape its effectiveness in different nations. Ethos, which focuses on the ethical commitment of EV manufacturers toward sustainability, can improve credibility and positively impact consumer attitudes worldwide. Furthermore, logos focused advertising, which emphasizes factual insights into the perks of EVs, effectively convinces consumers to consider EVs as realistic transportation alternatives. Overall, by recognizing local values and addressing specific environmental issues, advertisers can craft persuasive campaigns that promote the uptake of EVs globally (Mohamad, 2022; Rafiq, Parthiban, Rajkumari, Adil, Nasir and Dogra, 2024).

Technology Acceptance Model (TAM)

Davis (1989) developed the Technology Acceptance Model (TAM), which helps explain the reasons people choose to adopt new technologies. According to TAM, the key factors that shape users' attitudes and intentions toward technology adoption are perceived usefulness and perceived ease of use. Perceived usefulness pertains to how much a technology can improve a user's performance or overall experience. In the case of electric vehicles (EVs), perceived usefulness includes advantages such as lower costs, reduced environmental impact, and better efficiency. On the other hand, perceived ease of use involves how smoothly a technology fits into daily routines. For EVs, this could relate to aspects like the availability of charging stations, simple interfaces for users, and ease of maintenance (Davis, 1989). Everett Rogers' theory on the diffusion of innovations offers a wider perspective on how new technologies are adopted in society. Rogers (2003) outlines key elements such as the characteristics of innovation (relative advantage, compatibility, complexity, trialability, and observability), communication methods, social systems, and time, which all affect how quickly innovations are adopted. Similar to the concept of perceived usefulness in TAM, relative advantage points out how an innovation is seen as better than existing options. Compatibility, like perceived ease of use in TAM, evaluates how well the innovation aligns with the current values and experiences of users.

Innovations that are viewed as beneficial and congruent generally enjoy faster adoption rates. Rogers also underscores the role of effective communication and the impact of opinion leaders and social networks in promoting adoption (Rogers, 2003). Applying TAM to the adoption of EVs in Thailand illustrates the importance of perceived usefulness and ease of use in the decision making process of consumers. Research shows that individuals are more willing to embrace EVs when they recognize significant benefits, such as saving on fuel, environmental advantages, and incentives from the government (Higuera-Castillo et al., 2023). Communication strategies and educational initiatives that highlight these advantages can effectively shift consumer attitudes and boost adoption rates (Coffman, Bernstein and Wee, 2016). Making sure that EVs are seen as user-friendly is vital; strong charging networks, straightforward interfaces, and dependable support services are crucial for building this positive view (Zhou, Zhao, Cheng and Min, 2019). Rogers' theory complements TAM by stressing the importance of conveying the relative benefits of EVs and ensuring that they align well with users' way of life (Rogers, Singhal and Quinlan, 2019; García Aviles, 2020). Efficient use of communication tools, such as social media and local influencers, can help spread favorable information about EVs and aid in their adoption (Wang et al., 2022). Addressing perceived risks, like worries about battery lifespan and charging facilities, through innovations and educational efforts is vital for speeding up EV adoption (Yeğin and Ikram, 2022). Additionally, providing alternative options such as hybrid vehicles can help consumers feel more comfortable about fully transitioning to EVs (Nekmahmud, Naz, Ramkissoon, Haywantee, and Maria, 2022). To summarize, merging TAM with Rogers' theory creates a thorough framework to examine EV adoption in Thailand. Prioritizing perceived usefulness, ease of use, and tackling perceived risks are essential approaches for shaping consumer purchasing choices. Collaboration among key players such as the automotive sector, government bodies, and environmental groups is critical to creating a supportive environment for EV adoption. As infrastructure and public awareness improve, Thailand is set to progress toward its sustainable transportation objectives (Ni, 2024). Research emphasizes the importance of well-structured policies,

strong communication strategies, and technological progress in fostering widespread EV adoption (Bailey, Miele and Axsen, 2015; Ponsree, Gebsombut, Paiyasen, Archariyapibal, Srichiangwang, Nee and Naruetharadhol, 2020).

Perceived usefulness of EVs

Research has shown that how people view the usefulness of electric vehicles (EVs) varies significantly across different countries, greatly affecting their willingness to adopt these cars. In Norway and the Netherlands, which are among the leaders in EV usage globally, several elements contribute to the perception of EVs as beneficial. Axsen and Kurani (2013) have indicated that substantial government incentives like tax breaks, lower registration costs, and discounts on tolls help individuals in these countries see EVs as a smart financial choice. In addition, the availability of a comprehensive charging network in urban areas and along key roads enhances the practicality of owning an EV. Consumers appreciate the lower greenhouse gas emissions related to electric vehicles, enhancing their perceived advantages. The growing environmental awareness and social expectations favoring sustainable practices also influence this viewpoint (Chen and Ma, 2024).

In the United States, government funds play a crucial role in improving the perceived advantages of EVs. Lin and Wu (2018) identified incentives provided for EV adoption, including tax rebates and privileges like access to high occupancy vehicle lanes for EV drivers. Furthermore, improvements in EV technology, such as extended battery life and better charging options, help ease concerns about the vehicle's range and boost the perceived benefits of owning an EV (Ben and Boukettaya, 2022; Toolib, 2023). Public information campaigns that stress long term savings and ecological benefits also influence consumer attitudes toward the utility of these vehicles (Coffman, Bernstein, and Wee, 2017). In contrast, despite governmental efforts to promote EV use, Thailand faces unique challenges in improving the perceived advantages of EVs. Yang, Wei, and Jiang (2021) pointed out various obstacles, including insufficient charging infrastructure, worries about battery longevity, and the higher initial expense of EVs compared to conventional vehicles.

Additionally, consumer awareness concerning the economic and environmental benefits of EVs is relatively limited compared to more developed nations. This is supported by research conducted by Langbroek, Franklin, and Susilo (2018), which emphasizes the need for enhanced consumer education and infrastructure to support EV adoption in Thailand.

In response to these challenges and to enhance how Thai consumers view the usefulness of electric vehicles, the Thai government has begun to invest in charging facilities and provide financial incentives for EV usage (Manutworakit and Choocharukul, 2021). Overall, while countries like Norway, the Netherlands, and the United States have successfully promoted EV adoption through various initiatives, Thailand continues to confront significant obstacles that hinder this progress. By learning from the effective strategies of these other nations and adapting policies to fit local needs and consumer preferences, Thailand can work towards improving the perceived benefits of EVs and increasing their adoption (Noel, Zarazua de Rubens, Kester, and Sovacool, 2018).

Perceived Ease of Use of EVs

Perceived ease of use is a key factor affecting consumers' attitudes and intentions toward the adoption of electric vehicles (EVs). Research indicates that consumers' perceptions of how easy it is to operate EVs are influenced by several factors, including the ease of charging, familiarity with EV technology, and the availability of support services (Venkatesh, Morris, Davis and Davis, 2003). In countries with developed charging infrastructure and comprehensive support services, such as roadside assistance and vehicle maintenance, consumers are more likely to perceive EVs as easy to use and integrate into their daily routines (Cocron, Schmalfuß, Kreißig, Franke, Krems, Schwalm and Keinath, 2012). In Norway and the Netherlands, for example, where EV adoption rates are high, the perceived ease of use of EVs is enhanced by the availability of extensive charging networks and government funded support services (Liao, Molin and Wee, 2017; Chen and Ma, 2024). However, it is challenging to increase the perceived usability of EVs in Thailand due to limited access to support services and charging infrastructure. Despite the Thai

government's efforts to promote EV use through subsidies for manufacturers and investments in charging stations, there are still significant gaps (Tsai, Wu, Kathinthong, Tran, and Lin, 2024). One primary issue is the lack of EV charging infrastructure, especially in rural areas, which makes it less convenient for consumers outside of cities to purchase an EV. Additionally, the lack of general consumer education and knowledge about EVs affects Thai customers' perceptions of their complexity and inconvenience. Questions about the reliability of EVs and the availability of spare parts also exacerbate concerns regarding the ease of operating EVs in Thailand (Pitanuwat and Sripakagorn, 2015). Politicians, business leaders, and academic institutions must collaborate to build infrastructure, increase consumer knowledge, and foster confidence in EV technology to overcome these challenges.

To tackle these challenges and improve the perceived value of electric vehicles (EVs), it is important for Thai policymakers to focus on increasing the number of charging stations, especially in isolated and rural regions, since the lack of access to charging points is a major obstacle to widespread use (Li, Long and Chen, 2016; Hall and Lutsey, 2017). Conducting large public campaigns that emphasize the advantages of EVs and share details about charging locations and available support can help ease consumer worries and boost adoption rates (Rezvani, Jansson and Bodin, 2018). Additionally, partnerships between government and private companies can be vital in creating new ways to enhance EV accessibility, including services like mobile charging units and battery swapping programs (Neaimeh, Salisbury, Hill, Blythe, Scoffield, and Francfort, 2017). Offering incentives to EV manufacturers, such as financial support and investment in production facilities, has proven effective in promoting industry expansion and ensuring the availability of replacement parts, which further aids long-term adoption (Xue, Zhang, Wang, Tian, Xiong and Li, 2020; Hardman, Chandan, Tal, and Turrentine, 2017).

In conclusion, addressing the challenges related to EVs' perceived usability in Thailand requires a multipronged approach that incorporates infrastructure development, customer education, and industry collaboration. By overcoming these challenges, Thailand

can accelerate EV adoption and contribute to the transition to sustainable transportation. Knowledgeable consumers are more likely to purchase EVs, according to a study by Bektaş and Akyıldız (2024) highlighting the importance of consumer understanding in fostering favorable perceptions of EVs. Additionally, a study by Hussain and Qureshi (2024) emphasizes the critical importance of infrastructure development, showing that the availability of reliable charging networks significantly accelerates the adoption of EVs. As a result, encouraging EV adoption in Thailand requires a coordinated strategy that takes these key factors into account.

Perceived Risks and Alternatives

A major challenge for consumers when it comes to embracing electric vehicles is the feeling of risk and doubt surrounding these types of vehicles. To foster customer confidence and speed up the acceptance of EVs, it is vital to address these concerns. Significant factors include limitations on range, charging station availability, and the unpredictable nature of EV technology and market changes. Research conducted by Cocron, Schmalfuß, Kreißig, Franke, Krems, Schwalm and Keinath (2012) highlights the importance of eliminating perceived barriers to support the uptake of electric vehicles. One prevalent fear among prospective EV buyers is range anxiety, the concern of depleting battery power before reaching their destination. Studies show that consumers often overstate the importance of range limitations, leading to discomfort about owning an electric vehicle. Therefore, it is essential to clear up misunderstandings and improve the public's understanding of the actual range of EVs to ease this fear (Cocron et al., 2012).

Another key factor influencing consumer perception of electric vehicles is the provision of charging infrastructure. If there isn't a robust network of charging stations, potential buyers might hesitate to switch to electric vehicles due to concerns over accessibility and convenience. According to Hackbarth and Madlener (2012), Germany has successfully tackled this challenge by investing in the establishment of fast charging stations along major highways and in urban centers. Thailand should take similar initiatives

to reassure consumers about the accessibility of charging points. In addition, prospective buyers might feel uncertain about the technology of electric vehicles and the dynamics of the market. With rapid advancements in vehicle performance, charging facilities, and battery technology, worries about obsolescence and resale value can arise. Malek, Almajali and Almajali (2020) recommend that providing accurate and updated information on trends in EV technology, regulations, and incentives can help lessen customer uncertainty and build confidence in the long-term prospects of electric vehicles. Likewise, Wang, Ozden, and Tsang (2023) emphasize the necessity for transparency and communication to alleviate these uncertainties.

To encourage the adoption of electric vehicles in Thailand, it is crucial to overcome perceived risks and uncertainties. Policies aimed at removing barriers to adoption should be developed through partnerships among government bodies, automobile manufacturers, and other stakeholders. This might include strategies to expand the charging infrastructure network, offer financial incentives for EV purchases, and launch campaigns to educate the public and dispel myths about electric vehicles. By taking lessons from countries like Germany, which have successfully advanced EV adoption, Thailand can craft tailored approaches that enhance consumer trust in electric vehicle technology and accelerate the transition to sustainable transportation (Shu, Wang, Lin, Jia and Zhou, 2022; Su and Wan, 2024).

Consumer Decision Making

It is important to examine how consumers make decisions to grasp the key factors that influence the adoption of electric vehicles. Central to this examination is the concept of consumer decision making, which involves several crucial elements. These elements comprise awareness and information, the search process, social influences, and the final purchasing decision. For customers, having good information and awareness is vital, as they must understand the features, benefits, and availability of electric vehicles to make informed choices. Consumers actively engage in searching for, comparing, and evaluating

data about electric vehicles, which includes aspects like features, environmental impacts, regulatory issues, and financial incentives (Dessart and Pitardi, 2019; Yeğin and Ikram, 2022). Social influence also plays a significant role in how consumers adopt green products, encompassing media impact, recommendations from peers, and cultural norms. Various cultural and societal factors, along with the opinions and experiences of others, shape individuals' attitudes and behaviors towards embracing electric vehicles (Boztepe, 2016). The purchasing phase, the final part of the consumer decision making process, is affected by numerous factors such as pricing, experiences at dealerships, government support, and decisions regarding adoption (Tu and Yang, 2019; Prajogo and Purwanto, 2020). To create strategies that effectively promote the adoption of electric vehicles and sustainable consumption habits in Thailand, it is crucial to understand how each stage of consumer decision making works. Especially in countries like Thailand, where there is an increasing demand for sustainable transportation, this understanding is vital for promoting electric vehicle adoption. Research by Dessart and Pitardi (2019) highlights the importance of information search in consumer choices by showing how much customers depend on online sources for learning about electric vehicles. Likewise, Yeğin and Ikram (2022) stress the significant impact that educational initiatives and awareness campaigns have on shaping consumer views about ecofriendly products. In their analysis of social influences, Dholakia, Blazevic, Wiertz, and Algesheimer (2009) and Boztepe (2016) acknowledge that consumer feelings and intentions toward green products are strongly affected by peer advice and media representation. Furthermore, Tun and Yang (2019) alongside Prajogo and Purwanto (2020) investigate the purchasing phase and conclude that government incentives, experiences with dealerships, and pricing are crucial elements impacting final adoption choices.

Information and Awareness

The level of consumer understanding and awareness about electric vehicle technology is crucial for influencing how many people adopt and buy these vehicles.

Lately, the benefits of electric vehicles regarding the environment, economy, and technology have received much attention. To encourage widespread use, it is essential to make a strong effort to inform and educate the public on these advantages. Axsen and Kurani (2013) point out that awareness campaigns play a significant role in increasing consumer understanding of electric vehicles. The goal of these campaigns is to inform consumers about the perks of electric vehicles, such as lower costs for operation, decreased greenhouse gas emissions, and improved energy efficiency. By addressing common misunderstandings and highlighting the advantages, these campaigns can reduce consumer concerns and promote the use of electric vehicle technology. In various countries, initiatives led by the government and educational efforts have effectively raised public awareness and furthered the adoption of electric vehicles. For example, the Chinese government has pushed forward the transition to electric transportation through robust policies and incentives (Liu, Ma, Li, and Guan, 2023). These measures encompass subsidies for electric vehicle purchases, investment in charging stations, and public information campaigns about the advantages of electric vehicles. As a result, China has emerged as a leader in electric vehicle adoption, witnessing a substantial rise in sales and market share. In Thailand, where the uptake of electric vehicles is still developing, efforts must intensify to boost the sharing of information and enhance understanding of electric vehicles. Partnerships between public and private sectors, educational programs, and targeted marketing efforts can effectively increase consumer awareness and inform them about the benefits of electric vehicles. By stressing the environmental, economic, and societal advantages, these campaigns can help eliminate barriers to adoption and create demand for electric mobility options. Moreover, it is vital to offer consumers accurate, current information about electric vehicles to support informed buying choices. This should include information regarding government incentives, overall ownership costs, charging options, and different electric vehicle models. Automakers, governmental organizations, and nonprofit groups can work together to develop user-friendly websites, educational content, and resources that assist consumers in making choices and ease their transition to

electric vehicles. In summary, consumer awareness and comprehension of electric vehicle technology play a significant role in its acceptance and uptake. Countries such as China have successfully endorsed the adoption of electric vehicles and hastened the shift to electric transport through information campaigns, government initiatives, and educational programs. Similar measures are necessary in Thailand to boost consumer interest and demand for electric mobility solutions by informing them about the benefits of electric vehicles, correcting misconceptions, and enhancing awareness (Ponsree, Gebsombut, Paiyasen, Archariyapibal, Srichiangwang and Naruetharadhol, 2020; Austmann and Vigne, 2021; Zhang, 2021; Wang, Wan, Zhang and Zhao, 2022).

Search Process of information

An important stage in how consumers make choices is the search for information, particularly when they consider getting electric vehicles. During this time, buyers look for details and evaluate different aspects of owning electric cars to make well informed choices. Investigating the performance features and technical specifications of electric vehicles is essential in the search effort. When determining if an electric vehicle matches their requirements and wants, consumers take into account many factors, such as battery range, charging duration, acceleration, and the overall driving experience. Additionally, potential buyers often research the existence and convenience of the necessary charging infrastructure. The presence of reliable charging stations and easy access to charging facilities can significantly influence consumer views on the practicality and ease of owning electric vehicles. It is crucial for future electric vehicle buyers to carefully review information about home charging options, charging networks, and charging speeds.

Government policies and incentives play a crucial role in the process of searching for electric vehicles. buyers seek information about various incentives that can help reduce the expenses involved in acquiring and maintaining an electric vehicle, including tax credits, rebates, and subsidies (Li, Du and Long, 2020). Recognizing these incentives can aid in the decision making process and positively influence consumers' intentions to choose

electric vehicles. Furthermore, potential buyers turn to social media, EV forums, and digital resources to gather insights about the experiences and viewpoints of other electric vehicle owners. According to Nekmahmud, Naz, Ramkissoon and Maria (2022), user experiences, reviews, and recommendations from peers provide valuable information regarding the performance and satisfaction associated with electric vehicles in everyday scenarios. Interacting on social media and engaging in online forums gives consumers the opportunity to share tips, advice, and best practices for electric vehicle ownership. The way consumers perceive brands, along with their trust in them, greatly affects their preferences and purchasing decisions regarding electric vehicles. Consumers' tendency to regard electric vehicles as practical transportation options is largely influenced by the brands they connect with characteristics like creativity, reliability, and commitment to the environment. It is essential to understand the factors affecting brand perception and trust to encourage the growth of electric vehicle usage, especially in developing countries such as Thailand. Research conducted by Ayodele and Mustapa (2020), and Haghani, Sprei, Kazemzadeh, Shahhoseini and Aghaei (2023) reveals that well known car brands shape consumers' views of electric vehicles. Brands recognized for their reliability and innovation are typically regarded as more reputable and trustworthy by customers. Successful brands, such as Tesla in markets like the US and Europe, are known for their groundbreaking technology, excellent performance, and dedication to sustainability. In Thailand, where the electric vehicle market is still emerging, local brands and those with a solid market history may have an advantage in attracting buyers. By capitalizing on their established brands, domestic car manufacturers can assure consumers about the quality and efficiency of their electric vehicle offerings. Additionally, companies promoting local production, service networks, and customer service are likely to resonate better with Thai customers, who prioritize reliability and convenience. Consumer trust and perceptions of brands are shaped by broader factors beyond product features, including environmental responsibility, corporate social responsibility (CSR) efforts, and brand authenticity. Customers who prioritize environmental concerns and wish to make purchases aligned with their values are

often attracted to brands that actively promote sustainability, participate in CSR initiatives, and genuinely aim to reduce carbon footprints. Moreover, reliable information and accessible communication channels can enhance customer confidence in electric vehicle brands. Consumers are more likely to place their trust in manufacturers that provide clear and precise details about their electric vehicle models, such as feature sets, pricing, charging infrastructure, and performance metrics (Wang, 2021; Nanjundaswamy, Kulal, Dinesh and Divyashree, 2023; Yi, Tonesakulrungruang, Sajjanand and Chantanasiri, 2023; Zhang, Islam, Jambulingam, Lim and Kumar, 2024).

Social Influence: Pinning decision

The dynamics of social influence are intricate and play an important role in how consumers behave across different contexts, especially in relation to electric vehicles (EVs). Consumer decisions regarding the purchase of EVs are profoundly affected by social elements, including recommendations from friends, cultural expectations, and media focus. Numerous studies have highlighted the essential function that these social factors serve in molding consumer perceptions and actions related to innovative technologies like EVs. The recommendations from peers significantly impact an individual's decision making. Often, when consumers are making purchases, they turn to the insights and experiences shared by their friends, family, and social circles. A study conducted by Ramachandaramurthy, Ajmal, Kasinathan, Tan, K., Yong and Vinoth (2023) and Siriyanon and Choiejit (2024) concluded that peers exert a major influence on how individuals feel about embracing EVs. Endorsements and personal experiences shared by peers can enhance consumers' confidence in the viability and reliability of EVs, leading to increased adoption rates.

Another key consideration affecting consumer attitudes toward EVs is social norms. These norms represent the common standards and expectations that guide behaviors and choices within a community. In regions like the Netherlands and Norway, where EV adoption rates are relatively high, social values that advocate for environmental

responsibility and sustainability have contributed to making EVs more popular (Ye, Liao, Shiyong, Shao and Gao, 2021; Chen and Ma, 2024). These countries have built a social environment that promotes ecofriendly transportation methods, establishing a welcoming climate for EV usage.

Media influence is also a significant factor that shapes consumer perceptions and feelings regarding EVs. Positive portrayals in the media that highlight the cost effectiveness, technological advancements, and green benefits of EVs can have a strong impact on consumer preferences. Conversely, negative stories that point out potential drawbacks or challenges can deter buyers from viewing EVs as viable alternatives to traditional vehicles. Hence, media portrayals and societal attitudes towards EV adoption are heavily shaped by public narratives (Li, Wang, Yu and Zheng, 2022).

The effect of social influence on consumer choices is notable in many contexts, but its effect on EV adoption may vary across different countries and regions. In nations such as Norway and the Netherlands, the combination of robust social backing and government incentives has led to widespread acceptance of EVs (Chen and Ma, 2024). Conversely, in countries like Thailand, where the adoption of EVs is still emerging, the social influence may be less pronounced due to limited knowledge and cultural norms favoring traditional gasoline vehicles. To effectively foster EV adoption in Thailand and other emerging markets, tapping into social influence is vital. Initiatives that encourage peer interaction, targeted awareness efforts, and collaborations with influential stakeholders such as environmental groups, local governments, and public figures can be beneficial. By harnessing social influence, policymakers, companies, and advocacy groups can accelerate the transition toward sustainable transportation and bolster the global fight against climate change. Legislators, corporations, and advocacy organizations can hasten the shift to sustainable transportation and strengthen the global effort to combat climate change by leveraging the power of social influence (Chawla, Mohnot, Mishra, Singh and Singh, 2023).

Purchase Decision

Numerous elements come together to influence consumers when they decide to buy an electric vehicle. Financial incentives from the government, including tax reductions, rebates, and subsidies, are essential in encouraging people to adopt EVs. Studies conducted by Li, Du, and Long (2020) as well as Cao, Chen, Qiu, and Hou (2021) have shown that such incentives greatly decrease the upfront costs associated with buying an electric vehicle, thus making it a more attractive choice for buyers. The overall cost is a key factor in the decision making journey. buyers assess the full cost of ownership, which encompasses the buying price, ongoing maintenance fees, and operational costs, such as registration charges. Research by Coffman, Bernstein, and Wee (2016) reveals that competitive pricing and clear pricing details can enhance consumer confidence and speed up the acceptance of EVs. Furthermore, how buyers perceive the benefits of EVs heavily influences their choice of automotive options. Factors like driving range, battery efficiency, access to charging stations, and the reputation of the brand contribute to this perceived value. Positive experiences, like test drive opportunities and recommendations from friends, can improve this perception and increase the likelihood of a purchase decision (Yeğin and Ikram, 2022; Nekmahmud, Argon, Naz, Ramkissoon, and Maria, 2022). Psychological, personal, social, and cultural factors also significantly affect decisions regarding the purchase of an EV. Influences such as peer pressure, societal expectations, cultural beliefs, lifestyle preferences, and individual attitudes all shape consumer inclinations. Bailey, Miele, and Axsen (2015) emphasize the role of social factors, while Austmann and Vigne (2021) highlight the importance of psychological and individual dimensions. Additionally, feelings and motivations are critical in the decision to buy an electric vehicle. Positive emotions, like excitement about new technologies or a commitment to environmental sustainability, often drive purchases of EVs. Factors like the intention to reduce one's carbon emissions or save on fuel expenses also impact buying decisions. When considering options, buyers take into account various elements, including

cost efficiency, performance, features, and reliability. They conduct thorough comparisons of different electric vehicle models before reaching a well-informed decision. The process of choosing an EV involves several stages: recognizing the need, gathering information, weighing options, making the purchase, and following up afterward. Consumers start by identifying their automotive needs, then research electric vehicles, compare various models, select one for purchase, and evaluate their satisfaction post purchase. Some buyers might act on impulse, while others take their time deliberating over their preferences and needs before making a calculated decision. Effective marketing strategies, such as loyalty incentives, special offers, and promotions, can influence both behavioral types. Various barriers can hinder purchasing electric vehicles, including buyers' doubts, insufficient charging points, and budget constraints. Wang, Wan, Zhang, and Zhao (2022) emphasize the need to address these challenges through targeted measures like financial incentives, infrastructure improvements, and educational campaigns. In summary, various elements such as government incentives, pricing strategies, perceived value, psychological and social influences, emotions, the evaluation of choices, planned versus impulsive buying habits, marketing impacts, and purchasing obstacles play a crucial role in the decision to acquire an electric vehicle. In order to foster the adoption of electric vehicles and promote ecofriendly modes of transport, it is essential to recognize and tackle these factors.

RELATED RESEARCH

The research focus has increasingly shifted toward the use of green products, especially electric vehicles (EVs), because they have the ability to greatly lower environmental harm and encourage sustainable growth. It is important to recognize the factors that affect how consumers choose to adopt EVs, particularly in developing countries like Thailand, where the move toward sustainable transport is just beginning. This chapter examines a range of studies that shed light on what drives the adoption of EVs, emphasizing aspects such as the availability of product information, effective marketing, pricing strategies, charging facilities, government support and incentives, assessments of

environmental effects, customer feedback, and theoretical models like the Technology Acceptance Model and Rogers' Theory of the Diffusion of Innovations (2003). By integrating these research findings, the goal is to enhance and provide context for our hypotheses regarding EV adoption in Thailand.

The chapter starts with an analysis of how product details and compelling advertising impact how consumers think and choose, then explores the importance of the Technology Acceptance Model (TAM) and other elements in influencing how consumers see and behave, ultimately connecting these findings to a detailed model designed for the acceptance of electric vehicles (EVs). Recent research has identified several elements that affect the acceptance of electric vehicles, as noted by He, Luo, and Sun (2022) and Toolib (2023). These studies underline the value of environmental advantages and the perception of innovation. Likewise, Srisathan, Wongsaichia, Gebsombut, Naruetharadhol, and Ketkaew (2023) mentioned that how consumers view green technologies is a key factor in their rate of adoption. These investigations support the theory that an increase in product details and persuasive advertising can enhance consumer attitudes towards EVs in Thailand. Having detailed and accessible product information is vital during the consumer selection process. Lin and Wu (2018) pointed out that supplying complete details about EVs, which include features, advantages, and guidelines for use, boosts consumer knowledge and trust, leading to higher adoption rates. Similarly, Tahmid, Hasan, and Jafree (2023) emphasized that clear and understandable product information is necessary to reduce uncertainties. These conclusions support the notion that improved product information has a positive effect on consumer decision making related to EV adoption in Thailand. Pricing and financial factors are essential in the acceptance of EVs. Javid and Nejat (2017) observed that high initial prices pose a major obstacle, even though long-term savings on fuel and maintenance could balance these costs. Li, Tong, Xing, and Zhou (2017) discussed how government support and incentives can make EVs more affordable for consumers. Advertising that focuses on these economic concerns can notably affect consumer decisions, reinforcing the idea that persuasive advertising has a beneficial

influence on consumer choices regarding EV adoption in Thailand. The TAM framework, established by Davis (1989), explains the reasons behind consumer acceptance and adoption of new technologies, including electric vehicles. It suggests that the perceived usefulness and ease of use are the main factors determining technology acceptance. A lot of research has utilized this model regarding EV adoption, confirming that these elements greatly affect consumer attitudes and intentions (Zhang, Wang, Wan, Zhang, and Zhao, 2022). The concept of perceived usefulness in TAM relates to the advantages consumers believe they will gain from using electric vehicles. Research has demonstrated that expectations of environmental benefits, savings on expenses, and technological progress fuel the perceived usefulness of EVs (Coffman, Bernstein, and Wee, 2016). This aligns with the view that perceived usefulness can positively influence consumer choices about EV adoption in Thailand. Perceived ease of use represents another key aspect of the TAM. Studies show that if consumers find EVs simple to use and maintain, they are more inclined to accept them. Elements like user-friendly controls, widespread charging options, and solid customer support play crucial roles in improving perceived ease of use (Li, Long, Chen, Chen, Zheng, and Yang, 2020). This matches the belief that perceived ease of use positively impacts the decision making of consumers regarding the acceptance of EVs in Thailand. Perceived risks, such as worries surrounding battery longevity, charging availability, and vehicle range, can slow down the adoption of EVs. Neubauer, Pesaran, Gunawardane, and Thilina (2019) proposed that resolving these issues through technological advancements and educating consumers is vital. Moreover, providing hybrid cars as a transitional option can help reduce perceived risks (Nekmahmud, Naz, Farheen, Ramkissoon, Haywantee, and Maria, 2022). This supports the theory that perceived alternative risks can effectively influence consumer decisions related to EV adoption in Thailand. Creating a holistic model that includes the availability of product details, persuasive advertising, perceived usefulness, and perceived ease of use, as outlined by TAM, is crucial for forecasting consumer decisions about EV acceptance. The combined insights from these elements deliver a strong framework for comprehending the

complexities of EV adoption (Zhang, Wang, Wan, Zhang, and Zhao, 2022). This supports the view that a comprehensive model provides significant predictive value for consumer choices regarding EV acceptance in Thailand. Additionally, the idea that the comprehensive model's predictive strength surpasses that of any individual factor emphasizes the necessity of a unified approach to encouraging EV acceptance. The provision and accessibility of charging infrastructure are vital for the broad acceptance of EVs. Sovacool, Noel, Axsen, and Kempton (2018) highlighted that insufficient charging options can discourage potential customers because of concerns about range.

