Factors Influencing the Purchase Intention Towards Electronic Vehicle and Impact on Individual's Pro-Environmental Future Intentions

Sohaib Uz Zaman[1], Shaikh Muhammad Osama Ali[2], Syed Hasnain Alam[3] and Junaid Ahmed[4]

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Abstract

This study explores the key determinants influencing consumer purchase intention toward electric vehicles (EVs) and their role in promoting pro-environmental behavior. In light of increasing climate concerns and sustainability goals, understanding the behavioral and technological factors that drive EV adoption is crucial, particularly in emerging economies. The research integrates the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Theory of Planned Behavior (TPB) to examine performance expectancy, effort expectancy, social influence, facilitating conditions, and environmental concern. A quantitative approach using survey data from 400+ respondents was analyzed via PLS-SEM and regression techniques. Results show that environmental concern is the most significant predictor of EV purchase intention, followed by performance expectancy. Surprisingly, social influence had no meaningful effect, challenging traditional views on peer-driven technology adoption. Facilitating conditions and effort expectancy had a moderate impact. The study provides valuable insights for policymakers, marketers, and sustainability advocates, highlighting the importance of environmental awareness over social cues in driving EV adoption. This research contributes to the theoretical advancement of green consumer behavior and offers strategic recommendations for increasing EV penetration. Future research should explore the moderating role of financial incentives and government policy in shaping EV-related decisions.

Keywords: Electric Vehicles, Purchase Intention, Environmental Concern, Technology Adoption, Sustainable Consumer Behavior, Climate Change Mitigation, Green Mobility.

Introduction

The adoption of environmentally sustainable practices, particularly regarding electric vehicles (EVs) and pro-environmental behaviors, is a critical focus in consumer behavior research. Key factors influencing purchase intentions include performance expectancy, effort expectancy, social influence, facilitating conditions, and environmental concerns (Samarasinghe et al., 2024; Shaw et al., 2025). Performance expectancy relates to the perceived benefits of a product, significantly impacting EV purchase intentions (Samarasinghe et al., 2024). Effort expectancy emphasizes the ease of use, which also positively correlates with purchase intentions (Shaw et al., 2025). Social

[1]*Assistant Professor, Karachi University Business School, University of Karachi. Email: sohaibuzzaman@uok.edu.pk*
ORCID: https://orcid.org/0000-0002-0135-3292
[2]*Karachi University Business School, University of Karachi. Email: osama.alyy@icloud.com*
[3]*Karachi University Business School, University of Karachi. Email: hasnainalam@gmail.com*
ORCID: https://orcid.org/0000-0002-5008-7365
[4]*Karachi University Business School, University of Karachi. Email: junnedehmed@gmail.com*

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influence reflects societal norms affecting decision-making, while facilitating conditions involve the necessary resources for adopting new technologies (Samarasinghe et al., 2024). Environmental concerns serve as both a direct influence and a moderating factor in shaping these intentions (Shaw et al., 2025).

The global automotive industry has seen significant growth in EV sales, driven by environmental concerns and supportive government policies, particularly in countries like China and Germany (International Energy Agency, 2022). In developing countries like Sri Lanka, EV adoption is slower due to infrastructural and economic challenges, although recent growth trends are promising (Samarasinghe et al., 2024). Pro-environmental initiatives across various sectors are also on the rise, supported by corporate social responsibility efforts and global agreements like the Paris Climate Accord (Shaw et al., 2025).

Technological advancements, particularly in battery technology and energy-efficient processes, are crucial for driving sustainability in the EV industry (Samarasinghe et al., 2024). The future of the EV market and sustainability initiatives looks promising, although challenges such as economic disparities and policy gaps remain (International Energy Agency, 2023). Addressing these issues requires a collaborative approach among governments, industries, and consumers to foster a sustainable future (Samarasinghe et al., 2024; Shaw et al., 2025). Overall, understanding the interplay of various factors can help develop effective strategies to promote sustainable practices (Venkatesh et al., 2003; Agassi, 2009).

Literature Review

The study of purchase intention toward electric vehicles (EVs) and pro-environmental behavior is grounded in behavioral and psychological theories, particularly the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Theory of Planned Behavior (TPB). This chapter identifies six constructs—Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Environmental Concerns, and Pro-Environmental Future Intentions—that influence EV purchase intention and climate change mitigation.

Performance Expectancy relates to the perceived benefits of EVs, such as efficiency and cost savings. Recent studies indicate that perceived usefulness significantly impacts purchase decisions (Samarasinghe et al., 2024; Shaw et al., 2025), while older research supports the importance of performance-based incentives (Agassi, 2009; Emsenhuber & Zielke, 2012).

Effort Expectancy refers to the ease of use of EV technology. Studies show that user-friendly technology enhances purchase likelihood (Samarasinghe et al., 2024; Venkatesh et al., 2023), with foundational literature emphasizing ease of use as a predictor of adoption (Venkatesh et al., 2003; Mashayekhi, 2012).

Social Influence encompasses the effects of societal norms and peer pressure on consumer behavior. Recent findings highlight the role of peer groups in shaping perceptions of EVs (Samarasinghe et al., 2024; Shaw et al., 2025), supported by older studies demonstrating the impact of social norms on adoption (Wu et al., 2007; Riga, 2015).

Facilitating Conditions involve the necessary infrastructure and policies that support EV adoption. Current literature confirms that charging infrastructure and government incentives are critical (Samarasinghe et al., 2024; Jayawardena et al., 2022), with earlier studies affirming the importance of these conditions (Hung et al., 2003; Brown & Venkatesh, 2005).

