

PUBLIC TRANSPORTATION AND ELECTROMOBILITY IN POLISH AND COMMUNITY LAWS*

DATA PRZESŁANIA: 27.09.2018, DATA AKCEPTACJI: 20.12.2018, KODY JEL: R40, R41, R42

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ABSTRACT | The economic development of Poland depends on a modern, effective and safe transport system. It is dependent on proper legal regulations both Polish and EU. They give an opportunity to develop innovative urban logistics or electromobility. The aim of the article is to analyze EU and Polish legal regulations regarding innovative public transport, as well as to present development prospects for electromobility.

KEYWORDS | public transport, city logistics, congestion, electromobility

INTRODUCTION

Transport is a crucial factor in the process of socioeconomic development and an important element of the economy and social life. The size and structure of demand for transportation services have recently manifested themselves in the technological and innovative sphere, in legal and economic fundamentals, in location decisions and in the society's life model. These civilization challenges were listed in the White Paper dated 28 March 2011, which is the basic strategic document shaping the directions for the development of the transport sector in the European Union. The regulations laid down in the document stipulate a reduction in the Community's dependence on petroleum import, improvement of its effectiveness and the decarbonation of transport. The current transportation policy assumes ten objectives towards creating a competitive and resource-saving transportation and a 60% reduction in greenhouse gas emissions (Biała Księga..., 2011). In Poland, the strategy for the development of the transport sector is laid down in the Transport Development Strategy by 2020. The document sets the directions for building a cohesive and efficient transportation system. Its priorities include: development of connections linking Warsaw to all major regional capitals and the European network, development of transport connections linking

* The paper financed in the framework of „Horizon 2020” No. 17111.

major regional capitals with the most important Polish and European cities, development and construction of grade-separated junctions, ring roads, public transportation in cities, improvement of local connections, creation of transfer hubs, and development of road traffic safety infrastructure (Transport Development Strategy by 2013). The purpose of this article is to analyze Community and Polish laws concerning innovative public transportation, and to present the development perspectives regarding electromobility.

COMMUNITY AND POLISH TRANSPORTATION REGULATIONS

Transport is currently one of the key sectors of the European economy, as it provides jobs for 11 million people and significantly contributes to economic growth (its share in the gross value added for the 28 EU Member States is 4.8 per cent, i.e. EUR 548 billion). This means that the European Union should increase its efforts to shape and support a transportation policy which offers effective, safe and sustainable solutions which create conditions for a competitive industry generating employment and wealth. In pursuing this objective, the European Union has been observing the basic regulatory principles referring to the general conditions for the functioning of business entities, as expressed by the economic doctrines of liberalism and interventionism (Bentkowska-Senator, Kordel, 2007, pp. 16–23). Liberalization is a process with significant impact on transportation, as it eliminates barriers for access to internal transport markets as the result of emergence of free competition. This ideology is implemented by regulations which gradually tune the functioning of business entities to the adopted development strategy. As such, these regulations specify the most important challenges facing European transport. Among other things, they refer to: bottlenecks, dependence on petroleum, excessive greenhouse emissions, the quality of transport infrastructure in the EU and in individual member states. What is noteworthy, the European transport sector must face growing competition on fast-developing global transport markets (Murawski, Szczepański, 2014, pp. 22–49 et seq.).

Regulations referring to the functioning of mass public transportation in the European Union were included in the Treaty on the Functioning of the European Union (TFUE). In article 73, TFUE stipulates the right to offer public aid to carriers in order to coordinate the transport market or to reimburse for losses incurred in the provision of public transportation services (TFUE, 2006, p. 24). These provisions are elaborated on in the Regulation (EEC) of the Council No. 1191/69, Regulation (EEC) of the Council No. 1107/70 of 1970, and Regulation of the Council No. 1893/91 of 1991. Global and civilization challenges and public needs have implied new solutions, which were materialized on 23 October 2007 in Regulation (EC) No. 1370/2007 of the European Parliament and of the Council on public passenger transport services by rail and by road. Among others, its provisions stipulated:

- that proper state authorities should have the right to organize mass transit by: granting exclusive rights, paying compensations,
- the organization of a transport network and the appointment of a public service provider,
- mandatory provisions in contracts for the provision of public services, e.g. parameters needed to calculate possible compensations, the method of determining service provision costs, the maximum effective terms of contracts,

- the principles of distributing ticket sales revenue, a specification of whether they are completely retained by the carrier, whether the revenue is transferred to a state authority, and whether it is proportionally divided (Słowikowska, 2017, p. 31).

