CHAPTER I :
INTRODUCTION

1.1 Research Background

The global commitment to address climate change through the Paris Agreement has catalyzed significant policy developments in the transportation sector. The International Transport Forum (ITF) reports that road transport accounts for over one-fifth of global carbon dioxide emissions, making vehicle electrification a critical pathway for emissions reduction (ITF, 2021). This has led major economies to adopt regulations aligned with achieving 100% zero-emission vehicle (ZEV) sales for new light-duty vehicles by 2035, with initiatives like the ZEV Declaration and Global Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles now representing approximately one quarter of the global new vehicle market in 2023 (ICCT, 2023).

The implementation of ZEV policies has primarily manifested through the adoption of electric vehicles (EVs), which has seen remarkable growth driven by technological advances, policy support, and environmental awareness (ICCT, 2024). While significant increases in EV market shares have been observed across multiple regions, with notable growth in countries like Thailand and Vietnam for passenger cars, and Canada, the United Kingdom, and Chile for buses, regional disparities in policy implementation present ongoing challenges (ICCT, 2024). This is evident in emerging markets like Indonesia, which is striving to establish itself as a key player in the EV market within the Southeast Asian region (Budiono and Virgianita, 2024).

The adoption of electric vehicles (EVs) in Indonesia over the past five years also has shown a promising upward trajectory, driven by concerted government efforts and market dynamics (Kemenkomarves, 2023)[1]. This growth is reflected by the numbers of electric vehicle sales in 2024 that shown in the figure 1 below.

[1] https://maritim.go.id/detail/melalui-program-insentif-baru-pemerintah-dorong-ekosistem-kendaraan-listrik-di-indonesia

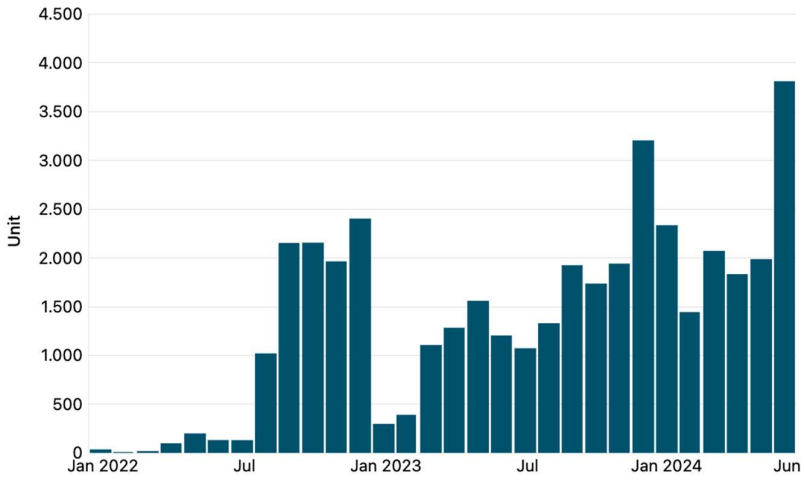

Figure 1. Monthly Wholesale Sales Volume of BEV Electric Cars in Indonesia period January 2022 - Juni 2024

Source: (databoks, 2024)[2]

In figure 1, we can see that the wholesale sales of BEV electric cars in Indonesia increased in 2024 compared to 2023 (month-on-month). The growth trajectory of BEV sales in Indonesia has been remarkable over the past few years. While there were no recorded wholesale BEV sales in the domestic market during 2018-2019, the market began to emerge in 2020 with a modest 120 units. From January to December 2023, the total wholesale sales reached 17,060 units, which is 65.2% higher than the 10,330 units sold during the same period in 2022[3]. This growth continued significantly, reaching approximately 13,400 units in Q2 2024[4]. This expansion has been supported by significant tax reductions, such as the reduction of the luxury tax for electric cars and a 1% tax incentive, making EVs more accessible to the average consumer. Based on IESR report in 2023, these subsidies and incentives have played a critical role in fostering a supportive ecosystem for EV adoption (IESR 2023)[5].

