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Diploma Thesis

Consumer intentions to purchase electric vehicles: a survey

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DIPLOMA THESIS ASSIGNMENT

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Thesis title

Consumer intentions to purchase electric vehicles: a survey

Objectives of thesis

The main objective is to find out about the most decisive aspects of electric vehicles (EVs) attracting consumers to buy them.

The partial goals are as follows:
- to make an overview of current state of acceptance of EVs by consumers and theories explaining consumer behavior,
- to conduct a survey among EV buyers and potential buyers in order to identify intentions and behavior,
- to interpret findings and explain EV buyers' decisions.

Methodology

Thesis is based on reviewing and analyzing the latest literature which includes books, research papers and reports related to the topic. In the practical part, consumers' intention will be researched in a survey by application of the relevant theories on consumer behavior and technology acceptance. Based on the evaluation of the literature review and survey results, findings will be interpreted in order to formulate conclusions.

The proposed extent of the thesis

40-60 pages

Keywords

Electric vehicles, combustion engine, emissions, sustainability, consumer behaviors

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Recommended information sources

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Declaration

I declare that I have worked on my diploma thesis titled "Consumer intentions to purchase electric vehicles: a survey" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 29 March 2021 _____

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Consumer intentions to purchase electric vehicles: a survey

Abstract

This thesis aims to investigate the most influential factors in consumers' intentions to purchase an electric vehicle. At the same time to compare them with different demographic factors of consumers in order to find out the degree of importance of this factor in eyes of different consumers and their final decision in buying an EV. This study adopts a quantitative approach and conducts a survey among a small sample of population in the Czech Republic. Based on 60 questionnaires there are no significant differences between people of different gender, age, income level, education and number of vehicles owned toward the selected influential factors. Except for a purchase price, social influence and performance expectancy factors where significant differences were found between men and women. This study uses theories (TAM,UTAUT) for better understanding the attitude of consumers toward new technologies. The study also provides suggestions for further research to better understand the attitude of consumers toward this controversial technology.

Keywords: Electric vehicles, emissions, consumer behaviour, technology acceptance model, sustainability, environment, transportation

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List of abbreviations

ACEA – The European Automobile Manufacturers' Association

ANOVA – Analysis of Variance

BEV – Battery Electric Vehicles

CEF - Connected Europe Facility

CO2 - Carbon Dioxide

CPV – Conventional Petrol Vehicle

DOE – Department of Energy

EEA – The European Environment Agency

EU - The European Union

EV – Electric Vehicle

GDE – The European Green Deal

GDI – Gasoline Direct Injection

HOV – High Occupancy Vehicle

IEA – The International Energy Agency

IPCC - Intergovernmental Panel on Climate Change

NOV – Number of Vehicles

PEOU – Perceived Ease of Use

PU – Perceived Usefulness

SIPE – Social Influence and Performance Expectancy

TAM -Technology Acceptance Model

UCS - Union of Concerned Scientists

UTAUT - Unified Theory of Acceptance and Use of Technology

VAT – Value Added Tax

1 Introduction

The present global situation of environmental pollution issues and exhaustibility of petroleum resources push the world to come up with new ideas. Petroleum dependence as an up-to-date topic encourages to bring a solution and open a new alternative way of transportation. Depending on the source of electricity, transition to electric vehicles as an alternative way of transportation can potentially help to reduce the CO2 emissions produced by this sector. Therefore, particular actions are being taken by the European Union in order to enhance the market with electric vehicles. The EU has also set the ambitious goal of Europe being the first CO2 neutral continent by 2050 according to the Green Deal (Fuchs et al. 2020). However, the consumers and their willingness to buy electric vehicles play the crucial role in the development and success of the electric vehicle market. EVs are considered to be new to people and since there is little information about the real utility of EVs and at the same time there are number of factors that might potentially keep the market from developing, the future of transportation sector is rather uncertain.

Even though the European Union is encouraging its members to support electric vehicle market with concrete advantages and subsidies for the consumers, a different attitude toward electric vehicles occurs in different countries in Europe. Moreover, there are still number of obstacles that must be fully resolved in order to fulfil the requirements and needs of the consumers.

The thesis aims to contribute to the better understanding of consumers' attitude towards EVs adoption by examining the influential factors (purchase price, range, infrastructure, environmental awareness, government incentives, social influence) with different demographic factors to bring an overview of what are the differences in consumers' attitude toward EVs and factors influencing decisions to buy them. At the same time the factors included in the theories explaining consumers' behaviour toward new technology (perceived usefulness, perceived ease of use, social influence and performance expectancy) are used in the survey in order to evaluate the attitude of the respondents toward electric vehicles.

2 Objectives and Methodology

2.1 Objectives

The thesis investigates the intentions of consumers to buy an electric vehicle. The main objective is to find out about the most decisive aspects of electric vehicles (EVs) attracting consumers to buy them. The thesis has a three partial goals, the first one is to make an overview of current state of acceptance of EVs by consumers and theories explaining consumer behaviour. The second one is to conduct a survey among EV buyers and potential buyers in order to identify the intentions and behaviour and the last one is to interpret findings and explain EV buyers' decisions.

2.2 Methodology

The methodology of the thesis is based on reviewing and analysing the latest literature which includes books, research papers and reports related to the topic. In the practical part, consumers' intention will be researched in a survey by application of the relevant theories on consumer behaviour and technology acceptance. Based on the evaluation of the literature review and survey results, findings will be interpreted in order to formulate conclusions.

3 Literature review

3.1 Electric engine vehicles

Since the electric vehicles are nowadays enforced especially in the EU, automotive companies are making significant investments in development of more efficient production of batteries and cars that will be run by them. Most of the well-known companies have already established their own electric vehicles to the market. Many of them take this opportunity for establishing new types and models to the market and potentially increase the portfolio for its clients (Simmons et al. 2015). Nowadays, electric vehicles are able to satisfy wide range of customer's appetite. Nevertheless, the requirements on electric vehicles are very high because of the vision of replacement of the conventional cars in the global transportation sector. With the increasing demand there is an increasing supply of types of vehicles. Some of the cars run just on electricity (plug-in electricity) while some (plug-in hybrid) run mainly on electricity but includes also conventional petrol engine when the car can be switched to the traditional fuel engine. The hybrid-electric cars use mainly the combustion engine but there are battery cells that can be used instead of petrol or diesel but these cars cannot be connected to the electricity source, the battery can be recharged only through regenerative braking (Enang & Bannister 2017).

The engine of electric vehicle is composed of many components connected by cluster of wires. Every electric motor is powered by electricity stored in a battery pack that can be recharged through a simple wall socket or through special charging unit. The development of networks of charging stations keeps the significant part of success or failure of future potential boom of electric vehicles. In some countries there are currently active projects to support the improvement of charging unit infrastructure however it is a question for long period of time (Momen et al. 2016).

The main principle of drive of every electric vehicle is an electric motor. Electric engine is a machine that transforms electrical energy to mechanical energy with significant efficiency compared to the combustion engine. The control unit of electric vehicle works on simple principles. Electric engine acts as a motor which uses the electric energy to run the car but also as a generator which uses the principle of recuperation. Electrical energy is delivered to the stator by the battery cells. When the electrical energy from the batteries is delivered to

the motor, the coils start moving due to magnetic fields between them. The moving rotor is the necessary part to make the car moving (Grunditz 2016).

3.1.1 EV and CPV price comparison

The benefits of electric vehicle for the user: in long term perspective its utilization is supposed to be significantly cheaper - driving electric vehicle can save hundreds of dollars annually. However, the current prices of electric engine vehicles are higher compared to the ones with combustion engine. The price, one reason that keeps the electric cars in the shadow of traditional ones (Wilson 2013). A simple example can be provided, the two relatively comparable cars, in terms of utility for the user, but one with electric engine and the second one with combustion engine. The user can have two cars with combustion engine for the same price as for one with the electric propulsion. As a particular example, the cheapest version of Hyundai Kona (1,0 T-GDI) with conventional petrol engine costs 14 100,-€ while the cheapest version of the same car, Hyundai Kona (ECO 39,2 kWh), with electric engine costs 32 393,-€ (prices available at official website of Hyundai dealer in the Czech Republic 2020). The difference in price of the same car with different power unit is considerable. However, the EU member states are continuously establishing subsidy programmes for enhancing of the EV market for the potential customers. Currently, in the Czech Republic there is still ongoing discussion on topic of concreate subsidy for initial purchase of electric vehicle while in other countries there are different amount of subsidies and supportive programmes for buying an electric vehicle. For instance, in Sweden the subsidy for initial purchase of an electric vehicle accounts 5840,-€. In the Czech Republic the owner of electric vehicle benefits from exemption from paying the highway charge and upon request obtains special registration plate that provides free parking in paid areas (ACEA 2020). In the future years new advantages and exemptions for electric vehicles are expected to come.

From the users' point of view the possibility of recharging the electric car at home is considered as an advantage comparted to the conventional petrol vehicle. Another positive that many users will appreciate is the driving experience provided by electric vehicle. Electric engine provides almost instant torque, while the torque of combustion motor depends on the engine's revolutions (Weiss et al. 2019).

3.1.2 Ecological aspects of electric vehicles

Electromobility as one of the phenomena of today is becoming more popular in terms of developing the sustainable and zero emissions transportation. Ecological reasons are one of the strongest reasons for introduction of electromobility. Globally, it is considered that electromobility keeps the biggest potential for reduction of the emissions and for more sustainable future. Furthermore, there is a question of negative aspects that current transportation trends cause to the society, meaning the local pollution. Electricity is widely considered as a clean source of energy however, the significant portion of emissions that are produced during generation processes in power stations undoubtedly needs to be taken into account as well. Moreover, there is the question of negative impact of production of battery cells whose production requires big energy consumption and thus has negative impact on the environment. Transportation sector undoubtedly deteriorates the situation of air pollution mainly in cities and areas where the transport is frequent. With increasing number of automobiles, the amount of toxic substances in the atmosphere increases. It is caused by pollutants produced by combustion of fuels (Ellingsen et al. 2016).