EU regulations concerning public transportation are also laid down in Regulation (EU) 2016/2338 of the European Parliament and of the Council of 14 December 2016. The document entered into force on 24 December 2017 and concerned all mass transit services, including those provided by means of road transport. The document also introduces new limits for awarding public procurement, bypassing the tender procedure. The document provides the specifics for drawing up contract specifications and the requirements concerning competitiveness. Furthermore, the document regulates the principles for granting compensations when procurements are awarded on general terms (Regulation of 2017).

Chronologically, the functioning of mass transit in Poland has been regulated by such laws as: the carriage law (of 15 November 1984), the act on road transport (of 6 September 2001), the act on railway transport (of 28 March 2003), the act on local government (municipal, powiat, voivodeship) and the act of 16 April 2004 on the work hours of professional drivers. However, it was only on 5 April 2013 that Polish public transportation regulations were brought to full compatibility with EU legislation, as formulated in the Act of 16 December 2010 (Journal of Laws of 2010, item 1440, as amended). The act was subsequently amended by the Act of 5 April 2013 amending the act on road transport, and the Act on the work hours of professional drivers (Journal of Laws of 2013, item 567). Domestic laws were adapted to the new Community conditions which regulated the road carrier profession. These regulations provided a definition of an operating base, an explicit definition of the bodies which issue a road carrier license, the specifics for issuing financial certificates for transport companies, and a specification of the conditions for the loss of good repute. The economic changes witnessed on the European and Polish markets forced another update, as included in the Act of 10 September 2016 on public mass transit (Journal of Laws, item 1342). Other important laws which shape the transportation policy of the state in Poland are: the Transport Development Strategy by 2020 (with a perspective by 2030) developed by the Ministry of Transport, Construction and Maritime Economy, the State Development Strategy, the National Strategy for Regional Development, The Sustainable Development Strategy for Rural Areas, Agriculture and Fishery. These documents are supplemented by Macroeconomic Development Strategies: the Development Strategy for Central, Western, Eastern and Southern Poland. The problem of sustainable transport, technical infrastructure, regional development and domestic communication links is also included in the operational and strategic objectives of 16 Regional operational programs (Zimny, 2017, p. 43). The regulations applicable to road transport also consider the provisions of the TIR convention written in 1949 by Belgium, Germany, France, Italy, Luxembourg, and the Netherlands. Poland joined the convention in 1980 under a government declaration of 10 February 1984 (Journal of Laws of 1984, item 77 of 10 March 1984).

TRANSPORT AND LOGISTICS PROCESSES

Socio-demographic changes have been currently perceived in the global, European and national aspect and involve the freedom of translocation. These factors affect the developmental processes

in cities. This stimulated the migration of the rural population to cities. Nearly 55% of the population lives in cities now, with almost 70% in developed countries. According to framework EU documents, there is significant demand for cross-European policies regarding mobility in the city, where nearly 60% of the EU population lives. On the one hand, cities produce approx. 85% GNP, and, on the other hand, they are also responsible for more than 40% of total CO₂ emissions, mainly generated by road transport. Similar translocation has been also recorded in Poland. According to the Main Statistical Office, as of the end of June 2017, the population of our country was 38422000 people; 23126000 people lived in cities (60 per cent of the population), and 15297000 people inhabited rural areas (Townsend, 2013, p. 74 et seq.; Motowidlak, 2015, p. 173 et seq.). This phenomenon caused a rapid increase in the number of cars, which translated into growing energy consumption in transport. Their values for 2014–2015 are presented in table 1.

Table 1. Energy consumption in transport in Poland according to fuel type in 2014–2015

Fuel types	Consumption in 2014 [TJ]	Consumption in 2015 [TJ]
Natural gas	17 421	17 847
LPG	72 680	70 966
Motor gasoline	148 309	156 926
Diesel oil	373 110	410 863
Electricity	14 304	15 506

Source: Kościółek, Biały (2018), p. 124.

