

Studia commercialia Bratislavensia

Vedecký časopis Obchodnej fakulty Ekonomickej univerzity v Bratislave

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Obsah

Contents

The state of electromobility in the Czech Republic and the Slovak Republic.....	189
Barbara Barilová	
Marketing environment of family businesses	202
Samuel Chlpek	
Electromobility in urban logistics.....	212
Michal Jankovič	
RECENZIA / BOOK REVIEW	
KUBINEC, M. 2022. Obchodná spoločnosť v kríze. 1. vydanie.	
Praha : C. H. Beck, 184 s.....	223
Andrea Slezáková	

The state of electromobility in the Czech Republic and the Slovak Republic

Barbara Barilová¹

Abstract

The importance of electric mobility in the world is growing in the long run. In several countries, national policies taking into account alternative drives have already been prepared or are being prepared, pilot projects are being implemented and electromobility is being integrated into transport systems. The use of electric vehicles represents a significant reduction in noise and emissions from transport, which has a positive impact on improving the quality of life. The paper focuses on the identification of the state of electromobility in the Czech Republic and Slovak Republic, in terms of the number of registrations and the availability of charging stations. It also examines whether the targets set by the European Union for 2020 have been met and whether the Covid-19 pandemic has had an impact on the purchase of electric cars. The Czech Republic failed to meet the targets for the number of electric vehicle registrations and the number of charging stations. The Slovak Republic did not manage to meet the target even in the number of registered electric cars, but in the area of charging infrastructure it managed to exceed it. It is noteworthy that the Covid-19 pandemic had a positive effect on the purchase of electric cars, due to declining interest in vehicles with a traditional combustion engine.

Key words

Electromobility, pandemic, sustainability, charging stations, infrastructure, fuels

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Introduction

Electromobility or electric mobility is a road transport system based on means of transport that are powered by electricity. The central elements of such a transport system are electric vehicles, supplemented by charging infrastructure, appropriate information technologies and legislation. Apart from building the charging infrastructure, electromobility does not require any special interventions in the road infrastructure. The main aim of electromobility is to reduce the amount of carbon dioxide and air pollutants emitted by various means of transport. In particular, the targets set by the Paris Agreement have led the European Union to legislate on the amount of CO₂ a car can produce while driving. It is the only large-scale automotive technology to date that is produced on a large scale. Electric mobility, which is clearly of interest for passenger cars, is equally important for other modes of transport. Battery buses, electric bicycles and small electric motor vehicles have spread throughout the cities to provide sustainable transport alternatives (energia.sk, 2015)(renaulteways.com, 2021).

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The EU 2020 energy and climate goals have put the EU on the right track to ensure secure, affordable and clean energy for all Europeans. Significant progress has already been made in increasing the use of renewable energy and increasing energy efficiency, and the EU is making progress in the transition to clean energy. The Treaty on the Functioning of the European Union stipulates that environmental protection conditions will be integrated into policy formulation and implementation, as well as into other Union initiatives. Unsustainable modes of transport are reflected in the rapid growth of motor vehicles, as well as the uncontrolled and irreversible use of natural resources (especially oil). This situation destroys global and local ecosystems and poses a risk to human well-being and health

Cohesion policy helps to integrate environmental concerns into policy areas and economic sectors, for example through investment in clean energy sectors, sustainable urban transport and urban development projects.. Legal action is also needed against the transport sector, which accounts for a quarter of Europe's greenhouse gas emissions, in order to achieve the EU's sustainable development policy goal (eea.europa.eu, 2016)(eur-lex.europa.eu, 2019)(consilium.europa.eu, 2021).

1 Methology of work

The aim of the paper is to point out the current state of electromobility in the Slovak Republic and the Czech Republic in terms of the number of registrations of electric vehicles, availability of charging stations and subsidies and to find out whether the goals set by the European Union were met. The author of the paper focused on answering two research questions (VO) to achieve the objective of the paper:

VO1: Has the Czech Republic and the Slovak Republic achieved the goals set by the European Union by 2020?

VO2: How did the state of electromobility change in the conditions of the Slovak Republic and the Czech Republic during the first wave of the Covid-19 pandemic?

The output of the paper is formulated answers to the results, which answer research questions regarding the achievement of the goals set by the European Union and the impact of the COVID-19 academy during the first wave. To obtain the results, we conducted secondary research, which consisted of data collection, processing and subsequent interpretation. Selected methods using the principles of logical thinking, such as analysis, synthesis and comparison, were also used in the paper. In this paper, an empirical scientific method was used, which allowed us to draw conclusions from empirical, ie verifiable evidence. We focused on comparing relevant data and displaying the current situation in the researched area. For the purposes of data presentation, we used their graphical display.

2 The results and discussion

The adoption of the Directive on the Development of Infrastructure for Alternative Fuels, which aims to attract investment in sustainable transport and the establishment of an uninterrupted network of fuel disposal infrastructure in the Union. They should support the

exchange of best practices in the implementation and management of alternative fuels infrastructure between local and regional development initiatives and use the European Structural and Investment Funds, in particular the European Regional Development Fund and the Cohesion Fund, for this purpose (eur.lex.europa.eu, 2014).

Most of the indicative targets that were set for 2020 have not been met in both of the countries. The only positive development in this regard was the expansion of the infrastructure of high-performance charging stations (above 22 kW), for which the 2020 targets were met in both countries. An interesting fact is that despite the crisis caused by the Covid-19 pandemic in the car market, the development of electromobility accelerated significantly in 2020 in both Slovakia and the Czech Republic. In 2020, when pandemic-related restrictions caused a serious crisis in the new car market in Europe, electric car sales rose sharply. This means that electromobility is much more resilient to downturns in the automotive industry and support for its development should be fully in line with the primary objective of national recovery plans.

The Fit for 55 plan is a package of various legislative instruments and documents designed to help EU member states reduce greenhouse gas emissions by 55 percent by 2030 compared to 1990. It consists of 14 basic documents, such as reducing car emissions, using renewable resources, energy, emissions trading, setting incentive tax rates for the use of "green energy" and the like. The automotive industry is hit hardest by emission reductions of all industries. The plan also includes a Regulation of the European Parliament and of the Council on the reduction of CO₂ emissions from cars, to which Slovakia also subscribes. This says that according to the original proposal, passenger car emissions should fall by 15 percent by 2020 compared to 2020 and by 37.5 percent by 2030, and even by 55 percent according to a new, more ambitious proposal (pravda.sk, 2022).

The automotive sector in Europe is an important part of the economy - providing up to 13.8 million jobs and representing more than 6,1% of total employment in the EU. In 2020, 12.9 million vehicles were produced in Europe, representing approximately 17% of global production in that year. More than 5.8 million vehicles were exported, worth € 134.1 billion (ec.europa.eu, 2015)(acea.auto, 2021).

2.1 The state of electromobility in the Slovak Republic

In Slovakia, we perceive a growing trend, which represents a shift from fossil fuels to alternative and sustainable energy sources. The importance of electromobility lies in the fact that transport is currently responsible for up to a quarter of greenhouse gas emissions, which makes it the dominant polluter, especially in urban areas. It is through its introduction that we can reduce the negative effects of transport on human health and also on the environment, which has a significant impact on it. The impetus for comprehensive measures to support the development of electromobility at the national level was the need to implement the obligations arising from the EU directive on the implementation of infrastructure for alternative fuels. In response to the requirements set out in the Directive, a National Policy Framework for the Development of the Alternative Fuels Market has been developed and adopted. and National Policy for the Development of Infrastructure for Alternative Fuels (mhsr.sk, 2019).

The documents specify strategic goals and directions for the development of road transport to alternative fuels. In relation to electromobility, the key objectives include:

- stimulating demand for electric vehicles,
- creating social acceptance of electric vehicles with special emphasis on economic and environmental benefits arising from the purchase and use of electric vehicles,
- developing charging infrastructure based on building a nationwide network,
- suitable conditions for the transformation of the transport sector in terms of the introduction of low and zero emission vehicles (economy.gov.sk, 2020).

Based on the prepared scenarios of electromobility development and in connection with their impact on the growth of the national economy, indicative targets for the number of electric vehicles (BEV and PHEV) and charging infrastructure were proposed to be achieved by 2030:

- by the end of 2020 there should be 10,000 in Slovakia electric cars,
- by the end of 2025 - 20,000 electric cars,
- by the end of 2030 - 30,000 electric vehicles (euki.de, 2021).

In terms of deployment of charging infrastructure, at the end of 2020 the total number of planned charging stations was 750 (including 600 with power up to 44 kW and 150 with power over 44 kW). The targets for 2025 and 2030 are 1,500 (1,200,300) and 3,000 (2,340,460). The network of high-performance charging stations (above 44 kW) is intended to cover mainly motorways, 25 expressways, major state roads and cities with more than 30,000 inhabitants, where 90% of the planned high-performance charging stations are to be located. as a priority direction for development in the alternative fuels sector and has not received much attention. Much more emphasis has been placed on increasing the number of vehicles powered by natural gas (CNG and LNG) and related infrastructure. For example, in the case of natural gas vehicles, the indicative target years for 2020, 2025 and 2030 are 5,000, 15,000 and 30,000 - almost the same values as for electric vehicles. Very little attention has also been paid to the development of hydrogen-powered vehicles and their filling infrastructure, as no targets have been set for this technology (euki.de, 2021).

In 2019, an action plan for the development of electromobility was adopted. The document expands the range of activities planned for 2030 to include the electrification of public transport in cities and also provides a program to promote hydrogen as an alternative fuel. However, the indicative targets for electromobility have remained unchanged. In accordance with the assumptions of 2019, which are set out in the plan, support for the development of electromobility is to be financed almost exclusively from EU funds and the availability of funds has been defined as a condition for its implementation. However, efforts in the same areas, which are related to gaseous fuels (CNG, LNG), are to be financed primarily from the state budget (mhsr.sk, 2019).