On the other hand, funding for public charging infrastructure and innovations in rapid charging technology can greatly enhance trust among consumers and increase the rate of electric vehicle (EV) usage (Schnell, Peters, Wong, Lu, Guo, Zhang, Kinney, and Horton, 2021). Additionally, government regulations and incentives are crucial in promoting the use of EVs. Research by Obrecht, Fale, Muneer and Knez (2018) found that tax deductions, rebates, and other financial perks lower the overall price of EVs, making them more appealing to buyers. Policies aimed at supporting clean energy and reducing emissions promote greater adoption of electric cars (Chen and Ma, 2024). It is important to grasp the ecological effects of EVs to encourage their use. Chinda, Boonnak, Chantabutr and Rasrungsan (2023) presented an in-depth study on the environmental impacts throughout the lifecycle of EVs, proving they are more effective than traditional gasoline powered vehicles for reducing emissions. This environmental advantage is significant in the decision making of consumers, especially for those who are environmentally aware (Tu and Yang, 2019). Reviews and feedback from customers play a major role in influencing potential buyers. Wongsunopparat and Cherian (2023) noted that favorable reviews increase the perceived reliability and appeal of EVs. The role of online platforms and social media is pivotal in sharing these reviews and shaping public views (Müller, 2019). Effective marketing techniques that connect with consumers' emotions, trustworthiness, and logical reasoning are crucial. Moreover, Vrtana and Krizanova (2023) observed that advertisements focusing on emotional, ethical, and rational advantages of electric vehicles

can effectively sway consumers to consider and adopt them. The Diffusion of Innovations Theory by Everett Rogers provides a broader perspective on the social spread of new technologies, such as electric cars. Research by Xia, Wu and Zhang (2022) highlights that the pace of innovation adoption is deeply influenced by time, social contexts, communication methods, and the traits of the innovation itself.

Both Rogers' framework and the Technology Acceptance Model (TAM) emphasize the significance of user perceptions and social dynamics in the adoption journey. Rogers' theory points out the perceived relative benefits of an innovation, which aligns with its perceived usefulness in the TAM. For electric vehicles, this comprises advantages like environmental protection, savings on costs, and efficiency (Rogers, Singhal and Quinlan, 2019). The decision making process when it comes to adopting EVs is intricate and layered. Koojaroenprasit and Pumpinyo (2022) highlighted that this process is swayed by a mix of informational, emotional, and social elements. Grasping these dynamics is crucial for forming effective marketing and policy frameworks. Raising awareness and offering truthful information are vital steps in promoting the use of electric vehicles. Huang, Lin, Lim, Tseng and Zhou (2021) revealed that heightened awareness and understanding regarding the advantages and use of EVs can favorably impact consumer perceptions and adoption figures. How consumers search for information concerning EVs is a significant factor in their decision making. Kennedy, James and Hampson (2022) pointed out that individuals depend on various sources, such as online reviews, expert insights, and personal recommendations, when gathering information prior to making a buying decision. Social influences, including peer pressure and the views of social networks, can have a considerable effect on the choice to adopt EVs.

Nour, Chaves Avila, Magdy and Sánchez Miralles (2020) found that positive recommendations from trusted individuals and groups build consumer trust and encourage adoption. The combination of these elements ultimately affects the final decision to purchase. Moons and De Pelsmacker (2015) suggested that the amalgamation of perceived benefits, simplicity of use, risk evaluation, and social influences will decide whether a

consumer acquires an electric vehicle. Comparing the trends in green product adoption in Thailand with those on a global scale could offer significant insights for policymakers and industry players. Studies indicate that embracing EVs could greatly lessen air pollution and alleviate the adverse environmental impacts caused by transportation (Horton, Schnell, Peters, Wong, Lu, Gao, Zhang and Kinney, 2021). Learning from successful EV adoption examples in other nations, like China and Norway, can assist in formulating specific strategies for Thailand (Schnell, Peters, Wong, Lu, Guo, Zhang, Kinney, and Horton, 2021). Over the past decade, the global market share of electric vehicles has seen remarkable growth due to technological progress, supportive government actions, and increasing environmental awareness among consumers. The International Energy Agency (IEA) states that electric vehicles represented about 4.6% of global vehicle sales in 2020, with notable rises in markets such as China, the United States, and various European countries (IEA, 2020). This change has invited both established automakers and newcomers, heightening competition within the electric vehicle industry (Schmitt, Hain, and Korcaj, 2018). Hence, adopting electric vehicles in Thailand presents a significant opportunity for sustainability. Utilizing TAM and the Diffusion of Innovations Theory can help illustrate the factors surrounding this adoption. Diminishing risks, enhancing access to information, and leveraging social influences are crucial aspects. By applying global strategies adapted to local contexts, Thailand can effectively transition towards sustainable transportation while achieving its environmental and economic objectives.

CHAPTER 3

Research Methodology

This chapter outlines the research methods employed in the study, with a focus on quantitative approaches. It discusses the design of the research, the population involved, sample size, the hypotheses, and the overall scope of the study. The chapter explains how data was constructed and gathered, detailing the acquisition of quantitative data via surveys. Furthermore, it covers the different statistical analysis tools and techniques in Structural Equation Modeling (SEM), such as Confirmatory Factor Analysis (CFA), Correlation Analysis, Multiple Linear Regression, and Path Analysis. Each method of research is explained in detail to ensure a complete understanding of the research framework and the data analysis methods.

Research Theory

This research explored what drives people in Thailand to choose green vehicles, with a special focus on electric vehicles (EVs). By using quantitative approaches and experts' views for the reliability of the questionnaire, the study aimed to understand what factors influence consumers' desire to adopt EVs in Bangkok. The primary theoretical framework for this research was the Technology Acceptance Model (TAM), which was introduced by Davis in 1989. According to TAM, three important aspects; perceived usefulness, perceived ease of use, and perceived risk uncertainties greatly influence the adoption of new technology. In the context of EVs, perceived usefulness includes advantages such as cost savings and positive environmental effects, whereas perceived ease of use pertains to how easy EVs are to operate compared to conventional vehicles. Additionally, perceived risk uncertainties involve the concerns that potential consumers may have regarding battery life, the availability of charging infrastructure, maintenance expenses, resale value, and overall vehicle reliability. These perceived risks can influence the decision-making process by reducing confidence in the adoption of electric vehicles. Alongside TAM, the study also included persuasive advertising theories from Petty and

Cacioppo (1986), which look into how emotional appeals, credibility, and logical reasoning shape consumer attitudes and intentions towards EVs. Emotional appeals can raise awareness about environmental issues, credibility helps build trust in EV manufacturers, and logical reasoning emphasizes practical benefits like cost effectiveness and ease of use. The research further addressed the importance of product information availability, such as details on technical specifications, pricing, and information about environmental impacts, citing works from Rahman, Carlson, Gudergan, Wetzels, and Grewal (2022), and Amsl, Watson, Teller, and Wood (2023). It investigated how strong charging networks and favorable government policies can affect consumer perceptions and decisions regarding EVs. Additionally, the influence of peer suggestions and social norms that encourage sustainable transport was examined for its effects on environmental awareness and the willingness to buy ecofriendly products, referencing the work of Wardani, Hendrati, and Sishadiyati (2020).

Research Design

This method focused exclusively on quantitative approaches to understand the acceptance of electric vehicles (EVs) in Thailand. A panel of nine industry experts with experience in EV technology, market trends, consumer behavior, and policy frameworks reviewed the questionnaire to ensure that the items accurately reflected the study's objectives. They provided feedback on the clarity and relevance of the questions, confirming their alignment with the research constructs (Creswell, 2014). After this validation, data were collected using descriptive research methods (Ali, 2021; Xiong, 2022; Lim, 2024). The study examined independent variables such as product information availability, persuasive advertising, and elements of the Technology Acceptance Model (TAM) to assess their influence on EV purchase decisions (Kotler and Armstrong, 2018). The goal was to identify the key drivers of consumer behavior and generate insights to support policies that promote EV adoption in Thailand.

Research Hypotheses

This research tested the hypotheses below to thoroughly explore how different components in the conceptual framework relate to consumer choices about electric vehicles (EVs) in Thailand.

H_1: The availability of product information positively influences consumer decision making regarding the adoption of EVs in Thailand.

Having detailed information about products greatly influences how consumers think and make choices, resulting in more positive views and a higher chance of adopting electric vehicles (Lee and Kim, 2019; Chen and Ma, 2024).

H_2: Persuasive advertising positively influences consumer decision making regarding the adoption of EVs in Thailand.

Advertising methods focused on the advantages for the environment and the savings in costs related to electric vehicles significantly influence how consumers see these vehicles and motivate them to choose them (Singh and Paul, 2020; Kotler and Armstrong, 2020; Bryla, Chatterjee and Ciabiada, 2022).

H_3: The availability of product information positively influences consumer decision making regarding EV adoption through perceived usefulness.

Easily available information about electric vehicles improves how consumers view the usefulness of these cars. This positive perception boosts the chances that they will choose to adopt such vehicles (Casado, Sánchez, Bigné and Smidts, 2023; Toolib, 2023).

H_4: The availability of product information positively influences consumer decision making regarding EV adoption through perceived ease of use.

Having straightforward access to details about products makes it easier for customers to see electric vehicles as convenient, which in turn has a good effect on their choices (Neubauer, Pesaran, Gunawardane and Thilina, 2019; Li, Long, Chen, Zheng and Yang, 2020).

H_5: The availability of product information positively influences consumer decision making regarding EV adoption by reducing perceived risks associated with alternative vehicles.

Easier access to information about products reduces worries consumers have regarding safety and dependability, which makes them more likely to select electric vehicles.

H_6: Persuasive advertising positively influences consumer decision making regarding EV adoption through perceived usefulness.

Successful marketing enhances the perceived value of electric vehicles, encouraging more people to embrace them by showcasing advantages like savings over time and their effect on the environment (Coffman, Bernstein, and Wee, 2016; Zhang, Wang and Zhao, 2022).

H_7: Persuasive advertising positively influences consumer decision making regarding EV adoption through perceived ease of use.

Promoting the ease of using electric vehicles, like easy charging methods, increases the chances that consumers will adopt them (Lin and Wu, 2018; Javanmardi, Hoque, Tauheed and Umar, 2023).

H_8: Persuasive advertising positively influences consumer decision making regarding EV adoption by addressing and mitigating perceived risks associated with alternative vehicles.

Advertisements that clearly show how electric vehicles lower risks when compared to conventional cars can positively influence consumers' choices to adopt them (Schnell, Peters, Wong, Lu, Guo, Zhang, Kinney and Horton, 2021; Koojaroenprasit and Pumpinyo, 2022).

Scope of the study

This research looks into the reasons behind the acceptance of green products in Thailand, particularly focusing on electric vehicles. It assesses the main factors that affect Thai consumer choices to embrace EVs, such as the availability of product information, persuasive advertising, and aspects of the Technology Acceptance Model, including perceived usefulness and user-friendliness. The geographic focus of this study is Bangkok, Thailand, where data will be gathered from 21 different districts to ensure a good representation of the population. The study will take place over three months, from September to November 2024, and will use both online questionnaires and face to face data collections. This research is limited to electric vehicles and does not cover other ecofriendly products or wider environmental policies. Its goal is to shed light on consumer habits concerning EV adoption and to provide suggestions for increasing acceptance rates among Thai consumers. All details are explained in Table 1 below.

Table 1: Survey distribution and collection schedule for Bangkok districts.

Day	Date	Time	Place	Target
Saturday	September 14, 2024	1:00 PM - 4:00 PM	District 1 (Phra Nakhon)	Survey Distribution and Collection
Monday	September 16, 2024	1:00 PM - 4:00 PM	District 2 (Pom Prap Sattru Phai)	Survey Distribution and Collection
Wednesday	September 18, 2024	1:00 PM - 4:00 PM	District 3 (Samphanthawong)	Survey Distribution and Collection

Table 1: Survey Distribution and Collection Schedule for Bangkok Districts (Continued)

Friday	September 20, 2024	1:00 PM - 4:00 PM	District 4 (Pathumwan)	Survey Distribution and Collection
Monday	September 23, 2024	1:00 PM - 4:00 PM	District 5 (Bang Rak)	Survey Distribution and Collection
Wednesday	September 25, 2024	1:00 PM - 4:00 PM	District 6 (Watthana)	Survey Distribution and Collection
Friday	September 27, 2024	1:00 PM - 4:00 PM	District 7 (Yannawa)	Survey Distribution and Collection
Monday	September 30, 2024	1:00 PM - 4:00 PM	District 8 (Sathorn)	Survey Distribution and Collection
Wednesday	October 2, 2024	1:00 PM - 4:00 PM	District 9 (Bang Kho Laem)	Survey Distribution and Collection
Friday	October 4, 2024	1:00 PM - 4:00 PM	District 10 (Dusit)	Survey Distribution and Collection
Monday	October 7, 2024	1:00 PM - 4:00 PM	District 11 (Bang Sue)	Survey Distribution and Collection
Wednesday	October 9, 2024	1:00 PM - 4:00 PM	District 12 (Phaya Thai)	Survey Distribution and Collection
Friday	October 11, 2024	1:00 PM - 4:00 PM	District 13 (Ratchatewi)	Survey Distribution and Collection

Table 1: Survey Distribution and Collection Schedule for Bangkok Districts (Continued)

Saturday	October 12, 2024	1:00 PM - 4:00 PM	District 14 (Huai Kwang)	Survey Distribution and Collection
Tuesday	October 15, 2024	1:00 PM - 4:00 PM	District 15 (Klong Toei)	Survey Distribution and Collection
Thursday	October 17, 2024	1:00 PM - 4:00 PM	District 16 (Chatuchak)	Survey Distribution and Collection
Saturday	October 19, 2024	1:00 PM - 4:00 PM	District 17 (Thonburi)	Survey Distribution and Collection
Monday	October 21, 2024	1:00 PM - 4:00 PM	District 18 (Klong San)	Survey Distribution and Collection
Wednesday	October 23, 2024	1:00 PM - 4:00 PM	District 19 (Bangkok Noi)	Survey Distribution and Collection
Friday	October 25, 2024	1:00 PM - 4:00 PM	District 20 (Bangkok Yai)	Survey Distribution and Collection
Monday	November 25, 2024	1:00 PM - 4:00 PM	District 21 (Din Daeng)	Survey Distribution and Collection

Population and sample size

This research focuses on consumers in Bangkok, Thailand, who are thinking about buying or using electric vehicles (EVs). As the capital and the economic hub of Thailand, Bangkok is an essential market for the uptake of EVs. To obtain valid and dependable findings, the initial target was to have 705 participants based on a questionnaire with 47 items. According to Collier (2020), the minimum sample size can be determined by multiplying the number of observed variables by a factor that usually ranges from 15 to 20. For this model, with 47 variables, the calculation would be 47 multiplied by 15, leading to the recommendation of a sample size of 705. This calculation guarantees that the sample will be sufficient to address the complexities of the structural equation model being studied. Nevertheless, the researcher received feedback from 901 individuals, which is more than the suggested sample. This larger group improves the study's reliability and offers a broader insight into EV adoption in Bangkok. A stratified random sampling method was employed, targeting residents from different districts in Bangkok. This strategy ensured that the sample was representative across various demographic sections (Patton, 2014; Howell, Su, Nassel, 2020). The chosen participants have been given standardized questionnaires to provide insights on their thoughts, behaviors, and views concerning EV adoption within Bangkok. This strategy allows the research to progress with data gathering and analysis, with the goal of identifying the factors that affect consumer choices related to EV adoption in the local area (Hair, Black, Babin and Anderson, 2010; Iliyasu and Etikan, 2021).

Sampling Plan

In order to obtain a representative group of consumers from Bangkok, Thailand, the research used a stratified random sampling technique. The twenty-one districts chosen from Bangkok included Phra Nakhon, Pom Prap Sattru Phai, Samphanthawong, Pathumwan, Bang Rak, Watthana, Yannawa, Sathorn, Bang Kho Laem, Dusit, Bang Sue, Phaya Thai, Ratchatewi, Huai Kwang, Klong Toei, Chatuchak, Thonburi, Klong San, Bangkok Noi,

Bangkok Yai, and Din Daeng to demonstrate the city's demographic range. With a population of 5,471,588 in 2023, the sampling proportions were established according to the population sizes of the districts in relation to the total population of the city, ensuring the ability to generalize the results The data collection began on September 14, 2024, and ended on November 25, 2024, covering a structured three-month period. To ensure comprehensive coverage and avoid repetition, the process was carried out in three phases. From September 14 to October 2, 2024, the first nine districts were surveyed. This was followed by data collection in districts ten to fifteen from October 4 to October 15, 2024. The final stage, from October 17 to November 25, 2024, focused on districts sixteen to twenty-one, completing the process according to the planned schedule.

This timeline permitted a well-structured and complete approach to gathering data, including sufficient breaks between the coverage of each district. After collecting the data, the entire month of December 2024 was reserved for compiling, cleaning, and analyzing the information. During this time, the data gathered was carefully checked for precision, discrepancies were corrected, and the information was set up for more detailed analysis. The study applied a stratified random sampling method to achieve a total sample size of nine hundred and one respondents, appropriately distributed among the districts based on their population sizes. This method ensured that each district was adequately represented and that a variety of demographic profiles were captured. All details are explained in Table 2 below.

Table 2: Sampling plan overview

Sampling Component	**Details of Sampling Plan**
Objective	To ensure a representative sample of consumers in Bangkok, Thailand, reflecting the city’s demographic diversity.
Sampling Method	Stratified random sampling. Bangkok’s twenty-one districts were used to divide the population into strata for proportional representation.

Table 2: Sampling Plan Overview (Continued)

Districts Included	Phra Nakhon, Pom Prap Sattru Phai, Samphanthawong, Pathumwan, Bang Rak, Watthana, Yannawa, Sathorn, Bang Kho Laem, Dusit, Bang Sue, Phaya Thai, Ratchatewi, Huai Kwang, Klong Toei, Chatuchak, Thonburi, Klong San, Bangkok Noi, Bangkok Yai, Din Daeng.
Total Population	5,471,588 (as of 2023). This figure was used to determine the sample size and ensure it reflects the overall population structure.
Sampling Frame Finalization	August 2024: Verification and updating of district population data to ensure accuracy in the sampling frame.
Sampling Execution	September 14, 2024, to November 25, 2024: Sequential contact with individuals from each district to systematically cover all areas without overlap.
Data Collection Schedule	- Districts 1 through 9: September 14 to October 2, 2024. - Districts 10 through 15: October 4 to October 15, 2024. - Districts 16 through 21: October 17 to November 25, 2024. Surveys distribution and collection conducted sequentially by district.
Data Analysis Period	The whole month of December 2024: Data compilation, cleaning, and analysis. This period involves reviewing the data for accuracy, addressing inconsistencies, and preparing it for detailed analysis.
Overall Sample Size	901 respondents. This sample size ensures that findings are reliable and representative of Bangkok's diverse population.
Distribution	Proportional distribution based on district population sizes. Ensures that the number of respondents from each district is representative of its population size relative to the city's total population.
Purpose of Stratification	To capture varied demographic profiles (age groups, income levels, occupations, lifestyles) and address consumer behaviors related to green products and EVs.
Benefit of Approach	Ensures adequate representation of each district, reflects demographic diversity, simplifies the research process, and enhances the comprehensiveness and reliability of the findings.

Table 3: Distribution across districts

The sample is being divided among the 21 main districts in Bangkok according to the population of each district in the city.

No.	District	Population (September 2023)	Sample size estimate	Sample percentage (%)
	Bangkok Metropolis	**5,476,829**		
1	Phra Nakhon	40,254	18	2.57
2	Pom Prap Sattru Phai	38,100	17	2.43
3	Samphanthawong	19,546	9	1.25
4	Pathumwan	40,077	18	2.56
5	Bang Rak	42,921	19	2.74
6	Watthana	80,515	36	5.14
7	Yannawa	73,416	33	4.69
8	Sathorn	71,306	32	4.55
9	Bang Kho Laem	77,673	35	4.96
10	Dusit	75,814	34	4.84
11	Bang Sue	118,634	53	7.58
12	Phaya Thai	64,037	29	4.09
13	Ratchatewi	64,468	29	4.12
14	Huai Kwang	83,692	38	5.35
15	Klong Toei	89,514	40	5.72
16	Chatuchak	154,003	69	9.84
17	Thonburi	98,286	44	6.28
18	Klong San	64,961	29	4.15
19	Bangkok Noi	98,028	44	6.26
20	Bangkok Yai	60,675	27	3.88
21	Din Daeng	109,802	49	7.01
	Total Sample districts	**1,565,722**	**705**	**100**

Data Collection Method

To effectively reach the target population, an online data collection method was employed. Participants were selected from 21 districts in Bangkok, Thailand, using a stratified random sampling technique based on population distribution data provided by the Thai Statistical Office. Online questionnaires were administered via Google Forms, which provided an accessible and user-friendly platform for respondents. This approach facilitated the collection of both statistical and descriptive data, thereby enriching the research findings. Throughout the process, confidentiality and anonymity were strictly maintained. Participants were informed that their participation was voluntary and that their responses would be used solely for academic research purposes. Appropriate measures were taken to safeguard privacy and ensure the secure management of all data. Upon completion of data collection, a rigorous validation and cleaning process was undertaken to ensure accuracy and reliability by verifying responses, addressing anomalies, and correcting any data entry errors (Dillman et al., 2014).

Data Analysis Method

The selection of specific statistical tools for this study was driven by the need to examine the complex relationships between various factors influencing electric vehicle adoption. Structural Equation Modeling (SEM) was chosen because it can simultaneously assess multiple relationships among observed and latent variables. This is particularly beneficial for exploring how factors such as perceived risk, product information, and persuasive advertising interact and contribute to the adoption of electric vehicles. SEM also allows for the analysis of both direct and indirect effects within a comprehensive theoretical model, making it ideal for capturing the multifaceted nature of consumer decision-making.

Confirmatory Factor Analysis (CFA), integrated within SEM, was used to validate the measurement model. CFA is crucial because it ensures that the constructs, like perceived usefulness or ease of use, are adequately measured by the survey items. This validation step is essential for ensuring the accuracy and consistency of the latent variables,

thereby strengthening the overall reliability of the model before exploring the structural relationships.

Correlation analysis was employed to understand the strength and direction of relationships between key variables. It served as an initial step to identify significant patterns, such as the potential influence of product information or advertising on EV adoption decisions. This helped narrow down the critical variables that were included in the more complex SEM model.

Simple and multiple linear regression analyses were used to investigate how independent variables (such as perceived usefulness and perceived risk) impact the dependent variable (EV adoption). Regression analysis is particularly useful for quantifying relationships between variables and determining how well a set of predictors can explain variability in EV adoption. Multiple regression allowed for the control of confounding variables, providing a clearer view of the relationships between key predictors and adoption outcomes.

To ensure the reliability and validity of the survey instrument, Cronbach's Alpha was used to measure internal consistency. This was crucial for confirming that the survey items were consistently measuring the intended constructs. The Kolmogorov-Smirnov test was applied to assess the normality of the data distribution, ensuring the assumptions for parametric tests were met and thus guaranteeing the robustness of the statistical analysis.

In conclusion, the selected statistical methods were carefully aligned with the research objectives, enabling a comprehensive and rigorous analysis of the factors influencing electric vehicle adoption. By employing a combination of descriptive statistics, correlation analysis, regression modeling, and advanced techniques like SEM and CFA, the study ensures that both the measurement and structural models are validated and the findings are reliable. These methods provide a thorough understanding of the complex relationships underlying consumer behavior regarding EV adoption.

Steps in Construction and Test of Research Tools

Validity of the questionnaire

The Index of Item-Objective Consistency (IOC) is a crucial measure for assessing the content validity of the questionnaire, evaluating how well the items align with the research objectives or constructs they aim to measure.

The IOC score is calculated using the formula:

$$\text{IOC} = \frac{\text{Number of agreements between judges}}{\text{Number of judges} \times (\text{Number of items} - 1)}$$

Where the frequency of agreements indicates how often experts agree on an item's significance for the specific construct, the count of judges signifies the overall number of experts participating, and the item count refers to the total questions present in the survey. IOC scores vary from 0 to 1, with elevated scores indicating improved consistency. According to Kareema and Zubairi (2022), a score exceeding 0.60 is recognized as a sign of adequate content validity.

In this research, nine experts in electric vehicles were chosen from different fields to validate the survey used to explore electric vehicle uptake among consumers in Thailand. Their varied expertise provided a thorough assessment of the questionnaire's relevance and precision. Among them, three experts from the automotive sector were included: a market analyst focusing on automotive trends and consumer habits in Thailand, a senior executive from a leading automotive producer within Thailand, and an industry consultant well versed in supply chain logistics. Additionally, three professionals from the electric vehicle engineering field shared their expertise: a professor concentrating on battery technology and energy storage, a lead engineer from a startup in the electric vehicle sector, and a researcher dedicated to thermal management and performance improvement. Also, three users of electric vehicles contributed practical suggestions: an early adopter, a longstanding EV user, and a fleet manager tasked with overseeing a fleet of electric vehicles. Lastly, three EV experts from the international automotive arena provided a worldwide viewpoint:

an automotive policy analyst from Europe, a global market strategist, and a sustainability consultant for the automotive industry. Their combined feedback was vital in confirming the questionnaire's validity, making sure it thoroughly covered essential aspects. All items received IOC scores above the 0.60 points, confirming a strong connection to the research goals and reinforcing the integrity of the study's conclusions. See Table 4 below for a detailed explanation.

Table 4: Detailed IOC index score

The identification of the item objective congruence index (IOC) regarding the analysis of what influences the acceptance of green products in Thailand, particularly focusing on electric vehicle transportation.

