Consumer Attitudes Towards Battery Electric Vehicles in the Czech Republic

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ABSTRAKT

Kvůli změně klimatu a nedostatku zdrojů musely být přehodnoceny tradiční formy mobility. Výzkumu a vývoji elektromobility se dostalo velké pozornosti, ale postojům a chování spotřebitelů méně. Ve srovnání s konvenčními vozidly jsou bateriová elektrická vozidla (BEV) stále většinou spotřebitelů považována za nevýhodná. Přijetí a přetvoření postojů spotřebitelů je zásadní pro úspěšné zavedení udržitelných dopravních systémů. Vzhledem k tomu, že Česká republika čelí ekologickým výzvám, vláda a výrobci originálního vybavení (OEM) zavádějí užitečné politiky, které mají povzbudit a řídit prodej elektrických vozidel, aby země mohla dosáhnout klimatického cíle OSN snížit emise skleníkových plynů. Výzkumný problém je zkoumán kvantitativně prostřednictvím webového průzkumu mezi 257 respondenty ze všech 14 krajů České republiky a dospěl k závěru, že dvě třetiny českých spotřebitelů jsou vůči BEV rezistentní. Výsledky této diplomové práce zahrnují vnímání charakteristik BEV, lidí, kteří mají zkušenosti a preferují taková vozidla na základě demografie, udržitelné doby nabíjení, vhodných nabíjecích míst, nákupních záměrů, budoucí jistoty a faktorů, které podporují loajalitu ke značkám BEV. Vzdělávání spotřebitelů a marketingové kampaně je třeba přizpůsobit trendům. Poskytnutím komplexního řešení tato studie navrhuje relevantní servisní a komunikační strategie k překonání těchto překážek

Klíčová slova: Postoje spotřebitelů, Chování spotřebitelů, bateriová elektrická vozidla, spotřebitelé, elektromobilita, Česká Republika.

ABSTRACT

Due to climate change and resource shortages, traditional forms of mobility have had to be rethought. The research and development of electromobility has received much attention, but consumer attitudes and behaviour have received less. Compared to conventional vehicles, battery electric vehicles (BEVs) are still deemed disadvantageous by most consumers. Consumer acceptance and reshaping of attitudes are essential for the successful implementation of sustainable transport systems. As the Czech Republic experiences

environmental challenges, the government and original equipment manufacturers (OEMs) are implementing useful policies to energize and steer the sale of electric vehicles so the country can achieve the United Nations climate objective of decreasing greenhouse gas emissions. The research problem is investigated quantitatively by conducting a web-based survey of 257 respondents from all 14 regions of the Czech Republic and concludes that two-thirds of Czech consumers are resistant to BEVs. The results from this diploma thesis include perceptions of the characteristics of BEVs, people who have experienced and prefer such vehicles based on demographics, sustainable charging time, suitable charging locations, purchasing intentions, future certainty, and factors that foster loyalty to BEV brands. Consumer education and marketing campaigns need to be adapted to trends. By providing a comprehensive solution, this study proposes relevant service and communication strategies to overcome these barriers.

Keywords: consumer attitudes, consumer behaviour, battery electric vehicles, consumers, electromobility, Czech Republic.

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CONTENTS

INTRODUCTION

Current environmental concerns are propelling the production and sale of Electric Vehicles (EVs) globally. EVs are considered as the panacea for green transportation (Chan, 2002), and as an alternative to Internal-Combustion Engine Vehicles (ICEVs). Unlike the Czech Republic, this has led to the increase in sales of EVs in several countries such as the USA, Norway, Iceland, Sweden, Denmark, Netherlands, Finland, and Germany. The technology driving EVs have been in existence for over a century (Høyer, 2008). However, due to the increased accessibility of ICEVs, electromobility was paused. Environmental awareness and limited oil supply are pushing for the adoption of green transportation, while advancements in electric motors and batteries are making EVs a formidable challenger for ICEVs. The term electromobility refers to transportation systems that are powered by electricity (eds. Contestabile, Tal & Turrentine, 2020).

Battery Electric Vehicles (BEVs) are the focal point of this research. These vehicles have the lowest footprint on the environment but need a major transformation in attitude and perception on the part of consumers. Consequently, neither the governments who support the adoption of BEVs through policy measures, nor the automotive industry that manufactures them, comprehend the decision process of buying them at present (eds. Contestabile, Tal & Turrentine, 2020). The Czech Republic is a perfect location for the application of electromobility, but contemporary and present-day interest in EVs is still relatively low. Therefore, the market gap for BEVs must be filled by researching consumer attitudes relating to their unpopularity and developing a solution.

This research proposes a communication programme for the Czech market, including timing and budgeting. After providing a theoretical overview of consumer behaviour in perspective, the thesis provides elements regulating consumer behaviour and an overview of consumer attitudes toward cars in the Czech Republic. Results of a web-based survey conducted to investigate Czech consumer attitudes towards BEVs are presented in the methodology and analysis section. According to the results of the survey, the proposal is designed and developed. The project section mainly outlines the proposed communication programme using the specific, measurable, achievable, realistic, and timely (SMART) concept. This is intended to increase the popularity of BEVs in the Czech market to achieve the thesis' objectives.

The importance of this research lies in its potential to address the EU Parliament's climate neutrality goal by 2050 for Czech transport. In the long run, the proposed communication programme will increase BEV adoption, provide consumers with flexible payment methods and services, and increase sales for OEMs and service providers. In addition to contributing to the understanding of BEVs and consumer attitudes in the Czech Republic, this thesis proposes a practical solution for enhancing electromobility in the country.

I. THEORY

1 CONSUMER BEHAVIOUR

1.1 Consumer Behaviour and Attitudes in Perspective

Emotions can play a key role in attitudes and behaviours. Cabanac (2002) defines emotions as "*conscious experiences characterized by intense mental activity and a high degree of hedonic content*." There is substantial evidence that affectively pleasing emotions can create positive attitudes towards and judgements about items, which may lead to more effective outcomes (Norman, 2005). Attitudes are learned dispositions to behave consistently in a positive or unfavourable manner toward a given object. The term "object" in consumer behaviour refers to products, brands, services, prices, packages, advertisements, promotional mediums, or the retailer selling the product (Schiffman & Wisenblit, 2018). In the words of Solomon (2019), an attitude is "*an attitude is a lasting, general evaluation of people (including oneself), objects, advertisements, or issues*." Norman (2005) states that attitudes can be influenced by visceral (affective), reflective (cognitive), or behavioural factors (the latter resulting from past experiences).

Consumers' knowledge and perceptions about an object (i.e., their beliefs) are captured by the cognitive component. Beliefs may be formed based on explicit or implicit message information (Wolin, Korgaonkar, & Lund, 2002). The belief can be based on the attributes of an object (for example, a car's attractive colour) or on its consequences (e.g., fuel charges increase the price of cars) (Pollay & Mittal, 1993). The affective component focuses on the consumer's emotions or feelings about an object, such as entertainment or irritation (Ducoffe, 1996). As an evaluative component, the affective component determines how an individual perceives an object's attitude in terms of some kind of favourable rating. In the cognitive component, the likelihood that a consumer will act or behave in a particular manner in response to the attitude of an object is considered, such as purchasing a car based on certain attributes (Schlosser, Shavitt, & Kanfer, 1999). A consumer's cognitive component is largely treated as an expression of his or her intent to purchase in marketing and consumer behaviour.

The ability to endure over time is what makes an attitude lasting. Since it applies to more than a momentary event, such as hearing a loud noise, it is general. Over time, consumers may, however, develop a negative attitude toward loud noises in general. From product-specific behaviour to more general, consumption-related behaviour, consumers have attitudes towards a wide range of attitude objects (Solomon, 2019). As a result of direct

experience with the product, word-of-mouth, exposure to the mass media, and other sources of information, consumers form attitudes about the product. Buying or not buying products or brands is influenced by consumers' attitudes toward the attitude object. When consumers feel positive and favourable about a product, they are more likely to purchase it. To ensure that consumers keep buying their products repeatedly, marketers ensure that consumers maintain these attitudes following the purchase (Schiffman & Wisenblit, 2018).

1.1.1 Consumer Attitude Formation

There are two routes to attitude formation described by the Elaboration Likelihood Model (ELM): the central route and the peripheral route. When thinking about a brand lead to attitudes being formed, it is termed the central route. By evaluating message claims extensively and critically, attitudes formed through this route produce more enduring judgments. Conversely, the peripheral route occurs when, for example, a consumer's attitude towards an advertisement leads them to form an attitude toward a brand. Through the peripheral route, judgements are transient based on simple and intuitive inferences drawn from easily processed cues, such as coupons, package colours, celebrities in adverts, and animation. This means that to form attitudes via the central route, more thought must be expended than to form attitudes via the peripheral route (Schiffman & Wisenblit, 2018). Consumer attitudes have been studied by psychologists using other models.

Martin Fishbein has provided three multi-attribute models: attitude towards object, attitude towards behaviour, and theory of reasoning action. Customers' attitudes towards products, brands, and services can be measured using the first model's attitude toward objects. In contrast, the second model analyses attitudes towards behaviour. In this model, the focus is on understanding an individual's behaviour toward an object. Actual behaviour is more closely related to attitude towards behaviour models. Customer attitude and behaviour are measured in this model, whereas customer attitude is measured only in the attitude toward object model. Third, we have the theory of reasoned action model, which combines cognitive and affective components. This model also measures intention. Individuals' intentions to act are also influenced by subjective norms. Consumers' feelings can be used to measure a subjective norm. Other people's opinions are relevant when a customer buys the product. Other people include family members, friends, roommates, co-workers, etc. (Schiffman, Kanuk & Hansen, 2012).

1.1.2 Adaptability of Consumer Behaviour and its Importance

Consumer behaviour is influenced by psychological factors such as motives, attitudes, perceptions, learning, habits, manners, personality, tendency to risk, and lifestyle. Pricing, products, income, location, and advertising are all economic factors that impact consumer behaviour. Cultural and social determinants of consumer behaviour include social groups, families, reference groups, and trend-setters. These determinants influence consumers' buying behaviour externally. To determine individual characteristics, internal determinants must be considered, such as sex, education, family life stage, income, and lifestyle (Karczewska, 2010).

With the advent of globalization, consumer behaviour seems to be determined by a diverse set of factors. These factors are influenced by nationality, cultural background, and religious affiliation. Consumer behaviour has been changing and new groups of consumers have emerged in recent years. Consumers and buyers are privileged in a market economy because it is customer oriented. The range of products and services available, the price, promotional activities, logistics in product distribution, and the marketing mix can all be influenced by consumers (Karczewska, 2010).

Consumer behaviour manifests through the purchase of products and services to satisfy needs. Before the act of purchase, selection is essential, which has its own guidelines. Because customers' finances are compared to product or service prices, economic criteria secured by psychological elements are important. An intention of the buyer is to reach the expected aspiration level (Rudnicki, 2004). Products must satisfy needs that are manifested by the needs they satisfy. The behaviour of consumers can be explained by the description of their internal reactions to different incentives and their individual perceptions, since such situations activate various behaviours during the purchasing process (Karczewska, 2010). Therefore, rational and irrational behaviour can be distinguished. The former refers to behaviour that is internally coherent and results in maximum satisfaction. When the buyer uses available income to purchase goods that will bring the most satisfaction, he or she acts rationally. In irrational consumer behaviour, consumers take conscious decisions that may not be in their best interests, because of incoherent behaviour. In most cases, irrational purchasing decisions are the result of imitation, incentives, snobbery, and subconscious motivation rather than cold calculation. These dependencies are often unknown to the buyer (Rudnicki, 2004).

Buying decisions are influenced by several factors that determine this behaviour. Various factors affect consumer behaviour (including economic, social, and cultural factors), as well as accidental factors. Buying decisions are difficult to predict due to the number of causal factors involved. In many cases, however, all determinants of behaviour gather, thus becoming regular determinants. Consumer behaviour is influenced by customers' needs, which are external determinants (Rudnicki, 2004). Even though some needs are prioritized and categorized by their importance, this fact does not motivate their significance. As far as priority needs are concerned, it does not provide any guidelines. A hierarchy of needs was developed by American psychologist Abraham Maslow based on the information above. To satisfy the lower-level need, which is more important, it is necessary to have a less important need emerge at the higher level of the hierarchy (Karczewska, 2010).

1.2 Consumer Attitudes Toward Battery Electric Vehicles

Globally, BEV adoption rates are generally low despite their significant environmental benefits. BEV adoption can be accelerated by designing effective policies and marketing communications that understand consumer behaviour and attitudes. An overview of recent studies investigating the factors affecting behavioural and attitudinal intentions towards BEV adoption is presented here. There are several recent literature reviews that summarise the main findings regarding behavioural intentions and attitudes towards BEVs. Rezvani, Jansson, and Bodin (2015) analysed the drivers and barriers for consumer adoption of PHEVs. One of the main reasons for PHEV's moderate adoption rate is consumers' perception of vehicles. Their study identified four factors that influence the behavioural intention to adopt BEVs: technical factors (e.g., overall technical performance), contextual factors (e.g., charging infrastructure), cost factors (e.g., cost of purchase and fuel), and individual and social factors (e.g., environmental concerns and PHEV experience).

In Li et al. (2017), 40 peer-reviewed journal articles are analysed to identify the reasons for consumers' intentions to adopt BEVs or lack thereof. This review is structured around three main factors: demographic, situational, and psychological, and the limitations of current research are discussed. The authors point out that understanding of BEV adoption requires understanding how different factors interact. In addition, Li et al. (2017) calls for more representative and larger scale dynamic surveys since most surveys rely on small samples of respondents with some BEV experience. Additionally, they point out that demographic factors are often not included in surveys, or their implications are poorly explained. The

main barriers to BEV adoption within the EU are discussed by Biresselioglu, Kaplan, and Yilmaz (2018). Additionally, they point out that the main barriers are a lack of charging infrastructure, economic restrictions and cost concerns, technical and operational constraints, a lack of trust, information, and knowledge, a limited supply of electrical and raw materials, and concerns about practicability, like Rezvani, Jansson and Bodin (2015).

According to Moons and De Pelsmacker (2012), emotional factors such as self-image and identity, satisfaction with contributing to a clean environment, and a belief that one is an opinion leader play a much greater role in determining BEV attitudes and behaviours than rational reasoning. A comprehensive review of consumer preferences for BEVs was also conducted by Liao, Molin, and van Wee (2017). While the financial and technical attributes of BEVs are generally found to have a significant impact on consumer intentions to adopt BEVs, the effects of individual-related, socioeconomic, and socio-demographic variables are unclear. We summarize in broader detail some recent studies on this topic, all of which were published since 2014, by Rezvani, Jansson and Bodin (2015), Li et al. (2017), Liao, Molin, and van Wee (2017), and Biresselioglu, Kaplan, and Yilmaz (2018) to highlight key findings. The scope, focus, and estimation methods of empirical studies on consumers' behavioural intentions and attitudes to adopt BEVs differ. There have been several studies in this field using structural equation modelling (SEM), which is based on the theory of planned behaviour (TPB), while many others have used various types of discrete choice models, such as standard logistic regression or multinomial regression.

According to these studies, financial incentives (e.g., tax exemptions) and developed infrastructure (e.g., re-charging stations) are significant factors in encouraging the adoption of BEVs. BEV adoption rates are also significantly influenced by consumer attitudes, personal norms, and environmental concerns, according to some recent studies. The effects of individual-related, socioeconomic, and sociodemographic factors on behavioural intention to adopt electric vehicles are ambiguous because they may vary by country and social class (Liao, Molin & van Wee, 2017). Bjerkan, Nørbech, and Nordtømme (2016), and Nayum and Klöckner (2014) examine the incentives for adoption of BEVs in Norway, but they do not examine whether attitudes towards energy efficiency, vehicle features, and energy and environmental labels influence Norwegian intention to adopt BEVs.

1.3 Specifics of Consumer Attitudes Toward Cars and Battery Electric Vehicles in the Czech Republic

Czech consumers are rather brand-oriented, according to current research. As a result of the economic crisis, which began in 2008, Czech consumers have changed their perception of brands-they are more sensitive to price changes and they trust proven brands more. However, they expect excellent performance even if they are willing to pay more money. The crisis also strengthened Czech attitudes toward their domestic brands, which they consider to be traditional and proven. In the Czech Republic, however, consumers perceive a higher price for this quality as being unconscionable. Domestic brands with a long history have been found to be the most popular among Czech consumers. Based on a closer examination of the Czech respondents with respect to the automotive industry, it is evident that their spontaneous brand awareness is mainly focused on Skoda vehicles (Štarchoň & Weberová, 2019). This explains why BEV products offered by Škoda Auto are popular with Czech consumers than any other brand.

Kotler and Armstrong (2020) describe four types of buying behaviour, situated on the level of involvement of the consumer and the level of difference between different brands. Purchasing a vehicle involves a high involvement of the consumer, and the automobile market provides a wide range of brands of types of vehicles. Consequently, in consonance with Kotler and Armstrong (2020), purchasing a new car is positioned or based in the 'complex buying behaviour' area. In Czech households, the choice to own a private car is influenced by several socio-demographic and housing structural factors. A car is more likely to be owned by people with higher incomes, larger families, families headed by males, and those living in detached or terraced houses. Tenants are less likely to own a car, which may indicate fewer safe parking options. Additionally, younger and older consumers have fewer cars than middle-aged households. If the household includes more retired members, however, the likelihood of owning a car increases. There is a lack of clarity about the effect of children. A household with more children is less likely to own a car. Families with children younger than age 5 experience less of this effect (Ščasný, 2011).

According to Formánek and Tahal (2020), 53% of Czech consumers perceive BEVs as the long-term successor to ICEVs, while only 29.4% support immediate restrictions on traditional ICEV usage. Women are more likely than men to favour the transition from ICEVs to BEVs. HEVs were viewed as the mid-term ascendant technology by 13.5% of

women, while BEVs were viewed as environmentally friendly by 13.1% of them. The proportion of women who agree with city regulations targeting ICEVs also increases to 8.9%, and the percentage of women who have previous experience with BEVs is reduced to 15.3%. According to the oldest respondents aged 65 and over, BEV ownership carries a distinct positive connotation: BEVs are viewed as prestigious and responsible, and acceptance of these connotations is 23.2% and 30% higher compared to the younger generation. In addition, the older generation has little experience with BEVs. About 20% of the youngest female age group between 15 and 24 approves city regulations. Among females 65 and older, it gradually rises to approximately 60%.

Compared with women, men have extensive personal experience with BEVs and consider them to be the future of personal mobility. The Czech Republic's capital city, Prague, has about 13% more respondents with previous experience with BEVs than the rest of the country, including high income earners. Gardeners and other hobbyists, however, seem to be more aware of environmental issues and self-control: they agree with city regulations imposed on ICEVs and 11.2% more likely to perceive ownership of a BEV as a sign of environmental responsibility. Gardeners are 12.6% less likely to have previous experience with BEVs. Green fingered gardeners tend not to follow BEVs and HEVs closely, and therefore tend not to have strong opinions about the long-term and mid-term technological developments in personal mobility. HEVs are more likely to be seen as the mid-term future of mobility by habitual book readers and internet users. (Formánek & Tahal, 2020).

BEVs are viewed more positively by individuals with strong brand awareness than by those with weak brand recognition. Physically active individuals also agree to previous BEV experiences and consider BEVs to be the future of personal mobility. Based on attitudes expressed by active drivers and their driving-related activities and interests, only 10.6% had previous experience with BEVs. Driving BEVs is perceived by most active drivers as limiting their current driving activities, and only 14% perceive BEVs as eco-friendly (Formánek & Tahal, 2020). Furthermore, a study by Kosova (2020) found that most Czech consumers associate eco-friendliness with BEVs but remain undecided about their adoption. Additionally, consumers agreed that BEVs had lower maintenance costs and daily expenditures than ICEVs. To reach new users, consumers suggested adopting more digital marketing tactics in marketing campaigns. Incentives from the government for the promotion of these vehicles have been acknowledged, especially when they are aimed at making them more cost-effective.

Young consumers were more favorable to BEVs because of their design, but high initial costs and insufficient charging stations were obstacles they encountered. OEMs like Tesla, with its zero-advertising cost, as well as BMW and Skoda, for their innovative products, were well received by consumers. Due to Prague's high parking costs, consumers indicated that tax incentives and specifically free parking would encourage them to adopt BEVs. Respondents regarded BEVs as cleaner and more silent than ICEVs (Kosova, 2020).

1.4 Consumer Acceptance of Battery Electric Vehicles

BEVs are a relatively new technology that has only recently become a mainstream product, so it is important to examine consumer awareness levels. Furthermore, it is important to understand what factors influence consumer decisions. The research study by Lan, Sheng, and Zhang (2014) focuses directly on BEV awareness to gain some insight into green marketing. Zhang, Yu, and Zou (2011) examined consumer awareness and factors affecting consumers' choices in China using a microeconomic and marketing approach. A survey was conducted in Nanjing, China, and data was collected from 299 respondents. Using three binary regression models, Zhang, Yu, and Zou (2011) determined the factors that contribute to the acceptance of BEVs: the purchase time frame and the purchase price. Academic degree, age, annual income, the number of family members, maintenance costs, and peers' opinions are additional factors that influence purchasing and price acceptance. According to the findings of this study, consumers in China have distinct criteria for purchasing BEVs and what motivates them to do so. A high level of environmental awareness is associated with the use of more environmentally friendly modes of transportation (Kumagai & Managi, 2019).

In many studies, BEVs have been found to be unpopular among consumers because consumers lack knowledge and awareness about them. Less than 50% of U.S. consumers can name a specific BEV brand and model (Singer, 2016), and less than 35% of California consumers are aware of incentives and subsidies for BEVs (eds. Contestabile, Tal & Turrentine, 2020). According to a survey conducted within U.S. cities (Krause, 2013), approximately two-thirds of respondents were unaware of BEVs' basic characteristics, and 95% were unaware of incentives. According to IBM's consumer survey (Gyimesi & Viswanathan, 2011), 45% of respondents had little to no knowledge of BEVs. In studies demonstrating the usefulness of BEVs, consumers were more aware of their benefits and considered them as future purchase options (Gyimesi & Viswanathan, 2011).

2 MARKETING COMMUNICATIONS

Despite their importance, network television, magazines, newspapers, and other traditional mass media are gradually losing their dominance. Instead, advertisers are offering smaller customer communities more personalized, interactive content through a variety of more-specialized, highly targeted media. In addition to specialty cable television channels and made-for-the-web videos, new media include online adverts, email and texting, blogs, mobile catalogues and coupons, and numerous social networks. Marketing has been revolutionized by such new media (Kotler & Armstrong, 2020). In marketing communication, the primary goal is to transfer the message from sender to receiver (Vodak, Soviar & Varmus, 2016). Successful message transfers can be demonstrated by the number of potential customers who are willing to pay for the offered value (for example, a product or service). To measure the success rate of marketing communications, or messages transmitted from the company to customers, the firm quantifies profits paid for products. Business results guide marketing (Kotler & Keller, 2014; Chernev, 2018).

In a management process, marketing plays an important role. As a result of this management process, customers are better understood, anticipated, and influenced efficiently, ensuring that the company achieves its goals (Hittmár & Strišš, 1997). There are many types of marketing communication, including advertisement, sales promotion, social media marketing, trade shows, public relations, personal sales, direct marketing, and event marketing (Kotler & Armstrong, 2020). The marketing of a company and its products or services are made up of all these forms of marketing communication. Further, they analyse the market and define its demands and characteristics, test market reactions, focus on defined segments of customers, and communicate with them. For today's companies, marketing is an integral part of sales and distribution. Product experience significantly influences consumer attitudes, behaviour, and preferences. Furthermore, marketing communication plays a significant role in consumer adoption of new products in addition to product experience. Consumers are often required to make repeated purchases in many of these new categories. As a result, most of the product characteristics are intangibles which consumers are not well informed about before adopting and using the product (Chernev, 2018). Consumers' preferences in categories that are new to them have been little researched in terms of the exact role(s) of marketing communication.