This means that Slovakia identifies natural gas as a priority in the development of low-emission transport. However, in the context of the current approach to natural gas in the European Union, the adoption of such a strategy should be considered risky and also one that does not guarantee the achievement of new targets of reducing greenhouse gas emissions by 2030 as well as the strategic goal of climate neutrality by 2050. As in the Czech Republic, electromobility is not regulated by a separate legislative law in Slovakia. Issues related to the technical aspects of the charging infrastructure and classification of electric vehicles have been incorporated into existing regulations. The only law dedicated exclusively

to electromobility concerns only the rules on financial support for the purchase of vehicles and the construction of charging infrastructure (ec.europa.eu, 2015).

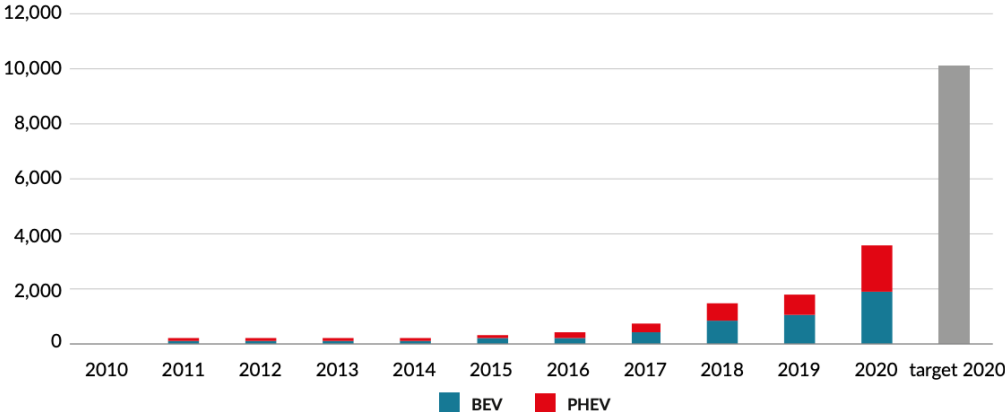
As stated in the planning documents, the financial support mechanisms for the purchase of vehicles and the development of charging infrastructure operated on the basis of EU funds within the framework of cohesion policy. In the years 2016 - 2018, the program to support the purchase of electric cars was completed, in which the maximum amount of the subsidy for a purely electric vehicle was 5,000 euros and for a plug-in hybrid electric car 3,000 euros. The subsidies concerned a total of more than 830 vehicles (BEV and PHEV) (economy.gov.sk, 2017). The first subsidy package for Slovakia, which amounted to 5.12 mil. The second subsidy package of 6 mil. However, it ran out in 3 minutes and 42 seconds (nine out of ten applications related to fully electric vehicles. The subsidy amounted to € 8,000 for a pure electric vehicle and € 5,000 for a plug-in hybrid electric car. 000 euros sDPH This package was to cover up to 750 electric cars (autobuild.pluska.sk, 2019) (mojelektromobil.sk, 2021).

As a result, we can assume that there will be similarly high interest in the third grant package. Based on the statement of the Minister of Economy of the Slovak Republic Richard Sulík, the third subsidy package will look different. It will be "a sufficiently large package of money and enough support for one car" says Sulík. Therefore, we expect a higher number of contributions in a lower value. The exact launch date has not yet been determined (teslamagazin.sk).

The only fiscal instrument implemented is the registration fee, which for the holder of a motor vehicle whose only energy source is electricity is EUR 33, while for the holder of a hybrid motor vehicle (HEV) and a hybrid electric vehicle (PHEV) the registration fee is reduced by 50% . The amount of the registration fee for a hybrid vehicle depends on the engine power and ranges from EUR 167 for engines up to 86 kW to EUR 2,997 for vehicles with an engine power exceeding 254 kW. As the fee for the most popular vehicles on the market is low and represents a one-off cost, its impact on the purchasing decisions of potential buyers is negligible (mhsr.sk, 2019) (Podatki.sk, 2017).

2.1.1 Number of electric vehicles in the Slovak Republic

Fig. 1 Number of electric vehicles (BEV and PHEV) in Slovakia in 2010-2020



Source: euki.de, 2021

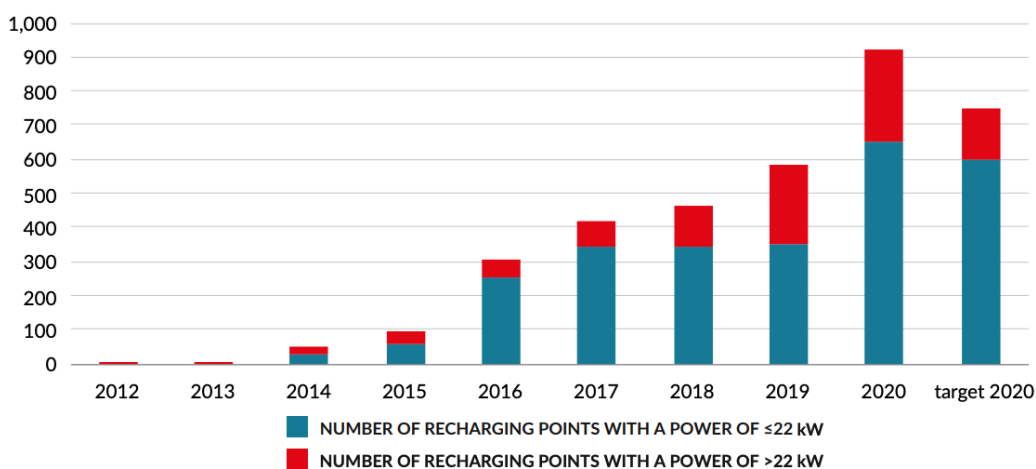
There should be total of 10,000 fully electric and plug-in hybrid vehicles on Slovak roads at the end of 2020, according to the forecast included in the National Policy Framework for the Development of the Alternative Fuels Market. Based on the published data, a total of approximately 3,500 such vehicles were registered in Slovakia at the end of December 2020. This means that only 35% of the target was met (eafo.eu, 2021).

As we can see in the picture above, the number of registrations is constantly growing. While in 2019 1782 electric cars were registered, in 2020 there were up to 3506, so the number almost doubled. We can state that the number of registrations has been growing rapidly since 2017, and in 2020 these vehicles represented almost 2% of the new vehicle market. For the following years, this figure is positive, given the significant decline in the number of new vehicles sold in all European markets in 2020 due to the COVID-19 pandemic. The primary goal of policies and regulations in the coming years should be to maintain current trends, which will make the indicative targets for 2025 and 2030 in Slovakia fully achievable (eafo.eu, 2021).

2.1.2 Charging infrastructure in the Slovak Republic

There were 924 functional charging stations in Slovakia at the end of 2020. This means that the indicative target of 750 charging stations was exceeded by more than 23%. Slovakia is the only country not only to achieve, but has exceeded the indicative targets for 2020 for the number of normal power (up to 22 kW) and high-performance (over 22 kW) charging stations. The number of charging stations with an output of more than 22 kW exceeded the target by more than 78%, and the number of charging stations with an output of up to 22 kW exceeded the target by more than 9% (eafo.eu, 2021).

Fig. 2 Number of charging stations in Slovakia in 2012-2020



Source: euki.de, 2021

GreenWay from Slovakia is the largest player in the segment of charging points with an output of over 22 kW. The company received € 17 million in 2018 from the European

Investment Bank, which it is to use for network expansion and further research. The power company ZSE Energia has the largest share in the segment of charging stations with an output of up to 22 kW. These companies plan to build at least a few charging stations along the main roads in Slovakia in the coming years, equipped with high-performance charging stations (with a capacity of at least 150 kW). (techbox.dennikn.sk, 2018) (euki.de, 2021).

2.2 The state of electromobility in the Czech Republic

Electromobility first appeared as a part of sustainable transport in the National Environmental Policy for 2012-2020 and the National Transport Policy for 2014-2020. These documents stated that the development of low and zero emission vehicles is one of the priority actions, but no specific plans have been presented in this area. Electromobility was further addressed in the National Energy Policy until 2040, in which it was identified as a measure aimed at:

- reduction of domestic consumption of liquid fuels,
- improving energy efficiency in road transport,
- increasing the share of alternative fuels, including electricity (www.mzp.cz)(mpo.cz).

The only planning document with a comprehensive approach to electromobility in the Czech Republic is the National Action Plan for Clean Mobility, which was adopted in October 2015 in fulfillment of the obligations arising from the implementation of EU Directive 2014/94 / EU. He talks about implementing infrastructure for other fuels. The following priorities have been defined in the section on the deployment of electromobility:

- reduction of domestic consumption of liquid fuels,
- creating demand for electric vehicles,
- creating conditions for social acceptance of electric vehicles,
- increasing the economic benefits of purchasing and using electric vehicles (euki.de, 2021).

EU funds available under cohesion policy, specifically under the Transport Operational Program from the EU Structural Funds, have been identified as the main source of funding. The planned financial support concerns the purchase of electric cars and the development of public and private charging infrastructure. The scenario of electromobility development in the Czech Republic, which is presented in the National Action Plan for Clean Mobility, includes a perspective until 2030. The indicative goals presented in the document are structured quite unusually - not only from a quantitative but also from a spatial point of view.

According to the adopted scenario, by the end of 2020, there should be 17,000 electric vehicles on the road in the Czech Republic, of which 6,000 BEV and 11,000 PHEV. The charging infrastructure was assumed to consist of at least 1,300 public points, including at least 500 high-performance points located along:

- highways,
- major state roads,
- in localities with population over 100 000 people (eaf0.eu, 2021)(euki.de, 2021).