Part 1: Product Information Availability												
Item	**Key drivers**	**Experts Opinion**										
		1	2	3	4	5	6	7	8	9	IOC	Result
Technical Specification	Technical specifications (e.g., battery range, charging time, horsepower) are important in my decision to consider purchasing an EV.	1	1	1	1	1	1	1	1	1	1.00	Accept
Cost and Pricing Information:	I perceive electric vehicles as cost-effective compared to traditional gasoline/diesel vehicles.	1	1	1	1	1	1	1	1	0	0.89	Accept

Table 4: Detailed IOC index score (continued)

	When evaluating the cost of an electric vehicle, I consider factors such as purchase price, maintenance costs, government subsidies, cost of charging infrastructure, and resale value.	1	1	1	1	1	1	1	0	1	0.89	Accept
Charging Infrastructure	I find the current charging infrastructure for electric vehicles in Thailand to be convenient.	1	1	1	0	1	1	1	1	0	0.78	Accept
	I have encountered challenges regarding EV charging infrastructure.	1	1	1	1	1	0	1	0	1	0.78	Accept
Government Policies and Incentives	I am aware of government policies or incentives aimed at promoting electric vehicles in Thailand.	1	1	1	1	1	1	1	1	1	1.00	Accept
	Government policies or incentives have influenced my decision to consider purchasing an electric vehicle.	1	1	1	1	1	1	1	1	0	0.89	Accept
Environmental Impact	The environmental impact of vehicles is important in my decision-making process.	1	1	1	1	1	1	0	1	1	0.89	Accept
	I believe electric vehicles are more environmentally friendly than traditional vehicles.	1	1	1	1	1	1	0	1	1	0.89	Accept
Consumer Reviews	Consumer reviews or ratings are influential in my decision to purchase an electric vehicle.	1	1	1	1	1	1	1	1	1	1.00	Accept

Table 4: Detailed IOC index score (continued)

Part 2: Persuasive Advertising												
Item	**Key drivers**	**Experts Opinion**										
		1	2	3	4	5	6	7	8	9	IOC	Result
Pathos (Emotional Appeal)	EVs make me feel environmentally responsible.	1	1	1	1	1	1	1	1	1	1.00	Accept
	Driving an EV gives me a sense of contributing to a cleaner environment.	1	1	1	1	1	1	1	1	1	1.00	Accept
	The idea of reducing pollution motivates me to consider purchasing an electric vehicle.	1	1	1	1	1	1	0	1	1	0.89	Accept
Ethos (Credibility and Ethics)	It is important to me that the company producing the electric vehicle is environmentally responsible.	1	1	1	1	1	1	1	1	1	1.00	Accept
	I trust the information provided by EV manufacturers regarding the environmental benefits of electric vehicles.	1	1	1	1	1	1	1	1	1	1.00	Accept
	I would be more inclined to purchase an EV if it is endorsed by a reputable environmental organization.	1	1	1	1	1	1	1	1	1	1.00	Accept
Logos (Logical Reasoning)	Electric vehicles are more cost-effective in the long run compared to traditional gasoline-powered vehicles.	1	1	1	1	1	1	1	1	1	1.00	Accept

Table 4: Detailed IOC index score (continued)

	The availability of charging stations influences my decision to consider purchasing an electric vehicle.	1	1	1	1	1	1	0	1	1	0.89	Accept
	Electric vehicles have comparable performance to traditional gasoline-powered vehicles.	1	1	1	1	1	1	1	1	1	1.00	Accept
	Government incentives such as tax rebates or subsidies encourage me to buy an electric vehicle.	1	1	1	1	1	1	0	1	1	0.89	Accept
	I am likely to recommend electric vehicles to others based on my own experiences or knowledge.	1	1	1	1	1	1	1	1	0	0.89	Accept
Part 3: TAM (Technology Acceptance Model)												
Item	**Key drivers**	**Experts Opinion**										
		1	2	3	4	5	6	7	8	9	IOC	Result
Perceived Usefulness of EVs	EVs reduce environmental pollution.	1	1	1	1	1	1	1	1	1	1.00	Accept
	EVs help in conserving energy resources.	1	1	1	1	1	1	0	1	0	0.78	Accept
	EVs have lower operational costs compared to traditional vehicles.	1	0	1	1	1	1	1	1	1	0.89	Accept
	EVs contribute to reducing dependence on fossil fuels.	1	1	1	1	1	1	1	1	1	1.00	Accept
	EVs are suitable for daily commuting needs.	1	1	1	1	1	1	1	1	1	1.00	Accept
	EVs offer advanced technological features compared to traditional vehicles	1	1	1	1	1	1	1	1	1	1.00	Accept

Table 4: Detailed IOC index score (continued)

Perceived Ease of Use of EVs	Charging an EV is convenient.	0	1	1	1	1	1	1	1	0	0.78	Accept
	Understanding and operating EV controls is easy.	1	1	1	1	1	1	0	1	0	0.78	Accept
	Finding charging stations is easy and accessible.	0	1	1	1	1	1	1	1	0	0.78	Accept
	Maintenance of EVs is simpler compared to traditional vehicles.	0	1	1	1	1	1	1	1	1	0.89	Accept
	Transitioning from a traditional vehicle to an EV is seamless.	1	1	1	1	0	1	1	1	1	0.89	Accept
Perceived Risk and Uncertainties	I am concerned about the performance reliability of electric vehicles.	1	1	1	1	1	0	1	1	1	0.89	Accept
	I am concerned about the battery life and replacement costs of electric vehicles.											
	I am concerned about the resale value of electric vehicles.											
Part 4: Consumer purchasing EVs												
Item	**Key drivers**	**Experts Opinion**										
		1	2	3	4	5	6	7	8	9	IOC	Result
Information and Awareness	I feel well-informed about electric vehicles (EVs).	1	1	1	1	1	1	1	1	1	1.00	Accept
	I rely on a variety of sources to learn about electric vehicles, including online articles, official websites, and social media.	1	1	1	1	1	1	1	1	1	1.00	Accept
	Access to detailed information about electric vehicles is important to me before making a purchase decision.	1	1	1	1	1	1	1	1	1	1.00	Accept

Table 4: Detailed IOC index score (Continued)

Search Process	I find it easy to locate relevant information about electric vehicles during my research.	1	1	1	1	1	1	1	1	0	0.89	Accept
	I am satisfied with the quality of information available about electric vehicles.	1	1	1	1	1	1	1	1	1	1.00	Accept
	I spend a considerable amount of time researching electric vehicles before making a decision.	1	1	1	1	1	1	1	1	1	1.00	Accept
Social Influence	The opinions of family and friends significantly affect my decision to purchase an electric vehicle.	1	1	1	1	1	1	1	1	1	1.00	Accept
	Online reviews and ratings from other consumers are influential in my decision to consider purchasing an electric vehicle.	1	1	1	1	0	1	1	1	1	0.89	Accept
	Exposure to social media influencers affects my perception of electric vehicles.	1	1	1	1	0	1	1	1	1	0.89	Accept
Purchase Decision	I am likely to purchase an electric vehicle based on my current research and information.	1	1	1	1	1	1	1	1	0	0.89	Accept
	Government incentives and subsidies play a significant role in my decision to purchase an electric vehicle.	1	1	0	1	1	1	1	1	1	0.89	Accept

Table 4: Detailed IOC index score (continued)

	Environmental benefits strongly influence my decision to buy an electric vehicle.	1	1	0	1	1	1	1	1	1	0.89	Accept

1 means certainty that there is congruence between strategies and objective theory
0 means uncertainty if there is congruence between the strategies and the theory
-1 means certainty that there is no congruence between strategies and objective theory

Reliability of the Questionnaire

After successfully finishing the Item Objective Congruence (IOC) test, the research team shared 30 pilot questionnaires online to evaluate their clarity, ease of comprehension, and overall layout. The responses from these pilot tests showed that the questionnaire was largely clear and well organized, although some sections were noted as needing enhancements. A thorough analysis of the data from the pilot questionnaires was conducted to check its reliability. The first results suggested that a few small changes were required. By integrating insights from nine experts along with the findings of this analysis, the questionnaire was revised to boost its accuracy and overall effectiveness. The final edition of the questionnaire was subjected to stringent reliability assessments. Internal consistency was measured using Cronbach's Alpha (α), which surpassed the satisfactory limit of 0.95, thus affirming the reliability of the tool. Following the standards set by Taber (2018), the Cronbach's Alpha values showed that the questionnaire was acceptable, with scores significantly above 0.7. Furthermore, the Kolmogorov Smirnov test was employed to determine the normality of the data distribution. The findings revealed that the P-value was greater than 0.05, indicating a normal distribution of the data, making it suitable for subsequent analysis.

Reliability

Notes

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	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=v1 v2 v3 v4 v5 v6 v7 v8 v9 v10 v11 v12 v13 v14 v15 v16 v17 v18 v19 v20 v21 v22 v23 v24 v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v36 v37 v38 v39 v40 v41 v42 v43 v44 v45 v46 v47 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
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	Elapsed Time	00:00:00.00

[DataSet4]

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	30	93.8
	Excluded[a]	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.952	47

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RELIABILITY
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v24
    v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v36 v37 v38 v39 v40 v41 v42 v43 v44 v45 v46 v47
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  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		09-OCT-2024 18:49:11
Comments		
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	Active Dataset	DataSet4
	Filter	<none>
	Weight	<none>
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	N of Rows in Working Data File	32
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=v1 v2 v3 v4 v5 v6 v7 v8 v9 v10 v11 v12 v13 v14 v15 v16 v17 v18 v19 v20 v21 v22 v23 v24 v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v36 v37 v38 v39 v40 v41 v42 v43 v44 v45 v46 v47 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	30	93.8
	Excluded[a]	2	6.3
	Total	32	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.952	47

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
v1	163.83	804.489	.686	.950
v2	164.23	824.185	.732	.951
v3	163.90	812.231	.638	.951
v4	164.60	820.662	.629	.951
v5	164.83	870.764	-.117	.955
v6	164.17	840.282	.371	.952
v7	164.63	852.930	.154	.953
v8	164.30	803.045	.745	.950
v9	163.87	810.878	.703	.950
v10	164.23	823.082	.568	.951
v11	164.30	802.631	.796	.950
v12	164.37	800.309	.813	.950
v13	164.10	823.679	.631	.951
v14	164.27	804.754	.782	.950
v15	164.37	819.206	.770	.950
v16	164.40	816.800	.699	.950
v17	164.27	832.616	.511	.952
v18	164.03	816.309	.572	.951
v19	164.43	845.082	.286	.953
v20	164.27	848.961	.229	.953
v21	164.20	825.821	.703	.951
v22	164.03	807.482	.775	.950
v23	164.27	815.995	.770	.950
v24	164.37	848.033	.315	.952
v25	163.83	820.213	.744	.950
v26	164.07	825.789	.690	.951
v27	163.90	801.817	.807	.950
v28	164.57	832.875	.532	.951
v29	164.10	826.576	.623	.951

v30	164.53	854.809	.169	.953
v31	164.27	858.133	.099	.953
v32	164.17	868.695	-.089	.954
v33	164.23	837.564	.428	.952
v34	163.63	829.068	.507	.952
v35	163.83	848.902	.267	.953
v36	164.23	843.357	.407	.952
v37	164.03	839.137	.399	.952
v38	163.67	813.126	.672	.951
v39	164.20	844.028	.395	.952
v40	164.17	840.764	.441	.952
v41	164.20	811.269	.781	.950
v42	164.23	854.185	.172	.953
v43	164.10	826.714	.620	.951
v44	164.20	844.234	.329	.952
v45	164.13	812.878	.805	.950
v46	164.50	839.569	.367	.952
v47	164.20	815.476	.736	.950

Research Tools

This research made use of a well designed questionnaire, created with the help of specialists, to explore the reasons behind the adoption of electric vehicles (EVs) in Thailand. The survey targeted people living in Bangkok and included a range of demographic details and feelings toward EVs. The questionnaire is divided into four major sections: The first part collects demographic data such as age, gender, income, education level, and job. An online survey will be used to gather data, using a method called stratified sampling to ensure all districts are represented. The results will be examined using descriptive statistics such as frequencies, averages, percentages, and standard deviations via SPSS version 27.0, providing an in-depth profile of the participants.

The second part focused on the availability of product information, investigating elements like technical features, pricing details, charging infrastructures, governmental policies and incentives, environmental impact, and customer reviews. This section contains twelve questions that will assess how these elements influence consumer attitudes towards EVs. The third part evaluates the impact of persuasive advertising, analyzing its effect on customer perceptions through emotional appeal (Pathos), trustworthiness (Ethos), and logical arguments (Logos). It includes ten questions that examine how these advertising factors influence consumer views and choices. The fourth part discusses aspects of the Technology Acceptance Model (TAM), including perceived usefulness, ease of use, and risk alternatives of EVs. This section consists of twelve questions aimed at measuring how these TAM factors affect consumer decisions on adoption. Participants will respond using a 5point Likert scale to indicate their agreement with each statement, as suggested by Joshi, Kale, Chandel and Pal, (2015). The scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree) to capture a variety of views and feelings. This method is consistent with Jenkins' (2007) scoring guidelines, where scores of 12 indicate low agreement, score of 3 shows moderate agreement, and scores of 45 represent high agreement. All details are explained in Table 5 below.

Table 5: Interpretation of the five-point Likert scale

Scale	Mean rating	Interpretation
5 scores	4.21-5.00	Strongly Agree
4 scores	3.41-4.20	Agree
3 scores	2.61-3.40	Neutral
2 scores	1.81-2.60	Disagree
1 score	1.00- 1.80	Strongly Disagree

Source: Jenkins (2007)

Structural equation modeling and interpretation

In this research, Structural Equation Modeling (SEM) was utilized to examine how different factors affect consumers' adoption of electric vehicles (EVs) in Bangkok. SEM, executed with AMOS 24.0 software, is an advanced statistical approach that combines factor analysis, multiple regression, and path analysis to explore causal connections between both observable and hidden variables. This method is important for testing theoretical models and comparing various conceptual frameworks, offering in-depth understanding of consumer attitudes towards EV adoption (Jöreskog, 1970; Kline, 2016; Tarka, 2018; Hair, Hult, Ringle, Sarstedt, Danks and Ray, 2021). The SEM analysis started with creating a theoretical causal model that outlines the expected relationships and correlations among variables based on prior research. Several goodness of fit indices was employed to assess how well the model fit the data, including the Chi-square test (χ^2), Goodness of fit Index (GFI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Tucker Lewis Index (TLI). These indices evaluate how closely the theoretical model matches the actual data, which aids in the validation and enhancement of the model. The Chi-square test (χ^2) compared the anticipated and actual frequencies, with smaller values indicating a more suitable model fit. A significance level lower than 0.05 implies that the model does not sufficiently represent the data, calling for further modifications. The Goodness of fit Index (GFI) assesses the model fit against an ideal model, with values above 0.90 seen as acceptable and those above 0.95 regarded as excellent. The Comparative Fit Index (CFI) compares the model with a baseline model, considering values of 0.90 or higher as acceptable, while scores exceeding 0.95 suggest a very good fit. The Root Mean Square Error of Approximation (RMSEA) measures model inaccuracies concerning degrees of freedom, with values less than 0.05 indicating a good fit, 0.05 to 0.08 a satisfactory fit, 0.08 to 0.10 a fair fit, and above 0.10 a poor fit. Lastly, the Tucker Lewis Index (TLI), which evaluates model complexity similarly to the CFI, mirrors its value range and interpretations, with figures of 0.90 and above being acceptable,

and those over 0.95 being considered excellent. Table 6 outlines the acceptable thresholds for model fit.

Table 6: Summary of acceptable values for model fit

Fit Indies Estimates	Recommended Level	Sources
Chi-Square (χ^2)	The lower the better (in relation to degree of freedom) with significance level <.05	Kline (2016); Shi, DiStefano, McDaniel and Jiang (2018)
Goodness of Fit (GFI)	>=.90 acceptable, >.95 excellent	Nihan and Sölpük (2020); Cho, Hwang, Sarstedt, and Ringle (2020).
Comparative Fit Index (CFI)	>=.90 acceptable, >.95 excellent	Xia and Yang (2019); Bedi and Bhale (2023)
Root Mean Square Error of Approximation (RMSEA)	<.05 good fit; between .05 and .08 reasonable fit. between .08 and .10 mediocre fit; and >.10 poor fit	Kenny, Kaniskan, and McCoach (2015); Xia and Yang (2019)
Tucker-Lewis Index (TLI)	>=.90 acceptable, >.95 excellent	Shadfar and Malek Mohammadi (2013); Cai, Chung and Lee (2023).
Root Mean Square Residual	RMR ≤ 0.08 (acceptable) RMR ≤ 0.05 (good fit)	Kline (2016); Byrne (2016); Sathyanarayana and Mohanasundaram (2024)

Hypothesized Relationships

H_1 → PIA and CDM (Direct effect): Product Information Availability directly affects Customer Decision Making. Better availability of product information directly influences how customers make decisions.

H_2 → PAD and CDM (Direct effect): Persuasive Advertising directly affects Customer Decision Making. persuasive advertising has a direct influence on decision making.

H_3 → PIA → Mediates PU → CDM: Product Information Availability Influences Customer Decision Making through Perceived Usefulness. Accessible product information makes the product seem more useful, influencing decision making.

H_4 → PIA → Mediates PEU → CDM: Product Information Availability affects Customer Decision Making through Perceived Ease of Use. Accessible information makes the product seem easier to use, influencing decision making.

H_5 → PIA → Mediates PRU → CDM: Product Information Availability Influences Customer Decision Making through Perceived Risk Uncertainties. Better product information helps reduce the Perceived Risk Uncertainties options, influencing decision making.

H_6 → PAD → Mediates PU → CDM: Persuasive Advertising influences Customer Decision Making through Perceived Usefulness. Persuasive advertising makes the product seem more useful, which affects decision-making.

H_7 – PAD → Mediates PEU → CDM: Persuasive Advertising influences Customer Decision Making through Perceived Ease of Use. Persuasive advertising makes the product seem easier to use, which influences decision making.

H_8 – PAD → Mediates PRU → CDM: Persuasive Advertising influences Customer Decision Making through Perceived Risk Uncertainties. Persuasive advertising helps reduce the perceived risks Perceived Risk Uncertainties, impacting decision making.

Conceptual Framework Summary:

- **Direct Effects:**

PIA → CDM: Product Information Availability directly influences Customer Decision Making.

PAD → CDM: Persuasive Advertising directly influences Customer Decision Making.

- **Mediated Effects:**

PIA → PU → CDM: Product Information Availability influences Customer Decision Making through Perceived Usefulness.

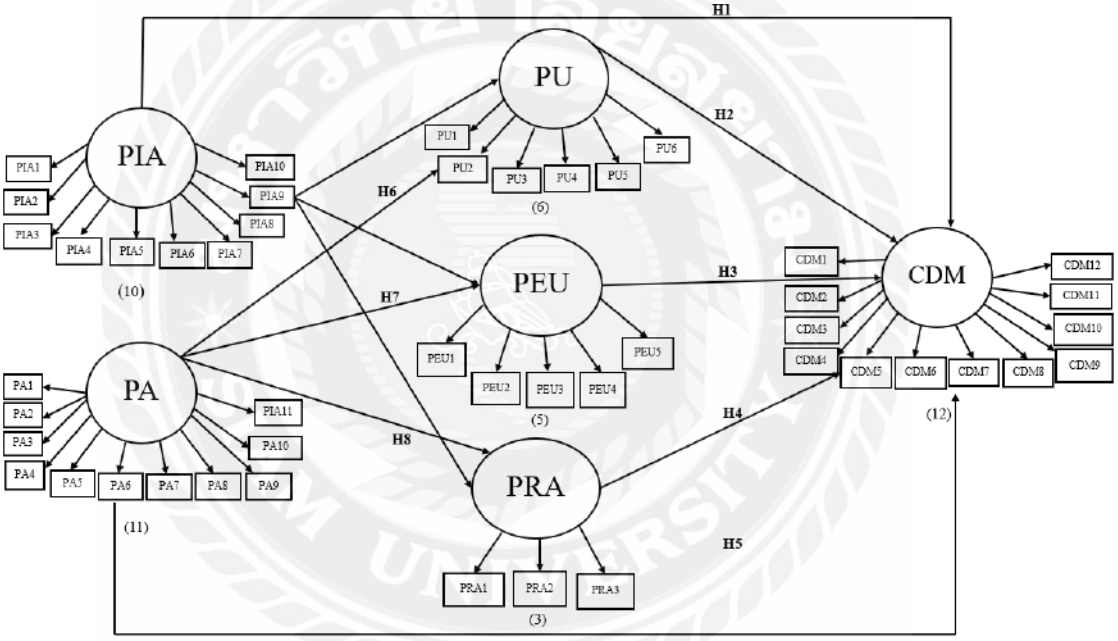
PIA → PEU → CDM: Product Information Availability influences Customer Decision Making through Perceived Ease of Use.

PIA → PRU → CDM: Product Information Availability influences Customer Decision Making through Perceived Risk Uncertainties.

PAD → PU → CDM: Persuasive Advertising influences Customer Decision-Making through Perceived Usefulness.

PAD → PEU → CDM: Persuasive Advertising influences Customer Decision Making through Perceived Ease of Use.

PAD → PRU → CDM: Persuasive Advertising influences Customer Decision Making through Perceived Risk Uncertainties.



Measurement Reliability and Model Notation

The assessment of measurement scales will involve determining their reliability through Cronbach's Alpha, which checks for internal consistency. Furthermore, to confirm the normal distribution of the data, the Kolmogorov Smirnov test will be utilized. (Otsu and Taniguchi, 2020; Cardoso and Galeno, 2023). The findings will be analyzed in relation to the research hypotheses, offering understanding into the elements that influence EV

adoption and aiding in creating focused marketing strategies. When handling the gathered data and assigning codes, the symbols in the LISREL model analysis will be specified as follows:

e: Represents error terms or residuals, which capture the variability in observed variables not explained by the model.

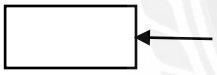
 represents a latent variable.

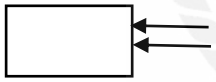
 represents an observed or measured variable.

 Indicates a causal relationship or direct effect from one variable to another. The variable at the tail causes a change in the variable at the head.

 represents a relationship or correlation between two variables where the direction of the effect is not specified. It shows a bidirectional relationship.

 Indicates covariance or correlation between two variables, meaning they share some variability or are related.

 Represents variables that are not influenced by other variables in the model (Independent variables).

 Represents variables that are not influenced by other variables in the model (Dependent variables).

CHAPTER 4

ANALYSIS AND INTERPRETATION OF RESULTS

This chapter gives a summary of the topic by detailing the methods used and discussing the results of the data examination. It starts by looking at the demographic characteristics of 901 participants, utilizing descriptive statistics from surveys to show their views on the variables studied. Moreover, additional statistical methods, like Structural Equation Modeling (SEM), are applied to analyze the proposed model and related hypotheses mentioned in the literature review, using SPSS 27.0 and AMOS 24.0 programs. Additionally, initial findings from the one way ANOVA test, independent T-test, and Confirmatory Factor Analysis (CFA) are included to evaluate the validity and reliability of the constructs.

Demographic characteristics of the respondents

Here is table 7 displaying the demographic details of 901 participants, including information on age, gender, education, monthly income, and access to EVs.

Table 7: Demographic characteristics of respondents (N=901)

Category		**Frequency**	**Percentage %**
Age range	18-24	146	16.2
	25-35	153	17.0
	35-44	256	28.4
	45-54	259	28.7
	55 and above	87	9.7
Gender	Male	353	39.2
	Female	527	58.5
	Prefer not to say	21	2.3
Education level	High school	100	11.1
	Bachelor's degree	291	32.3
	Master degree	304	33.7
	Doctorate	206	22.9

Table 7: Demographic characteristics of respondents (N=901) Continued.

Category		Frequency	Percentage %
Monthly income in Thai Baht	10000-20000	153	17.0
	25000-30000	281	31.2
	30000-35000	7	.8
	36000-40000	356	39.5
	More than 40000	103	11.4
Ever driven, owned, rented, test-driven, or ridden in an EV?	Yes	658	73.0
	No	243	27.0

Table 7 indicates that there were 146 participants (16.2%) who fell within the age range of 18 to 24 years. In the age group of 25 to 34 years, there were 153 respondents (17.0%). The age bracket of 35 to 44 years included 256 respondents (28.4%), while 259 respondents (28.7%) were aged 45 to 54 years. Lastly, there were 87 respondents (9.7%) who were 55 years old and older. Additionally, the sample had a higher number of females, totaling 527 respondents, which accounted for 58.5% of the whole group. Male participants totaled 353, making up 39.2% of the entire sample.

In terms of education, 100 respondents (11.1%) reported finishing high school. Meanwhile, 291 individuals (32.3%) achieved a bachelor's degree, and 304 respondents (33.7%) obtained a master's degree. There were also 206 respondents (22.9%) who earned a doctorate. Regarding monthly earnings, 153 respondents (17.0%) reported incomes between 10,000 and 20,000 Thai Baht, while 281 respondents (31.2%) earned between 25,000 and 30,000 Thai Baht. Furthermore, 7 respondents (0.8%) reported earning between 30,000 and 35,000 Thai Baht, whereas 356 respondents (39.5%) earned between 36,000 and 40,000 Thai Baht, and 103 respondents (11.4%) reported incomes of 40,000 Thai Baht or more. Out of the total respondents, 658 individuals (73.0%) reported that they have either owned, rented, test-driven, or ridden in an electric vehicle (EV), indicating a considerable

level of exposure to EV technology. In contrast, 243 respondents (27.0%) stated they have never interacted with an EV in any of these ways.

Descriptive Statistics and Normality Test

Awang (2015) emphasizes that checking for normality using skewness and kurtosis is crucial for the effective implementation of Structural Equation Modeling (SEM). Therefore, table 8 presents the descriptive statistics, highlighting the skewness and kurtosis necessary for drawing more accurate conclusions about the data and selecting suitable statistical approaches. For instance, if the data displays skewness, this can result in analytical biases, making statistical methods that presume normal distribution potentially unsuitable. Additional information can be found at the end of table 8 below.

Table 8: Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PIA 1: Technical specifications (e.g., battery range, charging time, horsepower) are important in my decision to consider purchasing an EV.	901	4.24	.746	-1.701	.082	5.391	.163
PIA 2: I perceive electric vehicles as cost-effective compared to traditional gasoline/diesel vehicles	901	4.26	1.003	-1.699	.081	2.619	.163

Table 8: Descriptive Statistics (Continued)

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PIA 3: When evaluating the cost of an electric vehicle, I consider factors such as purchase price, maintenance costs, government subsidies, cost of charging infrastructure, and resale value	901	3.34	1.475	-.517	.081	-1.239	.163
PIA 4: I find the current charging infrastructure for electric vehicles in Thailand to be convenient.	901	2.13	1.416	1.023	.081	-.375	.163
PIA 5: I have encountered challenges regarding EV charging infrastructure	901	2.94	1.615	.076	.081	-1.627	.163
PIA 6: I am aware of government policies or incentives aimed at promoting electric vehicles in Thailand	901	4.12	1.001	-1.483	.081	2.010	.163

Table 8: Descriptive Statistics (Continued)

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PIA7: Government policies or incentives have influenced my decision to consider purchasing an electric vehicle.	901	4.21	.968	-1.595	.081	2.490	.163
PIA 8: The environmental impact of vehicles is important in my decision-making process.	901	4.34	.896	-1.740	.081	3.229	.163
PIA 9: I believe electric vehicles are more environmentally friendly than traditional vehicles	901	4.41	.838	-1.922	.081	4.390	.163
PIA 10: Consumer reviews or ratings are influential in my decision to purchase an electric vehicle.	901	4.36	.867	-1.823	.081	3.888	.163
PAD 1: EVs make me feel environmentally responsible	901	4.24	.814	-1.505	.081	3.320	.163

Table 8: Descriptive Statistics (Continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PAD 2: Driving an EV gives me a sense of contributing to a cleaner environment	901	3.25	1.642	-.331	.081	-1.565	.163
PAD 3: The idea of reducing pollution motivates me to consider purchasing an electric vehicle	901	3.79	1.326	-1.031	.081	-.182	.163
PAD 4: It is important to me that the company producing the electric vehicle is environmentally responsible	901	4.24	.953	-1.643	.081	2.676	.163
PAD 5: I trust the information provided by EV manufacturers regarding the environmental benefits of electric vehicles	901	4.27	.933	-1.686	.081	3.037	.163

Table 8: Descriptive Statistics (Continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PAD 6: I would be more inclined to purchase an EV if it is endorsed by a reputable environmental organization	901	4.33	.885	-1.857	.081	4.070	.163
PAD 7: Electric vehicles are more cost-effective in the long run compared to traditional gasoline-powered vehicles.	901	4.29	.895	-1.589	.081	2.683	.163
PAD 8: The availability of charging stations influences my decision to consider purchasing an electric vehicle.	901	4.36	.839	-1.834	.081	4.138	.163
PAD 9: Electric vehicles have comparable performance to traditional gasoline-powered vehicles	901	4.26	.950	-1.701	.081	3.019	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PAD 10: Government incentives such as tax rebates or subsidies encourage me to buy an electric vehicle	901	4.30	.936	-1.817	.081	3.560	.163
PAD 11: I am likely to recommend electric vehicles to others based on my own experiences or knowledge.	901	4.26	.944	-1.713	.081	3.158	.163
TAM 1: EVs reduce environmental pollution	901	4.33	.762	-1.658	.081	4.580	.163
TAM 2: EVs help in conserving energy resources	901	4.36	.818	-1.715	.081	3.771	.163
TAM 3: EVs have lower operational costs compared to traditional vehicles.	901	4.28	.901	-1.663	.081	3.062	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
TAM 4: EVs contribute to reducing dependence on fossil fuels	901	4.49	.847	-2.192	.081	5.367	.163
TAM 5: EVs are suitable for daily commuting needs	901	4.36	.879	-1.753	.081	3.366	.163
TAM 6: EVs offer advanced technological features compared to traditional vehicles	901	4.18	.965	-1.575	.081	2.553	.163
TAM 7: Charging an EV is convenient.	901	4.23	1.097	-1.504	.081	1.413	.163
TAM 8: Understanding and operating EV controls is easy	901	4.37	.836	-1.667	.081	3.301	.163
TAM 9: Finding charging stations is easy and accessible	901	4.27	.962	-1.606	.081	2.496	.163
TAM 10: Maintenance of EVs is simpler compared to traditional vehicles	901	4.31	.908	-1.682	.081	3.056	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
TAM 11: Transitioning from a traditional vehicle to an EV is easy	901	4.36	.881	-1.697	.081	3.093	.163
TAM 12: I am concerned about the performance reliability of electric vehicles	901	4.39	.799	-1.673	.081	3.595	.163
TAM 13: I am concerned about the battery life and replacement costs of electric vehicles	901	4.38	.804	-1.787	.081	4.288	.163
TAM 14: I am concerned about the resale value of electric vehicles	901	4.40	.799	-1.732	.081	3.805	.163
CDM 1: I feel well-informed about electric vehicles (EVs)	901	4.25	.812	-1.524	.081	3.521	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
CDM 2: I rely on a variety of sources to learn about electric vehicles, including online articles, official websites, and social media.	901	4.23	.928	-1.615	.081	2.880	.163
CDM 3: Access to detailed information about electric vehicles is important to me before making a purchase decision	901	4.26	.946	-1.785	.081	3.426	.163
CDM 4: I find it easy to locate relevant information about electric vehicles during my research	901	4.25	.980	-1.612	.081	2.415	.163
CDM 5: I am satisfied with the quality of information available about electric vehicles	901	4.13	1.062	-1.347	.081	1.155	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
CDM 6: I spend a considerable amount of time researching electric vehicles before making a decision.	901	3.99	1.233	-1.295	.081	.647	.163
CDM 7: The opinions of family and friends significantly affect my decision to purchase an electric vehicle.	901	3.84	1.294	-1.157	.081	.183	.163
CDM 8: Online reviews and ratings from other consumers are influential in my decision to consider purchasing an electric vehicle.	901	3.98	1.281	-1.228	.081	.335	.163
CDM 9: Exposure to social media influencers affects my perception of electric vehicles	901	4.07	1.151	-1.349	.081	1.000	.163

Table 8: Descriptive Statistics (continued)

	N	Mean	Std. Deviation	Skewness	Kurtosis	N	Mean
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
CDM 10: I am likely to purchase an electric vehicle based on my current research and information	901	4.25	.897	-1.696	.081	3.401	.163
CDM 11: Government incentives and subsidies play a significant role in my decision to purchase an electric vehicle	901	4.35	.880	-1.856	.081	4.017	.163
CDM 12: Environmental benefits strongly influence my decision to buy an electric vehicle	901	4.40	.789	-1.664	.081	3.563	.163
Valid N (listwise)	901						

From the preceding discussion, negative skewness values indicate that a majority of scores are above the mean, whereas positive skewness values suggest that scores predominantly fall below the mean. According to the theory of kurtosis, positive values signify heavy tailed distributions with elevated peaks compared to normal data, while negative values indicate the opposite. The results of the normal distribution analysis, presented in the table above, reveal that the skewness values (ranging from -0.331 to -2.192) and kurtosis values (ranging from -0.182 to 5.391) for all items fall within the

acceptable thresholds of ±2 for skewness and ±3 for kurtosis, in accordance with Awang (2015). This indicates a normal distribution of the data.