Permanent development of transportation involves increased greenhouse emissions. In Poland, fuel combustion in 2016 corresponded to approximately 95.5% of the CO₂ emissions and equaled 322.23 million tons in absolute numbers. Contributing to this volume were the power engineering industry (50.4%), manufacturing and construction industry (9%), transport (16.2%) and other sectors (16.9%) (KOBiZE, 2018, p. 9).

An analysis of available sources and references indicates that transport is the basic link of the logistics system. An integrated management of the translocation of people and cargos in cities has therefore become a necessity. Both practitioners and theoreticians stress this in their works. For instance, J. Szoltysek proposed that, in balancing this problem, we should consider: the shape of demand for passenger and cargo transport, the distribution of carriage tasks, the use of technical resources and technologies, traffic management (e.g. transport in cities, monitoring, collecting and processing information about transport, its impact on people and the environment, the use of telematics, the essence and scale of transit, organization of the parking system and traffic control, proper use of throughput and cargo capacity), the functioning of the institutional sphere, including the role of the state and local governments, educational centers, carriage companies, non-government organizations, manufacturers of cars and mass transit vehicles, and the fuel valuation policy (Szoltysek, 2015, p. 70 et seq.; Blaik, 2010, p. 475 et seq.). Resettlements also caused the phenomenon of growing demand for specific services and products, which stemmed directly from the early functions of the city, i.e. industrial, commercial and communicational. Hence it became necessary involve logistics management in resolving this problem. Considering the concept of sustainable development and the negative impact of transport on the environment, urban logistics (Nurnberg, Iwan, 2017, p. 54) has preferred and developed these measures which refer to logistics

as a whole, and to the technologies which shape the transport policy and to methods of organizing it. U. Motowidlak proposes a similar analysis of the problem (Motowidlak, 2017, p. 179 et seq.). He suggested that sustainable urban mobility should facilitate innovations related to the types and means of municipal transport, supporting the development of an intermodal urban system, supporting the development of a municipal policy which favors pedestrian and bicycle traffic, and supporting the inclusion of urban mobility in integrated and strategic plans for the development of cities/agglomerations.

In urban agglomerations, there is an urgent need to implement smart transport and ICT services in logistics. This should improve the effectiveness of transport systems while minimizing its negative effects. In terms of road transport, this means better use of the GPS and GALILEO systems, wireless communication systems, fleet monitoring using the xTrack system, and traffic control, weather barrier, tolling, and traffic measurement systems. The search for new low-emissions solutions for public transportation in cities is presented in table 2.

Table 2. CO₂ emission reduction potential related to the introduction of ecological vehicles and alternative fuels in the city

Measure	CO ₂ reduction (%)
Introduction of biodiesel busses observing the provisions of EURO 0/EURO 1	55
Introduction of CNG busses instead of busses observing the provisions of EURO I	13
Introduction of CNG busses instead of busses observing the provisions of EURO II	84
Introduction of LPG busses instead of busses observing the provisions of EURO III	21
Introduction of electrical busses instead of busses observing the provisions of EURO III	64
Introduction of LPG taxis instead of Diesel and combustion engine vehicles	10
CNG delivery truck (12t) (urban cycle)	11
Electrical delivery truck (12t) (urban cycle)	53
Introduction of EEV busses with engines observing the provisions of EURO IV instead of busses observing the provisions of EURO III	2

Source: CIVITAS (2010), p. 3; Dünnebeil, Reinhard, Lambrecht (2015), p. 7.

The solutions proposed in the table are to limit traffic congestions in cities, which is the primary challenge for transport logistics and policies. They should also reduce the costs of delays in public transport, vehicle maintenance costs, the costs of pollutant emissions, and the costs of stress resulting from vehicle traffic disturbances (Kozlak, 2015, p. 5386 et seq.). Electromobility is one of the solutions to these challenges.

