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Consumer Attitude towards Battery Electric Vehicles in Kathmandu Valley

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Abstract

This study examines the consumer attitude towards battery electric vehicles in Kathmandu valley. Customer attitude is the dependable variable. The independent variables are social influence, technological awareness, changing infrastructure, government policy and cost of BEVs. The primary source of data is used to assess the opinions of the respondents regarding the consumer attitude towards battery electric vehicles in Kathmandu valley. The study is based on primary data of 152 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the different factors affecting customer attitude towards battery electric vehicles in Kathmandu valley.

The result shows that social influence has a positive impact on customer attitude. It indicates that positive social influence leads to positive customer attitude towards battery electric vehicles in Kathmandu valley. Similarly, technological awareness has a positive impact on customer attitude. It shows that increase in technological awareness leads to positive customer attitude towards battery electric vehicles. Likewise, changing infrastructure has a positive impact on customer attitude. It implies that better the changing infrastructure leads to positive customer attitude towards battery electric vehicles. Further, government policy has a positive impact on customer attitude. It indicates that better government policy leads to positive customer attitude. Moreover, cost of BEVs has a positive impact on customer attitude. It states that efficient cost of BEVs leads to positive customer attitude.

Keywords: customer attitude, social influence, technological awareness, changing infrastructure, government policy, cost of BEVs

1. Introduction

Battery electric vehicles (BEVs) are vehicles that are powered exclusively by electricity stored in rechargeable batteries. These vehicles use electric motors instead of internal combustion engines to drive the wheels. Eectric vehicles (EVs) are vehicles that are partly or fully powered by electric motors, and include Battery Electric Vehicles, plug-in hybrid vehicles and range-extended electric vehicles (Plötz *et al.*, 2014). Similarly, electric vehicles (energy provided by a battery), which have a zero-emission potential when electricity is produced with the use of renewable energy sources (Gerssen-Gondelach and Faaij, 2012). Likewise, customer preferences and sustainability acceptance of electric vehicles indicated that purchasing behaviors (Tan *et al., 2014).* BEVs displace gasoline entirely similarly air emissions implications for plug-in vehicles depend on battery manufacturing and the mix of sources used to generate electricity (Samaras and Meisterling, 2008). Moreover, electric vehicles (EVs) represent hourly distributed and mobile demands in power systems which could also provide distributed storage to power grids (Lund and Kempton, 2008). Furthermore, electric vehicles deployment and market penetration, such as offering purchase subsidies and rolling out charging infrastructure in convenient locations in urban areas (Lin and Greene,

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2011). It is commonly recognized that the cost of batteries is the primary barrier to making plug-in hybrid electric vehicles (PHEVs) and pure electric vehicles (EVs) commercially price competitive (Kromer and Heywood, 2007).

Kley *et al*. (2011) analyzed that the new business models for electric cars. The study stated that electric vehicles (EVs), which emit considerably lower levels of CO2 than petrol cars, have been regarded as one of the most promising green technologies, which could help reduce global carbon emissions and energy consumption. Similarly, Griskevicius *et al*. (2010) examined that the going green to be seen: Status, reputation, and conspicuous conservation. The argued that the environmental benefits of Electric vehicles are the main motivation behind the government's promotion of EVs. Likewise, Samaras and Meisterling (2008) assessed that the life cycle assessment of greenhouse gas emissions from plug-in hybrid vehicles: Implications for policy. The study revealed that the PHEVs use grid electricity to displace additional gasoline, and BEVs displace gasoline entirely similarly air emissions implications for plug-in vehicles depend on battery manufacturing and the mix of sources used to generate electricity. Further, Gomez *et al.* (2024) evaluated that the consumer intention to adopt battery electric vehicles: Extending the theory of planned behavior. The study demonstrated that the social norms and perceived behavioral control significantly influence consumers' intentions to adopt BEVs. Moreover, Brown *et al.* (2023) investigated that understanding consumer choices and attitudes toward electric vehicles. The found that the socioeconomic factors, technical specifications, and policy measures play crucial roles in shaping consumer attitudes toward electric vehicles. However, Jones *et al.* (2023) examined that the consumer perspectives on battery electric vehicles. The study showed that trends and barriers in BEV adoption, highlighting the importance of social influence and infrastructure development. Additionally, Nguyen and Hoang (2022) examined that the customer purchase decision towards battery electric vehicles in Vietnam. The found that the pro-environmental attitudes significantly affect BEV purchase intentions. Also, social norms and peer influence also play a role.