Marketing communications are changing due to several major factors. There is a change in consumer behaviour. The digitally connected mobile age has empowered consumers with

better information and communication capabilities. In addition to the internet, social media, and other technologies, consumers can find information on their own rather than relying on marketing information. Consumers can exchange brand-related information or even create their own brand messages and experiences by interacting with other consumers. The second reason is that marketing strategies are changing. Marketers are shifting away from mass marketing as mass markets fragment. Their marketing programs are increasingly focused on engaging customers and building relationships in more narrowly defined micro-markets (Kotler & Armstrong, 2020).

Furthermore, technological advancements have revolutionized the way companies and customers communicate. From smartphones and tablets to the many faces of the internet (brand websites, e-mail, blogs, streamed content, social media and online communities, and the mobile web), the digital age has brought a host of new information and communication tools. Social media and digital marketing have given birth to a new generation of targeted, social, and engaging marketing communications, just as mass marketing once did (Kotler & Armstrong, 2020).

2.1 Marketing Communication Tools for Battery Electric Vehicles

A wide range of activities are being implemented to reduce consumer barriers to understanding and using BEVs. As part of their consumer outreach and awareness efforts, OEMs, governments at the national and local levels, as well as other stakeholders have been involved. Public-private partnerships, advertisements, ride-and-drive events, and public-private partnerships are all part of BEV outreach and awareness programs organized by non-profit groups, city and state governments, automakers, and charge provider companies. As a result of local context and priorities, other outreach and awareness activities differ across markets. Below are some examples of marketing communication tools adopted by OEMs in conjunction with some private entities and the state to create AIDA (Awareness, Interest, Desire, and Action) for influencing consumer purchase:

2.1.1 Advertisement

Despite a slight increase in demand for BEVs, concerns about range anxiety, speed and infrastructure still linger among potential consumers. To calm nerves and persuade consumers of BEVs' value, usefulness, and appeal, some automakers have launched marketing campaigns and advertisements. The message about BEVs has been effectively

conveyed by a few creative teams. As Zeus and his wife Hera, Hollywood actors Arnold Schwarzenegger and Salma Hayek starred in BMW's Super Bowl 2022 commercial for its BMW iX BEV product. The Kia EV6 was also showcased in Kia's advertisement, which showed a robot dog's instant love for the car. General Motors' BEV product, the Chevy Volt, was also advertised during the Super Bowl event in 2012, showing aliens marvelling at the battery pack. According to the owner, the car runs on electricity for several dozen miles before switching over to fuel power. Ford's C-Max Energi advertisement parodied General Motors' 'n'est ce-pas? commercial. According to the advertisement, BEV drivers do not appear pompous and are environmentally conscious (Hawkins, 2022).

Renault already had four BEVs in 2011 when zero-emissions were still a novelty to consumers. Renault's advertisement stated, "You have already switched to electricity for many things. So, why not travel?" This advertisement was intended for European consumers, but it resonated with consumers around the world. Nissan's 2011 advertisement showed a polar bear fleeing its home to the city after being forced out. The polar bear hugged a person driving a Nissan Leaf BEV in the driveway, making an impactful statement about saving the earth. In 2014, Smart Canada Electric Drive compared its car with the Mustang, Audi A5 and Porsche pickup truck. Through its advertisement for the Hummer BEV version of 2020, GMC introduced the concept of a 'quiet revolution'. Various models of the 2020 Porsche BEV were shown in a car chase focused on their sleek, fast, and aesthetically pleasing features. With its XC40 Recharge offering, Volvo pitched a 'Pure Electric' spot in 2021. Based on TV advertisement measurement company iSpot, since April 2021 the advertisement has garnered 418,176,324 impressions, mostly from MSNBC, NBC, and CNN (Bhattacharjee, 2022). These advertisements were further channelled as video marketing on social media through platforms such as Twitter, YouTube, Facebook, and Instagram. Advertisement on the respective websites of the above-mentioned companies, television, digital out-of-home media, on blogs, and on mobile applications are not left out.

2.1.2 Interactive Marketing

Public events such as ride-and-drives, and BEV showcases are effective ways to attract media attention and introduce BEVs to consumers. According to a survey of electric vehicle experts, first-hand experience is a powerful source of information (Williams & Johnson, 2016). At least once a year, interactive marketing such as ride-and-drive events are held. As an example, California's Experience Electric campaign and Best.Ride.EVer

ride-and-drive series, National Test Drive Day in the Netherlands, Mass Drive Clean, Quebec's Branchez Vous, Regent Street Motor Show, and a number of other events. Oregon's EV Fest and Shanghai's EV Zone are examples of BEV showcases.

2.1.3 Tourism

Tourism-based outreach efforts also contribute to increasing awareness and usage of BEVs. BEVs are being integrated into rental car and car-sharing fleets that target resort destinations in several examples. As well as promoting new technology, resort destinations offer BEV promotional events. Through private sector partnerships, the Oregon Tourism Commission in 2016 developed Oregon Electric Byway itineraries to support tourism with BEVs and charging infrastructure at popular attractions in the state. Similarly, Jeju Island, South Korea, is working toward becoming an all-electric island by 2030 and has greatly increased its BEV fleet and charging infrastructure (Tweed, 2014).

2.1.4 Awards and Recognition

In recognition of individuals, organizations, or businesses who play a crucial role in advancing electromobility, governments and organizations present a variety of awards. Award categories range from general environmental leadership awards to electromobility awards. Through the installation of BEV chargers and providing preferred parking for BEVs (U.S. Green Building Council, 2016), one of the most popular green building certification programs used worldwide, points can be earned for Leadership in Energy and Environment Design (LEED).

2.1.5 Sponsorship

The annual National Drive Electric Week is an outreach event that highlights the benefits of BEVs and raises awareness about their widespread availability. At the national level as well as at local events, automakers, utilities, charging equipment manufacturers, non-profit organizations and government agencies support, sponsor, and participate. By coordinating communications and building awareness at the national level, Nissan sponsors this event. As a major sponsor, Nissan is recognized on the event website, in press releases, and on social media (National Drive Electric Week, 2023). The National Drive Electric Week is also promoted and sponsored by Nissan through press releases, emails, and social media posts. In addition to supporting consumer education and awareness for BEVs, the ‘Electric for All’ campaign in California aims to accelerate the cultural change towards BEVs.

Mercedes Benz, BMW, Audi, Toyota, Subaru, Stellantis, Ford, and General Motors sponsor this event by donating an item or service for an online prize drawing. In addition, they donate funds, food, and other items to offset the costs of local events, show off vehicles, provide charging devices for event participants to charge their cars, and offer test drives in person and virtually (Electric For All, 2022).

2.2 Marketing Communication Mix Utilized by Tesla: The Most Successful BEV Manufacturer

American company Tesla Motors Incorporated produces BEVs, and millions of consumers around the world love their vehicles. Tesla registered more than 250,000 pre-orders in just three days after presenting its offering, Tesla 3 in March 2016, and is the most successful BEV manufacturer in the world. From the perspective of external factors, such as marketing communication tools, Tesla maximizes its competitive advantages. The way Tesla communicates with its customers is very crucial, and the company strives to be as close to its customers as possible. To maximize the efficiency of marketing communication for each segment of customers, they use different marketing communication methods. However, these tools must be viewed from the perspective of supply, prices of competitors, trends, and preferences in consumer behaviour.

Developing successful marketing communications for Tesla Motors starts with two questions: where is customer interest focused, and how do customers perceive Tesla Motors' marketing communications? As a means of publicity, it uses primarily the internet, particularly its website, which publishes not only news about its products but also information about the company. Using offbeat and buzz-worthy marketing tools, Tesla reinvents automotive retail, bringing something new to customers' eyes (Andersen, Dauner & Palme, 2016). The vision of Elon Musk's future is one that every customer wants to be a part of, and he has created a new icon for technology and invention. The popular need of today is a result of this.

2.2.1 Advertising

Creating buzz and generating positive word-of-mouth marketing are Tesla's primary advertising strategies. A traditional advertisement strategy for Tesla includes TV and print ads, as well as digital advertising such as social media and Google AdWords. Their ads

emphasize their products' performance and environmental benefits. Tesla's advertising strategy consists of the following elements:

Social Media: Engaging with customers and promoting products through social media platforms such as Twitter, Facebook, and Instagram are a key part of Tesla's marketing strategy. As well as responding to customer inquiries and feedback, they share updates on new product launches, events, and company news.

Tesla's Website: There is a lot of information about their products, services, and company mission on their website. On the website, customers can also customize and order their vehicles (Chapman, 2016).

Influencer Marketing: To market their brand and products, Tesla partnered with high-profile celebrities and influencers. As an example, a video promoting Tesla's solar panels was created in partnership with YouTuber Casey Neistat.

Word-of-Mouth Marketing: A large part of Tesla's marketing strategy involves word-of-mouth. Referral incentives are offered to satisfied customers who refer new customers and encourage them to share their experiences (Gray, 2016).

2.2.2 Sales Promotion

As part of their marketing strategy, Tesla uses sales promotions to encourage customers to buy their products. Tesla's sales promotion consists of the following key elements:

Incentives for Test Drives: Customers are offered incentives to test drive Tesla's vehicles. For instance, when customers schedule a test drive, they may receive a discount or free Supercharging credits (Gray, 2016).

Financing Options: Customers who purchase Tesla's vehicles can choose from a variety of financing options. To make the purchase more affordable, these financing options may include low interest rates, low down payments, or other incentives (Oberoi, 2015).

Seasonal Promotions: Promotions and discounts are offered by Tesla to entice customers to buy their products during certain seasons. Special deals are offered during holiday seasons or other times of the year (Oberoi, 2015).

Offering Trade-In Options: Tesla offers trade-in options for customers looking to upgrade their cars. A new Tesla vehicle may be offered at a competitive price as an incentive to purchase a trade-in (D'Arcy, n.d.).

2.2.3 Personal Sales

Tesla's direct sales model entails selling its products directly to consumers through its own retail stores and online ordering system. Tesla's personal sales strategy includes the following elements:

Knowledge of Products: Tesla's salespeople are experts in the company's products and technology. Detailed information about the performance, charging capabilities, and features of the vehicles can be obtained from them.

Customer Service: Throughout the sales process, Tesla places a strong emphasis on customer service. To respond to customer concerns and inquiries, salespeople are trained to be responsive and helpful.

Personalized Sales Process: Tesla's sales process is designed to meet the needs and preferences of each customer. Test drives are provided by salespeople to ensure customers are satisfied with their vehicles (DeBord, 2016).

Customer Follow-Up: Salespeople at Tesla follow up with customers after the sale to ensure that they are satisfied with their purchase and to address any additional questions.

Design of Tesla’s Retail stores: Tesla's retail stores boast interactive displays and technology that allows customers to learn more about the company's products and technology and customize their vehicles (Kissinger, 2018).

2.2.4 Public Relations

Tesla's marketing strategy includes public relations. Tesla's public relations strategy includes the following elements:

Media Relations: Relationships with the media are managed by Tesla's dedicated communications team. Press releases are issued, media inquiries are answered, and positive coverage is generated for the business and its products (D’Arcy, n.d.).

Management of Crisis: In addition to handling any negative publicity or crises that may arise, Tesla's communications team is also responsible for crisis management. A timely and effective response is provided to concerns and criticisms (Oberoi, 2015).

Thought Leadership: In the automotive and technology industries, Tesla's CEO, Elon Musk, is a prominent figure. Media coverage of him and his views on sustainability, innovation, and technology are common.

Sustainability: Environmental responsibility and sustainability are at the core of Tesla's brand. As part of their sustainability initiatives, they demonstrate their commitment to reducing carbon emissions.

Philanthropy: An initiative related to renewable energy, education, and community development is supported by Tesla's philanthropic arm, the Tesla Foundation (Kissinger, 2018).

2.2.5 Direct Marketing

A direct marketing strategy for Tesla involves selling products directly to consumers without the assistance of intermediaries, such as dealers. Digital marketing, social media, and physical showrooms are all part of Tesla's direct marketing strategy. Direct marketing campaigns like email marketing and direct mail are used by Tesla to reach potential customers. Providing personalized information about the company's products and services is the focus of the company's direct marketing efforts (Andersen, Dauner & Palme, 2016). Tesla's online presence is a key component of its direct marketing strategy. To market its products directly to consumers, Tesla uses its website and social media platforms.

2.2.6 Event Marketing

Tesla's marketing strategy includes event marketing. Tesla's event marketing includes the following aspects:

Launching: To generate buzz and media coverage, Tesla hosts launch events for new products. Presentations from company executives and hands-on experiences with new products are usually included in these events and are typically exclusive and invite-only.

Test Drives: Potential customers can experience Tesla's vehicles first-hand at test drive events hosted by the company. A hands-on experience may include riding along with company representatives, driving on a designated course, or participating in other events.

Pop-Up Stores: In high-traffic areas, Tesla has opened pop-up stores to increase brand awareness and demonstrate the products. Displays, product demonstrations, and other interactive experiences may be available in these stores (Kissinger, 2018).

Events for Community Engagement: Tesla sponsors community events to engage and build loyalty with local communities. Among these events are car shows, charity events, and community gatherings.

Social Media Events: Using social media events as a means of engaging with their following and creating buzz about their products, Tesla hosts social media events. Among these events are live question-and-answer sessions with executives, Twitter chats with industry experts, and other interactions with company executives (Withers, 2016).

Creating a unique customer experience and building a strong brand image are the two main goals of Tesla's marketing communications mix. To differentiate itself from its competitors in the electric car market, Tesla uses a range of marketing strategies including advertising, sales and events promotion, personal selling, public relations, and direct marketing.

3 BATTERY ELECTRIC VEHICLES

3.1 Classification of Battery Electric Vehicles

This discussion introduces different types of EVs to clarify what BEVs are and why they are selected for research. In addition to BEVs, EVs on the market today include hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and extended-range electric vehicles (E-REVs). Each HEV is powered by an internal-combustion engine (ICE) and an electric motor. Due to its limited battery capacity, the electric motor can only provide power to start and accelerate the vehicle. In HEVs, the batteries are charged by recovering energy through deceleration or braking, not by outlets (eds. Contestabile, Tal & Turrentine, 2020). As a new type of HEV, PHEVs have better battery capacity and can be charged from the mains. In contrast to HEVs, PHEVs have a short pure-electric range, usually 50 to 100 km, and can be driven with an ICE once the battery is depleted. Like PHEVs, E-REVs also have better batteries and plug-in chargers. In pure-electric mode, an E-REV uses a fuel tank to extend its driving range by charging batteries and providing electricity directly to the motor. High-capacity lithium-ion batteries are the only source of energy for a BEV, which is powered entirely by an electric motor (Lytton, 2010).

The batteries are mainly charged with plug-in chargers. BEVs, which are sometimes referred to as full-electric, all-electric, or pure-electric vehicles have the highest battery capacity and longest electric driving range when compared to HEVs, PHEVs, and E-REVs. HEVs generate most of their energy from petrol or diesel. In addition to being unable to charge by an outlet, HEVs are no different from conventional fuel vehicles (CFVs). Even though PHEVs and E-REVs must be recharged from an external power source after battery depletion, their total driving range is like a CFV. BEVs, however, have a much shorter total driving range than the other three EVs, despite having a longer pure-electric driving range. Due to the longer charging time for BEVs than PHEVs or E-REVs, it is important to maintain timely charging to prevent a lack of power during the next use (eds. Contestabile, Tal & Turrentine, 2020). The behaviour and habits of consumers who use BEVs need to be significantly different from those of consumers who use CFVs or other EVs. Consumers will also be influenced by different factors when it comes to adopting BEVs. As a result, this review focuses on consumer attitudes and perceptions about BEVs rather than those related to HEVs, PHEVs, and E-REVs (Li et al., 2017).

3.2 Development of Battery Electric Vehicles

The popularity of BEVs has increased since they were introduced more than a hundred years ago for many of the same reasons. EVs dominated the road back in the mid-20th century, outnumbering ICEVs powered by fuel. With the advent of Ford's moving assembly line, however, this prevalence was challenged. Ford developed a transportation system based on fuel that would last more than a century thanks to the fact that fuel was more widely available than electricity. In the intermittent decades leading up to the dawn of the 20th century, some experimented with electromobility, but it was not until the dawn of the 21st century that EVs gained popularity. There have been many twists and turns in the history and development of EVs (Simpson & van Barlingen, 2021).

3.2.1 Early Battery Electric Vehicle Products (1830 to 1880)

In the early 1800s, engineers and automotive pioneers on both sides of the Atlantic developed the first electric vehicles through technological advancements in batteries and motors. Inventors in Hungary, the Netherlands, the U.K., and the U.S. began working on combining these technological advancements in the 1830s. While it is disputed, many believe the first small-scale EVs were developed between 1828 and 1832. A British inventor by the name of Robert Anderson exhibited the first EV at an industry conference in 1835. A disposable battery powered by crude oil turned the wheels of Robert Anderson's vehicle (Matulka, 2014).

In pursuit of electromobility, Anderson was not alone. A Hungarian scientist named Nyos Jedlik and a Dutch professor named Sibrandus Stratingh both made their model EVs around the same time. Thomas Davenport, an American blacksmith-turned-inventor, is also believed to have invented integral components of the electric motor that powered the first EV. Although they all travelled at top speeds of 12 km/h, steering was cumbersome, and the range was short, they were little more than prototypes of electrified carts. During the 1860s, a French physicist named Gaston Plante invented the first rechargeable lead-acid battery, a major advance in electromobility. This first "practical" BEV, however, was not created until the late 1880s in the U.S. by electromobility pioneer William Morrison, who combined batteries and electric motors (Anderson & Anderson, 2010). William Morrison, an immigrant Scottish chemist who lived in Des Moines, Iowa, used a traditional horse-drawn Surrey carriage, popular during the 19th century, that had been modified to fit

a battery. There was a maximum capacity of 12 people in Morrison's electric carriage and a maximum speed of 32 km/h (20 miles per hour) (Simpson & van Barlingen, 2021).

3.2.2 The Conversion to Motorized Transportation (1880 to 1914)

People began swapping their horses and carts for motorized vehicles around the turn of the 20th century. The automobile gained popularity as a result, and the battle for mobility's future began. There were three options: steam, fuel, and electric. In those days, the three power sources on American roads were evenly distributed: steam powered 40% of vehicles, electric powered 38%, and fuel powered only 22% (Anderson & Anderson, 2010). The popularity of steam vehicles had been growing since the 1870s, and at the turn of the century, they held a slim majority of the U.S. market. They suffered major setbacks, however, that ultimately led to their demise. Steam vehicles needed to be started up and refilled continuously with water for up to 45 minutes, which limited their range. In the end, steam proved to be not very practical for powering personal vehicles, despite its reliability for factories and trains (Matulka, 2014).

In 1886, Gottlieb Daimler and Carl Benz simultaneously developed the world's first automobiles in Germany while Morrison worked on his electric carriage. Unlike gasoline-powered cars, fuel-powered cars needed to be started with a heavy hand crank and changed gears manually. In addition to being louder and emitting pollutants, they were also far noisier than their steam or electric cousins (Simpson & van Barlingen, 2021). In contrast to steam and fuel, BEVs did not have any issues. In addition to being quiet, easy to drive, and emitting no odours, they were also easy to maintain. BEVs quickly gained popularity among urban residents, especially women. They were suitable for short trips within cities, but the poor road conditions outside the cities made them unsuitable for longer trips. BEVs became easier to charge as more people gained access to electricity in the 1910s. As a result of their popularity, many pioneers of the time took note: Porsche developed the world's first hybrid car, while Thomas Edison co-developed an affordable EV with his friend and former employee Henry Ford (Matulka, 2014). With the creation of Ford's cost-efficient assembly line and the wider availability of fuel, all this momentum halted.

3.2.3 The Return of Battery Electric Vehicles (1970 to 2003)

During the 1970s, with oil prices and fuel shortages reaching an all-time high, interest in lowering society's dependency on oil grew. As a result of this social shift, automakers began exploring options for alternative fuel vehicles (AFVs), including EVs. Even NASA

helped raise awareness when its electric lunar rover became the first manned vehicle on the moon when General Motors prototyped an urban EV. In contrast to fuel-powered cars, EVs suffered from several drawbacks, including a limited range and slow top speeds, and consumers were uninterested (Simpson & van Barlingen, 2021). However, scientists and engineers continued to develop the technology despite the lack of consumer interest. The next 20 years were spent developing electric variations of popular models, aiming to improve batteries and achieve ranges and speeds comparable to those of fuel-powered vehicles (eds. Contestabile, Tal & Turrentine, 2020).

The introduction of the Toyota Prius was a major turning point. As the world's first mass-produced HEV, the Prius debuted in 1997 in Japan. The Toyota Prius hit the market in 2000 (Matulka, 2014), and became an instant success with several celebrity endorsements and product placements in movies and music videos (eds. Contestabile, Tal & Turrentine, 2020). The Prius has become the world's best-selling hybrid due to rising fuel prices and concerns over carbon pollution. Martin Eberhard and Marc Tarpenning, both entrepreneurs, saw an opportunity in 2003 and acted (Simpson & van Barlingen, 2021).

3.2.4 The Major Revolution (2003 to 2020)

As lithium-ion battery capacity grew in their previous venture, Eberhard and Marc founded Tesla Motors in 2003. In 2006, the Silicon Valley startup announced it would build an electric sports car that could travel more than 320 km on a single charge. Many big automakers accelerated the development of their own EVs because of Tesla's subsequent success. Nissan raised the competition in 2010 with the launch of the Nissan Leaf. As a result, this all-electric, zero-emission car became the world's top-selling BEV of all time. The market also saw the introduction of new battery technologies, which helped improve EV range and cut battery costs. Since 1991, the price of lithium-ion batteries has declined by 97%. In turn, consumers have been able to afford EVs because of lower costs. Since then, almost every mass-market automobile manufacturer has jumped on the electric bandwagon, and many have vowed to abandon ICE (Simpson & van Barlingen, 2021).

3.2.5 The Breaking Point (2021 and beyond)

Electromobility, and especially passenger EVs, has grown rapidly. Regardless of how it is measured, BEV sales, presence on the roads, government mandates, percentages in all vehicle sales, or simply vehicle manufacturers committing to electromobility—it is gradually becoming undeniable that governments, society, and consumers expect

electromobility to play a significant role in the future. This trend is perfectly illustrated by three points:

- From a negligible number in 2010, there are now approximately 1 million BEVs on the road. In 2020, there were 10 million EVs on the road worldwide.
- The value of Tesla is estimated at 1 trillion US dollars, and its founder and CEO, Elon Musk, is the richest man on the planet due to Tesla.
- A record 6.6 million EVs and BEVs were sold in 2021 despite the coronavirus pandemic's impact on global vehicle sales. In 2021, nearly 10% of global car sales were electric (Simpson & van Barlingen, 2021).

Not only is this growth widespread, but it is also not country specific. BEV sales have been growing continuously in all major markets around the world, but nowhere has this growth been faster than in Europe. In 2020, Europe outsold China as the global leader in BEV sales, representing the fifteen top EV markets, despite China continuing to have the largest stock of EVs in terms of numbers. In that list, Norway is at the top, having almost entirely phased out the sale of ICEVs (eds. Contestabile, Tal & Turrentine, 2020). Nearly 80% of new cars sold in September 2021 were fully electric, making Norway the country with the highest BEV penetration (Vantage Market Research, 2022).

As early as 2022, the Nordic country was the first country in the world to sell 100% EVs. Norwegians may be the first, but all the major automotive markets are expected to transition to electric by 2035. McKinsey & Company predicted passenger EV adoption in the second half of 2020 will reach the tipping point, or the point beyond which significant and often unstoppable changes occur. Moreover, this growth shows no signs of slowing. EVs are an integral part of the decarbonization process for governments, companies, and individuals looking towards a sustainable future (eds. Contestabile, Tal & Turrentine, 2020).