Whole world and especially Europe struggles with the issue of CO2 emissions and very often its allied with motoring. For instance, China struggles with significant amount of air pollution, in recent years the situation has got even worse. The Chinese government endow the purchasing of electric vehicles but within current situation it does not cause a significant change. The situation in Europe is different, the European Union decides to regulate the production of toxic pollutants by establishing strict regulation which every automotive company needs to fulfil. Otherwise, the companies must pay penalties of significant amount. Nevertheless, according to the statistics personal vehicles do not play such a significant role in total amount of emissions produced by human beings and their activities. For instance, the agriculture and animal production (32%) cover a significant part CO2 produced by people (UCS 2019). According to the statistics of the World Bank the biggest CO2 production comes from electricity and heat production in percentage it covers almost 50% of total CO2 emissions in the world. How can be electric vehicles considered more environmentally friendly if the production of electricity leaves the weightiest carbon footprint? Are the electric cars the breaking element that will bring relief to the environment? It is more about the complexity not to change only one sector it must go hand by hand with the production. There is no sense of creation a vehicle that produces zero emissions when its

production burdens the environment even more than the so “harmful” conventional petrol vehicles (Foster et al. 2014).

Fossil fuels are considered as the base of non-renewable resources, namely the petroleum, natural gas, coal etc. The coal which is the most widespread fossil fuel has also the biggest reserves. According to the statistics, based on current utilization the reserves of coal should last for more than 130 years, in case of the petroleum the reserves are estimated for around 50 years and the reserves of natural gas have been enumerated for approximately next 70 years. However, the level of utilization of mentioned fossil fuels might change in the future for that reason these numbers are only approximate (Kezirian et al. 2017). Not only countries of the European Union but also other states in the world aim to be the most competitive economy as possible. Nevertheless, it must fulfil the so-called Kyoto Protocol, which is part of an internationally agreed contract between states about lowering the greenhouse gases. Whereas the significant part of emissions (up to 94%) produced by human activity is attributed with energetic sector (Wilson 2013).

Another interesting study of global production of CO2 emissions has been published by one magazine focusing on car industry. The articles also deal with the fleet average emission of CO2, which is actually total sum of CO2 emission of all sold cars by one company divided by the number of cars sold in given period. In year 2018, car factory must fulfil the limit of 130 g/km on average – every extra gram means the penalty of 95€ for every car sold. Back to the global production of CO2, it is obvious that human activity corresponds with very little production of the CO2 compared to the oceans and the Earth. Speaking in numbers it accounts for around 3, 5% and of these 3, 5% only 5, 5 % of CO2 is covered by passenger cars (IPCC 2018).

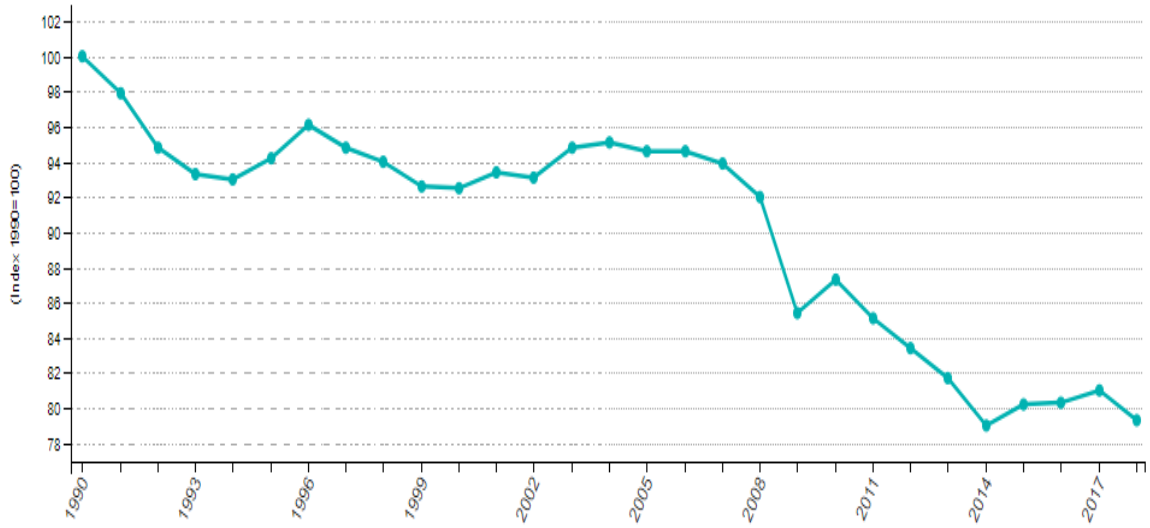
3.2 Policies supporting BEV

3.2.1 European Green Deal

The European Green Deal are sets of initiatives established by the European Commission with the aim of implementing new strategy for dealing with environmental and climate challenges. The newly established commitment focuses on the transformation of the European Union into a modern society with efficient economy based on zero emissions of greenhouse gases. The elimination of greenhouse gases is expected to go along with

sustainable economic growth and resources efficient economy. The objective of zero net emissions is planned to be fulfilled by year 2050. The European Union has been transforming the economy for many years which resulted in reduction of greenhouse gas emission by 23% as seen in the (Figure 1.) below, comparing the years 1990 and 2018.

Figure 1. Greenhouse gas emissions trend, EU-27, 1990 - 2018



Source: EEA, 2020

In summer 2020 the European Commission provided the targeted action plan with a list of required actions that must be undertaken in order to achieve the desired goal. The action plan includes support in industrial innovations and investments in the field of environmentally-friendly technologies, more economical and cleaner transport, decarbonisation of the energy sector, innovations in building sector to provide more energy-efficient buildings. There will be also financial support of €100 billion for the most affected regions from the side of the EU between the years 2021-2027 (GDE 2020).

The EU member states are pushed to fulfil the strict requirements of lowering greenhouse gases emission while significant part of the EU international partners does not follow the same ambitions of achieving these objectives. This is a really important aspect that needs to be taken into consideration. Due to the strict emission regulations introduced by the European Commission the production is being relocated to the countries out of Europe where the reduction of carbon footprint does not play such a significant role as in the case of the European Union, which undoubtedly causes the increase of import into the EU. Nowadays the globalized world opens great possibilities for economic prosperity for instance in possibility of low-cost import. The relocation of industrial processes to the areas where the

policies for environmental protection are not in place could result in relocation of the greenhouse gas emissions, however not in their reduction. The vision of elimination of greenhouse gas emissions by 2050 stands very uncertainly on the relocation of polluting production to the non-EU areas. Obviously, the European Union cannot regulate the CO2 emissions in other states in the world, however, the EU restrictions do not even forbit the import from these areas which is undoubtedly the biggest issue of the Paris Agreement respectively of the European Green Deal. Therefore, The Green Deal for Europe is becoming bad deal for the planet (Fuchs et al. 2020).

3.2.2 Transportation emissions

According to the statistics 25% of greenhouse gases emissions are produced by transport in the European Union (EEA 2020). To fulfil the European Green Deal goal, of Europe being the first climate neutral continent by 2050, almost 90% reduction in transport emissions is needed. The emissions need to be cut down in every sector of transportation road, railway, aviation and waterborne as well. In order to do so a new strategy for reduction of net emissions will be adopted. There must be provision of sustainable transport solution in order to satisfy the users' needs at the affordable price and at the same time fulfilling the clean vision. Multimodal transportation system needs systematic innovations and support in order to increase its utility. Significant part of road transport is supposed to transform into the railways and waterways system therefore significant improvements in infrastructure are needed to be undertaken (EUR-Lex 2018). The EU multimodal transport system will be built aligned with sustainable mobility service which will together lead to decrease in pollution mainly in big cities. All this will be developed with financial support of the European Commission mainly through the CEF (Connected Europe Facility). CEF is the main EU instrument for promotion of development and infrastructure investments. The European Commission will also propose the enlargement of the emission trading system in order to cover the nautical sector. According to the European Green Deal, the EU should increase the production of alternative fuels and its utilization in different sectors of transport (GDE 2020).

Together with expected increasing number of non-emission vehicles on European roads there will be increasing demand for recharging stations. The green deal vision is expecting to have 1 million of recharging stations all around Europe by year 2025 (GDE 2020). According to the statistics in Europe there were 132,114 public recharging stations in year

2016. Three years later there were 170,149 of public refuelling stations. Taking into consideration the data of the last years approximately 12,500 of new charging stations are added up every year in Europe. In order to achieve the goal of 1 million recharging stations in Europe by 2025 there must be a significant increasing in building of recharging stations in Europe. Speaking in number almost 166,000 stations must be constructed every year (STATISTA 2020).

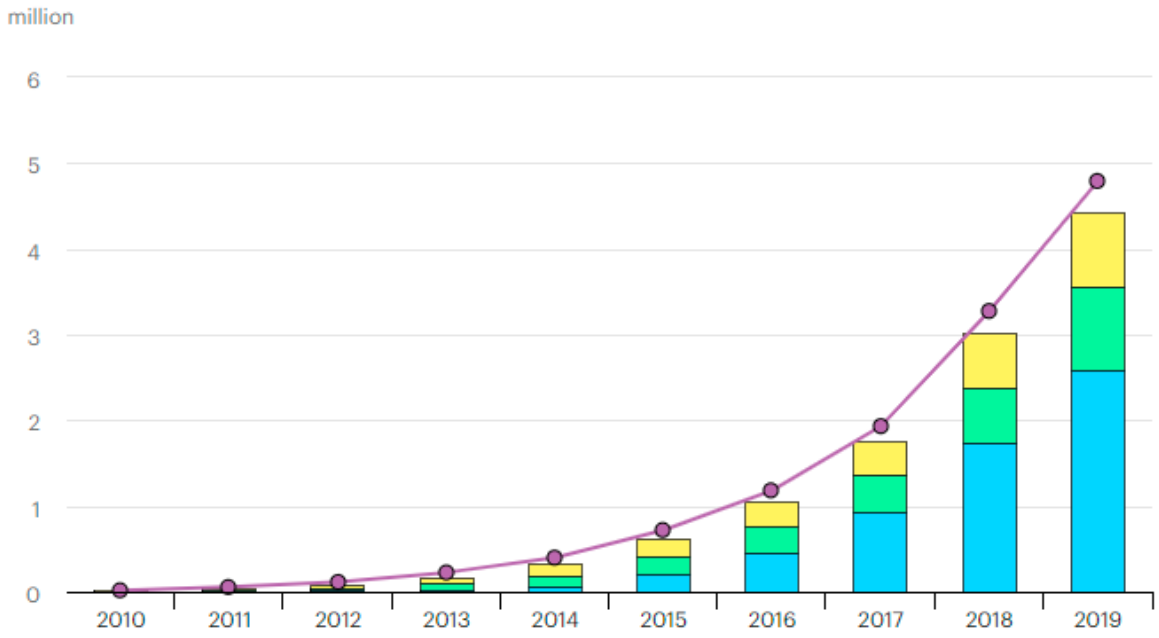
The overall goal for transportation sector is to decrease the net emissions especially in big cities and improve transport in sustainable way. In order to do so, the European Commission will again suggest stricter standards for emissions of conventional petrol vehicles and also will consider the utilization of European emissions trading system in road transport. There will be more controlled access of the most contaminating ships to the European Union ports. All these steps are expected to bring cleaner and more sustainable transport for the EU (GDE 2020).