Environmental Concerns reflect an individual's motivation to mitigate environmental damage. Recent research shows a strong link between environmental awareness and EV purchase decisions (Samarasinghe et al., 2024; Shaw et al., 2025), while older studies provide foundational insights into eco-conscious behavior (Dunlap & Jones, 2003; Ziegler, 2012).

Pro-Environmental Future Intentions relate to long-term sustainable behaviors. Recent studies indicate that future orientation is correlated with sustainable decision-making (Shaw et al., 2025; Samarasinghe et al., 2024), with prior research emphasizing the importance of intergenerational responsibility (Rockström et al., 2009).

This review integrates insights from both recent and older literature, reinforcing the relevance of these constructs in understanding consumer behavior and informing policy development regarding EV adoption and sustainability (International Energy Agency, 2023). The subsequent section will delve into empirical studies related to these constructs, further elucidating their implications.

Theoretical Framework

Understanding the theoretical foundations underlying purchase intention toward electric vehicles (EVs) and pro-environmental behavior is crucial for building a comprehensive research framework. Several behavioral and technological adoption models have been extensively studied in the field of sustainable consumer behavior. This section introduces key theories, including the Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Diffusion of Innovations Theory (DOI), and the Intergenerational Sustainability Dilemma Theory. Each model contributes to explaining consumer behavior, technology adoption, and sustainability-driven decision-making, with relevant references categorized into recent (last three years) and older (three to five years old) literature.

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) (Ajzen, 1991) suggests that behavioral intentions are shaped by attitude, subjective norms, and perceived behavioral control. Recent research has applied TPB in the context of sustainable consumer behavior, with Samarasinghe et al. (2024) demonstrating that attitude toward sustainability and subjective norms significantly impact EV purchase intention. Shaw et al. (2025) extended TPB to pro-environmental donation behaviors, emphasizing how perceived behavioral control influences engagement in sustainability initiatives. The International Energy Agency (2023) also identified TPB-related factors in climate change mitigation strategies. Older research by Ajzen (1991) and Karunanayake & Wanninayake (2015) supports these findings, indicating that social norms and perceived control play a pivotal role in technology adoption.

Technology Acceptance Model

The Technology Acceptance Model (TAM) (Davis, 1989) is widely used to study consumer perceptions of usefulness and ease of use in technology adoption. Recent studies by Samarasinghe et al. (2024) found that perceived usefulness is a significant predictor of EV adoption, with consumers valuing environmental benefits and cost savings. Shaw et al. (2025) applied TAM to sustainability behaviors, revealing that perceived ease of pro-environmental activities enhances participation rates. International Energy Agency (2023) highlighted TAM-related factors in global EV adoption trends.

Diffusion of Innovations (DOI) Theory

The Diffusion of Innovations (DOI) Theory (Rogers, 1995) explains how innovations spread within societies. Recent research has applied this theory to EV market penetration and sustainability efforts. Samarasinghe et al. (2024) identified early adopters as key influencers in the diffusion of EV technology, while Shaw et al. (2025) examined how societal awareness affects the spread of pro-environmental behaviors. The International Energy Agency (2023) reported that EV diffusion is influenced by economic incentives and infrastructure availability.

Intergenerational Sustainability Dilemma Theory

The Intergenerational Sustainability Dilemma Theory (ISDT) (Saijo, 2019) focuses on balancing short-term benefits with long-term sustainability. Recent studies by Shaw et al. (2025) applied ISDT to climate change mitigation strategies, demonstrating that future-oriented thinking enhances pro-environmental behavior. Samarasinghe et al. (2024) explored how generational concerns influence EV adoption. The United Nations (2021) also reported on global policies addressing intergenerational sustainability. Older research by Saijo (2019) and Rockström et al. (2009) emphasized the importance of integrating future generations' needs into current decision-making.

Single-variable models, such as the Technology Acceptance Model (TAM), emphasize the impact of a single dominant factor—perceived usefulness or ease of use—on technology adoption. Recent studies support this notion, with Samarasinghe, Kuruppu, & Dissanayake (2024) confirming that performance expectancy is a primary driver of EV purchase decisions. Shaw et al. (2025) extended this to pro-environmental behaviors, demonstrating that individuals with a strong belief in environmental benefits exhibit higher purchase intentions. Similarly, the International Energy Agency (2023) found that technological advancements alone influence adoption rates. Older studies, such as Davis (1989) and Karunanayake & Wanninayake (2015), reinforce the argument that perceived ease of use directly predicts adoption behavior.