3.3 Market Growth for Battery Electric Vehicles

As of 2020, the global BEV market was valued at 246.70 billion US dollars. A compound annual growth rate (CAGR) of 24.3% is projected for the market from 2021 to 2028, from 287.36 billion US dollars to 1,318.22 billion US dollars. In 2020, the Asia-Pacific BEV market was valued at 118.08 billion US dollars. Coronavirus had a staggering and unpredicted global impact, with BEVs experiencing a progressive demand shock in all regions. In 2020, the global market exhibited a growth rate of -9.7%, compared to the

average annual growth rate during 2017 to 2019. This sudden increase in CAGR can be attributed to this market's growth and demand, which will return to pre-pandemic levels once the Coronavirus crisis is completely over (Fortune Business Insights, 2022).

OEMs are also planning to launch new BEV models between 2022 and 2024, making this period the most promising for BEV sales. The slight decline in battery prices and government support in several markets for vehicle electrification will also contribute to market growth. Increasing investments in electromobility are contributing to the growth of the BEV market. A growing number of market players, including Daimler AG, Tesla Incorporated, Ford Motor Company, Groupe Renault, and Toyota Motor Corporation, have committed to producing more BEVs. Ford announced plans to invest 300 million US dollars at its Romanian plant in 2023 to develop new light commercial vehicles. This segment is also being heavily invested in by companies such as Daimler AG and Mercedes Benz. Over the forecast period, the market is expected to grow on a long-term basis (eds. Contestabile, Tal & Turrentine, 2020).

3.3.1 Market Segmentation of Electric Vehicles

EV market segments include vehicle type, propulsion type, power output, end use, charging standard, and region. Passenger vehicles, heavy commercial vehicles, two-wheelers, electric-scooters and bikes, and light commercial vehicles are further segmented by vehicle type. Additionally, the market is divided into HEVs, BEVs, and fuel cell electric vehicles (FCEVs) based on the type of propulsion. A further segmentation is based on Power Output: less than 100 kW, 100 kW to 250 kW, and more than 250 kW. EVs are also segmented according to their end use: private, commercial, and industrial use (Vantage Market Research, 2022).

3.3.2 Key Market Players

The market is gradually becoming highly competitive and fragmented in nature, with key players such as Tesla Incorporated, General Motors, BMW Group, Nissan Motors Company Limited, BYD Company Limited, Toyota Motor Corporation, Daimler AG, Ford Motor Company, The Volkswagen Group, Groupe Renault, Hyundai Motor Company, and many others. California-based BEV manufacturer, Tesla Incorporated is typically known for its autopilot mode, allowing semi-autonomous features, innovative design, quality assurance, and technological advancements in its products. To fill the charging station gap in North America, Tesla constructed a network of charging stations across the continent.

As part of the company's efforts to make green energy available for charging stations, the company also built solar power plants. One of the world's largest manufacturers of commercial vehicles and luxury automobiles is Daimler AG. To support the growing demand for BEVs, the company launched a line of passenger and commercial vehicles, as well as buses. The company also provides financing, insurance, fleet management, leasing, and other services related to electromobility (Fortune Business Insights, 2022).

3.3.3 Selected Regional Market Growth of Battery Electric Vehicles

After a decade of rapid growth, the global electric car stock reached 10 million in 2020, a 43% increase over 2019. In 2020, BEVs accounted for two-thirds of electric car registrations and two-thirds of stock. China has the largest EV fleet, with 4.5 million vehicles, while Europe had the greatest annual increase with 3.2 million vehicles. As a result of the Coronavirus pandemic, the global automotive market was significantly affected. In the first part of 2020, new car registrations dropped by about one third from the previous year. Overall, activity dropped by 16% from the first half to the second half, partly offset by stronger second-half activity (eds. Contestabile, Tal & Turrentine, 2020). Global EV sales share soared 70% to an all-time high of 4.6% in 2020, despite conventional and overall new car registrations falling. With 1.4 million new registrations, Europe led the way with about 3 million new EVs in 2020. A total of 1.2 million BEVs were registered in China, while 295 000 were registered in the United States. BEV registrations increased in 2020 due to several factors. On a total cost of ownership basis, BEVs are gradually becoming more competitive in some countries. BEV sales were buffered from the downturn in the car market by several governments providing or extending fiscal incentives (International Energy Agency, 2021).

Europe: In 2020, the European car market contracted by 22%. Yet new EV registrations increased more than double to 1.4 million, representing 10% of total sales. Among the large markets, German EV registrations reached 395,000 and French registrations reached 185,000. Registrations in the U.K. more than doubled to 176,000. The percentage of EV sales in Norway reached a record high of 75% in 2019, up a third from the previous year. Iceland sold more than 50% of electric vehicles, Sweden sold 30%, and the Netherlands sold 25%. In Europe, EV registrations surged despite the economic slump due to two policy measures (eds. Contestabile, Tal & Turrentine, 2020). To begin with, the EU's CO2 emissions standards set a target year for 2020 to limit new cars' average emissions per

kilometre driven. Furthermore, many European governments increased subsidies for EVs as part of stimulus packages to combat the effects of the pandemic. BEVs accounted for 54% of electric car registrations in European countries in 2020, surpassing PHEVs. BEV registrations doubled from the previous year, while PHEV registrations tripled. BEVs accounted for 82% of all EV registrations in the Netherlands, 73% in Norway, 62% in the U.K., and 60% in France (International Energy Agency, 2021).

China: Overall, China's car market suffered less from the pandemic than other regions. New car registrations in the first half of 2020 were down about 9%, and EV registrations were lower than the overall market. After China constrained the pandemic in the second half, sales share increased to 5.7%, up from 4.8% in 2019. Approximately 80% of all EVs registered were BEVs, because of policy actions that muted incentives. Despite signals that they would be phasing out more gradually before the pandemic, the subsidies were instead cut by 10% and extended through 2022, instead of expiring at the end of 2020. Several cities relaxed car license policies in response to the pandemic, so that more ICEVs could be registered to help support the local automotive industry (International Energy Agency, 2021).

United States of America: There was a 23% decline in the U.S. car market in 2020, although EV registrations declined less than the overall market. 295,000 EVs were registered in 2020, of which 78% were BEVs, down from 327,000 in 2019. Due to the expiration of federal tax credits for Tesla and General Motors, which accounted for most of the EV registrations, their sales share increased to 2% in 2020 (eds. Contestabile, Tal & Turrentine, 2020).

Africa: In Africa, the revolution is only just getting started, and the available information paints a bleak picture. Only about 1,000 of South Africa's 12 million vehicles are electric, according to government estimates. The number of EVs in Kenya is about 350 out of 2.2 million. As part of a plan to increase the share of EVs in the car import market to 5% by 2025, Kenya is slashing EV import duties in half. Additionally, Ghana, Rwanda, the Seychelles, and Mauritius have reduced or eliminated import duties. By 2023, Egypt plans to manufacture EVs in-house. The goal in Namibia is to have 10,000 EVs on the road by 2030, while the goal in South Africa is to have 2.9 million by 2050. As a result, dozens of startups are working to capitalize on these aspirations, focusing on public transportation

buses and motorcycles. At least 50 startups in Kenya are developing two- or three-wheel BEVs, according to the United Nations Environment Program (Centurion, 2022).

Other Countries: In other countries, EV markets remained resilient in 2020. EV registrations remained broadly unchanged from the previous year at 51,000 in Canada, where the new car market shrank by 21%. A notable exception is New Zealand. As the market declined by 21%, it saw a decline of 22% in new EV registrations despite its strong pandemic response. As a result of New Zealand's lockdown in April 2020, there were exceptionally low EV registrations. As another exception, in 2020 the overall new car market in Japan contracted by 11% from its 2019 level, while EV registrations fell by 25%. Since 2017, when 54,000 registrations and a 1% share of the EV market peaked in Japan, the EV market has declined in absolute and relative terms. There were 29,000 registrations in 2020 and a 0.6% share of sales (International Energy Agency, 2021).

3.4 Drivers Supporting the Battery Electric Vehicle Market

With respect to BEV market strategy, there is a need to outline the significant drivers for market growth on the purchase and adoption of these vehicles. The drivers for BEV market adoption include:

3.4.1 Rising Product Options and Manufacturers

Consumers usually perceive Tesla or the Toyota Prius when discussing BEVs, which is strange because the Prius is a Hybrid-Electric Vehicle (HEV), and not a full BEV. Although Tesla has sold a lot of BEVs, many consumers cannot afford them. With so many automakers now joining the BEV market, the options seem endless, and more are on the way. Many car manufacturers currently offer BEVs, and their names are instantly recognizable, introducing BEVs in almost every segment and market. As an example, VW offers a fully electric ID.4 in the US, while Hyundai, Kia, Toyota, Skoda, and even Mini have BEVs already available. In this new era of electrified vehicles, consumers can buy a BEV based on its features rather than simply because it is electric (Ramos, 2022).

3.4.2 Increase in Fuel Prices

Fuel independence is one of the reasons consumers choose BEVs, not only for the expense but also to avoid having to stop at fuel stations on a regular basis. In recent years, many

consumers have discovered that BEVs make it convenient to charge their vehicles at night, in the comfort of their own homes, and then get on with their day the next day (eds. Contestabile, Tal & Turrentine, 2020). A 'fuel station-free' lifestyle is becoming more and more luxurious. Additionally, fuel prices are higher than ever before worldwide, and it is very difficult to predict when these spikes in fuel prices will occur-as well as when they will drop. BEVs also have the advantage of raising consumer awareness about the impact of constantly filling up at fuel stations on the environment (Ramos, 2022).

3.4.3 Eco-friendliness

The shift to electromobility will save enormous amounts of CO2 emissions, since every BEV on the road reduces air pollution. Climate change and global warming are causing drastic changes around the world (eds. Contestabile, Tal & Turrentine, 2020). As BEVs are perceived as green transportation, car shoppers are eager to do their part for the environment. Ultimately, these vehicles will help save our environment from smog and climate change since they emit no tailpipe emissions. This is a very worthwhile initiative to reduce ecological damage and improve public health. Better air quality means fewer health problems due to less exhaustion of harmful emissions (Vij, 2022).

3.4.4 Improved Driving Range

BEVs were heavily criticized when they first appeared for having a range far less than ICEVs. However, the new crop of BEVs all offer respectable battery ranges and can be used as daily drivers without hesitation. BEVs from the Lucid brand offer a range of over 500 miles, which is impressive, and beats the former king of range, the Tesla Model S. As battery technology has improved over the years, even the more affordable BEVs have improved their range. Currently, for instance, consumers can purchase a Nissan Leaf that offers more than 200 miles of range, which will suffice for most people going about their daily commute without having to recharge (Ramos, 2022).

3.4.5 Convenience and Comfort

With no gears, BEVs provide a better driving experience without any complicated controls. Acceleration, braking, and steering are all that is required to manage a calm, convenient, safe, and noise-free ride. Compared to ICEVs and their exhaust systems, BEVs are extremely silent due to their electric motors. Many studies have shown that vehicle noise is associated with anxiety, depression, high blood pressure, heart disease, stroke, and other

negative effects. The effects of noise pollution can also lead to severe depression (Vij, 2022).

3.4.6 Less Maintenance Costs

BEVs outperform ICEVs when total ownership costs are considered, including factors such as purchase price, fuelling costs, and maintenance expenses, especially in the more affordable segments, according to a Consumer Report. The typical driver can save 6,000 to 10,000 US dollars over the life of a BEV when compared to owning an ICEV (Heisel, 2020). BEVs require no fuel for movement and transportation, and its electric motors require no oil changes, new spark plugs, or fuel filters. The electric motors also decelerate the vehicle, and its regenerative braking also extends the lifespan of brake pads. Typically, this results in lower maintenance costs and increased savings (Drive Clean, 2021).

3.5 Barriers Hindering the Battery Electric Vehicle Market

Market barriers and bottlenecks to the purchase, adoption, and use of BEVs must be emphasized when discussing BEV market strategy. These main markets barriers include:

3.5.1 Ineffective Marketing and Limited Consumer Education

Modern BEVs have many capabilities that many potential users are unaware of, due to poor marketing and advertising from automakers. A more significant barrier is often a lack of awareness about the use of new technology (National Research Council, 2013 & 2015). Particularly, potential users complain about the poor quality of the information about charging points, access, and payment methods available. The result is that non-users expect more problems with everyday electric vehicle use than experienced users encounter (Vogt & Bongard, 2015). Furthermore, car labels provide information on fuel consumption and CO2 emissions so that consumers can make an informed buying decision. Most car-labelling schemes in EU Member States do not provide BEV-specific information. There is no information given about the range of electric driving, for example.

3.5.2 Uncertainty and Lack of Consumer Acceptance

BEV technology has been around for more than 150 years. Several manufacturers began to build battery-powered cars in the early 20th century; their lack of vibration, smell, and noise made them stand out from early petrol and diesel-fueled vehicles. However, they were more expensive than ICEVs and could not travel far. As a result, their use declined,

especially after large petroleum reserves were discovered in the early 20th century. In this way, fossil fuels became more accessible and affordable. Today, BEV technology is considered relatively new by consumers. Thus, they perceive that some aspects, such as vehicle range, charging availability, and ownership costs, are uncertain. The battery life expectancy is of particular concern to them. For a normal used car that is typically slowly charged, it is highly unlikely that the battery will fade below 80 % capacity before 250 000 kilometres. Rather, potential users believe that if the battery does not last as long as expected, either the resale value will drop, or a new battery will be needed. ICEVs, on the other hand, have been optimized over many decades, and consumers feel that they can assess the potential risks of ownership (van Essen et al., 2015; National Research Council, 2013 & 2015).

3.5.3 Limited Charging Infrastructure

BEV adoption is hindered by the lack of public charging infrastructure, according to a recent study by Ernst & Young. Insufficient access to charging points in cities was cited as the main reason for not switching to BEVs by over a third of survey respondents. Prior to this, the high cost of BEVs served as a leading barrier to adoption. For consumers without on-site parking, home-charging is a viable option, but workplace or public charging facilities are unevenly distributed and can be expensive. The Royal Automobile Club (RAC) found that around a third of U.K. drivers are unable to charge their BEVs at home. The number of public charging points increased by 40% in 2021, but most BEV owners charge their vehicles at home or at work. In 2021, there were roughly 1.8 million charging stations available worldwide, including 600,000 fast-charging stations (Wood, 2022). This number is still inadequate and limited.

3.5.4 High Purchase Price

With the current crop of electric vehicles on the market, the elephant in the room is that they are still very expensive. Yet, there is no real used BEV market. Until the last five to ten years or so, BEVs were so expensive that only those who usually purchased brand-new BMWs and Mercedes could afford them. Most people cannot afford even the cheapest BEVs, which cost anywhere from 20,000 to 30,000 euros. Additionally, main dealers are often required to perform maintenance, but none of these issues are insurmountable (Gregory, 2021).

3.6 Battery Electric Vehicle Market in the Czech Republic

A fundamental part of the Czech economy is the automotive industry. A substantial proportion of Czech gross domestic product, one-quarter of industrial production, and more than one-fifth of Czech exports are derived from the production of cars, parts, and accessories, as well as the growing number of special-purpose organizations focusing on research and development, software engineering, and other supporting services. In all regions of the Czech Republic, the automotive industry directly employs more than 180,000 people (Jahn, 2022). More than 9% of the Czech economy is derived from the auto industry, which accounts for 26% of all industrial output. Škoda, Hyundai, and Toyota-Peugeot-Citroen Automobile (TPCA) all have factories in the Czech Republic, and all have launched at least some electric or hybrid models. However, ambition remains a little lacking even at these plants (Gosling, 2021). In terms of establishing research and development centres, the Czech Republic is a competitive location. Research centres for autonomous technologies are already in place at Valeo, and BMW and Accolade are working on similar centers (Kučírek, 2022).

According to the Czech Automobile Register, there were about 11,000 BEVs registered in July 2022, which represents 0.1% of all vehicles in the country (Denik, 2022). Electromobility in the Czech Republic is significantly behind, and the overall process may seem rushed to Czech consumers. The Czech Republic has less than 4% of newly registered electric or plug-in hybrid cars, which is almost every fifth vehicle registered across the EU. More than 80% of newly registered cars in the Czech Republic have either a petrol or diesel engine, with petrol clearly leading the way. This share is much lower within the EU, around 50%. This ranks the Czech Republic second to last in the EU, and only Cypriots with 0.8% of BEVs are more negative about them. Similarly reserved approaches can also be observed in Slovakia and Poland - except for Hungary, where BEVs represented 3.5% of sales (Pohůdka, 2022).

BEVs on the Czech market can cost up to a million Czech crowns, and some models have more expensive versions. Compared to 2020, 2,646 BEVs were sold in the Czech Republic in 2021, a decrease of 616 (Matoušek, 2022), representing a 19% decrease year-over-year in the number of BEVs sold (Pohůdka, 2022). The Škoda Enyaq iV topped the market with 738 units sold, followed by Hyundai Kona with 206 units, and the Tesla Model 3 with 201 units. Dacia Spring Electric is the cheapest electric car on the Czech market. Despite its Chinese origins, the Romanian model can also be purchased for under half a million Czech

crowns despite being based on the Chinese Renault City K-ZE. There is, however, a modest power of 33 kW with a stated range of 230 km and an overall smaller size for available electromobility. In the Czech market, Dacia offers two equipment levels, but only the more basic, better-equipped model costs less than half a million Czech crowns (Matoušek, 2022).

In most countries where electromobility is significant, state support is a common denominator. There are still higher initial prices for BEVs than for ICE vehicles, mainly due to the lithium-ion batteries. As car companies work on this problem, battery prices should decrease in the future. As a result, it is entirely up to the state to decide whether to promote electromobility in some way. BEVs have been actively supported by many European countries. Besides Norway, we can name, for example, the neighbours of the Czech Republic - Germany, Austria, and Slovakia. Private individuals can apply for a subsidy of 6,000 euros in Germany. Another 3,000 euros will be discounted by the automaker, so a new user can save up to 9,000 euros. BEVs with a price tag of up to 40,000 euros are eligible for the discount. In 2023, however, the level of subsidies will decrease, and Germans will receive 1,500 euros less. In contrast, Austrians can apply for a contribution of 5,000 euros, and additional subsidies in the order of hundreds of euros can be obtained for home chargers (Pohůdka, 2022).

Slovakia also holds two subsidy calls for BEVs. For the purchase price of a BEV up to 50,000 euros, Slovaks can apply for 8,000 euros. The form of the next challenge is being developed. In the Czech Republic, private individuals do not qualify for subsidy programs (Vrchota, 2022). Only public administrations in the Czech Republic are eligible for BEV subsidies. Subsidies are available to municipalities, regions, public universities, and research institutions. There are other forms of support planned, but they are only intended for entrepreneurs at this time. In the future, however, the government is also considering subsidies for private individuals. The Czech Republic had 944 charging stations with 1,841 charging points at the end of 2021, according to the Ministry of Industry and Trade. During the next few years, the public network will be significantly densified. According to the National Clean Mobility Action Plan, at least 19,000 charging stations should be operational in the Czech Republic by 2030. Czech roads will be home to at least 220,000 electric cars by then (Pohůdka, 2022). By 2030, Škoda wants over 50% of European sales to be BEVs. Volkswagen, its parent company, aims for over 70%. BEVs accounted for around 10% of cars produced in the Czech Republic as of 2021 (Gosling, 2021).

4 METHODOLOGY

4.1 Main Goal

The main goal of the thesis is to investigate and comprehend the variables that influence perceptions, thoughts, and beliefs about BEVs. In this way, we aim to propose a communication programme that will increase the popularity of BEVs in the Czech Republic. The communication programme will increase consumer awareness and education from BEV owners, OEMs, the Ministry of Transport, service providers, notable celebrities, and influencers.

A communication programme with timing and budgeting will be proposed based on the findings of the research, which involves a survey of Czech consumers who have limited or no experience with BEVs. By bringing all key stakeholders together, the communication programme will create a platform that will clear all doubts, myths, and uncertainties regarding BEV prospects, as well as provide consumers with first-hand information through education and interaction.

4.2 Sub-Goals

As a result of the main goal stated above, the research aims to achieve the following specific objectives:

- Analyse consumers' knowledge on the characteristics and future certainty of BEVs, based on their experiences with and perceptions about them.
- Identify the factors that make consumers more likely to purchase BEVs.
- Propose a promotional campaign tailored to Czech consumer behaviour to increase the popularity of BEVs.

4.3 Research Questions

Research questions which will be examined in this research are as follows:

- RQ1: Why are BEVs unpopular in the Czech Republic?
- RQ2: Who are the people most interested in purchasing BEVs?
- RQ3: What can be done to increase the popularity of BEVs in the Czech Republic?

4.4 Research Methods: Quantitative Versus Qualitative Research

Qualitative and quantitative data can be used as primary data. Basically, the distinction is based on what information is used to analyse the specific phenomenon listed in the research questions. Unlike quantitative data, qualitative data is less structured and is based on qualitative information such as mimics, gestures, and other observations that can be interpreted. These studies provide insight and understanding into the problem. Quantitative studies, on the other hand, often involve numbers, figures, and statistics as well as quantitative information (Blumberg, Cooper & Schindler, 2011). Tests and verification are emphasized when focusing on the facts and reasons behind social events. Compared to qualitative methods, this approach is more logical and critical.

Research techniques include observations, interviews, surveys, and experiments, all of which are structured (Gauri, Grønhaug, & Strange, 2020). According to Blumberg, Cooper, and Schindler (2011), the choice between the two research approaches depends on the nature of the research problem, whether it is exploratory, descriptive, or predictive. We consider a quantitative survey suitable for our research. This approach allows for quick collation of data from many respondents. We can then determine what attitudes, beliefs, and thoughts customers hold about BEVs, which will lead to the success of this thesis.

ANALYSIS

5 RESEARCH CHARACTERISTICS

5.1 Research Design

5.1.1 Sampling Method

Next, a sampling plan must be designed after determining the research method. Basically, this determines how many individuals are selected for the survey and on what basis they are selected (Schmidt & Hollensen, 2006). Sampling is compelling for several reasons, including lower costs, increased accuracy, faster data collection, and easy availability of the population element. Even though there are no exact numbers that can accurately reflect the precise target population, it is advisable that the sample size be large enough to be representative (Blumberg, Cooper & Schindler, 2011). Our survey included 257 participants from all 14 regions of the Czech Republic, with an appreciable proportion of males and females. For this research, people over the age of 18 in the Czech Republic were the target population. As mandated by law, this group is eligible to drive and buy vehicles. With five age groups, the sample size is based on the quasi-representative method. The age groups are 18 to 25 years, 26 to 35 years, 36 to 45 years, 46 to 55 years, and 56 years and over. We mainly focused on consumers aged 20 to 35 with academic backgrounds. The group represents a future high-income segment and will, therefore, likely to buy a car.

Probability and non-probability sampling are the two types of sampling procedures. The probability sampling method is any sampling method that involves some form of random selection to ensure that different units in the population have equal chances of being selected. In contrast, non-probability does not predict which of the units in a population will be selected. There are some units with a zero probability of being selected. Non-probability samples are the best option in this case since they allow for the selection of sample units according to personal judgement. The choice of convenience, judgment, or theoretical sampling is available within non-probability samples. Convenience sampling allows for the flexibility of including everyone who is accessible. This method is the cheapest and easiest to use among the other two. Our research question can be better understood using the convenient sample as a means of understanding opinions. A snowball sampling procedure occurred because of spreading the questionnaire on Facebook, resulting in continuous contributions from users. The concept refers to people discovering other individuals with similar characteristics or interests who might be interested in

participating in the survey, as well as identifying other individuals (Blumberg, Cooper & Schindler, 2011).

