

## ELECTROMOBILITY INFRASTRUCTURE AND VEHICLES IN THE CONTEXT OF POLISH LEGISLATION

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### ABSTRACT

**Motives:** The increased interest in alternative fuels requires the creation of special legislation, especially in the context of rules for the development and performance of proper infrastructure necessary for electric vehicles. Any change in these regulations usually results in an increased interest in electric or hybrid cars. This, in turn, entails the need to develop appropriate infrastructure for alternative fuels.

**Aim:** The aim of this paper is to present the legal regulations in force in Poland related to the support of electromobility, which is particularly important in the context of the European Union policy aiming to reduce environmental pollution through, among others, the use of alternative fuels.

**Results:** The article presents the basic concepts of electromobility included in national and European legislation along with their adoption with regard to the increasing interest in electromobility in Poland. This entails the need to introduce changes, both in legal regulations and road infrastructure.

**Keywords:** electromobility, charging point, alternative fuels, Alternative Fuel Infrastructure Register, electric vehicle

### INTRODUCTION

Regarding the idea of climate protection by e.g. reduction of CO<sub>2</sub> emissions to the atmosphere, the automotive industry and car users are gradually moving away from the use of petrol or oil. They are increasingly turning to vehicles powered by alternative fuels, with a particular interest in electric vehicles. And these, according to the European Environment Agency, are to be a key element of the European mobility system, contributing to reducing the impact on climate change and air quality (Burchart-Korol, 2020).

The issues related to alternative fuels and their introduction into everyday use are being addressed by numerous entities from all over the world. A few such initiatives, focused on the use of electrically powered vehicles, can be mentioned here:

1. The United Nations is promoting alternative fuels through The Partnership for Clean Fuels and Vehicles (PCFV). The UN also runs the Electric Mobility Programme, where it pursues objectives such as developing policies, sharing best practices, piloting technology options, tracking electric vehicle consumption, calculating emissions and economic benefits, and supporting the formulation of electric mobility plans at national and regional levels.

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2. Global Fuel Economy Initiative (GFEI) – GFEI’s goal is to provide improved fuel economy as well as the use of efficiency technologies in both light and heavy-duty vehicles, including hybrid and fully electric vehicles.

3. International Transport Forum (ITF), which main tasks are:

- a. to promote the understanding of governments about the role of transport as a key element of economic growth and its impact on the social and environmental dimensions of sustainable development;
- b. raising the public profile of transport policy and a better understanding of the importance of transport for the economy, the environment, and society.

4. Driving Change Together – Katowice Partnership for Electromobility (COP24) – the declaration is a broadly worded guideline for accelerating the transition to low-carbon vehicles, enabling market and technological development. The partnership aims to “bring together countries, regions, cities, as well as institutions, NGOs and companies working for the development of electromobility”, and the way to achieve it is “international cooperation and exchange of experience in this area”, with particular emphasis on support for research and development (COP24, 2018).

5. International Energy Agency (IEA) is dedicated to transport research and analysis, focusing on how countries can improve the sustainability of their transport systems.

6. European Environment Agency (EEA), since 2000, publishing the TERM report (Transport and Environment Reporting Mechanism), which monitors the progress and effectiveness of the integration of transport into environmental strategies (European Environment Agency, 2016). Such reports include indicators used to track the environmental performance of the transport sector and measure progress towards key transport policy objectives.

7. Partnership on Sustainable Low Carbon Transport (SLoCaT) – a partnership engaging international entities connected with global transport

to collaborate on sustainable, low carbon transport by working on public and non-motorised transport and fuel and vehicle efficiency (SLoCaT, 2015), enabling the following Sustainable Development Goals to be reached (Leśniewski et al., 2021): 3.9 (air quality), 7.3 (energy efficiency), 9.1 (sustainable infrastructure), 11.2 (urban transport), 12.c (fuel subsidies), and 13.2 (climate change mitigation).

Interestingly, the promotion of the use of electric and hybrid vehicles can be carried out by creating parking stands for these types of vehicles. The following is an indication of the Polish legal standards which results in facilitations for owners of electric cars. Article 12b of the Act on public roads (1985) contains two interesting standards. The first one concerns the obligation of the authority in charge of traffic management on roads to designate a parking space at publicly accessible charging stations on public roads, in residential zones, and in traffic zones. Such parking spaces must be marked in a way that allows them to be unambiguously distinguished from parking spaces intended for other motor vehicles. The second legal regulation contained in Art. 12b of this act states that parking spaces for electric or hybrid vehicles may be designated outside of the spaces at public charging stations. The legislator indicates that such parking spaces are created to promote vehicles powered by alternative fuels. Additionally, Article 148a of the Road Traffic Law (1997) indicates that until 1 January 2026 electric vehicles are allowed to use bus lanes designated by the road administrator.