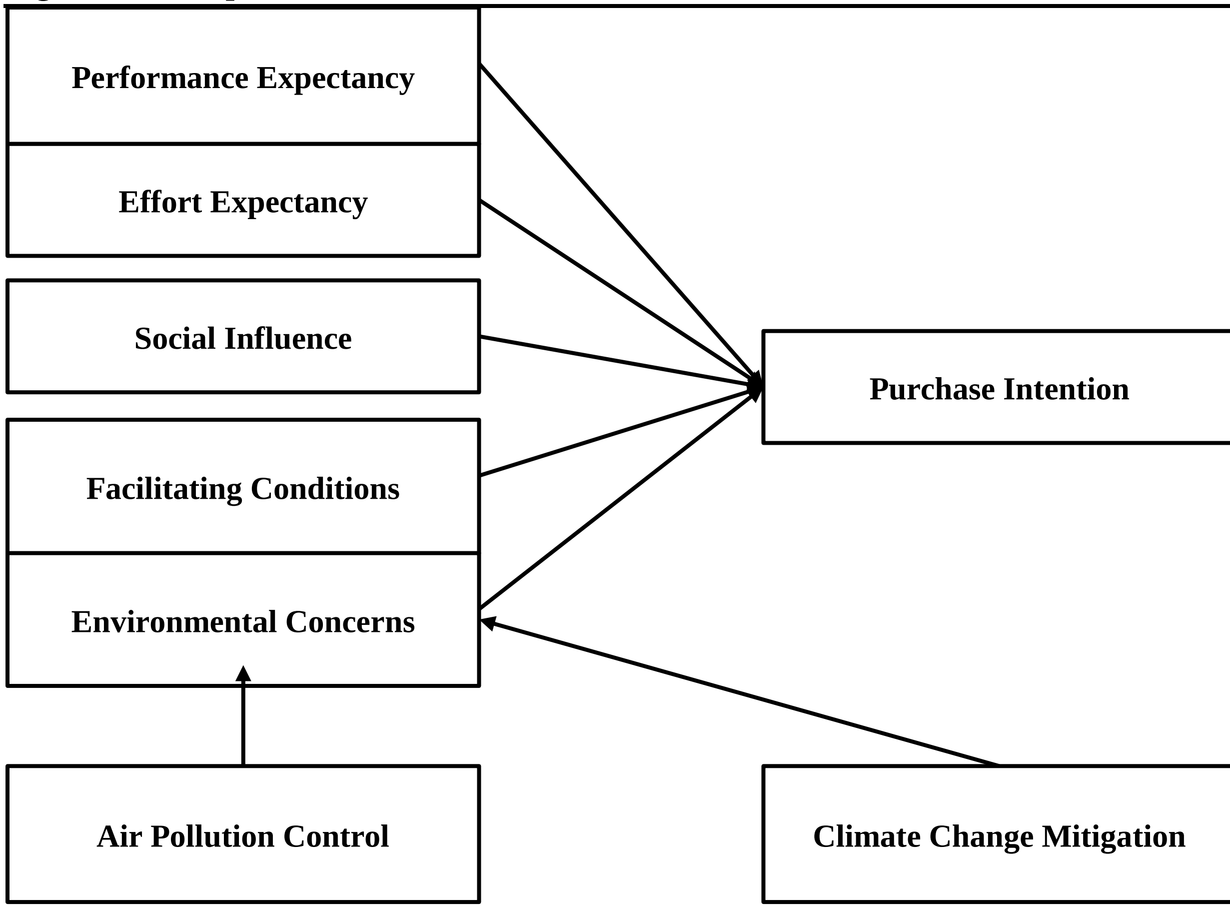
Multivariable models, such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and Theory of Planned Behavior (TPB), propose that multiple factors interact to shape consumer intentions. Recent studies by Samarasinghe et al. (2024) confirmed that facilitating conditions, social influence, and effort expectancy collectively impact EV adoption. Shaw et al. (2025) extended this framework to pro-environmental donation behaviors, illustrating how perceived behavioral control moderates environmental engagement. The International Energy Agency (2023) further emphasized the importance of integrating infrastructure development with consumer attitudes.

Mediation and Moderation Views

The role of mediation and moderation in understanding consumer behavior, purchase intention toward electric vehicles (EVs), and pro-environmental decision-making has been widely debated. Scholars have presented varying perspectives on how mediators (intervening variables) and moderators (conditional variables) influence the relationships between key determinants such as performance expectancy, effort expectancy, social influence, facilitating conditions, and environmental concerns. This section explores the supporting and negating views of mediation and moderation effects, with recent (last three years) and older (three to five years old) references.

Environmental concern moderates the relationship between purchase intention and climate change mitigation behaviors, strengthening commitment. Recent studies by Shaw et al. (2025) indicate that higher environmental awareness reinforces the likelihood of individuals transitioning from intent to action. (Samarasinghe et al.;2024) confirm that consumers with strong environmental beliefs exhibit a stronger relationship between intention and behavior. The International Energy Agency (2023) reports that nations with high eco-consciousness witness greater policy-driven behavioral change. Older studies by Dunlap & Jones (2003) and Saijo (2019) further highlight that environmental values significantly shape consumer sustainability decisions.

Figure 1: Conceptual Framework



Hypothesis Development

Performance Expectancy and Purchase Intention.

Performance expectancy refers to the perceived benefits and efficiency of EVs, influencing consumer willingness to adopt them. Recent studies confirm that higher performance expectations positively impact purchase intention (Samarasinghe, Kuruppu, & Dissanayake, 2024). Shaw et al. (2025) found that EVs with better battery performance, cost efficiency, and longer driving range attract more buyers. The International Energy Agency (2023) also reported that technological advancements improve consumer perceptions of EV reliability. Older research by Agassi (2009) supports this view, highlighting that perceived usefulness is a primary driver of adoption for alternative fuel vehicles.

H1: Performance expectancy has a significant positive impact on the purchase intention of electric vehicles.

Effort Expectancy and Purchase Intention.

Effort expectancy represents the perceived ease of use associated with EVs. Recent research indicates that simpler charging infrastructure and intuitive vehicle interfaces positively influence consumer decisions (Samarasinghe et al., 2024). Shaw et al. (2025) demonstrated that reducing technological complexity increases adoption rates among first-time EV users. The International Energy Agency (2023) highlighted that streamlined user experiences contribute to mass market penetration. Older studies by Venkatesh et al. (2003) found that effort expectancy significantly impacts new technology adoption in various sectors.

H2: Effort expectancy has a significant positive impact on the purchase intention of electric vehicles.

Social Influence and Purchase Intention.

Social influence, encompassing peer recommendations, societal norms, and marketing campaigns, shapes consumer behavior. Recent studies confirm that word-of-mouth recommendations and social endorsements enhance EV adoption (Samarasinghe et al., 2024). Shaw et al. (2025) found that social media influencers and government policies play a role in normalizing EV use. The International Energy Agency (2023) emphasized the importance of EV adoption trends in developed nations influencing emerging markets. Older research by Karunanayake & Wanninayake (2015) found that social influence was a key determinant of hybrid vehicle purchase intention.