High-performance charging stations form the basic network that enables the smooth movement of electric cars in the Czech Republic - the places are up to 150 km apart, which is less than the range of a personal electric car. The remaining 800 points, mostly of normal performance, should create another network located mainly in localities with a population of at least fifteen thousand. The construction of such a network in 2020 is estimated to provide access to charging infrastructure for at least a quarter of the country's population. Thirty-five thousand BEVs and sixty-six thousand PHEVs are to be registered by 2025. The infrastructure network will expand to locations with more than tens of thousands of inhabitants. In 2030, the electric vehicle fleet is to include approximately 250,000 BEV and PHEV cars, with the charging service based on real-time pricing. The price of the service will depend on the time and current network load. Two-way power flow based on V2G (Vehicle-to-Grid) technology will be provided. It is expected that after 2030, the mechanisms supporting electromobility will be terminated. The reason will be to achieve full maturity and competitiveness, even in terms of cost, compared to traditional drive technologies. The initiative in the Czech Republic, which concerns education, is also very interesting. In 2018, elements were introduced into the school curriculum that speak of environmentally friendly forms of transport and mobility. This step helps to build social awareness and also to accept emission-free transport at school age (euki.de, 2021).

Issues related to electromobility in the Czech Republic have not been comprehensively addressed in a separate legislative act. The technical side of the charging infrastructure was addressed by the amendment to the Act on Fuel and Petrol Stations. The Public Procurement Act includes provisions that allow public entities in the procurement process to use criteria based on an analysis of the costs that need to be incurred for the entire life cycle of a vehicle. This makes it possible to take into account the full range of benefits associated with the purchase and subsequent use of electric vehicles. In the Czech Republic, an amended Road Act came into force in 2019, according to which special license plates are issued by electric cars, which facilitate their identification on the roads. Owners of electric cars and hybrids could request a brand change free of charge. For special license plates, it is necessary to meet the condition that defines that the average emissions of the vehicle are less than 50 g / km (teslamagazin.sk, 2018).

The operational program, aimed at increasing the competitiveness of companies, financed the purchase of more than 500 electric cars and the purchase and installation of approximately 270 charging stations. The total amount of funding was EUR 20 million (approximately EUR 4 million of which was for the purchase of electric vehicles). The amount of the subsidy for the purchase of an electric car was up to 10,000 euros. It was also possible to obtain subsidies for the purchase of the electric bus, but its amount was only 40 thousand euros (euki.de) (teslamagazin.sk). Unlike other countries, in the Czech Republic, subsidies to support electromobility are intended only for legal entities.

There have been 6 calls for subsidies in the Czech Republic so far. The State Agency for Enterprise and Innovation (API) recently launched applications for the "Low Carbon Technologies" program, which also includes subsidies for electric cars and charging stations. This program supports three areas, namely electromobility, energy storage and secondary raw materials. Approximately € 24 million has been earmarked for subsidies, of which € 50 million is to support electromobility. This call was primarily focused on commercial electric vehicles and the minimum amount of the subsidy was EUR 10,000. The amount initially set aside for financial support was approximately EUR 2 million, but was later tripled to approximately EUR 6 million (teslamagazin.sk, 2021)(elektrickevozy.cz, 2020).

Other programs were originally planned to be launched in 2021, but the Ministry of Industry and Trade has announced that this will not happen. (elektrickevozy.cz) (euki.de). Once again, there will be several subsidy programs available that will ensure a more advantageous purchase of electric cars, but again, ordinary consumers will not see them (elektrickevozy.cz, 2020).

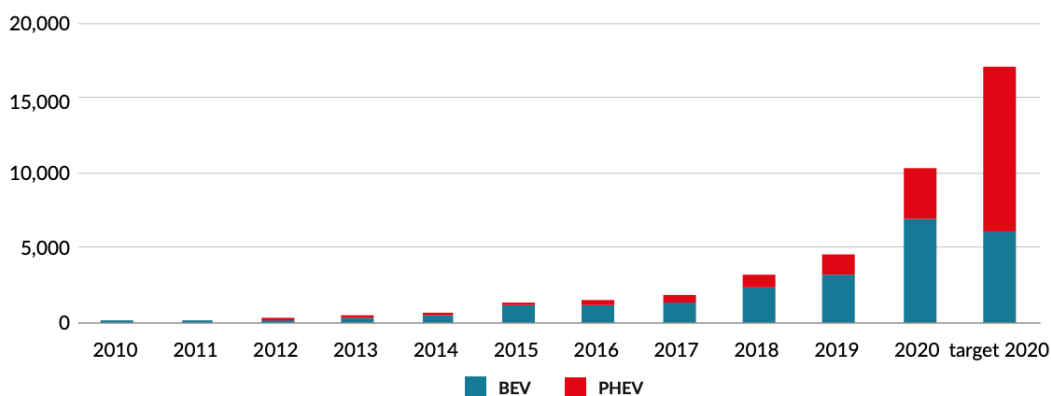
As regards tax measures, the following incentives have been applied:

- exemption from road tax for electric cars (the tax applies only to entrepreneurs),
- remission of the fee for issuing special tables with a registration number,
- From 1 April 2020, passenger cars will also be exempt from motorway tolls (eur-lex.europa.eu, 2014).

Local governments have also been given the power to exempt electric cars from parking fees and to allow such vehicles to drive in bus lanes. As previously announced by the Czech government, further tax incentives were planned to be introduced in 2021, such as a toll exemption for DMC > 12 t electric tolls and to increase depreciation in the first year of use of the charging station. However, due to the economic downturn caused by the COVID-19 pandemic, the implementation of these plans is uncertain (euki.de, 2021).

2.2.1 Number of electric vehicles in the Czech Republic

Fig. 3 Number of electric vehicles (BEV and PHEV) in the Czech Republic in 2010-2020



Source: euki.de, 2021

In line with the forecast set out in the National Clean Mobility Action Plan, approximately 17,000 electric cars should be on the road in the Czech Republic at the end of 2020, of which 6,000 BEV and 11,000 PHEV.

As we can see in the picture, the growth rate of electric vehicle registration has increased significantly over the last two years. With ongoing support mechanisms, such as the possibility of drawing subsidies for the purchase of EVs for individuals, the prospects for further growth of the EV market in the Czech Republic are very promising.

However, data from the end of 2020 show that 10,000 electric vehicles were registered in the Czech Republic. Most of them, almost 7,000 BEV and more than 3,300 PHEV. The

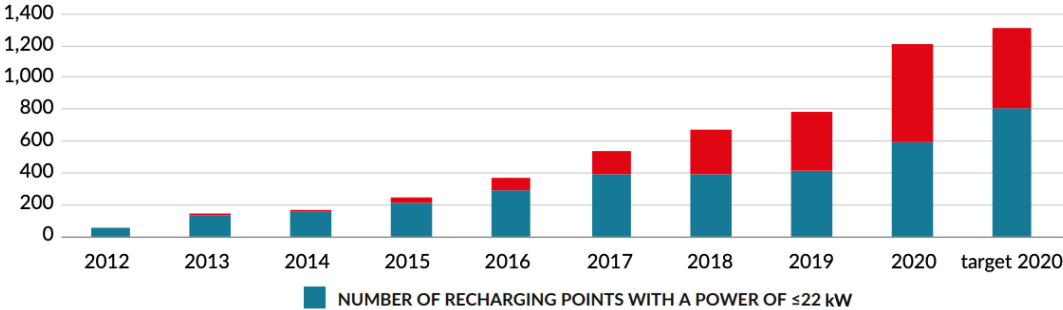
common target was thus reached at around 60% and the target for BEVs was exceeded by 15%.

The 2015 forecast shows that the domestic market potential for plug-in hybrid electric vehicles was significantly overestimated, as the target was only met at 28%. The data clearly show that these types of vehicles, which were not previously covered by financial and non-financial support mechanisms, are much less attractive to Czech customers than purely electric cars. Achieving the indicative targets set out in the National Clean Mobility Action Plan for 2025 and 2030 is thus fully within reach (euki.de, 2021).

2.2.2 Charging structure in the Czech Republic

The charging structure in the Czech Republic should represent 1,300 charging stations at the end of 2020, of which 500 of them should be high-performance, according to the forecast set out in the National Net Mobility Action Plan. Based on available data, the total number of charging points operated in the Czech Republic as of December 2020 was 1,200, of which more than 600 were fast charging stations. This means that the indicative target for charging infrastructure for 2020 has been met at around 92%, while the target for the number of fast charging stations has been exceeded by more than 20% (eafo.eu, 2021).

Fig. 4 Number of charging stations in the Czech Republic in 2012-2020



Source: euki.de, 2021

The result can be assessed positively, given that the Czech legal system does not set any binding targets for the development of infrastructure for charging electric vehicles.

The EV charging market in the Czech Republic is diverse. The market leader is the power company ČEZ. According to estimates, the company operated more than 230 charging stations (about 400 points) at the end of 2020 with a market share of more than 35%. The second largest player in the market in terms of the number of charging stations is the energy company E.ON (approximately 12% market share). Unlike Slovakia, two large foreign entities are starting to build their infrastructure network in the Czech Republic: the American Tesla (Supercharger with a capacity of at least 150 kW) and the consortium of European car companies IONITY (high-power points - with a capacity of at least 150 kW) (euki.de, 2021).

Conclusion

In Slovakia and the Czech Republic, electromobility is at an early stage of development. The Czech Republic has failed to meet its targets for the number of registrations of electric vehicles and the number of charging stations. The Slovak Republic also failed to meet the target in the number of registered electric vehicles, but managed to exceed the target in the area of charging infrastructure. Efforts related to direct financial support schemes and fiscal instruments to support the use of electric vehicles have not been sufficient to reach the 2020 targets. However, we can assess that there has been a steady and rapid increase in the number of registered electric vehicles and charging stations over the last three years.

The automotive sector is an important industry for both countries, representing a significant part of national GDP, offering many jobs and a significant share of exports. The automotive sector is facing major changes related to the transition to emission-free technologies. This direction is in line with the main pillar paradigm of EU development, which is the green and digital economy. Without effective measures aimed at implementing such investments, the future of the automotive sector in the Czech and Slovak Republics is uncertain.

The Covid-19 pandemic had a negative impact on the automotive sector. However, it has had a positive impact on the sale of electric cars, as we have seen a growing trend. The reason is the declining interest in vehicles with a traditional internal combustion engine, and, conversely, the growing interest in electric cars and plug-in hybrids. The decision to reduce EU greenhouse gas emissions from 40% to 55% by 2030 compared to 1990 implies the need to ensure significant reduction in emissions in the road transport sector.