In the case of variables exhibiting kurtosis values greater than 3 (>3), some researchers acknowledge a degree of acceptability. Such distributions are described as *leptokurtic*, meaning they possess a sharp peak and a narrow base. It has been argued that kurtosis values can deviate considerably from 3, even for distributions that are not markedly different from normal. Katz, Wild, Elmore, and Lucan (2013) note that "kurtosis is characterized by a vertical stretching or flattening of the frequency distribution. ... A kurtotic distribution could appear more peaked or more flattened than the normal bell-shaped distribution." Similarly, Sapp (2006) observes that "when [kurtosis is] positive, the distributions are leptokurtic or peaked." Cohen (2008) further explains that "a distribution can be leptokurtic due to extreme tails or extreme peakedness." Moreover, a paper by Chissom (1970) in *The American Statistician* distinguished kurtosis from peakedness, stating that "it is difficult to determine the shape of a distribution from the kurtosis value alone, since almost any distribution may have a negative kurtosis value."

The Average Score Results of Each Observed Variable

Each observed variable was evaluated on its own through a Likert scale. Participants assigned scores to particular statements ranging from 1 to 5, with 5 indicating strong agreement, 4 suggesting agreements, 3 being neutral, 2 showing disagreement, and 1 representing strong disagreement. The data gathered from the questionnaire were recorded and examined, as illustrated in the table 9 below:

Table 9: Percentage distribution and means of respondents' opinions on product information availability (n = 901)

Product Information Availability		**% of total percentages Strongly agree…strongly disagree** →					**Mean** $\bar{x}$ **3.835**	**S.D** **1.082**	**Agreeable level**
		5	4	3	2	1			
PIA 1	Technical specifications (e.g., battery range, charging time, horsepower) are important in my decision to consider purchasing an EV.	35.2	58.4	2.8	1.8	1.8	4.24	0.746	Strongly agree
PIA 2	I perceive electric vehicles as cost-effective compared to traditional gasoline/diesel vehicles.	51.2	36.0	4.6	4.7	3.7	4.26	1.003	Strongly agree
PIA 3	When evaluating the cost of an electric vehicle, I consider factors such as purchase	24.1	38.8	3.8	13.2	20.1	3.34	1.475	Disagree

Table 9: Percentage distribution and means of respondents' opinions on product information availability (n = 901) (continued)

		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 3.835	S.D 1.082	Agreeable Level
		5	4	3	2	1			
PIA 4	I find the current charging infrastructure for in Thailand to be Convenient	12.9	7.4	7.8	23.4	48.5	2.13	1.416	Disagree
PIA 5	I have encountered challenges regarding EV charging infrastructure.	27.4	16.9	6.9	20.3	28.5	2.94	1.615	Disagree
PIA 6	I am aware of government policies or incentives aimed at promoting electric vehicles in Thailand	40.2	45.3	5.0	5.9	3.7	4.12	1.001	Agree
PIA 7	Government policies or incentives have influenced my decision to consider purchasing	45.5	41.6	4.8	5.0	3.1	4.21	0.968	Strongly agree

Table 9: Percentage distribution and means of respondents' opinions on product information availability (n = 901) (continued)

		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 3.835	S.D 1.082	Agreeable level
		5	4	3	2	1			
PIA 8	The environmental impact of vehicles is important in my decision-making process.	52.2	37.5	4.0	4.3	2.0	4.34	0.896	Strongly agree
PIA 9	I believe electric vehicles are more environmentally friendly than traditional cars	55.6	36.3	3.3	3.0	1.8	4.41	0.838	Strongly agree
PIA 10	Consumer reviews or ratings are influential in my decision to purchase an electric vehicle	52.3	38.4	4.1	3.1	2.1	4.36	0.867	Strongly agree

Note: According to Ibarra and Revilla (2014), the mean ratings are categorized as follows: Mean = 4.21-5.00: strongly agree; Mean = 3.41-4.20: agree; Mean = 2.61-3.40: neutral; Mean = 1.81-2.60: disagree; Mean = 1.00-1.80: strongly disagree.

According to the information provided, the ratings for Product Information Availability indicate an agreeable level ranging from 4.41 to 2.13, with an overall mean suggesting agreement. On the other hand, the standard deviation varies from 1.615 to 0.746, indicating a slight variation in responses to the survey items.

Table 10: Percentage distribution and means of respondents' opinions on persuasive advertising (n = 901)

Persuasive Advertising		**% of total percentages Strongly agree…strongly disagree** →					**Mean** $\bar{x}$ **4.144**	**S.D** **1.010**	**Agreeable level**
		5	4	3	2	1			
PAD 1	EVs make me feel environmentally responsible	40.1	49.9	5.3	3.1	1.6	4.24	0.814	Strongly agree
PAD 2	Driving an EV gives me a sense of contributing to a cleaner environment	32.5	24.9	4.9	10.2	27.5	3.25	1.642	Neutral
PAD 3	The idea of reducing pollution motivates me to consider purchasing an EV	36.0	39.2	4.2	9.2	11.4	3.79	1.326	Agree
PAD 4	It is important to me that the company producing the electric vehicle is environmentally responsible.	46.8	41.5	3.6	5.3	2.8	4.24	0.953	Strongly Agree

Table 10: Percentage distribution and means of respondents' opinions on persuasive advertising (n = 901) continued.

Persuasive Advertising		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 4.144	S.D 1.010	Agreeable level
		5	4	3	2	1			
PAD 5	I trust the information provided by EV manufacturers regarding the environmental benefits of electric vehicles	48.2	40.0	5.3	3.7	2.9	4.27	0.933	Strongly Agree
PAD 6	I would be more inclined to purchase an EV if it is endorsed by a reputable environmental organization.	50.1	40.7	3.8	2.8	2.7	4.33	0.885	Strongly Agree
PAD 7	Electric vehicles are more cost-effective in the long run compared to traditional gasoline-powered vehicles.	48.7	39.7	5.1	4.7	1.8	4.29	0.895	Strongly Agree
PAD 8	The availability of charging stations influences my decision to consider purchasing an electric vehicle	50.9	41.2	2.7	3.4	1.8	4.36	0.839	Strongly Agree

Table 10: Percentage distribution and means of respondents' opinions on persuasive advertising (n = 901) continued.

Persuasive Advertising		**% of total percentages Strongly agree…strongly disagree** →					**Mean** $\bar{x}$ **4.144**	**S.D** **1.010**	**Agreeable level**
		5	4	3	2	1			
PAD 9	Electric vehicles have comparable performance to traditional gasoline-powered Vehicles.	47.7	40.4	4.9	3.8	3.2	4.26	0.950	Strongly Agree
PAD 10	Government incentives such as tax rebates or subsidies encourage me to buy an electric vehicle.	50.4	38.7	4.7	2.9	3.3	4.30	0.936	Strongly Agree
PAD 11	I am likely to recommend electric vehicles to others based on my own experiences or knowledge.	47.3	40.8	5.3	3.2	3.3	4.26	0.944	Strongly Agree

Note: According to Ibarra and Revilla (2014), the mean ratings are categorized as follows: Mean = 4.21-5.00: strongly agree; Mean = 3.41-4.20: agree; Mean = 2.61-3.40: neutral; Mean = 1.81-2.60: disagree; Mean = 1.00-1.80: strongly disagree.

Using this framework, the scores for Persuasive Advertising display a consistent range between 4.36 and 3.25, which reflects general consensus. Moreover, the standard deviation falls between 1.642 and 0.814, implying there is a minor fluctuation in answers to the survey questions.

Table 11: Percentage distribution and means of respondents' opinions on technology acceptance model (n = 901)

Technology Acceptance Model (TAM)		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 4.336	S.D 0.876	Agreeable level
		5	4	3	2	1			
TAM 1	EVs reduce environmental pollution	44.8	47.6	4.7	1.3	1.6	4.33	0.762	Strongly agree
TAM 2	EVs help in conserving energy resources.	50.2	41.3	4.0	3.1	1.4	4.36	0.818	Strongly Agree
TAM 3	EVs have lower operational costs compared to traditional vehicles.	47.7	41.4	4.4	4.2	2.2	4.28	0.901	Strongly Agree
TAM 4	EVs contribute to reducing dependence on fossil fuels.	63.2	29.0	3.3	2.4	2.1	4.49	0.847	Strongly Agree
TAM 5	EVs are suitable for daily commuting needs.	53.9	35.5	5.1	3.6	1.9	4.36	0.879	Strongly Agree
TAM 6	EVs offer advanced technological features compared to traditional vehicles	42.4	44.3	5.5	4.3	3.4	4.18	0.965	Agree
TAM 7	Charging an EV is convenient	54.9	28.0	5.8	7.4	3.9	4.23	1.097	Strongly Agree

Table 11: Percentage distribution and means of respondents' opinions on technology acceptance model (n = 901) continued.

Technology Acceptance Model (TAM		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 4.336	S.D 0.876	Agreeable level
		5	4	3	2	1			
TAM 8	Understanding and operating EV controls is easy	52.8	36.8	6.0	2.9	1.4	4.37	0.836	Strongly Agree
TAM 9	Finding charging stations is easy and accessible	50.4	35.6	7.1	4.0	2.9	4.27	0.962	Strongly Agree
TAM 10	Maintenance of EVs is simpler compared to traditional vehicles	50.8	37.4	5.9	3.6	2.3	4.31	0.908	Strongly Agree
TAM 11	Transitioning from a traditional vehicle to an EV is easy.	54.1	34.6	6.0	3.6	1.8	4.36	0.881	Strongly Agree
TAM 12	I am concerned about the performance reliability of electric vehicles	53.2	37.6	5.7	2.3	1.2	4.39	0.799	Strongly Agree
TAM 13	I am concerned about the battery life and replacement costs of electric vehicles	51.1	41.1	3.9	2.4	1.6	4.38	0.804	Strongly Agree
TAM 14	I am concerned about the resale value of electric vehicles.	54.1	37.3	4.9	2.6	1.2	4.40	0.799	Strongly Agree

Note: According to Ibarra and Revilla (2014), mean ratings are categorized as follows: a mean of 4.21 to 5.00 indicates strong agreement, 3.41 to 4.20 reflects agreement, 2.61 to 3.40 signifies neutrality, 1.81 to 2.60 represents disagreement, and a mean of 1.00 to 1.80 denotes strong disagreement. This classification provides a clear framework for interpreting survey results.

According to this framework, the scores for the Technology Acceptance Model show a favorable range from 4.49 to 4.18, implying general consensus. Moreover, the standard deviation varies from 1.097 to 0.799, reflecting a small difference in how people responded to the survey questions.

Table 12: Percentage distribution and means of respondents' opinions on consumer decision making (n = 901)

Consumer Decision Making (CDM)		**% of total percentages Strongly agree…strongly disagree** →					**Mean** $\bar{x}$ **4.166**	**S.D** **1.021**	**Agreeable level**
		5	4	3	2	1			
CDM 1	I feel well-informed about electric vehicles (EVs).	41.2	48.4	6.5	2.1	1.8	4.25	0.812	Agree
CDM 2	I rely on a variety of sources to learn about electric vehicles, including online articles, official websites, and social media	44.4	43.3	5.7	3.8	2.9	4.23	0.928	Strongly Agree
CDM 3	Access to detailed information about electric vehicles is important to me before making a purchase decision	46.7	42.7	3.6	3.4	3.6	4.26	0.946	Strongly Agree

Table 12: Percentage distribution and means of respondents' opinions on consumer decision making (n = 901) continued.

Consumer Decision Making (CDM)		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 4.166	S.D 1.021	Agreeable level
		5	4	3	2	1			
CDM 4	I find it easy to locate relevant information about electric vehicles during my research	50.1	36.1	6.2	4.6	3.1	4.25	0.980	Strongly Agree
CDM 5	I am satisfied with the quality of information available about electric vehicles	45.6	36.8	6.0	8.2	3.3	4.13	1.062	Agree
CDM 6	I spend a considerable amount of time researching electric vehicles before making a decision.	43.2	36.5	5.7	6.7	8.5	3.99	1.233	Agree
CDM 7	The opinions of family and friends significantly affect my decision to purchase EV	36.2	41.3	4.6	6.5	11.4	3.84	1.294	Agree
CDM 8	Online reviews and ratings from other consumers are influential in my decision to consider purchasing an electric vehicle	45.6	32.4	5.2	7.5	9.2	3.98	1.281	Agree

Table 12: Percentage distribution and means of respondents' opinions on consumer decision making (n = 901) continued.

Consumer Decision Making (CDM)		% of total percentages Strongly agree…strongly disagree →					Mean $\bar{x}$ 4.166	S.D 1.021	Agreeable level
CDM 9	Exposure to social media influencers affects my perception of electric vehicles.	44.8	35.8	6.4	6.9	6.0	4.07	1.151	Agree
CDM 10	I am likely to purchase an electric vehicle based on my current research and information.	44.7	44.7	4.4	3.4	2.7	4.25	0.897	Strongly Agree
CDM 11	Government incentives and subsidies play a significant role in my decision to purchase an electric vehicle.	51.8	38.8	4.0	2.9	2.4	4.35	0.880	Strongly Agree
CDM 12	Environmental benefits strongly influence my decision to buy an electric vehicle	53.9	37.0	5.8	2.2	1.1	4.40	0.789	Strongly Agree

Note: According to Ibarra and Revilla (2014), mean ratings are categorized as follows: a mean of 4.21 to 5.00 indicates strong agreement, 3.41 to 4.20 reflects agreement, 2.61 to 3.40 signifies neutrality, 1.81 to 2.60 represents disagreement, and a mean of 1.00 to 1.80 denotes strong disagreement.

According to this framework, the ratings for Consumer Decision Making show a level of agreement between 4.40 and 3.84, which implies general consensus. Moreover, the standard deviation spans from 1.294 to 0.812, reflecting a small difference in the answers given to the survey questions.

Multicollinearity testing

Carrying out this test is very important for analyzing the data because, as stated by Jain and Chetty (2020), multicollinearity means there is a relationship between two or more independent variables. Therefore, checking for multicollinearity in a dataset is essential to identify issues related to increased variability in the data. This variability can make the dataset overly sensitive to small changes and lead to instability in the regression model, which can result in biased and unreliable outcomes if not addressed. There are various methods to identify multicollinearity in a dataset, including Pearson correlation, Variance Inflation Factor (VIF), P-value and Coefficient value Test (Regression Analysis), and ANOVA (Regression Analysis). For this research analysis, we will use the Variance Inflation Factor (VIF).

Table 13: Tolerance and variance inflation factor (VIF)

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	8.092	1.821		4.444	.000		
	PIA1	-.105	.245	-.011	-.428	.669	.797	1.255
	PIA2	.280	.192	.041	1.453	.147	.716	1.396
	PIA3	.539	.148	.117	3.644	.000	.560	1.784
	PIA4	.111	.140	.023	.792	.428	.678	1.474
	PIA5	-.268	.143	-.064	-1.880	.060	.503	1.987
	PIA6	.172	.187	.025	.922	.357	.762	1.312
	PIA7	.112	.188	.016	.595	.552	.803	1.245
	PIA8	.153	.211	.020	.726	.468	.748	1.338
	PIA9	.504	.227	.062	2.217	.027	.736	1.358
	PIA10	-.113	.221	-.014	-.511	.610	.725	1.378
	PAD1	.197	.227	.023	.867	.386	.784	1.275
	PAD2	-.407	.123	-.098	-3.304	.001	.652	1.533
	PAD3	.572	.134	.111	4.273	.000	.848	1.180
	PAD4	.261	.197	.037	1.325	.185	.757	1.321
	PAD5	.514	.203	.070	2.537	.011	.747	1.340
	PAD6	.265	.221	.034	1.201	.230	.700	1.429
	PAD7	.356	.215	.047	1.659	.097	.723	1.383
	PAD8	.671	.223	.083	3.004	.003	.759	1.318
	PAD9	.162	.207	.023	.782	.434	.691	1.447
	PAD10	.695	.199	.095	3.488	.001	.767	1.304

Table 13: Tolerance and variance inflation factor (VIF) continued

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	PAD11	.226	.203	.031	1.110	.267	.724	1.382
	TAM1	.477	.247	.053	1.928	.054	.750	1.332
	TAM2	.644	.237	.077	2.714	.007	.707	1.415
	TAM3	.196	.214	.026	.916	.360	.716	1.396
	TAM4	.422	.224	.052	1.884	.060	.742	1.348
	TAM5	.506	.221	.065	2.288	.022	.704	1.420
	TAM6	.292	.199	.041	1.468	.142	.723	1.383
	TAM7	.649	.182	.105	3.573	.000	.670	1.492
	TAM8	.146	.233	.018	.625	.532	.702	1.424
	TAM9	.364	.214	.051	1.699	.090	.629	1.590
	TAM10	.353	.217	.047	1.623	.105	.685	1.460
	TAM11	-.074	.238	-.010	-.311	.756	.604	1.655
	TAM12	.249	.235	.029	1.063	.288	.759	1.318
	TAM13	.050	.235	.006	.215	.830	.748	1.336
	TAM14	.601	.229	.070	2.619	.009	.793	1.261

a. Dependent Variable: (Consumer Decision Making) CDM

To highlight the importance, a test for multicollinearity was performed using the Variance Inflation Factor, known as VIF. Regression analysis was used to evaluate tolerance values and VIF results. As noted by Dormann et al (2013), a dataset may be at risk of multicollinearity if the tolerance values are below 0.1 and the VIF scores are above

10. In this particular analysis, thirty-five independent variables were examined, which dealt with product information accessibility, persuasive advertising, and the technology acceptance framework, with consumer decision making as the dependent variable. The findings show that the dataset does not exhibit multicollinearity, as the lowest tolerance value recorded was 0.503 (pertaining to product information accessibility), and the maximum VIF score was 1.987 (also linked to product information accessibility). These results are encouraging for the regression model.

Test of Validity and Reliability

To maintain consistency within the research dataset, it is vital to perform tests of reliability or validity. Over the years, Cronbach's alpha has been recognized as a useful tool for this purpose in research. In a study conducted by Rovinelli and Hambleton (1977), known as the index of item objective congruence, content specialists were engaged to evaluate the validity of items in criterion referenced tests. Experts were asked to give a content validity score: a score of 1 indicated complete confidence that the item measured the desired attribute, a score of -1 indicated certainty that it did not measure the attribute, and a score of 0 was given when there was uncertainty about the item's ability to measure the intended attribute. Items with scores below 0.5 were modified, while those with scores of 0.5 or higher were kept.

Following this process, the questionnaire titled "Analyzing the Drivers of Green Product Adoption in Thailand: A Focus on Electric Vehicles Transportation," intended for this study, was created using a sample of 901 respondents. Additionally, the pretest results were evaluated for reliability with Cronbach's alpha needing to be above 0.70 or 70 percent (Cronbach, 1990). The Kaiser Meyer Olkin (KMO) values were greater than the suggested 0.7. The significance of Bartlett's test of sphericity was noted ($p<0.05$), and Cattell's scree test was also applied (Pallant, 2007).

In total, 47 observable variables were used to assess 16 latent variables. Specifically, the category of Product Information Availability contained 10 observable

variables, with a Cronbach's alpha of 0.329; the Persuasive Advertisement category contained 11 observable variables with a Cronbach's alpha of 0.619; the Technology Acceptance Model category comprised 14 observable variables, showing a Cronbach's alpha of 0.823; lastly, the Consumer Decision Making category included 12 observable variables with a Cronbach's alpha of 0.789. Overall, these findings indicate that the dataset is suitable for factor analysis, as the KMO values for all aspects of the study exceed 0.7, with Bartlett's tests of sphericity also showing significance below the level of 0. 001. Refer to the table below.

Table 14: Summary of KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.919
Bartlett's Test of Sphericity	Approx. Chi-Square	10880.705
	Df	1081
	Sig.	.000

Table 15: Cronbach's alpha (reliability statistics) for variables in the model

Variables	**Number of items**	**Cronbach's Alpha**
Product Information Availability	10	0.329
Persuasive Advertising	11	0.619
Technology Acceptance Model (TAM)	14	0.823
Consumer Decision Making	12	0.789

The values of Cronbach's alpha for Product Information Availability (0.329) and Persuasive Advertising (0.619) in this research are below the commonly accepted standard of 0.70, which is typically used to evaluate internal consistency (Cronbach, 1990). Although this benchmark is widely recognized across various disciplines, it is important to note that lower alpha values can still be acceptable in certain research contexts, particularly in exploratory studies or during the development of new scales. Nunnally (1978) suggests

that an alpha as low as 0.60 may be permissible during the early stages of scale construction, especially when the aim is to explore constructs or to develop a measurement tool rather than finalize a mature scale. This perspective is particularly relevant for innovative or emerging constructs, where full reliability may not yet be achievable. Similarly, DeVellis (2016) emphasizes that a Cronbach's alpha below 0.70 for newly developed constructs does not necessarily indicate a problem, and slightly lower values may be considered acceptable as long as the scale is grounded in sound theoretical foundations and the items are designed to capture the intended construct. Furthermore, McDonald (1999) points out that low Cronbach's alpha values may occur when a construct is multidimensional. In such cases, the overall alpha may not accurately reflect the internal consistency of the scale, particularly if multiple sub-dimensions are present but not fully captured by the current measurement model. This consideration is especially pertinent for Product Information Availability and Persuasive Advertising, where the constructs may involve various factors or dimensions that are not perfectly aligned. Therefore, the low Cronbach's alpha values observed in this analysis are not inherently problematic; rather, they reflect the exploratory nature of the research and the ongoing efforts to refine the measurement scales. These findings suggest that future research should reevaluate these constructs, enhance the measurement items, and further explore the potential multidimensionality to improve reliability.

Confirmatory Factor Analysis (CFA)

In order to effectively identify the connections between the observed variables, also referred to as indicators, and the latent variables, called factors, Brown and Moore (2012) suggest using Confirmatory Factor Analysis, which is a type of Structural Equation Modeling (SEM). This method was successfully applied in this study to explore the association among four latent variables and the 47 observed variables. Additionally, it aimed to determine both the number and the type of factors that explain the variance and covariation found within the indicators included in this dataset. The confirmatory factor

analysis was conducted using Amos version 24.0. For this CFA, it was necessary for all measurement scales to undergo the analysis according to the following criteria: Comparative Fit Index (CFI), Incremental Fit Index (IFI), and Tucker Lewis Index (TLI) must be at least 0.95; chi-square to degrees of freedom ratio (x^2/df) should be less than or equal to 3.0; standardized root mean square residual (SRMR) must be less than or equal to 0.08; and root mean square error of approximation (RMSEA) should not exceed 0.06 (Hu and Bentler, 1999).

Table 16: Summary of Goodness of Fit measurement metrics (CFA/SEM)

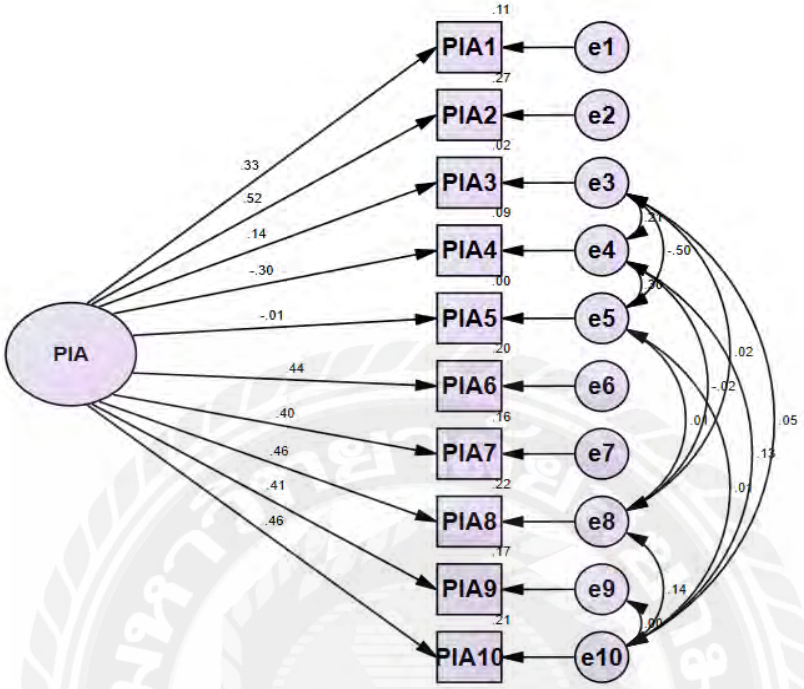
Fit Indies Estimates	**Recommended Level**	**Sources**
Normed Chi-square (CMIN/DF)	<3.00 good fit	Kline (2023)
Goodness of Fit Index (GFI)	>=.90 acceptable >.95 excellent	Lee and Kim (2016); Cho, Hwang, Sarstedt and Ringle (2020)
Adjusted Goodness of Fit Index (AGFI)	>=.85 acceptable >=.90 good fit	Schermelleh- Engel, Moosbrugger and Müller (2003)
Comparative Fit Index (CFI)	>=.90 acceptable >.95 excellent	Chinda, Techapreechaw ong and Teeraprasert (2012); Vassallo and Saba (2015)
Normed Fit Index (NFI)	>=.90 acceptable	Wu (2009); Yaşlioğlu and Yaşlioğlu (2020)

Table 16: Summary of Goodness of Fit measurement metrics (CFA/SEM) continued

Incremental Fit Index (IFI)	>=.90 acceptable	Feng and Chen (2020)
Root Mean Square Residual (RMR)	<.05 good fit	Bruner and Kumar (2005); Zeynel (2023)
Root Mean Square Error of Approximation (RMSEA)	<.05 good fit between .05 and .08 reasonable fit	Tennant and Pallant (2012); Pedroso et al., (2016)
Tucker-Lewis Index (TLI)	>=.90 acceptable >.95 excellent	Shadfar and Malekmohamm adi (2013)

The Result of The Confirmatory Factor Analysis on Product Information Availability

Product Information Availability (PIA) was measured with 10 observed variables (PIA1, PIA2, PIA3, PIA4, PIA5, PIA6, PIA7, PIA8, PIA9, PIA10). The evaluation of the measurement model showed good fitness indicators (X^2=87.238; RMR=0.044; RMSEA=0.054), especially after a covariance was drawn between certain exogenous variables. Although the results from these indicators appear to be satisfactory, with many observed variables exceeding the set threshold for an accepted model fit, the following variables (PIA1, PIA3, PIA4, PIA5) would be deleted in the collective CFA/ final SEM because their parameter values fall below the acceptable benchmark for a good model fit. They therefore do not qualify to be predictors of product information availability. This detail is illustrated in Figure 2 below.