Certain facilitations concerning the spread of electric cars may apply not only to the owners of such vehicles but also to entities interested in building charging stations. Article 29 section 1 point 25 of the Construction Law (1994) stipulates that the construction of charging stations, except for charging infrastructure for public road transport within the meaning of Article 2 point 3 of the Act on electromobility and alternative fuels (2018), does not require a building permit decision, but only a notification. Article 29 section 2 point 26 of the Construction Law states that the construction

of charging points does not require a decision on planning permission or notification.

The aim of the article is to present legal provisions related to the promotion of electromobility. It is extremely important, since – according to the assumptions of the European Union – it is necessary to reduce air pollution and the use of fuels coming from oil.

## METHODOLOGY

In the case of electromobility, a certain trend can be observed: the change in legislation entails an increased interest in electric and hybrid cars, and the interest in such cars entails the need to create the necessary infrastructure to support them (cf.: Flaszka & Matuszczyk, 2018; Jacolik, 2019; Kołtonowski et al., 2021; Kowalski & Depta, 2019; Krawiec & Krawiec, 2017; Mazurek, 2021; Molecki, 2017; Pilecki & Binka, 2018; Zaniewska-Zielińska, 2018).

Firstly, the article presents the basic concepts of electromobility with an indication of the differences between the definitions contained in the Directive on the deployment of alternative fuels infrastructure (2014) (European Directive) and the Act on electromobility and alternative fuels (Polish act). The Member States, when implementing the provisions of directives of the European Parliament and the Council, adapt these standards to the existing legislation in the country. Therefore, there may be differences between definitions in the understanding of certain concepts.

Afterwards, the Polish law on electromobility was analysed and it was indicated which authorities are responsible for drawing up which documents in this respect. The law imposes on various entities the obligation to prepare plans or reports aimed at ensuring the availability of stations and charging points. Apart from the obligation to provide infrastructure, the Act also describes the requirements

concerning the number of electric cars in the fleet of vehicles used by the chief and central bodies of state administration and local self-government units.

## BASIC DEFINITIONS

In order to properly understand the essence of the problems addressed in this article, it is first necessary to familiarise oneself with the basic terms related to electromobility and their legal definitions (Table 1).

As can be seen from Table 1, the Act on electromobility and alternative fuels adopts almost identical definitions to those in the EU Directive.

“The definition of alternative fuels [from the Act on electromobility and alternative fuels] does not contain a closed catalogue of alternative fuels. Therefore, it is possible that apart from electricity, hydrogen, liquid biofuels, synthetic and paraffinic fuels, compressed natural gas (CNG), including that derived from biomethane, liquefied natural gas (LNG), including that derived from biomethane, or liquefied petroleum gas (LPG) listed in the provision – other substances may also be alternative fuels. The condition of qualifying them as alternative fuels will be that they do not originate from crude oil, including its processing, and that they are used for powering engines of motor vehicles or vessels” (Kokocińska & Pokrzywniak, 2020). The EU definition is very broad and in principle open to all types of vehicles equipped with an electric motor, both in terms of their construction (two-, three-, or four-wheel), the power of the installed electric drive (with no lower limit of power), and the possible combination of the electric drive with other types of drive. In this context, the definition of an “electric vehicle” in the provisions of the Act on electromobility and alternative fuels is much narrower, as certain types of vehicles are not covered at all (e.g. hybrid vehicles, electric bicycles and electric mopeds), although they fall within the EU definition (Kokocińska & Pokrzywniak, 2020).