The development of electromobility should be reflected in national projects, co-financed from national recovery plans, multi-annual financial frameworks 2021-2027 and other external sources. However, the absorption of such huge resources will require the identification of priority initiatives and projects that would enable them to achieve tangible results. The greatest potential in terms of efficient use of unavailable resources is offered by the electrification of public transport and the development of charging infrastructure for electric vehicles.

Resources

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Marketing environment of family businesses¹

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Abstract

This paper deals with the marketing environment of family businesses. The main goal of the paper is to identify the general marketing environment in the conditions of family businesses on the basis of analyzes. The introduction deals with the theoretical definition of family businesses (as the main research component in this article) and marketing, with a more detailed focus on the marketing environment of businesses. The methodology describes two main analyzes that are used in the paper - SWOT and PESTEL analysis. Both deal with the marketing environment of the company, each of its different parts. The results implement a work methodology that points to the issue of the marketing environment with a specific focus on family businesses. The analyzes used are supplemented by specific problems that plague family businesses in the business environment. The final chapter summarizes the essential information from the paper.

Key words

family business, marketing environment, marketing environment of family businesses

JEL Classification: M10, M30

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Introduction

There are more than 90 definitions of family businesses in Europe. This fact causes that if the business is considered family according to one of them, according to the second and the next one, it no longer has to meet the characteristics that the given definition indicates for classifying the business as a family business. According to Krošláková (2020), family businesses are such business entities if at the same time it is true that the family owns enough capital to be able to exercise control over the business and at the same time participate in top management positions. Although the first family businesses began to develop to a greater extent in the second half of the 19th century (in Slovakia until after 1990), the topic of their support still resonates for a long time in discussions led by institutions for the support of the business environment in the European Union. The terms "business of family" and "family business" are not defined in the current legislation of the Slovak Republic, despite the fact that the explanatory content of these terms is known to the general public and is used in cases where it concerns the business activities of persons related to each other (Krošláková et al., 2013). One of the most comprehensive definitions of the family business in the conditions of the Slovak Republic is provided by the Slovak Business Agency (2019), according to which a family business is understood as a group of individual persons with a blood relationship or a court decision, or if it is a legally recognized relationship with the same effect (adoption, marriage), or if these natural persons have personal, mutual ties with

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each other and are interested in creating mutual dependence, connectedness and dependence (mate, partner) through these common ties. At the same time, however, these persons must meet at least one of the following conditions in relation to the company:

- One or more members own more than 50% of market shares, votes or shares in the company;
- One or more members own such a market share, number of votes or shares in the company that they are able to enforce their will against the other co-owners (hereinafter referred to as "has influence");
- One or more members exercise control functions in the enterprise and "have influence";
- One or more members exercise management functions in the enterprise and "have influence".

Marketing of family businesses is one of the important stages of fulfilling the essence of business (the purpose of making a profit). According to Moresová and Sedliačikova (2021), the importance of marketing in connection with family businesses has been gaining strength in recent years. According to research carried out on customers, it can be seen that customers prefer products and services from family businesses, and this situation thus indicates a unique opportunity to use the special position of family businesses in marketing activities (Sharma et al. 2015; Braidford et al., 2014). There are several studies that examine the relationship between the entrepreneurial and marketing orientation of a business. Already the authors Morris and Paul (1987) assumed that more entrepreneurial firms will also be more marketing-oriented - while the entrepreneurial orientation of a firm includes three dimensions (innovation, risk-taking and proactivity), marketing orientation refers to the size and consistency of its investments from marketing activities and people, and also includes the adoption of the marketing concept by the company itself. Binz et al. (2013) and Papula et al. (2015) point out that an essential part of family business marketing is planning, and that marketing strategy planning must be part of business continuity (succession) planning. And considering that marketing according to Kotler et al. (2012) talks about how to make and sell what people want to buy, the most important stage of marketing planning is understanding the marketing environment, that is, the place where marketing takes place. The marketing environment has two levels:

- macro-environment (it refers to wider social forces that influence business, demographic, economic, natural, technological, political and cultural influences) (Kupkovič, 1999);
- micro-environment (refers to the influence of the business and its ability to serve customers, such as the company, distribution channels, consumer markets, competitors or the public) (Kotler et al., 2012).

1 Methodology

The main aim of the paper is to identify the general marketing environment in the conditions of family businesses based on the analyses.

Partial aims are:

- obtaining relevant theoretical knowledge about family businesses, internal and external influences on them, as well as theoretical knowledge of the marketing environment and its position in the conditions of the business environment,

- compilation of a SWOT analysis in which the main parts of the marketing environment of family businesses are generally identified,
- specification of PESTEL analysis and draft recommendations of individual factors for the environment of family businesses.

Partial aims help to fulfill the main aim of the article more accurately, and by fulfilling them, we can better understand the overall contribution of the work and bring better results.

By analyzing current knowledge in the field of family business and marketing - marketing environment, we characterize the issue of this article in more detail. In the article, we use synthesis, which represents the merging of theoretical knowledge from several parts so that it finally brings benefit in the form of fulfilling the main goal. In a certain part, we also use comparison, primarily within the framework of comparing areas that have common features, in this case, it concerns possible similar relationships between individual barriers of family businesses, which can become a fundamental source of problems in the marketing environment of this type of business.

With a SWOT analysis, we specify the marketing environment of family businesses in more detail. We use SWOT analysis as a strategic planning tool to assess strengths and weaknesses, opportunities and threats. It includes monitoring the marketing environment from its internal and external side of the organization, and thanks to it we can create general or partial conclusions, that is, use the deduction method and derive more specific ones from general statements.

The article also deals with the explanation of the PESTEL analysis, its impact on the marketing environment of companies, as well as a closer specification of its individual parts with possible suggestions for a family business.

2 Results and discussions

Researching the marketing environment in the conditions of family businesses belongs to a specific area focused on the issue of family businesses. Although the marketing environment has its place among experts and marketing activities are a decisive factor in the success of large and small businesses, there are very few sources of literature devoted to the marketing of family businesses itself, or to the marketing of family businesses as one of the important factors for increasing the competitiveness of all family businesses on market.

Within the framework of business activities, whether family or non-family businesses, it is necessary to realize that the business is always located in a certain time and space area. The business environment changes dynamically, which results in the impossibility of being able to accurately predict the future of the business environment for the entrepreneur himself.

2.1 General SWOT analysis of family business

The SWOT analysis itself is a valuable strategic management tool for the business environment, which helps companies of all types identify strengths and reveal weaknesses. Family businesses differ from non-family businesses in that they operate through the interplay of family, business and ownership. Just a SWOT analysis of each of these subsystems ensures valuable inputs for the best possible interplay and thus the successful course of the family business. With the SWOT analysis, in this article we try to synthesize the external and internal analysis of the company and identify specific parts in family businesses.

Strengths: These include attributes that create financial and personal success for both owners and employees and can be used to create a competitive advantage.

Weaknesses: These are generally internal issues and can relate to family and business matters such as rivalry, capital funding or communication. If they were not taken into account, they could delay the company's projects or even lead the company to bankruptcy.

Opportunities: These are factors external to the business that, if taken advantage of, can help the business (or the business's projects) achieve its long-term goals. For example, working with a marketing consultant to introduce a new product line for a certain target market or to improve the perception of the company.

Threats: These external factors can threaten the business or the success of business projects within the entire family business. For example, the departure of an employee who was key for certain clients could affect relations with clients and thus the company's income.

Within the framework of strengths, knowledge of the industry proves to be the most appropriate. Family businesses belong to small and medium-sized enterprises, and therefore the focus on their business activity is always specifically defined and concretized. Related to this is a greater opportunity to succeed in segmented markets. Less bureaucratic burden in decision-making and greater commitment of both family members and non-family members who participate in the running of the business. Weaknesses include legislative instability, which in Slovakia is caused by insufficient support from the state and its bodies. Nepotism, which can be encountered in every single family business, is also a typical feature of Slovakia. Stagnation in the area of marketing activities is also a weak point, and we will also address this point in further research conducted on family businesses.

The opportunity for family businesses is their own story to build on, but the unity between management and shareholders. Since these are generally small and medium-sized enterprises, employees receive more emphasis in the field of social care, training, courses, which is directly related to the loyalty of the staff. In the case of threats to family businesses, it is important to take into account financial needs and maintaining cash flow, there are often problems with access to credit, and it is also possible to confuse contractual ties with emotional ties. Family disputes or poor morale of family employees can cause problems and threaten the smooth running of the family business.

The following table shows an overview of the strengths, weaknesses, opportunities and threats of family businesses in general. As already mentioned in the article, the main distinguishing feature of family businesses is the interplay of family, business and ownership. It is possible to pay special attention to these parts and examine their strengths and weaknesses, which creates an even deeper focus on the issue.

Table 1. General SWOT analysis of family business

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> - greater capacity for progress, - less bureaucratic burden when making decisions, - greater commitment, - more business opportunities and innovations, - greater opportunities in segmented markets, - excellent social and work atmosphere inside the company, - respect in the market, - industry knowledge. 	<ul style="list-style-type: none"> - weaker discipline, - stagnation in the field of marketing, - excessive nepotism, - objectivity in the assessment of family members as company employees, - more difficult conversion of shares into cash, - structural, strategic and systemic problems, - legislative instability, - minimal use of performance measurement metrics.
<ul style="list-style-type: none"> - reputation and story of the company, - staff loyalty, - unity between management and shareholders, - social care, - continuity, - management reporting, - trainings, courses and others, - selection of employees. 	<ul style="list-style-type: none"> - financial needs to maintain cash flow, - problems with access to loans, - the coexistence of family and non-family managers, - confusing contractual ties with emotional ties, - postponement of succession and distrust in the younger generation, - higher competition, - family disputes, - worse employee morale.
OPPORTUNITIES	THREATS

Source: own processing

2.2 General PEST/PESTEL analysis of family business

While the SWOT analysis focuses on both internal and external environmental factors, the PEST/PESTEL analysis focuses only on the external, macro-environment that affects the business (Turner, 2002, Morrison, 2013). The basis is a PEST analysis, which deals with the political-legal, economic, socio-cultural and technological environment, which not only currently affect, but can also affect the company in the future. In recent years, legal and environmental environments have been added to the basic PEST analysis - the name of the analysis has been slightly changed to PESTEL analysis (Oxford College of Marketing, 2016).