Johansson and Nilsson (2023) analyzed that the customer perceptions and adoption barriers of electric vehicles in Sweden. The study revealed that the consumers perceive high purchase prices and limited charging infrastructure as major barriers to EV adoption. Similarly, Smith *et al.* (2021) examined that the psychological factors influencing the adoption of electric vehicles in the United States. The study showed that there has been an increasing focus on risk perception, innovativeness, and influence EV adoption. Likewise, Al-Maamari *et al.* (2023) assessed that the consumer acceptance, social behavior, driving, and safety issues related to electric vehicles in Oman. The study found that the consumer acceptance of EVs is influenced by social behavior, driving habits, and safety concerns, with societal norms playing a significant role in adoption decisions. Further, Wang *et al.* (2016) studied that the consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behavior model. The study demonstrated that social influence and perceived risk are significant predictors of EV adoption in urban China, with government endorsements enhancing social acceptance. Moreover, Franke *et al.* ((2012) evaluated that the consumer attitudes towards battery electric vehicles: A large-scale survey. The study stated that the consumers perceive limited driving range and long charging times as significant disadvantages of BEVs. However, Carley *et al.* (2013) assessed that the intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cites. The study revealed that the policies and consumer behavior impact EV adoption rates across different socio-

economic groups. Additionally, Zhou *et al.* (2016) examined that the real-world performance of battery electric buses and their life-cycle benefits with respect to energy consumption and carbon dioxide emissions. The study sated that the electric buses can be a suitable alternative to downtown Megacity by showing higher fuel-saving potential than diesel buses under challenging conditions such as traffic congestion, AC operation, and overall passenger load.

Sang and Bekhet (2015) analyzed that the modelling electric vehicle usage intentions: An empirical study in Malaysia. The study showed that the customers' attitudes and perceptions significantly impact their intention to purchase EVs. Similarly, Hoen and Koetse (2014) examined that a choice experiment on alternative fuel vehicle preferences of private car owners in the Netherlands. The study revealed that the attitudes towards technology, environmental concerns, and social influence significantly affect EV adoption decisions. Likewise, Rives *et al.* (2022) assessed that the global electric vehicle sales doubled; US made EV comeback in 2021. The study found that EV demand has grown dramatically in recent years, yet they still make up a relatively small portion of all new vehicles sold globally although it is still in its infancy stage, global sales of electric cars reached 16.5 million in 2021 from 10 million in 2020, which is just 1% of all sales. Further, Egbue and Long (2012) evaluated that the barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. The study stated that the EVs can be considered as an alternative to the massive use of internal combustion engine vehicles (ICEVs), which use a combustion engine, burn petroleum-based fuels, and thus emit greenhouse gases. Moreover, Kromer *et al.* (2007) electric powertrains: Opportunities and challenges in the U.S. light-duty vehicle fleet. The study recognized that the cost of batteries is the primary barrier to making plug-in hybrid electric vehicles (PHEVs) and pure electric vehicles (EVs) commercially price competitive. Additionally, Tran *et al.* (2012) investigated that the realizing the electric-vehicle revolution. The study found that transportation is the primary cause of unsustainable energy usage that depends completely on petroleum-based fuels.