5.1.2 Web-Based Quantitative Survey and Data Collection Method

Several instruments were examined based on three criteria: cost efficiency, time available, and target group accessibility. We were able to reach 257 participants by using the Internet as a platform for our survey. We distributed the questionnaire via social networks such as Facebook, Instagram, and Twitter. Due to time constraints, such a large sample size could only be achieved by using a web-based survey. Social networks could, however, distort reality and reduce their validity if used as platforms. Furthermore, a web-based quantitative survey is the most cost-effective. There are several freeware providers on the Internet that allow the creation, conduct and analysis of questionnaires in a professional manner. The research software of choice was Google Documents, which is freeware.

Web-based surveys also have the advantage of being accessible to the targeted group. It is important to note, however, that a web-based survey has some limitations. Participants might not take online surveys seriously or will not take sufficient time to complete them since they are anonymous (Blumberg, Cooper & Schindler, 2011). Non-response error is another major weakness of web-based quantitative surveys. The survey was refused by some people because they were unfamiliar with BEVs. Respondents who have difficulty understanding or need assistance answering questions may also experience difficulties because the interviewer is absent. The most suitable communication instrument for our study is a web-based survey, despite its shortcomings. Especially regarding the above-stated criteria of cost efficiency, time availability and target group accessibility.

5.1.3 Questionnaire

According to Blumberg, Cooper, and Schindler (2011), there are three types of questions: administrative, classification, and target. The survey was prepared in two languages; in English and translated into Czech (see Appendix P I). This was to enable a wider reach to participants and create convenience. Beginning with a brief introduction to the research topic and clarification of some terms, the survey informed participants about the time needed for completion and assured them of anonymity, and that their data would only be used for academic purposes. There are four parts to the target questions section. First, we examine how consumers evaluate BEV characteristics including compatibility, relative advantages and disadvantages, complexity, and observability (Questions 1 to 5, 7 and 8).

In Question 12, we tested consumer behaviour regarding short- and long-distance driving. The second part of the survey examined purchase intentions (Question 6), because we are interested in how people intend to accept and adopt BEVs. We then examined factors that could promote brand loyalty among consumers (Question 11). In the final part, future certainty is tested by assessing the thoughts of people about the prospects of BEVs (Question 13). In the final section of the questionnaire, classification questions are used to determine respondents' gender, age, occupation, and region of residence. In this way, comprehensive segmentations can be drawn (Question 14 to 18).

A pre-test was run where some friends and experts in the field were asked to fill out the questionnaire and check for errors. To ensure low complexity and avoid ambiguity, all questions were formulated coherently and understandably. Two different measurement scales were used in the questionnaire design. Several types of nominal scales were used, including multiple choices, and single response scales. Additionally, interval scales were applied in the form of Likert scales and summated ratings. When a respondent has multiple options, but only one answer is desired, a multiple choice, single response scale is appropriate (Question 1, 3, 6, 8, 9, and 13 to 18). There is a preference for the Likert scale summated rating in this study. Opinions are expressed in the form of statements that are either positive or negative toward the object of interest. Participants were frequently asked to rate the degree to which they agreed with statements (Questions 7 and 13). Multiple rating scales were used for other questions, where we collected and arranged statements based on consumers' degree of agreement or importance (Questions 2, 4, 5, and 10 to 12).

5.2 Significance of the Research

Several studies have examined consumer behaviour toward BEVs, but few have focused on the Czech market. This research's findings will therefore aid the Ministry of Transport, OEMs, and service providers in making informed business decisions regarding BEVs. The findings can help the mentioned stakeholders gain a better understanding of Czech customers' attitudes and behaviours towards BEVs. Also, the results can be used to identify problems associated with implementation and develop better solutions to gain the trust of customers. BEVs are emerging technologies, so consumers must also be educated to their full potential.

As marketed by OEMs, BEVs are perceived as 'toy cars' that do not meet eco-friendly requirements. In our interactions with people at the MotorTechna auto show held on 15th March 2023, at the Brno Exhibition Centre, many consumers expressed concerns that

BEVs will be powered by the combustion of enormous amounts of fossil fuels such as coal to charge and run. In addition, some expressed concern about lithium-ion mining for BEV batteries, which they view as contributing to further environmental degradation. Understanding how consumers perceive and accept BEVs over ICEVs is crucial. Only effective marketing strategies and campaigns can change these attitudes. Growth in BEV adoption will lead to an improved competitive landscape for the Czech Republic's transportation sector, creating jobs, and improving the economy.

6 RESEARCH RESULTS AND ANALYSIS

6.1 Analysis and Interpretation of Research Results

In this chapter, the main findings from the survey are exhibited and discussed in detail. As previously discussed in the theoretical framework, attitudes are learned dispositions to behave consistently in a positive or unfavourable manner toward a given object. The term "object" in consumer behaviour refers to products, brands, services, prices, packages, advertisements, promotional mediums, or the retailer selling the product (Schiffman & Wisenblit, 2018). Also, in the words of Solomon (2019), an attitude is "*an attitude is a lasting, general evaluation of people (including oneself), objects, advertisements, or issues*." The object in this study refers to BEVs as products, and this chapter presents findings from consumer attitudes in the Czech Republic, which is the general evaluation towards this given object or product.

Consumers' knowledge and perceptions (i.e., their beliefs) about BEVs are assessed by the cognitive component, where beliefs formed based on explicit or implicit message information (Wolin, Korgaonkar, & Lund, 2002). 257 responses were collected for analysis, representing various attitudes towards BEVs in the Czech Republic. By comparing statistics from different groups within the population, useful inferences are drawn. Data analysis primarily focuses on comparing categorical variables within the same population using the Chi-square test and comparing continuous variables using the correlation coefficient test. Microsoft Excel software was used to analyse the results.

6.1.1 Demographic Composition of Sample

Table 1 illustrates the general demographic composition of the survey sample which comprises of 257 respondents from all the 14 regions of the Czech Republic, with 151 males (58.8%) and 106 females (41.2%). Obviously, on the topic of attitudes towards vehicles, men exhibit more interest in participating than women. The highest number of respondents who participated in the survey emerge from the 26 to 35 and 18 to 25 age groups respectively, since they are young and technologically savvy. In contrast, the lowest number of respondents emerge from the 56 and above age group, since they are less interested in new technologies and products and exhibit more loyalty to ICEVs. With educational background, it is observed that respondents with bachelor's degrees are the highest, followed by master's degree holders and secondary school level with graduation

respectively. Only 1 respondent representing 0.4% holds elementary education recording the least in the educational background demographic. With occupation, the highest number of respondents are public and private sector managers, IT professionals, office workers in the private sector and professionals in the technological and engineering related field, respectively. The least respondents emanate from manual workers, students, media persons and one person retired. The highest number of respondents were received from Prague, South Moravia, Central Bohemia, and Moravia-Silesian regions, with the lowest respondents from Karlovy Vary, Vysocina, Pardubice, and South Bohemian regions.

Table 1: Demographic composition of sample. (Source: own research)

Demographics	Number (*n*)	Percentage (%)
Gender		
Males	151	58.8
Females	106	41.2
Age Groups		
18 to 25 years	70	27.2
26 to 35 years	88	34.2
36 to 45 years	51	19.8
46 to 55 years	28	10.9
56 years and above	20	7.8
Educational Background		
Elementary	1	0.4
Secondary School (Apprenticeship)	8	3.1
Secondary with Graduation	43	16.7
Higher Professional	15	5.8
Bachelor's Degree	88	34.2
Master's Degree	86	33.5
Doctoral (PhD)	16	6.2
Occupation		
Manager (Private or Public Sector)	45	17.5
Office Worker (Company, NGO, etc.)	34	13.2
Official (Government, Public Administration, etc.)	14	5.4
Teacher	14	5.4
Professional (Health, Advocacy, Counselling, etc.)	13	5.1
Professional (Technical - Engineering, Construction, etc.)	30	11.7
Manual Worker	9	3.5
Service Industry	17	6.6
Artistic and Creative Art	11	4.3
Media	4	1.6
Information Technology (IT)	39	15.2
Finance / Trade	18	7
Student	8	3.1
Retired	1	0.4

Region of Residence		
Prague	64	24.9
Central Bohemian	27	10.5
Plzen	12	4.7
Zlin	20	7.8
Karlovy Vary	5	1.9
Usti	10	3.9
Liberec	15	5.8
Pardubice	8	3.1
Hradec Kralove	9	3.5
Vysocina	8	3.1
Olomouc	12	4.7
South Bohemian	9	3.5
Southern Moravia	36	14
Moravian-Silesian	22	8.6
Total	**257**	**100**

6.1.2 General Expectations of Vehicles

First, participants were asked about their general opinions about vehicles, to assess the cognitive component of consumer attitudes, as well as their expectations and needs regarding vehicles. Specifically, the first question concerned what consumers like and expect from driving a vehicle. The outcome of the research suggests a relatively high cognitive response in favour of mobility and convenience, representing 61.1%, followed by independence, privacy, and security with 23% and comfort placing third with 8.6%. The least response recorded was psychological health benefits with just 0.8% (see Appendix P II for pie-chart).

Table 2: General expectations for cars from sample. (Source: own research)

Expectations	**Number of Respondents (*n*)**	**Percentage (%)**
Chance to Explore	9	3.5
Comfort	22	8.6
Independence, Privacy & Security	59	23
Mobility and Convenience	157	61.1
Psychological Health Benefits	2	0.8
Relieving Stress	8	3.1
Total	**257**	**100**

The second question assessed general factors consumers consider when purchasing a vehicle. Utilizing a five-point scale from 1 to 5, participants rated each of the six factors, to determine what they consider most when shopping for vehicles. These six factors are style, brand name, size of vehicle, cost of ownership, type of vehicle, and vehicle history.

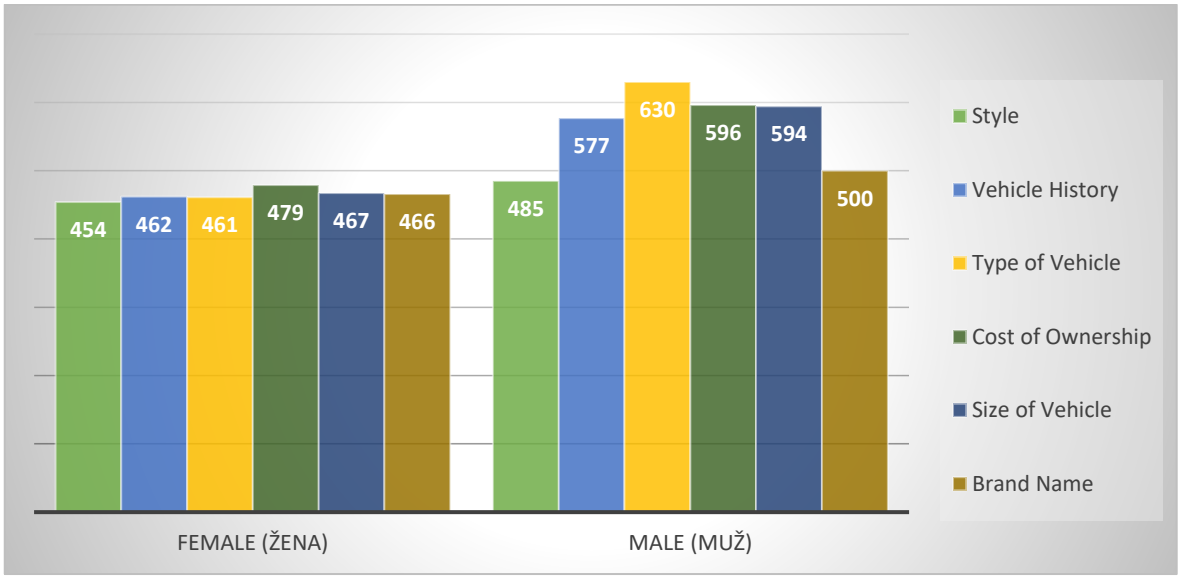

Figure 1: Pivot chart illustrating factors of preference between males and females. (Source: own research)

Figure 1 shows how participants rated the six factors according to the survey and is divided into gender demographics. Females exhibit the strongest desire for cost of ownership, followed by the size of the vehicle, and brand name. The least factor rated is style, followed by vehicle history and type of vehicle. This explains that females are most concerned with overall financial obligations with owning vehicles, and least concerned with vehicle aesthetics. On the other hand, males demonstrate the strongest desire for type of vehicle, secondly, cost of ownership and thirdly, size of vehicle. The least feature rated is style, with vehicle history and brand name following chronologically. It can be extrapolated that males are most concerned with the type of vehicle (e.g., sports car, crossover, sedan, etc.), and just like females, are least concerned with vehicle aesthetics. In summary, combining the responses of both genders, Czech consumers highly regard the type of vehicle (17.7%), followed by cost of ownership (17.4%), the size of vehicle (17.2%), and vehicle history (16.8%). The least preferences are the brand name (15.7%) and aesthetics (15.2%) (see Appendix P III for graph).

6.1.3 Experience with Battery Electric Vehicles

This section deals with data received from respondents regarding their experience with BEVs and HEVs. As previously defined in the theory, an HEV is powered by an internal-combustion engine (ICE) and an electric motor. Due to its limited battery capacity, the electric motor can only provide power to start and accelerate the vehicle. Also, in HEVs, the batteries are charged by recovering energy through deceleration or braking, not by outlets (eds. Contestabile, Tal & Turrentine, 2020). From this classification, driving an HEV could be determined as an introductory experience to a BEV.

Table 3: Experience with BEVs and HEVs according to gender and age groups. (Source: own research)

Experience	18 to 25 years	26 to 35 years	36 to 45 years	46 to 55 years	56 years and above	Grand Total
No	**46**	**58**	**25**	**10**	**11**	**150**
Females	29	22	11	1	3	66
Males	17	36	14	9	8	84
Yes (BEV)	**10**	**12**	**15**	**13**	**8**	**58**
Females	6	2	3	4	1	16
Males	4	10	12	9	7	42
Yes (HEV)	**14**	**18**	**11**	**5**	**1**	**49**
Females	11	9	4	-	-	24
Males	3	9	7	5	1	25
Grand Total	**70**	**88**	**51**	**28**	**20**	**257**

In Table 3, survey participants' experiences with BEVs and HEVs are broken down by gender and age group. Among females between 18 and 25 years of age, 6 respondents out of a total of 16 have experience with BEVs, and 11 respondents out of a total of 24 from the same age group have experience with HEVs. The second highest age group admitting experience with BEVs is the 46- to 55-year-olds, with only 4 respondents, followed by the 36- to 45-year-olds with 3. Just one respondent from the 56 and older age group has BEV experience. Women aged 26 to 35 years hold second place with 9 respondents for HEV experience, and women aged 36 to 45 hold third place with 4 respondents. There were no respondents aged 46 to 55 and 56 and above who had experience with HEVs.

With respect to BEV experience with male respondents, the age group 36 to 45 years recorded the highest number with 12, followed by the 26 to 35 years group with 10. The age group 46 to 55 years comes in third with 9. It is interesting to note that the oldest age group recorded 7 and the youngest recorded 4. With 9 respondents, the age group 26 to 35 years reported the most HEV experience, followed by 46 to 55 years with 5. With 3 and 1 respectively, the youngest and oldest age groups are fourth and fifth, respectively.

Table 4: Experience with BEVs and HEVs according to gender. (Source: own research)

Experience	**Females**	**Males**	**Grand Total**
No	66	84	**150**
Percentage (%)	62.3	55.6	58.4
Yes (BEV)	16	42	**58**
Percentage (%)	15.1	27.8	22.6
Yes (HEV)	24	25	**49**
Percentage (%)	22.6	16.6	19.1
Grand Total	**106**	**151**	**24**
Percentage (%)	100	100	100

Based on gender and their respective percentages, Table 4 illustrates experiences with BEVs and HEVs. There are 62.3% of females with no experience with BEVs, 15.1% with BEV experience, and 22.6% with HEV experience. In contrast, 27.8% of males have experience with BEVs, while 58.4% and 19.1% have no experience with BEVs and HEVs, respectively. The results show that females (22.6%) have more experience with HEVs than males (16.6%), however the situation is reversed for experience with BEVs, with males having an advantage over females. Additionally, we can deduce that females in the Czech Republic are more inclined to HEVs, whereas males are also inclined to BEVs with respect to experience. However, owing to this outcome, it is significantly clear that the great majority of both genders have no experience with BEVs, which identifies that BEVs are unpopular in the Czech Republic.

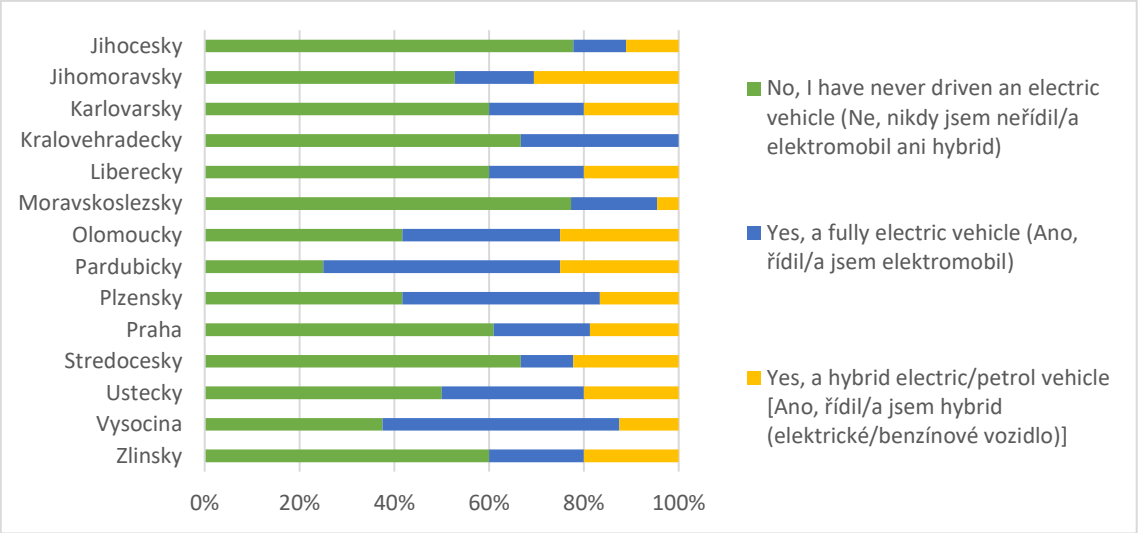

Figure 2: Experience with BEVs and HEVs according to regions. (Source: own research)

The least regions with BEV experience are the South Bohemia (Jihocesky) and Karlovy Vary (Karlovarsky) regions with 1 respondent each. Hradec Kralove (Kralovehradecky), Liberec (Liberecky), Central Bohemia (Stredocesky), and Usti (Ustecky) recorded 3 respondents each for BEV experience. Following with 4 respondents for BEV experience are the Moravia-Silesian (Moravskoslezsky), Olomouc (Olomoucky), Pardubice (Pardubicky), Zlin (Zlinsky), and Vysocina regions. Obviously, from the biggest region and capital city of the Czech Republic, Prague had the highest number of respondents with BEV experience with 13, followed by South Moravia (Jihomoravsky) with 6 and Plzen (Plzensky) regions with 5. The situation is similar for Prague and South Moravia regions with HEV experience, with 12 and 11 respectively. Central Bohemia comes third with 6 HEV experiences, and Zlin follows with 4.

The remaining regions with HEV experience are Olomouc and Liberec with 3 each; Pardubice, Plzen, and Usti with 2 each, and South Bohemia, Karlovy Vary, Moravia-Silesian, and Vysocina regions have only 1 each. No respondent attested to having experiences with HEVs in the Hradec Kralove region. In summary, 58.4% of Czech consumers have no experiences with BEVs, with just 22.6% having driven BEVs, and 19% have experiences with HEVs. From these findings, we can conclude that BEVs are unpopular in the Czech Republic.

6.2 The Outcome of Knowledge on Consumer Attitudes

To better understand how knowledge impacts consumers' attitudes, we asked respondents to rate perceived advantages and disadvantages. In addition, we assessed their knowledge of BEVs compared to ICEVs, the preferred maximum charging hours, the ideal charging location, and key factors for purchasing a BEV.

6.2.1 Attitudes Toward Advantages of Battery Electric Vehicles

Question number 4 in the survey demanded participants to rate the advantages of BEVs, which are also the drivers supporting the growth of the BEV market. From secondary data and as previously mentioned in the theoretical aspect (Ramos, 2022; eds. Contestabile, Tal & Turrentine, 2020; Vij, 2022; Heisel, 2020; Drive Clean, 2021), seven advantages were outlined in the fourth question where participants had to rate each factor, based on how advantageous they perceive BEVs, from 0 to 100%.

Table 5: Rating of advantages of BEVs by survey participants. (Source: own research)

	Safe to Drive	Low Maintenance Cost	Better Driving Experience	High Resale Value	No Fuel Required	Very Fast	Convenience
Mean	50.62	55.53	55.64	30.00	60.27	55.33	55.72
Mode	0	100	100	0	100	100	100
Median	50	60	60	20	80	70	70

Based on the responses to question number 4 of the questionnaire, Table 5 illustrates the respondents' perceptions of the seven advantages of BEVs. To measure central tendency, the mean, or in simple terms, the average, is the sum of all values divided by the total number of values (Bhandari, 2020). The highest mean of 60.27 is recorded by ‘no fuel required’, followed by ‘convenience’ and ‘better driving’ experience with 52.72 and 55.64 respectively. The lowest mean recorded is ‘high resale value.’ This means that averagely, consumers find BEVs as highly advantageous with their ‘no fuel required’ characteristic, and averagely find these vehicles as less advantageous with its high resale value. The mode determines the most frequently occurring value and measures central tendency as well as the most popular choice of consumers. Rating in percentages from 0 to 100, the most popular choice of consumers for drive safety and high resale value was zero (0), and in

contrast, 100 for no fuel required, convenience, better driving experience, speed, and low maintenance cost.

Besides measuring the median, which is the value in the middle of an ordered dataset, it also measures the central tendency that separates the lowest 50% from the highest 50%. When comparing the mean and median of results with a skewed right distribution, the mean is generally higher (Bhandari, 2020). This situation occurs with drive safety and high resale value, which are the least ranked advantages of BEVs by consumers. As a result, the distribution is skewed right and asymmetrical, with quite a few values at the low end, and a large number at the high end. The median, which is the middle number of the responses from the smallest to the largest, falls into the lower range (where most of the numbers come from). Despite this, because the mean is an average of all values, high and low, the few outliers on the high end increase the mean. On the other hand, when comparing the mean and median of results with a symmetrical distribution, they are fairly close. A symmetrical data set has a mean and median that are close together because the middle value, when ordered from smallest to largest, represents the average, the balancing point in the data (Bhandari, 2020). This is evident in results from no fuel required, convenience, better driving experience, low maintenance cost, and speed.

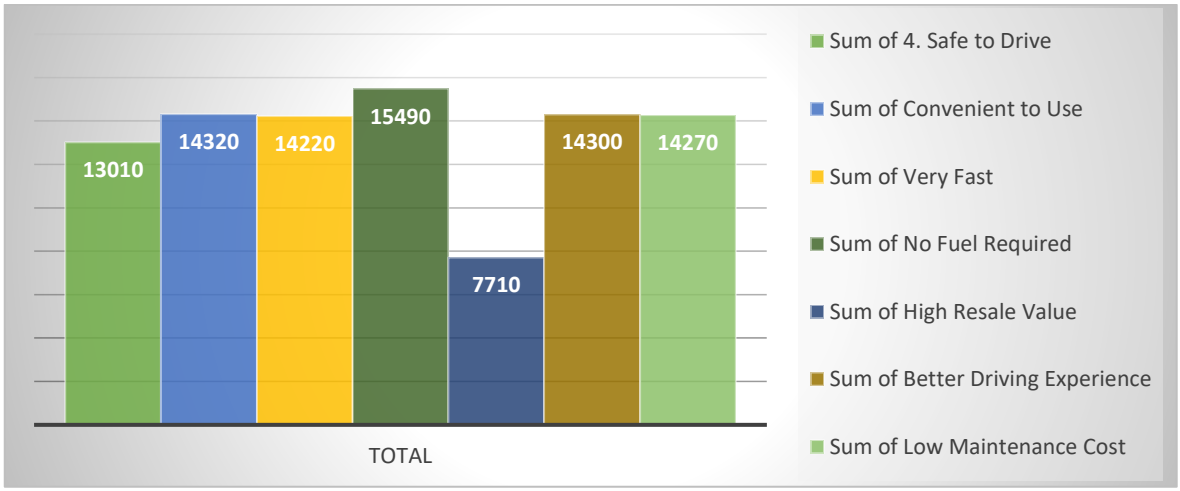

Figure 3: Total sum of advantages of BEVs from consumers. (Source: own research)

In summary, from figure 3, consumers in the Czech Republic rate ‘no fuel required’ for BEVs as extremely advantageous with 16.6%, and in second place, ‘convenience’ follows with 15.35%. Closely following in third, fourth, and fifth places are, better driving experience (15.32%), low maintenance cost (15.29%), and speed (15.24%), respectively.