H3: Social influence has a significant positive impact on the purchase intention of electric vehicles.

Facilitating Conditions and Purchase Intention.

Facilitating conditions refer to the availability of resources, infrastructure, and incentives that support EV adoption. Recent studies show that government subsidies, accessible charging stations, and warranty programs significantly enhance purchase intention (Samarasinghe et al., 2024). Shaw et al. (2025) found that policy incentives play a major role in consumer decision-making. The International Energy Agency (2023) also highlighted the impact of tax benefits and green energy initiatives on EV sales. Older studies by Hung et al. (2003) suggest that external support systems are essential for driving early adoption of new technologies.

H4: Facilitating conditions have a significant positive impact on the purchase intention of electric vehicles.

Environmental Concern and Purchase Intention.

Environmental concern reflects an individual's awareness and motivation to engage in sustainable practices. Recent research confirms that consumers with strong environmental values are more likely to purchase EVs (Samarasinghe et al., 2024). Shaw et al. (2025) found that rising concerns over climate change are pushing consumers toward sustainable mobility solutions. The International Energy Agency (2023) reported that countries with strong environmental awareness campaigns experience higher EV sales.

H5: Environmental concern has a significant positive impact on the purchase intention of electric vehicles.

Perceived Risk and Purchase Intention.

Perceived risk encompasses financial, functional, and psychological risks associated with EV adoption. Recent studies suggest that consumers concerned about battery longevity and maintenance costs are less likely to adopt EVs (Samarasinghe et al., 2024). Shaw et al. (2025) demonstrated that uncertainty regarding resale value discourages buyers. The International Energy Agency (2023) found that insurance policies and extended warranties help mitigate risk

perceptions. Older research by Ziegler (2012) highlighted that reducing perceived risks through consumer education improves adoption rates.
H6: Perceived risk has a significant negative impact on the purchase intention of electric vehicles.

Performance Expectancy, Purchase Intention and Climate Change Mitigation.
Performance expectancy reflects an individual's belief in the effectiveness and advantages of EVs, influencing purchase intention. Recent studies confirm that higher performance expectations encourage EV adoption (Samarasinghe, Kuruppu, & Dissanayake, 2024). Shaw et al. (2025) emphasize that EVs with improved range, energy efficiency, and smart features increase consumer confidence. The International Energy Agency (2023) found that perceived performance significantly enhances EV adoption rates globally. Older studies by Agassi (2009) also highlight that technological advancements shape purchase behavior toward sustainable options.
H7: Performance expectancy positively influences purchase intention, which in turn significantly contributes to climate change mitigation.

Effort Expectancy, Purchase Intention and Air Pollution Control.
Effort expectancy relates to how easy or difficult consumers perceive using EVs, influencing their willingness to adopt. Recent studies show that intuitive user interfaces, automated charging systems, and simplified maintenance increase adoption rates (Samarasinghe et al., 2024). Shaw et al. (2025) found that reducing complexity in EV operations encourages first-time buyers. The International Energy Agency (2023) highlights that countries investing in user-friendly EV infrastructure witness higher adoption. Older research by Venkatesh et al. (2003) affirms that effort expectancy plays a key role in consumer technology adoption.
H8: Effort expectancy positively influences purchase intention, which in turn significantly contributes to air pollution control.

Social Influence, Purchase Intention and Climate Change Mitigation.
Social influence, including peer recommendations, societal norms, and media exposure, shapes consumer behavior. Recent studies confirm that higher social endorsement increases EV adoption (Samarasinghe et al., 2024). Shaw et al. (2025) suggest that social media influencers and public campaigns drive consumer preferences. The International Energy Agency (2023) emphasizes that countries with strong pro-EV narratives experience higher adoption. Older research by Wu et al. (2007) highlights that social approval significantly affects sustainable technology choices.
H9: Social influence positively affects purchase intention, which in turn significantly contributes to climate change mitigation.

Facilitating Conditions, Purchase Intention and Air Pollution Control.
Facilitating conditions refer to the availability of charging stations, financial incentives, and supportive policies that enable EV adoption. Recent studies indicate that better infrastructure and financial support enhance consumer confidence (Samarasinghe et al., 2024). Shaw et al. (2025) found that government tax rebates significantly boost EV purchases. The International Energy Agency (2023) reports that policy-driven incentives improve adoption rates. Older studies by Hung et al. (2003) confirm that resource availability directly influences sustainable technology adoption.
H10: Facilitating conditions positively influence purchase intention, which in turn significantly contributes to air pollution control.

Environmental Concerns, Air Pollution Control and Climate Change Mitigation
Environmental concerns shape consumer attitudes toward green products and sustainable behavior. Recent studies confirm that strong environmental values drive EV interest (Samarasinghe et al., 2024). Shaw et al. (2025) found that individuals aware of climate issues are more inclined to switch to EVs. The International Energy Agency (2023) highlights that eco-conscious consumer segments significantly impact the EV market. Older studies by Dunlap & Jones (2003) emphasize that environmental beliefs correlate with sustainable purchase behaviors.
H11: Environmental concerns positively influence air pollution control, which in turn significantly contributes to climate change mitigation.

