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Driving Factors for Women's Switch to Electric Vehicles in Conservative Kuwait

Andri Ottesen[1]
Australian University (AU), Misref Kuwait
Center for Sustainability Research and Consultancy (CSRC)
London School of Economics - Middle East Center (MEC), London UK
Sumayya Banna[2]
Arab Open University (AOU), Ardiya, Kuwait
London School of Economics - Middle East Center (MEC), London UK
Basil Alzougool[3]
Arab Open University (AOU), Ardiya, Kuwait
London School of Economics - Middle East Center (MEC), London UK
Vladimir Simović[4]
Australian University, Misref Kuwait
Institute of Economic Sciences, Belgrade, Serbia

A B S T R A C T

Electric vehicles (EVs) may constitute the most disruptive and innovative product since the smartphone. Further, there seems to be a relationship between the percentage of women in congress and plug-in vehicles sold in 2021. This study considers the relation between the country with the least number of women in congress and the least EVs sold—the State of Kuwait. This study asks 234 women

[1] Corresponding author, e-mail: a.ottesen@ack.edu.kw
[2] Email: sumayya@aou.edu.kw
[3] Email: balzougool@aou.edu.kw
[4] Email: v.simovic@ack.edu.kw, vladimir.simovic@ien.bg.ac.rs

drivers in Kuwait what policy-level changes would make them switch from conventional Internal Combustion Engine cars (ICE) to EVs. The results showed the following: More than 50% of participants would buy EVs within the next three years if several conditions were met: lower purchase price with government assistance and availability of suitable infrastructure for EVs such as wide availability of fast charging stations, fast lanes, and free parking spaces. More than 40% of participants would start thinking seriously about buying EVs if gas/fuel prices increased by 50–199%; they also thought EVs were safer regarding fire and car crashes. They would pay 6–20% more for EVs that are environmentally friendly and faster than gasoline cars. About 40% of women drivers would be able to charge EVs in their residential areas in Kuwait, but the lack of charging stations remains the biggest obstacle to the mass adoption of EVs. This study also made various suggestions to overcome barriers to EV introduction in Kuwait, such as the increase of fast charging stations, as well as marketing strategies and government initiatives and policies. One key implication is that focused educational efforts are needed to help women owners in Kuwait better understand the benefits and overall potential of EVs.

KEYWORDS: *electric vehicles, sustainable mobility, women drivers, attitudes, barriers, Kuwait*

Introduction

Although women constitute half of society, they tend to have lower socioeconomic positions compared to men (Barjesteh, 2016). Moreover, while women's competence levels have received much attention (Ivanovic et al., 2021), existing studies often fail to investigate women's attitudes and concerns about their preferences as consumers of any market or sector. The existing gender-based cultural values distrust women's judgment and, thus, prevent them from taking an active role in decision-making processes (Şeşen & Pruett, 2017. The problem of gender-based inequality related to product preferences must be understood and resolved to improve the country's overall economic growth. Nowadays, women are increasingly becoming a strong force in the car buyer market (Moutinho, Davies, & Curry, 1996). Thus, it becomes important to investigate the attitudes of women (particularly in Kuwait) because they have become key drivers of the market and economy, especially in a gender-based culture such as Kuwait.

Another issue that is more visible and escalating at a faster pace than ever before is the high price of fossil fuels and their significant contribution

to global warming-related issues. This has led to the need for alternative, sustainable sources of energy to replace fossil fuels in the long term and conserve the environment (Banister, 2008; Goodland, 1995; Leung et al., 2018, Mattioli, Wadud, & Lucas 2018; Qian & Yin, 2017; Wang et al., 2017). The number of new electric vehicles (EVs), either fully electric or hybrids, appearing on roads has grown rapidly worldwide. The transportation sector is mainly driven by the attitudes of consumers in the transport market who decide whether to buy newly introduced sustainable products—that is, EVs.

Therefore, based on the above, it is worth studying if women's concern for EVs' features differs from that of men, and if manufacturers would design EVs differently if they considered women's perspective, especially for niche markets or applications.