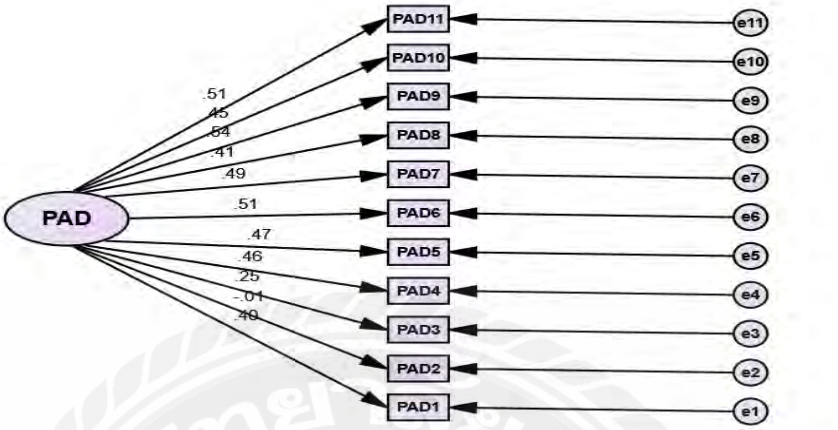


Chi-square=87.238; p=0.000>0.05; DF=24; RMR=0.044<0.05; GFI=0.981>0.90; RMSEA=0.054<0.1; AGFI=0.957>0.90

Figure 2: Measurement model for product information availability

The Result of The Confirmatory Factor Analysis on Persuasive Advertising

Persuasive Advertising (PAD) was measured with 11 observed variables (PAD1, PAD2, PAD3, PAD4, PAD5, PAD6, PAD7, PAD8, PAD9, PAD10, PAD11) The assessment of the measurement model revealed favorable fitness indicators (X^2=131.950; RMR=0.056; RMSEA=0.47). While the outcome of this indices seems to be fit, having a good number of the observed variables surpassing the established threshold for acceptable fit model, the observed variables (PAD2, PAD3) would be deleted in the collective CFA/ final SEM because their parameter values fall below the acceptable benchmark for a good model fit. They therefore do not qualify to be predictors of persuasive advertising. This detail is illustrated in Figure 3 below.

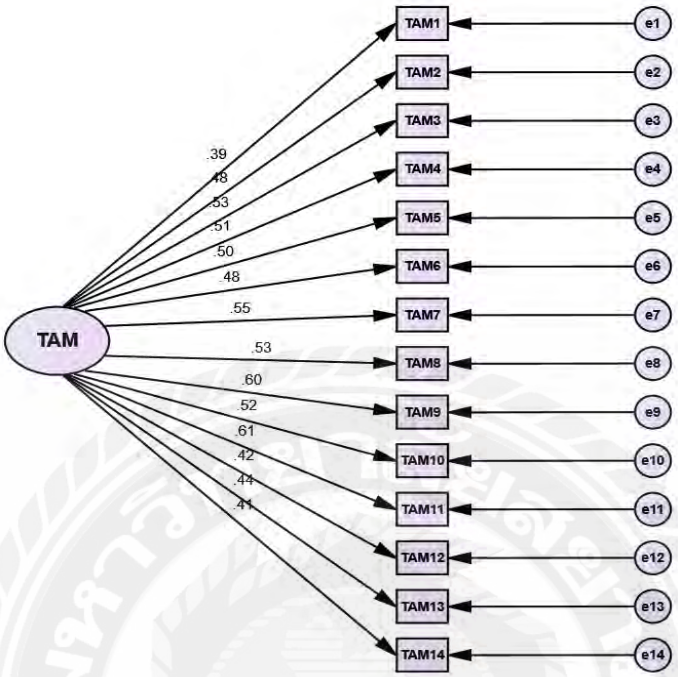


Chi-square=131.950; p=0.000>0.05; DF=44; RMR=0.056<0.05; GFI=0.974>0.90; RMSEA=0.47<0.1; AGFI=0.961>0.90

Figure 3: Measurement model for persuasive advertising

The Result of The Confirmatory Factor Analysis on Technology Acceptance Model

Technology Acceptance Model (TAM) was measured with 14 observed variables (TAM1, TAM2, TAM3, TAM4, TAM5, TAM6, TAM7, TAM7, TAM8, TAM9, TAM10, TAM11, TAM12, TAM13, TAM14). The assessment of the measurement model revealed favorable fitness indicators (X^2=225.198; RMR=0.028; RMSEA=0.46). The outcome of this indices seems to be fit, having a good number of the observed variables surpassing the established threshold for acceptable fit model. The observed variables here therefore qualify to be predictors of technology acceptance model. This detail is illustrated in Figure 4 below.



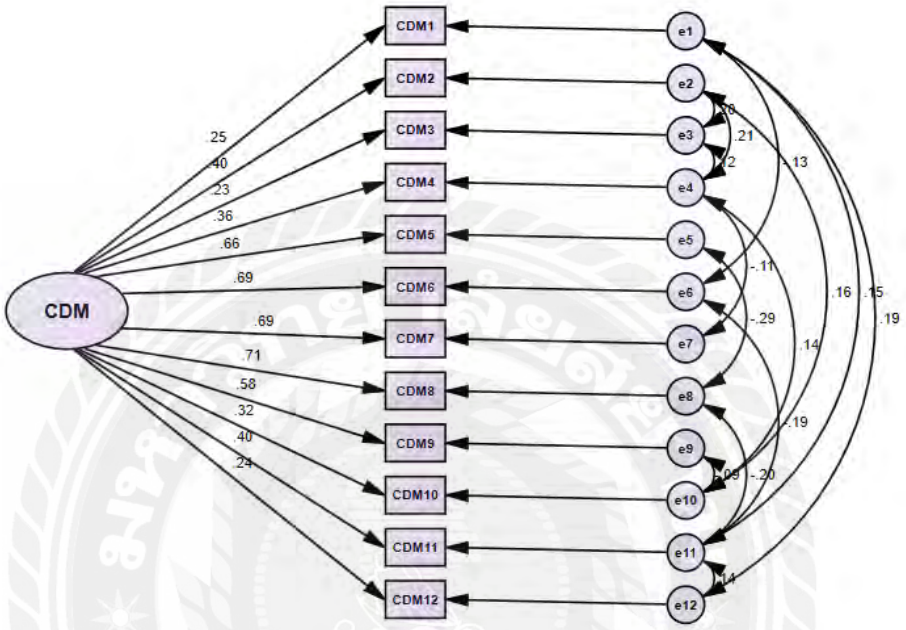
Chi-square=225.198; p=0.000>0.05; DF=77; RMR=0.028<0.05; GFI=0.966>0.90; RMSEA=0.46<0.1; AGFI=0.953>0.90

Figure 4: Measurement model for technology acceptance

The Result of The Confirmatory Factor Analysis on Consumer Decision Making

Consumer Decision Making (CDM) was measured with 12 observed variables (CDM1, CDM2, CDM3, CDM4, CDM5, CDM6, CDM7, CDM7, CDM8, CDM9, CDM10, CDM11, CDM12) The assessment of the measurement model revealed favorable fitness indicators (X^2=216.122; RMR=0.049; RMSEA=0.070). While the outcome of this indices seems to be fit, having a good number of the observed variables surpassing the established threshold for acceptable fit model, the following observed variables (CDM1, CDM3, CDM10, CDM12) would be deleted in the collective CFA/ final SEM because their parameter values fall below the acceptable benchmark for a good model fit. They therefore

do not qualify to be predictors of consumer decision making model. This detail is illustrated in Figure 5 below.



Chi-square=216.122; p=0.000>0.05; DF=40; RMR=0.049<0.05; GFI=0.961>0.90; RMSEA=0.070<0.1; AGFI=0.924>0.90

Figure 5: Measurement for consumer decision making model

Table 17: Items removed following the initial CFA

Recall that every item mentioned here was removed because their parameter values were lower than the acceptable level for a proper model fit, as detailed in the specific CFAs earlier.

S/N	Deleted Items	Description
1.	PIA1	Technical specifications (e.g., battery range, charging time, horsepower) are important in my decision to consider purchasing an EV.
2.	PIA3	When evaluating the cost of an electric vehicle, I consider factors such as purchase price, maintenance costs, government subsidies, cost of charging infrastructure, and resale value
3.	PIA5	I have encountered challenges regarding EV charging infrastructure.
4.	PAD2	Driving an EV gives me a sense of contributing to a cleaner environment.
5.	CDM1	I feel well-informed about electric vehicles (EVs)
6.	CDM3	Access to detailed information about electric vehicles is important to me before making a purchase decision
7.	CDM10	I am likely to purchase an electric vehicle based on my current research and information.
8.	CDM12	Environmental benefits strongly influence my decision to buy an electric vehicle.

Based on the foregoing, 39 variables have been considered fit enough to proceed to structural equation modelling (SEM).

Table 18: Factor loading for the measurement model of drivers of green product adoption in Thailand: a focus on electric vehicles transportation. (n=901) continued.

Factor loading is the measure of how much a variable relates to a factor, shown by a correlation coefficient. Similar to factor scores, factor loadings show the degree to which the factor accounts for the differences in an observed variable. When factor loadings are high, nearing 1 or -1, it indicates that the factor significantly affects the variable.

Unobserved variables	**Observed variables**	**Factor Loading: λ**				
		AVE	**CR**	**St. Loading Factor**	**Z value**	**P Value**
Product Information Availability	PIA2	0.143	0.485	0.52	--	--
	PIA4			0.48		*
	PIA6			0.44		*
	PIA7			0.40		*
	PIA8			0.46		*
	PIA9			0.41		*
	PIA10			0.46		
Persuasive Advertising	PAD1	0.190	0.693	0.40		--
	PAD3			0.25		
	PAD4			0.46		*
	PAD5			0.47		*
	PAD6			0.51		*
	PAD7			0.49		
	PAD8			0.41		
	PAD9			0.54		
	PAD10			0.45		
	PAD11			0.51		

Table 18: Factor loading for the measurement model of drivers of green product adoption in Thailand: a focus on electric vehicles transportation. (n=901) continued.

Unobserved variables	Observed variables	Factor Loading: λ				
		AVE	CR	St. Loading Factor	Z value	P Value
Technology Acceptance Model	TAM1	0.253	0.823	0.39		--
	TAM2			0.48		*
	TAM3			0.53		*
	TAM4			0.51		*
	TAM5			0.50		*
	TAM6			0.48		*
	TAM7			0.55		*
	TAM8			0.53		*
	TAM9			0.60		
	TAM10			0.52		
	TAM11			0.61		
	TAM12			0.42		
	TAM13			0.44		
	TAM14			0.41		

Table 18: Factor loading for the measurement model of drivers of green product adoption in Thailand: a focus on electric vehicles transportation. (n=901) continued.

Unobserved variables	**Observed variables**	**Factor Loading: λ**				
		AVE	**CR**	**St. Loading Factor**	**Z value**	**P value**
Consumer Decision Making	CDM2	0.247	0.772	0.40		--
	CDM4			0.40		*
	CDM5			0.66		*
	CDM6			0.69		*
	CDM7			0.69		
	CDM8			0.71		
	CDM9			0.58		
	CDM11			0.40		
Note: χ^2 (901) = 1389.933 (p=.000); TLI=0.899; CFI=0.909; RMSEA=0.034; NFI=0.838; GFI=0.927; * p<0.001						

This figure below visually represents Table 18, illustrating the factor loadings of each variable in the model.

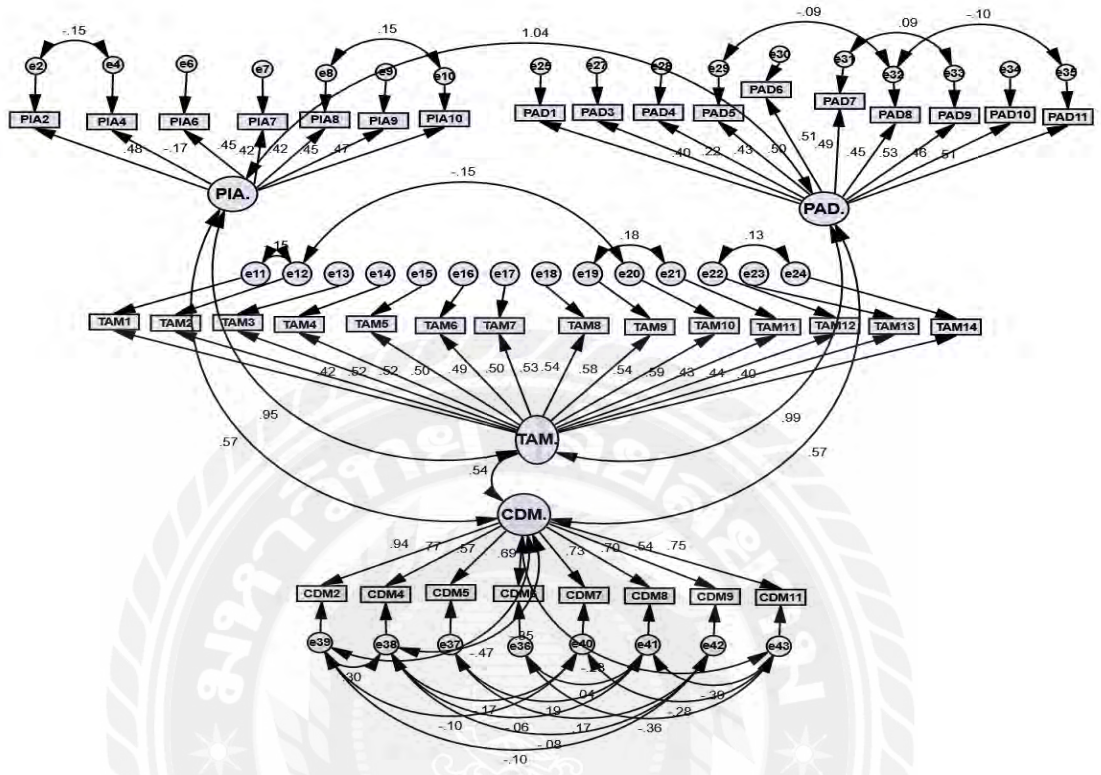


Figure 6: CFA of the measurement model (N=901)

The values of CMIN, which represents Chi-square minimum, are shown in the table below. This figure is utilized to evaluate how significant the relationship is between the observed variables and the expected outcomes, and it is alternatively referred to as the likelihood ratio chi-square. The table also features DF (Degrees of Freedom), CFI (Comparative Fit Index), and RMSEA (Root Mean Square Error of Approximation). All these measures are included in the indices that assess how well a model fits, and the findings demonstrate that these criteria have been met successfully. This information is depicted in Table 19 below.

Table 19: Model fit measures

Measure	Estimate	Threshold	Interpretation
CMIN	1389.933	--	--
DF	672.000	--	--
CMIN/DF	2.068	Between 1 and 3	Excellent
CFI	0.909	>0.95	Acceptable
RMSEA	0.034	<0.06	Excellent
PClose	1.000	>0.05	Excellent

Cutoff Criteria*

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

Note: Hu and Bentler (1999) recommend using a combination of measures to assess model fit in covariance structure analysis. I prefer a combination of CFI > 0.95 and SRMR < 0.08. To further strengthen the evidence, I also consider RMSEA < 0.06.

Structural Equation Modelling (SEM)

Structural Equation Modeling (SEM), which precedes the Confirmatory Factor Analysis (CFA) model, was employed to create a comprehensive hypothesized model, or the main conceptual model for this research. The AMOS software, version 24.0, was utilized successfully to obtain the Maximum Likelihood Estimation (MLE) to ensure its suitability with the data gathered earlier regarding the Drivers of Green Product Adoption in Thailand: A Focus on Electric Vehicles Transportation. The analysis included Goodness of fit measures to assess the precision and acceptability levels of the model during this evaluation.

The hypothesized relationships existing among the model construct were described in a structural model, grouped into three (3), thus, **independent variables** (Product Information Availability: PIA2, PIA 4, PIA6, PIA7, PIA8, PIA9, PIA10), (Persuasive Advertising: PAD1, PAD 3, PAD4, PAD5, PAD6, PAD7, PAD8, PAD9, PAD10, PAD11); **mediators** derived originally from TAM: Technology Acceptance Model but spread among three distinct elements (Perceived Usefulness – PU, Perceived Ease of Use – PEU, and Perceived Risk and Uncertainties – PRU). However, for better clarity in relation to the questionnaire/survey item, PU was associated to TAM1, TAM2, TAM3, TAM4, TAM5, TAM6; PEU was associated to TAM7, TAM8, TAM9, TAM10, TAM11; while PRU was associated to TAM12, TAM13, TAM14; **dependent variable** (Consumer Decision Making - CDM). Based on the foregoing, after much satisfaction was obtained from the measurement model, all nine (9) hypotheses associated to the model were tested, thereby resulting to a working conceptual framework. See the figure 7 below.

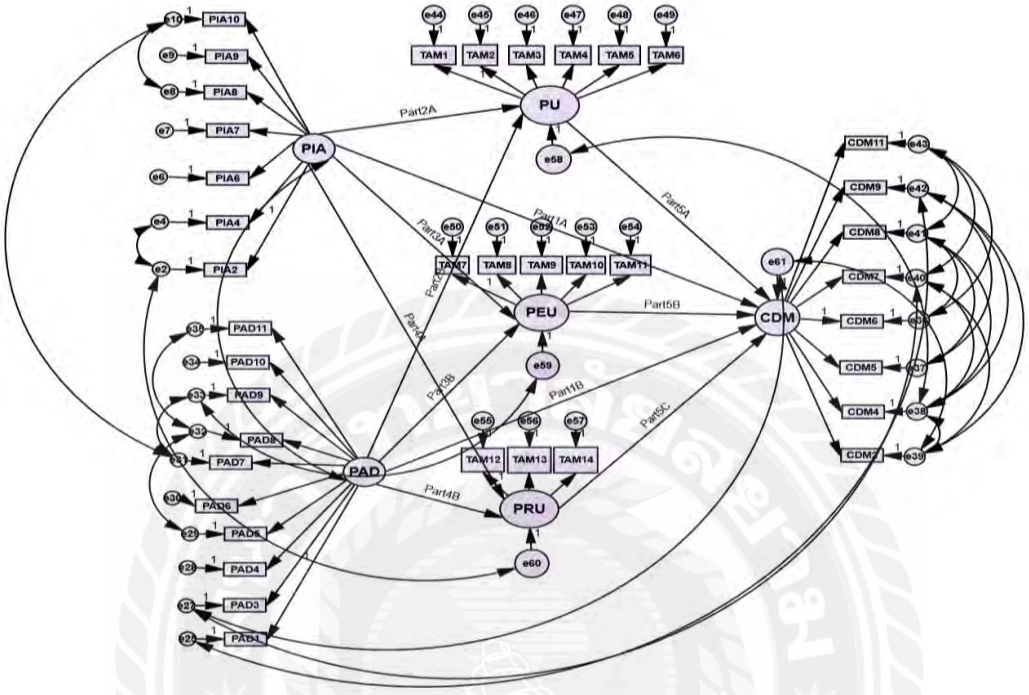


Figure 7: Hypothesis model for goodness-of-fit testing

Table 20 offers a recap of the structural paths found in the model, as well as the outcomes of the hypothesis evaluations and the related standardized estimates derived from a sample of 901 participants. This table gives a clear summary of the main results from the structural equation modeling analysis, enabling readers to evaluate the accuracy of the hypotheses and the connections among the variables in the research. Refer to table 20 below.

Table 20: Summary of structural paths and hypothesis results/standard estimates (n=901)

H	From	TO		Hypothesis model		
				Standardized regression weight: estimate	Z	P
H1	PIA	CDM		0.415***	10.721	0.000
H2	PAD	CDM		0.502***	6.523	0.000
H3	PIA	PU	CDM	0.594***	16.83	0.000
H4	PIA	PEU	CDM	0.581***	9.855	0.000
H5	PIA	PRU	CDM	0.448***	17.80	0.000
H6	PAD	PU	CDM	0.685***	11.80	0.000
H7	PAD	PEU	CDM	0.685***	4.358	0.000
H8	PAD	PRU	CDM	0.503***	17.44	0.000

Table 20: Summary of structural paths and hypothesis testing results, standard estimates (n=901) (Continued.)

Model goodness-of-fit statistics	Acceptable levels Criteria	Hypothesis model
Chi-square statistic	_	1355.230
Df	>0	665
CMINDF	<3	2.038
p-value	>0.05	p=0.000
GFI	>0.90	0.929
AGFI	> 0.80	0.917
RMR	< 0.05	0.041
RMSEA	< 0.05	0.034
CFI	>0.90	0.912
IFI	>0.90	0.913
NFI	>0.90	0.842
TLI	>0.90	0.902
Note: *p<0.05, **p<0.01, ***p<0.001		

A Close analysis via the structural equation modeling framework, shows clearly the adoption of correlation between factors resulting to a chi-square value of 1355.230, with a p-value of 0.000, and 665 degrees of freedom (DF). The presence of degrees of freedom greater than zero indicates that the number of specified paths in the model is less than the number of unique (non-redundant) sources of information. Based on the foregoing, we are sure that the model can be measured, with an assessable model fit, especially when viewed

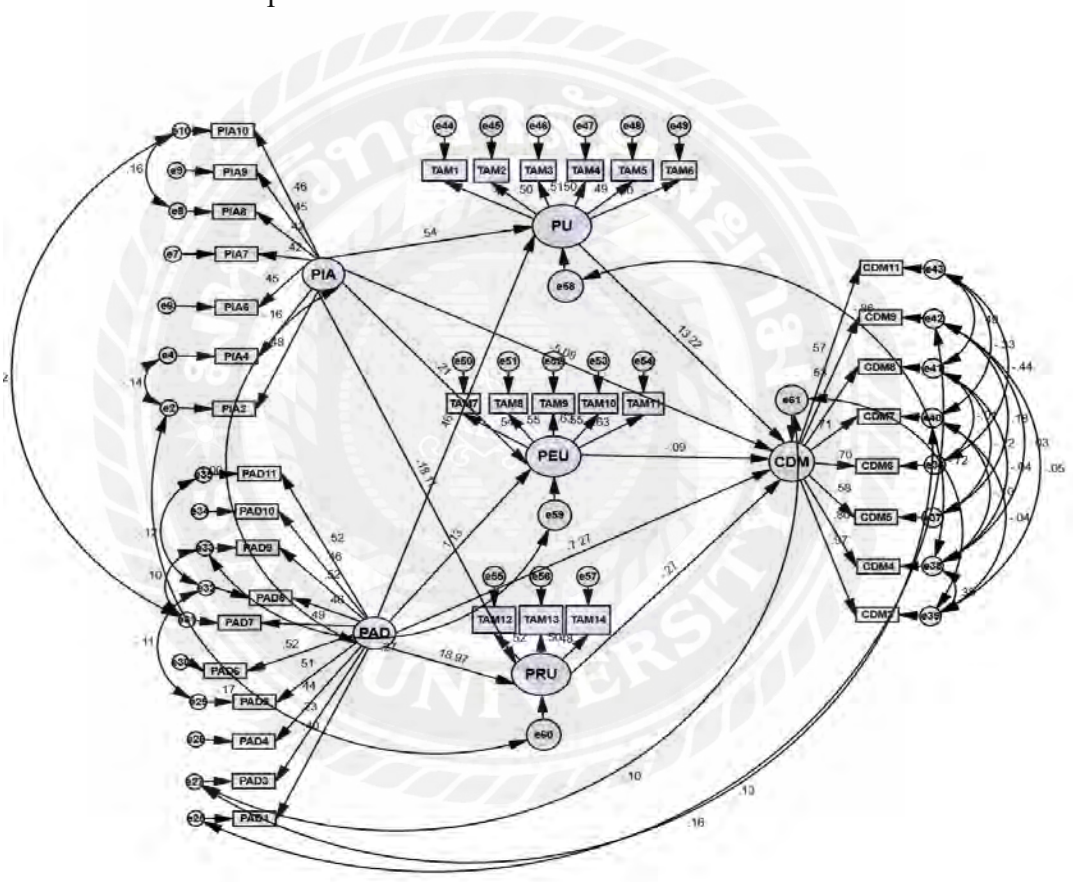
through the lens of the identified model fit indices stated for consideration earlier in chapter 3. However, Kline (2023), has this to say about measurement of model fit, thus, a value of a relative chi-square index (CMIN/DF) equal to or less than 3 suggested adequate model fit. Therefore, CMIN/DF was calculated by using a Chi-square value dividing the degree of freedom, in this model, the CMIN/DF ratio as 1355.230/665 = 2.038, indicating an acceptable fit of the current model to the data. For more fitness assessment, other model fit indices were employed, hence, the Comparative Fit Index (CFI=0.912), Incremental Fit Index (IFI=0.913), Root Mean Square Residual (RMR=0.041), Root Mean Square Error of Approximation (RMSEA=0.034), Goodness-of-Fit Index (GFI=0.929), Adjusted Goodness-of-Fit Index (AGFI=0.917), Normed Fit Index (NFI=0.842), and Tucker Lewis Index (TLI=0.902), evidently, all model fit indices were met according to the suggested cutoff values by Kline (2023), with the exception of the NFI. Due to the complexity of the model, only the NFI which though didn't reach the threshold but was almost close, is **not** sufficient reason to conclude the entire model generally **unfit**.

In this analysis, the Normed Fit Index (NFI) for the proposed model was recorded at 0.842, which falls below the commonly accepted threshold of 0.90 (Bentler, 1990; Hu & Bentler, 1999). Although values above 0.90 are typically regarded as indicative of good model fit, several scholars have noted that slightly lower NFI values may still be acceptable, particularly in exploratory research or when evaluating complex models.

Marsh, Hau, and Wen (2004) argue that fit indices such as the NFI should be interpreted in relation to model complexity and sample size. They contend that lower values, typically between 0.80 and 0.90, are common in more intricate models and can still be deemed acceptable, especially when supported by robust validation techniques such as bootstrapping. Similarly, Kline (2015) emphasizes that NFI values ranging from 0.85 to 0.90 are frequently observed in practical applications of Structural Equation Modeling (SEM) and do not necessarily indicate poor model fit. In such cases, researchers are advised to consider multiple fit indices and the overall pattern of model evaluation, rather than relying exclusively on a single cutoff. Additionally, Schreiber et al., (2006) stress the

importance of assessing model fit holistically. A model presenting an NFI marginally below 0.90 should not be automatically rejected, particularly if other fit indices, such as the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI), demonstrate acceptable levels of model fit.

See figure 8 below for a more explicit summary of the Structural Equation Modelling for Analyzing the Drivers of Green Product Adoption in Thailand: A Focus on Electric Vehicles Transportation.



Note: The model fit indices are as follows: Chi-square = 1355.230, df = 665, p = 0.000; RMSEA = 0.034 (< 0.05); RMR = 0.041 (< 0.05); GFI = 0.929 (> 0.90); AGFI = 0.917 (> 0.90); IFI = 0.913 (> 0.90); NFI = 0.842 (> 0.90); CFI = 0.912 (> 0.90); TLI = 0.902 (> 0.90); CMIN/DF = 2.038 (< 3).