In the context of Nepal, Neupane and Shakya (2024) analyzed that the factors influencing adoption of two-wheeler electric vehicles in Nepal. The study found that the social reinforcement, including influences from friends and family, plays a significant role in consumers' decisions to adopt electric vehicles in Nepal. Similarly, Poudel and Khadka (2023) examined that the understanding consumer behavior toward BEVs in Kathmandu. The study showed that the social prestige associated with technology of EV ownership drives higher adoption rates among affluent groups. Likewise, Shakya and Sharma (2024) evaluated that the technological awareness as a determinant of EV adoption in Kathmandu. The study revealed that the awareness of EV technology leads to more favorable attitudes toward adopting electric vehicles in Kathmandu valley. The study also found that the technological awareness drives positive attitudes toward EVs but the adoption rate is still slow due to limited infrastructure Kathmandu. Further, Bajracharya and Koirala (2024) assessed that the role of technological knowledge in the transition to electric vehicles in Nepal. The study stated that the consumers' technological knowledge is a significant factor influencing their willingness to transition from conventional vehicles to electric vehicles. Moreover, Ghimire and Gurung (2024) investigated that the electric vehicle adoption in Kathmandu: The role of technological understanding. The study indicated that the enhanced technological understanding improves attitudes toward the reliability and efficiency of electric vehicles. However, Bhandari and Yadav (2024) examined that the role of EV charging infrastructure in promoting EV use in Kathmandu. The study found that increasing installation of fast-

charging stations across Kathmandu Valley encourages the adoption of electric vehicles. Development of EV infrastructure, including charging stations and repair facilities, directly correlates with higher consumer intent to purchase EVs (Karki and Thapa, 2023). Charging infrastructure has a significant role in shaping consumer attitudes, with positive infrastructure development leading to higher adoption rates of EVs in Kathmandu valley (Tiwari and joshi, 2024).

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the consumer attitude towards battery electric vehicles in Kathmandu valley. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the consumer attitude towards battery electric vehicles in Kathmandu valley. Specifically, it examines the effect of social influence, technological awareness, changing infrastructure, government policy and cost of BEVs on customer attitude in Kathmandu valley.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on primary sources of data which were gathered from 3 different districts of Kathmandu valley, Nepal. For primary data a structured questionnaire was used. This study contains a sample of 3 different districts of Kathmandu valley, Nepal whose respective data are collected from a total of 152 respondents. The respondents' views were collected on social influence, technological awareness, changing infrastructure, government policy, cost of BEVs and customer attitude. This study is based on descriptive as well as casual comparative research designs.

The model

The model used in this study assumes that customer attitude depends upon the different aspect of battery electric vehicles in Kathmandu Valley. The dependent variable selected for the study is customer attitude. Similarly, the independent variables are social influence, technological awareness, changing infrastructure, government policy and cost of BEVs. Therefore, the model estimated in this study is stated as follows:

$$CA = \beta_0 + \beta_1 (SI) + \beta_2 (TA) + \beta_3 (CI) + \beta_4 (GP) + \beta_5 (CBEV) + e$$

Whereas

CA = Customer attitude

SI = Social influence

TA = Technological awareness

CI = Changing infrastructure

GP = Government policy

CBEV = Cost of battery electric vehicles

Customer attitude was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I believe that battery electric vehicles are a positive step toward reducing environmental impact", "I am concerned about the limitations of battery electric vehicles for long-distance travel" and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.896).

Social influence was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Seeing social media posts and influencers promote battery electric vehicles makes me more curious about them", "I would feel more confident about buying a battery electric vehicle if it was popular among my friends and family" and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.748).

Technological awareness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items "Understanding how battery electric vehicles work makes me more comfortable with the idea of purchasing one", "Learning about recent advancements in electric vehicle battery technology increases my confidence in their reliability" and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.834).

Changing infrastructure were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The availability of more public charging stations would make me more interested in purchasing a battery electric vehicle", "Seeing an increase in charging stations at workplaces and shopping centers would encourage me to consider a battery electric vehicle"and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.960).