3.2.3 Government incentives (subsidies, tax credits, etc.)

Nowadays, only China overcomes the European market in electric vehicles growth of sales. Taking into consideration the fact of almost twice bigger population, the market potential for the electric vehicle is obviously higher as well. However, the European Union is establishing a strong base for the development of electric vehicle market and encourages its members to support this particular market with concrete advantages and subsidies for the potential customers. The variety of policies means a variety of approaches to electric vehicle market which results in different purchase incentives among the European states (Wappelhorst et al. 2020).

Global EV sales by its key market is shown in (Figure 2.) below. As already discussed, the most electric vehicles are sold in the Chinese market followed by European and US markets. In the (Figure 2.) the Chinese market is represented by blue colour, the European by green colour and yellow colour belongs to the market of the United States. The line shows relatively steep increasing trend of electric vehicle market in the whole world.

Figure 2. Global electric car sales by key markets, 2010-2019



Source: IEA, 2020

In 2019 the share of electric vehicles registered within Europe rises to 3.46% of total vehicles registered. The biggest shares of electric vehicle sales are recorded in Norway, Germany, the Netherlands, France, and the United Kingdom. The tax benefits and purchase incentives vary among countries. For better imagination of government incentives, to increase the purchase of electric vehicles particular examples in different countries will be provided (ACEA 2020).

3.2.3.1 Subsidies in selected countries

In Germany there is a benefit for ownership of 10 years exemption for tax for electric vehicles registered until the end of 2020. At the same time, in Germany there exists a benefit of reduction of the taxable amount for electric vehicles (from 1% to 0.5% of gross list price per month) and additional reduction of taxable amount for electric vehicles with a gross list price up to €60.000 (from 1% to 0.25 of the gross list price per month) for vehicles owned by a company. In order to increase the purchase incentives in Germany since June 2020 there is €9.000 bonus for purchase of electric car of total value €40.000 or more, for vehicles cheaper than €40.000 there is bonus of €7.500 (ACEA 2020). In the Netherlands, the Dutch

Government ratified the subsidy programme for purchase of an electric vehicle. From July 2020 private consumers are allowed to apply for subsidy but only if particular conditions are fulfilled. Customers in the Netherlands could receive €4.000 of subsidy for purchase of a new electric vehicle of initial price up to €45.000, the range of vehicles cannot be less than 120 kilometres. At the same time, the customer must avoid purchase of another vehicle within three years otherwise part of the subsidy has to be repaid. Also, the vehicle must be purchased through authorized dealer for the subsidy to be recognized. The newly established EV subsidy scheme is planned until 2025 with expected decrease in initial prices of electric vehicles by the Dutch Government. Consistently with expected decrease in EV prices the amount of subsidy will decrease as well. Based on an official government document the amount of subsidy in 2025 will be only €2.250 compared to €4.000 in 2020 (MIWM 2020). The Dutch Government also tackles the biggest barrier for electric vehicles – charging spots infrastructure. According to ACEA the Netherlands has the second most extended charging network after Norway. Norway and the Netherlands are the only countries that provide over 1000 charging units per one million of population for the EV users. Compared to Romania, where the infrastructure of the charging units is one of the poorest in Europe, with only 6 recharging units per million population (ACEA 2020). The Governments of the European countries are pushing car manufacturers to invest in production of electric vehicles in order to be able to achieve very strict regulations of CO2 reduction target in future years. However, the support from the government to increase the incentives to buy an electric vehicle widely vary among European countries. At the same time the infrastructure of recharging units within Europe is insufficient. Not considering the fact that over 62% of all charging points in the European Union are split among only 3 countries (Netherlands, France and Germany) (ACEA 2020). As well as the amount of financial support from the governments vary significantly among states, also promotion actions taken to develop the infrastructure of recharging units vary greatly. Countries such as the Netherlands, Germany or Norway belong to the countries where the support of electrification by subsidy programmes is the most evident also to a significant extent support the develop the infrastructure. The sufficient density of recharging stations is one of the initial steps to integrate the EV among wider public. Moreover, the development of infrastructure serves as a promotion tool to increase the awareness of electric vehicles (Wappelhorst et al. 2020). For instance, the Dutch Government implemented grants between 2015-2018 of total budget €7.2 million for construction of recharging network (MIWM 2018). In Norway, the promotion actions were

focused on development of fast recharging points. In 2017 the Norwegian Government introduced a programme for the construction of fast recharging stations every 50 kilometres along all main roads in the country. Currently, except for one main road, the goal of fast recharging station every 50km along main roads has been successfully accomplished. By 2025 Norway aims to sold only zero emission vehicles. This ambitious goal is supposed to be achieved through stricter green tax system which favours electric vehicles over the conventional petrol vehicles. Through this intervention the Norwegian Government aims to make EV market more competitive (Kristensen et al. 2019).

The government incentive programmes in Norway, such as exemption EVs from 25% VAT on purchase or no road and ferry tolls, that have been established in Norway to a significant extent meet the expectation of increased EVs sales. Currently, Norway is the only country worldwide, where more electric vehicles than CPV were sold in 2019. According to the statistics electric vehicles market recorded annual growth of almost 22% between years 2019-2020. Similarly, in the Netherlands they have experienced positive impact of the government supportive activities to increase the sales of EVs. Even though the amount of electric vehicles sold in the Netherlands is not that significant compared to the Norway still there was almost 10% increase in share of EV among all vehicles sold (Wappelhorst et al. 2020). An interesting example is Switzerland - Swiss Confederation consists of 26 cantons and every canton has its own legislature. Therefore, the government incentives vary among particular regions. For instance, in Zürich there are tax benefits provided for the EV users. Despite the lower government incentives, the sales of electric vehicles are above European average in Switzerland mainly due to more developed charging infrastructure compared to neighbour countries (ACEA 2020).

3.3 Comparison of BEV (Battery Electric Vehicles) with CPV (Conventional Petrol Vehicles)

Due to the trends of nowadays the comparison of BEV with CPV has been done in many researches. However, the results are not always the same. It depends on many factors that must be taken into account to get the most reliable data possible. In other words, it is very hard to generalize or to set a winner of this particular competition. A conventional petrol

vehicle has a combustion engine that burns petrol or diesel and compared to the alternative fuel vehicle produces considerable amount of emissions and work less efficiently. However, the new alternative fuel vehicles face a lot of constrains which keep them from wider commercialization. The primary technological issue is the energy storage. The new battery technologies have a lot of limits which are uncertain. The cost, longevity, safety and ineffective production are the main issues that remain unsolved nowadays. According to the U.S. department of Energy DOE vehicle technology programme the main goal should be to decrease the cost of high-power batteries to help increase the competitiveness of alternative fuel vehicles, in this case battery electric vehicles. First of all, the comparison of different size cars will be discussed (Egbue et al. 2012).

According to the study, it is obvious that the CO_2 emissions can vary widely depending on the car size. The results were based on the point when the electric vehicle becomes more environmentally friendly than the conventional petrol car. As previously mentioned, in comparison with CPV, the manufacturing of batteries for BEV significantly increases the CO_2 emissions. In category of compact cars, the electro-mobility can provide the biggest benefit in terms of lowering the greenhouse gases (Graham et al. 2001). The battery electric vehicle of the small size is going to be more environmentally friendly is case of reaching around 110 thousand of kilometres during its lifetime. The issue of small compact cars is that they are very often bought as "a second car" for city use (Hobday 2020).Therefore, they are very likely not reaching the border of the previously mentioned sum of kilometres. In this particular case, the small compact cars with battery-electric engine will be cleaner only with assumption that all energy for their use will be gained from renewable resources. More interesting data have been achieved by comparison of cars of higher class. Nowadays, with current state of utilization of non-renewable resources, it would be necessary to drive approximately 160 thousand kilometres with e.g. Tesla Model S in order to reach more clean results compared to the same efficient diesel car. Is the same case as with small compact cars, this mentioned Tesla model S will overcome the diesel car only if all electricity is gained from renewable resources, which is as publicly known unreachable condition nowadays (Staffell 2019).

Another factor that needs to be taken into consideration is the environmental benefits from driving an electric vehicle. Primarily, as it was briefly discussed above, the battery electric vehicles are not as clean as they are presented. Technically, the BEV cannot be considered

as zero emission cars because of relatively high amount of emissions produced in vehicle manufacturing and at the same the electricity used for recharging the EV is not emission neutral either (Holland et al. 2015).

Important topic of CO_2 emissions produced by vehicles is the distribution of the emissions. The main difference between emissions produced by electric vehicle and conventional petrol car is that the greenhouse gasses do not occur in the area where the vehicle is operating. On the other hand, in case of conventional petrol cars the situation is different. The emissions occur exactly where the car is driven because it is known that CPV produces it itself. If two cars, one with combustion engine and the second one with battery electric engine, are driven in the same area e.g. city, the locations of their emission are different (Holland et al. 2015). Does this really help to improve the environmental situation in the world in terms of decreasing the production of greenhouse gases and could be this approach considered as a sustainable one?