Figure 8: Standardized estimates results

Results of Hypotheses Testing

Following the outcome of the SEM, the generated hypotheses model to an extent represents the theoretical constructs stated for this research and their relationships. All structural paths shown in the model were statistically significant at $p<0.05$. Structural paths and their estimates were summarized in table 4.15 with results of hypotheses tests. The results showed: Product Information Availability positively affected Consumer Decision Making (β= 0.415***). Persuasive Advertising positively affected Consumer Decision Making (β=0.502***). Product Information Availability positively affected Consumer Decision Making through Perceived Usefulness (β= 0.594***), Product Information Availability positively affected Consumer Decision Making through Perceived Ease of Use (β= 0.581***), Product Information Availability positively affected Consumer Decision Making through Perceived Risk and Uncertainties (β=0.448***), Persuasive Advertising positively affected Consumer Decision Making through Perceived Usefulness (β=0.689***), Persuasive Advertising positively affected Consumer Decision Making through Perceived Ease of Use (β=0.685***), Persuasive Advertising positively influenced Consumer Decision Making through Perceived Risk and Uncertainties (β=0.503***). Structural paths and their standardized estimates were summarized in table 21.

Table 21: Structural paths and their standardized estimates

H	From	TO			Hypothesis results			
				Direct effect	**Indirect Effect**	**Total Effect**	**Hypothesis relation**	**Decision**
H1	PIA	CDM		0.415***	---	0.415***	Positive	Accepted
H2	PAD	CDM		0.502***	---	0.502***	Positive	Accepted

Table 22: Structural paths and their standardized estimates (Cont'd)

H3	PIA	PU	CDM	---	0.594***	0.594***	Positive	Accepted
H4	PIA	PEU	CDM	---	0.581***	0.581***	Positive	Accepted
H5	PIA	PRU	CDM	---	0.448***	0.448***	Positive	Accepted
H6	PAD	PU	CDM	---	0.689***	0.689***	Positive	Accepted
H7	PAD	PEU	CDM	---	0.685***	0.685***	Negative	Accepted
H8	PAD	PRU	CDM	---	0.503***	0.503***	Negative	Accepted
Note: *p<**0.05**, **p<**0.01**, ***p<**0.001**								

Mediation Analysis

Total Direct, Direct and Indirect Effects

The mediation was achieved using version 4.2 of the PROCESS macro models, which is a tool for path analysis modeling with observed variable OLS and logistic regression. This tool was developed by Andrew F. Hayes. The direct effect demonstrates the connection between the independent variable and the dependent variable, excluding the mediator. The Indirect Effect illustrates how the dependent variable is shaped by the independent variable through the mediator. This means there is a connection that goes from an independent variable to a mediator and subsequently to a dependent variable. In this analysis, the sole dependent variable is CDM (Customer Decision Making), which is affected by two independent variables: PIA (Product Information Availability) and PAD (Persuasive Advertising). The mediator is the TAM (Technology Acceptance Model), which is further divided into three parts: Perceived Usefulness (PU), Perceived Ease of Use (PEU), and Perceived Risk Uncertainties (PRU). These three components together create the mediator. Therefore, including them in the relationship between the independent and dependent variables represents the Indirect Effect (IE), while the Direct Effect (DE) stands

alone without them. Additionally, the total effect (TE) is created by adding the DE and IE together.

From the analysis via SPSS, the DE (Direct Effect) shows that the independent variable PIA directly influences the dependent variable CDM at β=0.415, while the second independent variable PAD directly influences the dependent variable CDM at β=0.502. This direct effect is stated in table 21 above. Furthermore, the table 21 above alongside its corresponding details also emphasize the IE (Indirect Effect), which shows how the subcomponents of TAM, (i.e., PU, PEU, and PRU) mediate the relationship between the independent variables (PIA and PAD) and the dependent variable (CDM). The mediation analysis therefore revealed that product information availability significantly predicts customer decision making through perceived usefulness β=0.593 (R^2 = 0.352, F (1.90) = 16.83, p < .001), indicating that 35.2% of the variance in Customer Decision Making is explained by Product Information Availability through Perceived Usefulness. Furthermore, product information availability significantly predicts customer decision making through perceived ease of use β=0.581 (R^2 = 0.337, F (1, 90) = 9.855, p < .001), indicating that 33.7% of the variance in Customer Decision Making is explained by Product Information Availability through Perceived Ease of Use. Again, product information availability significantly predicts customer decision making through perceived risk uncertainties β=0.448 (R^2 = 0.200, F (1.90) = 15.006, p < .001), indicating that 20.0% of the variance in Customer Decision Making is explained by Product Information Availability through Perceived Risk Uncertainties. Persuasive Advertising (PAD) also shows significant indirect relationship with Customer Decision Making (CDM), through Perceived Usefulness β=0.690 (R^2 = 0.474, F (1, 90) = 11.80, p < .001), indicating that 47.4% of the variance in Customer Decision Making. More so, Persuasive Advertising significantly predicts customer decision making through perceived ease of use β=0.685 (R^2 = 0.469, F (1, 90) = 4.359, p < .001), indicating that 46.9% of the variance in Customer Decision Making is explained by Product Information Availability through Perceived Ease of Use. Finally, persuasive advertising significantly predicts customer decision making through

perceived risk uncertainties β=0.503 (R^2 = 0.253, F (1.90) = 14.186, p < .001), indicating that 25.3% of the variance in Customer Decision Making is explained by Product Information Availability through Perceived Risk Uncertainties.

The impact of predictors and mediating elements, including their direct, indirect, and overall effects, is displayed in table 21. According to the regression model made up of outside factors such as Product Information Availability, Persuasive Advertising, and the Technology Acceptance model, 29.0% (R2=0.29) of the overall variation can be clarified, concerning the internal factor: Consumer decision making. The findings indicated that the direct effects, indirect effects, and total effects were analyzed.

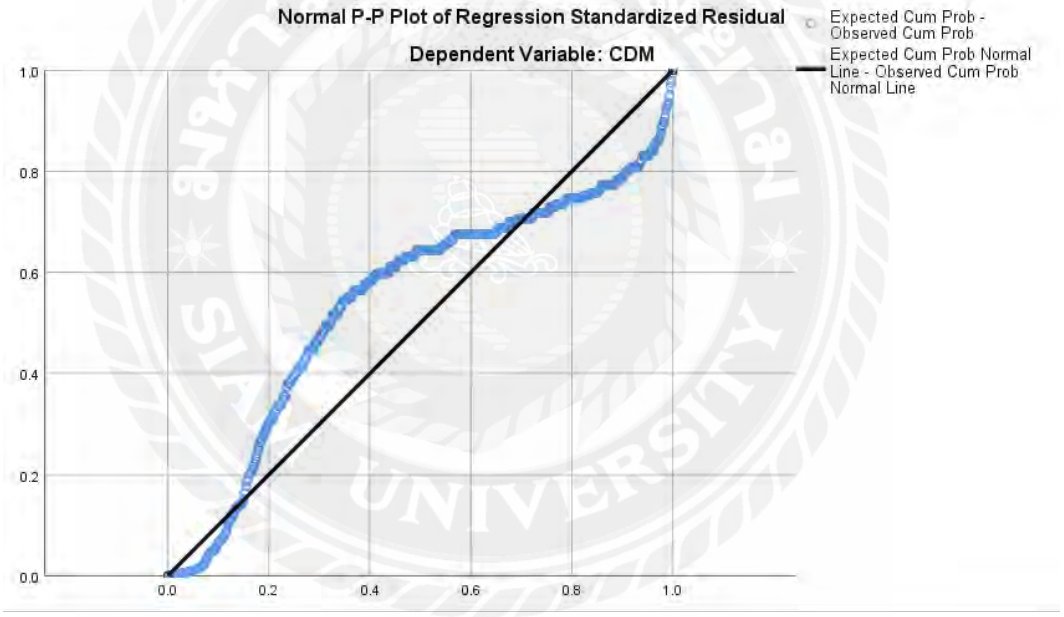


Figure 9: Normal P-P Plot of regression standardization residual dependent variable: CDM

Recall that a normal regression plot, also known as a normal probability plot, is a graphical tool that compares a data set to a normal distribution. It's used to determine if the error term in a linear regression model is normally distributed.

In a normal probability plot, sorted data is plotted against values that make the

resulting image look like a straight line if the data is approximately normally distributed. Based on the foregoing, deviations from a straight line indicate that the data is not normally distributed, just as it is in the plot at figure 9 above.

At the consummation of this chapter, the researcher summarizes by reinstating the key points worthy of note in this context. Hence, he makes a rundown of the processes in the data analysis as well as the results thereof, especially relating the six (6) items conceptual model with the associated hypotheses. The final structural model used here shows relatively a good fit with the observed data, statistically determined via relevant goodness-of-fit indices. Some of the factors, i.e., product information availability positively influenced consumer decision making in adopting green product (electric vehicles) in Thailand; Persuasive advertising was found to have a positive effect on consumer decision-making in adopting green products, specifically electric vehicles, in Thailand. The study revealed that perceived usefulness also positively influenced consumer decisions by mediating the effects of both product information availability and persuasive advertising. Furthermore, perceived ease of use positively affected consumer decision-making when it was influenced by the availability of product information. However, when perceived ease of use was mediated through persuasive advertising, its impact on consumer decision-making turned negative. Similarly, perceived risks and uncertainties played a dual role: they positively influenced consumer decisions when mediated by product information, suggesting that sufficient information helped consumers manage perceived risks; yet, these same risks and uncertainties had a negative effect when conveyed through persuasive advertising, indicating a possible lack of trust or credibility in the promotional content.

CHAPTER 5

Summary, Conclusion and Recommendation

This fifth chapter divides into three main sections, making it very applicable to solid research. Consequently, this chapter will wrap up the research findings through descriptive analysis, as well as the results from testing the hypotheses using Structural Equation Modeling (SEM). This analysis supports the suggested links between the variables in question, depending on the specific situation. In particular, it relates back to the research goals, which include examining how product information availability and persuasive advertising affect consumer attitudes toward EVs in Thailand; investigating how product information availability, persuasive advertising, and the Technology Acceptance Model (TAM) influence consumer choices about adopting electric vehicles in Thailand; and seeking a detailed model that will encourage the adoption of EVs in Thailand, combining factors such as product information availability, persuasive advertising, TAM, and the consumer decision making process. The next section of this chapter will address the importance of this study for relevant organizations by providing suitable recommendations. Finally, this chapter will conclude with suggestions for future research.

Summary of Research Findings

Over the years, studies have been made relating to this research by exploring several factors that influence green product adoption, such as technological and economic factors. Moreover, comparative studies have also been conducted to examine the differences in drivers of green product adoption across various countries and cultures. This study contributes to the existing body of knowledge on green product adoption by providing insights into the drivers of electric vehicle adoption in Thailand. Theoretical and practical implications of the study's findings were discussed, highlighting the importance of integrating environmental and social factors into marketing strategies to promote green product adoption, with specific reference to the purchase of electric vehicles in Thailand.

The findings revealed that environmental concerns, government incentives, and social influence are significant drivers of electric vehicle adoption in Thailand. The findings are summarized in the manner below.

A descriptive analysis was used to examine demographic factors such as age, income, and education level of the respondents, which are relevant in shaping consumers' intentions to adopt electric vehicles, thereby making the research realistic and meaningful. The findings showed that the largest age group was 45–54 years, with 259 respondents (28.7%) out of the total 901 participants. Additionally, females made up a larger portion of the sample, totaling 527 respondents or 58.5% of the population. In terms of educational attainment, the highest number of respondents, 304 (33.7%), held a master's degree, followed closely by 291 (32.3%) with a bachelor's degree. This indicates that the sample population was generally well-educated and sufficiently informed to participate in the survey. Regarding income, 356 respondents (39.5%) earned between 36,000 and 40,000 Thai Baht per month, which is considered an average income in Thailand and highlights the economic relevance of the target population. In conclusion, out of the total respondents, 658 individuals (73.0%) reported that they have either owned, rented, test-driven, or ridden in an electric vehicle (EV), indicating a considerable level of exposure to EV technology. In contrast, 243 respondents (27.0%) stated they have never interacted with an EV in any of these ways.

Most importantly, the descriptive analysis was also used to analyze the 47 variables in the data derived from the respondents in relation to the study of analyzing the drivers of green product adoption in Thailand: A focus on electric vehicles transportation. According to Ibarra and Revilla (2014), the mean ratings are categorized as follows: Mean = 4.21-5.00: strongly agree; Mean = 3.41-4.20: agree; Mean = 2.61-3.40: neutral; Mean = 1.81-2.60: disagree; Mean = 1.00-1.80: strongly disagree. Based on the foregoing, the ratings for product information availability indicate an agreeable level ranging from 4.41 to 2.13, with an overall mean suggesting agreement, indicating that costumers of green product in Thailand, precisely electric vehicles believe that product information availability is a driver

of green product adoption in Thailand. However, their individual agreement level varies, hence, the standard deviation ranges from 1.615 to 0.746, indicating a slight variation in responses to the survey items.

The ratings for persuasive advertising show an agreeable level ranging from 4.36 to 3.25, indicating overall agreement, indicating that consumers of green product in Thailand, precisely electric vehicles believe that persuasive advertising is a driver of green product adoption in Thailand. However, their individual agreement level varies, hence, the standard deviation ranges from 1.642 to 0.814, suggesting a slight variation in responses to the survey items. The ratings for technology acceptance model indicate an agreeable level ranging from 4.49 to 4.18, suggesting overall agreement, indicating that costumers of green product in Thailand, precisely electric vehicles believe that technology acceptance model is a driver of green product adoption in Thailand. However, their individual agreement level varies, hence, the standard deviation ranges from 1.097 to 0.799, indicating a slight variation in responses to the survey items. Finally, the ratings for consumer decision making indicate an agreeable level ranging from 4.40 to 3.84, suggesting overall agreement, indicating that consumers of green product in Thailand, precisely electric vehicles believe that consumer decision making is a driver of green product adoption in Thailand. However, their individual agreement level varies, hence, the standard deviation ranges from 1.294 to 0.812, indicating a slight variation in responses to the survey items.

Overall, Product Information Availability comprised 10 measurement variables. However, during the course of the analysis, some observed variables were excluded due to low factor loadings. The remaining variables that met the threshold are as follows: PIA2, which states that electric vehicles are perceived as cost effective compared to traditional gasoline/diesel vehicles, had the highest factor loading at 0.52. PIA4, stating I find the current charging infrastructure for electric vehicles in Thailand to be convenient, showed a loading of 0.48. PIA6, which indicates that government policies or incentives are aimed at promoting electric vehicles, recorded a factor loading of 0.44. PIA7, asserting that government policies or incentives have influenced the decision to consider purchasing an

electric vehicle, had a loading of 0.40. PIA8, which reflects that the environmental impact of vehicles is important in the decision-making process, had a factor loading of 0.46. PIA9, stating that electric vehicles are more environmentally friendly than traditional vehicles, loaded at 0.41. Lastly, PIA10, which notes that consumer reviews or ratings are influential in the decision to purchase an electric vehicle, recorded a loading of 0.46. Among all these, PIA2 had the highest factor loading, indicating that the perception of cost-effectiveness significantly influences consumers' decisions to purchase electric vehicles in Bangkok, Thailand.

Overall, persuasive advertising consisted of 11 measurement variables. However, one variable was removed due to failing to meet the threshold. Among the retained items, PAD1, which states that electric vehicles make the user feel environmentally responsible, recorded a factor loading of 0.40. PAD3, which expresses that the idea of reducing pollution motivates the respondent to consider purchasing an electric vehicle, showed a factor loading of 0.25. PAD4, stating that it is important that the company producing the electric vehicle is environmentally responsible, loaded at 0.46. PAD5, which highlights that the information provided by EV manufacturers regarding the environmental benefits of electric vehicles can be trusted, had a factor loading of 0.47. PAD6, which asserts that the respondent would be more inclined to purchase an EV if it is endorsed by a reputable environmental organization, loaded at 0.51. PAD7, stating that electric vehicles are more cost-effective in the long run compared to traditional gasoline-powered vehicles, recorded a factor loading of 0.49. PAD8, which states that the availability of charging stations influences the respondent’s decision to consider purchasing an electric vehicle, loaded at 0.41. PAD9, expressing that electric vehicles have comparable performance to traditional gasoline-powered vehicles, had the highest loading of 0.54. PAD10, which notes that government incentives such as tax rebates or subsidies encourage respondents to buy an electric vehicle, loaded at 0.45. Lastly, PAD11, which states that the user is likely to recommend electric vehicles to others based on their own experiences or knowledge, showed a factor loading of 0.51. Among these, PAD9 had the highest factor loading,

indicating that performance comparability is a key persuasive factor influencing consumer decisions to adopt electric vehicles in Bangkok, Thailand.

Overall, Technology Acceptance Model (TAM), was measured with 14 variables, given thus, TAM1 which states that EVs reduce environmental pollution loads at 0.39; TAM2 EVs help in conserving energy resources, loads at 0.48; TAM3 EVs have lower operational costs compared to traditional vehicles loads at 0.53; TAM4 EVs contribute to reducing dependence on fossil fuels loads at 0.51; TAM5 EVs are suitable for daily commuting needs loads at 0.50; TAM6 EVs offer advanced technological features compared to traditional vehicles loads at 0.48; TAM7 Charging an EV is convenient loads at 0.55; TAM8 Understanding and operating EV controls is easy loads at 0.53; TAM9 Finding charging stations is easy and accessible loads at 0.60; TAM10 Maintenance of EVs is simpler compared to traditional vehicles loads at 0.52; TAM11 Transitioning from a traditional vehicle to an EV is easy loads at 0.61; TAM12 I am concerned about the performance reliability of electric vehicles loads at 0.42; TAM13 I am concerned about the battery life and replacement costs of electric vehicles loads at 0.44; TAM14 I am concerned about the resale value of electric vehicles loads at 0.41. Hence, variable 11, TAM11 had the highest factor loading, supporting the belief that it is easy to transition from traditional vehicle to electric vehicle.

Overall, consumer decision making was measured with 12 variables, out of which 4 variables were removed, left with 8 variables, thus, CDM2 ‘I rely on a variety of sources to learn about electric vehicles, including online articles, official websites, and social media’ loading at 0.40; CDM4 ‘I find it easy to locate relevant information about electric vehicles during my research’, loaded at 0.40; CDM5 ‘I am satisfied with the quality of information available about electric vehicles’, loaded at 0.66; CDM6 ‘I spend a considerable amount of time researching electric vehicles before making a decision’, loaded at 0.69; CDM7 ‘The opinions of family and friends significantly affect my decision to purchase an electric vehicle’, loaded at 0.69; CDM8 ‘Online reviews and ratings from other consumers are influential in my decision to consider purchasing an electric vehicle’,

loaded at 0.71; CDM9 ‘Exposure to social media influencers affects my perception of electric vehicles’, loaded at 0.58; CDM11 ‘Government incentives and subsidies play a significant role in my decision to purchase an electric vehicle’, loaded at 0.40. Hence, CDM8 has the highest factor loading, which means that online reviews and ratings from other consumers greatly influence consumers’ decision to consider purchasing an electric vehicle in Thailand. When examining structural paths and hypothesis testing results, all the hypotheses (H_1 to H_8) had a p-value less than 0.01, leading to their acceptance. Therefore, better availability of product information and persuasive advertising, as well as mediation of same through perceived usefulness, perceived ease of use and perceived risk and uncertainties directly influence how customers make decisions as regards purchasing EVs in Thailand. Below is a table 22 in representation of this.

Table 22: Results of the direct/indirect path for the structural model (n=901)

Hypotheses	**Path**	**Standard Coefficient**	**p-value**	**Decision**
H_1	PIA ⟶ CDM	0.415	0.000	Accepted
H_2	PAD ⟶ CDM	0.502	0.000	Accepted
H_3	PIA→ PU→ CDM	0.594	0.000	Accepted
H_4	PIA→ PEU→ CDM	0.581	0.000	Accepted
H_5	PIA→ PRU→ CDM	0.448	0.000	Accepted
H_6	PAD → PU → CDM	0.448	0.000	Accepted
H_7	PAD→ PEU→ CDM	0.685	0.000	Accepted
H_8	PAD→ PRU→ CDM	0.503	0.000	Accepted
Note: $\chi 2$ (901) =1355.230, $p<0.05$), CFI=0.912, TLI=0.902, RMSEA=0.034, GFI=0.929				

Discussion of Research Results

The primary objective of this study is to explore the influence of product information availability, persuasive advertising, and the Technology Acceptance Model (TAM) on consumer attitudes toward electric vehicles (EVs) in Thailand. To ensure the

findings are robust and representative, the study includes a diverse sample of respondents, balancing both male and female participants for fairness (Creswell, 2014; Bryman, 2016; Fink, 2017). Respondents are selected based on certain criteria, such as age, educational level, financial stability, and relevant experience, such as owning or driving an EV. This ensures that the sample provides informed insights, and the descriptive analysis of their demographic attributes demonstrates an appropriate balance (Malhotra, and Birks, 2007; Field, 2013). In addition, the structural equation modeling (SEM) analysis evaluates the relationships between the variables. The overall model, which aims to analyze the drivers of green product adoption in Thailand with a focus on electric vehicle transportation, aligns well with the empirical data, as evidenced by the model fit. The X/df value of 2.038 meets the criteria of being less than 3 (Kline, 2023). Furthermore, individual model indices are above the accepted threshold of 0.90: the Goodness of Fit Index (GFI) is 0.929 (Lee and Kim, 2016; Cho, Hwang, Sarstedt and Ringle, 2020), the Adjusted Goodness of Fit Index (AGFI) is 0.917 (Schermel Ich-Engel, Moosebrugger and Muller, 2003), the Comparative Fit Index (CFI) is 0.912 (Chinda, Techapreechawong and Teeraprasert, 2012; Vassallo and Saba, 2015), the Incremental Fit Index (IFI) is 0.913 (Bollen, 2014), and the Root Mean Square Residual (RMR) is 0.041 (Bruner and Kumar, 2005; Zeynel, 2023). The Root Mean Square Error of Approximation (RMSEA) is 0.034 (Tennant and Pallant, 2012; Pedroso et al., 2016), indicating a strong fit. The only index that slightly missed the target was the Normed Fit Index (NFI), which was 0.842 (Schumacker and Lomax, 2015), falling just short of the recommended threshold. The measurement model in this study incorporates several key variables, including Product Information Availability (PIA), Persuasive Advertising (PAD), and Technology Acceptance Model (TAM), with TAM further divided into perceived usefulness, perceived ease of use, and perceived risk/uncertainties. The final variable included in the model is the Customer Decision Model (CDM).

Product Information Availability

Product Information Availability (PIA) comprised 10 measurement variables, 3 of these measurement variables were removed since they didn't meet up with the threshold of 0.40. The variables removed were PIA1 (λ=0.33), PIA3 (λ = 0.14), PIA5 (λ = -0.01). Some EV consumers don't need information about technical specifications (e.g., battery range, charging time, horsepower) of an EV before they could decide to purchase EVs. Perhaps, there are other features of EVs that mostly interest them. More so, some of these customers don't care about the purchase price of these EVs, as long as they perceive strong potential benefits served by the EVs, etc. However, the findings of the study indicated that overall, product information availability reached agreeable levels with the other 6 measurement variables loading well, thus; PIA2 (λ =0.52), PIA 4 (λ =0.48), PIA6 (λ =0.44), PIA7 (λ =0.40), PIA8 (λ =0.46), PIA9 (λ =0.41), PIA10 (λ =0.46). Specifically, variables PIA8 and PIA9 relate to product information as regards environmental friendliness, is akin to a study according to Axsen and Kurani (2013), consumers frequently give environmental factors top priority when selecting eco-friendly items, such as EVs. Thus, encouraging the widespread adoption of EVs requires an understanding of and commitment to addressing consumer misconceptions surrounding the environmental consequences of these vehicles. Customers' decision making as regards purchasing EVs are therefore greatly influenced by the availability of product information in relation to government policies and incentives, environmental friendliness/influence of such product. This relates to the study according to Yang (2019), Norway has set up extensive databases that provide precise EV parameters, which raises consumer knowledge and awareness. The availability of clear information is probably going to help Norwegian customers make well informed decisions and adopt EVs.

Persuasive Advertising

Persuasive Advertising (PAD) was assessed using 11 observed variables, of which 1 was excluded due to not meeting the predetermined threshold. Specifically, PAD2 (λ = -0.01) was removed, suggesting that consumers of electric vehicles (EVs) in Thailand may

not require emotional appeals regarding environmental responsibility, as these messages are likely already well known by the general public. Indeed, consumers may already be aware of the environmental benefits of EVs and may not need such persuasion through advertising. This insight is supported by research indicating that while consumer awareness of the environmental advantages of EVs is growing in Thailand, there are still misconceptions about the long-term environmental impact of the vehicles (Tang, Xu and Wang, 2022).

The remaining 10 observed variables, however, showed strong loadings, with values indicating significant relevance for persuasion in EV advertising. These include PAD1 ($\lambda = 0.40$), PAD 3 ($\lambda = 0.23$), PAD4 ($\lambda = 0.46$), PAD5 ($\lambda = 0.47$), PAD6 ($\lambda = 0.51$), PAD7 ($\lambda = 0.49$), PAD8 ($\lambda = 0.41$), PAD9 ($\lambda = 0.54$), PAD10 ($\lambda = 0.45$), and PAD11 ($\lambda = 0.51$). While it is expected that consumers are already cognizant of their environmental obligations, it is plausible that their emotional responses can still be influenced by appeals related to other aspects, such as a company's commitment to health, safety, and wellbeing in the environment. This assumption aligns with previous studies suggesting that ethical advertising practices, including genuine sustainability efforts and clear communication, can enhance brand credibility and foster consumer trust. Chaffey and Ellis-Chadwick (2019) emphasize the importance of aligning advertising messages with real environmental actions, while Madichie (2010) suggests that companies demonstrating corporate social responsibility (CSR) through their advertising can improve their reputation and appeal to environmentally conscious consumers.

Technology Acceptance Model

The Technology Acceptance Model (TAM) was assessed using 14 observed variables, all of which reached an acceptable level of significance. These included TAM1 ($\lambda = 0.40$), TAM2 ($\lambda = 0.48$), TAM3 ($\lambda = 0.53$), TAM4 ($\lambda = 0.51$), TAM5 ($\lambda = 0.50$), TAM6 ($\lambda = 0.48$), TAM7 ($\lambda = 0.55$), TAM8 ($\lambda = 0.53$), TAM9 ($\lambda = 0.60$), TAM10 ($\lambda = 0.52$), TAM11 ($\lambda = 0.61$), TAM12 ($\lambda = 0.42$), TAM13 ($\lambda = 0.44$), and TAM14 ($\lambda = 0.41$). TAM

is divided into three key components: perceived usefulness, perceived ease of use, and perceived risk and uncertainty. These factors explain why individuals adopt new technologies, such as electric vehicles (EVs) in this context.

The results indicate that consumers in Thailand are inclined to adopt EVs based on the perceived usefulness of these vehicles, including their potential to reduce environmental pollution, conserve energy, lower operational costs compared to traditional vehicles, and reduce dependence on fossil fuels. Additionally, consumers recognize the perceived ease of use, such as the convenience of charging, the advanced technological features that set EVs apart from traditional vehicles, and the suitability of EVs for daily commuting. This aligns with findings from Higueras-Castillo et al. (2023), who suggest that consumers are more likely to adopt EVs when they perceive significant benefits, such as lower fuel costs, environmental advantages, and government incentives. The rate of adoption is also influenced by the perceived risk and uncertainties associated with the technology. In Thailand, consumers are aware of these concerns, which is supported by Malek, Al-Majali, and Almajali (2020). Their research indicates that providing accurate and up to date information about EV technology trends, policies, and incentives can reduce customer uncertainty and foster trust in the long-term viability of EVs. Furthermore, initiatives such as the establishment of a comprehensive charging infrastructure and offering financial incentives for purchasing EVs could help mitigate risks and uncertainties, ultimately encouraging greater adoption of EVs in Thailand.

Customer Decision Making

Customer Decision Making (CDM) was measured using 12 observed variables, of which 4 were excluded due to not meeting the set threshold of $\lambda = 0.40$. These variables; CDM1 ($\lambda = 0.25$), CDM3 ($\lambda = 0.23$), CDM10 ($\lambda = 0.32$), and CDM12 ($\lambda = 0.24$), were removed because some potential EV consumers in Thailand may not be influenced by these specific aspects when deciding to purchase an electric vehicle. This suggests that other factors could be more motivating, such as a general interest in new technology or a desire

to display affluence, which goes beyond the purely rational decision making model. This finding contrasts with studies by Dessart and Pitardi (2019) and Yeğin and Ikram (2022), which argue that consumers engage in active search behavior, looking for, comparing, and assessing information on EVs, including features, environmental impacts, regulatory frameworks, and financial incentives. Despite the exclusion of these variables, the remaining 8 observed variables met the threshold, with loadings such as CDM2 ($\lambda = 0.40$), CDM4 ($\lambda = 0.40$), CDM5 ($\lambda = 0.66$), CDM6 ($\lambda = 0.69$), CDM7 ($\lambda = 0.69$), CDM8 ($\lambda = 0.71$), CDM9 ($\lambda = 0.58$), and CDM11 ($\lambda = 0.40$). These findings support the notion that consumers in Thailand adopt EVs based on accessible and varied information sources. Specifically, CDM2 implies that consumers heavily rely on online resources, such as articles, official websites, and social media, to learn about EVs. This supports the work of Dessart and Pitardi (2019), who highlight the importance of information search in consumer decision making. Moreover, Yeğin and Ikram (2022) highlight the role of educational programs and awareness campaigns in shaping customer perceptions of environmentally friendly products. Additionally, CDM7 highlights that the opinions of family and friends significantly influence consumers' decisions to purchase EVs in Thailand. This finding aligns with research on the impact of social influence, such as that by Dholakia, Blazevic, Wiertz, and Algesheimer (2009) and Boztepe (2016), who emphasize that consumer attitudes and intentions regarding green products are significantly shaped by peer recommendations and media influence.