**Table 1.** Basic definitions

Definition	Directive on the development of an alternative fuels infrastructure	Act on electromobility and alternative fuels
Alternative fuels	fuels or energy sources that serve, at least partially, as a substitute for crude oil-based energy sources in transport and that have the potential to contribute to the decarbonisation of transport and the greening of the transport sector, including, inter alia: – electricity, – hydrogen, – biofuels meaning liquid or gaseous fuel for transport produced from biomass (Art. 2 letter i) the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (2009), – synthetic and paraffinic fuels, – natural gas, including biomethane, in gaseous form (compressed natural gas – CNG) and in liquid form (liquefied natural gas – LNG), – liquefied petroleum gas (LPG)	fuels or electricity used for the propulsion of motor vehicles or vessels as a substitute for fuels derived from crude oil or obtained from oil processing, in particular electricity, hydrogen, liquid biofuels, synthetic and paraffinic fuels, compressed natural gas (CNG), including from biomethane, liquefied natural gas (LNG), including from biomethane, or liquefied petroleum gas (LPG)
Electric vehicle (EV)	a motor vehicle fitted with a power unit containing at least one non-peripheral electric device as an energy converter with an externally chargeable electrical energy storage system	motor vehicle within the meaning of Art. 2 point 33 of the Act of 20 June 1997 – Law on Road Traffic, using for propulsion exclusively electrical energy accumulated by connecting to an external power source
Charging point	a device that enables a single electric vehicle to be charged or the battery of a single electric vehicle to be replaced	a facility for the recharging of individual electric vehicles, hybrid vehicles and zero-emission buses, and a location where the battery used for their propulsion is replaced or recharged
Normal power charging point	a charging point less than or equal to 22 kW capable of supplying electricity to an electric vehicle, with the exception of devices less than or equal to 3.7 kW which are installed in private households or whose primary purpose is not charging electric vehicles and which are not accessible to the public	a charging point with a capacity less than or equal to 22 kW, excluding devices with a capacity less than or equal to 3.7 kW installed at locations other than public charging stations, in particular in residential buildings
High power charging point	a charging point with a capacity greater than 22 kW capable of supplying electric energy to an electric vehicle	a charging point with a capacity greater than 22 kW
Publicly accessible charging or refuelling point (publicly accessible charging station)	a recharging or refuelling point supplying an alternative fuel, which allows users throughout the Union non-discriminatory access (meaning different conditions of authentication, use and payment)	a charging station open on equal terms to any electric or hybrid vehicle owner
Charging station	–	a) a constructional facility comprising a normal-capacity charger or high-capacity charger connected to a construction site, or b) a free-standing building installation with one or more normal-capacity charge points or high-capacity charge points – equipped with software allowing the provision of charging services, together with a parking space and, where the charging station is connected to a distribution network within the meaning of the Law of 10 April 1997 – Energy Law (1997), the installation leading from the charging point to the electricity connection

Source: own elaboration based on the Directive on the development of alternative fuel infrastructure and on the Act on electromobility and alternative fuels.

## ANALYSIS OF LEGISLATION

### Directive 2014/94/EU of the European Parliament and the Council

As Poland is a member state of the European Union, it had to implement into its legislation the provisions of Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the development of alternative fuel infrastructure. This directive was created for several reasons, of which, with regard to the issue at hand, the most relevant seem to be: environmental protection, in particular against air pollutants such as nitrogen dioxide (NO<sub>2</sub>), benzoalfapirene (C<sub>20</sub>H<sub>12</sub>) or sulphur oxides (SO<sub>x</sub>), and the EU's dependence on oil imports. Apart from worsening the EU's trade balance with the rest of the world, dependence on imports of raw materials is also a threat to the EU's energy security. The preamble to the directive indicates that it is necessary to provide vehicle users with data on the geographical location of publicly accessible charging and refuelling points for alternative fuels. If companies or internet portals provide such information, it must be made available in an open and non-discriminatory manner to all users. Information on the availability of charging and refuelling points should, where appropriate, be included in traffic and travel information services as part of an intelligent transport system. These matters are regulated by the Act on electromobility and alternative fuels (hereinafter referred to as the Act), which is the implementation of the provisions of the Directive into Polish law.

### Act on electromobility and alternative fuels

The explanatory memorandum to the draft of the Act on electromobility and alternative fuels indicates that: “alternative fuels require special infrastructure used for refuelling/charging motor vehicles powered by these fuels. Without the development of appropriate infrastructure, consumers will not be interested in switching from motor vehicles

running on conventional fuels (e.g. petrol, diesel) to vehicles using alternative fuels for propulsion. In turn, entrepreneurs are not interested in doing business with alternative fuels because there are no customers for these fuels. As a result, neither the vehicle market nor the infrastructure has developed in a way that allows for greater fuel diversification in the market and increased climate neutrality of transport” (Explanatory Memorandum to the Act on electromobility and alternative fuels, 2018).