3.4 Theories of consumer behaviour

Consumers' preferences for electric vehicle are crucial factors to market success of electric vehicles in upcoming transportation sector. Studies considering the preferences of people for electric vehicles take into account the financial, political, technical and infrastructural attributes and furthermore are explained through theory of planned behaviour and theory of reasoned action. In order to have comprehensible overview of consumers' preferences for EV, electric vehicles are usually compared to conventional petrol vehicles. In the following section, the previously mentioned attributes are introduced, followed by the connection of these attributes to the theories (Liao et al. 2017).

3.4.1 Theory of planned behaviour

The theory of planned behaviour is determined by three factors attitude: subjective norm and perceived behavioural control. Theories depend on motivation and ability which are crucial factors to predict the consumer behaviour in comprehensible way. Studies related to electric vehicle adoption take into consideration all three determinants. In case of attitude, based on financial attributes, the studies have discovered that high initial price tends to have a negative impact on the EV adoption, on the other hand, the high initial cost is to some extent

compensated by lower utilization costs. Considering the technical attributes, the limited driving range is a significant functional barrier. Nevertheless, even the technical attributes have positive impact on the consumers' attitude in sense of appreciable driving experience due to high acceleration and low noise produced by the vehicle. Moreover, in some cases, people's positive approach to EVs is a question of higher social status and positive attitude to new technologies that are expected to correspond with sustainability of the environment. (Skippon et al. 2016). Besides from infrastructure and vehicle characteristic barrier, the concept of mobility necessities needs to be added to the theory. Based on the studies the consumers' behaviour and lifestyle might be also a barrier for EV adoption. In other words, current characteristics of electric vehicle does not correspond with personal needs (Moons et al. 2015).

Studies have also examined the subjective norm, which shows whether the social pressure has an effect on the EV adoption. The results of these studies show that people tend to purchase an electric vehicle while their surroundings consider electric vehicle as a good option or when they already own one. Subjective norm is to a significant extent affected by people in the surroundings, it follows that improved image of electric vehicle would potentially lead to wider awareness of electric vehicle among society (Haustein & Jensen 2018).

3.4.2 Attributes and consumer preferences towards EVs

Financial attributes are undoubtedly one of the main factors influencing the initial purchase of any kind of vehicle. Financial attributes include not only the vehicle purchase price but also the cost related to its utilization. Price awareness also differ among population and particular studies have proven that people with higher income tend to be less sensitive to price (Glerum et al. 2014). The financial attributes are interconnected with policy attributes which include particular instruments for easier adoption of market with electric vehicles. In order to enhance the electric vehicle market, national governments have started to implement subsidy programmes for potential buyers of electric vehicle. The main aim of subsidy programmes is to help people to overcome the barrier of financial unaffordability. The financial support from the side of state is intended to be one of the main factors that will motivate and persuade people to prefer electric vehicle purchase over the purchase of conventional petrol vehicle. The governments are establishing financial support in the form

of subsidy for initial purchase but the advantages for potential buyers also include exemptions and discounts on parking fees, road tolls etc. (Wappellhorst et al. 2020).

Another attribute that must be taken into consideration is the infrastructure of charging points available. The quality of infrastructure is definitely a question of state initiatives that vary widely among states. It is obvious that the density of petrol stations is much higher compared to the density of electric recharging station and this is also considered as one of the drawbacks that keeps the market with electric vehicles behind sales of conventional petrol vehicles. Nevertheless, the improvement in infrastructure is crucial for the fulfilment of the future transportation goals as well as for sufficient motivation for people to choose EV over CPV (Tamor el al. 2015).

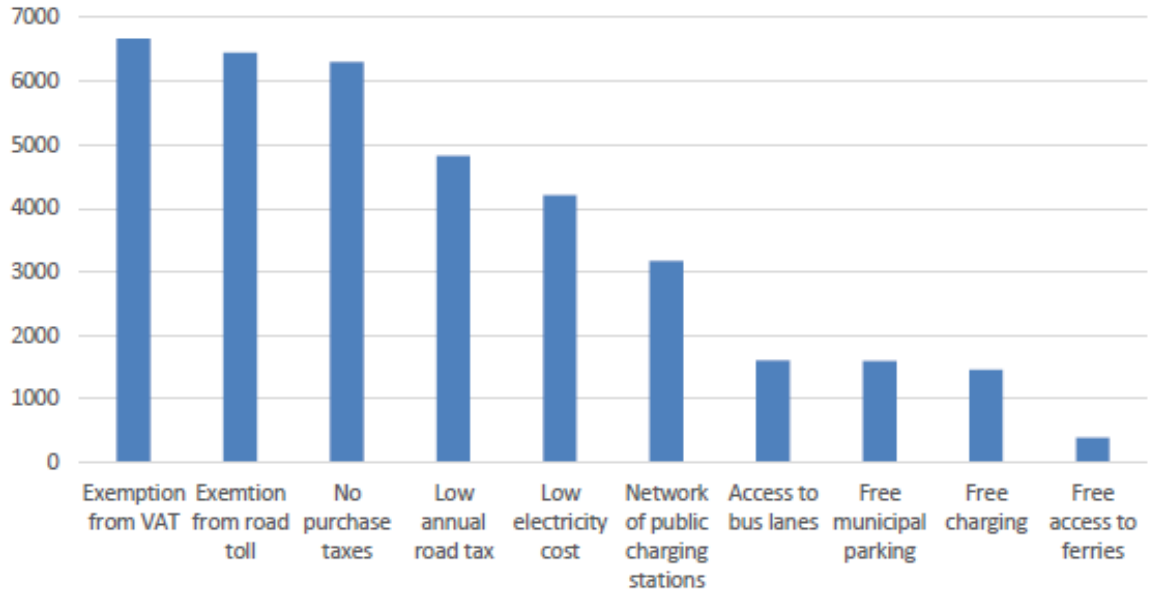
Technical attributes deal with technical characteristics of the vehicle which must be also taken into consideration. The low range belongs to the main technical issues of the electric vehicles that keep them from being widespread among vehicle users around the world. The charging time, which is generally considered as drawback compared to the conventional petrol vehicle, also play a significant role in consumers' motivation in purchasing an electric vehicle. Nevertheless, electric vehicles also provide a set of benefits to its consumers such as lower fuel costs and enjoyable driving experience thanks to instant torque not depending on the revolutions of the engine like in case of conventional combustion engine (Wang et al. 2018).

Generally, the issues that this sector faces, people tend to be sceptical to adoption of electric vehicle mainly due to uncertainty toward EVs, its immature technology and other barriers that were already discussed (Noel 2019). Studies bring the evidence of most common obstacles that slow down the adoption of electric vehicles, such as low range and high initial cost. As already discussed in the section of comparison of EV with CPV, the initial price of electric vehicle is significantly higher compared to the conventional petrol vehicle (Barth et al. 2016). In case of non-financial reasons, the insufficient infrastructure of recharging stations remains another aspect of current unsuccess of EV market. Nevertheless, some individuals are more aware of the environmental aspect and are willing to decrease the consumption of petroleum by using the conventional engine cars less and therefore decrease the production of greenhouse gases and together with increasing government initiatives the number of users of electric vehicles is expected to increase in the future years. The potential group of early adopters who are willing to pay more money for let's say an uncertain product

in exchange of vision for cleaner future. However, the majority of consumers tend to be more conservative to adopt a new technology (Egbue et al. 2012).

3.4.3 Consumer intent towards EV purchase

Figure 3. Most important EV incentives according to Norwegian EV owners



Source: Lorentzen et al., 2017

Consumer intention is closely connected with the motivation that exists in the area of electric vehicle market. At the same time the electric vehicle market is to a significant extent affected by government incentives. As an example, results of the research done among population in Norway is shown above in (Figure 3.). It shows the most important incentives that persuade people to purchase an electric vehicle. Consumers' intention is affected by the government incentives such as exemption from VAT, exemption from road tolls and no purchase tax for electric vehicles as the main drivers to purchase an electric vehicle (Lorentzen et al. 2017). Consumers' intention to buy an electric vehicle is to a significant extent affected by the same factors as their motivation. The financial aspect plays a significant role in positive but as well in negative point of view. The positive aspect is the vision of lower costs connected with the utilization. A number of studies also state that the environmental aspect creates significant part in the consumers intention. Customers who are more environmentally friendly and who even overlook the higher initial cost are more likely to adopt upcoming wave of electric vehicles. Nowadays, to some extent, people tend to go

with the trend and accept to pay higher price in order to be early adopter of the new coming transportation trend. Even with awareness of the other current drawbacks of electric vehicle such as a limited infrastructure of charging units or uncertainty of the value of operational costs (Degirmenci et al. 2017).

3.4.4 Consumer decision-making about EV purchase

Consumers behaviour in purchase of electric vehicle decision making process includes particular steps that are influenced by internal and external factors and at same time divides potential buyers into groups according to their need and wants. In particular study problem recognition, as a first step of the decision making process, includes three specific groups of potential customers. The first group called higher expected satisfaction (financial aspects) includes people who are not in need of a new car but they want to have another one with the vision of saved money on fuel costs. The second group, current dissatisfaction (environmental aspects), is formed by people who want a new car that will satisfy their visions because the old one does not, those people are aware of the environmental impact. The third group, new need (technological aspects), so called early adopters, people who intend to buy an electrical vehicle based on passion for new technologies (Klöckner 2014).
The second step of the decision making process evaluates the searching method, in other words: where does the initial thought of buying an electric vehicle come from. Based on the research done in the United States most of the respondents 31% have personal experience with test drive. 20% of respondents gain knowledge about electric vehicles through other consumers' reports and ratings, followed by personal recommendation 18%. Independent ratings of electric vehicles address 10% of potential buyers. The remaining 21% consist of mixture of automotive magazines, dealership, and manufacturer available info (Taylor et al. 2018). Another step of the decision making process deals with alternative evaluation of the main reasons to purchase an electric vehicle. Apart from general aspects, for the purchase of particular electric vehicle, such as reliability, durability, quality of workmanship and brand reputation the potential buyers also evaluate more specific aspects. Based on the data from survey among Chinese population the most important aspect for electric vehicle users remains the savings of money on fuel costs - almost 40% of the respondents. Approximately 22% of the respondents consider the reduction of environmental impact as the most significant aspect. 17% of the respondents consider the possible of advantages, e.g. exemption from road tolls, HOV (high-occupancy vehicle) lane access etc., resulting from

utilization of electric vehicles as the main purchase decision tool. Around 6% of potential buyers decide based on the possible use of futuristic technologies together with the desire of support of electrification (Yang et al. 2019).