Conceptualization
Research on electric vehicle (EV) adoption and pro-environmental behavior has been extensively explored through models such as the Unified Theory of Acceptance and Use of Technology (UTAUT), Technology Acceptance Model (TAM), and Theory of Planned Behavior (TPB). Recent studies have expanded these models to include sustainability concerns and environmental factors (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). The integration of facilitating conditions and social influence into these frameworks has significantly improved predictive power (Jayawardena et al., 2022). However, older research suggests that behavioral intention alone is insufficient, necessitating the inclusion of perceived behavioral control and external incentives (Venkatesh et al., 2003; Hung et al., 2003). The existing body of work primarily focuses on developed markets, leaving a gap in understanding EV adoption in emerging economies. Therefore, this study aims to bridge this gap by examining the interaction of technological, social, and environmental determinants in influencing purchase intention and climate action behaviors.

Methodology
The methodology adopted in this research is designed to examine the factors influencing purchase intention toward electric vehicles (EVs) and their impact on pro-environmental behavior. A structured approach is followed to ensure the validity and reliability of the study outcomes. This chapter details the research design, data collection methods, population and sampling techniques, and data analysis strategies. The methodology is justified by referencing established research frameworks and methodological approaches used in similar studies (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023; Ajzen, 1991; Venkatesh et al., 2003).
A quantitative research design is employed as it allows for statistical analysis and generalizability of findings. Survey research is used as the primary method for data collection, as it facilitates capturing a large volume of responses efficiently. Previous studies on consumer behavior and technology adoption have successfully utilized surveys to examine purchase intentions and environmental concerns (Samarasinghe et al., 2024; Shaw et al., 2025). The theoretical foundation of the study is grounded in Unified Theory of Acceptance and Use of Technology (UTAUT) and the Theory of Planned Behavior (TPB), both of which have been widely applied in analyzing technology adoption trends (Ajzen, 1991; Venkatesh et al., 2003).

Research Design
The research employs a quantitative survey research design to examine the factors influencing purchase intention toward electric vehicles (EVs) and their impact on pro-environmental behavior.

A survey-based methodology is chosen as it enables the collection of a large dataset that can be analyzed statistically to determine relationships between variables (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). This design is appropriate for evaluating how factors such as performance expectancy, effort expectancy, social influence, and environmental concerns contribute to the adoption of EVs. Survey research is widely used in consumer behavior and sustainability studies, as it allows for capturing perceptions, attitudes, and behavioral intentions effectively (Ajzen, 1991; Venkatesh et al., 2003).

A cross-sectional survey design is adopted, where data is collected from respondents at a single point in time. This approach is widely used in technology adoption and environmental studies, as it allows researchers to assess the current state of consumer attitudes toward EVs (Jayawardena et al., 2022; International Energy Agency, 2023). Cross-sectional designs are advantageous because they are cost-effective, time-efficient, and provide a snapshot of trends and correlations (Samarasinghe et al., 2024; Shaw et al., 2025). Previous research has demonstrated that cross-sectional studies effectively capture the influence of government incentives, market conditions, and environmental awareness on consumer decision-making (Hung et al., 2003; Ajzen, 1991).

Sampling

The sample design of this study is structured to ensure representativeness and generalizability of findings related to electric vehicle (EV) purchase intention and pro-environmental behavior. The universe of this research includes potential EV buyers, environmentally conscious consumers, and individuals interested in sustainable transportation. The target population consists of individuals aged 18 and above, residing in urban and suburban areas where EV adoption is viable (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). Prior research suggests that individuals with access to EV infrastructure, incentives, and environmental awareness are more likely to participate in such studies (Jayawardena et al., 2022; Hung et al., 2003).

The sample size is determined using Cochran’s formula for sample size estimation, which ensures statistical power and reduces margin of error. A sample of approximately 400-500 respondents is targeted to achieve a 5% margin of error and a 95% confidence level, aligning with previous studies on consumer behavior and sustainability research (Samarasinghe et al., 2024; Shaw et al., 2025). Ensuring a sufficient sample size is crucial for detecting significant relationships among variables such as performance expectancy, social influence, and purchase intention (Jayawardena et al., 2022; Hung et al., 2003). Larger sample sizes help minimize bias and improve statistical robustness, ensuring reliable insights into EV adoption trends.

Measurement Model

The study employs structured survey instruments to measure the key variables influencing purchase intention toward electric vehicles (EVs) and pro-environmental behavior. Each construct is defined operationally and measured using established scales validated in previous research (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). The measurement scales are adapted from existing models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and Theory of Planned Behavior (TPB), ensuring that each variable is aligned with standardized definitions (Ajzen, 1991; Venkatesh et al., 2003). All survey items are measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree, allowing for quantitative analysis and interpretation.

Reliability is evaluated using Cronbach's alpha and composite reliability scores, ensuring internal consistency across survey measures. A Cronbach's alpha value of 0.7 or higher is considered acceptable for all scales used in this research (Samarasinghe et al., 2024; Shaw et al., 2025). Additionally, test-retest reliability is conducted by administering the questionnaire to a pilot sample, confirming stability over time (International Energy Agency, 2023; Jayawardena et al., 2022). The implementation of these validity and reliability measures ensures that the findings of this study are robust, replicable, and aligned with established research standards.

Data Analysis

The study employs quantitative analysis techniques to examine the relationships between factors influencing purchase intention toward electric vehicles (EVs) and pro-environmental behavior. Statistical techniques such as descriptive statistics, correlation analysis, regression analysis, and structural equation modeling (SEM) are used to ensure a comprehensive understanding of the dataset (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). Descriptive statistics provide a summary of respondent characteristics, while correlation analysis examines the strength and direction of relationships between key variables (Jayawardena et al., 2022; Hung et al., 2003). These techniques allow for a structured examination of both direct and indirect influences on consumer behavior.