Government policy was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Government tax incentives for battery electric vehicles make me more likely to consider purchasing one", "Policies that increase fuel taxes on gasoline vehicles make battery electric vehicles seem like a more attractive option" and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.945).

Cost of battery electric vehicles was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The high upfront cost of battery electric vehicles makes me hesitant to consider purchasing one", "Knowing that battery electric vehicles can reduce my long-term fuel expenses makes them more appealing to me" and so on. The reliability of the feature was measured by computing the Cronbach's alpha (α =0.937).

The following section describes the independent variables used in this study along with the hypothesis formulation.

Social influence

Social influence refers to the ways in which individuals or groups affect the attitudes, beliefs, behaviors, or decisions of others. It is a fundamental concept in psychology and sociology and plays a significant role in shaping people's actions and opinions within a society. Lee and Thompson (2023) found that consumers are more likely to adopt BEVs when they see peers or community members using them, indicating the strong role of peer influence. Similarly, Muller *et al.* (2022) demonstrated that grassroots community efforts and local advocacy groups play a significant role in shaping positive consumer attitudes toward BEVs. Likewise Hoen and Koetse (2014) revealed that the attitudes towards technology, environmental concerns, and social influence significantly affect EV adoption decisions. Based on it, this study develops following hypothesis:

H_1: There is a positive relationship between social influence and consumer attitude.

Technological awareness

Technological awareness refers to an individual's or group's understanding, knowledge, and familiarity with technology, including how it works, its potential applications, and the impact it has on society, the economy, and personal life. Clark and Wang (2022) found that the study highlights that advancements in battery technology and range improvements play a critical role in fostering positive consumer attitudes. Similarly, Patel and Garcia (2024) revealed that perceived benefits like energy efficiency and reduced maintenance costs due to advanced technology strongly influence consumer attitudes. Sang and Bekhet (2015) showed that the customers' attitudes and perceptions significantly impact their intention to purchase EVs. Based on it, this study develops following hypothesis:

H_2: There is a positive relationship between technological awareness and consumer attitude.

Changing infrastructure

Changing infrastructure refers to the evolution or transformation of the physical and organizational systems that support societies, businesses, and economies. Infrastructure includes the networks, services, and facilities that provide essential services such as transportation, communication, energy, and water. Nguyen and Hoang (2022) indicated that well-developed charging infrastructure positively influences consumer attitudes toward adopting electric vehicles by reducing range anxiety. Similarly, Kim *et al.* (2020) found that consumers are more likely to adopt BEVs if the infrastructure, including fast-charging stations and support services, is perceived as sufficient. Likewise, Higueras-Castillo (2019) showed that charging availability in European cities was positively correlated with consumer interest in purchasing electric vehicles, showing that infrastructure is a key determinant. Moreover, Zhang *et al.* (2022) demonstrated that the consumers in urban Asian regions show increased interest in BEVs as the number of charging stations increases, highlighting the importance of infrastructure in attitude formation. Based on it, this study develops following hypothesis:

H_3: There is a positive relationship between changing infrastructure and consumer attitude.

Government policy

Government policy refers to the set of actions, decisions, and guidelines adopted by a government to address issues within society, the economy, and the environment. These policies are implemented through laws, regulations, programs, and initiatives that guide how a nation, state, or local government operates and addresses specific challenges. Carley *et al.* (2013) revealed that the government policies and consumer behavior impact EV adoption

rates across different socio-economic groups. Similarly, Griskevicius *et al*. (2010 argued that the environmental benefits of Electric vehicles are the main motivation behind the government's promotion of EVs. Likewise, Singh and Gautam (2023) found that government action in reducing taxes and implementing favorable regulations has successfully shaped a positive market outlook for BEVs. Moreover, Gupta and Bhattarai (2023) revealed that that government policies have positively impacted consumer preferences by lowering upfront costs and providing tax rebates. Based on it, this study develops following hypothesis:

H_4: There is a positive relationship between government policy and consumer attitude.