Purchase decision as the next step of consumer's decision making process of buying an electric vehicle is formed by internal and external factors. The external factors such as availability of the product in the market, state incentives in electric vehicle purchase, sufficient infrastructure and price are key factors influencing the final purchase. For better imagination of internal factors a particular study was conducted among population in the United States. 3.500 owners of electric vehicle answered the following demographic characteristics to report internal factors. Based on the survey almost 80% of the buyers were men, 87% of the respondents were graduates of college with average household income of over $145.000. This clearly shows that income belongs to the group of key internal factors influencing the electric vehicle purchase, considering the fact that in 2019 the median household income in United States was $61.937 the financial barrier remains a significant aspect (CEIC 2020).

For analysis of the data gathered among people interested in purchase of electric vehicle different models and frameworks are used. However, in the study conducted by Klöckner (2014), stage model of behavioural change has been implemented. The model includes particular stages pre-decisional, pre-actional, actional and purchase. The pre-decisional stage is affected by social and personal norms also the noticeable emotional gain of electric vehicles seems to be determinative in the pre-decisional stage. In the pre-actional stage, knowledge about electric vehicle types have been examined which shows that attitude towards electric vehicle is not based on the same level of knowledge of electric vehicles among the examined group of potential customers. The actional stage discusses the knowledge about availability of the particular car type. The results show that four out of five potential customers skip some of these stages and almost half of the participants did not change among the stages. This particular model seems to be very suitable for the analysis of the decision making process and at the same time it shows the gap between intention and behaviour of the customers. (Klöckner 2014).

3.5 Technology Acceptance Model

Technology acceptance model is a useful tool for describing consumers' attitude to a new technology, in this case the acceptance of electric vehicle as a significant player in the transportation sector in the upcoming years. The TAM consists of specific factors that persuade people to use the new technology. Despite the relatively frequent use of technology acceptance model many researchers consider the TAM as incomplete with lack of variables taking into account the social influence. TAM 2 and TAM 3 have been introduced in order to develop more explanatory powerful models which include social influence processes and cognitive instrument processes, which play significant role in user acceptance. After the analysis of technology acceptance models the UTAUT model (Unified Theory of Acceptance and Use of Technology) has been developed, it has the highest explanatory power. This model is built on performance expectancy, social influence, facilitating conditions and expectancy. (Khazaei et al. 2016). Firstly, the acceptance of new technology depends on the believe and persuasion of potential customers in the particular product, to what extent the consumers believe it will help them to increase their performance. In other words, whether they find the new technology useful. Secondly, whether the customers believe in particular product in sense of simplicity to use it. Both of these factors are crucial for positive acceptance, if the product is not easy to use, customers tend to be rather rejective (Yang et al. 2019).

Automotive segment has belonged to the worldwide phenomenon for many years, the popularity among world population is undoubtable and today's world could barely exist without it. Nevertheless, this segment has negative impact on the environment therefore more sustainable ways of transport are needed to be invented. In recent years, significant incentives in order to promote electric vehicles as a new way for transportation have been established. Despite increasing availability of electric vehicles on the market, the conventional petrol vehicle still dominates worldwide (Müller 2019).

The acceptance of electric vehicles has been studied among German population which will serve as a particular example. The survey was based on benefits and drawback of electric vehicles compared to the conventional petrol vehicle. The comparison examined EV and CPV in specific aspects such as purchase price, costs related to use, variability of models, and refuelling/recharging network available. Based on the results of the study there are differences, in the level of acceptance, regarding the use for commercial or private purposes.

The survey has proven that people tend to accept electric vehicles for commercial use rather than for the private. Among private users, the biggest issue remains the initial price of EV in comparison with CPV, regardless the fact of rising government incentives in the form of subsidy programmes for the potential EV buyers. In the commercial sector the situation is slightly different, people are not that much aware of financial attributes and at the same time they appreciate the vision for more sustainable transportation sector. Regardless of it, the financial and social attributes, the insufficient infrastructure of recharging stations are generally considered as the biggest drawback in both, private and commercial, sectors. Without significant improvements in this section electric vehicles could not be accepted globally (Wolff et al. 2018).

Considering the fact all new technologies are meant to be useful and easy to use but in reality, not all technologies are easy to use as well as useful. There are several methods that can be used for data analysis of consumers' decision making process regarding the electric vehicle purchase. The technology acceptance model seems to be suitable for this particular analysis taking into consideration the specific breakdown of the model. Nowadays, it is very important to take into account the social influence which is a crucial factor on whether or not the technology of electric vehicle is going to be widely accepted.

4 Practical Part

In this section, based on the main findings of the literature review the specific research questions and influential factors are formulated in order to address the main aspect of consumers intention to purchase an electric vehicle. In the following subsections a survey among selected sample of respondents is conducted to gather specific data for further quantitative analysis.

4.1 Research questions

Since the research goal is to identify the intention of consumers to purchase an electric vehicle, the research questions must correspond with this goal. Therefore, the main focus was on different factors which affect the customers' perception of electric vehicle and intention to buy them. In the survey selected factors were presented and further on were compared with demographic factors in order to find out the level of influence of different demographic over affecting factors.

First question:

Which factors have impact on the consumer's intention to purchase EVs?

Second question:

Can Technology Acceptance Model sufficiently explain the consumer's intention to buy EV?

4.2 Statistical hypothesis

Through hypothesis testing the sample was analysed in order to evaluate the level of importance of demographic factors over selected factors that influence the consumers' intention to purchase an electric vehicle. Each of the selected factors was tested and based on the results, the conclusion was conducted, at the same time it will clarify to what extent the different demographic factors of the consumers are influencing the willingness to buy an electric vehicle. All hypotheses are related to the consumers' intention to purchase an electric vehicle.

Purchase cost

$H_0$1: The degree of importance of the purchase cost factor does not depend on gender of the respondent

$H_1$1: The degree of importance of the purchase cost factor depends on gender of the respondent

Range

$H_0$2: The degree of importance of the range factor does not depend on the number of vehicles owned by the respondent

$H_1$2: The degree of importance of the range factor depends on the number of vehicles owned by the respondent

Charging infrastructure

$H_0$3: The degree of importance of charging infrastructure factor does not depend on the number of vehicles owned by the respondent

$H_1$3: The degree of importance of charging infrastructure factor depends on the number of vehicles owned by the respondent

Environmental awareness

$H_0$4: The degree of importance of environmental awareness factor does not depend on the education level of the respondent

$H_1$4: The degree of importance of environmental awareness factor depends on the education level of the respondent

Government incentives

$H_0$5: The degree of importance of government incentives factor does not depend on the income of the respondent

$H_1$5: The degree of importance of government incentives factor depends on the income of the respondent

Social influence

$H_0$6: The degree of importance of social influence factor does not depend on the age of the respondent

$H_1$6: The degree of importance of social influence factor depends on the age of the respondent

Perceived usefulness (PU)

$H_0$7: The degree of importance of PU factor does not depend on the income of the respondent

$H_1$7: The degree of importance of PU factor depends on the income of the respondent

Perceived ease of use (PEOU)

$H_0$8: The degree of importance of PEOU factor does not depend on the age of the respondent

$H_1$8: The degree of importance of PEOU factor depends on the age of the respondent

Social influence and performance expectancy(SIPE)

$H_0$9: The degree of importance of SIPE factor does not depend on gender

$H_1$9: The degree of importance of SIPE factor depends on gender

4.3 Research method

Quantitative research method is used for the collection and analysis of the data through a survey among the population in the Czech Republic. Due to the fact, the survey is conducted among Czech population, the questions are presented primarily in Czech language in order to simplify the questionnaire to the respondents. Nevertheless, the results are then translated to the English language. The survey is divided into three section, the first section collects the background information about the respondents to gather the demographic factors that will be further on compared with the selected factors. In the second section of the survey respondents are asked specific set of structured questions according to the particular factors. In order to minimize the misunderstanding and ensuring the most exact data only one

question per each factor has been selected. The third part is based on the Technology Acceptance Model which examines the perceived usefulness, perceived ease of use of EVs. This model has been developed by Professor Davis in 1989 but since then some modifications and new variable have been implemented into the model. The additional variables were added with the aim to better understand the attitude of consumers toward particular technology. In this section three statements were selected for each TAM factor also to find out whether the TAM respectively UTAUT model is suitable for this testing.
The data gather among the selected sample of respondents are analysed via SPSS. The ANOVA test was chosen for the testing. It examines whether there can be found statistically significant difference between testing groups and it clarifies which hypothesis is supposed to be approved.

The world of electric vehicles undoubtedly belongs to the group of new technologies and that is why the technology acceptance model is included in the thesis. Apart from perceived usefulness and perceived ease of use the questions in the third part also evaluate the performance expectancy and social influence which belongs to the factors affecting the attitude of consumers toward electric vehicles. The questions focusing on social influence and performance expectancy are, to a certain extent, connected to the factors mentioned in the section two as well which points out the suitability of technology acceptance model factors for the evaluation of this topic.

4.3.1 Survey structure

The questionnaire is divided into three subsections and all of them are completed by the respondents themselves. The survey aims to collect data that could be further on evaluated. To obtain the most relevant data the Likert scale has been used in the section two and three. The Likert scale consists of 5 point and it is used to measure the strength of the agreement or disagreement with the particular statement. Each response is assigned with a number in the following order: (1 – strongly disagree),(2 – disagree), (3 – undecided), (4 – agree), (5 – strongly agree). The advantage of this method is the more exact data achieved and at the same time the respondents have wider degree of option compared to the YES/NO questionnaires.