PERSPECTIVES FOR THE DEVELOPMENT OF ELECTROMOBILITY IN POLAND

The public transport transformations recorded in contemporary states, including Poland, stem from the new structure of industrial production, the location of this production, the level of urbanization, the geographic structure of cargo exchange, and the economic cooperation of retail structures, the development of e-commerce or tourism. Therefore, the re-orientation of the public transport developmental model referring to the carriage of passengers, goods and commodities conditions the development of the economy as a whole (Paprocki, 2015).

Technical and technological progress, as well as social responsibility for development have qualitative impact on new, innovative solutions in transport. They stem from such laws as: the Energy Law of 10 April 1997 (as amended, Journal of Laws of 2018, items 755, 650, 685, 771, 1000, 1356 and 1367), the Construction Law of 7 July 1994 (Journal of Laws of 2018, item 1202) and the Act of 11 January 2018 on electromobility and alternative fuels (Journal of Laws of 2018, item 317). Supported by Directive 2014/94/EU of 22 October 2014, these laws lay down the principles of use of a zero-emissions bus in public transport and distinguish four car categories, for which regulations were implemented to encourage their purchase, thus introducing improvements for the user. They refer to the category of electrical, hybrid, LPG and hydrogen-fueled cars (*Perspektywy...*, 2018, pp. 8–9). Electromobility can fully develop in the face of a transformation of public transport perceptions. This means that dethronement of the combustion engine as the main method of fueling mobility will be one of the major upcoming technological transformations. These challenges involve far-fetched changes pertaining to the organization of urban mobility, its ecology, as well as urban design and the ways people live in (Jesień, Kurtyka, 2016, p. 73 et seq.). The Polish electromobility plan assumes the coordination of measures focusing around five areas, including the industry, the market, acceptance, infrastructure and regulation. The plan will be carried out in three temporal stages. The first stage is planned for completion by the end of 2018 and assumes the implementation of piloting programs aiming to focus social interest on electromobility and to develop regulations tackling this problem. As part of stage two, to be carried out in 2019–2020, electrical car recharging infrastructure will be built in selected agglomerations. Ultimately, as part of stage three, planned for 2020–2025, demand for electrical cars will be naturally stimulated in households and in public transport (Kurtyka, 2018, p. 25). European and Polish regulations concentrate on eliminating barriers to electromobility in a horizontal manner. This translates into sales volumes recorded for cars running on alternative fuels. And so, approximately 88,329 new passenger electric vehicles (EVs), plug-in hybrid and range-extended electric vehicles (PHEV and EREV, commonly referred to as PHEV) and fuel cell electric vehicles (FCEV – marginal values) were registered in the EU+EFTA in the 1st quarter of 2018. In the span of a year, their sales increased by nearly 40.9%, and the average share on the market was about 2.0%, whereas this result is clearly inflated by wealthy EFTA countries (Switzerland and Norway), since the EU average is 1.7%. In turn, there are approximately 340 new EV/PHEV/EREV/FCEV cars registered in Poland (17th position), which is 0.24% of the total sales result. However, a 113.8% increase was still recorded, compared to the previous year. Electrical cars were about 44.7% – 152 items, as illustrated in figure 1.

Analyzing detailed electric car sales records for 2017 and 2018, we can clearly distinguish European leaders being Norway (6993 and 9694), Germany (5064 and 9127), France (7404 and 7322), the Netherlands (1667 and 3945) and Great Britain (4654 and 3895) (ACEA).