Hypothesis Testing and Results

The second objective of this study was to examine the influence of product information availability, persuasive advertising, and the technology acceptance model on consumer decision making regarding the adoption of electric vehicles in Thailand. Using structural equation modeling, the study tested eight hypotheses, exploring both direct and mediating effects on consumer decisions. The results provided strong support for the hypotheses, revealing that product information availability positively influenced consumer

decision making (β = 0.415***), as did persuasive advertising (β = 0.502***). These findings highlight the importance of clear product information and persuasive advertising in encouraging electric vehicle adoption. Further, the study found that product information availability positively influenced decision making through several mediators. Specifically, it affected consumer decision making through perceived usefulness (β = 0.594***), perceived ease of use (β = 0.581***), and perceived risk and uncertainties (β = 0.448***). Likewise, persuasive advertising showed significant positive effects on decision making through these same mediators (β = 0.689***, β = 0.685***, and β = 0.503*** respectively). These results align with existing research, which emphasizes the critical role of accessible product information in reducing consumer uncertainty and fostering confident decision making, particularly in the context of emerging technologies such as electric vehicles (Chen, Fay, and Wang 2011; Steinhart, Mazursky, and Kamins, 2013).

The significant influence of persuasive advertising found in this study corroborates previous work by Kim, Lee, and Jung (2020) and Braca and Dondio, (2022), which suggests that advertising can effectively shape consumer perceptions, reduce perceived risks, and foster adoption. In this study, advertising influenced key TAM constructs, perceived usefulness, ease of use, and perceived risk, demonstrating its capacity to reduce uncertainty and facilitate adoption. The inclusion of TAM in this study proved to be insightful, as it showed that perceived usefulness and ease of use are key mediators between product information, persuasive advertising, and consumer decision making. The positive effects of product information availability and persuasive advertising on decision making through these constructs (β = 0.594***, β = 0.581***, β = 0.689***, and β = 0.685***) are consistent with TAM's predictions (Davis, 1989; Venkatesh and Bala, 2008). Moreover, the significant role of perceived risk highlights the importance of managing consumer perceptions of uncertainty, particularly for high cost, innovative products like electric vehicles, as highlighted by Thakur (2016). The outcomes of the hypotheses testing are discussed individually, along with their respective implications as follows.

H_1: product information availability directly affects customer decision making. better availability of product information directly influences how customers make decisions.

Product information availability positively influenced customer decision making (β = 0.415***), with significant loadings for the individual measurement items, which were as follows: PIA2 (λ = 0.52), PIA 4 (λ = 0.48), PIA6 (λ = 0.44), PIA7 (λ = 0.40), PIA8 (λ = 0.46), PIA9 (λ = 0.41), and PIA10 (λ = 0.46). Based on these results, Hypothesis 1 is accepted, with a significant value of 0.000, which is less than 0.001 (***$p < 0.001$). This supports prior research suggesting that product information availability is a crucial factor in influencing consumers' decisions to purchase electric vehicles (EVs) in Thailand. Yang (2019) highlights that in Norway, the establishment of extensive databases with precise EV specifications has significantly improved consumer knowledge and awareness, aiding in the adoption of EVs. Similarly, in Thailand, the availability of detailed and clear information is likely to help consumers make informed decisions and boost EV adoption. This is particularly true for information available through online articles, customer reviews, and other educational resources. Access to comprehensive product information enables consumers in Thailand to understand key benefits of EVs, such as lower operating costs, environmental advantages, and government incentives. It also helps to alleviate concerns related to charging infrastructure, charging times, and other uncertainties. With better access to information, Thai consumers are empowered to compare different EV models, evaluate their specifications and prices, and assess the feasibility of owning an electric vehicle. Furthermore, detailed information on charging methods, locations, and costs plays a crucial role in helping consumers evaluate the practicality of switching to EVs.

H_2: persuasive advertising influences customer decision making. effective advertising has a direct impact on decision making

Persuasive advertising positively impacted consumer decision-making (β = 0.502***), with a significant value of 0.000, which is less than 0.001 (***$p < 0.001$). The individual measurements of persuasive advertising also showed consistent results, further

supporting the notion that persuasive advertising plays a key role in influencing consumers' decisions to purchase electric vehicles (EVs) in Thailand. This finding aligns with the research of Sriram, Zhang, and Sivarajah (2013), who suggest that advertisers have the power to shape consumer perceptions and preferences, ultimately driving the adoption of eco-friendly products like EVs by effectively communicating their benefits. The findings indicate that well-crafted advertisements can forge an emotional connection with consumers, fostering brand loyalty and preference. Advertisements that highlight EVs' advanced technology and environmental benefits generate excitement and enthusiasm among consumers. Additionally, advertisements that compare the advantages and costs of EVs with traditional vehicles help customers make more informed purchasing decisions. Endorsements from reputable brands can further increase the credibility and awareness of EV products. Furthermore, showcasing satisfied customers and their positive experiences with EVs in advertisements helps to build trust and strengthen brand credibility. Given the importance of cultural values in Thailand, advertisements that emphasize the environmental benefits and cost effectiveness of EVs are particularly effective in resonating with Thai consumers. The Thai population places significant value on preserving the environment and making cost conscious decisions, so advertising that aligns with these values has the potential to significantly influence consumer behavior toward EV adoption.

H_3: product information availability influences customer decision making through perceived usefulness. accessible product information makes the product seem more useful, affecting decision-making.

Product information availability positively influenced consumer decision making through perceived usefulness ($\beta = 0.594$***), with a significant value of 0.000 (***$p < 0.001$), which is below the alpha level of 0.05. This hypothesis is thus accepted, as the results align with the assumption that accessible product information enhances the perceived usefulness of a product, which, in turn, influences consumer decision making.

This finding is supported by Coffman, Bernstein, and Wee (2017), who assert that “public awareness efforts that emphasize the longterm financial savings and environmental advantages of EVs also play a role in influencing how consumers view these vehicles' utility.” Moreover, as demonstrated by Noel, Zarazua de Rubens, Kester, and Sovacool (2018), the availability of relevant product information can help shape consumer perceptions of EVs' usefulness. By learning from successful international strategies and tailoring policies to address local contexts, Thailand can enhance the perceived usefulness of EVs and accelerate their adoption rates. Accessible product information provides a clearer understanding of the benefits associated with electric vehicles. This can include straightforward details about EVs' advantages, such as lower operating costs, reduced environmental impact, and government incentives. Additionally, information regarding EV models; such as range, charging time, and performance, enables consumers to compare and evaluate different products. By offering clear guidance on maintenance requirements, costs, and procedures, concerns about EV ownership are alleviated. User friendly comparison tools that allow customers to evaluate EVs against traditional gasoline powered vehicles also contribute to better informed decisions. Finally, accessible information on battery durability, lifespan, and replacement costs helps address common concerns regarding the long term usability of EVs in Thailand.

H_4: product information availability influences customer decision-making through perceived ease of use. accessible information makes the product seem easier to use, impacting decision making.

Product information availability positively affected consumer decision-making through perceived ease of use ($\beta = 0.581$), with a significant value less than the alpha level of 0.05, thus supporting the hypothesis at $***p < 0.001$. This result suggests that accessible product information makes the product seem easier to use, influencing consumer decision making. As noted by Axsen, Goldberg, and Bailey (2016), knowledgeable customers are more likely to adopt EVs, highlighting the importance of consumer awareness in shaping

positive perceptions of these vehicles. This finding aligns with the general belief among Thai EV consumers that accessible product information simplifies their understanding of EV technology. Clear explanations remove complexities related to the use of the product, encouraging consumers to perceive EVs as easy to use, thereby enhancing their likelihood of purchase. The information available includes crucial details such as charging instructions, step by step guidelines on charging procedures, types of charging stations, and payment methods. Additionally, information on maintenance and repair offers accessible guidance on routine maintenance, troubleshooting, and repair procedures, further easing consumer concerns about adopting EVs.

H_5: product information availability impacts customer decision making through perceived risk uncertainties. better product information helps reduce the perceived risks of alternative options, influencing decision making.

Product information availability positively affected consumer decision-making through perceived risk and uncertainties ($\beta = 0.448$***), with a significant p-value at ***$p < 0.001$. This hypothesis is accepted, supporting previous studies that suggest providing better product information can reduce the perceived risks associated with alternative options, thereby influencing the decision making process for consumers considering electric vehicles in Thailand. As Malek, Al-Majali, and Almajali (2020) point out, providing accurate and up-to-date information about EV technology, trends, laws, and incentives can significantly reduce consumer uncertainty and build trust in the longterm viability of EVs. Furthermore, uncertainties commonly arise when adopting new technologies, and this is especially true for electric vehicles. The findings of this study indicate that the availability of better product information helps mitigate these uncertainties. For instance, detailed information about EV pricing, available incentives, and operating costs provides a clearer picture of the total cost of ownership, which directly impacts consumers' decisions to purchase EVs. Additionally, clear information about charging station locations, types, and payment methods reduces concerns related to

charging infrastructure. Accessible guidance on routine maintenance, troubleshooting, and repair procedures can also alleviate fears about the longterm maintenance of EVs, further encouraging consumers to adopt them.

H_6: persuasive advertising influences customer decision making through perceived usefulness. effective advertising makes the product seem more useful, which affects decision-making.

Persuasive advertising negatively affected consumer decision making through perceived usefulness ($\beta = 0.689^{***}$), with a high significant value as the p-value is 0.000, which is less than the standard significance threshold of 0.05. This hypothesis is therefore accepted with a significant value at $^{***}p < 0.001$, strongly supporting the assumption and related studies that effective advertising can make a product seem more useful, thus influencing decision making. The potential usefulness of electric vehicles (EVs) is often emphasized through persuasive advertising, directly impacting customer decision making.

Thai consumers are likely to respond positively to advertising campaigns that highlight the collective benefits of EV adoption, such as reducing air pollution and decreasing dependence on fossil fuels (Bryla, Chatterjee, and Ciabiada, 2022). In the U.S., for example, advertisements often depict heartwarming stories of families enjoying clean air and beautiful landscapes because they own EVs, which fosters optimism and hope for a sustainable future (Soltani-Sobh, Heaslip, Stevanovic, Bosworth, and Radivojevic, 2015). This finding shows that Thai EV consumers can often be persuaded to adopt EVs through advertisements that emphasize the product's usefulness. Persuasive ads can focus on practical benefits, such as fuel cost savings, the ecofriendly attributes of EVs that resonate with Thai values, concerns about air pollution, and the convenience of charging at home or at public stations, all of which help to alleviate range anxiety.

H_7: persuasive advertising influences customer decision making through perceived ease of use. effective advertising makes the product seem easier to use, which influences decision making.

Persuasive advertising negatively affected consumer decision making through perceived ease of use ($\beta = 0.685^{***}$), with a significant p-value of 0.000. This hypothesis is therefore accepted with a significant value at $^{***}p < 0.001$, supporting the assumption and related studies that persuasive advertising can make a product appear easier to use, thus influencing decision making. Advertising that highlights the lower lifetime costs of owning an EV, including savings on fuel and maintenance, can provide a compelling case for potential buyers (Soltani-Sobh, Heaslip, Stevanovic, Bosworth, and Radivojevic, 2015). Moreover, as noted by Sooksatra and Sanguanpiyapan (2016), the appeal of EVs among Thai consumers can be enhanced by promoting government programs and incentives that encourage EV adoption, such as tax breaks, rebates, and infrastructure development. Furthermore, persuasive advertising plays a significant role in making Thai EV consumers perceive the technology as easy to use, positively influencing their purchasing decisions. This is achieved by highlighting user-friendly features, such as touchscreen displays, voice commands, and clear instructions on the charging process, including types of charging stations and payment methods.

H_8: persuasive advertising influences customer decision-making through perceived risk uncertainties. effective advertising helps reduce the perceived risks of alternatives, impacting decision-making.

Persuasive advertising positively influenced consumer decision-making through perceived risk and uncertainties ($\beta = 0.503^{***}$), with a significant p-value of 0.000. This supports the hypothesis and related studies that effective advertising helps reduce the perceived risks associated with alternatives, thereby impacting decision-making. As such, this hypothesis is accepted with a significant value at $^{***}p < 0.001$. Ethical advertising practices, such as genuine commitment to sustainability and transparent messaging,

enhance brand credibility and foster consumer trust (Chaffey and Ellis-Chadwick, 2019). The findings suggest that Thai EV consumers are concerned about the risks and uncertainties surrounding the adoption of EVs in Thailand. However, persuasive advertising can alleviate these concerns, enabling consumers to make confident purchasing decisions and even recommend EVs or related green products to others. Such advertising should offer clear, easy-to-understand explanations of EV basics, such as batteries, charging systems, and electric motors. Visual aids, such as graphics illustrating charging times and driving ranges, can help customers quickly grasp essential information. Furthermore, sharing real-life experiences from satisfied EV owners in Thailand, highlighting the benefits, can build trust. Persuasive advertisements can effectively reduce risks and uncertainties associated with range anxiety, battery durability, and the safety features/standards of EVs, including crash testing and emergency response procedures.

Conclusion on Key Drivers of EV Adoption in Thailand

The survey raised eight (8) hypotheses used to identify several important drivers of EV adoption, including product information availability, persuasive advertising, the technology acceptance model, and customer decision-making. Respondents emphasized the need for clear and accessible product information, suggesting that effective communication can enhance consumer confidence in electric vehicles. Additionally, persuasive advertising was recognized as a crucial factor, with many believing that targeted marketing strategies could significantly influence their purchasing decisions. While there are varying levels of agreement on these drivers, individual experiences, perceptions of technology reliability, and personal values regarding sustainability contribute to differing opinions. In other words, respondents highlighted the necessity for clear and accessible product information, which is vital for enhancing consumer confidence in electric vehicles. Persuasive advertising not only demystifies the technology but also addresses potential concerns that consumers may have. Additionally, the role of persuasive advertising was recognized as a critical factor in influencing purchasing decisions. Many participants

expressed that targeted marketing strategies, tailored to highlight the benefits and sustainability of EVs, could significantly sway their choices. While there is a spectrum of agreement on these drivers, individual experiences, perceptions of technology reliability, and personal values regarding sustainability contribute to varied opinions. For instance, those with a strong commitment to environmental issues may prioritize sustainability features, while others might focus more on cost-effectiveness or performance. In conclusion, a multifaceted approach that incorporates clear communication, strategic advertising, and an understanding of diverse consumer motivations is essential for effectively promoting EV adoption. By addressing these elements, stakeholders can better align their efforts with consumer needs and preferences, ultimately driving greater acceptance of electric vehicles in the market. The following Figure 10 illustrates the factors influencing EV adoption in Thailand.

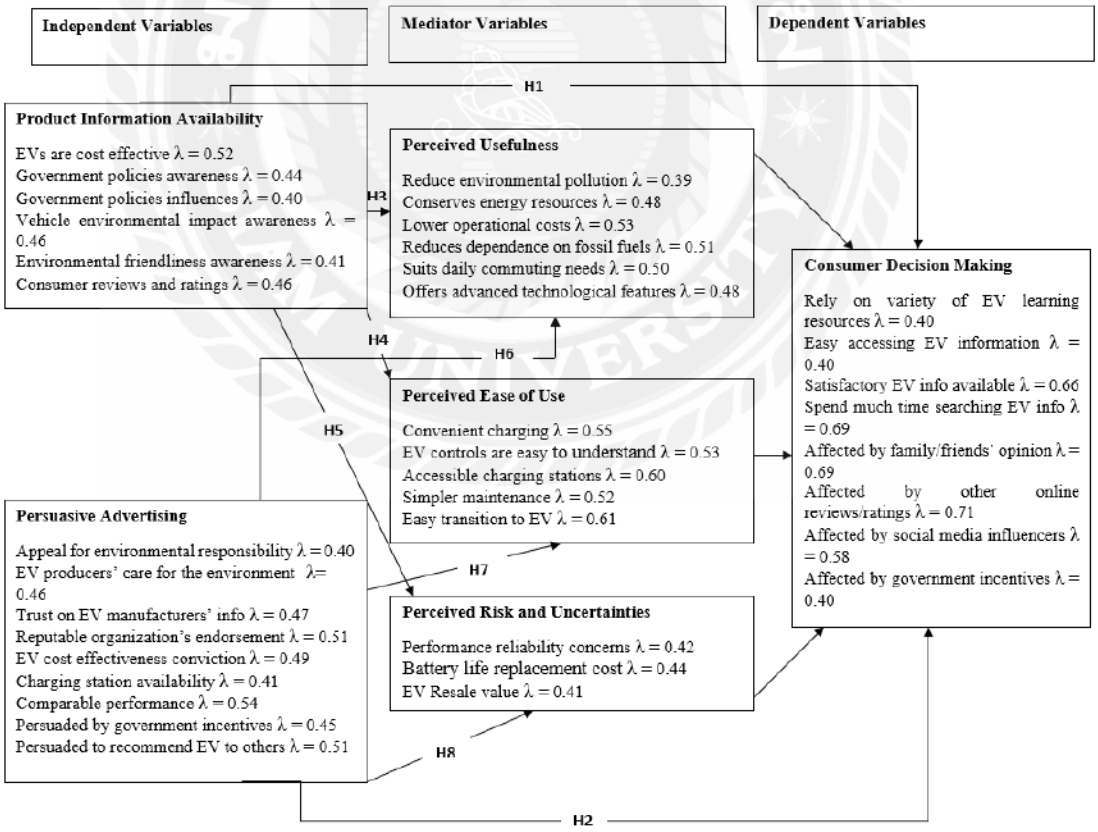
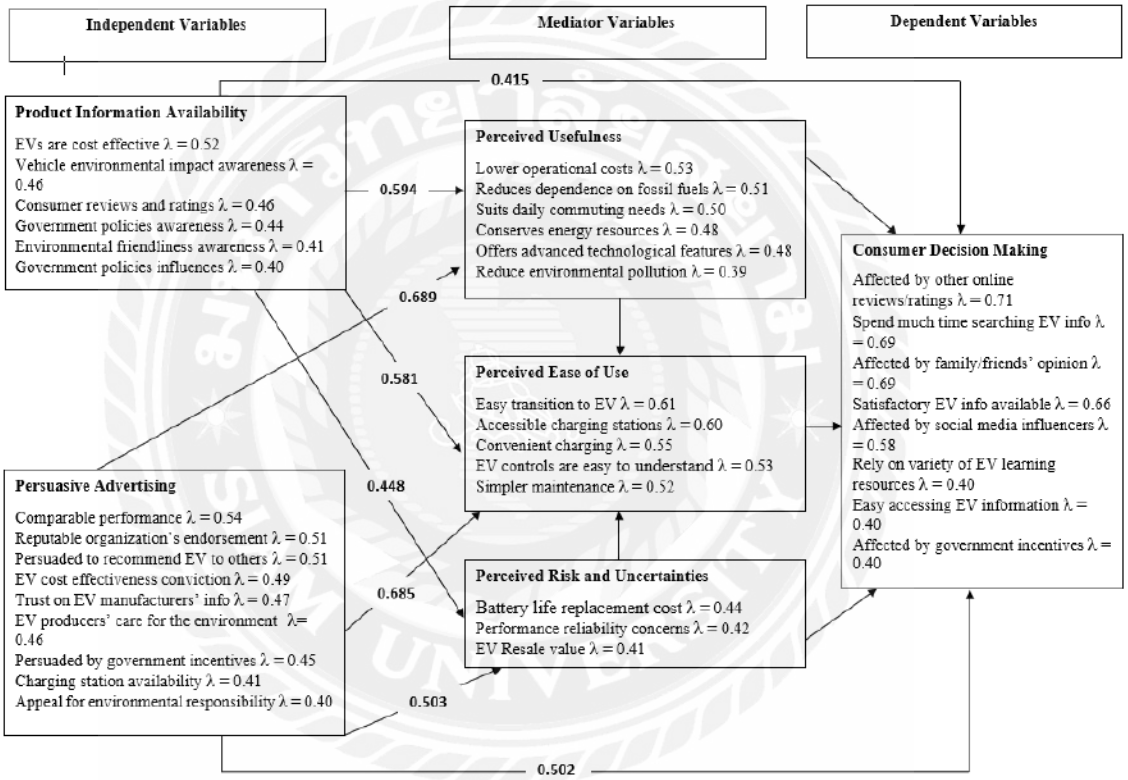


Figure 9: Conceptual framework summary

The hypotheses test result shows EV consumers in Thailand have in the past been positively influenced to adopt such green products and even more, there is good possibility of potential EV consumers in Thailand, adopting green products, especially purchasing electric vehicles, due to availability of such product information, persuasive advertising and varied technology acceptance models. Hence, the result of the hypotheses test, thus;



Note: $\chi 2$ (901) =1355.230, $p<0.05$, CFI=0.912, TLI=0.902, RMSEA=0.034, GFI=0.929

Figure 10: Factors influencing the adoption of green product in Thailand: a focus on electric vehicles transportation.

Based on the analysis, considering each of the observed variables (factors) used to test the independent, mediator, and dependent variables, the results indicate that product information highlighting the cost-effective features of electric vehicles (EVs) ranks highest, with a factor loading (λ) of 0.52. Additionally, persuasive advertising that compares the performance of EVs to traditional gasoline vehicles ranks highest with a factor loading (λ) of 0.54. Regarding perceived usefulness, the variable "lower operational costs" ranks highest (λ = 0.53) and plays the most significant mediating role within perceived usefulness. Similarly, under perceived ease of use, the variable "easy transition to EV" ranks highest (λ = 0.61) and serves as the primary mediator. For perceived risk and uncertainties, the variable "battery life and replacement cost" ranks highest (λ = 0.44) and takes on the central mediating role. Finally, in terms of consumer decision-making, the variable "affected by online reviews/ratings" ranks highest (λ = 0.71) and plays the most substantial mediating role in consumer decision-making. The fig 12 below illustrates these findings.

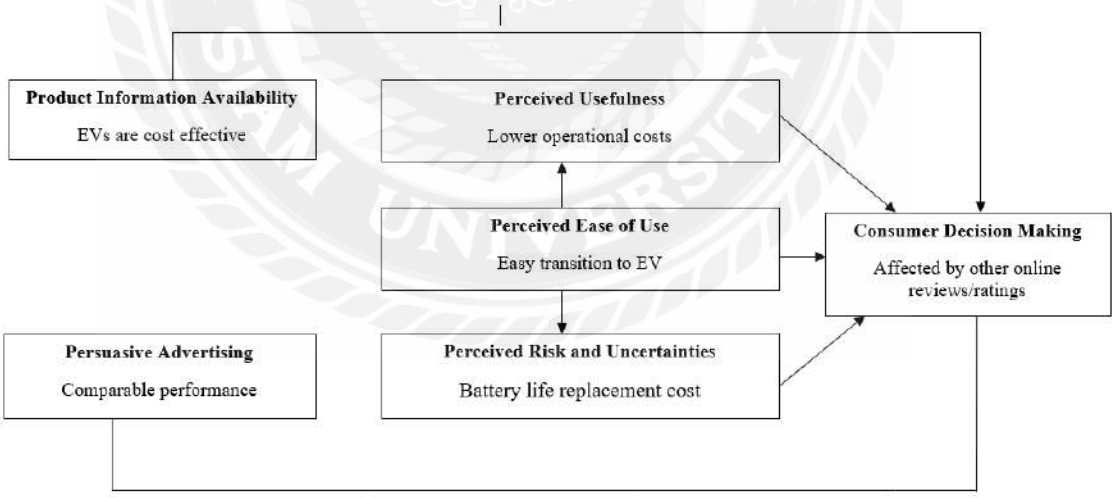


Figure 11: The practical approach for facilitating the purchase of electric vehicle product (green product adoption) in Thailand

Note: PIA and PAD are both independent variables and do not need to be connected to each other. The only connections should be between the independent variables and the dependent variable (CDM), which is already shown in the figure. Additionally, both PIA and PAD connect to CDM through the mediator variables, as indicated by the arrows pointing from the independent variables to the mediators and from the mediators to CDM.

Recommendations for Promoting EV Adoption in Thailand

Policy/Business recommendations

The recommendations provided here are based on the mediation analysis, with a primary focus on the results of the indirect effects. The hypotheses in the research mainly examine how the dependent variable is influenced by the independent variables through mediators; specifically, the relationship where an independent variable affects a mediator, which then influences the dependent variable. In direct effect (DE) analysis, the relationship between the independent and dependent variables is assessed without considering mediator variables. In contrast, mediator variables are included in the analysis of indirect effects (IE), which examine the influence of the independent variable on the dependent variable through the mediators. Reviewing my hypotheses, most of the effects fall under indirect effects. Since the study incorporates mediator variables (H3–H8), it is appropriate to prioritize indirect effects in the recommendations. This approach reflects the deeper, more nuanced relationships explored in the research, which often have a greater impact. While H1 and H2 represent direct effects, as they do not involve mediators, H3 through H8 incorporate mediators, indicating that my study is more centered on indirect effects than direct ones. Consequently, my recommendations place more emphasis on indirect effects rather than direct effects. In light of the findings from the study "Analyzing the Drivers of Green Product Adoption in Thailand: A Focus on Electric Vehicles Transportation," several recommendations can be made for key stakeholders in the Thai electric vehicle (EV) market from both academic and business perspectives.

To enhance EV adoption in Thailand, improving the availability and accessibility of product information is paramount. Establishing a government-supported platform or mobile app offering a comprehensive database on EV models, technical specifications, environmental benefits, and government incentives is essential. The platform should be user-friendly, regularly updated, and easily accessible, empowering consumers to make informed decisions. Similar platforms, such as Norway's EV database, have shown positive results. This aligns with the study's findings that product information availability significantly influences consumer decision-making, particularly in terms of perceived ease of use (IE = 0.581) and perceived risk uncertainties (IE = 0.448). Shifting advertising strategies is also crucial. While Thai consumers are likely already aware of the environmental benefits of EVs, marketing campaigns should focus more on the practical advantages, such as fuel savings, lower maintenance costs, and technological innovations. This shift will appeal to a broader audience, addressing immediate concerns beyond environmental issues. Ethical advertising that reflects a genuine commitment to sustainability, similar to campaigns by Volvo, can help build trust and credibility. This approach resonates with findings that persuasive advertising influences decision-making by increasing perceived usefulness (IE = 0.689), significantly encouraging adoption (DE = 0.502). Addressing concerns about perceived usefulness and ease of use is also essential. Expanding the charging infrastructure is key to this. Ensuring charging stations are available in both urban and rural areas will bolster consumer confidence in owning an EV. Additionally, offering incentives such as subsidies for home charging stations will reduce concerns about convenience and cost, fostering greater adoption. As observed in the study, product information significantly influences decision-making through perceived ease of use (IE = 0.581). Leveraging social influence is vital for increasing adoption. Thai consumers are highly influenced by the opinions of family, friends, and online communities. Campaigns leveraging social media influencers and testimonials from both current and prospective EV owners can enhance credibility. Word-of-mouth recommendations and shared experiences will influence potential buyers, reinforcing the

study's findings that persuasive advertising shapes decision-making through perceived risk and uncertainties (IE = 0.503).