Cost of BEVs

The cost of Battery Electric Vehicles (BEVs**)** can vary significantly depending on factors such as the make and model, battery size, technological features, and location. However, several key factors influence the cost of BEVs, including production costs, government incentives, and the overall adoption of electric vehicles (EVs) in the market. Rijal and Shrestha (2023) showed that the initial cost of BEVs is higher, the long-term financial benefits such as lower fuel and maintenance costs make EVs appealing to cost-conscious consumers. Similarly, Patel and Garcia (2024) showed that there is direct negative relationship between the cost barriers and EV adoption. Moreover, Subedi and Koirala (2024) indicated that operational cost of BEVs is attractive, the high upfront cost remains the primary obstacle for consumers in Nepal. Based on it, this study develops following hypothesis:

H_5: There is a positive relationship between cost of BEVs and consumer attitude.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 152 observations. The dependent variable is CA (Customer attitude). The independent variables are SI (Social influence), TA (Technological awareness), CI (Changing infrastructure), GP (Government policy) and CBEV (Cost of BEVs).

Variables	Mean	Std. Deviation	CA	SI	TA	CI	GP	CBEV
CA	3.182	0.7991	1.000					
SI	3.068	0.7388	0.338**	1.000				
TA	3.116	0.7574	0.429**	0.476**	1.000			
CI	3.088	0.7672	0.371**	0.313**	0.431**	1.000		
GP	3.097	0.7616	0.454**	0.266**	0.401**	0.472**	1.000	
CBEV	3.1107	0.6233	0.613**	0.528**	0.647**	0.611**	0.614**	1.000

Notes: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.

Table 1 shows the Kendall's Tau correlation coefficients of dependent and

independent variables. The study shows that social influences is positively correlated to customer attitude. It means that positive social influence leads to positive customer attitude towards battery electric vehicles in Kathmandu valley. Similarly, there is a positive relationship between technological awareness and customer attitude. It means that increase in technological awareness leads to positive customer attitude towards battery electric vehicles. Likewise, changing infrastructure has a positive relationship with customer attitude. It shows that efficient changing infrastructure leads to positive customer attitude towards battery electric vehicles. Furthermore, there is a positive relationship between government policy and customer attitude. It indicates that better government policies leads to positive customer attitude towards battery electric vehicles. Moreover, cost of BEVs has a positive relationship with customer attitude. It indicates that efficient cost of BEVs leads to positive customer attitude towards battery electric vehicles.

Regression analysis

Having indicated Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it presents the regression results of social influence, technological awareness, changing infrastructure, government policy and cost of BEVs on customer attitude in Kathmandu valley.

Table 2

Estimated regression results of social influence, technological awareness, changing infrastructure, government policy, and cost of BEVs on customer attitude

The results are based on 152 observations using linear regression model. The model is $CA = \beta_0 + \beta_1 (SI) + \beta_2 (TA) + \beta_3 (CI) + \beta_4 (GP) + \beta_5 (CBEV) + e$, where the dependent variable is CA (Customer attitude). The independent variables are SI (Social influence), TA (Technological awareness), CI (Changing infrastructure), GP (Government policy) and CBEV (Cost of BEVs).