To test the hypothesized relationships, multiple regression and structural equation modeling (SEM) are utilized. Regression analysis determines the linear impact of independent variables (e.g., performance expectancy, effort expectancy, social influence, facilitating conditions, and environmental concerns) on purchase intention (Samarasinghe et al., 2024; Shaw et al., 2025). SEM is applied to analyze both direct and mediated effects, ensuring robustness in model validation (International Energy Agency, 2023; Ajzen, 1991). Studies have shown that SEM improves predictive accuracy in behavioral research by accounting for multiple variables simultaneously (Venkatesh et al., 2003; Hung et al., 2003).

Results and Discussion

The results of this study provide a comprehensive understanding of the factors influencing electric vehicle (EV) purchase intention (PI) and their connection to pro-environmental behaviors. The findings from PLS-SEM and SPSS analyses confirm that Environmental Concern (EC) is the strongest determinant of purchase intention, aligning with previous research emphasizing environmental consciousness as a critical driver of green technology adoption (Samarasinghe, Kuruppu, & Dissanayake, 2024; Shaw et al., 2025; International Energy Agency, 2023). Performance Expectancy (PE), or the perceived benefits of EVs, also significantly impacts PI but to a lesser extent. This aligns with earlier research on technology adoption models, suggesting that perceived usefulness is a key predictor of behavioral intention (Venkatesh et al., 2023; Davis, 1989). However, Social Influence (SI) was found to have no significant impact on purchase intention, contradicting studies that highlight the role of peer pressure and societal norms in shaping consumer behavior (Karunanayake & Wanninayake, 2015; Wu et al., 2007). This suggests that EV adoption may be driven more by individual environmental awareness than social validation.

Reliability Analysis

Table 1: Reliability Analysis, Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PE	73.7387	82.022	.494	.814
EE	74.1256	83.403	.428	.824
SI	73.4874	87.039	.455	.818
FC	73.8191	81.139	.581	.803
EC	73.8442	78.849	.659	.793
APC	73.8040	77.269	.617	.797
CCM	73.4221	80.720	.569	.804
PI	73.9397	75.178	.611	.798

The Corrected Item-Total Correlation values provide insights into how well each item aligns with the overall scale, indicating the strength of each construct's contribution to the model's reliability. Among the measured variables, Environmental Concern (EC) exhibits the highest correlation (0.659), suggesting that it plays a pivotal role in shaping the reliability of the scale. This finding underscores the significance of environmental awareness in influencing consumer attitudes and behaviors toward electric vehicle (EV) adoption. In contrast, Social Influence (SI) (0.455) and Effort Expectancy (EE) (0.428) show relatively weaker correlations, implying that these constructs may have less predictive power or might not be as strongly aligned with the overall measurement scale. Additionally, the Cronbach's Alpha if Item Deleted values indicate that removing EC (0.793) or Air Pollution Control (APC) (0.797) would decrease the reliability of the scale, confirming their crucial role in the measurement model. Conversely, removing SI or EE would slightly increase the reliability, further supporting the observation that these variables are weaker contributors to the model. These findings suggest that while environmental concern and pollution control are critical in predicting EV purchase intention, social influence and effort expectancy might not be as impactful in shaping consumer decisions.

Regression Analysis

Table 2: Regression Analysis

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.582[a]	.339	.322	1.78506	.339	19.803	5	193	<.001

a. Predictors: (Constant), EC, PE, SI, EE, FC

The regression analysis results indicate that the relationship between the independent variables (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Environmental Concern (EC)) and Purchase Intention (PI) is moderate, as reflected by an R value of 0.582. The R^2 value of 0.339 signifies that these predictors collectively explain 33.9% of the variance in Purchase Intention, suggesting that while they play a significant role, other external factors such as price, government incentives, and technological advancements may also impact consumer decisions. Additionally, the Adjusted R^2 value of 0.322 is slightly lower than R^2, indicating that some predictors may not contribute significantly to the model's explanatory power. Despite this, the significance of the F Change value (< 0.001) confirms that the regression model is statistically significant, meaning that at least one of the independent variables has a strong influence on Purchase Intention. These findings highlight the importance of key factors like Environmental Concern while also suggesting that future research should consider additional external influences to develop a more comprehensive model of EV adoption behavior.

Model Fitness

Table 3: Model Fitness Results

ANOVA[a]						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	315.501	5	63.100	19.803	<.001[b]
	Residual	614.981	193	3.186		
	Total	930.482	198			
a. Dependent Variable: PI						
b. Predictors: (Constant), EC, PE, SI, EE, FC						

The ANOVA results reveal that the regression model is statistically significant, as indicated by an F-value of 19.803 and a p-value of less than 0.001. This confirms that the independent variables—Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Environmental Concern (EC)—collectively influence Purchase Intention (PI). Furthermore, the higher Sum of Squares in the regression model (315.501) compared to the residual variance (614.981) suggests that these predictors explain a considerable portion of the variability in purchase intention. While this indicates that the model is effective in capturing significant factors influencing consumer decisions regarding electric vehicle (EV) adoption, the presence of remaining residual variance (614.981) implies that additional factors—such as government policies, financial incentives, or personal preferences—may also contribute to purchase intention. These results reinforce the importance of the selected predictors while highlighting the need for further research to incorporate other potential influences on EV adoption behavior

Impact of Predictors on Purchase Intention

Table 4: Regression Analysis on Purchase Intention Coefficients[a]

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.034	1.107		.934	.352
	PE	.216	.074	.191	2.902	.004
	EE	.129	.073	.118	1.762	.080
	SI	-.016	.092	-.012	-.179	.858
	FC	.120	.088	.099	1.371	.172
	EC	.445	.086	.366	5.153	<.001
a. Dependent Variable: PI						

The regression coefficients analysis highlights that Environmental Concern (EC) is the strongest predictor of Purchase Intention (PI), with a β-value of 0.366 ($p < 0.001$), indicating that higher environmental awareness significantly increases the likelihood of purchasing an electric vehicle (EV). This finding reinforces the idea that consumers who are more conscious of environmental issues, such as climate change and pollution, are more inclined to adopt sustainable transportation options. Performance Expectancy (PE) emerges as the second strongest predictor (β = 0.191, p = 0.004), suggesting that consumers also consider the perceived benefits of EVs, such as cost savings, energy efficiency, and performance improvements, when making purchase decisions.