Despite these advancements, the EV market in Indonesia faces several challenges compared to global leaders. The country's EV infrastructure, particularly charging facilities, remains underdeveloped, which hinders wider adoption. Moreover, while the

[2]https://databoks.katadata.co.id/transportasi-logistik/statistik/66bc6023da301/tren-penjualan-mobil-listrik-menguat-semester-i-2024

[3]https://databoks.katadata.co.id/datapublish/2024/01/16/penjualan-mobil-listrik-di-indonesia-melonjak-pada-akhir-2023

[4]https://databoks.katadata.co.id/transportasi-logistik/statistik/66bc6023da301/tren-penjualan-mobil-listrik-menguat-semester-i-2024

[5]https://iesr.or.id/efektivitas-insentif-kendaraan-listrik-butuh-dukungan-pemerintah-untuk-mereformasi-kebijakan-lainnya

government has introduced several incentives, there is a need for more comprehensive policy reforms to enhance their effectiveness. For instance, comparisons with neighboring Thailand reveal that Indonesia's policies are less aggressive, as Thailand offers more substantial incentives and has a more developed charging infrastructure (industry.co.id, 2024)[6]. As Indonesia continues to expand its EV market, addressing these infrastructural and policy gaps will be crucial to sustaining its growth trajectory.

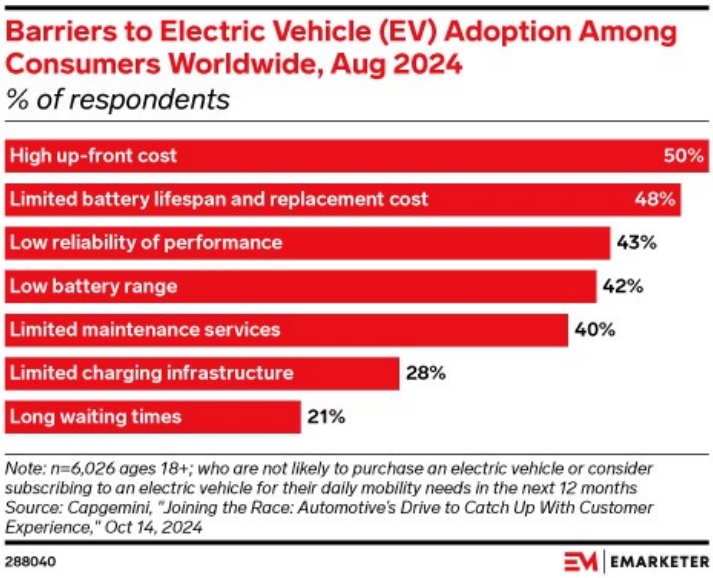

Figure 2. Barriers to EV Adoption among Consumers Worldwide

source: EMARKETER, 2024[7]

A global survey conducted by Capgemini in August 2024, involving 6,026 respondents aged 18 and above, reveals significant barriers to electric vehicle (EV) adoption among consumers worldwide, as shown in figure 2. above. The study identifies that financial considerations dominate consumer hesitation, with 50% of respondents citing high up-front costs as the primary barrier. Technical limitations also play crucial roles, as 48% express concerns about battery lifespan and replacement costs, while 43% worry about performance reliability. Infrastructure-related challenges persist, with 42% concerned about low battery range, 40% noting limited maintenance services, and 28% highlighting insufficient charging infrastructure (Capgemini, 2024).

[6] https://www.industry.co.id/read/132930/strategi-marketing-dalam-penjualan-kendaraan-listrik-atau-ev

[7] https://www.emarketer.com/chart/269114/barriers-electric-vehicle-ev-adoption-among-consumers-worldwide-aug-2024-of-respondents

Further analysis of the Indonesian market specifically reveals similar yet more pronounced adoption barriers. According to Indonesia Electric Vehicle Outlook (IEVO) 2023 by IESR, electric vehicle adoption in Indonesia showed remarkable growth in 2022, with both electric motorcycles (E2W) and electric cars (E4W) experiencing a 5-4 fold increase compared to 2021. However, despite this growth, adoption rates remain significantly below the Nationally Determined Contribution (NDC) targets set under the Paris Agreement for reducing transport emissions (IESR, 2023b).

A result of a survey by Databoks in 2023, as pictured in figure 3, shows that charging infrastructure availability is the primary concern, with 71.2% of Indonesian respondents citing difficulties in finding charging stations (SPKLU). The high purchase price remains a significant barrier for 62% of potential buyers, while 52% express concerns about limited driving range. Battery-related issues, including replacement costs and maintenance, concern 46.6% of respondents, and charging duration is problematic for 32.4%. Performance and safety considerations affect 28.6% of potential adopters, while limited model choices influence 10.2% of respondents. These statistics align with the global trends while highlighting Indonesia's unique challenges, particularly in charging infrastructure development and accessibility.