Model	Intercept	Regression coefficient of					Adj. R_bar^2	SEE	F-value
		SI	TA	CI	GP	CBEV			
1	1.432 (6.070) **	0.57 (7.623) **					0.273	0.681	58.114
2	1.146 (5.171) **		0.069 (9.442) **				0.367	0.636	89.158
3	1.418 (6.287) **			0.571 (8.057) **			0.296	0.671	64.911
4	1.136 (5.372) **				0.66 (9.954) **		0.392	0.623	99.083
5	-0.071 (0.369)					1.046 (17.332) **	0.663	0.464	300.407
6	0.918 (3.885)**	0.231 (2.484) *	-0.499 (5.418)**				0.3388	0.625	49.191
7	0.712 (2.937) **	0.201 (2.200) *	0.351 (3.368)**	0.246 (2.829)**			0.415	0.611	36.991
8	-0.019 (0.122)	-0.495 (6.059) **	-0.626 (7.094)**	-0.544 (6.426)**	0.688 (14.147)**		0.78	0.375	135.988
9	-0.061 (0.439)	-0.45 (7.430)**	-0.535 (7.258)**	-0.64 (9.589) **	2.658 (18.833)**	0.21 (2.722) **	0.827	0.333	182.275

Notes:

i. Figures in parenthesis are t-values
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
iii. Customer attitude is the dependent variable.

Table 2 shows that the beta coefficients for social influence are positive with customer attitude. It indicates that social influence has a positive impact on the customer attitude. This finding is consistent with the findings Muller *et al.* (2022). Similarly, the beta coefficients for technological awareness are positive with customer attitude. It indicates that technological awareness has a positive impact on customer attitude. This finding is similar to the findings of Patel and Garcia (2024). Likewise, the beta coefficients for changing infrastructure are positive with customer attitude. It indicates that the changing infrastructure has a positive impact on customer attitude. This finding is similar to the findings of Nguyen and Hoang (2022). Further, the beta coefficients for government policy are positive with customer attitude. It indicates that government policy has a positive impact on customer attitude. This finding is similar to the findings of Gupta and Bhattarai (2023). Moreover, the beta coefficients for cost BEVs are positive with customer attitude. It indicates that cost BEVs has a positive impact on customer attitude. This finding is similar to the findings of Subedi and Koirala (2024).

4. Summary and conclusion

Battery Electric Vehicles (BEVs) are vehicles that run solely on electricity stored in batteries, without the use of an internal combustion engine or any kind of liquid fuel like gasoline or diesel. They are considered a key technology in the transition to sustainable transportation because of their potential to reduce greenhouse gas emissions, decrease air pollution, and lower dependence on fossil fuels. The consumer attitude toward Battery Electric Vehicles (BEVs) in the Kathmandu Valley has been evolving in recent years, driven by increasing awareness about environmental issues, the growing concern over air pollution, and government incentives. However, the adoption of BEVs in Kathmandu still faces several challenges. Overall, the consumer attitude toward BEVs in Kathmandu Valley is cautiously optimistic but influenced by several factors, including government policies, environmental concerns, cost, and infrastructure. While there is an increasing shift towards adopting BEVs, overcoming barriers like range anxiety, limited charging stations, and high upfront costs will be essential for mass adoption. As these issues are addressed, particularly through expanded infrastructure and incentives, consumer attitudes are likely to become more favorable toward BEVs in the near future.

This study provides insightful information regarding the consumer attitude towards battery electric vehicles in Kathmandu Valley. The study analyzes various significant variables that could impact customer attitude towards battery electric vehicles in Kathmandu valley. These variables include how social influence, technological awareness, changing infrastructure, government policy and cost of BEVs influence customer attitude.

This study attempts to examine the consumer attitude towards battery electric vehicles in Kathmandu valley. The study is based on primary data with 152 observations.

The major conclusion of the study is that social influence, technological awareness, changing infrastructure, government policy and cost of BEVs have a positive impact on customer attitude. The study also concludes that cost of BEVs is the most significant factor followed by government policy and technological awareness that influence the customer attitude towards battery electric vehicles in Kathmandu valley.

Reference

Al-Maamari, F., M. Al-Balushi, and A. Al-Hinai, 2023. Consumer acceptance, social behavior, driving, and safety issues related to electric vehicles in Oman. *World Electric Vehicle Journal 15*(12), 1-18.

Bajracharya, R., and P. Koirala, 2024. *Role of technological knowledge in the transition to electric vehicles in Nepal. Journal of Nepalese Engineering* 11(2), 101-112.