In the first section the background information of the respondents is asked in the questionnaire to get the demographic factors for further evaluation. It includes the following items:

- *Gender* (male/female)
- *Age* (18-24; 25-34; 35-44; 45-54; 55-64; 65+)
- *Income per month in CZK* (15.200-31.200; 31.201-60.000; 60.001-100.000; 100.000+)
- *Education level* (primary/secondary /tertiary)
- *Number of vehicles* (0,1,2,3+)

The second section is focused on specific factors that affect the consumers' intention to buy an electric vehicle based on literature review. The method of five-point Likert scale evaluation was used for evaluation of selected variables and sub-question related to the factors listed below:

- *Purchase cost* – to determine to what extend the initial price affects the consumers' decision to purchase EV
- *Range* – how does the driving range affect the purchase intention
- *Charging infrastructure* – to what extent the limited charging infrastructure affects the purchase intention
- *Environmental awareness* – how important is the individual environmental awareness in purchase decision
- *Government incentives* – how important are the government incentives from the viewpoint of customers
- *Social influence* – to what extent the social influence affects the intention to purchase electric vehicle

Purchase cost factor question:

- The initial price of electric vehicle will be balanced by its lower utilization costs

Range factor question:

- The driving range of electric vehicle is sufficient

Charging infrastructure factor question:

- Infrastructure of charging units is sufficient in the Czech Republic

Environmental awareness factor question:

- Electric vehicles help to reduce the CO2 emissions produced by automotive industry

Government incentives factor question:

- Advantages resulting from government incentives for electric vehicle users are crucial for increased intention to buy it

Social influence factor question:

- Driving electric vehicle is part of social status nowadays

The third section investigates the perceived usefulness *'the degree to which a person believes that using a particular system would enhance his or her job performance'*, the perceived ease of use *'the degree to which a person believes that using a particular system would be free from effort'* which are the two basic factors of TAM (Davis 1989). At the same time, this sections includes the questions focusing on the performance expectancy and social influence of consumer towards electric vehicles which are factors taken over from UTAUT. Therefore, the following questions are divided into three groups: Questions related to the perceived usefulness (PU), the perceived ease of use (PEOU) and the social influence and performance expectancy (SIPE) of electric vehicle. Selected questions are structured in the form of Likert scale evaluation of attitude.

Perceived usefulness (PU)

- Using electric vehicle can save money
- Charging electric vehicle at home is too expensive
- Using electric vehicle is less time efficient compared to the conventional petrol vehicle

Perceived ease of use (PEOU)

- Using electric vehicle is more comfortable compared to the conventional petrol vehicle
- Charging electric vehicle takes a long time
- Free parking in cities is the main advantage of electric vehicles

Social influence and performance expectancy (SIPE)

- Using electric vehicle is unpredictable in winter conditions

- Driving electric vehicle brings more enjoyable ride compared to the conventional petrol vehicle
- Using electric vehicle is more friendly to the environment

4.3.2 Sample

For the data collection non-probability sampling was selected. The aim of the sampling is to get sample from large population. In this case, sample of 60 respondents chosen from Czech population specifically selected with the aim to target wide spectre of the population. For this reason, the questionnaires were sent to respondents in different parts of the country, to the people living in cities but as well to people living in the countryside so that the answers also reflect the different consumers' needs. In order to preserve the balance of the sample appropriate ratio of men and women at different age groups were examined. It is necessary to mention that the group of respondents were people with, at least some, interest in auto industry and likely owners or user of the vehicle, therefore the results cannot be generalized also because the sample size is not sufficient. The questionnaire itself, was developed through simple platform for questionnaire creation and then distributed among the respondents via social media platform such as Facebook and via email as well.

5 Results and Discussion

In this chapter the results of the research will be presented. The collected data among selected sample of population have been analysed in the SPSS in order to test the selected hypotheses which tested the importance of demographic factors within selected factors affecting the intention to purchase electric vehicle. It is necessary to remind that the survey examines only 60 respondents in the Czech Republic with interest in automotive industry and therefore the results cannot be generalized. In other words, the results of the survey might be slightly different in comparison with perception of electric vehicles among wider public.

5.1.1 Sample Profile

In the (Table 1.) below the profile of the respondents is presented. Speaking about gender, the number of male (65%) respondents was bigger than female (35%), almost two thirds of the respondents were represented by men. For age, the majority of the respondents were in age from 25-34 (43,3%). One quarter of the respondents were formed by people in the youngest examined group, people in age from 18 to 24 (25%). On the other hand, only two respondents were from the group of age from 65+. Considering the education level, only two (3.3%) of the respondents had primary education on the contrary almost 70% of the respondents were people with university education and the rest was represented by people with secondary level of education. For the income section, the distribution was following 45% of the respondents answered that their monthly salary does not overcome 31.200 CZK, approximately 40% of the respondents belong to the income group of 31.201 CZK up to 60.000 CZK and the rest of the respondents' salaries does not overcome 100.000 CZK. 45% of the respondents answered they own 1 vehicle, 21.7% own 2 vehicles, 5% answered they own 3 or more vehicles and 28.3% of the respondents do not own a vehicle.

Table 1. Survey sample profile (N=60)

		Men	Women
Number		39	21
Proportion		65%	35%
Age group	18-24	23.1%	28.6%
	25-34	43.6%	42.8%
	35-44	17.9%	14.3%
	45-54	10.3%	0.0%
	55-64	0.0%	14.3%
	65+	5.1%	0.0%

Education	Primary	5.1%	0.0%
	Secondary	30.8%	23.8%
	Tertiary	64.1%	76.2%
Income (CZK)	15.200-31.200	35.9%	61.9%
	31.201-60.000	41.0%	33.3%
	60.001-100.000	23.1%	4.8%
	100.000+	0.0%	0.0%
Number of vehicles	0	20.50%	42.8%
	1	41%	52.4%
	2	30.8%	4.8%
	3+	7.7%	0.0%

5.1.2 Hypothesis testing results

Quantitative data analysis was used to analyse the non-parametric data to accept or reject the hypothesis related to the topic of consumers' intention to purchase an electric vehicle. Every selected influential factor was paired with particular demographic factor in order to evaluate the degree of importance. The ANOVA test was selected for this testing with the level of significance of 5% (α=0.05). To compare the means of answers of different respondents in comparison with the selected influential factor.

Purchase price

The first hypothesis tested whether the answer to the question considering the purchase cost factor is influenced by gender of the respondents. The means of answers of male and female show that the difference is statistically significantly different based on the results of the testing p-value (0.025) < α (0.05).Therefore, the H_0 has been rejected and based on the results it is stated that there is statistically significant difference between men and women answering the question related to the purchase price factor. Based on the results of the test, more respondents disagree with the statement that purchase price will be balanced by lower utilization costs. Men tended more to disagree with this statement rather than women as it is clearly visible in the (Table 2.) below where number 1 represents male and number 2 represents female and the mean value shows the most common answer on the Likert scale evaluation of agreement.

Table 2. Purchase price and gender

Descriptives

6.Purchase price

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	39	2,26	1,093	,175	1,90	2,61	1	5
2	21	2,90	,944	,206	2,48	3,33	1	4
Total	60	2,48	1,081	,140	2,20	2,76	1	5

ANOVA

6.Purchase price

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5,738	1	5,738	5,262	,025
Within Groups	63,245	58	1,090		
Total	68,983	59			

Range

The hypothesis related to the range factor tested whether the number of vehicles owned influences the attitude toward the range factor of electric vehicle. The results of the statistical testing p-value (0.294) > level of significance (0.05) show that there is no statistical difference between answers of people with different number of vehicles in possession. This fact approves the null hypothesis which says that the importance of range factor is not dependent on the demographic factor (number of vehicles owned). Based on the means of answers to the question related to the range factor, showed in (Table 3.) below, respondents generally do not agree with the statement that the range of electric vehicle is sufficient.

Table 3. Range and NOV

Descriptives

7.Range

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0	17	2,53	1,231	,298	1,90	3,16	1	5
1	27	2,56	1,396	,269	2,00	3,11	1	5
2	13	2,00	1,225	,340	1,26	2,74	1	4
3	3	1,33	,577	,333	-,10	2,77	1	2
Total	60	2,37	1,301	,168	2,03	2,70	1	5

ANOVA

7.Range

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6,365	3	2,122	1,270	,294
Within Groups	93,569	56	1,671		
Total	99,933	59			

Infrastructure

The third hypothesis related to the infrastructure of charging points was also tested whether the answer to the infrastructure factor question is dependent on the number of vehicles owned. The statistical analysis approved the null hypothesis (P=0.627 >0.05) which states that the infrastructure factor is not dependent on demographic factor number of vehicles owned. The results of this test are comparable with the range factor question results, the majority of the respondents do not agree, as presented in the (Table 4.) below, with the statement that infrastructure of charging point is sufficient in the Czech Republic.

Table 4. Infrastructure and NOV

Descriptives

8.Ifrastructure

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0	17	1,94	,899	,218	1,48	2,40	1	3
1	27	2,04	,854	,164	1,70	2,37	1	4
2	13	2,08	1,115	,309	1,40	2,75	1	4
3	3	1,33	,577	,333	-,10	2,77	1	2
Total	60	1,98	,911	,118	1,75	2,22	1	4

ANOVA

8.Ifrastructure

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,489	3	,496	,585	,627
Within Groups	47,494	56	,848		
Total	48,983	59			

Environmental awareness

In case of the next hypothesis that deals with environmental awareness factor, the education level factor was tested in pair with EA statement in order to find any correlation between them. The tests results (P=0.232>0.05) show that there is not statistically significant difference between answers of respondents with different level of education. Therefore, the null hypothesis has been approved which clarifies the statement that the environmental awareness does not depend on education level. The distribution of answers to this question is spread over the range of Likert scale evaluation see (Table 5.) and therefore it cannot be stated whether respondents rather agree or disagree with the statement that electric vehicle helps to reduce the CO2 emissions produced by automotive industry.

Table 5. Environmental awareness and Education

Descriptives

9.Environmental awareness

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	2	4,50	,707	,500	-1,85	10,85	4	5
2	17	2,71	1,213	,294	2,08	3,33	1	5
3	41	2,98	1,475	,230	2,51	3,44	1	5
Total	60	2,95	1,407	,182	2,59	3,31	1	5

ANOVA

9.Environmental awareness

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5,845	2	2,922	1,501	,232
Within Groups	111,005	57	1,947		
Total	116,850	59			

Government incentives

The fifth hypothesis tested whether there can be found any correlation between government incentives factor and the income level. The statistical analysis shows (P=0.773>0.05) that there is no statistically significant difference between answers of respondents with different level of income, it approves the null hypothesis, the answers to the statement considering government incentives factor do not depend on income level of the respondents, shown in the (Table 6.) below.