Drive safety places sixth with 13.94%, and the least rated advantage is high resale value with a minimal percentage of 8.26%. Since BEVs do not require fuel for their operation, majority of consumers in the Czech Republic believe that the major driver supporting the gradual market growth of these vehicles is this advantage over ICEVs.

6.2.2 Attitudes Toward disadvantages of Battery Electric Vehicles

Similar to Question number 4, Question number 5 in the survey demanded participants to rate the disadvantages of BEVs, which are also the barriers hindering the BEV market. From secondary data and as previously mentioned in the theoretical aspect (National Research Council, 2013 & 2015; Vogt & Bongard, 2015; van Essen et al., 2015; Gregory, 2021; Wood, 2022), seven disadvantages were outlined in the fifth question where participants had to rate each factor, based on how disadvantageous they perceive BEVs, from 0 to 100%.

Table 6: Rating of disadvantages of BEVs by survey participants. (Source: own research)

	Less Charging Stations	**Expensive Battery Replacement**	**Long Charging Time**	**Short Driving Range**	**Too Heavy**	**Expensive Price**	**Too Silent**
Mean	74.01	82.10	70.97	76.26	65.68	82.30	41.44
Mode	100	100	100	100	100	100	0
Median	80	90	80	80	80	90	40

Table 6 illustrates respondents' perceptions of the seven disadvantages of BEVs based on their responses to question number 5 of the questionnaire. As the highest mean score, 82.30 was recorded for 'initial expensive price,' followed by 82.10 for 'expensive battery replacement,' and 76.26 for 'short driving range'. In terms of mean, 'BEV silence' (too quiet) which may lead to accidents is the lowest. As a result, consumers find BEVs highly disadvantageous with their initial high cost, and less disadvantageous with their quietness. From 0 to 100, consumers' most popular choice for silence is zero (0), and for other perceived disadvantages, 100. When comparing the mean and median of results with a skewed right distribution, the mean is generally higher. This situation occurs with the silence of BEVs, which is the least ranked disadvantage by consumers, and the distribution is skewed right and asymmetrical. Conversely, the mean and median are fairly close when compared to a symmetrical distribution. The results are evident in the limited number of

charging stations, the expensive battery replacements, the prolonged charging time, the short driving range, the excess weight, and the high purchase price of BEVs.

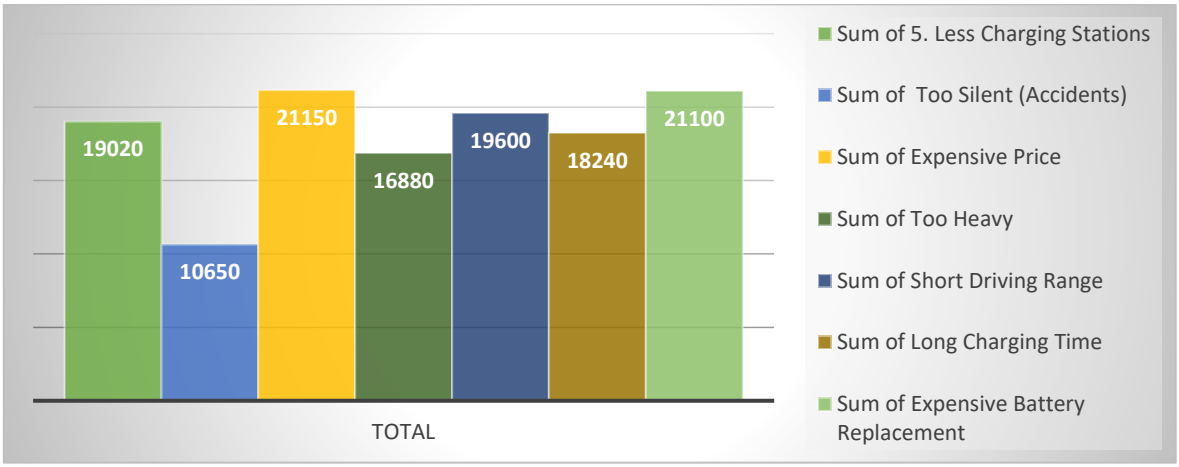

Figure 4: Total sum of disadvantages of BEVs from consumers. (Source: own research)

In conclusion, from figure 4, consumers in the Czech Republic rate 'expensive price' for BEVs as highly disadvantageous with 16.7%, and in second place, expensive battery replacement follows with 16.66%. Keenly following in third, fourth, and fifth places are short driving range (15.48%), less charging stations (15%), and long charging time (14.4%), respectively. Excess weight (too heavy) places sixth with 13.33%, and the least rated disadvantage is BEV silence (which may lead to accidents) with a minimal percentage of 8.41%. Majority of Czech consumers believe the major barrier hindering the BEV market is the price.

6.2.3 Comparison Between Battery Electric Vehicles and Internal-Combustion Engine Vehicles

For Question number 7 of the survey, participants were required to express their degree of agreement or disagreement with six statements which compared BEVs to ICEVs. Utilizing a five-point Likert scale, the points were strongly agree, agree, no idea, disagree, and strongly disagree. The six statements provided were a combination of the barriers hindering and drivers supporting the market growth of BEVs. The first statement compared the noise levels, and the second compared the speed between the two types of vehicles. The third statement compares eco-friendliness and the fourth compared overall costs between charging and fuelling between BEVs and ICEVs respectively. The fifth statement compared initial price and the sixth compared technology between these vehicles.

Table 7: Responses from sample illustrating attitudes in comparison between BEVs and ICEVs in exact numbers. (Source: own research)

	Quieter than ICEV	**Faster than ICEV**	**Ecofriendly than ICEV**	**Cost to Charge Cheaper than fuel**	**BEV Price cheaper than ICEV**	**BEV Tech has improved than ICEV**
Agree	100	104	60	60	16	90
Strongly Agree	138	102	64	54	17	89
No Idea	10	35	12	53	26	30
Disagree	5	12	52	61	58	30
Strongly Disagree	4	4	69	29	140	18
Grand Total	**257**	**257**	**257**	**257**	**257**	**257**

Table 8: Responses from sample illustrating attitudes in comparison between BEVs and ICEVs in percentages. (Source: own research)

	Quieter than ICEV	**Faster than ICEV**	**Eco-friendly than ICEV**	**Cost to Charge Cheaper than fuelling**	**BEV Price cheaper than ICEV**	**BEV Tech has improved than ICEV**
Agree	38.91	40.47	23.35	23.35	6.23	35.02
Strongly Agree	53.7	39.69	24.9	21.01	6.61	34.63
No Idea	3.89	13.62	4.67	20.62	10.12	11.67
Disagree	1.95	4.67	20.23	23.74	22.57	11.67
Strongly Disagree	1.56	1.56	26.85	11.28	54.47	7
Grand Total	**257**	**257**	**257**	**257**	**257**	**257**

Tables 7 and 8 illustrate responses from survey participants based on their level of agreement and disagreement, with respect to comparison between BEVs and ICEVs. This was conducted to assess the knowledge of consumers. For the ‘agree’ row, most consumers believe that BEVs are faster in acceleration than ICEVs, and less agree that BEVs are

cheaper in price. Answering to ‘strongly agree’, most consumers think that BEVs are silent than ICEVs, since BEVs have no engines. The highest percentage recorded in the ‘no idea’ row with 20.62% is the comparison between the overall costs of charging and fuelling between these two types of vehicles. This percentage exceeds the percentage of consumers who strongly disagree and is very close to the percentage of consumers who strongly agree. The highest disagreement is also exhibited by consumers in the comparison between charging and fuelling. The strongest disagreement from consumers is exhibited with the statement, ‘prices of BEVs are cheaper than ICEVs.’

In inference, consumers highly agree that BEVs are silent in operation compared to ICEVs. The second highest agreement is exhibited by consumers with speed, where they believe BEVs are faster in acceleration, followed by the agreement that BEV technology has massively improved over the years compared to ICEVs. Although, most consumers agree that BEVs are eco-friendlier than ICEVs, a large proportion of Czech consumers believe otherwise. Having interactions with consumers at the MotorTechna auto show in Brno on March 15, 2023, some opined that the Czech Republic would have to combust large volumes of fossil fuel (for e.g., coal) to keep BEVs running. They also hinted that the mining of lithium-ion batteries for BEVs further degrades the environment. Owing to these two points, many consumers in the Czech Republic feel that BEVs are not as eco-friendly as marketed and advertised by OEMs. For the strongest disagreement where consumers believe that BEV prices are more expensive than ICEVs, this corresponds to the highest rated disadvantage of BEVs pointed out in the previous section of this study. Therefore, there is a correlation between the strongest disagreement with BEVs as compared to ICEVs, and the main barrier hindering the market growth of BEVs in the Czech Republic; the price.

6.2.4 Consumer Attitudes Toward Charging of Battery Electric Vehicles

For Questions number 8 and 9, consumer attitudes on charging were assessed from survey participants. Question number 8 examined the most ideal charging place for consumers’ BEVs in case they owned one.

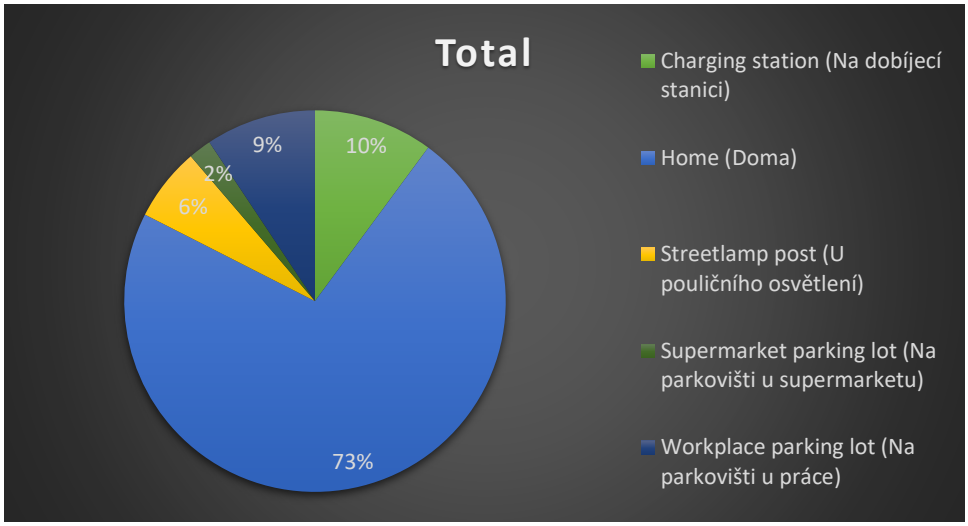

Figure 5: Pie-chart illustrating the most preferred charging place for BEVs by consumers. (Source: own research)

Figure 5 illustrates that clearly, most consumers amounting to 72.4% prefer home charging to workplace parking lot, charging stations, streetlamp posts, and supermarket parking lots. 10.1% of consumers opted for charging stations, 9.3% prefer workplace parking lots, and surprisingly, 6.2% selected streetlamp posts as their most ideal charging points. Supermarket parking lots came last with 2% as the least preferred place.

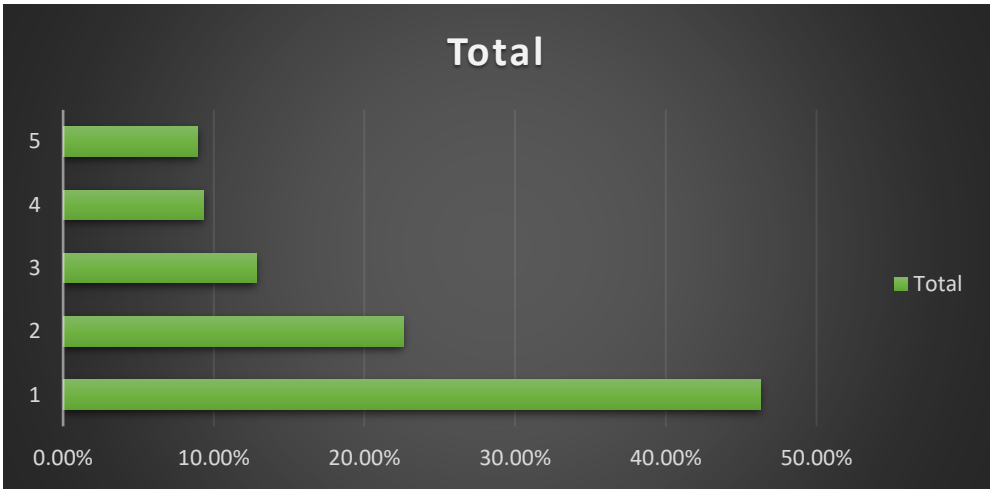

Figure 6: Pivot chart illustrating preferred maximum hours of charging by consumers. (Source: own research)

In Question number 9 of the survey questionnaire, participants were requested to choose from one to five, the preferred maximum number of charging hours for BEVs. Evidently, from figure 6, 46.3% of consumers believe 1 hour as the maximum charging time is the

best. 22.6% chose 2 hours, 12.8% selected 3 hours, 9.3% for 4 hours, and 9% for 5 hours. From this assessment, we can extrapolate that most Czech consumers prefer a limited number of hours for charging their BEVs, which is 1 hour.

6.2.5 Factors for Battery Electric Vehicle Purchase

Participants were asked to rate the importance of eight statements, which are factors considered when purchasing a BEV, in question number 10 of the survey questionnaire, using a five-point Likert scale. The eight statements are: charging costs, overall maintenance and servicing costs, the ability to purchase a used one, driving performance, driving range, charging stations availability, price, and environmental benefits.

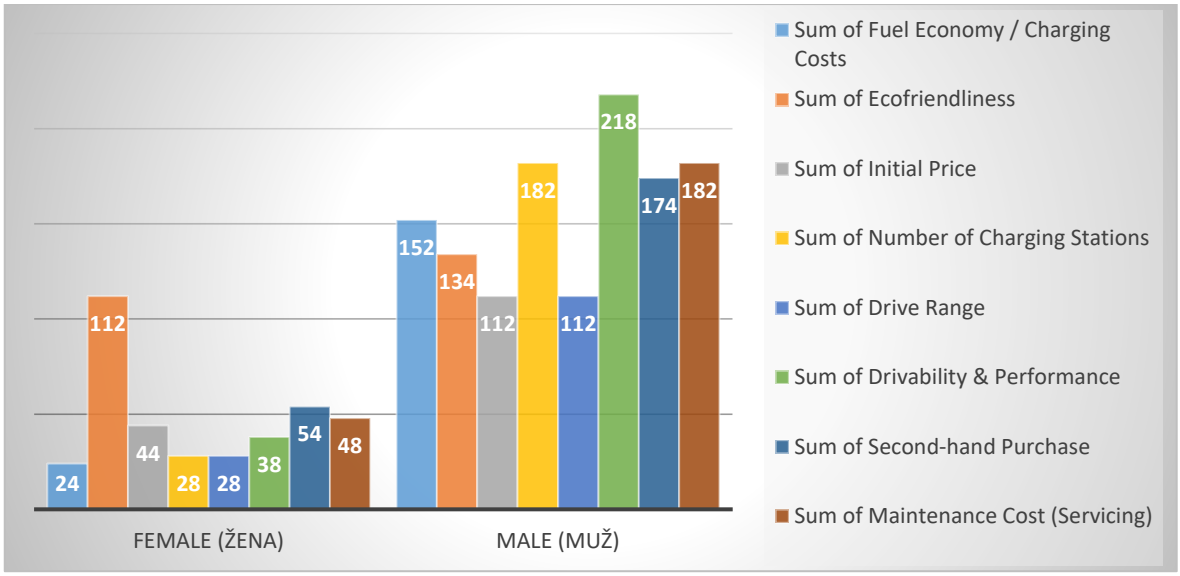

Figure 7: Pivot chart illustrating ranked factors for BEV purchase according to male and female consumers. (Source: own research)

From figure 7, it can be observed that female consumers rated environmental benefits highly than any other factor, with charging costs rated as the least factor. However, the ability to purchase a second-hand BEV is rated as the second most vital factor, with overall maintenance and servicing costs placing third. Initial price comes fourth, and driveability and performance place fifth. Interestingly, there is a tie between drive range and charging station availability, placed sixth by female consumers. On the other hand, male consumers consider driveability and performance as the ultimate factors for purchasing BEVs, and a tie is realized between drive range and initial price as the least factors. Another tie is recognized between charging station availability and overall maintenance and servicing costs, as the second most considered factors. Following closely in fourth position is the

ability to purchase a second-hand BEV, and placing fifth and sixth are charging costs and environmental benefits, respectively.

From the findings, we can deduce that female Czech consumers factor environmental benefits and the ability to purchase used BEVs highly than male consumers. In contrast, male Czech consumers highly consider drivability and performance, overall maintenance and servicing costs, and availability of charging stations across the country than female consumers. In summary, Czech consumers consider driveability and performance as the highest factor for BEV purchase by 15.6%, secondly with environmental benefits with 15%. Overall maintenance costs and servicing comes third with 14%, and the ability to purchase a used BEV places fourth with 13.9%. Placing fifth, sixth, seventh, and eighth are charging station availability (12.8%), overall charging costs (10.7%), initial price (9.5%), and drive range (8.5%), respectively (see Appendix P V for graph).

6.3 Attitudes Toward Brand Loyalty

Question number 11 of the survey questionnaire required participants to rate five factors for brand loyalty to OEMs, using a five-point Likert scale. The factors are extended warranty, reward programmes, battery care, regular software updates, and smartphone connectivity to BEVs.

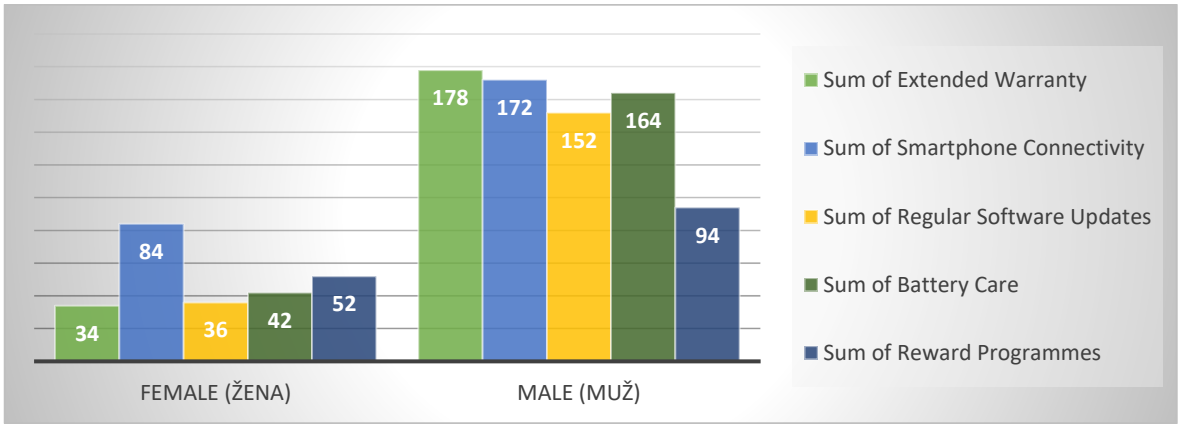

Figure 8: Pivot chart illustrating ranked factors for brand loyalty between male and female consumers. (Source: own research)

From figure 8, it can be observed that female consumers rated smartphone connectivity as the highest preference, and extended warranty was rated lowest for BEV brand loyalty. Reward programmes is considered second with female consumers but ranked last with male consumers. Both battery care and regular software updates are ranked third and fourth

among male and female consumers. Unlike females, male consumers rated extended warranty as the first and foremost factor, with smartphone connectivity placing second. In summary, Czech consumers rate smartphone connectivity with BEVs as the topmost factor with 25.4%, and second with extended warranty by 21%. In third, fourth, and fifth position are battery care (20.4%), regular software updates (18.7%), and reward programmes (14.5%), respectively (see Appendix P VI for graph).

6.4 Purchase Intention of Battery Electric Vehicles

Question number 6 of the survey questionnaire required participants to determine their willingness to buy BEVs in the next five years. Six possible answers were provided to choose from, instead of a typical yes or no response.

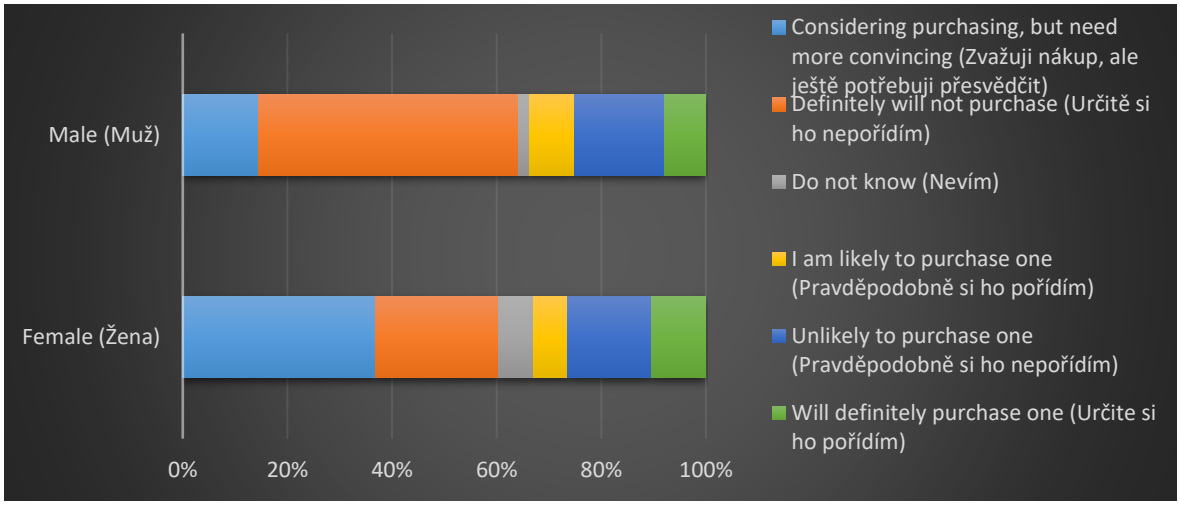

Figure 9: Pivot chart illustrating purchase intention of BEVs between male and female participants. (Source: own research)

From figure 9, it can be observed that with regards to the response ‘considering purchasing, but need more convincing’, female participants take the lead with 36.8% against males with 14.6%. This means compared to males, females are more interested in purchasing BEVs, but need to be convinced more through further consumer education and effective marketing communication efforts. The situation continues for the response, ‘will definitely purchase one’, where females outshine males with 10.4% against 8% respectively. Regarding the response, ‘do not know’, which suggests uncertainty with BEV purchase, females outnumber males with 6.6% against 2% with males respectively. On the other hand, 49.7% of male respondents are definitely not interested in purchasing BEVs,

compared to females with 23.6%. Furthermore, with the response, 'I am likely to purchase one', which suggests a little intention to purchase but not very certain, males dominate 8.6% against females with 6.6%. The trend continues with the response, 'unlikely to purchase' which is a much polite manner of expressing unwillingness to purchase BEVs, where males outnumber females with 17.2% against females with 16%. From this finding, we can infer that female consumers in the Czech Republic are more interested in purchasing BEVs in the next five years than males.