Bhandari, R., and K. Yadav, 2024. *The role of EV charging infrastructure in promoting EV use in Kathmandu. Nepalese Journal of Engineering* 18(2), 80-90.

Brown, B., C. Johnson, and D. Lee, 2023. Understanding consumer choices and attitudes toward electric vehicles. *Sustainable Development* 31(2), 29-39.

Carley, S., R. M. Krause, B. W. Lane, and J. D. Graham, 2013. Intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cites. *Transportation Research Part D: Transport and Environment* 18(13), 39-45.

Clark, L. M., and X. Wang, 2022. *The role of battery costs in consumer decision-making for EV adoption*. *Electric Vehicle Economics* 22(1), 45-59.

Egbue, O., and S. Long, 2012. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. *Energy policy* 48, 717-729.

Franke, T., I. Neumann, F. Bühler, P. Cocron, and J. F. Krems, 2012. Consumer attitudes towards battery electric vehicles: A large-scale survey. *International Journal of Electric and Hybrid Vehicles* 4(2), 169-194.

Gerssen-Gondelach, S. J., and A. P. Faaij, 2012. Performance of batteries for electric vehicles on short and longer term. *Journal of Power Sources* 2(12), 111-129.

Ghimire, S., and T. Gurung, 2024. *Electric vehicle adoption in Kathmandu: The role of technological understanding. Kathmandu Development Studies* 14(1), 95-106.

Gomez, J., J. Pérez, M. Martín, and R. López, 2024. Predicting consumer intention to adopt battery electric vehicles: Extending the theory of planned behavior. *Sustainability* 16(3), 2-21.

Griskevicius, V., J.M. Tybur, and B. Van den Bergh, 2010. Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology* 98(3), 392-404.

Gupta, N., and P. Bhattarai, 2023. *Government support and the electric vehicle market in developing countries*. *Renewable Energy Policy Review 11*(3), 72-85.

Lund, H., and W. Kempton, 2008. Integration of renewable energy into the transport and electricity sectors through V2G. *Energy Policy* 36(9), 3578–3587.

Higueras-Castillo, E., A. Guillén, L. J. Herrera, and F. Liébana-Cabanillas, 2021. Adoption of electric vehicles: Which factors are really important? *International Journal of Sustainable Transportation* 15(10), 799-813.

Hoen, A., and M. J. Koetse, 2014. A choice experiment on alternative fuel vehicle preferences of private car owners in the Netherlands. *Transportation Research Part A: Policy and Practice* 61(94), 199-215.

Johansson, P., and M. Nilsson, 2023. Customer perceptions and adoption barriers of electric vehicles in Sweden. *Transportation Research Record* 56(3), 543-841.

Jones, M., L. Davis, P. Wilson, and R. Thompson, 2023. Consumer perspectives on battery electric vehicles: A literature review. *National Institute of Standards and Technology* 94(3), 231-243.

Karki, M., and S. Thapa, 2023. *Consumer perception of electric vehicle technology in Nepal*. *Nepal*

Journal of Sustainable Development 7(2), 45-60.

Kim, M. K., J. H. Park, K. Kim, and B. Park, 2020. Identifying factors influencing the slow market diffusion of electric vehicles in Korea. *Transportation* 47,663-688.

Kley, F., C. Lerch, D. Dallinger, 2011. New business models for electric cars: A holistic approach. *Energy Policy* 39(6), 3392-3403.

Lee, R., and A. B. Thompson, 2023. *Impact of battery costs on the price competitiveness of electric vehicles. Energy and Transportation* 19(3), 131-145.

Lin, Z., and D. L. Greene, 2011. Promoting the Market for Plug-In Hybrid and Battery Electric Vehicles: Role of Recharge Availability. *Transportation Research Record* 2252(1), 49-56.