The Act on electromobility and alternative fuels specifies:

1. rules for the development and operation of infrastructure for the use of alternative fuels in transport, hereinafter referred to as “alternative fuels infrastructure”, including the technical requirements to be met by this infrastructure;
2. obligations of public entities regarding the development of alternative fuels infrastructure;
3. information obligations concerning alternative fuels;
4. conditions for the operation of clean transport zones;
5. national policy framework for the development of alternative fuels infrastructure and the manner of its implementation.

The Act provides the basis for ensuring access to charging stations for users of electric and hybrid vehicles. It introduces the concept of “operator of a public charging station” – this is the entity responsible for the construction, management, operational safety, operation maintenance and repairs of a public charging station. his operator, among a number of other obligations, must:

1. enable the connection and charging of the electric vehicle and the hybrid vehicle;
2. provide data to the Alternative Fuels Infrastructure Register on the availability of a charging point and the price for the charging service.

He must also equip the charging point installed at the public charging station with a metering system allowing the measurement of electricity consumption and the transmission of metering data from this system to the charging station management system in near real-time. The charging station operator must

also agree with the traffic management body on the number of parking bays that can be designated at public charging stations. He may also act as a charging service provider or sign a contract with another entity that will provide the service using the charging station belonging to the charging station operator.

The provisions of the Act, in addition to specifying the tasks of operators of a publicly accessible charging station, charging service providers, technical requirements of charging stations, also impose an obligation to design, build new public buildings and multi-family buildings in such a way as to ensure the connection power allowing to equip the stations with charging points with a power of not less than 3.7 kW (Article 12 section 1 of the Act). This provision applies to construction projects for which an application has been made for a decision on a construction permit or a separate decision on approval of a construction project after 1 January 2019 (Article 75 of the Act).

In Article 11 of the Act on electromobility and alternative fuels, the legislator indicated that activities related to charging infrastructure for public road transport are public purposes within the meaning of the Act on real estate management (1997). The investments for which the public purpose provisions can be applied to charging stations are:

1. construction and maintenance of road public transport charging infrastructure;
2. projects necessary to connect charging points forming part of this infrastructure to the network, consisting in particular in the modernisation, expansion or construction of the network.

Article 67 of the Act contains a provision from which it follows that the construction of public charging stations indicated in the plan (discussed below) and implementation of projects necessary to connect them to the network constitute a public purpose within the meaning of the provisions of the Act on real estate management. The fact that these activities are treated for public purposes allows, *inter alia*, the institution of expropriation to be applied, thanks to which it is possible to more quickly acquire land for the implementation of this project. With

the emergence and development of electromobility, the Act imposes the obligation to create 3 different documents:

1. a plan for the location of publicly accessible charging stations and natural gas stations along the roads of the TEN-T core network under its management;
2. a national policy framework for the development of alternative fuels infrastructure;
3. a report on charging points within the municipality, installed in public charging stations/plan for the construction of public charging stations.

Ad 1) Plan for the location of publicly accessible charging stations and natural gas stations along the roads of the TEN-T core network under its management

The Act requires the General Director of National Roads and Motorways to develop a plan for the location of public charging stations and natural gas stations along the roads of the TEN-T core network under his management, for not less than 5 years (Art. 32 sec. 1). The main objective of TEN-T (Trans-European Transport Network) is to ensure the territorial cohesion of the EU and to facilitate the free movement of persons and goods (Regulation on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU, 2013). An efficient transport system within the Union is supposed to contribute to improving the functioning of the single internal market, stimulate regional economic growth, and increase the competitiveness of the individual Member States and the EU as a whole on a global scale. The Regulation of the European Parliament and the Council, in Article 38, identifies the most important roads (existing or planned) for the achievement of the TEN-T policy objectives and reflects the changing demand for transport and the need for multimodal transport. This network contributes in particular to serving increased mobility and ensuring a high level of safety and to developing a low carbon transport system. Member States have to construct and adapt