The political factors of a family business determine the extent to which the government and government policies can influence the organization or a particular industry. It includes not only the political side and stability, but also trade, fiscal or tax policy.

The economic factors of family business have a direct impact on the economy and its performance, which in turn directly affects the organization and its profitability. These include interest rates, employment or unemployment rates, raw material costs, and exchange rates. From this point of view, the European Union itself draws attention to the need to perceive family businesses as a combination of providers of economic strength, but also of important social values. According to her, family businesses have consequences for society as a close community that go beyond financial impacts (SBA, 2018).

Social factors of the family business: This is about the social environment and the identification of new trends. This factor helps entrepreneurs to better understand the needs and wishes of consumers in the social environment. This includes family demographics, level of education, cultural trends, changes in attitudes or, for example, a change in the family's lifestyle.

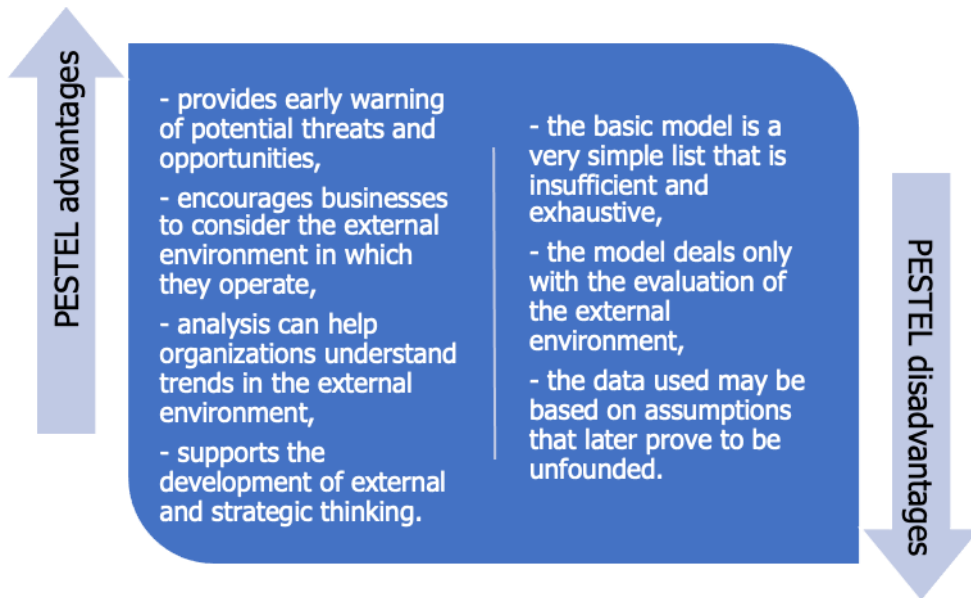
Technological factors of family business: The rate of technological innovation and development that can affect the market is essential in any type of business. They adapt to the current situation and the market, so they should include changes in digital or mobile technologies, automation, research and development.

Environmental factors of family business: These factors are influenced by the surrounding environment and the influence of ecological aspects. With the growing importance of CSR (Corporate Sustainability Responsibility) and sustainability, this element is becoming more and more important nowadays. Factors include the emphasis on the climate, the recycling process, the carbon footprint, waste disposal and sustainability itself.

Legal (Legislative) Factors of Family Business: A business must understand what is legal and permitted in the area in which it does business. The company must be aware of every legislative change and its impact on business operations. In Slovakia, there is no legislative definition of family businesses, but there are other legislative regulations that regulate business activity as such. There is no uniform definition of family business throughout the European Union, thanks to which it would be possible to obtain relevant data to map their economic development, the sectors in which they do business or their size structure (SBA, 2018). Legal factors thus include labour legislation, consumer law, and health and safety at work. Political and legal factors are very close - political factors are governed by government policy and legal factors are those that a business must comply with.

The Oxford College of Marketing states in their 2016 article that although PESTEL is an essential analytical tool for any business strategy, there are certain advantages and disadvantages associated with it:

Picture 1. Advantages and disadvantages of PESTEL analysis



Source: own processing according to Oxford College of Marketing, 2016

2.3 Proposal of recommendations resulting from the PESTEL analysis for the environment of family businesses

In terms of political factors, the state needs to strengthen democratic institutions so that businesses can thrive in an open, transparent and stable political environment. Strengthening the democratic institution will contribute to greater transparency and can contribute positively to the reduction of corruption in the country. According to SBA (2018), the policy areas that will most benefit the development of the family business environment are taxation, corporate law, corporate transfer planning, awareness raising, and education specific to family ownership and management. In the area of economic factors, unemployment was dealt with between 2013 and 2015 by a proposal in which the establishment of three new family businesses (family businesses, family farms, and family business companies) was promoted within the political scene in Slovakia with the aim of supporting poorer regions suffering from higher unemployment or fewer jobs (Mucha et al., 2016).

Social factors are an important element in establishing the stability of employees and company values. This factor can be influenced by, for example, the birth rate, which reflects future demand. The gender composition of the labour market can be used by family businesses to understand the level of the liberal nature of society, and to strengthen the rights of women in their own companies. Gender composition, as one of the social factors, can thus become an indicator of household disposable income for the company. If we try to look for the connection between economic and social factors, the demographic trend seems to be a good indicator for forecasting the demand of the economy. For example, if the population in Europe ages, the demand for such products that are intended for this target group will automatically increase. This opens up the possibility for family businesses to consider

developing new products based on demographic trends and to adapt features that suit the target group.

The introduction of digitization is one of the key parts of technological factors that can have a significant impact on the future of family business. In this area, companies should work on creating digital trust through higher transparency of processes and security in the processing of personal data. Nowadays, there is a tendency to focus only on the development of digital technologies, but this factor also deals with methods of distribution, production and logistics. However, we can place greater emphasis on strengthening the position of partners in the supply chain. By analyzing this area with the help of technology, family businesses (but essentially also small and medium-sized businesses) can strengthen supply chain partners, which can ultimately bring greater transparency and the supply chain itself will become more flexible. The technological changes that happen every day in Europe also affect the field of business, and family businesses should perceive and incorporate these changes into their own structures. This is, for example, the development of business activities into the online environment (e-commerce) and related infrastructure development, and the acceptance of mobile payments, which can be assessed based on the preferred options in the local economy and adapt the business model accordingly. The current topic is also the transition to the infrastructure related to the 5G network. In the area of family business enterprises, it is important to assess to what extent the local market is ready for the introduction of 5G connectivity.

Environmental regulations at national and local levels can often be different. This causes complications already when placing the company in the environment, but also when developing products and pricing strategies. Family businesses should be aware of the level of consumer activism regarding environmental concerns in the area in which they operate. Such knowledge will help better adaptation during product development itself, but also, for example, during PR activities that create recognition of the company's brand and stabilize the company in competitive conditions. An interesting knowledge for future research can also be the data on the average expenses of the budget of family businesses on renewable energy sources. Making such an investment can be considered by family businesses as part of their competitive strategy.

In the area of legal factors, in the case of family businesses, from the point of view of PESTEL analysis, we can focus on laws on health and safety at work. Different countries have different approaches to employee health and safety, so it should be a priority to do thorough research on a business before entering the market. Data protection laws are also a very current topic. The European Union is trying to regulate the handling of personal data, and its priority is that their storage remains only in the countries of the European Union. If a company gets involved in a lawsuit, it is questionable how long the legal proceedings themselves take in the market where the company operates. It may therefore be an advantage to conduct a survey regarding the length of court proceedings in view of the legal problem that family businesses may face. However, this part is theoretically easy to understand, but problems can also arise in the case of the independence of the judiciary and the relative influence of the government (here we see a very close connection between the political and legal factors of the PESTEL analysis). The independence of the judiciary often reflects the strength and credibility of a country's institutions, which can result in the outflow of business entities from a given market.

Conclusion

Family businesses form an important part of the business environment. In Europe, there are more than 90 different definitions of family businesses, but despite this, there is no legislation that would determine their status uniformly. This means that if the business is considered family-owned according to one definition, it may no longer meet the requirements according to the other. Authors in various literature sources state that the marketing of family businesses is one of the important phases of fulfilling the essence of business, but they devote almost no space to it. Knowledge about the marketing environment of family businesses is also absent, although Kotler et al. (2012) state that the marketing environment is an important part of creating marketing planning. Within its activities, a family business is located in a certain time and space area, therefore, according to the author of this article, it is important to examine the marketing environment and classify it in a specific area focused on the issues of today's family businesses.

Due to the fact that when examining the marketing environment we focus on its micro and macro level, it is an appropriate choice to use analysis in this case, especially SWOT and PESTEL analysis. With the SWOT analysis, we examine both the internal and external attributes of the company's environment, and with the PESTEL analysis, we focus more in-depth on the external (macro) environment, which can be influenced by several factors, such as political, economic, social, technological, environmental, legal (or legislative). Even in this case, there are only a few resources that would deal with individual factors and their problems in the family business, therefore it was important to obtain comparative information from several sources, especially from those that have long been devoted to the barriers of family businesses in this area.

Both analyzes in the article take into account the specific problems of family businesses and create a suitable prerequisite for the possibility of realizing the company's weaknesses, by solving which the company can achieve positive success in various target markets. Part of the results is therefore devoted to recommendations and suggestions that result from the general PESTEL analysis of family businesses, they specify the recommendations in more detail and look at their impact, often also in the connection of individual PESTEL factors. One of the biggest disadvantages of the PESTEL analysis is that, although it contains a lot of data, it is mostly based on assumptions that may later turn out to be unfounded.