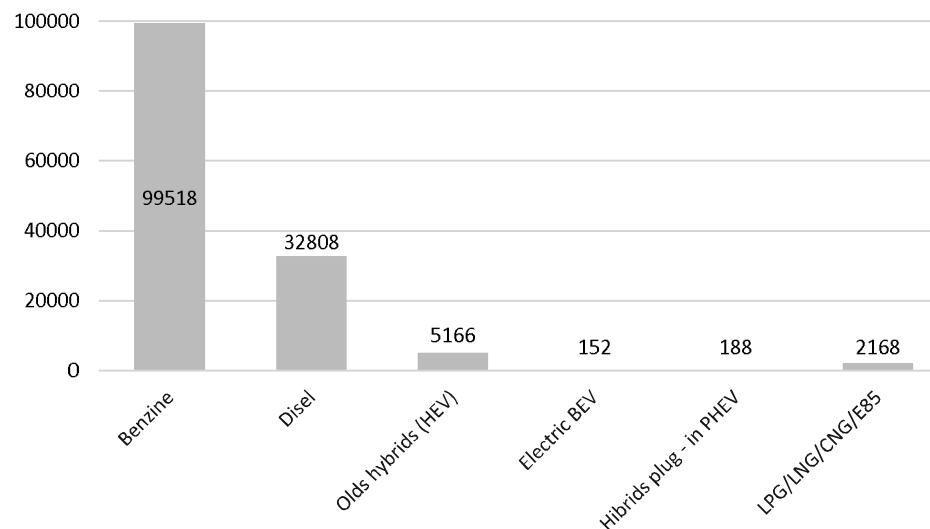


Figure 1. The number of electric cars registered in Poland in the 1st quarter of 2018

Source: ACEA data for Q1 2018.

CONCLUSIONS

Public transport, its scope, and a rational policy implemented by the state and by local governments, predominantly municipal, can contribute to a fast-paced switch to electric busses. There are currently 31 electric busses working in 5 Polish cities. However, their number is to increase to about 1 thousand by 2025. In turn, the number of passenger cars is to increase from 500 to 1 million. In 2016, a series of production facilities launched production of electric busses, including Solaris Urbino 12 Electric and the Ursus facility in Lublin, offering CITY SMILE busses from 8.5 to 18 m. The Sanok-based Autosan facility has also announced the production of its electric bus – the SANCITY. Further progress depends on the cooperation of multiple entities, as illustrated in figure 2.

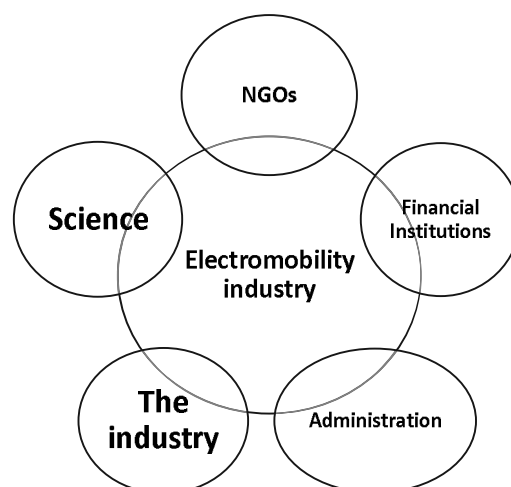


Figure 2. Entities supporting the electromobility industry

Source: Plan Rozwoju... (2017), p. 16.

The development of electromobility requires the impact of Polish research centers in the development of technologies related to the production of zero-emission vehicles. This entails a high level of complexity and firmness in the approval and legislative process, and with the extension of electric car range. In practice, this means that the density of energy in batteries and the weight and volume should be increased per 1 kWh of electrical capacity, which reduces the costs of the most expensive part – the battery – for 1 kWh per 1 recharging cycle, or, possibly, per a complete life cycle, which neutralizes the low cost of energy and maintenance, compared to conventional cars. To complement these measures, the Ministry of Energy will build 6 thousand recharging points in 32 agglomerations, as there are currently only 329 of them, which does not even suffice for providing each 100 thousand of residents with a single charger.

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TRANSPORT PUBLICZNY I ELEKTROMOBILNOŚĆ W PRAWIE POLSKIM I UNIJNYM

STRESZCZENIE	Rozwój gospodarczy Polski zależy od nowoczesnego, efektywnego i bezpiecznego systemu transportu. Uzależniony on jest od właściwych regulacji prawnych zarówno polskich, jak i unijnych. Dają one szansę na rozwój innowacyjnej logistyki miejskiej czy elektromobilności. Celem artykułu jest analiza unijnych i polskich regulacji prawnych dotyczących innowacyjnego transportu publicznego, a także przedstawienie perspektyw rozwojowych elektromobilności.
SŁOWA KLUCZOWE	transport publiczny, logistyka miejska, kongestia, elektromobilność

Translated by Olena Wiaderna