Table 6. Government incentives and Income level

Descriptives

10.Government incentives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	27	3,37	1,043	,201	2,96	3,78	2	5
2	23	3,17	1,267	,264	2,63	3,72	1	5
3	10	3,10	1,449	,458	2,06	4,14	1	5
Total	60	3,25	1,188	,153	2,94	3,56	1	5

ANOVA

10.Government incentives

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,749	2	,375	,259	,773
Within Groups	82,501	57	1,447		
Total	83,250	59			

Social influence

In case of social influence factor, the hypothesis tested whether there can be found statistically significant difference in answers between different age groups of respondents. Based on the results p-value (0.612) was higher than α (0.05) which approves the null hypothesis that there is not statistically significant difference between the answers of respondents of different age. The results, see (Table 7.) below, also show that regardless of age most of the respondent agree ($\bar{x}$=4.20) with the statement that utilization of electric vehicle is considered as part of 'image' nowadays.

Table 7. Social influence and Age

Descriptives

11.Social influence

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	15	4,20	,775	,200	3,77	4,63	2	5
2	26	4,19	1,059	,208	3,76	4,62	1	5
3	10	4,40	,516	,163	4,03	4,77	4	5
4	4	4,25	,500	,250	3,45	5,05	4	5
5	3	3,33	1,155	,667	,46	6,20	2	4
6	2	4,50	,707	,500	-1,85	10,85	4	5
Total	60	4,20	,879	,113	3,97	4,43	1	5

ANOVA

11.Social influence

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2,845	5	,569	,719	,612
Within Groups	42,755	54	,792		
Total	45,600	59			

The next group of hypotheses were set to test the TAM factors respectively UTAUT factors, perceived usefulness, perceived ease of use, social influence and performance expectancy, to find out the influence of demographic factors toward the factor of this model. At the same time to describe the attitude of respondents (consumers) toward electric vehicle. In order to do so for each group three statements were introduced.

Perceived usefulness (PU)

The hypothesis was focused on the first group of statements with the aim to test whether the answers to these questions are dependent of income of the respondents. The results show the p-value was in all cases higher than alfa. Therefore, PU factor does not depend on income of respondents. The first statement tested whether people believe that using electric vehicle can save money (P= 0.258> 0.05). The results for the second statement (P=0.113>0.05) show that respondents that belong to the 3rd group of income level (60.001-100.000 CZK) tend to disagree with the statement that charging electric vehicle at home costs a lot of money and respondents with lower income appeared to be neutral toward this particular question. The last statement in this group tested whether respondents believe traveling by electric vehicle is less time efficient compared to conventional petrol vehicle and if the income level influence their decisions. From the results in (Table 8.) below (P=0.813>0.05) it is visible

that irrespective of the income group of the respondents the most common answer to this statement was strongly agree (5) or agree (4) on the Likert evaluation scale.

Table 8. PU and Income

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
12.Perceived usefulness1	1	27	3,22	,974	,187	2,84	3,61	2	5
	2	23	2,78	1,085	,226	2,31	3,25	1	4
	3	10	3,30	1,160	,367	2,47	4,13	2	5
	Total	60	3,07	1,056	,136	2,79	3,34	1	5
13.Perceived usefulness2	1	27	2,78	,751	,145	2,48	3,07	1	4
	2	23	2,65	,982	,205	2,23	3,08	1	4
	3	10	2,10	,876	,277	1,47	2,73	1	4
	Total	60	2,62	,885	,114	2,39	2,85	1	4
14.Perceived usefulness3	1	27	4,26	,764	,147	3,96	4,56	2	5
	2	23	4,39	,891	,186	4,01	4,78	2	5
	3	10	4,40	,699	,221	3,90	4,90	3	5
	Total	60	4,33	,795	,103	4,13	4,54	2	5

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
12.Perceived usefulness1	Between Groups	3,054	2	1,527	1,388	,258
	Within Groups	62,680	57	1,100		
	Total	65,733	59			
13.Perceived usefulness2	Between Groups	3,399	2	1,700	2,264	,113
	Within Groups	42,784	57	,751		
	Total	46,183	59			
14.Perceived usefulness3	Between Groups	,270	2	,135	,208	,813
	Within Groups	37,063	57	,650		
	Total	37,333	59			

Perceived ease of use (PEOU)

The next group of statements was focused on perceived ease of use factor, and testing the degree of importance of age of the respondents in answering these statements. The results are shown in the (Table 9.) below, the p-value is higher than $\alpha=0.05$ PEOU1 ($P=0.473>0.05$), PEOU2 ($P=0.409>0.05$), PEOU3 ($P=0.459>0.05$) which approves that there are not statistically significant differences in responses in relation to age of the respondents. Based on the statistical results, in general the respondents tend to be rather neutral to the statement that using electric vehicle is more comfortable compared to the conventional petrol vehicle. However, the respondents from the group age 55-64 and 65+ disagree with this this statement. It is necessary to mention that these age groups include only 5 respondents. In case of the next statement from this group the situation is statistically more unilateral. Regardless of the age the respondents generally agree with the statement that charging electric vehicle takes long time. The average value of the responses across age groups was 4.10 which represents agree on the Likert scale. The last statement of this group

checks whether people believe that free parking in cities is the main advantage of the respondents and surprisingly the average (3.73) answer appears to agree (4) on the Likert scale evaluation.

Table 9. PEOU and Age

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
15.Perceived ease of use1	1	15	2,53	,834	,215	2,07	3,00	1	4
	2	26	2,38	,852	,167	2,04	2,73	1	4
	3	10	2,80	1,229	,389	1,92	3,68	1	5
	4	4	2,25	1,258	,629	,25	4,25	1	4
	5	3	2,00	,000	,000	2,00	2,00	2	2
	6	2	1,50	,707	,500	-4,85	7,85	1	2
	Total	60	2,43	,927	,120	2,19	2,67	1	5
16.Perceived ease of use2	1	15	3,93	,961	,248	3,40	4,47	2	5
	2	26	4,08	,845	,166	3,74	4,42	2	5
	3	10	4,10	1,197	,379	3,24	4,96	2	5
	4	4	4,75	,500	,250	3,95	5,55	4	5
	5	3	3,67	,577	,333	2,23	5,10	3	4
	6	2	5,00	,000	,000	5,00	5,00	5	5
	Total	60	4,10	,915	,118	3,86	4,34	2	5
17.Perceived ease of use3	1	15	3,67	,900	,232	3,17	4,16	2	5
	2	26	3,85	,925	,181	3,47	4,22	2	5
	3	10	3,80	1,033	,327	3,06	4,54	2	5
	4	4	3,25	,957	,479	1,73	4,77	2	4
	5	3	3,00	1,000	,577	,52	5,48	2	4
	6	2	4,50	,707	,500	-1,85	10,85	4	5
	Total	60	3,73	,936	,121	3,49	3,98	2	5

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
15.Perceived ease of use1	Between Groups	3,996	5	,799	,923	,473
	Within Groups	46,737	54	,866		
	Total	50,733	59			
16.Perceived ease of use2	Between Groups	4,304	5	,861	1,031	,409
	Within Groups	45,096	54	,835		
	Total	49,400	59			
17.Perceived ease of use3	Between Groups	4,165	5	,833	,946	,459
	Within Groups	47,568	54	,881		
	Total	51,733	59			

Social influence and performance expectancy (SIPE)

The SIPE hypothesis was the last group of statements of the attitude of consumers towards electric vehicle and that is why the UTAUT factors such as social influence and performance expectancy were chosen. Especially the performance expectancy is an important feature in the process of vehicle purchase, in this case the answers were tested if there is any statistically significant difference between male and female answering those questions as seen in (Table 10.) below. In the first case there is statistically significant difference because the p-value (P=0.046>0.05) was lower than 5% level of significance in answering the

questions whether respondents see the utilization of electric vehicle unpredictable in winter. According to the data on average men tend to agree with this statement rather than women. In case of the second statement, driving electric vehicle brings more enjoyable ride compared to the conventional petrol vehicle, the results are statistically significantly different (P=0.018<0.05) between men and woman. On average men answered that they do not agree with this statement, with average value of answer 1.87 on Likert scale and women were more neutral in this case ($\bar{x}$=2.57). The last statement evaluated whether respondents believe using electric vehicle is more friendly to the environment. In this case, there can be found statistically significant difference (P=0.006>0.05) between male and female answers. While women (3.76) tended to agree with this statement, men (2.77) were more neutral or even disagree with this statement as it is visible from the average value of answers on Likert scale.

Table 10. SIPE and Gender

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
18.Social influence and performance expectancy1	1	39	3,87	1,105	,177	3,51	4,23	1	5
	2	21	3,33	,658	,144	3,03	3,63	2	5
	Total	60	3,68	1,000	,129	3,43	3,94	1	5
19.Social influence and performance expectancy2	1	39	1,87	1,174	,188	1,49	2,25	1	5
	2	21	2,57	,811	,177	2,20	2,94	1	4
	Total	60	2,12	1,106	,143	1,83	2,40	1	5
20.Social influence and performance expectancy3	1	39	2,77	1,385	,222	2,32	3,22	1	5
	2	21	3,76	1,091	,238	3,27	4,26	1	5
	Total	60	3,12	1,367	,176	2,76	3,47	1	5

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
18.Social influence and performance expectancy1	Between Groups	3,958	1	3,958	4,172	,046
	Within Groups	55,026	58	,949		
	Total	58,983	59			
19.Social influence and performance expectancy2	Between Groups	6,682	1	6,682	5,916	,018
	Within Groups	65,502	58	1,129		
	Total	72,183	59			
20.Social influence and performance expectancy3	Between Groups	13,451	1	13,451	8,065	,006
	Within Groups	96,733	58	1,668		
	Total	110,183	59			

5.2 Discussion

Nine hypotheses were proposed to evaluate the influencing factors on consumers' intention to purchase an electric vehicle and in addition to find out the relation of different demographic factors towards them. The first 6 hypotheses were focused on selected influential factors and 3 hypotheses were focused on the technological acceptance theory

factors and its relationship with different demographic factors. Interesting results were gathered especially by UTUAT factor where there is statistically significant difference in social influence and performance expectancy in comparison with gender of the respondents. While social influence factor in the second section checked in pair with age did not find any statistically significant difference. According to the results of testing only in hypothesis 1 and hypothesis 9 were found statistically significant differences. In all other cases the null hypotheses were approved.