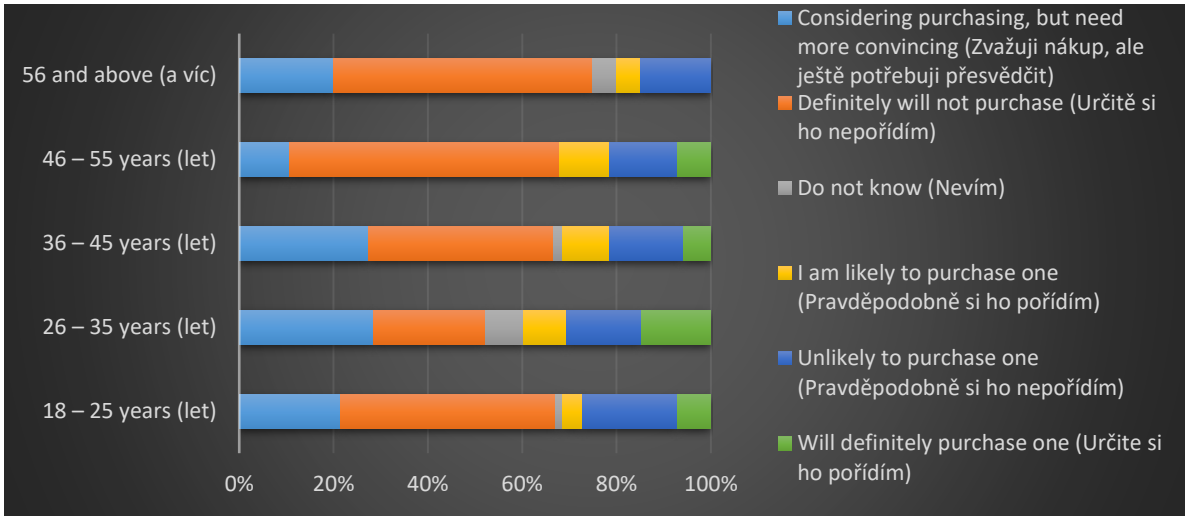

Figure 10: Pivot chart illustrating purchase intention of BEVs among age groups of sample. (Source: own research)

Figure 10 shows purchase intention from respondents sorted into the five age groups used in the survey. People aged between 26 and 35 years form the majority with considering purchasing BEVs but need to be convinced more, with 28.4%, and definite purchase intention in the next five years with 14.8%. For definite purchase intention, placing second are the age groups 18 to 25 and 46 to 55 years, with both exhibiting 7.1%. In fourth place for definite purchase intention is the age group 36 to 45 years with 5.9%. However, no respondent aged 56 years and above agreed to definitely purchase a BEV, but 20% express interest but need to be convinced more. The highest score for disapproval is also recorded by people aged between 46 and 55 years with 57.1%, followed by people aged 56 years and above with 55%.

In summary, persons aged between 26 and 35 years in the Czech Republic demonstrate the highest intention to purchase BEVs in the next five years, followed by persons aged between 36 and 45 years of age. These two age groups are classified as millennials.

Following in third position for highest purchase intention for BEVs in the next five years are persons aged between 18 and 25 years and are classified as Generation Z. Placing fourth are persons aged between 46 and 55 years of age, classified as Generation X, and persons aged 56 years and above (Baby boomers) demonstrate the least purchase intention.

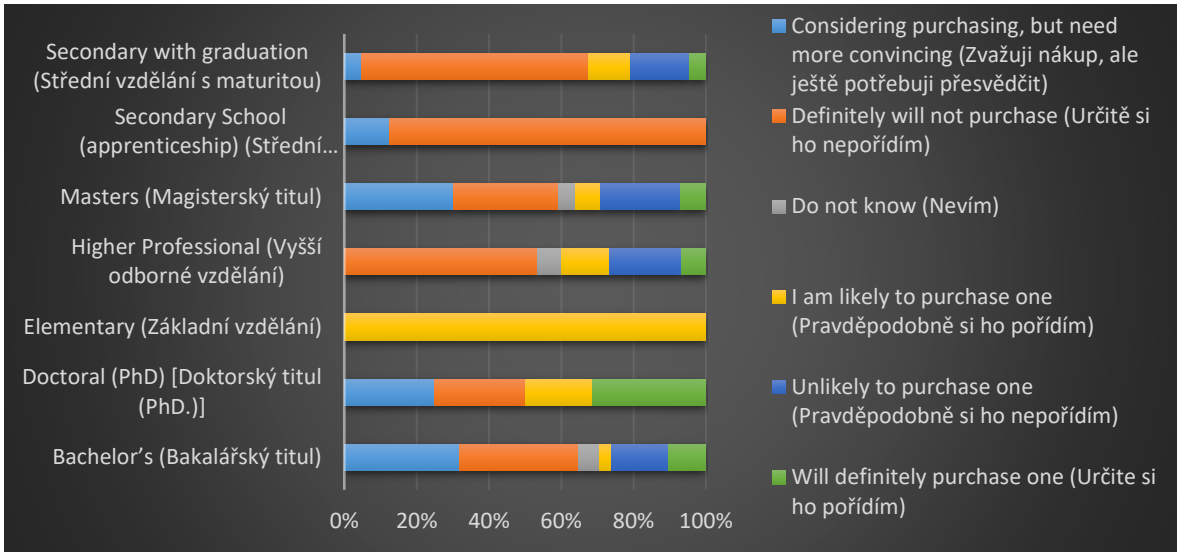

Figure 11: Pivot chart illustrating purchase intention of BEVs among educational background of sample. (Source: own research)

Figure 11 displays purchase intention of BEVs in the next five years according to the educational background of the survey sample. It can be observed that persons with doctorate degrees express the highest purchase intention with 31.3%, 18.8% and 25%, by answering, 'will definitely purchase one', 'likely to purchase one', and 'considering purchasing, but need to be convinced more', respectively. Persons who hold a master's degree place second with 7% each agreeing to definitely purchase and likely to purchase, and 30.3% hinting to likely purchase but need to be convinced more. Closely following is in third position are people who hold a bachelor's degree, with 10.2% admitting to surely purchase, 3.4% agreeing to likely purchase, and 31.8% admitted to considering purchasing but need to be convinced more with marketing efforts.

The highest disapproval emerges from persons who hold secondary school with apprenticeship status, with 87.5% admitting to 'definitely will not purchase'. We can easily conclude from this finding that consumers who are highly educated in the Czech Republic are more interested in purchasing BEVs than consumers with less educational backgrounds. Therefore, the main target consumers for BEVs are the highly educated class of the Czech Republic.

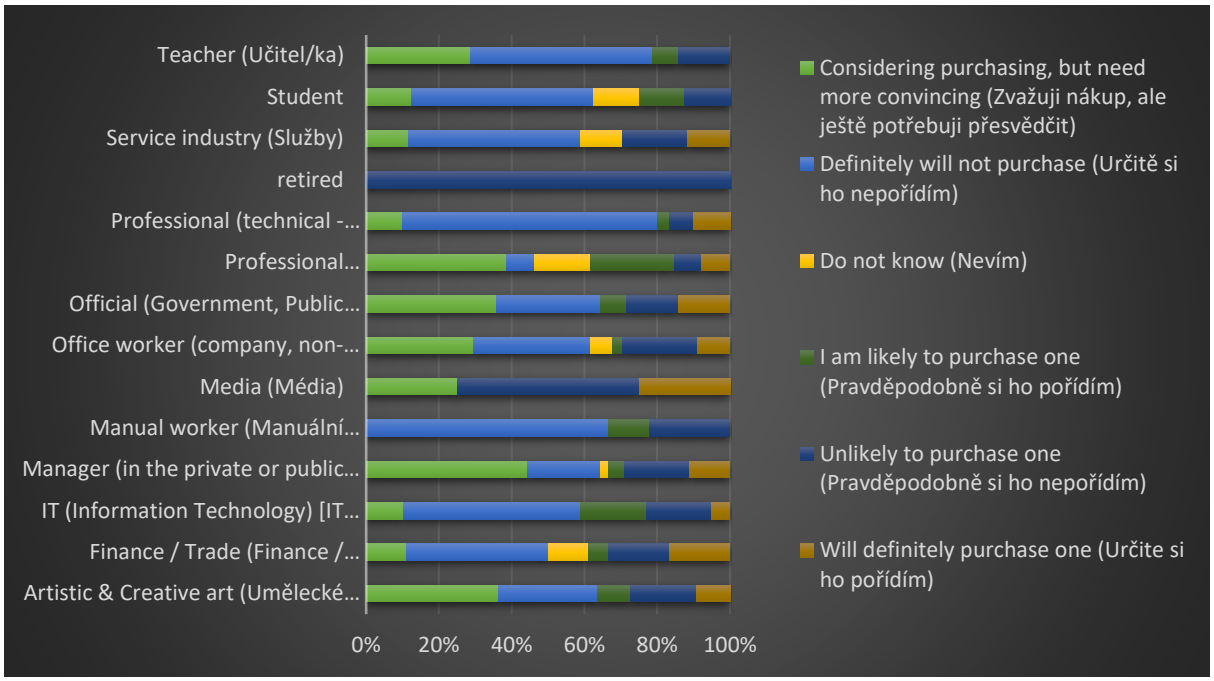

Figure 12: Pivot chart illustrating purchase intention of BEVs among occupation of sample. (Source: own research)

Figure 12 displays purchase intention of BEVs in the next five years from survey sample according to their occupation. It is observed that, professionals (in health, advocacy, counselling, etc.) record the highest purchase intention rate, with 38.5% accepting to purchase but need to be convinced more, 23.1% admitting to likely purchase, and 11.1% agreeing to definitely purchase. Managers in the private and public sector come second with 4.4% likely to purchase BEVs, 44.4% considering purchasing but need more convincing, and 11.1% intend to definitely purchase in the next five years. Following keenly in third and fourth positions are officials (in government and public administration) and creative art industry persons, respectively. In fifth position is media persons, financial experts come sixth, and office workers (in NGOs) place seventh with purchase intention. The least interested in purchasing BEVs are the retired, manual workers, professionals (in the technical, engineering, and construction field), service industry persons, and students.

Therefore, we can extrapolate that healthcare professionals, counsellors, advocates, managers in the public and private sector, governments officials and public administrators, creative art persons, and media personalities, are the potential customers for BEV adoption in the Czech Republic. Notwithstanding this finding, a greater percentage of persons in all related occupation expressed their disapproval for BEVs in the next five years, alluding to

the fact from secondary data that BEVs are unpopular in the Czech Republic. Summarizing purchase intention, only 9% of respondents expressed high interest in purchasing BEVs in the next five years, by answering 'will definitely purchase'. Also, only 7.8% of respondents are likely to purchase, and 23.7% want to purchase but need to be convinced more through effective marketing campaigns. In contrast, 38.9% of respondents claimed they absolutely are not interested in purchasing, with 16.7% answering to 'unlikely to purchase', and 3.9% do not know. From these findings, it is explicit that purchase intention for BEVs in the Czech Republic is relatively low (see Appendix P VII for graph).

6.5 Future Certainty

In Question number 13 of the survey questionnaire, we assessed the future certainty of BEVs in the Czech Republic as a viable means for transportation. Survey participants were asked if they sincerely believed that BEVs are the future of mobility. Five possible answers were provided in a five-point Likert scale, namely: strongly agree, agree, no idea, disagree, and strongly disagree.

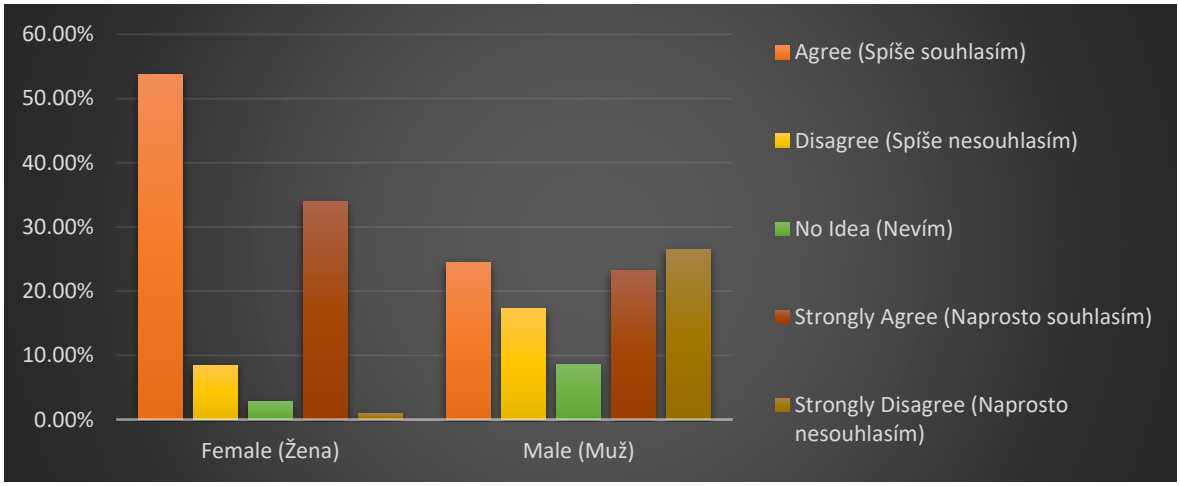

Figure 13: Pivot chart illustrating the future certainty of BEVs between male and female participants. (Source: own research)

Figure 13 illustrates the responses from both genders with respect to the future certainty of BEVs. It is observed that females are more optimistic about the future of BEVs than males. 53.8% of females agree while only 24.5% of males agree to this assertion. For the strongly agree response, females express more optimism with 34% against males with 23.2%. For uncertainty with the 'no idea' response, males dominate with 8.6% against 2.8% for females. Females disagree with this assertion by 8.5%, and strongly disagree with just 1%.

On the other hand, males disagree with 17.2% and strongly disagree with 26.5%. Consequently, we can infer that women in Czech Republic are optimistic about the future of electromobility than men. This finding, however, correlates with purchase intention as discussed in the previous section with regards to comparison between both genders, where women tend to be more interested in purchasing BEVs in the next five years.

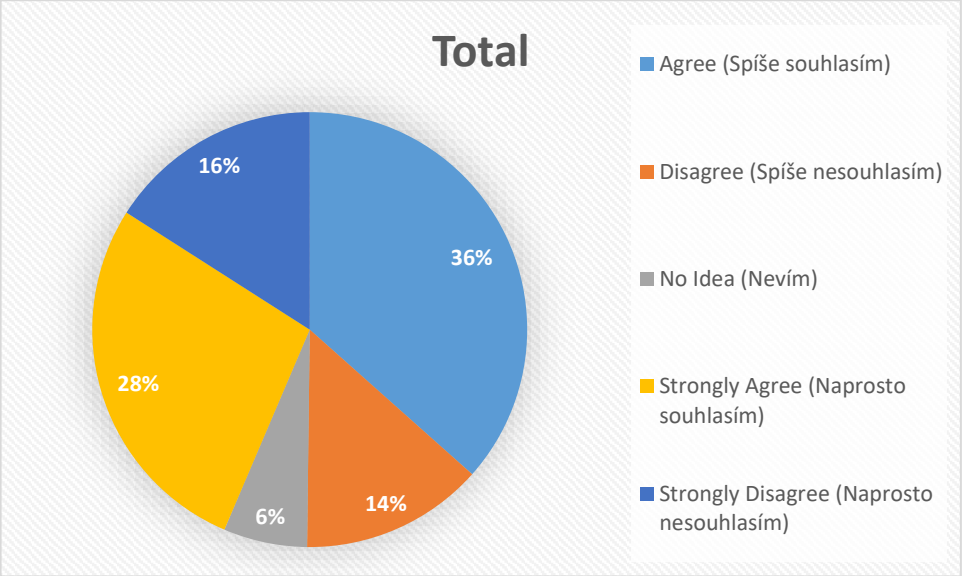

Figure 14: Pie chart illustrating the future certainty of BEVs in overall percentages. (Source: own research)

From figure 14, the pie-chart exhibits the overall responses for the future certainty of BEVs. 36.6% of respondents agree, 27.6% strongly agree, 6.2% are uncertain, 13.6% disagree, and 16% strongly disagree. This means that there is relatively low future certainty with BEVs in the Czech Republic. Generally, from the results and findings of this study, it is absolutely explicit that BEVs are unpopular in the Czech Republic, compared to other European countries such as Norway, Iceland, Sweden, Denmark, Netherlands, Finland, and Germany.

7 ANSWERING RESEARCH QUESTIONS

RQ1: Why are BEVs unpopular in the Czech Republic?

Based on the findings presented in this thesis, it can be concluded that BEVs are not popular in the Czech Republic. This can be attributed to several factors. Firstly, most consumers have no experience with BEVs, with only 22.6% of respondents having driven BEVs and 19% having experience with HEVs. This lack of experience may be due to the limited availability of BEVs in the country, which can be a result of a variety of factors such as low consumer demand, lack of government incentives, and limited charging infrastructure and limited consumer education in advertising campaigns.

Moreover, the initial cost of purchasing a BEV is perceived as high, with the highest mean score of 82.30 recorded for 'initial expensive price', followed by 82.10 for 'expensive battery replacement' and 76.26 for 'short driving range'. These factors contribute to the perception that BEVs are not cost-effective for most consumers, and as such, they are less inclined to purchase them. Furthermore, the limited number of charging stations, perceived long charging time, and short driving range are also regarded as significant disadvantages that make BEVs less practical and less convenient for everyday use.

It is also interesting to note that the results suggest that females in the Czech Republic are more inclined towards HEVs, whereas males are more inclined towards BEVs with respect to experience. This gender difference in preference could be due to various factors, including differences in perceived benefits and disadvantages, lifestyle, and financial considerations. Also, this situation may be because HEVs offer a compromise between the environmental benefits of BEVs and the convenience and reliability of traditional conventional vehicles. Additionally, the lower cost of ownership and maintenance associated with HEVs makes them a more attractive option for many consumers.

In summary, the low popularity of BEVs in the Czech Republic can be attributed to several factors, including limited availability, high purchase price, limited charging infrastructure, and perceived disadvantages such as short driving range and long charging time. In addition, the unpopularity of BEVs can also be due to a lack of awareness and knowledge. These factors make the experience of owning and driving BEVs less convenient and less practical than ICEVs. The research highlights that there is a need for more extensive infrastructure development, particularly in charging stations, and development in pricing,

to encourage BEV adoption in the country. Addressing these challenges is vital to achieve the government and the EU's goal of reducing greenhouse gas emissions and promoting sustainable transportation.

RQ2: Who are the people most interested in purchasing BEVs?

Answering this research question determines the target group for BEVs in the Czech Republic. Based on the results presented in the thesis, it can be inferred that younger individuals in the age group of 18 to 45 are the most interested in purchasing BEVs. This is evident from the fact that the highest number of respondents who participated in the survey and who had experience with BEVs or HEVs emerged from the three age groups: 18 to 25 (Generation Z), 26 to 35, and 36 to 45 years (Millennials). This could be attributed to several factors including their willingness to adopt new technologies, their environmental consciousness, and their familiarity with BEVs. Additionally, younger individuals may have a greater willingness to take on the initial costs associated with purchasing BEVs, given the potential long-term cost savings associated with owning one.

Furthermore, the results suggest that education level is also a significant factor in determining interest in BEVs. Respondents with higher levels of education, such as doctorates, bachelor's, and master's degrees, are more interested in purchasing BEVs. This may be because individuals with higher levels of education are more aware of the environmental impact of BEVs and are more likely to prioritize sustainability in transportation, in their purchasing decisions.

The data also indicates that individuals with higher-paying and more technology-focused jobs, such as professionals in the health, advocacy, consulting, and counselling industry; public and private sector managers; office workers in the private sector and NGOs; creative art and artistic professionals; government officials, media persons; and finance and insurance professionals, are more interested in purchasing BEVs. This may be because these individuals are more likely to have the financial means to purchase and maintain BEVs. Additionally, they have the tendency to prioritize sustainability and may have a greater understanding of technological advancements and associated benefits of BEVs.

Respondents who rated 'convenience' and 'better driving experience' as the most advantageous characteristics of BEVs are more interested in purchasing BEVs. This is an indication that consumers who prioritize convenience and driving experience may be more

interested. This trend could be attributed to the fact that BEVs offer several advantages over traditional conventional vehicles, including smoother and quieter driving experiences, and the convenience of charging at home.

In inference, younger, educated, and technologically savvy individuals, particularly those in higher-paying and more technology-focused jobs, are the most interested in purchasing BEVs. However, it is important to note that interest in BEVs may be influenced by a variety of factors, including government incentives, availability of charging infrastructure, and the perceived advantages and disadvantages (characteristics). As such, it is important for policymakers and OEMs to consider these factors when promoting and developing the BEV market in the Czech Republic.

RQ3: What can be done to increase the popularity of BEVs in the Czech Republic?

The data presented in the thesis suggests that there are several steps that can be taken to increase the popularity of BEVs in the Czech Republic. Firstly, the government can offer more incentives for the purchase of BEVs, such as tax breaks, subsidies, and reduced registration fees. These incentives would make BEVs more affordable for consumers and encourage them to consider purchasing electric cars. Additionally, the government can work to create more favourable policies for BEVs, such as setting stricter emissions standards for conventional vehicles, which would make BEVs more appealing and competitive.

Secondly, car manufacturers and services providers such as the CEZ Group can work to improve the charging infrastructure for BEVs in the Czech Republic. This would involve increasing the number of charging stations across the country, as well as investing in fast charging technology to reduce the amount of time it takes to charge. A robust charging infrastructure would make BEVs more convenient for consumers and increase their appeal. This would also help to address concerns around the limited driving range, which is a significant factor that deters many consumers from purchasing.

Thirdly, car manufacturers can work to address the perceived disadvantages of BEVs, such as their high initial cost, limited driving range, and long charging time. This could involve developing more affordable BEV models, increasing battery capacity, and improving the efficiency of charging technology. This would boost the widespread adoption of BEVs.

Fourthly, car manufacturers and policymakers can work to increase public awareness of the environmental benefits of BEVs, as well as their potential cost savings in the long run. This could involve more rationally targeted marketing campaigns, educational programs, and public outreach initiatives to increase knowledge and awareness of BEVs among consumers. By highlighting the benefits of electric cars and dispelling common myths and misconceptions, more consumers may be inclined to consider purchasing BEVs.

Last but not the least, there can be efforts to increase the availability of BEVs in the Czech Republic. This would involve working with car manufacturers to ensure that a wider range of BEV models are available for purchase in the country. This would provide consumers with more options to choose from and increase the likelihood that they will find a BEV that meets their needs and preferences. Additionally, car manufacturers can work to develop partnerships with local dealerships and expand their distribution networks, making it easier for consumers to find and purchase BEVs.

To increase the popularity of BEVs in the Czech Republic, the government through the Ministry of Transport, car manufacturers, and policymakers can work together to offer incentives, improve charging infrastructure, address perceived disadvantages, increase public awareness, and increase availability. By taking a comprehensive and collaborative approach, it is possible to create an environment in which BEVs are more widely adopted and become a more viable and attractive option for Czech consumers.

In summary, the following are additional measures to the above-mentioned solutions for BEV popularity in the Czech Republic:

Purchase Price Development: The main barrier to widespread BEV adoption in the Czech Republic is the high cost of buying a BEV. Czech consumers are concerned about the resale value of BEVs and uncertainties regarding battery technology progress and drive range. To reduce this risk, car manufacturers can offer financing programs that guarantee a certain resale value after a predetermined period. Flexible leasing offers are another way to alleviate price uncertainty and protect buyers from potential declines in BEV resale value.