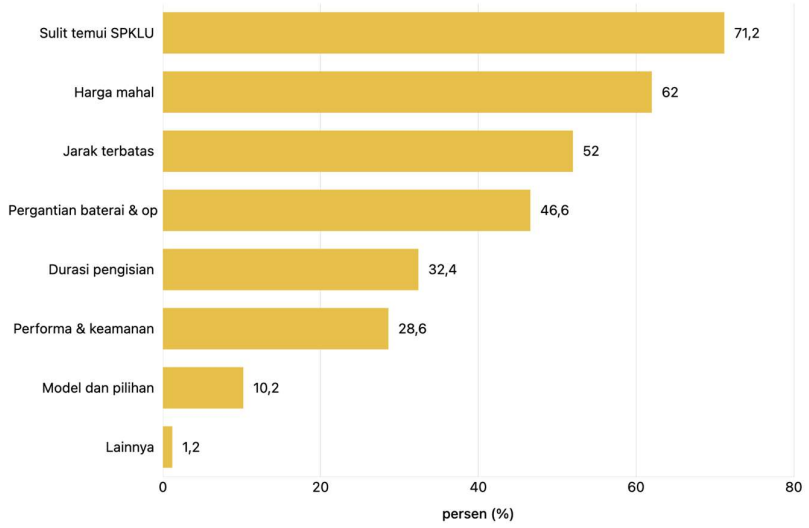

Figure 3. Barriers to Electric Vehicle Adoption in Indonesia (2022)

Source: databoks, 2023[8]

[8]https://databoks.katadata.co.id/transportasi-logistik/statistik/8b113e53b51a0e7/harga-mahal-hingga-masalah-pengisian-baterai-ini-kendala-adopsi-kendaraan-listrik-di-indonesia

With the concerning condition above, in this study, we will explore and analyze several key variables that are suspected to influence the purchase intention of electric vehicles (EVs) in Indonesia. Firstly, we consider the perceived benefits of EVs, which are the positive aspects that potential buyers can benefit from these vehicles. Benefits include environmental friendliness, reduced air pollution, and economic advantages such as lower running costs. Recent research has indicated that EVs can help reduce CO2 emissions even without rapid decarbonization of the energy sector globally (Schnell et al., 2021). The silent operation of EVs also contributes to a quieter urban environment, which is another appealing benefit for consumers. Widespread adoption of EVs could potentially lead to an increase in renewable power generation, thereby reducing the carbon intensity of the power system (He et al., 2019). Additionally, EVs often have lower running costs compared to conventional vehicles due to cheaper electricity prices and reduced maintenance needs (Boulanger et al., 2011; Rapson and Muehlegger, 2023).

Purchasing products like EVs which contain relatively new technology requires customers to consider the risks more carefully. Perceived risk associated with EV's are the concerns or potential downsides that buyers might worry about. Common risks include the limited driving range of EVs, which can cause "range anxiety" for drivers concerned about running out of power (Lim et al., 2015; Pevec et al. 2020; Shrestha et al. 2022). The availability of charging infrastructure is another major concern, as insufficient charging stations can make it difficult for owners to charge their vehicles conveniently (Salah and Kama, 2016; Nguyen et al., 2022). Moreover, the higher investment and upfront cost of EVs compared to traditional vehicles can be a deterrent for many consumers (Hardman et al., 2021).

With perceived risk came into assessment, perceived benefits as a critical variable that balances against the perceived risks, will shape customers' perceived value of EVs. This assessment of perceived benefits takes into account the current advancements in EV technology, such as improvements in battery life and charging speed (Asfani et al., 2020). It also considers the increasing foreign investments in the Indonesian EV market and the positive news coverage about EV usage, which can enhance consumer confidence and interest in EVs (Damayanti et al., 2020; Wicaksono et al., 2021). As more people experience the benefits of EVs and share their positive experiences, the overall perceived value of these vehicles increases.