Government support and incentives also play a crucial role in facilitating EV adoption. Expanding tax breaks, offering purchase subsidies, and providing financial support for home charging stations will make EVs more affordable. Clear communication of these incentives through platforms like brochures, websites, and apps will ensure consumers are well-informed. Drawing inspiration from models like the U.S. federal tax credit, Thailand can implement similar measures to encourage broader EV adoption, aligning with perceived risk uncertainties (IE = 0.448). A key barrier to EV adoption is the misconception about the environmental impact of EVs, particularly regarding their production and disposal. It's crucial to correct these misunderstandings through targeted educational campaigns that emphasize the overall environmental benefits of EVs. Partnering with environmental organizations to disseminate accurate information will help debunk myths and build consumer trust, fostering a supportive public attitude toward EV adoption. This recommendation therefore aligns with the giving of the first hypothesis (H_1) which states that Product Information Availability positively affects Consumer Decision Making (DE = 0.415). From a business perspective, leveraging consumer research insights to create targeted marketing strategies is vital. Highlighting both long-term cost savings and environmental benefits, along with clear communication of product information, will align with consumer expectations. Addressing concerns about range anxiety and charging infrastructure will alleviate worries about perceived ease of use and perceived risk uncertainties. Collaboration between the automotive and energy sectors is vital in expanding charging networks and further driving EV adoption. This resonates with H_4 and H_5, i.e., (IE = 0.581) and (IE = 0.448), respectively. Automobile manufacturers should prioritize clear, accessible product information and invest in marketing strategies that emphasize both the functional and environmental benefits of EVs. Global manufacturers have successfully combined these elements, and Thai manufacturers should follow suit. Collaboration between manufacturers, the government, and environmental organizations

will create a unified message that resonates with consumers, particularly regarding sustainability. This is in line with hypothesis three (H_3), Product Information Availability positively affects Consumer Decision Making through Perceived Usefulness (IE = 0.594). Ultimately, stakeholders should prioritize long-term consumer value over short-term profitability. Global research from countries like China and the U.S. reveals that consumers seek affordable, high-quality EVs with advanced technology. Thai stakeholders should focus on competitive pricing, improved battery life, and enhanced technology, offering a variety of models at different price points to meet consumer demand. To conclude, a comprehensive approach integrating improved product information, persuasive advertising strategies, expanded charging infrastructure, leveraging social influence, and government incentives is key to driving EV adoption in Thailand. By aligning marketing and infrastructure with consumer needs, Thailand can accelerate its transition to electric vehicles, contributing to a more sustainable future and economic growth.

Role of Environmental Organizations (Theoretical contribution)

Building upon the recommendations for key stakeholders in the Thai EV market, the role of environmental organizations remains essential to the success of these initiatives. These organizations play a critical role in fostering collaboration, shaping policies, and guiding public messaging to align with the broader goal of a sustainable and green future. Environmental organizations are instrumental in guiding governments, automobile manufacturers, and marketing agencies toward sustainable practices. They advocate for policies that promote EV adoption and work to ensure the necessary infrastructure, such as charging stations, is developed. By collaborating with governments, these organizations help shape policies that address urban pollution, climate change, and energy efficiency, pushing for long-term solutions that make the transition to EVs feasible and beneficial for both consumers and the environment. In the automotive industry, environmental organizations influence manufacturers by fostering a market environment where sustainability is prioritized. As the demand for eco-friendly technologies rises,

manufacturers are increasingly driven by the advocacy of environmental groups, pushing them to develop greener vehicles that meet both consumer expectations and regulatory requirements. These organizations help manufacturers understand consumer demand for sustainable transportation options, encouraging them to innovate and offer accessible, environmentally friendly vehicles. Marketing and advertising agencies also benefit from the guidance of environmental organizations. These groups ensure that campaigns emphasize the environmental benefits of EVs, such as reducing carbon emissions and improving air quality. Working alongside advertisers, they ensure that messaging resonates with consumers, particularly those concerned about sustainability. Their input helps shape campaigns that not only highlight the practical advantages of EVs but also build trust among potential buyers by presenting EVs as credible, eco-friendly alternatives to traditional vehicles. In essence, environmental organizations serve as a key force connecting governments, manufacturers, and marketers. While each of these groups plays a crucial role in EV adoption, environmental organizations provide the advocacy and leadership necessary to unite them under a common goal of sustainability. Their work in shaping policies, encouraging innovation, and guiding public messaging ensures that the transition to electric vehicles is not just a market trend but a movement toward a greener, more sustainable future for all.

Directions for Future Research on EV Adoption in Thailand

Building on the findings of this study, future research should explore the intersection of emerging technologies, policy evolution, economic factors, and consumer behavior trends in driving electric vehicle (EV) adoption in Thailand. As the EV landscape continues to evolve, researchers must anticipate technological advancements, infrastructure developments, shifting societal attitudes, and economic dynamics to provide a robust foundation for future studies and practical applications.

One crucial area for future research is the role of next-generation battery technologies in shaping consumer adoption. Advances in solid-state batteries, ultra-fast

charging solutions, and battery longevity improvements could significantly alter consumer perceptions of EVs. Investigating how these technological breakthroughs affect perceived convenience, cost-effectiveness, and environmental sustainability would offer valuable insights. Additionally, the potential for second-life applications of EV batteries, such as energy storage for renewable grids, warrants exploration, as it could further enhance the economic and environmental appeal of EV adoption. Research should also consider how a circular economy approach, including effective recycling and repurposing of EV components, can contribute to sustainability.

Artificial intelligence (AI) and big data analytics present another promising avenue for research. AI-driven predictive modeling could enhance targeted marketing strategies, tailoring persuasive advertising based on individual consumer preferences, driving behaviors, and social influences. Furthermore, AI could optimize charging infrastructure by predicting demand patterns, reducing congestion at charging stations, and integrating smart grid solutions for efficient energy distribution. Future studies should assess the feasibility and consumer acceptance of AI-driven innovations in the EV ecosystem. Additionally, AI could contribute to optimizing supply chains, improving predictive maintenance, and enhancing fleet management for both individual consumers and commercial EV users.

Behavioral research should also evolve to account for the influence of social and cultural factors on EV adoption. While this study has examined the role of product information and advertising, future research could investigate how family structures, peer influence, and social identity impact consumer decision-making. The role of hyper-personalized advertising, leveraging AI to craft emotionally resonant and culturally relevant messaging, should be explored to determine its effectiveness in the Thai market. Additionally, as younger generations become more environmentally conscious, longitudinal studies tracking shifting generational attitudes toward EVs will be critical in forecasting long-term adoption trends. Incorporating behavioral economics concepts, such

as loss aversion, status quo bias, and habit formation, could further enhance the understanding of consumer resistance or willingness to adopt EVs.

Future studies should take into account how government policies have changed over time and their lasting effects on the adoption of electric vehicles. By comparing Thailand's EV strategies with the successful approaches of other countries, like Norway's monetary incentives and China's investments in infrastructure, we could create better policy frameworks. Moreover, it's important to investigate the establishment of carbon credit systems, as well as regulations for cross border EV use and trade policies regarding battery materials, to grasp their possible impacts on local economies. Understanding how partnerships between the public and private sectors can speed up the growth of infrastructure, promote manufacturing, and minimize dependence on fossil fuels is another vital area for research. In addition, it would be beneficial to analyze financial options such as tax incentives, loans with low interest rates, and leasing strategies to enhance affordability and overall access for more consumers. There is also a need to look into how EVs can align with Thailand's larger sustainability goals. As the country strives to move toward cleaner energy sources, studies should explore means of integrating electric vehicles into a system powered by renewable energy. Investigating the practicality of solar charging stations, vehicle to grid technologies, and intelligent urban planning could contribute to developing a framework for sustainable transportation. Furthermore, assessing the environmental consequences of widespread EV adoption, including emissions throughout the life cycle of production and battery disposal, would provide a comprehensive view of sustainability. It is also essential to consider decentralized energy approaches, such as community based renewable microgrids, to guarantee reliability and effectiveness in EV charging networks.

The differences in electric vehicle (EV) adoption between urban and rural areas are crucial topics for further research. This study concentrated on city dwellers, but upcoming research should delve into the specific obstacles that rural communities face. Challenges may include insufficient charging stations, greater travel distances, and various

socioeconomic influences on EV adoption. Analyzing both urban and rural locations could guide policy measures tailored to ensure fair access to EV technology for everyone. Moreover, research could look into creative solutions like mobile charging units and battery swapping systems that might help address infrastructure deficits in underdeveloped regions. Additionally, the rise of self-driving EVs and shared transportation models opens up new avenues for study. The introduction of electric taxis that drive themselves, ridesharing services, and subscription models for vehicle ownership could change how people view car ownership. Understanding how these developments align with the preferences and financial situations of Thai consumers would be insightful for forecasting Thailand's transportation future.

Research must also focus on what regulations are necessary to safely and efficiently implement autonomous and shared EV transport. Lastly, it is important to analyze where Thailand stands in the global EV supply chain. With Southeast Asia emerging as a manufacturing center for EVs, studies concerning Thailand’s ability to draw foreign investments, enhance local production, and participate in the global EV marketplace are essential. Recognizing the strengths and obstacles Thailand encounters in this industry could aid decisionmakers in crafting plans to solidify the nation’s position in the international green economy.

Future investigations should also assess the role of Thailand's domestic automotive industry in shifting to EV production and how regional trade agreements influence the country's competitiveness on the world stage. By investigating these interconnected areas, research can offer a well-rounded and forward-thinking view of EV adoption in Thailand. Exploring new technologies, improvements in infrastructure, changing consumer habits, and economic factors, along with policy guidelines and global patterns, will ensure that future inquiries expand on current knowledge while anticipating changes. This comprehensive method will help create better strategies for boosting EV adoption, promoting sustainability, and establishing Thailand as a frontrunner in clean transportation solutions.

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APPENDICES

Appendix A: English Version of the Questionnaire

This research is conducted as part of a doctoral dissertation in Marketing at Siam University. Its purpose is to develop a Structural Equation Model (SEM) to analyze the drivers of green product adoption in Bangkok, Thailand, with a specific focus on electric vehicle transportation.

Questionnaire

Part 1. Personal Information

Please mark ✓ on the option that best applies to you.

Gender	
☐ Male	☐ Female
☐ Prefer not to say	
Age Group	
☐ 18-24	☐ 25-34
☐ 35-44	☐ 45-54
☐ 55 and above	
Education level	
☐ High school	☐ Bachelor degree
☐ Master's Degree	☐ Doctorate
Monthly income (Baht)	
☐ 10,000 - 20,000	☐ 25,000 - 30,000
☐ 35,000 - 40,000	☐ 40,000 or more
Have you ever owned, rented, test-driven, or ridden in an electric vehicle (EV), either personally or through work, a ride-sharing service (e.g., EV taxi), or public transport?	
☐ Yes	☐ No

Part 2: Product Information Availability

Please mark ✓on the item that is most appreciated.

(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Item	**Key drivers**	**Agreement level**				
		1	2	3	4	5
Technical Specification	Technical specifications (e.g., battery range, charging time, horsepower) are important in my decision to consider purchasing an EV.	□	□	□	□	□
Cost and Pricing Information	I perceive electric vehicles as cost-effective compared to traditional gasoline/diesel vehicles.	□	□	□	□	□
	When evaluating the cost of an electric vehicle, I consider factors such as purchase price, maintenance costs, government subsidies, cost of charging infrastructure, and resale value.	□	□	□	□	□
Charging Infrastructure	I find the current charging infrastructure for electric vehicles in Thailand to be convenient.	□	□	□	□	□
	I have encountered challenges regarding EV charging infrastructure.	□	□	□	□	□
Government Policies and Incentives	I am aware of government policies or incentives aimed at promoting electric vehicles in Thailand.	□	□	□	□	□
	Government policies or incentives have influenced my decision to consider purchasing an electric vehicle.	□	□	□	□	□
Environmental Impact	The environmental impact of vehicles is important in my decision-making process.	□	□	□	□	□
	I believe electric vehicles are more environmentally friendly than traditional vehicles.	□	□	□	□	□
Consumer Reviews	Consumer reviews or ratings are influential in my decision to purchase an electric vehicle.	□	□	□	□	□

Part 3: Persuasive Advertising

Please mark ✓on the item that is most appreciated.

(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Item	**Key drivers**	**Agreement level**				
		1	2	3	4	5
Pathos (Emotional Appeal)	EVs make me feel environmentally responsible.	□	□	□	□	□
	Driving an EV gives me a sense of contributing to a cleaner environment.	□	□	□	□	□
	The idea of reducing pollution motivates me to consider purchasing an electric vehicle.	□	□	□	□	□
Ethos (Credibility and Ethics)	It is important to me that the company producing the electric vehicle is environmentally responsible.	□	□	□	□	□
	I trust the information provided by EV manufacturers regarding the environmental benefits of electric vehicles.	□	□	□	□	□
	I would be more inclined to purchase an EV if it is endorsed by a reputable environmental organization.	□	□	□	□	□
Logos (Logical Reasoning)	Electric vehicles are more cost-effective in the long run compared to traditional gasoline-powered vehicles.	□	□	□	□	□
	The availability of charging stations influences my decision to consider purchasing an electric vehicle.	□	□	□	□	□
	Electric vehicles have comparable performance to traditional gasoline-powered vehicles.	□	□	□	□	□
	Government incentives such as tax rebates or subsidies encourage me to buy an electric vehicle.	□	□	□	□	□
	I am likely to recommend electric vehicles to others based on my own experiences or knowledge.	□	□	□	□	□

Part 4: TAM (Technology Acceptance Model)
Please mark ✓on the item that is most appreciated.
(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Item	**Key drivers**	**Agreement level**				
		1	2	3	4	5
Perceived Usefulness of EVs	EVs reduce environmental pollution.	□	□	□	□	□
	EVs help in conserving energy resources.	□	□	□	□	□
	EVs have lower operational costs compared to traditional vehicles.	□	□	□	□	□
	EVs contribute to reducing dependence on fossil fuels.	□	□	□	□	□
	EVs are suitable for daily commuting needs.	□	□	□	□	□
	EVs offer advanced technological features compared to traditional vehicles	□	□	□	□	□
Perceived Ease of Use of EVs	Charging an EV is convenient.	□	□	□	□	□
	Understanding and operating EV controls is easy.	□	□	□	□	□
	Finding charging stations is easy and accessible.	□	□	□	□	□
	Maintenance of EVs is simpler compared to traditional vehicles.	□	□	□	□	□
	Transitioning from a traditional vehicle to an EV is seamless.	□	□	□	□	□
Perceived Risk and Uncertainties	I am concerned about the performance reliability of electric vehicles.	□	□	□	□	□
	I am concerned about the battery life and replacement costs of electric vehicles.	□	□	□	□	□
	I am concerned about the resale value of electric vehicles.	□	□	□	□	□

Part 5: Consumer purchasing EVs.
Please mark ✓on the item that is most appreciated.
(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

Item	**Key drivers**	**Agreement level**				
		1	2	3	4	5
Information and Awareness	I feel well-informed about electric vehicles (EVs).	□	□	□	□	□
	I rely on a variety of sources to learn about electric vehicles, including online articles, official websites, and social media.	□	□	□	□	□
	Access to detailed information about electric vehicles is important to me before making a purchase decision.	□	□	□	□	□
Search Process	I find it easy to locate relevant information about electric vehicles during my research.	□	□	□	□	□
	I am satisfied with the quality of information available about electric vehicles.	□	□	□	□	□
	I spend a considerable amount of time researching electric vehicles before making a decision.	□	□	□	□	□
Social Influence	The opinions of family and friends significantly affect my decision to purchase an electric vehicle.	□	□	□	□	□
	Online reviews and ratings from other consumers are influential in my decision to consider purchasing an electric vehicle.	□	□	□	□	□
	Exposure to social media influencers affects my perception of electric vehicles.	□	□	□	□	□
Purchase Decision	I am likely to purchase an electric vehicle based on my current research and information.	□	□	□	□	□
	Government incentives and subsidies play a significant role in my decision to purchase an electric vehicle.	□	□	□	□	□
	Environmental benefits strongly influence my decision to buy an electric vehicle.	□	□	□	□	□

Note: This questionnaire is intended for academic research only, and the contents are confidential.

Appendix B: Thai Version of the Questionnaire

การวิจัยนี้ดำเนินการเป็นส่วนหนึ่งของวิทยานิพนธ์ระดับปริญญาเอกสาขาการตลาดที่มหาวิทยาลัยสยามโดยมีวัตถุประสงค์เพื่อพัฒนาแบบจำลองสมการโครงสร้าง (SEM) เพื่อวิเคราะห์ปัจจัยที่มีอิทธิพลต่อการยอมรับผลิตภัณฑ์ที่เป็นมิตรกับสิ่งแวดล้อมในประเทศไทยโดยมุ่งเน้นเป็นพิเศษที่การใช้ยานยนต์ไฟฟ้า

Questionnaire

Part 1. ข้อมูลส่วนตัว

กรุณาทำเครื่องหมาย ✓ ในตัวเลือกที่ตรงกับคุณมากที่สุด

เพศ	
☐ ชาย	☐ หญิง
☐ ไม่ประสงค์จะพูด	
อายุ	
☐ 18-24	☐ 25-34
☐ 35-44	☐ 45-54
☐ 55 and above	
ระดับการศึกษา	
☐ โรงเรียนมัธยมปลาย	☐ ปริญญาตรี
☐ ปริญญาโท	☐ ปริญญาเอก
รายได้ต่อเดือน (บาทไทย)	
☐ 10,000 - 20,000	☐ 25,000 - 30,000
☐ 35,000 - 40,000	☐ มากกว่า 40,000
คุณเคยเป็นเจ้าของ เช่า ทดลองขับ หรือโดยสารรถยนต์พลังงานไฟฟ้า (EV) ไม่ว่าจะส่วนตัวหรือผ่านที่ทำงาน บริการร่วมโดยสาร (เช่น แท็กซี่ EV) หรือระบบขนส่งสาธารณะหรือไม่	
☐ ใช่	☐ ไม่ใช่

Part 2: ข้อมูลผลิตภัณฑ์ ความพร้อมจำหน่าย

กรุณาทำเครื่องหมาย ✓ ในตัวเลือกที่ตรงกับคุณมากที่สุด

(1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = เป็นกลาง, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง).

รายการ	ปัจจัยขับเคลื่อนหลัก	ระดับความเห็นด้วย				
		1	2	3	4	5
ข้อกำหนดทางเทคนิค.	ข้อมูลจำเพาะทางเทคนิค (เช่น ระยะทางที่แบตเตอรี่วิ่งได้ เวลาในการชาร์จ แรงม้า) มีความสำคัญต่อการตัดสินใจซื้อยานยนต์ไฟฟ้าของฉัน	□	□	□	□	□
ข้อมูลต้นทุนและราคา	ฉันมองว่ายานยนต์ไฟฟ้าคุ้มต้นทุนเมื่อเทียบกับยานยนต์ที่ใช้น้ำมันเบนซินหรือดีเซลแบบดั้งเดิม	□	□	□	□	□
	เมื่อประเมินต้นทุนของยานยนต์ไฟฟ้าฉันจะพิจารณาปัจจัยต่างๆเช่นราคาซื้อ ต้นทุนการบำรุงรักษา เงินอุดหนุนจากรัฐบาล ต้นทุนโครงสร้างพื้นฐานการชาร์จ และมูลค่าขายต่อ	□	□	□	□	□
โครงสร้างพื้นฐานการชาร์จรถยนต์ไฟฟ้า	ฉันพบว่าโครงสร้างพื้นฐานการชาร์จรถยนต์ไฟฟ้าในปัจจุบันของประเทศไทยสะดวกสบาย	□	□	□	□	□
	ฉันประสบปัญหาเกี่ยวกับโครงสร้างพื้นฐานการชาร์จรถยนต์ไฟฟ้า	□	□	□	□	□
นโยบายและสิ่งจูงใจจากรัฐบาล	ฉันทราบเกี่ยวกับนโยบายหรือแรงจูงใจของรัฐบาลที่มุ่งส่งเสริมรถยนต์ไฟฟ้าในประเทศไทย	□	□	□	□	□
	นโยบายหรือแรงจูงใจของรัฐบาลมีอิทธิพลต่อการตัดสินใจของฉันในการพิจารณาซื้อรถยนต์ไฟฟ้า	□	□	□	□	□
ผลกระทบต่อสิ่งแวดล้อม	ผลกระทบต่อสิ่งแวดล้อมของรถยนต์มีความสำคัญในกระบวนการตัดสินใจของฉัน	□	□	□	□	□
	ฉันเชื่อว่ารถยนต์ไฟฟ้าเป็นมิตรต่อสิ่งแวดล้อมมากกว่ารถยนต์แบบดั้งเดิม	□	□	□	□	□
ความคิดเห็นของผู้บริโภค	บทวิจารณ์หรือการให้คะแนนของผู้บริโภคมีอิทธิพลต่อการตัดสินใจซื้อรถยนต์ไฟฟ้าของฉัน.	□	□	□	□	□

Part 3: การโฆษณาที่ชักจูงใจ

กรุณาทำเครื่องหมาย ✓ ในตัวเลือกที่ตรงกับคุณมากที่สุด

(1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = เป็นกลาง, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง).

รายการ	ปัจจัยขับเคลื่อนหลัก	ระดับความเห็นด้วย				
		1	2	3	4	5
พาโทส (อารมณ์)	รถยนต์ไฟฟ้าทำให้ฉันรู้สึกว่ามีความรับผิดชอบต่อสิ่งแวดล้อม	□	□	□	□	□
	การขับรถไฟฟ้าทำให้ฉันรู้สึกว่าได้มีส่วนสนับสนุนให้สิ่งแวดล้อมสะอาดขึ้น	□	□	□	□	□
	แนวคิดในการลดมลพิษเป็นแรงบันดาลใจให้ฉันพิจารณาซื้อยานยนต์ไฟฟ้า	□	□	□	□	□
อีโทส (ความน่าเชื่อถือ)	สำหรับฉันแล้วการที่บริษัทที่ผลิตยานยนต์ไฟฟ้ามีความรับผิดชอบต่อสิ่งแวดล้อมถือเป็นเรื่องสำคัญ	□	□	□	□	□
	ฉันไว้วางใจข้อมูลที่ผู้ผลิตยานยนต์ไฟฟ้าให้มาเกี่ยวกับประโยชน์ต่อสิ่งแวดล้อมของยานยนต์ไฟฟ้า	□	□	□	□	□
	ฉันจะมีแนวโน้มที่จะซื้อยานยนต์ไฟฟ้ามากขึ้นหากได้รับการรับรองจากองค์กรด้านสิ่งแวดล้อมที่มีชื่อเสียง	□	□	□	□	□
โลโกส์ (การใช้เหตุผลเชิงตรรกะ)	ยานยนต์ไฟฟ้าคุ้มค่ากว่าในระยะยาวเมื่อเทียบกับยานยนต์ที่ใช้น้ำมันเบนซินแบบดั้งเดิม	□	□	□	□	□
	การมีสถานีชาร์จไฟฟ้ามีอิทธิพลต่อการตัดสินใจซื้อยานยนต์ไฟฟ้าของฉัน	□	□	□	□	□
	รถยนต์ไฟฟ้ามีประสิทธิภาพที่เทียบเคียงได้กับรถยนต์ที่ใช้น้ำมันเบนซินแบบดั้งเดิม	□	□	□	□	□
	แรงจูงใจจากรัฐบาล เช่น การลดหย่อนภาษีหรือเงินอุดหนุน เป็นแรงกระตุ้นให้ฉันซื้อรถยนต์ไฟฟ้า	□	□	□	□	□
	ฉันมักจะแนะนำรถยนต์ไฟฟ้าให้กับผู้อื่นตามประสบการณ์หรือความรู้ของตัวเอง	□	□	□	□	□

Part 4: TAM (รูปแบบการยอมรับเทคโนโลยี)

กรุณาทำเครื่องหมาย ✓ ในตัวเลือกที่ตรงกับคุณมากที่สุด

(1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = เป็นกลาง, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง).

รายการ	ปัจจัยขับเคลื่อนหลัก	ระดับความเห็นด้วย				
		1	2	3	4	5
การรับรู้ประโยชน์ของยานพาหนะไฟฟ้า EVs	ยานยนต์ไฟฟ้าช่วยลดมลภาวะต่อสิ่งแวดล้อม	□	□	□	□	□
	ยานยนต์ไฟฟ้าช่วยอนุรักษ์ทรัพยากรพลังงาน	□	□	□	□	□
	ยานยนต์ไฟฟ้ามีต้นทุนการดำเนินงานต่ำกว่าเมื่อเทียบกับยานยนต์แบบเดิม	□	□	□	□	□

Part 4: TAM (รูปแบบการยอมรับเทคโนโลยี) อย่างต่อเนื่อง

	รถยนต์ไฟฟ้าช่วยลดการพึ่งพาเชื้อเพลิงฟอสซิล	□	□	□	□	□
	ยานยนต์ไฟฟ้าเหมาะสำหรับการเดินทางในชีวิตประจำวัน	□	□	□	□	□
	ยานยนต์ไฟฟ้ามีคุณสมบัติทางเทคโนโลยีขั้นสูงเมื่อเทียบกับยานยนต์แบบเดิม	□	□	□	□	□
การรับรู้ความง่ายในการใช้ยานพาหนะไฟฟ้า	การชาร์จยานยนต์ไฟฟ้าสะดวก	□	□	□	□	□
	การทำความเข้าใจและใช้งานระบบควบคุมยานยนต์ไฟฟ้าเป็นเรื่องง่าย	□	□	□	□	□
	การค้นหาสถานีชาร์จนั้นง่ายและเข้าถึงได้	□	□	□	□	□
	การบำรุงรักษายานยนต์ไฟฟ้านั้นง่ายกว่ายานยนต์แบบเดิม	□	□	□	□	□
	การเปลี่ยนจากยานยนต์แบบเดิมไปเป็นยานยนต์ไฟฟ้านั้นง่ายดาย	□	□	□	□	□
ความเสี่ยงและความไม่แน่นอนที่รับรู้:	ฉันกังวลเกี่ยวกับความน่าเชื่อถือของสมรรถนะของยานยนต์ไฟฟ้า	□	□	□	□	□
	ฉันกังวลเกี่ยวกับอายุการใช้งานแบตเตอรี่และต้นทุนการเปลี่ยนทดแทนของยานยนต์ไฟฟ้า	□	□	□	□	□
	ฉันกังวลเกี่ยวกับมูลค่าการขายต่อของรถยนต์ไฟฟ้า	□	□	□	□	□

Part 5: การตัดสินใจของผู้บริโภค

กรุณาทำเครื่องหมาย ✓ ในตัวเลือกที่ตรงกับคุณมากที่สุด

(1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = เป็นกลาง, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง).

รายการ	**ปัจจัยขับเคลื่อนหลัก**	**ระดับความเห็นด้วย**				
		1	2	3	4	5
ข้อมูลและความตระหนัก:	ฉันรู้สึกว่าได้รับข้อมูลเกี่ยวกับรถยนต์ไฟฟ้าเป็นอย่างดี	□	□	□	□	□
	ฉันอาศัยแหล่งข้อมูลต่างๆเพื่อเรียนรู้เกี่ยวกับรถยนต์ไฟฟ้ารวมถึงบทความออนไลน์ เว็บไซต์ทางการ และวิกิพีเดีย	□	□	□	□	□
	การเข้าถึงข้อมูลโดยละเอียดเกี่ยวกับรถยนต์ไฟฟ้ามีความสำคัญต่อฉันก่อนที่จะตัดสินใจซื้อ	□	□	□	□	□
กระบวนการค้นหา	ฉันพบว่าการค้นหาข้อมูลที่เกี่ยวข้องเกี่ยวกับรถยนต์ไฟฟ้าระหว่างการค้นคว้านั้นเป็นเรื่องง่าย	□	□	□	□	□
	ฉันพอใจกับคุณภาพของข้อมูลเกี่ยวกับรถยนต์ไฟฟ้าที่มีอยู่	□	□	□	□	□

Part 5: การตัดสินใจของผู้บริโภค (อย่างต่อเนื่อง)

	ฉันใช้เวลาค่อนข้างมากในการค้นคว้าเกี่ยวกับรถยนต์ไฟฟ้าก่อนตัดสินใจ	□	□	□	□	□
อิทธิพลทางสังคม:	ความคิดเห็นของครอบครัวและเพื่อน ๆ ส่งผลต่อการตัดสินใจซื้อรถยนต์ไฟฟ้าของฉันอย่างมาก	□	□	□	□	□
	บทวิจารณ์และการให้คะแนนออนไลน์จากผู้บริโภครายอื่นมีอิทธิพลต่อการตัดสินใจซื้อรถยนต์ไฟฟ้าของฉัน	□	□	□	□	□
	การได้รับอิทธิพลจากผู้มีอิทธิพลบนโซเชียลมีเดียส่งผลต่อการรับรู้ของฉันเกี่ยวกับรถยนต์ไฟฟ้า	□	□	□	□	□
การตัดสินใจซื้อ	ฉันมีแนวโน้มที่จะซื้อรถยนต์ไฟฟ้าตามการค้นคว้าและข้อมูลปัจจุบันของฉัน	□	□	□	□	□
	แรงจูงใจและเงินอุดหนุนจากรัฐบาลมีบทบาทสำคัญในการตัดสินใจซื้อรถยนต์ไฟฟ้าของฉัน	□	□	□	□	□
	ประโยชน์ด้านสิ่งแวดล้อมมีอิทธิพลอย่างมากต่อการตัดสินใจซื้อรถยนต์ไฟฟ้าของฉัน	□	□	□	□	□

หมายเหตุ: แบบสอบถามนี้จัดทำขึ้นเพื่อการวิจัยทางวิชาการเท่านั้น และข้อมูลทั้งหมดจะถูกเก็บเป็นความลับ.