Accelerating Market Growth with BEV Owners: BEV owners can accelerate market growth by dispelling doubts, myths, and negative perceptions about BEVs. They can participate in marketing initiatives such as webinars, seminars, trade shows, sales promotions, workshops, and advertisements. This will significantly impact consumer education.

Rational Advertising for BEVs: Most BEV marketing campaigns in Czech Republic lack rational appeal. This research shows that consumers do not appreciate BEVs, and to persuade them to purchase, OEMs must use facts, logic, and relevant data in advertisements. Advertisements should focus on functional benefits and problem-solving issues such as the reduction of greenhouse gas emissions from BEVs. Advertisements can highlight driving range in hours and battery capacity after a single charge. Cheaper overall maintenance cost should also be emphasized over vehicle aesthetics, which only received a 15.2% rating from most consumers.

Car Rental Adoption: Car rental companies can play a significant role in BEV popularity. Since BEVs are expensive and there is no significant used BEV market, many customers cannot afford to buy one. However, by including BEVs in car rentals, more customers can experience them first-hand. According to the findings of this thesis, 58.4% of Czech consumers have not yet experienced BEVs. Therefore, making BEVs available for rent at affordable prices can help increase their popularity in the country.

Celebrity Endorsements and Influencer Marketing: To overcome market acceptance barriers, effective communication strategies such as influencer marketing and celebrity endorsements can be used. Providing celebrities with BEVs to share on social media can help build trust and catch the attention of a larger audience.

Interactive Marketing: BEV marketers can use interactive marketing to connect with consumers on a more personal level. This can be done by clearing up uncertainty about charging hours, battery technology and capacity, ownership costs, driving safety and range, eco-friendliness, and resale value. BEV quizzes can be used to analyse responses and provide customers with the best package options. OEMs and service providers can benefit from this by increasing engagement and conversation rates.

Experiential Marketing: This is another effective way to build consumer awareness by engaging all five senses and creating lasting memories that foster loyalty. Through car races and rallies, test drives, trade shows and fairs, symposiums, in-store experiences, workshops, and sponsorships, OEMs and service providers can connect with customers in an authentic and relatable way. For raising consumer and product awareness, offline experiential marketing activities can be held in at least five of the country's major regions.

PROJECT

8 PROPOSAL FOR COMMUNICATION PROGRAMME

Proposal Title: Accelerating Market Adoption of Battery Electric Vehicles (BEVs) in the Czech Republic

8.1 Introduction

The transportation industry is changing rapidly, and the adoption of BEVs is a significant part of this transformation. In the Czech Republic, the adoption of BEVs is still in its early stages, and the findings from this thesis have confirmed this problem. Although there are many benefits to owning and driving BEVs, such as reducing carbon emissions and improving air quality, BEVs are still not widely known or understood. In this circumstance, this thesis proposal suggests and outlines a communication programme aimed at promoting the adoption and popularity of BEVs in the Czech Republic.

The following communication programme outlines an integrated marketing approach for promoting BEVs in the Czech Republic.

Project Objective

The objective of this program is to promote the use of BEVs in the Czech Republic. As the world shifts towards cleaner and more sustainable energy sources, it is important to encourage the adoption of BEVs as a sustainable alternative to conventional cars. The programme will focus on creating awareness of the benefits of BEVs, providing information on charging infrastructure, and offering test drives to potential customers. The programme will use an integrated marketing approach, including the marketing mix and various communication tools and strategies.

Mind Starters

English: Clean Vehicles for a Cleaner Czech Republic.

Translation in Czech: Čistá vozidla pro čistší Českou Republiku.

Internal Meetings for Brainstorming

Stakeholder meetings between car manufacturers, the Ministry of Transport, service providers in the BEV charging sector, BEV owners, influencers, celebrities, and advertising agencies must be held to brainstorm ideas about the campaign plan. Physical meetings can be held in the initial stages and proceeded by online meetings on Zoom or Microsoft Teams.

Sustainability

Sustainability has been a fundamental idea for decades and will be reflected in the action of this programme. The programme will promote BEVs as a sustainable alternative to conventional cars and will work closely with local communities and businesses to promote the development of charging infrastructure and increase awareness. The programme will also work with car manufacturers to ensure that the production of BEVs is sustainable and environmentally friendly. The programme will align with the Czech Republic and the European Union's values on sustainability and environmental consciousness.

8.2 Proposed Marketing Mix

The marketing mix for electric cars in the Czech Republic will include the following elements:

8.2.1 Product Policy

BEVs will be available in a range of models from various car manufacturers. The focus will be on promoting the benefits of BEVs, including lower running costs, reduced emissions, and a smoother driving experience. The programme will also highlight the technological advancements in BEVs, such as the ability to charge at home or at fast-charging stations across the country.

8.2.2 Pricing Policy

The prices of BEVs will be competitive compared to conventional cars. However, the programme will offer incentives and discounts to encourage the purchase of BEVs. These incentives could include tax credits or rebates, reduced charging fees, leasing options, or lower financing rates.

8.2.3 Promotion (Communication Policy)

The communication policy will focus on creating awareness of the benefits of electric cars through various channels, including social media, online advertising, and traditional advertising (such as billboards and radio advertisements). The programme will also organize events and workshops to educate potential customers about BEVs and offer test drives. The programme will work with celebrities, influencers, bloggers, and vloggers to create engaging content about BEVs.

8.2.4 Place (Distribution Policy)

BEVs will be available through dealerships and car rental companies. The programme will work with dealerships and car rentals to ensure that they are knowledgeable about BEVs and can offer test drives and rent out to interested customers at affordable prices. The programme will also work with local governments, the Ministry of Transport, service providers in the BEV charging space, and businesses to promote the development of charging infrastructure across the country.

8.3 The Micro-Environment (SWOT Analysis)

The programme will take into consideration the strengths, weaknesses, opportunities, and threats that may impact the adoption of BEVs. The programme will work with car manufacturers, dealerships, and local communities to address any challenges that may arise, and work with the government to address any regulatory barriers that may exist.

8.3.1 Strengths

The strengths of the programme include the availability of BEVs from various car manufacturers, the competitive pricing compared to conventional cars, the benefits including lower running costs and reduced emissions, and leasing options. The programme will also be encompassed with a strong network of partners, including car manufacturers, dealerships, local communities, BEV owners, notable celebrities, and influencers.

8.3.2 Weaknesses

A major weakness of the programme will be the lack of awareness among potential customers about the benefits of BEVs. The programme will need to invest in education and awareness-raising activities to overcome this weakness.

8.3.3 Opportunities

The programme will have opportunities to work with local communities and businesses to promote the benefits BEVs, and work with the government and service providers to promote the development of charging infrastructure across the country.

8.3.4 Threats

A major threat to the programme will be the stiff competition from conventional cars. The program will need to demonstrate the benefits and interesting characteristics of BEVs and provide incentives and leasing options to encourage customers to purchase them.

8.4 Component of Message

8.4.1 Advertising Appeal

The programme will focus mainly on promoting the advantages of BEVs, including lower running costs, reduced emissions, and a smoother driving experience. The communication strategy will use various advertising appeals, including subtle emotional, humour, fear (in a much clever manner), and romance, and mainly rational. The campaign will use storytelling to create an emotional connection with potential customers.

8.4.2 Unique Selling Point (USP)

The unique selling point of BEVs will be their environmentally friendly nature and lowered running costs compared to conventional cars. The campaign will immensely highlight these benefits and demonstrate how BEVs can improve the quality of life for individuals and communities.

8.4.3 Recipient of the Message (Target Group)

The target audience for the campaign will be individuals and businesses in the Czech Republic who are interested in sustainability. The programme will focus on reaching out to this audience through various channels, including social media, online advertising, and traditional advertising. From the findings of this thesis, we inferred that the main target for the campaign is the young, highly educated, and technologically savvy in higher-paying and more technology-focused jobs, who are mainly Millennials and Generation Z individuals. The campaign will also try as much as possible to focus on other demographic groups, so no one will be left out or ostracized.

8.4.4 Hashtag

Our proposed hashtag for this campaign is #DriveElectricCZ and translated into Czech as #PohonElektrickáCZ. This hashtag is short, catchy, and easy to remember, and propels the main message of the campaign, which is to promote the adoption of BEVs.

8.4.5 Slogan

Our proposed slogan for this campaign is "Powering a Sustainable Future" and translated into Czech as "Napájení Udržitelné Budoucnosti". This slogan is simple, yet powerful. It communicates the message that BEVs are a crucial part of building a sustainable future for the Czech Republic. It also highlights the fact that BEVs are an environmentally friendly alternative to traditional fuel-powered vehicles. The slogan is easy to remember and can be used in various forms of communication, including advertising, social media, and promotional materials.

8.5 Estimated Cost of Campaign

The cost of the communication campaign will depend on the specific activities and channels used to promote BEVs in the Czech Republic. The program will work within a reasonable budget to ensure that the cost of the program is not a barrier to its success. The budget for this proposal is CZK 10,000,000. The budget will be allocated as follows:

- Financing and leasing programme: CZK 2,000,000
- Charging infrastructure expansion: CZK 3,000,000
- BEV owner educational campaign: CZK 500,000
- Rational advertising campaign: CZK 1,500,000
- BEV rentals: CZK 1,000,000
- Marketing campaign and sponsorship: CZK 1,000,000
- Celebrity endorsements and influencer marketing: CZK 1,000,000
- Communication channels: CZK 1,000,000

8.6 Marketing Communication Tools and Strategies

8.6.1 Strategies and Tactics

Strategy 1: Advertising and Promotion

The developed catchy slogan for the campaign, "Powering a Sustainable Future" and translated into Czech as "Napájení Udržitelné Budoucnosti", will resonate with Czech consumers as a crucial part of the advertising and promotion strategy. An advertising campaign that stresses the benefits of BEVs and their suitability for the Czech Republic

will be launched. This campaign will include online ads, billboards, and television commercials. Social media platforms and influencers will be utilized to create a buzz around BEVs. Promotions and discounts will be offered to incentivize the purchase of BEVs and partner with car rental companies to offer BEVs as an alternative to ICEVs.

Strategy 2: Education and Awareness

Creating engaging content that showcases the features and benefits of BEVs is an essential part of the education and awareness strategy. Events where consumers can test drive BEVs and learn more about the technology will be held. Leveraging with media outlets to generate interest in BEVs through interviews and articles will be facilitated. Financing and leasing options that make BEVs more affordable for consumers will be offered. A customer support team that can answer questions and aid BEV owners will be created.

Strategy 3: Charging Infrastructure

Developing a comprehensive charging infrastructure that makes it easy for consumers to charge their BEVs is a critical component of the charging infrastructure strategy. The first step is to install charging stations at strategic locations such as parking garages, supermarkets, shopping malls, workplace parking lots, fast food chains, and cinemas. The second requirement is to install many private charging points in homes at affordable prices for consumers. The third step is for workplaces to build capacity by developing exclusive charging station networks.

The campaign is intended to use various marketing communication tools and strategies to promote BEVs in the Czech Republic. The programme will use the SMART framework and the AIDA model.

8.6.2 Communicating with Target Segments: The AIDA Model

The program will use the AIDA model (Attention, Interest, Desire, Action) to create a persuasive message that will encourage potential customers to act. The programme will create awareness through various channels, including social media, online advertising, and traditional advertising. The program will generate interest by highlighting the benefits of electric cars and providing information on charging infrastructure. The campaign will create desire by offering test drives and incentives to encourage customers to purchase BEVs. Finally, the programme will encourage action by making it easy for customers to purchase and provide support throughout the process.

8.6.3 The SMART Concept

Specific Goals:

- Increase consumer awareness and knowledge about BEVs, addressing concerns related to resale value, battery technology, charging, and drive range.
- Promote innovative financing schemes, such as guaranteed resale value and flexible leasing options, to reduce price uncertainty for potential BEV buyers.
- Engage BEV owners as brand ambassadors to positively promote BEVs and clear doubts, myths, and negative perceptions.
- Implement rational and fact-based advertising campaigns that highlight functional benefits and problem-solving solutions of BEVs.
- Include BEVs in car rental services to provide consumers with first-hand experience and overcome the affordability barrier.
- Build market acceptance for BEVs through celebrity endorsements, positioning BEVs as a sustainable mobility solution, and leveraging interactive marketing channels to educate consumers.

Measurable Outcomes:

- Increase in consumer awareness and knowledge about BEVs, measured through pre-and post-campaign surveys.
- Increase in the adoption of innovative financing schemes, such as guaranteed resale value and flexible leasing options, measured through sales data and customer feedback.
- Increase in positive online reviews and testimonials from BEV owners who participate in marketing communication initiatives.
- Increase in rational and fact-based advertising campaigns, measured through consumer engagement, website traffic, and conversion rates.
- Increase in the availability and utilization of BEVs in car rental services, measured through rental bookings and customer feedback.
- Increase in market acceptance of BEVs, measured through consumer perception surveys and social media sentiment analysis.

Achievable Strategies:

- Collaborate with BEV manufacturers to implement innovative financing schemes, such as guaranteed resale value and flexible leasing options, and promote them through targeted marketing campaigns.
- Engage BEV owners through social media campaigns, testimonials, and events to promote positive word-of-mouth marketing.
- Partner with advertising agencies to develop fact-based advertising campaigns that highlight functional benefits and problem-solving solutions of BEVs, supported by relevant data and statistics.
- Collaborate with car rental companies to include BEVs in their fleet, providing affordable and accessible opportunities for consumers to experience BEVs.
- Collaborate with influencers and celebrities to endorse BEVs, leveraging their reach and influence to build trust and promote BEVs as a sustainable mobility solution.
- Utilize interactive marketing channels, such as email, polls, chatbots, blogs, and social media, to educate consumers about BEVs and address their concerns.

Relevant Strategies:

- Collaborate with local stakeholders, including government agencies, car manufacturers, utilities, and car rental companies, to build a collaborative ecosystem that supports BEV adoption.
- Align the marketing campaigns with the cultural and social context of the Czech Republic to resonate with local consumers and gain their trust.
- Monitor and analyse the market response to the implemented strategies and make necessary adjustments to ensure relevance and effectiveness.

Timely Strategies:

The implementation of this proposal will take place over a period of 24 months. The timely strategy is as follows:

- Month 1-3: Develop financing programmes to guarantee BEV resale value.
- Month 4-6: Increase charging infrastructure in strategic locations.

- Month 7-9: Develop educational campaigns for BEV owners, influencers, and celebrities to promote BEV adoption.
- Month 10-12: Improve rational advertising in marketing communications.
- Month 13-15: Expand BEV rentals in the car rental industry.
- Month 16-18: Develop marketing campaigns to overcome market acceptance barriers.
- Month 19-21: Launch interactive and experiential marketing campaigns to raise consumer awareness.
- Month 22-24: Improve communication channels to educate consumers on the value for money of BEVs.

8.6.4 Marketing Communication Tools

The following marketing communication tools will be used to achieve the campaign objectives:

Advertising: The campaign will use various advertising media such as television, radio, newspapers, magazines and tabloids, flyers, billboards, postcards, posters, and digital adverts that will be anchored by various developed websites. Digital displays at bus and train stations, on public buildings, and at shopping malls, point of sale display and retail advertising will be utilized.

Public Relations: Activities will focus on generating interest, educating prospective customers, and sharing stories that will create desire for BEVs. Similarly, experiential events will create memorable opportunities to interact with people. The public relations team will build the reputation and enhance positive public opinion of BEVs to great fame by adopting principles of public relations in the entire firm by handling engagements with the media. This will involve reacting to questions raised, organizing for interviews and other press events.

Personal Selling: Personal selling will go a long way in strengthening the relationship between OEMs and their consumers.

Sales Promotions: Dealerships will have BEVs displayed at vantage points to ensure potential target customers see and purchase. Test drives will be offered to interested customers.

Direct Marketing will be focused on any step of the AIDA model to generate interest, provide information on offers that will motivate prospective customers to dig a little deeper and learn more. Various tools for direct marketing will include emails, text messages, catalogues, brochures, promotional letters. Through this method, messages reach consumers directly.

Digital Marketing will offer a plethora of tools that can be deployed at any stage of the AIDA model and SMART concept. Paid digital adverts, search engine optimization (SEO), pay per clicks (PPC), banner and video marketing on social media such as YouTube, Facebook, Twitter, Instagram and mobile apps, and word-of-mouth. Blogs, newsletters, digital case studies and customer testimonials can be powerful tools for stoking desire. The websites will engage customers through the purchasing process which will be key to persuading prospects to become customers.

Guerrilla Marketing, like digital marketing, will be designed to impact any stage of the AIDA model and SMART concept, and will be used by especially, new consumers for awareness-building, to make an impact in new markets. The campaign will use it frequently for engaging experiential activities that solidify desire and create emotional bonds with consumers.

Sponsorship: the campaign will sponsor auto shows, car racing and sporting events and concerts. The programme will also sponsor health programmes on television and radio to educate the public about BEVs and sustainability. Also with such programmes, listeners and viewers will be permitted to call in and answer some questions concerning quizzes about BEVs, and winners will be rewarded.

Test Drives: The programme will provide free test drives in dealerships and at events such as car racing and auto shows.

Celebrity Endorsement: The communication programme will also focus on endorsements from local celebrities who are environmentally conscious. These celebrities will be chosen from three generations namely, baby boomers (born between 1946 and 1964), generation X (born between 1965 and 1980), millennials (born between 1981 and 1996). This is to attract more people from almost every age bracket.

8.7 Measurement and Evaluation

The programme will measure and evaluate the success of the marketing campaign using various metrics, including number of inquiries and test drives, sales figures and reports, number of social media followers and engagement rates, metrics from the effectiveness of advertising campaigns, and number of charging stations installed. In addition, website traffic, customer feedback, and email open rates will also be analysed to gauge the effectiveness of the campaign.

8.8 Summary

Through a SMART communication programme that utilizes specific, measurable, achievable, relevant, and time-bound objectives, we aim to increase the adoption and popularity of BEVs in the Czech Republic. By developing a catchy slogan, launching an advertising campaign, offering financing, and leasing options, and expanding the charging infrastructure, we believe that we can achieve these objectives and promote a sustainable future for the Czech Republic. The adoption of BEVs is a crucial step in reducing carbon emissions and improving air quality, and we are committed to making it possible for more Czech consumers to experience the benefits of this technology. The promotion of BEVs in the Czech Republic provides an opportunity for automobile manufacturers to increase sales and promote sustainable transportation. By evaluating the campaign's objectives, automobile manufacturers can refine their marketing messages and decide on the best tools to use to deliver these messages effectively.

CONCLUSION

In response to climate change and global resource shortages, traditional mobility has been re-evaluated. Even though BEVs offer a promising alternative to these problems, they are not widely accepted by consumers because of their low acceptance. In this thesis, the attitudes of people who live in the Czech Republic regarding the purchase of battery electric vehicles were examined (beliefs, opinions, perceptions, and thoughts). An 18-question survey was designed to conceptualize the relationship between consumer awareness, perception, and interest in BEVs. In addition, the questionnaire incorporates the effect of knowledge about vehicles in general and BEVs on general expectations of vehicles, experience with BEVs, characteristics (drivers and barriers to market growth), charging, factors for BEV purchase and brand loyalty, purchase intention, and future certainty. Using a social media-distributed online questionnaire, we surveyed consumers' attitudes. By analysing the data collected, we were able to answer the three formulated research questions: why are BEVs unpopular in the Czech Republic, who are the people most interested in purchasing BEVs, and what can be done to increase their popularity.

The first research question examined the reasons behind BEV unpopularity in the Czech Republic and the barriers to their widespread adoption. In the first step, consumers were asked to rate their general expectations of vehicles, followed by their experiences with BEVs. Moreover, the characteristics of BEVs are discussed in terms of drivers and barriers to market growth, as well as how consumers perceive them. Most consumers surveyed are unfamiliar with BEVs, with only 22.6% having first-hand experience. Consumers consider the 'no fuel required' feature (16.6%) and convenience (15.4%) of BEVs to be the main drivers of market growth, according to the analysis. Among other factors, a better driving experience appears third, low maintenance costs appear fourth, and driving safety and resale value appear last. Additionally, it suggests that the BEV market currently faces seven barriers. Initial purchase price, expensive battery replacement, short driving range, limited number of charging stations, long charging times, excessive weight, and silence are ranked by Czech consumers in descending order.

We asked consumers to compare BEVs with conventional vehicles to further examine their knowledge of BEVs. Most consumers believe that BEVs are quiet and faster. In addition, they believe that BEV technology has improved over the last decade and is eco-friendly. Most consumers are unaware of charging costs and cheaper ownership costs, so they are the least rated comparisons. Among consumers with knowledge of charging, home

charging is highly preferred with 72.4% rating, followed by charging stations, workplaces, streetlamp posts, and supermarket parking lots, with one hour as the most preferred maximum charging time. Driving performance, eco-friendliness, and overall maintenance costs are the main factors that influence Czech consumers to purchase BEVs. Driving range and the initial purchase price are the least ranked factors for purchasing, both of which are barriers to market growth. The most important factor for brand loyalty is smartphone compatibility with BEVs, followed by extended warranties, battery care, regular software updates, and reward programs.

We examined purchase intention and future certainty in the last phase of the survey. In terms of purchase intention, only 19% of consumers are certain to purchase BEVs within five years, while 7.8% are likely to buy, and 23.7% are considering purchasing but need more persuasive marketing communication. Meanwhile, 38.9% of consumers disapprove outright of BEVs, 16.7% disapprove subtly, and 3.9% are unsure. Most consumers agree that BEVs are the future of transportation and mobility, with 36.6% strongly agreeing and 27.6% strongly disagreeing. Despite this, consumer education and effective marketing campaigns can drive and increase popularity and widespread adoption of BEVs since most consumers agree that they have a promising future.

In answering the third research question, in the project part of this study, we proposed a comprehensive marketing communication programme to gradually eliminate the identified barriers that lead to lack of acceptance in two years. Overall, we conclude that consumer attitudes toward battery electric vehicles have been negatively shaped by various adoption barriers and insufficient marketing communication tools by OEMs. A significant investment in research and development, support for the creation of new markets, and new business models will be needed to increase BEV adoption in the future. The market introduction of this technology has the potential to significantly change individuals' mobility attitudes and behaviours, as well as society's mobility in general.

Therefore, the research questions were answered, and the main goal of the thesis was met.

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LIST OF ABBREVIATIONS

AIDA - Awareness, Interest, Desire, and Action

AFV - Alternative Fuel Vehicle

BEV - Battery Electric Vehicle

BMW - Bavarian Motor Works

BYD - Build Your Dreams

CAGR - Compound Annual Growth Rate

CEZ - České Energetické Závody

CFV - Conventional Fuel Vehicle

CNN - Cable News Network

CO2 - Carbon Dioxide

ELM - Elaboration Likelihood Model

E-REV – Extended-Range Electric Vehicle

EU - European Union

EV - Electric Vehicle

FCEV - Fuel Cell Electric Vehicle

GMC - General Motor Company

HEV - Hybrid Electric Vehicle

ICE - Internal-Combustion Engine

ICEV - Internal-Combustion Engine Vehicles

km - Kilometers

km/h - Kilometers Per Hour

kW - Kilowatt

LEED - Leadership in Energy and Environment Design

MSNBC – Microsoft National Broadcasting Company

NASA - National Aeronautics and Space Administration

NBC - National Broadcasting Company

OEM - Original Equipment Manufacturer

PHEV - Plug-In Hybrid Electric Vehicle

PPC - Pay Per Click

RAC - Royal Automobile Club

SEM - Structural Equation Modelling

SEO - Search Engine Optimization

SMART – Specific, Measurable, Attainable, Relevant, and Timely

TPB - Theory of Planned Behaviour

TPCA - Toyota-Peugeot-Citroen Automobile

UK - United Kingdom

US - United States

USA - United States of America

VW - Volkswagen

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APPENDIX P I: SURVEY QUESTIONS

(EN) 1. What do you generally like about driving a vehicle? *

(CZ) 1. Co máte obecně rádi na řízení vozidla?