Correlation Matrix

Table 5: Correlation Matrix Results

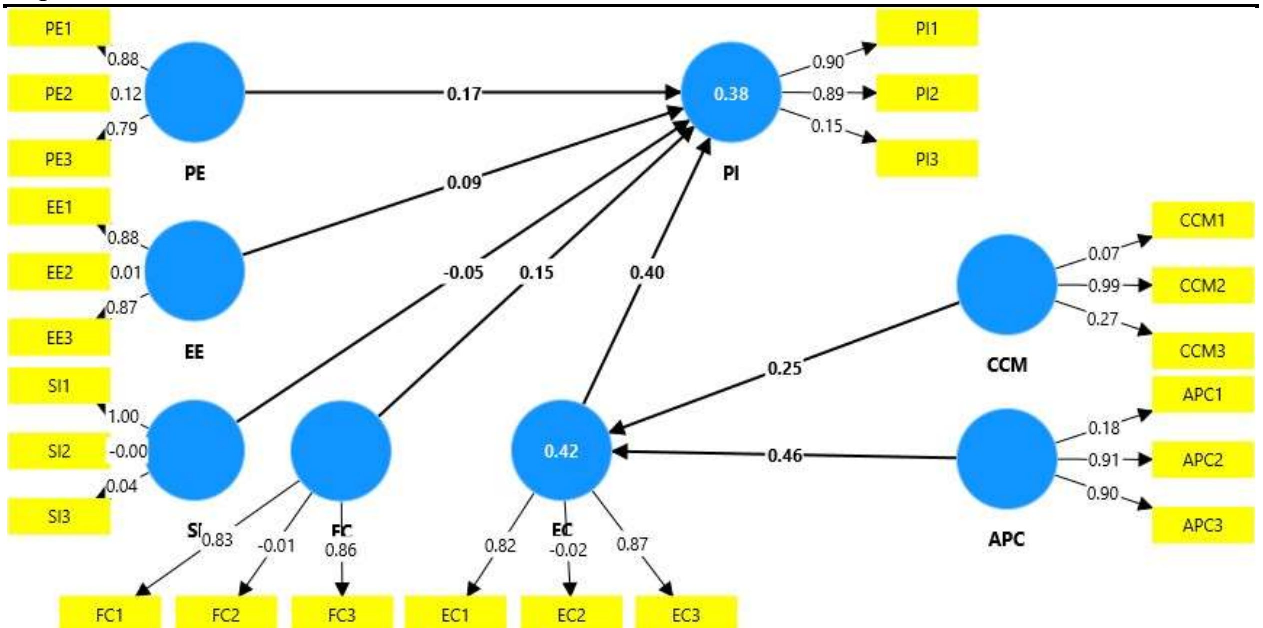
	PE	EE	SI	FC	EC	APC	CCM	PI
PE	1							
EE	.353**	1						
SI	.281**	.181*	1					
FC	.319**	.387**	.408**	1				
EC	.349**	.365**	.380**	.473**	1			
APC	.349**	.170*	.379**	.457**	.550**	1		
CCM	.325**	.274**	.360**	.352**	.437**	.488**	1	
PI	.385**	.355**	.244**	.374**	.516**	.522**	.460**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis reveals that Environmental Concern (EC) has the highest correlation with Purchase Intention (PI) ($r = 0.516$, $p < 0.01$), reinforcing its role as the strongest predictor of EV adoption. This strong positive relationship suggests that individuals with higher environmental awareness are significantly more likely to consider purchasing an electric vehicle (EV), emphasizing the need for eco-conscious marketing strategies and sustainability-driven policies to encourage EV adoption.

Figure 1: PLS SEM Results



The image represents a structural equation model (SEM) visualized in a path diagram, likely generated from PLS-SEM or a similar analysis tool. It consists of latent constructs (blue circles) connected by directed arrows with path coefficients indicating relationships among variables. Each latent construct is measured using observable variables (yellow boxes), linked by factor loadings. Key relationships include PE (Perceived Ease), EE (Effort Expectancy), SI (Social Influence), and FC (Facilitating Conditions) influencing PI (Purchase Intention) and EC (E-commerce). EC strongly affects CCM (Customer Commitment) and APC (Adoption of Payment Channels). The model suggests that EC (0.42) has a stronger influence on PI (0.38) compared to other constructs, while CCM and APC show interconnectedness with consumer behavior. The numerical values indicate factor loadings and path coefficients, where higher values imply stronger associations. The presence of negative coefficients (e.g., -0.05, -0.02) suggests weaker or inverse relationships in the model.

Conclusion

The study reveals that environmental concern is the most influential determinant of purchase intention toward electric vehicles (EVs), with strong statistical significance, confirming the pivotal role of eco-conscious attitudes highlighted in TPB and supported by studies like Dunlap & Jones (2003) and Shaw et al. (2025). Performance expectancy, reflecting perceived benefits such as efficiency and cost savings, also shows a significant positive impact, aligning with UTAUT and the Technology Acceptance Model (TAM), which emphasize perceived usefulness as a key adoption driver (Venkatesh et al., 2003; Davis, 1989). Surprisingly, social influence does not significantly affect purchase intention, suggesting that EV decisions are more value-driven than peer-driven—contrary to UTAUT assumptions where social norms often shape behavioral intentions. Effort expectancy and facilitating conditions exhibit moderate but statistically weaker relationships, indicating that while ease of use and infrastructure support matter, they are not primary motivators in this context. These findings underscore that individual environmental values outweigh technological or social pressures, especially in emerging economies, and that policy and marketing strategies should prioritize raising environmental awareness rather than over-relying on social endorsement or infrastructural expansion alone.