Another factor that is included in the consideration is facilitating conditions which are the external factors that support the adoption of EVs. In Indonesia, the development of the EV market faces several challenges. These include the need for a widespread and reliable charging infrastructure, government policies and incentives to make EVs more affordable, and public awareness campaigns to educate consumers about the benefits of EVs (Syamnur et al., 2019; Yuniza et al., 2021). The readiness of the local automotive industry to produce and support EVs is also a critical facilitating condition (Kar et al., 2013; Deng et al., 2020; Yozwiak et al., 2022).

Understanding the suggested factors that can influence consumer interest in purchasing EVs is crucial for the successful adoption of these vehicles. Studies by Liao et al. (2017) shows that various variables such as incentives, environmental concerns, and technological advancements play a significant role in shaping consumer preferences towards EVs. This result is also supported by research from Utami et al. (2020), which found that adoption intention of EVs in Indonesia is influenced by various factors, including incentives, business opportunities, and the overall perception of electric vehicles.

Lastly, as the EV market grows, consumers are seeking more information and reassurance about the benefits and practicality of EVs. The marketing efforts of automotive companies play a significant role in attracting potential EV buyers. Kendall Smith, Senior Director Business Development of Nielsen Auto Team highlights the need for innovative marketing strategies to drive the adoption of electric vehicles (EVs) as marketing efforts. While companies are investing heavily in marketing campaigns to highlight the benefits of EVs and address consumer concerns like, for example, by offering test drives to allow potential buyers to experience the performance and convenience of EVs firsthand. according to Smith, effective marketing must also address key concerns such as cost, charging infrastructure, and environmental impact. He then continued that to succeed, marketers should leverage digital platforms, provide clear and compelling information, and focus on building trust and awareness among potential buyers. Engaging and educating consumers through targeted campaigns and partnerships will be crucial in accelerating the EV revolution (Nielsen, 2021)[9].

[9] https://www.nielsen.com/id/insights/2021/the-electric-vehicle-revolution-demands-fresh-marketing-strategies/

By investigating these variables, this study aims to understand the factors that influence the intention to purchase EVs in Indonesia and provide insights into how to effectively promote EV adoption in Indonesia.

1.2 Research Problem

Despite the growing trend in electric vehicle (EV) adoption, the purchase intention for EVs in Indonesia remains relatively low compared to other countries. As shown in Table 1.1. below, in 2022, Indonesia's EV sales reached over 15,000 units, marking a significant increase from previous years and followed by consistent growth in the following years, but still representing a small fraction of the global market (below 1%).

Table 1. Global EV Sales vs Indonesia EV Sales

Year	Global EV Sales[10][11]	Indonesia EV Sales[12][13]	%
2021	6.774.000	3.159	0,05%
2022	10.524.000	15.427	0,15%
2023	14.194.000	69.625	0,49%
2024Q2	6.202.947 [14][15]	38.259	0,62%

Source: Data compile by author, 2025

In contrast, according to IEA's Global EV Outlook 2023 (IEA, 2024b)[16] and EV Volumes (2024)[17], global electric vehicle (EV) sales continued to grow, with a 22% year-on-year increase in combined BEV and PHEV sales during the first half of 2024, as shown on Figure 4 below. According to EV Volumes, China remains the global leader,

[10] https://rhomotion.com/news/over-four-million-evs-sold-globally-in-2024/
[11] https://databoks.katadata.co.id/transportasi-logistik/statistik/020528b821bbbe6/penjualan-mobil-listrik-global-cenderung-naik-sedekade-terakhir
[12] https://databoks.katadata.co.id/transportasi-logistik/statistik/6785f939e1516/penjualan-bulanan-mobil-hybrid-di-indonesia-sampai-desember-2024
[13] https://databoks.katadata.co.id/transportasi-logistik/statistik/6784d3d462dcd/penjualan-mobil-listrik-di-indonesia-meningkat-2020-2024
[14] https://www.evuniverse.io/p/evsales2024-h1
[15] https://www.trendforce.com/presscenter/news/20241202-12389.html#:~:text=Global%20PHEV%20Sales%20Surge%20by,Share%20Exceeds%2040%25%2C%20Says%20TrendForce
[16] https://www.iea.org/reports/global-ev-outlook-2023/executive-summary
[17] https://ev-volumes.com/news/ev/is-the-global-ev-market-slowing-down/

accounting for 60% of global EV sales in the first half of 2024, with BEVs and PHEVs representing 46% of the Chinese new-car market in June 2024.