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Electromobility in urban logistics¹

Michal Jankovič²

Abstract

The purpose of this article is to provide knowledge of electro mobiles usage in urban logistics. The article focuses on electro mobiles used in both freight as well as public transportation. The article is mostly based on analysis of secondary sources, which show us the focus of usage of electro mobiles in the mentioned areas. The article also compares usage of electro mobiles in urban logistics in Europe and Slovakia and compares the two. This article has shown us that since second part of the last decade, Europe has been trying to electrify vehicles used in urban logistics. Most developed European countries have slowly but surely been increasing their electric bus fleet and are planning to increase their numbers in further. Unfortunately, the less developed countries are still heavily dependent on ICEV vehicles in both freight and public transport.

Key words

Urban logistics, Electric vehicles, , sustainability, public transport, freight transport

JEL Classification: M30, M39, O13

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Introduction

Urban freight transport logistics is an energy-intensive activity that involves vehicle movement on congested roadways in densely populated regions. The widespread use of conventionally powered Internal Combustion Engine Vehicles (ICEVs) over many years has been negatively impacting the environment in many ways. Greenhouse gas emissions from ICEVs not only aggravate climate change but also take a serious toll on the cardio-pulmonary and respiratory health of the humans inhaling them. In addition, prolonged exposure to high noise levels due to the operation of ICEVs is detrimental to health.

With an increasing proportion of population living in urban areas and increasing demand for freight transport services in cities, owing largely to the explosion of e-commerce, the adversity resulting from the use of ICEVs will only worsen the livability of urban spaces.

It is now an opportune moment for all stakeholders involved in various degrees of decision-making to seek win-win measures to ensure sustainability. Given the short driving distances in urban localities, using Battery Electric Vehicles (EVs) for goods distribution in urban areas is a pertinent approach available to firms for moving towards sustainable transport operations.

The electrification of urban freight transportation fleet is a high impact solution in the context of fighting climate change. While EVs may still indirectly produce carbon dioxide emissions due to the widespread use of fossil fuel-based electricity, they diminish urban

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particulate as well as noise pollution significantly. Ambitious environmental regulations, together with the technological advances made by the industry in recent years, have made electro-mobility a real alternative for companies providing services in urban localities (Malladi et al.,2020).

1 Methodology

The main goal of this article is to provide knowledge of electro mobiles usage in urban logistics. The article focuses on electro mobiles used in both freight as well as public transportation. The article is mostly based on analysis of secondary sources, which show us the focus of usage of electro mobiles in the mentioned areas. The article also compares usage of electro mobiles in urban logistics in Europe and Slovakia and compares the two.

To fulfill the goal, we will use these methods:

- comparison and analysis of sources and publications on the chosen topic and synthesis of identified approaches and theories in order to understand the interrelationships of the issue,
- collection, critical analysis, and synthesis of collected data from secondary sources,
- a method of scientific abstraction to identify and disclose irrelevant information,
- a method of deduction aimed at formulating the main areas of research.

2 Results and Discussion

According to Ehrler and Camilleri (2021), mass introduction of the electric freight vehicles in the daily operations did not happen yet. The transition from conventionally powered diesel vehicles towards electric vehicles in urban freight transport did not appear to be an easy one due to the insufficient technology maturity and not yet proven business case.

Recent years have shown an increasing number of trials and demonstrators running EFVs in daily city logistics operations. In some cities EFVs are penetrating more and more specific niche markets. Running services and new demonstrations are continuously delivering new results on the performance of the electric freight vehicles in urban logistics.

2.1 Project FREVUE

The Validating Freight Electric Vehicles in Urban Europe (FREVUE) project commenced in March 2013 and was finalized in September 2017. The purpose of this 4 ½ year project was to demonstrate how electric freight vehicles can be successfully incorporated in urban logistic operations. Involving eight of Europe's largest cities, the project covered the breadth of urban freight applications (Quak et al.,2016)

The overall objective of FREVUE was to create an evidence base on European best practice which will underpin future uptake of electric freight vehicles (EFVs) by logistics operators and justify potential policy interventions to promote the use of EFVs for urban

deliveries. This will be achieved through the introduction of EFVs into routine logistics operations, coupled with innovative logistics concepts around freight consolidation. Overall FREVUE trialed over 80 electric freight vehicles (EFVs) and assisted with the installation of 75 charging points in demonstrator cities. Urban consolidation centers and innovative policy such as free parking, pre-booking systems for EFV charging and operational incentives for the use of EFVs were also trialed and reported on within the project.

The results of the project found that EFVs are indeed a viable alternative to conventional freight vehicles. The size of vehicles trialed ranged from small car-derived vans to 19t trucks and dynamic data was received with more than 50 data series covering a period of 12 months or more. Distance driven by the FREVUE EFVs totaled 757,073 km, at an average of 52.4 km per day, for an average of 7.2 hours. Initial concerns regarding vehicle range have largely proven unfounded and no safety issues were reported.

There were significant environmental benefits observed from the EFVs trialed in the project with reduced NOx emissions of 2147.5 kg, reduced PM10 emissions of 72.2 kg and well-to-wheel GHG emission savings of 455t if the conventional vehicles replaced were assumed to be Euro 3/III vehicles. With a higher penetration level of EFVs in the future, these environmental benefits and related monetary savings would be significantly higher. Attitudes towards EFVs improved over the lifetime of the project for all stakeholders with positive responses from drivers, fleet/depot managers, logistics operators, traffic network managers, electrical grid managers and customers. Drivers were particularly pleased with the reliability of EFVs, high power, reduced noise and lower maintenance requirements. As a measure of the project's success, many of the demonstrators have further increased the number of EFVs in their fleet and plan to continue doing so going forward.

Fig. 1 Cities included in FREVUE project



Source: https://frevue.eu/wp-content/uploads/2019/04/FREVUE-Final-Report_v2.0.pdf

However, important barriers to the widespread uptake of EFVs remain. FREVUE results show that while a positive business case regarding the total cost of ownership is certainly achievable for smaller EFVs of up to 3.5 tons, this becomes more challenging for larger, mostly retrofitted vehicles and is still difficult to achieve for large EFVs over 12 tons. Related to this, vehicle availability remains limited for vehicles of 3.5 tons and above, though this is expected to change rapidly over the coming years. The FREVUE project has created significant networking opportunities throughout the freight industry where the lessons learnt for electrifying freight vehicles can be shared across the whole of Europe. The incorporation of Phase 2 Cities showed the potential impact of the project where guidance on incorporating EFVs from the original demonstrator cities is shared. Overall, the impact of FREVUE has led to a significant increase in electric freight vehicle numbers, charging infrastructure and improved logistics in the freight sector. The increased future uptake of EFVs as a direct result of FREVUE will contribute to a reduction in congestion, improve air quality and enhance population health (Muenchmeyer, 2017)

2.2 Low Emission Zones

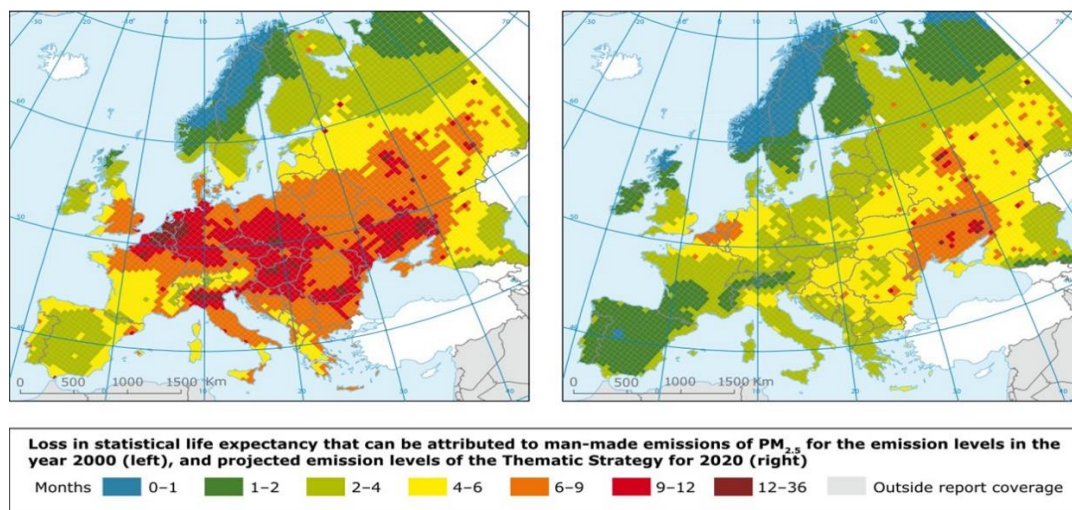
Low Emission Zones are areas where the most polluting vehicles are regulated. Usually this means that vehicles with higher emissions cannot enter the area. In some low emission zones the more polluting vehicles have to pay more if they enter the low emission zone.

There are increasing numbers of Zero Emission Zones in operation, preparation or planning. These are zones where only Zero Emission Vehicles are allowed in. This means Battery Electric or Hydrogen Fuel Cell Vehicles. For some plug-in hybrid vehicles may be allowed entry for an interim period, together with geofencing. Low Emission Zones are often the most effective measure that towns and cities can take to improve air pollution. Low emission zones reduce emissions of fine particles, nitrogen dioxide and (indirectly) ozone. These are the three main air pollutants of concern in Europe.

Fine particulates are also known as PM10 (particulate matter less than 10 micrometre in diameter) or PM2.5 (particulate matter less than 5 micrometre in diameter). A micrometre (μm) is a millionth of a metre (A human hair is about 90 μm in diameter). These fine particulates enter our bodies through its defenses and cause damage to our hearts and lungs.

The following left hand map shows an estimate of how many months life expectancy was reduced by man-made fine particles across Europe in 2000. The right hand map shows the months estimated when the many measures for air pollution have been implemented, in 2020. This shows the improvement that can be achieved with different air quality measures, for example cleaner Euro standards and Low Emission Zones. (UARiE, 2020)

Fig. 2 Loss of statistical life expectancy that can be attributed to anthropogenic contributions for emission levels in 2000 and projected emission levels in 2020



Source: <https://www.eea.europa.eu/>

2.3 Electromobility in Slovak road freight transport

According to Marián Vaculčíak, CEO of Geis SK s.r.o. (2020), electromobility is currently mostly used in the passenger cars field. Its use in freight transport in the future certainly cannot be ruled out, but he does not expect it in massive quantities in the near future.