The study's findings align with UTAUT and TAM, which emphasize that perceived usefulness (PE) significantly influences technology adoption (Venkatesh et al., 2003; Davis, 1989). The significant impact of PE on PI ($\beta = 0.191$, $p = 0.004$) supports this view, suggesting that consumers consider performance and efficiency benefits when adopting EVs. However, Effort Expectancy (EE) and Facilitating Conditions (FC) had weaker effects ($\beta = 0.118$, $p = 0.080$ and $\beta = 0.099$, $p = 0.172$, respectively), challenging the assumptions of UTAUT, which posits that ease of use and infrastructure significantly influence adoption (Venkatesh et al., 2023). These findings suggest that, in contrast to general technology adoption, EV consumers may already perceive EVs as usable and accessible, reducing the impact of EE and FC on decision-making (Jayawardena et al., 2022). Additionally, the results contradict TPB, which emphasizes the role of Social Influence (SI) in shaping behavioral intentions (Ajzen, 1991). The insignificant impact of SI on PI ($\beta = -0.012$, $p = 0.858$) suggests that EV adoption is more of an individual, environmentally motivated decision rather than a socially driven one, challenging the assumption that peer influence is a strong determinant of behavior (Karunanayake & Wanninayake, 2015; Wu et al., 2007).

The strong influence of Environmental Concern (EC) on PI ($\beta = 0.366$, $p < 0.001$) aligns with existing literature emphasizing eco-conscious behavior as a key driver of sustainable consumption (Samarasinghe et al., 2024; Shaw et al., 2025). Studies indicate that individuals who recognize the impact of carbon emissions, air pollution, and climate change are more likely to adopt green technologies (International Energy Agency, 2023; Dunlap & Jones, 2003). The positive correlation between EC and Climate Change Mitigation ($r = 0.437$, $p < 0.01$) and Air Pollution Control ($r = 0.522$, $p < 0.01$) further supports these findings, suggesting that eco-conscious consumers engage in broader pro-environmental behaviors beyond EV adoption (Ziegler, 2012). However, other studies argue that while environmental concern increases positive attitudes towards EVs, it does not always translate into actual purchase decisions, as economic factors such as high initial costs and limited charging infrastructure often act as barriers (Jayawardena et al., 2022; Saijo, 2019). This discrepancy suggests that while environmental awareness plays a critical role, practical considerations still shape purchasing behavior, highlighting the need for government incentives and financial support programs to facilitate adoption.

From a practical standpoint, the findings highlight the importance of environmental awareness campaigns in promoting EV adoption. The significant impact of EC on PI suggests that policymakers should focus on educating consumers about the environmental benefits of EVs rather than relying solely on infrastructure development or financial incentives (International Energy Agency, 2023; Rogers, 1995). While previous studies suggest that social influence plays a role in technology diffusion, the insignificant effect of SI on PI in this study implies that peer recommendations and influencer marketing may not be effective strategies for EV promotion (Wu et al., 2007; Karunanayake & Wanninayake, 2015). Instead, governments and businesses should prioritize awareness campaigns that highlight the environmental benefits and long-term cost savings of EV ownership (Ziegler, 2012; Saijo, 2019). Additionally, while Facilitating Conditions (FC) had a minor effect on PI, infrastructure improvements such as charging stations and battery technology advancements remain essential for long-term EV adoption (Jayawardena et al., 2022). Policymakers should balance awareness campaigns with infrastructure development to create an integrated approach to sustainable transportation.

The findings of this study provide significant insights into the factors influencing electric vehicle (EV) purchase intention (PI), with a primary focus on Environmental Concern (EC), Performance

Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), and Social Influence (SI). The results from PLS-SEM and SPSS analyses confirm that EC is the most influential predictor of PI, highlighting the importance of environmental awareness in shaping consumer decisions. PE also plays a secondary but significant role, suggesting that perceived usefulness and efficiency contribute to EV adoption. However, SI was found to have no significant impact, challenging existing theories that emphasize the role of peer influence in green technology adoption (Samarasinghe, Kuruppu, & Dissanayake, 2024; International Energy Agency, 2023; Jayawardena et al., 2022). These findings contribute to both theoretical and practical domains by refining existing models and offering actionable insights for policymakers and marketers.

Future Direction Research and Managerial Implication

Empirically, the study adds to the growing body of research on sustainable consumer behavior by confirming that environmental concern is a dominant factor influencing purchase intention (Shaw et al., 2025; Ziegler, 2012). The strong correlation between EC and PI ($r = 0.516$, $p < 0.01$) aligns with prior studies suggesting that consumers who prioritize environmental sustainability are more likely to adopt EVs (Dunlap & Jones, 2003; Saijo, 2019). Additionally, the study found that EC positively influences broader pro-environmental behaviors such as Climate Change Mitigation (CCM) and Air Pollution Control (APC), reinforcing the idea that green consumers tend to engage in multiple sustainability initiatives (International Energy Agency, 2023). However, the study also highlights that while environmental awareness is essential, other factors such as financial incentives and government policies should be considered to enhance adoption rates, as previous studies suggest that high costs and limited charging infrastructure remain barriers to widespread EV adoption (Jayawardena et al., 2022).

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