This study focused on Kuwait, a small Arab country (area: 17,818 km^2; one-third size of Scotland) in the Middle East north of the Arabian Gulf between Iraq and Saudi Arabia (CIA World Factbook, 2022). Kuwait has a relatively open economy with about 6% of the global crude oil reserves. Petroleum accounts for over 50% of its GDP, 92% of export revenue, and 90% of governmental revenue (Giris & Ramadan, 2018). Kuwait is a very lucrative market for large automobiles in the Middle East and North Africa (MENA) region. The reason is the low-cost fuel, tax-free customs on imported automobiles, improved economic situation, and increased per capita income environment in Kuwait over the past 50 years. Further, Kuwait has the highest vehicle ownership rate in the MENA. This proves that Kuwait's automobile market is rapidly growing and should strive to provide cars that suit its consumers.

Norway has a population similar to Kuwait's and also relies heavily on oil sales. Here, 86% of new cars sold in 2021 were plug-in vehicles—EVs or plug-in hybrid electric vehicles (PHEV)—compared with less than 1% in Kuwait (Ottesen et al., 2022). C. are both major oil producers. Then, what factors would create an environment where EVs—an acclaimed, innovative, and disruptive product—could thrive? When considering women's representation in the national congress and sales of EV/PHEV in 2021, a moderate to strong relationship appears. Regression between 22 countries' 2021 plug-in vehicle sales figures as a percentage of new cars sold and the percentage of women's representation in congress revealed a 52% correlation (Table 1).

Table 1. Proportional seats held by women in national congress in 2021 (%) and EVs and PHEVs sold in 2021 as percentage of new cars

Countries	Women in congress in 2021	New plug-in vehicles sold in 2021
Norway	45%	86.20%
Iceland	48%	71.70%
Sweden	47%	43.30%
Denmark	40%	35.20%
Finland	46%	30.80%
Netherlands	39%	29.80%
Germany	35%	26.00%
Switzerland	43%	22.50%
Portugal	40%	20.00%
United Kingdom	34%	18.60%
Belgium	42%	18.40%
France	40%	18.30%
Ireland	23%	15.70%
Romania	19%	15.53%
China	25%	15.00%
Italy	36%	9.30%
Spain	43%	7.80%
Canada	30%	6.60%
New Zealand	49%	5.49%
United States	28%	4.00%
Australia	31%	2.40%
Japan	10%	1.00%

Source: World Bank (2022) and International Energy Agency (2022). EV: electric vehicles; PHEV: plug-in hybrid electric vehicles. Countries selected on bases on availability of sales data for 2021.

However, a strong regression relationship does not indicate causality. We cannot claim that more women in national congress will increase sales of EV/PHEV or other zero-emission vehicles. Yet, previous studies revealed that women preferred EVs, being more environmentally conscious than men. In Iceland, which is a leader in EV adoption, environmental concerns influenced women's buying decisions, while fast acceleration motivated men to buy EVs/PHEVs (Ottesen & Banna, 2021; Ottesen & Kjartansdottir, 2015). The same result was noted for the world laggard Kuwait, which sold 88 EV/PHEV in 2021 (Ottesen & Banna 2021; Ottesen et al., 2022, Ottesen, Banna & Alzougoul 2022). Maybe, if Kuwaiti women held more than 2% of

seats in the national congress, the environment for EV sales would be more favorable, leading to more sales (World Bank 2022). The International Transport Forum and FIA Foundation (2022) indicate that women leaders—at public, private, and policy levels—generally consider the social and environmental impacts of their decision-making compared with men leaders. This raises two questions: What would it take for Kuwaiti women to switch to EVs from their conventional gasoline cars? How would they change the transportation setting in Kuwait if they had more influence regarding zero-emission vehicles such as EVs? This study attempts to answer these questions.

Literature Review

Most of the existing literature agrees that the only simplistic solution to existing environmental problems is implementing sustainable mobility and cleaner technologies such as EVs with limited or zero greenhouse-gas emissions (Adnan et al., 2017; Goodland, 1995; Montalvo, 2008; Milev, Hastings, & Al-Habaibeh, 2021). Further, previous studies reveal the importance of a market shift toward the adoption of cleaner models and greener products by promoting sound environmental behavior. The promotion of sustainable mobility must begin with public pressure and demands from consumer interest groups and NGOs to influence attitudes toward buying eco-friendly products such as EVs (Goodland, 1995; Montalvo, 2008; Milev et al., 2021).

Consumers' attitudes are their predisposition (readiness) to act based on the assessment of possible outcomes (Goodland, 1995). Consumer attitude involves positive or negative vibes toward new products (Chu et al., 2019; Khurana, Kumar, & Sidhpuria, 2020). Positive attitudes arise from the perceived and expected good environmental and social outcomes from adopting sustainable mobility and cleaner technologies—EVs (Goodland, 1995; Montalvo, 2008).