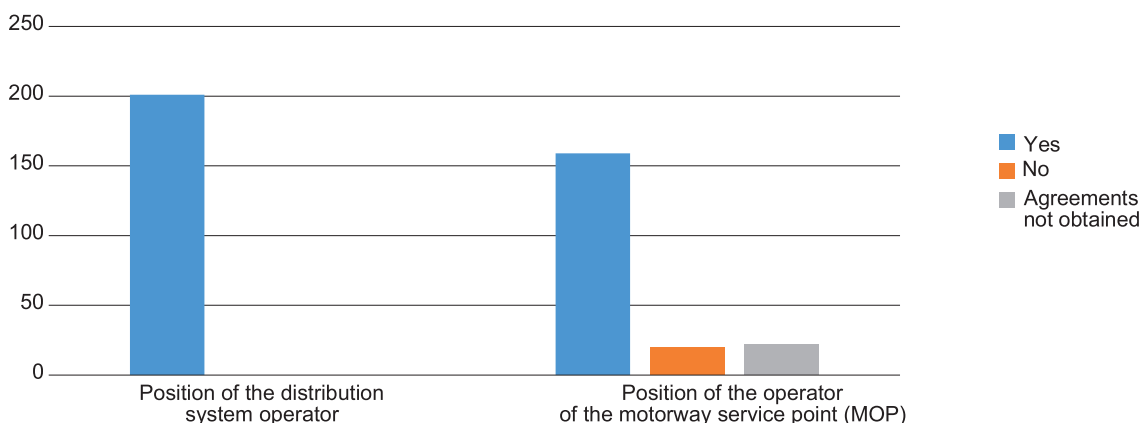
the infrastructure to the guidelines of the regulation until 31 December 2030.

Furthermore, Annex 1 of Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (2007) indicates that the spatial data elements disclosed in the Infrastructure for Spatial Information in a country are the following: transport networks – road, rail, air and water transport networks and related infrastructure. These include connections between different networks, e.g. the Trans-European Transport Network (TEN-T) as defined in Decision No 1692/96/EC of the European Parliament and of the Council of 23 June 1996 on Community guidelines for the development of the trans-European transport network and future revisions of that Decision.

The Regulation of the European Parliament and the Council sets out guidelines for TEN-T roads, among which the need for access to charging points for alternative fuel vehicles is indicated. When carrying out construction works on roads belonging to the TEN-T network, the possibility of providing a sufficient number of electro-mobility points should be designed and prepared.

According to the Act, the location plan for public charging stations and natural gas stations includes: the determination of the number and locations of public charging stations and natural gas stations, taking into account compressed natural gas (CNG) and liquefied natural gas (LNG), refuelling points, necessary to cover the demand for alternative fuels in vehicles travelling on the roads of the TEN-T core network. Such a plan, concerning 201 points, was prepared, agreed and posted on the website of the General Directorate for National Roads and Motorways (GDDKiA, 2018). It shows at which first-category motorway service points (MOP) a public charging station could be located, differentiating between the position of the distribution system operator and the position of the operator of the motorway service point. The consultation aimed to determine whether there is a possibility to locate distribution charging stations at MOPs (according to the distribution system operator and the operator of MOP), which yielded the following results (Fig. 1).

The data presented show that in most cases there is a possibility to build public charging stations at MOP points. Below (Fig. 2) shows which MOPs were consulted and which locations are covered by the plan.



**Fig. 1.** Results of the consultation on the location plan for public charging stations and natural gas stations – number of MOPs where it is possible to locate distribution charging stations (according to the distribution system operator and the operator of MOP)

Source: own elaboration based on GDDKiA (2018).