Apart from the technical limits of electric vehicles, it is also necessary to say that being environmentally friendly is not a cheap and in the end, someone has to pay for it. Increasing the cost of transport in terms of wider use of electric vehicles is problematic. At the moment, therefore, greater expansion in our country is limited by high acquisition costs. Wider use also depends on the development of this technology, i.e. what it will be able to do and how quickly producers will be able to improve it and support its use.

He also states that one of the obstacles certainly still is insufficient infrastructure, i.e., lack of charging points and insufficient battery capacity for comparable performance with combustion engines. In his opinion, there also is an issue in how or if electromobility even is environmentally friendly. One thing is that using electric freight vehicles reduces emissions, but it is certainly important to think about the ecology of electricity production itself, the production of batteries, and especially their disposal at the end of their life.

The development of electromobility in the field of road freight transport can also be influenced by state incentives. The state certainly has options to support alternative vehicle propulsion. It may be a tax advantage or, conversely, the application of entry bans on vehicles with internal combustion engines into low-emission zones. The gradual development of electromobility is a fact, but in the light of available information and his previous experience, Mr. Vaculčíak is convinced that in the near future there will be no major change in road freight transport compared to today, so the most widespread will remain use of conventional internal combustion engines.

2.4 Electromobility in Public transportation

Europe's bus manufacturers are developing pioneering solutions to help cities reduce congestion, pollution and noise in parallel. E-mobility will be a key solution to achieve this, but requires the right charging infrastructure in the right places, such as urban nodes, airports and bus terminals.

That is why ACEA is urging the European Commission and member states to scale up support for alternative fuel infrastructure dedicated to buses, as part of the review of Europe's Alternative Fuels Infrastructure law (AFID) ACEA brings together Europe's five main bus and coach manufacturers: Daimler, Iveco, MAN, Scania and Volvo Group. (Kuchta,2021)

The development of non-emission public transportation modes is one of the strategic EU policies. Urban transport is currently responsible for 40% of the total CO₂ generated by road traffic in Europe. The transportation accounts for 30% of the overall energy consumption and 27% of greenhouse gas emissions. Of all the sectors that emit CO₂, the transport sector is one of the fastest growing sectors. However, by 2050 emissions caused by transportation needs to be reduced by 60%, Achieving this will be a great challenge. What is more, the instability of fuel prices has a significant impact on the economy. It became important to reduce energy consumption of transport sector and increase the use of renewable sources (Bartłomiejczyk, Kołacz, 2020).

Buses are the most widely used form of public transport in the EU, serving cities and suburban and rural areas. The following data confirm the importance of the role of this mean of transport in the transport systems:

- 692,207 buses are in circulation on the EU's roads today.
- In the EU, 55.7% of all public transport journeys (or 32.1 billion passenger journeys per year) are made by urban and suburban buses.
- Buses are an important link in the multimodal mobility chain. They also constitute a tool for implementation of a sustainable transport policy, and therefore they can and should be a tool for electromobility:
- With one bus capable of replacing 30 cars on the road, buses help ease traffic congestion.
- Buses and coaches have the lowest carbon footprint per passenger of any form of motorized transport. (ACEA, 2021)

Urban buses are specifically identified as a prioritized space for electrification, as these vehicles have predictable routes, allowing for smaller batteries and planned charging infrastructure. (Mutter, 2019)

Overall, in 2020, 72.9% of all new medium and heavy buses (over 3.5 tons) registered in the European Union ran on diesel, down almost 10 percentage points from 2019. At the same time, electrically chargeable vehicles (ECV) made up 6.1% of total new bus registrations last year, and hybrid buses increased their market share from 5.7% in 2019 to 9.5%. All alternatively powered vehicles (APV) combined represented more than a quarter of the total EU bus market in 2020. (Includes natural gas, LPG, biofuels, and ethanol vehicles)

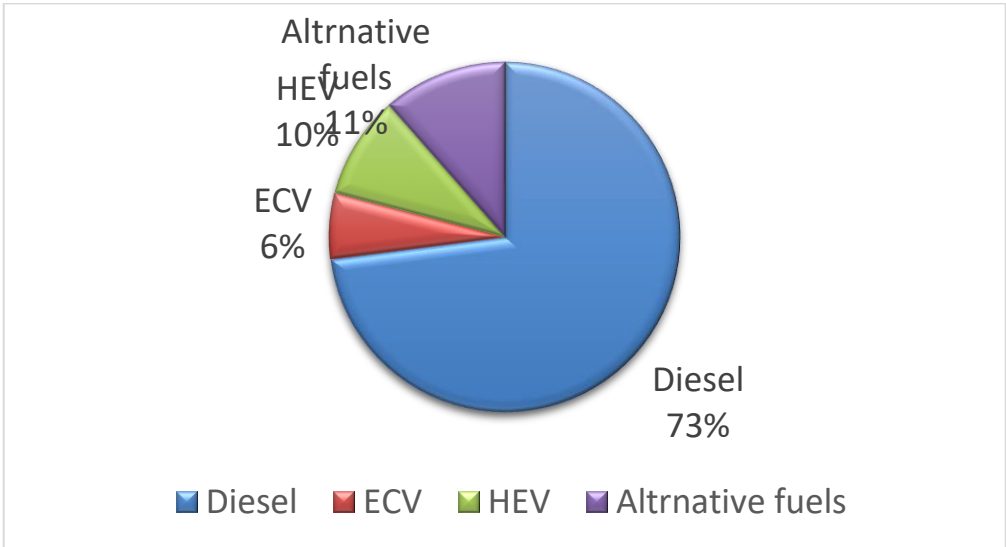
In 2020, registrations of new electrically chargeable buses in the EU increased by 18.4% from 1,448 units in 2019 to 1,714 buses sold in 2020, representing a market share

of 6.1%. With 446 electric buses sold in 2020, the Netherlands was the leading market for these vehicles, followed by Germany (388 units) and Poland (200 units). Together, these three countries accounted for more than 60% of total sales of electrically chargeable buses across the EU.

Hybrid electric vehicles (HEV), on the other hand, made up 9.5% of the EU bus market in 2020. Registrations of hybrid buses totaled 2,662, an increase of 36.0% compared to 2019. Germany accounted for roughly half of total sales with 1,243 units. By contrast, in 14 EU countries not a single hybrid electric bus was sold last year.

11.4% of all new buses sold in the European Union in 2020 ran on alternative fuels, nearly all of them powered by natural gas. France (+71.3%), Sweden (+63.4%) and Spain (+13.4%) – the largest EU markets for these vehicles – all posted double-digit percentage increases in 2020. This contributed to an uplift in sales of 24.3% across the region, reaching a total of 3,206 buses registered last year (ACEA,2021).

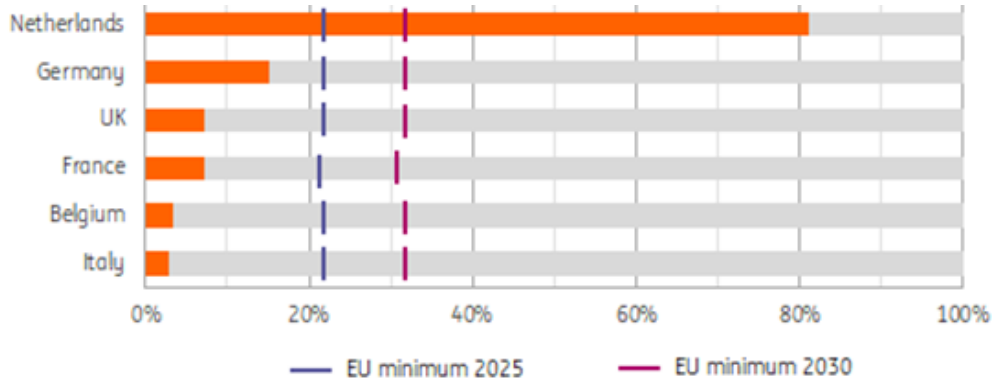
Graph 1 New buses by fuel type in the EU



Source: ACEA

In most European countries, electrification of the fleet has just started. Most electric buses are currently purchased by Western European countries and the Nordics. The EU clean vehicle directive sets minimum requirements for purchasing new zero emission public buses (electric + fuel cell electric) in member states, which differ across the continent. In most Western European countries, a minimum share of 22.5% should be zero emission by 2025, rising to 32.5% by 2030, for most countries. For some Eastern European countries, like Romania, requirements are lower. However, this sets only a bare minimum, and several countries and cities have more ambitious targets with still a long way to go. This means electric buses will continue to be promoted and acceleration of the uptake in the years to come is expected.

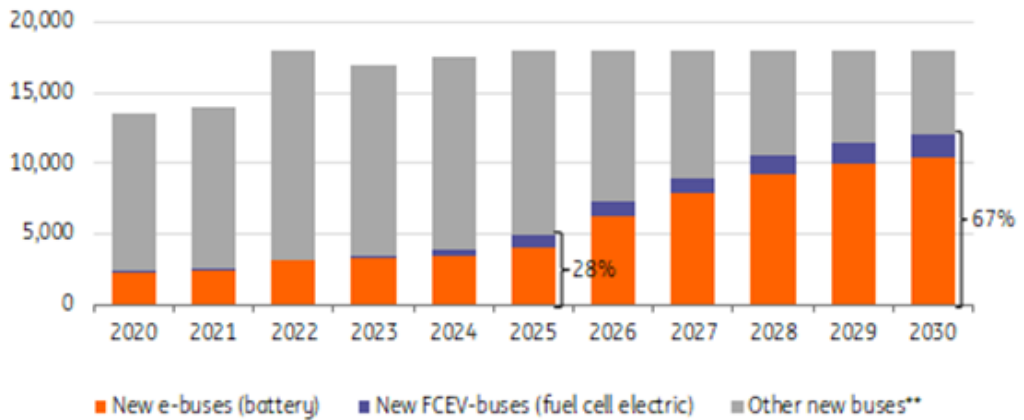
Fig. 3 Share of zero emission buses in new registrations of public buses 2020



Source: <https://think.ing.com/amp/article/all-aboard-europes-electric-bus-revolution-290921/>

As European countries emerge from the pandemic and start looking forward again, sales of electric buses are expected to significantly increase from 2023 onwards. In 2025, over 4,000 new e-buses are expected to come online across Europe (vs an expected 2,450 in 2021). It is also expected that beyond 2025, new inflows will accelerate to over 10,000 buses as transition programs come on stream and targets become more pressing. This is equal to almost 60% of new sales. While fuel cell electric buses are expected to take a larger share in the long-distance transport segment in the run up to 2030, battery electric buses will continue to dominate. Together, two-thirds of new buses are expected to be zero emission by then.