The growing literature on consumers' attitudes toward EVs (e.g., Anagnostopoulou et al., 2018; Driscoll et al., 2013; Hoen & Koetse, 2014; Ishida, Magnusson, & Nagahira, 2017; Temple, 2021; Thiel et al., 2012; Gomez Vilchez et al., 2017) shows that the following factors influence most consumers' attitudes toward EVs in developed markets (e.g., US, Japan, and European countries): vehicle price, speed, purchase cost, driving range, battery replacement, recharging time, and maintenance cost. Ottesen and

Banna (2018) find that financial factors, battery-charging infrastructure, and battery-related concerns remain major obstacles to widespread EV penetration in Iceland. Mandys (2021) suggests that potential EV adopters in the UK constitute young people: students and married people with good incomes. The most important attributes for potential EV buyers are purchase costs, performance, maximum range, and environmental friendliness; high purchase cost and low maximum range are the two main barriers. Note that these studies on consumer attitudes do not discriminate between genders.

Moutinho et al.'s (1996) gender-based study analyzes consumer data from men and women; they find clear attitudinal differences between men and women buyers regarding expectations, determinants of satisfaction, car brand loyalty, and car-buying pattern. Hjorthol (2013) shows that early EV adopters are middle-aged men (30–50 years old) with high-level education and high-level income who live in cities in households with more than one car. However, Hjorthol does not consider women's perceptions and preferences about EVs. Mukhopadhyay (2020) identifies a positive relationship between women-led enterprises and renewable sources of energy.

Ziefle et al.'s (2014) gender-based study examines EV attitudes among customers; they find that low comfort and technological barriers, such as the availability of charging stations, are the main barriers to EV acceptance. Conventional cars' perception of comfort (design, feel, looks, and optics) is much higher compared to that of EVs, especially in older people. Gender and age are significant drivers of EV acceptance, especially among women who have higher environmental consciousness than men. User diversity does not significantly explain barriers to EV acceptance. Further, Erdem, Sentürk, and Simsek (2010) find that Turkish consumers with high-level income, education, and consciousness about global warming are more willing to pay for hybrids and EVs; their study does not consider gender preference. Febransyah (2021) finds that wealthy and highly educated Indonesian consumers have a moderate preference towards buying EVs. Their intention to purchase is influenced by emotion, functionality, car identity, and cost of ownership. Febransyah does not differentiate between men's and women's preferences. Broadbent, Metternicht and Wiedmann (2021) find that consumers are heterogeneous, with varying car-buying motivations, perceptions, attitudes to EVs, and policy awareness.

The next group most ready to buy EVs are early mainstream consumers—designated EV Positives. They are concerned about vehicle

range, perception of EV expense, charging-related inconvenience, and unknown value proposition of batteries. They are relatively unaware of incentives compared to more price-sensitive EV Owners. EV Positives favor incentives designed to affect purchase price reductions and increase nationwide fast-charger deployment. Cui et al. (2021) find that environmental concern is the most significant predictor of EV purchase motivation, followed by price consciousness, openness to experience, social influence, and self-esteem. Hardman and Tal (2016) identify environmental, performance, and technological motivations as the main reasons for the adoption of EVs, with new technology bringing in new segments of buyers. However, the financial purchase incentives are not important to high-end EV adopters. Lashari, Ko, and Jang (2021) find that environmental and economic perceptions of EV use are the strongest predictors of EV purchases. Further, technological concerns negatively impact EV purchase intentions. Kongklaew et al. (2021) find that, in Thailand, public infrastructure and car performance in terms of range and battery life are the main concerns among EV buyers. They indicate that consumers aged 26–35 years with more than five years of driving experience are key targets for early EV adoption.

In the MENA, Maliki and Khalifa (2014) find that new conventional car-buying decisions in Algeria are based on consumers' brand perceptions. Bahhouth, Ziemnowicz, and Zheib (2012) explore how culture and traditions shape the consumer habits of Kuwaiti consumers. They find that Kuwaiti families are still influenced by old traditions and male domination; thus, men take active roles in car purchasing decisions. Therefore, marketers must understand what drives gender preferences to favor one product and brand. The more marketers understand consumer behavior as regards gender attitudes, the better they can tailor the shopping experience and create a more loyal customer segment by meeting their needs, wants, and requirements. Only one study is conducted in UAE as part of the Gulf Cooperation Council (GCC): Kiani (2017) examines global EV market trends, complementary battery technologies, trends by manufacturers, emission standards across borders, and prioritized advancements, as these factors will dictate future conditions for the UAE's transport industry. Kiani finds that local government policies are essential to cover aspects of technology, infrastructure requirements, changes in power dynamics, consumer incentive programs, market regulator behavior, and communications among key stakeholders in the UAE.