In case of the first hypothesis the attitude toward purchase price factor is dependent on gender and at the same time according to the data people tend to disagree with the statement that purchase price can be balanced by lower utilization costs. Similar studies have found out that purchase price factor belongs to the main factors affecting the consumers' adoption and intention to purchase electric vehicles (Lévay et al. 2017). The second hypothesis shows the attitude toward range factor is not dependent on the number of vehicles owned by the respondents. The results of this survey also approved the significance of importance of range factor in consumers' intentions to purchase an electric vehicles because respondents tended to disagree with the statement that the range of electric vehicle is sufficient. This fact corresponds with the studies that tested the challenges for better adoption of electric vehicles among wider public and according to the results the range factor barrier is an important aspect in adoption of EVs (Muehlegger et al. 2018). However, car manufactures are familiar with this factor, therefore there is ongoing research how to avoid this drawback (Lambert 2019). On the contrary, the results from the survey among Chinese population show that consumers do not consider driving range as an important factor in making a purchase decision. Nevertheless, this result cannot be generalized because the sample was too small to reflect the whole Chinese market (Jian et al. 2019).

According to the results the attitude of consumers toward charging infrastructure factor is not dependent on the number of vehicles owned. The results of statistical testing also show that respondents do not see the charging infrastructure in the Czech Republic as sufficient. This factor is generally considered as one of the most influential in purchase intentions process and studies in different European countries approve this fact. Even though the poor situation of charging infrastructure among countries in Europe does not really support the wide adoption of EVs among consumers. Some countries like Norway or the Netherlands are exceptions, in those countries there are over 1000 of charging units per one million of inhabitants which can to some extent cover the needs of EV users (ACEA 2020).

Based on the results of the next hypothesis environmental awareness is not dependent on the level of income of the respondents. This factor is very controversial and results of the survey also show that there are people who believe that electric vehicles are helping to reduce the CO2 emissions but at the same time there are people who do not support this statement which was reflected in the results. This factor cannot be generalized even in the small sample tested, since there are people whose intentions are motivated by environmental awareness to purchase an electric vehicle but there are also those who do not consider it as an advantage of electric vehicles. These results are also supported by a study conducted in Denmark where the environmental awareness factor divides people into two groups (Thøgersen & Jones 2019).

The next hypothesis shows that government incentives factor is not influenced by the income level of the respondents. The results of the statistical testing also show that people rather agree that advantages resulting from government incentives for EV users are increasing the intention to buy them. This factor is relatively hard to compare because different government incentives occur in different countries therefore the attitude of consumers toward this factor might be affected by this fact.

The hypothesis testing social influence factor and the effect of age of the respondents over this factor approves the null hypothesis that there is not statistically significant difference between age groups. On average all age groups tend to agree with the statement that using electric vehicle is part of social status nowadays. Regardless of age, people nowadays tend to go with the trend and buy things because of social status and are to a significant extent influenced by the others. Which is also proven by the results of the testing among the small sample in the Czech Republic. Even some studies in other parts of the world approve this fact. For instance, the research among a small sample of Chinese population tested have proven that social influence has positive effect on increasing willingness to buy an EVs (Jian et al. 2019).

The hypothesis evaluating the relationship between PU (perceived usefulness) and income found out that there is not statistically significant difference in any of the statements tested. The results also show that regardless of the income level respondents tend to be neutral to the first statement. The reason might be that likely majority of the respondents do not have personal experience with using electric vehicle which is reflected in the statistics. The results of the second statement show that only respondents with income higher than 60.000 CZK disagree with the statement that charging electric vehicle at home is expensive. The

respondents with lower income tended to be neutral to this statement. The last statement that evaluates the perceived usefulness shows that regardless of income level respondents agree that using electric vehicle is less time efficient compared to the conventional petrol vehicle. In general, the results show that respondents are aware of perceived usefulness factor of electric vehicles which is mainly approved by the last statement where the results were the most unilateral.

The hypothesis evaluating the degree of importance of age of the respondents over PEOU (perceived ease of use) found that there is not statistically significant difference. Therefore, the degree of importance of PEOU factor does not depend on the age of the respondents. According to the statistical data the answer to the first statement, using electric vehicle is more comfortable than conventional petrol vehicle, was on average neutral. This result might be to a significant extent influenced by the lack of personal experience of the respondents with using the electric vehicle. The second statement approves one of the drawbacks of electric vehicle also discussed in various studies (Rubino et al. 2018) that charging electric vehicle takes long time. Regardless of age, respondents agree with this statement. The last statement of PEOU factor reveals that free parking for EV in cities is the main advantage is accepted by the majority of the respondents regardless of age. The statistical results prove the importance of PEOU factor among respondents, it plays its role in intention to purchase an electric vehicle.

The degree of importance of social influence and performance expectancy statements were tested together with gender of the respondents. If we compared the data from the second section, we could see that there is no statistically significant difference in question related to social influence in case of age of the respondents. However, the data from the UTAUT factor that checks the SIPE (social influence and performance expectancy) factor shows that there is statistically significant difference in case of gender. In other words, according to the data of the survey the degree of importance of social influence factor does not depend on age of the respondents but it does depend on the gender of the respondents. Interesting results were gathered especially by the last statement which reveals that women tended to agree with the statement that using electric vehicle is more friendly to the environment while men were more neutral to this statement or even disagree. Statistical analyses have shown that the TAM respectively UTAUT factors are able to bring interesting data about respondents which can be further on used for evaluation of consumers' intention to purchase an electric vehicle.

Comparable literature sources have also shown that perceived usefulness, perceived ease of use, social influence and performance expectancy have impact on intention to use EV respectively to purchase electric vehicles (Wolff et al. 2018; Yousif et al. 2019).

The study itself deals with certain limitations, as it was already mentioned the results of the survey cannot be generalized because the sample size is not big enough to reflect the attitude of the whole society or at least the attitude of the population in the Czech Republic. Even though the survey is done among people with interest in car industry the knowledge might differ among the respondents which might have influenced the results as well.

6 Conclusion

The main goal of this thesis was to find out about the most decisive factors of electric vehicles influencing consumers' intentions to buy them. Based on the literature review research the main factors were selected. Using the survey, the selected factors were compared with demographic factors of chosen sample of population. It was found that in majority of cases, selected influential factors do not depend on demographic factors of the respondents. Except for purchase price, social influence and performance expectancy factors where statistically significant differences between men and women were found.

One of the partial goals was to study the current consumers' attitude toward EVs and the theories explaining consumers behaviour. Since the electric vehicles are a rather new technology people tend to be conservative in adoption of electric vehicles mainly due to the number of deficiencies of this technology. However, theories such as UTAUT explaining different consumers' behaviour toward adoption of EVs in different countries. It was found out that in some countries the governments provide more suitable environment for easier adoption of EVs among wider public.

Another partial goal was to conduct a survey among a sample of population in order to evaluate the selected factors influencing the consumers' intentions and behaviour towards buying an electric vehicle. The results approved the importance of selected influential factors of consumers' intentions to purchase an electric vehicle. At the same time, it shows the suitability of TAM respectively UTAUT theories to explain consumers' intention to buy an EVs. In case of some factors e.g., environmental awareness factor the consumers' attitude was found neutral probably due to ongoing discussion of uncertainty of contribution of electric vehicles technology in reduction of global CO2 emissions.

The EVs buying decisions are to a significant extent influenced by the selected factors that are needed to be taken into account in establishing a new way how to increase the interest of consumers to buy electric vehicle. In the end, the author finds the following recommendations viable for the further research. Since the purchase price factor is undoubtedly one of the most influential in consumers' intentions to purchase an electric vehicle, therefore, the author suggests studying this particular factor in more details to find out what can be the turning point that will persuade people to purchase electric vehicles instead of conventional petrol vehicles. Is the increase of the initial price of CPVs to the level of EVs the only possible solution?

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8 Appendix

Background Information		Choice
GENDER	Male	□
	Female	□
AGE	18-24	□
	25-34	□
	35-44	□
	45-54	□
	55-64	□
	65+	□
EDUCATION	Primary	□
	Secondary	□
	Tertiary	□
INCOME	15.200-31.200	□
	31.201-60.000	□
	60.001-100.000	□
	100.000+	□
NUMBER OF VEHICLES	0	□
	1	□
	2	□
	3+	□

SURVEY QUESTIONS (1= strongly disagree → 5 = strongly agree)	1	2	3	4	5
Purchase price					
The initial price of electric vehicle will be balanced by its lower utilization costs	□	□	□	□	□
Range					
The driving range of electric vehicle is sufficient	□	□	□	□	□
Charging infrastructure					
Infrastructure of charging units is sufficient in the Czech Republic	□	□	□	□	□
Environmental awareness					
Electric vehicle helps to reduce CO2 emissions produced by automotive industry	□	□	□	□	□
Government incentives					
Advantages resulting from government incentives for electric vehicle users are crucial for increased intention to buy it	□	□	□	□	□
Social influence					
Driving electric vehicle is part of social status nowadays	□	□	□	□	□
Perceived usefulness (PU)					
Using electric vehicle can save money	□	□	□	□	□
Charging electric vehicle at home is too expensive	□	□	□	□	□
Using electric vehicle is less time efficient compared to the conventional petrol vehicle	□	□	□	□	□
Perceived ease of use (PEOU)					
Using electric vehicle is more comfortable compared to the conventional petrol vehicle	□	□	□	□	□
Charging electric vehicle takes a long time	□	□	□	□	□
Free parking in cities is main advantages of electric vehicles	□	□	□	□	□
Social influence and performance expectancy (SIPE)					
Using electric vehicle is unpredictable in winter conditions	□	□	□	□	□
Driving electric vehicle brings more enjoyable ride compared to the conventional petrol vehicle	□	□	□	□	□
Using electric vehicle is more friendly to the environment	□	□	□	□	□