Fig. 4 New registrations in Europe and zero emission bus-shares per year

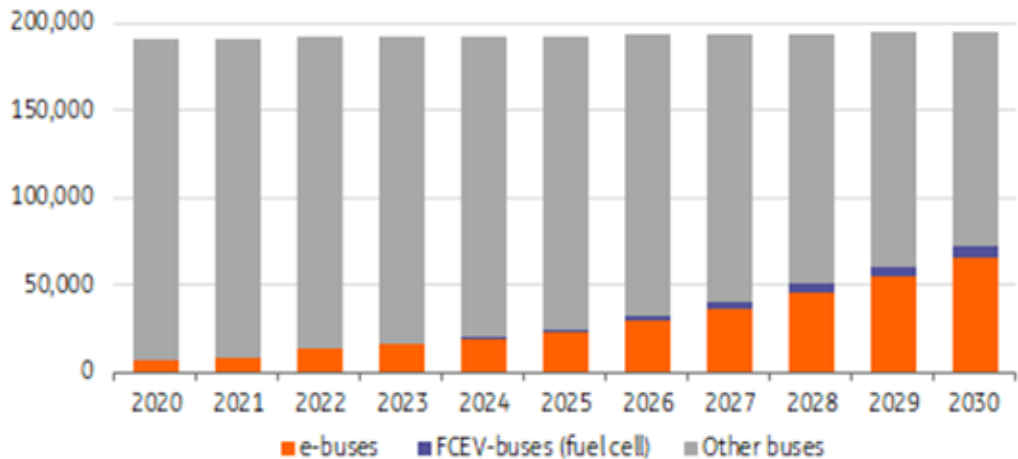


Source: <https://think.ing.com/amp/article/all-aboard-europes-electric-bus-revolution-290921/>

With new sales of e-buses increasing, Europe's bus fleet will continue to see further substitution. In nine years time, the electric bus fleet – including existing trolley buses, which play a significant role in some cities in Central and Eastern Europe – is expected to reach 65,000 units. Germany and the UK will run the largest e-fleets. This implies the fleet share will surge from barely 4% in 2020 to an expected 33% in 2030. Additionally, the rolling

stock will contain a small share of fuel cell electric vehicles. This reflects a significant shift, but at the same time it means the largest portion will still need to be replaced after 2030.

Fig. 5 Total public transport fleet in Europe, e-bus and fuel cell electric bus shares



Source: <https://think.ing.com/amp/article/all-aboard-europes-electric-bus-revolution-290921/>

The shift to e-buses won't be without challenges. Electrification of Europe's public fleets is not simply a matter of ambition and budget. Within countries, stakeholder interests will influence public contracts. Other challenges could also impact the pace of change along the way. The most important are:

Infrastructure: Enlarging the e-bus fleet requires upgraded charging infrastructure to efficiently deploy the vehicles in daily operation. This will mean added investment to expand and strengthen electricity networks. Alongside significantly increasing supply of (renewable) power to the grid, this is a general challenge for countries in the energy transition, but also a condition to electrify.

Production capacity: The manufacturing of e-buses will need to be expanded rapidly in the years to come. This will be a challenge. Manufacturers like Mercedes, Volvo and VDL, but also Ebusco, BYD and Switch are extending production, but shortages of capacity or components like batteries or semiconductors may be limiting factors. Meanwhile, manufacturing is just emerging from the pandemic-induced slowdown.

Contracts and operations: Aligning public contracts and authority-operator relations with longer life cycles and the deployment of electric buses is necessary. This may require legal and organizational adaptations, like upfront frameworks facilitating the takeover of vehicles by a successive operator, resulting in optimal commercial funding conditions for public transport fleets. (Luman, 2021)

2.5 Electromobility in Public transportation in Slovakia

Although we cannot talk about thousands or hundreds of electric buses in Slovakia yet - given the population and the size of the cities, the numbers are not to be taken lightly.

An example of the infrastructure that includes electric buses is the capital city. Bratislava and Západoslovenská energetika have signed a memorandum aimed at mutual support for electromobility. It will help not only with the electric bus, but of course also with other electric cars.

The main goal is to build the necessary infrastructure and, last but not least, to develop e-car sharing. Both parties want to create the conditions for the implementation of technical solutions and innovations that can facilitate the way to transport that is not only safe, but also environmentally friendly, sustainable and, of course, affordable. Bratislava Public Transport purchased a total of 18 electric buses, most of which were subsidized by European Union funds, the rest by the state budget and the city budget. Electric buses are low-floor, fully air-conditioned and with wifi connection. Their range is around 160 km, but of course they will be able to continuously recharge the batteries using a pantograph. In addition to Bratislava, electric buses operate in several cities, such as Košice, Poprad, Žilina and Šala. (e-car, 2020)

Conclusion

This article has shown us that since second part of the last decade, Europe has been trying to electrify vehicles used in urban logistics. While we can see projects like FREVUE were successful, the increase in electric freight transport has not been quite as big as the European union would need it to be in order to help with the fight against the climate change and since the end of the project no initiative had been deployed. Similar conclusion might be conducted in regards of Slovak freight fleet. Currently there is no sight of any increase in the electric freight vehicles numbers. Electric public transportation has been a little bit better. Most developed European countries have slowly but surely been increasing their electric bus fleet and are planning to increase their numbers in further. Same could be said of Slovakia where the municipalities have been trying to increase the electric bus fleet. Unfortunately, the less developed countries are still heavily dependent on ICEV vehicles in both freight and public transport.

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RECENZIA / BOOK REVIEW

KUBINEC, M. 2022. Obchodná spoločnosť v kríze. 1. vydanie. Praha : C. H. Beck, 184 s.

Andrea Slezáková¹

Na slovenský knižný trh bola v roku 2022 uvedená unikátna vedecká monografia doc. JUDr. Martina Kubinca, PhD. s názvom „Obchodná spoločnosť v kríze“. V súlade s dlhoročnými praktickými skúsenosťami, ako aj vedeckou činnosťou autora, je predmetné dielo zamerané na analýzu právnych noriem regulujúcich právne postavenie spoločnosti v kríze a účinkov krízy na samotnú spoločnosť, jej spriaznených veriteľov, členov štatutárneho orgánu a tretie osoby vrátane (nespriaznených) veriteľov spoločnosti. Recenzentmi publikácie boli prof. JUDr. Milan Ďurica, PhD., prof. JUDr. Mojmír Mamojka, ml., PhD., doc. JUDr. Kristián Csach, PhD., LL.M.

Predmetná vedecká monografia je prehľadne členená do logicky nadväzujúcich kapitol, a to Kríza obchodnej spoločnosti – základné aspekty, Vlastné imanie a záväzky spoločnosti, Plnenie nahradzujúce vlastné zdroje, Zákaz vrátenia krízového plnenia a právne následky jeho porušenia. Autor pracuje so širokým diapazónom domácej i zahraničnej literatúry.

Autor konštatuje, že východiskom pre prijatie ustanovení o spoločnosti v kríze bola snaha zákonodarcu posilniť právne postavenie tzv. externých veriteľov najmä kapitálových spoločností, pre ktoré platí doktrína oddelenia majetku spoločnosti od majetku spoločníkov, ktorá je dôsledkom právnej subjektivity týchto právnych foriem obchodných spoločností.

Vo vedeckej monografii autor uvádza, že úprava spoločnosti v kríze je v podstatnej miere prevzatá z rakúskeho zákona o zachovaní vlastného kapitálu a víta reguláciu z pohľadu potreby ochrany veriteľov najmä kapitálových spoločností, ktorá v ostatných rokoch naberala na aktuálnosti, a to aj s ohľadom na početné prípady, ktoré podkopali právnu istotu a oprávnené očakávania predovšetkým tzv. nezabezpečených nespriaznených veriteľov. Zároveň konštatuje, že nemožno idealisticky očakávať, že slovenská legislatíva bude garantovať plné uspokojenie pohľadávok veriteľov obchodných spoločností v každom štádiu, osobitne nie v kríze, v konkurze alebo v reštrukturalizácii a hovorí o vytvorení základných mantinelov pre férovú hospodársku súťaž, s garanciou minimálnych práv jej účastníkov a s povinnosťou štátu požadovať a efektívne vynucovať odo jej účastníkov rešpektovanie práv iných podnikateľov a prostredníctvom legislatívy vytvoriť základné ochranné mechanizmy posilňujúce zodpovednosť podnikateľov tak, aby účel podnikania – dosahovanie zisku bol limitovaný aj zodpovednosťou za stratu z podnikania v najširšom rámci.

Celkový rámec publikácie dotvárajú úvod a záver, v ktorom sa čitateľ môže oboznámiť s úvahami de lege ferenda a zhodnotením pozitív aj negatív platnej právnej úpravy právneho inštitútu spoločnosti v kríze. Dielo predstavuje originálny vedecký výstup k špecifickej problematike, ktorý môže slúžiť nielen pre potreby právnej vedy, ale aj aplikačnej praxe. Jeho aktuálnosť zdôrazňuje i súčasná pandemická situácia súvisiaca so šírením ochorenia COVID-19, ktorá ovplyvňuje domácu, európsku a svetovú ekonomiku, prinášajúc so sebou okrem iného dôsledky v podobe vyššieho počtu krízou dotknutých obchodných spoločností.

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