Although the existing literature focuses on EV consumers in developed countries, far fewer studies consider developing countries, including Asian markets such as China, Malaysia, and India. Therefore, this review of literature emphasizes mainly the MENA reign. Further, to our knowledge, only one pilot study (Ottesen & Banna, 2021) provides an initial insight into new car purchasing behavior among Kuwaiti consumers. Ottesen and Banna (2021) identify three potential new car buyers' segments: (1) Value Seekers are unlikely to become early EV adopters in the GCC. (2) Performance Seekers mainly include younger men who prefer speedy EVs. (3) Safety Seekers are mainly younger women with environmental consciousness who prefer to drive EVs. Further, EVs' low maintenance is the predictive factor for EV adoption in the GCC in the future. This pilot study is based on only the authors' subjective interpretation of EVs and not solid factual data reflecting the perceptions of EV drivers in Kuwait.

Therefore, no study has explored the EV phenomenon in depth in Kuwait as an essential part of GCC. Thus, this study fills this literature gap by contributing significant knowledge on this sustainable mobility phenomenon, particularly from the perspective of female conventional car owners.

Method

This study employed a quantitative method (questionnaire with 234 women drivers) to achieve its objective. A large-scale questionnaire survey was conducted with sample respondents to provide a broad picture of the EV phenomenon in Kuwait. Qualitative data obtained through open-ended questions covered the same ground in greater depth to confirm the survey results. Part 1 of the questionnaire (11 items) focused on data on respondents' demographic characteristics: age, education, household income, employment, nationality, and the number of cars owned by the household. Part 2 includes in-depth questions—closed-ended (18 items) and open-ended (2 items) questions—to enrich our understanding of EV drivers' viewpoints in Kuwait.

Two web links with the questionnaire were formulated for the Arabic and English versions. The authors presented the questionnaire using Google Forms, a validated tool, for data collection. Data collection occurred from February to May 2022. The random sampling technique was used to collect data, with many questionnaires distributed to the targeted respondents. The

participation criteria were women entrepreneurs, aged at least 18 years, and car drivers. Participants were explained the study's purpose and asked to complete the questionnaire. The instructions for completing the questionnaire were given on the cover page to avoid any misunderstanding. The large sample size of about 300 women (234 responded) enabled the collection of meaningful demographic data to draw actionable conclusions about the population (Bell et al., 2018). The data were analyzed using various statistics in the SPSS program. Descriptive statistics (i.e., frequencies and percentages) were also computed.

Findings

In total, 234 women entrepreneurs aged 18-60 years, who were conventional car owners with driving licenses, and lived in Kuwait (a qualifying variable) participated in this study. Table 2 presents a summary of the respondents' demographic characteristics. Approximately half the participants (46.2%) were aged 26–39 years, while more than one-third (38.9%) were aged 18–25 years. Further, more than half were single (57.7%), while approximately one-fifth (17.9%) were married with three kids or more. Approximately two-thirds (62%) were Kuwaiti, and one-third of them were Arabs. More than half (58.5%) had a bachelor's degree. More than one-third owned two cars (35%), and 27.4% owned five cars or more. The monthly income of more than half the respondents (60.3%) was less than 1,000 KWD (3,300 USD).

Table 2. Demographic characteristics of the respondents: women entrepreneurs

Variable	Categories	N=234	%
Age Range	18–25 years	91	38.9%
	26–39 years	108	46.2%
	40–49 years	27	11.5%
	50–60 years	8	3.4%
Marital Status	Single	135	57.7%
	Married without kids	16	6.8%
	Married with one kid	18	7.7%
	Married with two kids	23	9.8%
	Married with three or more kids	42	17.9%
Ethnicity	Kuwaiti	145	62.0%
	Arab-Non-Kuwaiti	71	30.3%
	Asian-Non-Arab	17	7.3%