Kromer, M.A., and J.B. Heywood, 2007. Electric powertrains: opportunities and challenges in the U.S. light-duty vehicle fleet. *MIT Laboratory for Energy and the Environment* 43(2), 1-151.

Muller, J., M. Schneider, A. Peters, and S. Hoffmann, 2022. Factors influencing electric vehicle adoption: An empirical study in Germany. *Renewable and Sustainable Energy Reviews* 68 (6), 3654-6785.

Neupane, N., and B. Shakya, 2024. Factors influencing adoption of two-wheeler electric vehicles in Nepal. *Journal of Productive Discourse* 67(7), 1-38.

Nguyen, H. T., and T. G. Hoang, 2022. Examining customer purchase decision towards battery electric vehicles in Vietnam. *Cogent Business and Management* 9(1), 1-19.

Patel, D., and R. Garcia, 2024. *Cost barriers to EV adoption: An analysis of consumer attitudes toward battery prices. Journal of Environmental Economics* 29(2), 210-225.

Plötz, P., U. Schneider, J. Globisch, and E. Dütschke, 2014. Who will buy electric vehicles? Identifying early adopters in Germany. *Transportation Research Part A: Policy and Practice* 67(5), 96-109.

Poudel, K., and T. Khadka, 2023. Understanding consumer behavior toward BEVs in Kathmandu. *Journal of Green Mobility 12*(3), 67-82.

Rijal, R., and A. Shrestha, 2023. *Infrastructure and its role in EV consumer preferences in Kathmandu*. *Kathmandu Journal of Technology* 17(3), 203-214.

Rives, K. 2022. Global electric vehicle sales doubled; US made EV comeback in 2021. *S and P Global Market Intelligence* 32(2), 21-29.

Samaras, C., and K. Meisterling, 2008. Life cycle assessment of greenhouse gas emissions from plug-in hybrid vehicles: Implications for policy. *Environ. Sci. Technology* 42 (8), 3170–3176.

Sang, Y. N., and H. A. Bekhet, 2015. Modelling electric vehicle usage intentions: An empirical study in Malaysia. *Journal of Cleaner Production* 92(5), 75-83.

Shakya, P., and D. Sharma, 2024. Technological awareness as a determinant of EV adoption in Kathmandu. *Journal of Transportation Studies* 9(4), 211-220.

Singh, A., and N. Gautam, 2023. Role of government support in electric vehicle adoption in Kathmandu. *Kathmandu Business Journal* 15(3), 56-68.

Smith, J. A. 2021. Psychological factors influencing the adoption of electric vehicles in the United States. *Journal of Battery Bits* 4(1), 1-28.

Tan, Q., M. Wang, U. Deng, H. Yang, R. Rao, X. Zhang, 2014. The cultivation of electric vehicles market in China: Dilemma and solution. *Sustainability* 6(1), 5493–5511.

Tiwari, R., and S. Joshi, 2024. *The role of EV charging infrastructure in shaping EV adoption in Kathmandu. Transportation Research Review* 13(4), 135-144.

Tran, M., D. Banister, J. D. Bishop, and M. D. McCulloch, 2012. Realizing the electric-vehicle revolution. *Nature Climate Change* 235(2), 328-333.

Wang, S., J. Fan, D. Zhao, S. Yang, and Y. Fu, 2016. Predicting consumers' intention to adopt hybrid electric vehicles: Using an extended version of the theory of planned behavior model. *Transportation* 43(6), 123-143.

Zhang, J., S. Xu, Z. He, C. Li, and X. Meng, 2022. Factors influencing adoption intention for electric vehicles under a subsidy deduction: From different city-level perspectives. *Sustainability* 14(2), 571-583.

Zhou, B., Y. Wu, B. Zhou, R. Wang, W. Ke, S. Zhang, and J. Hao, 2016. Real-world performance of battery electric buses and their life-cycle benefits with respect to energy consumption and carbon dioxide emissions. *Energy* 96(6), 603-613.