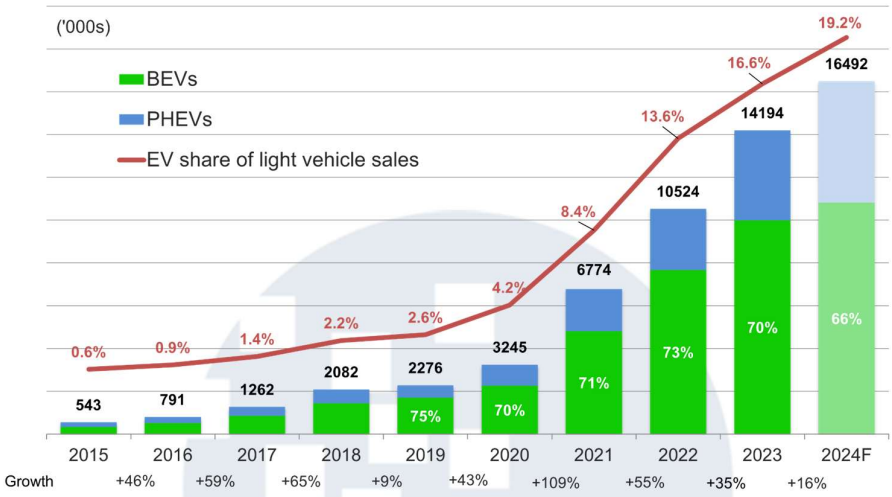

Figure 4. Global Sales of New EV (2015 - 2024 Forecast)

Source: EV-Volumes, 2024

Although Indonesia's EV market shows promising growth, global EV markets have shown varying trends in 2024. Europe has experienced stagnating EV sales, with just a 1% increase compared to last year, due to reduced subsidies and a shift in focus toward charging infrastructure development. Meanwhile, the U.S. market demonstrated stronger performance with a 12% rise in EV sales during the first half of 2024. According to EV Volumes forecasts, global EV sales are expected to reach 16.5 million units in 2024, with China leading at 10 million units, followed by Europe at 3.3 million units, and North America at 2 million units. When comparing these figures to the data shown in Table 1.1, Indonesia's relatively modest sales numbers highlight several key challenges that need to be addressed to accelerate local EV adoption and enhance consumer purchase intention, including infrastructure development, cost considerations, and prevailing consumer perceptions and purchase intention.

Based on the above discussion, this research addresses two distinct types of gaps in the context of EV adoption in Indonesia. First, a significant business gap exists between current EV adoption rates and international sustainability targets, as evidenced by IEA data showing that global EV sales need to reach 60% by 2030 compared to current rates of 14% (IEA, 2023:42). This gap is particularly pronounced in Indonesia, where low

purchase intention for EVs presents a critical challenge for meeting international sustainability standards. Second, several research gaps persist in understanding EV adoption barriers, as conceptualized by Adu and Miles (2023:75-77), including evidence gaps in establishing causal relationships between adoption factors, methodological gaps in approaching the problem comprehensively, and theoretical gaps in understanding the interplay between various adoption barriers. While existing surveys by Milieu Insight[18] and Deloittee[19] have provided descriptive insights into factors such as charging infrastructure, costs, and consumer awareness, there remains a critical need for research that investigates the causal relationships between these factors. This study aims to address both the business and research gaps by examining these causal relationships to better understand and address the barriers to EV adoption in Indonesia, ultimately contributing to both practical solutions for increasing EV adoption and theoretical understanding of adoption barriers in emerging markets.

1.3 Research Objective

The purpose of this research is to investigate the factors that influence the purchase intention of electric vehicles (EVs) in Indonesia. This study employs the Consumers Perceived Value Theory, focusing on the variables of perceived benefits and perceived sacrifices/risks. Additionally, it incorporates the facilitation condition from the Unified Theory of Acceptance and Use of Technology (UTAUT) and the marketing mix to assess the marketing efforts of EV sellers. Therefore, this research aims to answer the following questions:

1. Whether marketing efforts are able to influence perceived benefit and perceived risk?
2. Whether the facilitation conditions are able to influence perceived benefit and perceived risk?
3. Whether perceived benefits, perceived risks, and perceived value are able to mediate the relation between marketing efforts and purchase intention?