Variable	Categories	N=234	%
	American/European/Australian	1	0.4%
Educational Level	Less than high school	2	0.9%
	High school diploma	47	20.1%
	Trade/commerce degree	28	12.0%
	Bachelor's degree	137	58.5%
	Master's degree	16	6.8%
	Doctoral degree	4	1.7%
Number of Cars in	One car	19	8.1%
Household	Two cars	82	35.0%
	Three cars	34	14.5%
	Four cars	35	15.0%
	Five or more cars	64	27.4%
Monthly Income	Less than 500 KWD	86	36.8%
	500–999 KWD	55	23.5%
	1,000–1,499 KWD	55	23.5%
	1,500–1,999 KWD	22	9.4%
	2,000 KWD and above	16	6.8%

Source: Authors

Regarding attitudes relating to EVs (see Table 3), 44% of respondents would pay 6–20% more for an EV that is environmentally friendly than for gasoline cars, while about one-third (30.4%) would pay a maximum of 5% more for such a car. Further, 43.5% would pay 6–20% more for an EV that is much quicker than a normal gasoline car (0 to 100 km/h in 4 seconds), while about one-third (30.8%) would pay a maximum of 5% more for such a car. Of the respondents, 43.2% would seriously start thinking about buying an EV if the gas/fuel prices increased by 50–199%, while about a quarter (23.5%) did not care about EVs. Approximately half of the respondents (48.3%) would change their mind about buying EVs if the government regulated and controlled the cost of these cars so they are 10–30% cheaper than gasoline cars, whereas one-fifth (20.5%) would change their mind if the cost was like gasoline cars. Approximately one-third of respondents (29.1%) would change their mind about buying an EV if there were public and free fast charging stations every 10–25 km, while approximately a quarter of them (23.5%) would change their minds if there were charging stations every 26–50 km. More than half of the respondents would change their minds about buying EVs if there was a fast lane for only EVs on major highways (59.8%) or if there were public and accessible

parking spaces almost at the same capacity as handicap spaces (57.7%). More than half of the respondents (56.4%) would buy an EV within the next three years. Of them, 11.5% were certain, and 44.9% were very likely to buy. Moreover, 40.6% thought that EVs are safe in terms of fire and car crashes. Further, 39.7% of them would be able to charge EVs in their residential areas in Kuwait, while 29.4% of them would not.

Table 3. Attitudes of participants relating to electric vehicles

Question	**Categories**	**N=472**	**%**
How much more would you pay for an electric car that is more environmentally friendly than gasoline cars?	0%	32	13.7%
	1–5%	39	16.7%
	6–10%	52	22.2%
	11–20%	51	21.8%
	21–29%	29	12.4%
	30% or more	31	13.2%
How much more would you pay for an electric car that is much quicker than a normal gasoline car (about 0–100 km/h in 4 seconds)?	0%	32	13.7%
	1–5%	40	17.1%
	6–10%	53	22.6%
	11–20%	49	20.9%
	21–29%	32	13.7%
	30% or more	28	12.0%
How much would the gas/fuel price have to increase for you to start thinking seriously about buying an electric vehicle.	500% and above	5	2.1%
	400–499%	8	3.4%
	300 –399%	9	3.8%
	200–299%	24	10.3%
	100–199%	44	18.8%
	50–99%	57	24.4%
	Less than 50%	32	13.7%
	Indifferent/I do not care about electric vehicles	55	23.5%
I would change my mind toward buying an electric vehicle if the government regulated and controlled the costs of electric vehicles so they are _____.	30% cheaper than gasoline cars	57	24.4%
	10% cheaper than gasoline cars	56	23.9%
	Same cost as gasoline cars	48	20.5%
	10% higher cost than gasoline cars	29	12.4%
	Indifferent/I do not care about electric vehicles	44	18.8%