- ○ Mobility & Convenience (Mobilitu a pohodlí)
- ○ Relieving Stress (Uvolnění od stresu)
- ○ Independence, Privacy & Security (Nezávislost, soukromí a bezpečnost)
- ○ Chance to Explore (Možnost objevovat)
- ○ Making Memories (Vytváření vzpomínek)
- ○ Psychological Health Benefits (Pozitivní dopad na psychické zdraví)
- ○ Comfort (Komfort)

(EN) 2. What do you consider when generally buying a vehicle? *(Please rate each factor by ticking in the respective box) [5 is the highest]*

(CZ) 2. Co při koupi vozidla zvažujete? *(Ohodnoťte každý faktor zaškrtnutím příslušného políčka) [*5 je nejvyšší*]*

B I U

	1	2	3	4	5
Style (Styl)	☐	☐	☐	☐	☐
Brand name (Z...	☐	☐	☐	☐	☐
Size of vehicle ...	☐	☐	☐	☐	☐
Cost of owners...	☐	☐	☐	☐	☐
Type of vehicle ...	☐	☐	☐	☐	☐
Vehicle history ...	☐	☐	☐	☐	☐

(EN) 3. Have you ever driven an electric vehicle? *

(CZ) 3. Řídil/a jste někdy elektromobil?

- ○ Yes, a hybrid electric/petrol vehicle [Ano, řídil/a jsem hybrid (elektrické/benzínové vozidlo)]
- ○ Yes, a fully electric vehicle (Ano, řídil/a jsem elektromobil)
- ○ No, I have never driven an electric vehicle (Ne, nikdy jsem neřídil/a elektromobil ani hybrid)

(EN) 4. What do you consider as the main benefits or advantages of an electric vehicle? *(Please rate the factors below in percentage by ticking in the respective box)*

(CZ) 4. Co považujete za hlavní výhody elektromobilů? *(Ohodnoťte níže uvedené faktory v procentech, zaškrtnutím příslušného políčka)*

	0	10	20	30	40	50	60	70	80	90	100
They ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Low ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Better...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
High r...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
No fu...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
They ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
They ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Row 8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

(EN) 5. What do you consider as the main disadvantages or drawbacks of electric vehicles? *(Please rate the factors below in percentage by ticking in the respective box)*

(CZ) 5. Co považujete za hlavní nevýhody nebo nedostatky elektromobilů? *(Ohodnoťte níže uvedené faktory v procentech, zaškrtnutím příslušného políčka)*

B I U

	0	10	20	30	40	50	60	70	80	90	100
Less ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Batter...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Charg...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Short ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Too h...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Initial ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Their ...	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

(EN) 6. How likely are you to consider purchasing an electric vehicle in the next five (5) years?

(CZ) 6. Jaká je pravděpodobnost, že v příštích pěti (5) letech budete zvažovat nákup elektromobilu?

- ○ Will definitely purchase one (Určite si ho pořídím)
- ○ I am likely to purchase one (Pravděpodobně si ho pořídím)
- ○ Considering purchasing, but need more convincing (Zvažuji nákup, ale ještě potřebuji přesvědčit)
- ○ Unlikely to purchase one (Pravděpodobně si ho nepořídím)
- ○ Definitely will not purchase (Určitě si ho nepořídím)
- ○ Do not know (Nevím)

(EN) 7. Below are some statements people have made about the benefits of electric cars. *(For each statement, please indicate whether you personally agree or disagree with the statements by ticking in the respective box)*

(CZ) 7. Níže jsou uvedena prohlášení lidí o výhodách elektromobilů. *(U každého prohlášení uveďte, zda s ním souhlasíte, či nikoliv, zaškrtnutím příslušného políčka)*

	Strongly Agree ...	Agree (Souhlas...	No idea (Netuší...	Disagree (Neso...	Strongly Disagr...
Electric vehicle...	☐	☐	☐	☐	☐
Electric vehicle...	☐	☐	☐	☐	☐
Electric vehicle...	☐	☐	☐	☐	☐
The cost to cha...	☐	☐	☐	☐	☐
Price of electric...	☐	☐	☐	☐	☐
Electric vehicle ...	☐	☐	☐	☐	☐

(EN) 8. Where would you like to charge your electric vehicle? *

(CZ) 8. Kde byste chtěli mít možnost dobití elektromobilu?

- ○ Home (Doma)
- ○ Charging station (Na dobíjecí stanici)
- ○ Supermarket parking lot (Na parkovišti u supermarketu)
- ○ Streetlamp post (U pouličního osvětlení)
- ○ Workplace parking lot (Na parkovišti u práce)

(EN) 9. In your opinion, what is the maximum time (in hours) an electric vehicle should take to fully charge?

(CZ) 9. Jaká je podle vás maximální doba (v hodinách), za kterou by se mělo elektrické vozidlo plně nabít?

B I U

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5

(EN) 10. Below are some factors other people have told us are important when considering purchasing an electric vehicle. *(For each factor, please tell us how important it would be to you if you consider purchasing an electric vehicle by ticking in the respective box)*

(CZ) 10. Níže je uvedeno několik faktorů, které lidé při zvažování nákupu elektromobilu označili jako důležité. *(U každého faktoru, zaškrtnutím příslušného políčka uveďte, jak důležité by byly pro vás, pokud byste zvažoval/a koupi elektromobilu)*

B I U

	1 - Not that imp...	2	3 - Quite import...	4	5 - Most import...
Fuel economy /...	☐	☐	☐	☐	☐
Maintenance c...	☐	☐	☐	☐	☐
The ability to p...	☐	☐	☐	☐	☐
How well it driv...	☐	☐	☐	☐	☐
How far you co...	☐	☐	☐	☐	☐
Number of char...	☐	☐	☐	☐	☐
Initial price (Po...	☐	☐	☐	☐	☐
Environmental ...	☐	☐	☐	☐	☐

(EN) 11. What will make you more loyal to an electric car brand or manufacturer in case you purchase one? *(Please rate according to the scale by ticking in the respective box)*

(CZ) 11. V případě, že si pořídíte elektromobil, co vás učiní loajálnější vůči značce nebo výrobci? *(Ohodnoťte dle stupnice, zaškrtnutím příslušného políčka)*

	1 - Not that imp...	2	3 - Quite import...	4	5 - Most import...
Extended warra...	☐	☐	☐	☐	☐
Reward progra...	☐	☐	☐	☐	☐
Battery care pa...	☐	☐	☐	☐	☐
Regular softwa...	☐	☐	☐	☐	☐
Smartphone co...	☐	☐	☐	☐	☐

*

(EN) 12. Thinking about how far you drive, how often on average do you make on the following types of trips? *(Please tick in the respective box)*

(CZ) 12. Co se týče vzdálenosti, jak často podnikáte následující typy cest? *(Zaškrtněte příslušné pole)*

	Most da...	A few ti...	Once a ...	Once a ...	Once a ...	Every 3 ...	Every 6 ...	Less oft...	Never (...
Short di...	☐	☐	☐	☐	☐	☐	☐	☐	☐
Medium...	☐	☐	☐	☐	☐	☐	☐	☐	☐
Longer ...	☐	☐	☐	☐	☐	☐	☐	☐	☐

(EN) 13. Do you sincerely believe that electric vehicles are the future of transportation and the automobile industry?

(CZ) 13. Věříte, že elektromobily jsou budoucností dopravy a automobilového průmyslu?

- ◯ Strongly Agree (Naprosto souhlasím)
- ◯ Agree (Spíše souhlasím)
- ◯ No Idea (Nevím)
- ◯ Disagree (Spíše nesouhlasím)
- ◯ Strongly Disagree (Naprosto nesouhlasím)

Finally, a few questions about you 😊 (Nakonec pár otázek o vás 😊) *

(EN) 14. Are you.....?

(CZ) 14. Jste.....?

- ◯ Male (Muž)
- ◯ Female (Žena)

(EN) 15. Which of the following age groups do you fall under?

(CZ) 15. Do které z následujících věkových skupin patříte?

- ◯ 18 – 25 years (let)
- ◯ 26 – 35 years (let)
- ◯ 36 – 45 years (let)
- ◯ 46 – 55 years (let)
- ◯ 56 and above (a víc)

(EN) 16. What is your level of education? *

(CZ) Jaké je Vaše nejvyšší dosažené vzdělání?

- ◯ Without education (Bez vzdělání)
- ◯ Elementary (Základní vzdělání)
- ◯ Secondary School (apprenticeship) (Střední vzdělání s výučním listem)
- ◯ Secondary with graduation (Střední vzdělání s maturitou)
- ◯ Higher Professional (Vyšší odborné vzdělání)
- ◯ Bachelor's (Bakalářský titul)
- ◯ Masters (Magisterský titul)
- ◯ Doctoral (PhD) [Doktorský titul (PhD.)]

(EN) 17. What is the prevailing nature of your work?

(CZ) 17. Jaká je převažující povaha Vaší práce?

- ◯ Manager (in the private or public sector) [Manager/ka (v soukromém, nebo veřejném sektoru)]
- ◯ Office worker (company, non-governmental organization, etc.) [Administrativní pracovník/ce (ve firmě, ne...
- ◯ Official (Government, Public Administration,...etc.) [Úředník/ce (státní zaměstnanec, veřejná správa,...atd.)]
- ◯ Teacher (Učitel/ka)
- ◯ Professional (health/advocacy/counselling/services....etc.) [Specializovaný odborník/ce (zdraví/advokaci...
- ◯ Professional (technical - engineering, construction...etc.) [Specializovaný odborník/ce (technický - inženýr...
- ◯ Manual worker (Manuální pracovník/ce)
- ◯ Service industry (Služby)
- ◯ Artistic & Creative art (Umělecké a kreativní obory)
- ◯ Media (Média)
- ◯ IT (Information Technology) [IT (informační technologie)]
- ◯ Finance / Trade (Finance / Obchod)
- ◯ Other...

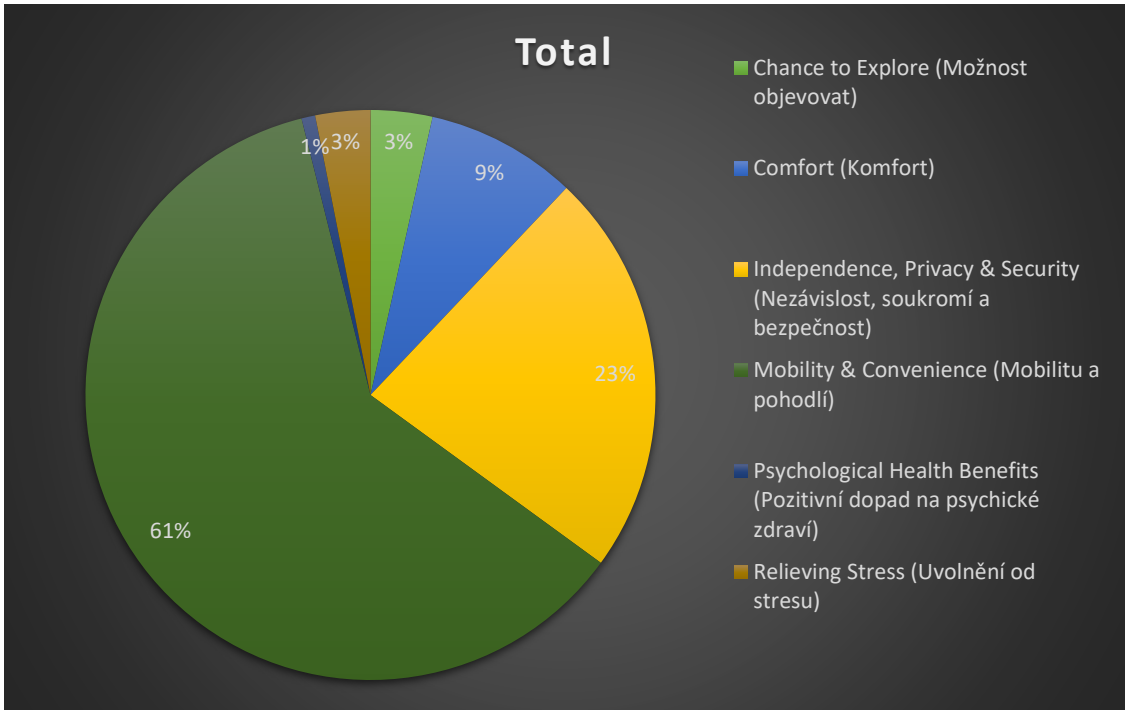
(EN) 18. In which region do you reside? *

(CZ) 18. V kterém kraji žijete?

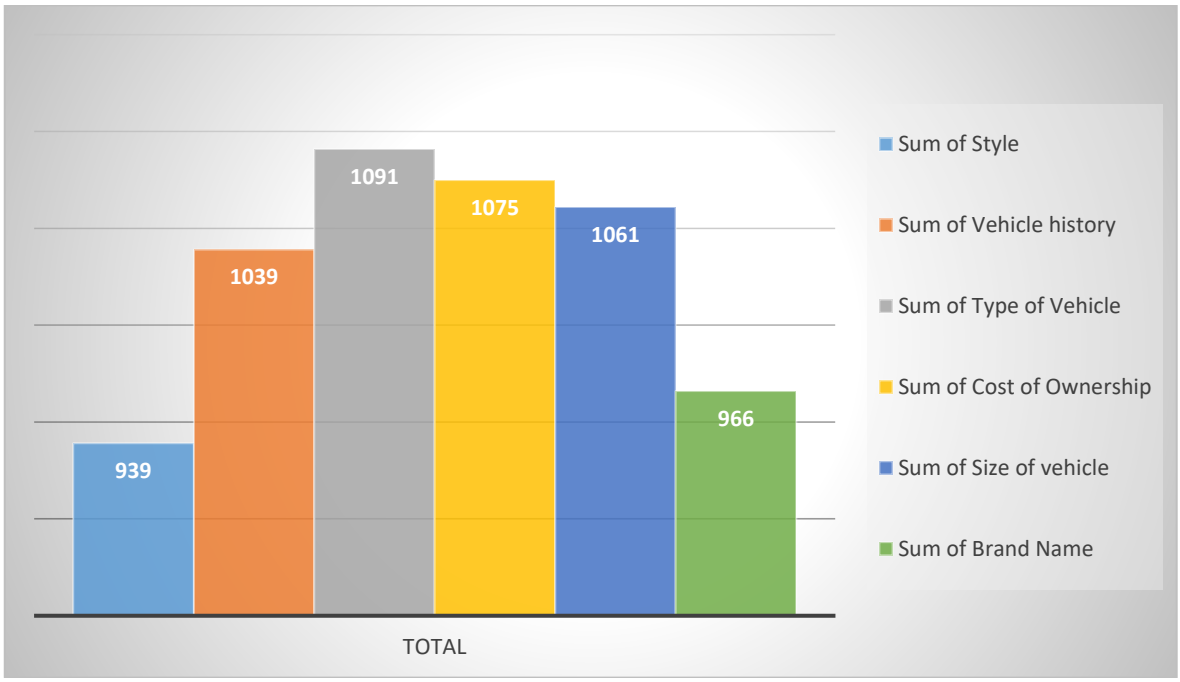
- ◯ Praha
- ◯ Stredocesky
- ◯ Plzensky
- ◯ Zlinsky
- ◯ Karlovarsky
- ◯ Ustecky
- ◯ Liberecky
- ◯ Pardubicky
- ◯ Kralovehradecky
- ◯ Vysocina
- ◯ Olomoucky
- ◯ Jihocesky
- ◯ Jihomoravsky
- ◯ Moravskoslezsky

Thanks for taking time to fill our survey, have a nice day! 😊 *(Děkujeme, že jste si udělali čas na vyplnění našeho dotazníku, mějte se hezky!* 😊*)*

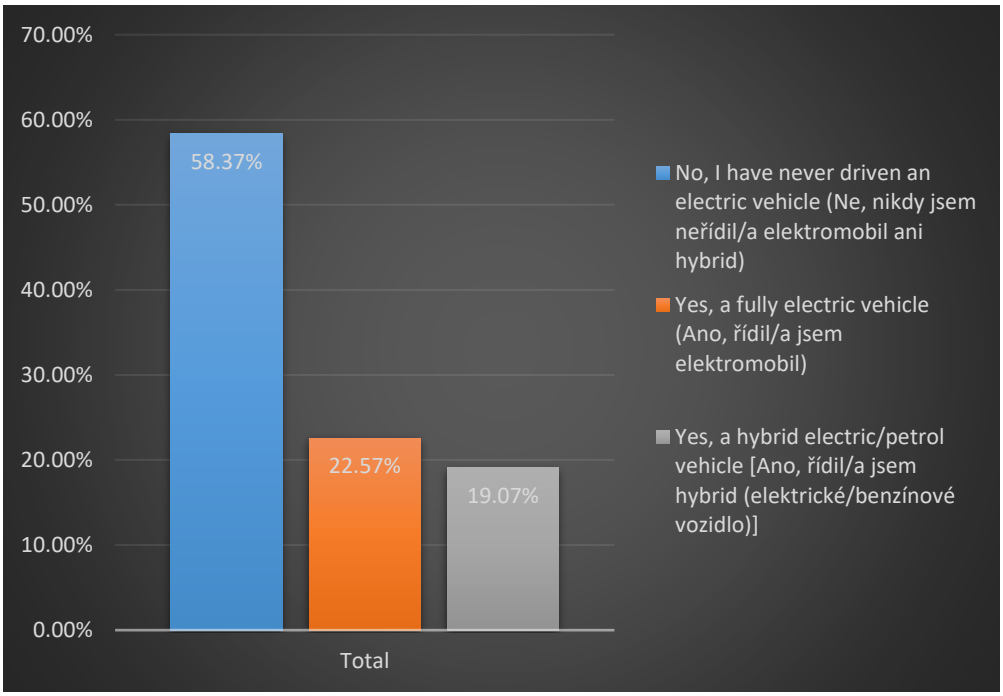
APPENDIX P II: PIE-CHART ILLUSTRATING GENERAL EXPECTATIONS FOR CARS FROM SURVEY SAMPLE



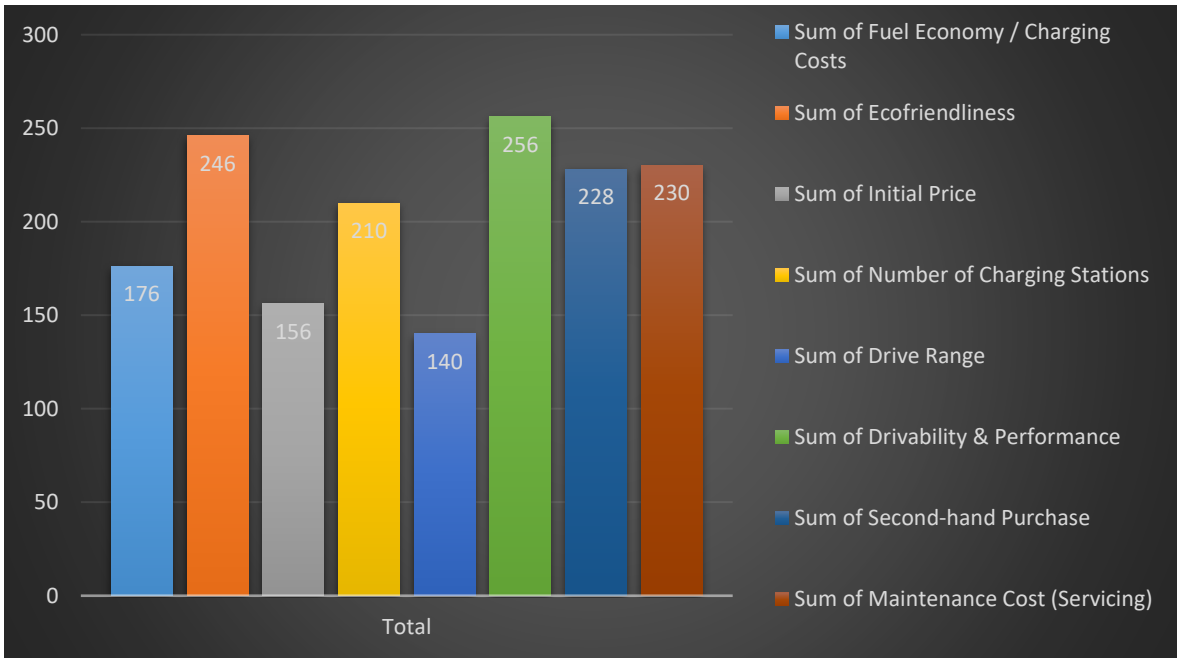
APPENDIX P III: GRAPH ILLUSTRATING TOTAL SUM OF FACTORS OF PREFERENCE FPR VEHICLES



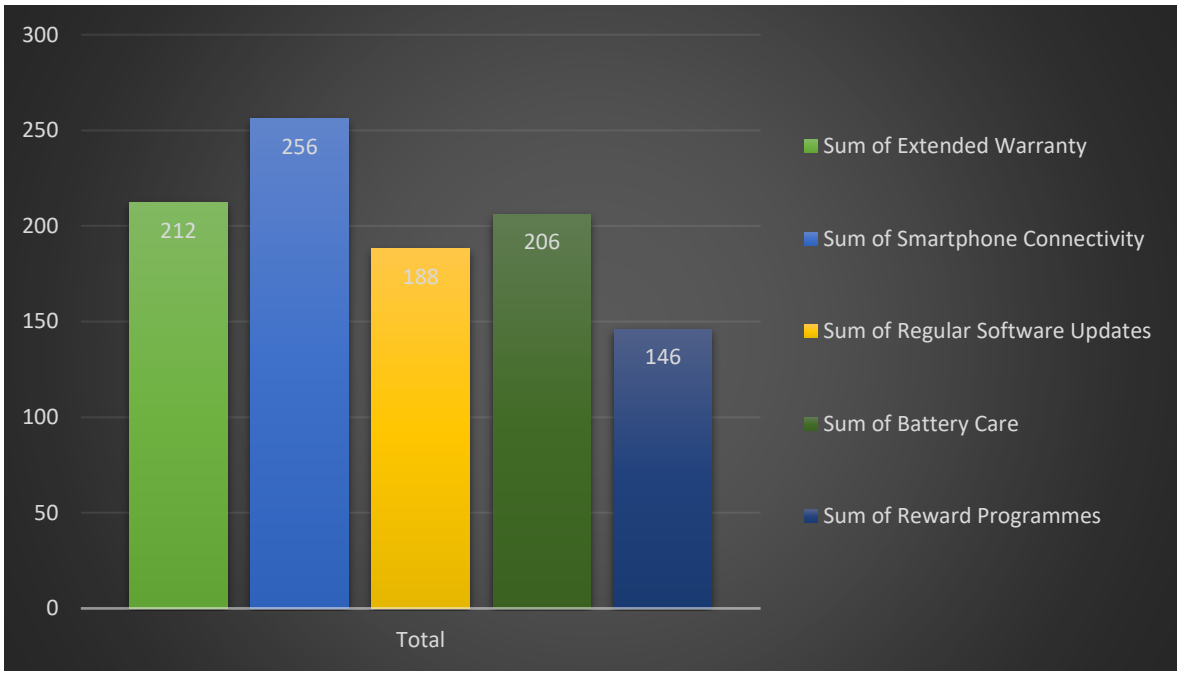
APPENDIX P IV: GRAPH ILLUSTRATING TOTAL CONSUMER EXPERIENCES WITH BEVs AND HEVs



APPENDIX P V: GRAPH ILLUSTRATING TOTAL SUM OF FACTORS FOR BEV PURCHASE



APPENDIX P VI: GRAPH ILLUSTRATING TOTAL SUM OF RESPONSES FOR BRAND LOYALTY FACTORS



APPENDIX P VII: GRAPH ILLUSTRATING TOTAL PERCENTAGES OF SURVEY SAMPLE WITH PURCHASE INTENTION OF BEVs