[18] Milieu Insight. "Leading Reasons against Purchasing An Electric Car (Bev/Phev) in Southeast Asia in 2021, by Selected Country." *Statista*, Statista Inc., 17 Nov 2021, https://www.statista.com/statistics/1292458/sea-top-reasons-against-buying-electric-cars-by-country/

[19] Deloitte. "Leading Concerns of Consumers for Purchasing Electric Vehicles (Ev) in Southeast Asia in 2020, by Country." *Statista*, Statista Inc., 5 Mar 2021, https://www.statista.com/statistics/1230052/sea-top-concerns-for-ev-purchase-by-country/

4. Whether perceived benefits, perceived risks, and perceived value are able to mediate the relation between facilitating condition and purchase intention?

1.4 Research Benefits

1.4.1. Industry or Management

This research will provide valuable insights for the EV industry and EV sellers in Indonesia. By understanding the factors that influence consumers' purchase intentions, companies can tailor their marketing strategies to better meet the needs and preferences of potential buyers. The findings on perceived benefits and perceived sacrifices/risk will help businesses highlight the advantages of EVs while addressing common concerns and barriers. Additionally, insights from the facilitation condition and marketing activity analysis will guide companies in improving their marketing efforts, making EVs more accessible and appealing to consumers. This research will support the EV industry in developing more effective strategies to boost sales and foster a stronger market presence in Indonesia.

1.4.2. Academic

For the academic community, this research aim to contribute to the existing body of knowledge on consumer behavior and technology adoption, particularly in the context of electric vehicles. By integrating the Consumers Perceived Value theory with the facilitating condition from the UTAUT model and marketing mix, this study offers a comprehensive framework for analyzing consumers perceived value and purchase intentions on EV. The research findings will provide a deeper understanding of how perceived value, facilitation factors, and marketing efforts interact to influence consumer decisions. This can serve as a foundation for future studies on EV adoption and related fields, promoting further academic exploration and discussion. Additionally, the study's context-specific insights can be useful for comparative research in other regions or markets, enhancing the global understanding of EV adoption and purchase intention dynamics.

CHAPTER II :
RESEARCH FRAMEWORK

2.1. Electric Vehicles: An Overview

According to Denton and Pells (2024), there are three types of electric vehicle. They are PEV, HEV and PHEV.

Pure electric vehicles (PEVs), also known as battery electric vehicles (BEVs) or simply electric vehicles (EVs), use a battery instead of a fuel tank and an electric motor instead of an internal combustion engine (ICE). These vehicles run solely on electricity and need to be plugged in for recharging. They produce no tailpipe emissions. Most modern EVs can travel between 100 to 300 miles on a single charge. Examples include the Nissan LEAF, Volkswagen ID.3/ID.4, Jaguar I-Pace, Audi Q4 e-tron, and Tesla Model 3.

Hybrid electric vehicles (HEVs) use both an internal combustion engine and one or more electric motors that draw power from batteries. This combination allows HEVs to offer the advantages of good fuel efficiency and lower tailpipe emissions, while still providing the power and driving range of conventional vehicles. Standard HEVs cannot be recharged from an external power source; instead, they recharge their batteries through regenerative braking and the internal combustion engine. Examples of popular HEVs include the Toyota Prius, Honda CR-V, and BMW 3 Series. These vehicles effectively blend traditional vehicle performance with enhanced fuel economy and environmental benefits.

Plug-in hybrid electric vehicles (PHEVs) feature a battery, an electric drive motor, and an internal combustion engine (ICE). These vehicles can operate using the ICE, the electric motor, or a combination of both. One of the key advantages of PHEVs is that they can be recharged from an external power source, allowing them to drive purely on electric power for 20 to 50 miles. When the battery is depleted, the vehicle seamlessly switches to hybrid mode, utilizing both the ICE and electric motor, thus eliminating any range anxiety. Notable examples of PHEVs include the Mitsubishi Outlander PHEV, BMW 330e, and Volkswagen Golf GTE.

Range-extended electric vehicles (E-REVs) are a specialized type of PHEV. They include an internal combustion engine and generator specifically designed to recharge the battery once it is depleted. This setup ensures that the vehicle can continue running on