Question	Categories	N=472	%
I would change my mind toward buying an electric vehicle if there are public and free fast charging stations every _____.	Less than 10 km	39	16.7%
	10–25 km	68	29.1%
	26–50 km	55	23.5%
	51–75 km	20	8.5%
	76 km or more	12	5.1%
	Indifferent/I do not care about electric vehicles	40	17.1%
I would change my mind about buying an electric vehicle if there is a fast lane for only electric vehicles on major highways (e.g., on the 30 and 40 highways).	No	37	15.8%
	Yes	140	59.8%
	Indifferent/I do not care about electric vehicles	57	24.4%
I would change my mind about buying electric vehicles if there are public and free parking spaces almost at the same capacity as handicap spaces.	No	49	20.9%
	Yes	135	57.7%
	Indifferent/I do not care about electric vehicles	50	21.4%
Would you buy an electric vehicle in Kuwait within the next three years?	Of course not	28	12.0%
	Unlikely	74	31.6%
	Very likely	105	44.9%
	Certainly	27	11.5%
How safe do you think electric vehicles are in Kuwait in terms of fire and car crash?	Very dangerous	12	5.1%
	Dangerous	20	8.5%
	Neutral	107	45.7%
	Safe	51	21.8%
	Very safe	44	18.8%
If you have an electric vehicle, would you be able to charge it in your residential area in Kuwait?	Very impossible	38	16.2%
	Impossible	31	13.2%
	Neutral	72	30.8%
	Possible	38	16.2%
	Very possible	55	23.5%

Source: Authors

Additionally, the survey contained an open-ended question requiring respondents to express their thoughts, opinions, and ideas and provide information about how they feel and think about EVs. An open-ended question is usually exploratory and descriptive to obtain more details and insights about a phenomenon than closed-ended questions, which are

quantitative, short, and factual. This study collected opinions from respondents by asking them: "Your comments and feedback about electric vehicles in Kuwait."

Table 4 presents the most repeated themes generated by a text analyzer software. Respondents had concerns about the environment and shared phrases such as the following: green, preserving, eco-friendly, air pollution, carbon gas emission reduction, greenhouse gases, health improvement, and cancer free. Respondents also expressed interest in EVs' functionalities and features such as smooth driving, powerful engine, speed, comfort, safety, and rechargeable and recyclable batteries. Moreover, respondents identified obstacles and expressed worry about the EV phenomenon in Kuwait in terms of speed limits, less popularity, unsuitability due to hot summer, lack of government plans and policies, lack of EV dealerships, maintenance costs, lack of shaded areas designed for EVs, lack of good-quality roads, and no culture of environmental awareness among people of Kuwait.

Table 4. Generated themes about electric vehicles (EVs)

Environment concerns	**Limits**
Features of EVs	Less popular
Smooth driving	Not suitable for hot summer weather in Kuwait
Powerful cars with strong engines	No government plan
Speed	Dealerships more focused on fueled cars
Comfort	Maintenance costs
Safety	Lack of shaded parking for EVs
Recyclable batteries	Lack of drivable roads
Obstacles/worries	Lack of culture awareness for the environment

Source: Authors

Discussion

This study examined the attitudes toward EVs of women entrepreneurs who are conventional car owners in Kuwait. One reason to select women entrepreneurs was their attitude toward innovations (Omolekan & Alli, 2020). We also discussed how women's participation matters in terms of providing incentives for environmentally friendly vehicles as well as building up infrastructures and providing education. We provided a stark

comparison of two oil exporting states with a similar population, Norway, with 45% women in congress, and Kuwait, with 2% women in congress. The former prides itself on having managed to lower its GHG emission by about 3%, with cumulated EV and PHEV ownership of 20% and 86% of new cars sold in 2021. The latter, on the other hand, subsides the price of gasoline and does not provide any incentives towards pursuing or owning zero-emission vehicles and, as a result, sold less than 1% of EVs and PHEVs in 2021 (see table 1).

According to the findings, more than half of the respondents would buy an EV within the next three years, but under four conditions: (1) the government must regulate and control the costs of EVs so they are 10–30% cheaper than gasoline cars, (2) public and free fast charging stations must be available every 10–km, (3) fast lanes for only EVs must be available on major highways, and (4) public and free parking spaces must be available at almost the same capacity as handicap spaces. This means that the respondents perceived the role of government as fundamental to encouraging EVs' popularity, as it must provide suitable infrastructure and pricing policies. This result is consistent with previous studies in other countries (e.g., Hardman et al., 2018; Skippon et al., 2016; Zhang et al, 2018).

Moreover, more than 40% of respondents would seriously start thinking about buying EVs if gas/fuel prices increased 50–199%; they think that EVs are safe in terms of fire and car crashes. Furthermore, they would pay 6–20% more for an EV that is both environmentally friendly and much quicker than gasoline cars. This means that women entrepreneurs in Kuwait would prefer EVs over gasoline cars in the future because of their environmental, economic, and technological values. This result is consistent with previous studies in other countries (e.g., Çolak & Kaya, 2020; Li et al., 2019; Lin & Wu, 2018; Ottesen & Banna, 2021; Zhang et al., 2018). In addition, about 40% of respondents would be able to charge EVs in their residential areas in Kuwait. This means that infrastructure for charging EVs is available in some areas of Kuwait.

Additionally, the most repeated themes about how women entrepreneur car owners feel and think about EVs were related to environmental friendliness, functionalities and features of EVs, and obstacles facing EVs in Kuwait. The findings also showed that women drivers had positive vibes toward EVs as they expressed words such as fun, amazing, wow, great, good, awesome, new, exciting, happy, future, etc. Although most

respondents cared about the environment and were willing to buy EVs in the future, they had concerns about the lack of practicality due to hot and dry weather conditions and EV batteries lasting in Kuwait. This indicates that respondents are aware of the design of EVs that are already available in the international market but limited in emerging markets such as Kuwait.

Limitations and Future Studies

This study provided insights into the phenomenon of sustainable mobility through EVs by including views of diverse women consumers such as non-Kuwaitis and the self-employed. This constituted a better holistic approach than the previous study by Ottesen and Banna (2021). Yet, certain limitations exist. First, although this study utilized a mixed-mode approach (qualitative and quantitative questionnaire including open- and close-ended questions), it remained descriptive due to a lack of focus on hypothesis and empirical testing. Therefore, future research should involve purely quantitative data and empirical investigation of various hypotheses and variables to better represent the studied population in Kuwait. This can lead to a more comprehensive conclusion about the population in Kuwait. Second, future studies should focus on qualitative in-depth interviews with women entrepreneurs who are current EV owners in Kuwait about obstacles, opportunities, features, and preferred designs through a focus group study on which features and services would be needed for mass implementation. Further, a comparison study about incentives to buy EVs based on experiences of other countries should also be conducted. Finally, future studies should focus on women managers, if any, of car dealerships in Kuwait to collect their viewpoints and obtain more insights into the EV phenomenon to further explore the following: (1) obstacles to adopting the sustainable mobility model through EVs and (2) hesitation to introduce EVs in Kuwait to replace conventionally fueled cars.

Conclusion and Implications

This study's key objective was to examine sustainable mobility through the EV phenomenon in Kuwait from the perspective of women entrepreneurs who are conventional car owners. The findings revealed that the women respondents intend to and would buy an EV within the next three years, but under several conditions. These conditions include cheaper

pricing policies controlled by the government and the availability of suitable infrastructure for EVs relating to charging stations, fast lanes, and free parking spaces. Potential women customers in Kuwait also prefer EVs over gasoline cars in the future because of their environmental, economic, and technological values. Although there is the ultimate desire to buy EVs among diversified groups of women in Kuwait, some major concerns still exist, which could form barriers to EV introduction in Kuwait. One barrier is the lack of government plans, policies, and initiatives to build awareness and create a firmer culture focused on environmental preservation in Kuwait by introducing sustainable mobility through EVs and discouraging the use of conventional fueled cars.

Considering the above results, this study has theoretical and practical implications. First, this study contributes to the limited literature on sustainable mobility through EVs in developing countries in general and Kuwait in particular. It could also help researchers compare EV adoption between developing and developed countries, particularly from the viewpoint of women entrepreneurs. Second, the findings suggest that women drivers in Kuwait prefer EVs over gasoline cars because of their environmental, economic, and technological values. Therefore, marketing campaigns should highlight these values when targeting women, particularly car drivers and entrepreneurs. Moreover, this study suggests that women entrepreneurs who are conventional car owners in Kuwait would buy EVs in the future if the infrastructure relating to fast charging stations, fast lanes, and free parking spaces were available. Therefore, policymakers and governments are encouraged to start building and providing this infrastructure to encourage EV adoption. Additionally, this study suggests that the government might need to implement awareness programs to educate women customers about environmental sustainability and air pollution. Another way is to provide subsidized programs for EV buyers to combat the high prices of EVs. There should also be changes in the infrastructure to include EV recharging networks covering Kuwait. This would make it more convenient for women customers to recharge their cars using renewable energy sources. Insurance companies and other financial institutions would also play a major role in financing renewable energy projects (Vojinović, 2017) so that the country does not run out of electricity. Roads must be further improved and cared for to make them more suitable for EV drivers in Kuwait, as also suggested by Degirmenci and Breitner (2016) and Thananusak et al. (2017).

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