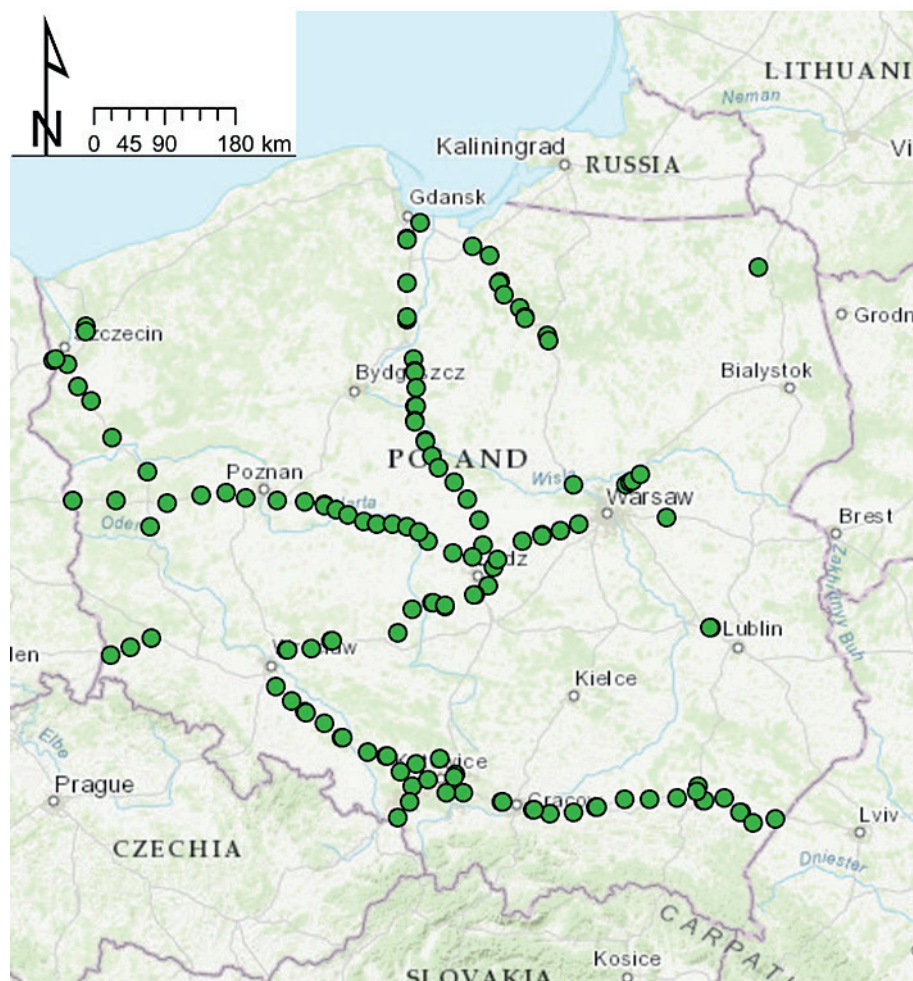


Fig. 2. Location of consulted MOPs  
Source: own elaboration based on GDDKiA (2018).

Ad 2) National policy framework for the development of alternative fuels infrastructure

The national policy framework for the development of alternative fuel infrastructure is developed by the minister competent for climate affairs (Art. 43 sec. 1). Their current version was adopted on 29 March 2017. In the National Framework, with regard to the content of the article, there are (Art. 43 sec. 2): an assessment of the existing state and future development of the market for alternative fuels in the transport sector, a national target for the number of charging points installed in publicly accessible charging stations in municipalities, and the measures necessary

to ensure that the national targets for the number of charging points are achieved.

Ad 3) Report on charging points within the municipality, installed in public charging stations/ plan for the construction of public charging stations

A report on the charging points on the commune's territory, installed in publicly accessible charging stations, was to be drawn up by 15 January 2020 by the commune head, mayor or city president. This report, according to Article 61 section 2, contains information on:



1. the number and location of publicly available charging stations, taking into account the capacity of the charging points installed in these stations;
2. the number and location of public charging stations planned to be built by 31 December 2020, taking into account the capacity of the charging points planned to be installed in these stations;
3. the number of charging points missing to achieve the minimum number of charging points, as indicated in Art. 60 sec. 1, on 31 December 2020, taking into account the charging points referred to in point 2.

Article 60 of the Act defines the minimum number of publicly accessible charging stations in a municipality. In case the report shows that the number of available charging stations is insufficient, the commune head, mayor or city president prepares a plan for the construction of public charging stations. This plan shall specify:

1. the number and location of planned publicly accessible charging stations with the number of charging points planned to be installed in them, taking into account the power of each of these points;
2. the proposed schedule for the construction of the public charging stations.

According to Art. 60 sec. 1 point 3, the minimum number of charging points in municipalities with a population higher than 150.000, where at least 95.000 motor vehicles are registered and there are at least 400 motor vehicles per 1.000 inhabitants, is 100. The city of Olsztyn can be given as an example of such a municipality, expanding significantly with many multi-family buildings being built and located near the Warsaw-Gdańsk route (S7). Due to the fact that in Olsztyn there was not the required number of charging points, on June 26, 2020 resolution No. XXII/395/20 on approval of the “Plan for construction of public charging stations in the area of the Municipality of Olsztyn” was adopted (Rada Miasta Olsztyna [Olsztyn City Council], 2020). The plan accepted by this resolution assumes building the missing charging points; 94 points are planned to be built, each with a power of 22 kW. Additionally, locations for 6 reserve charging points have been identified, also of 22 kW capacity.

## RESULTS

The Act on electromobility and alternative fuels requires the President of the Office of Technical Inspection to maintain the Alternative Fuels Infrastructure Register (Art. 42 sec. 2). The Register contains the following information on (Art. 42 sec. 3):

1. coordinates of natural gas stations, up to the national spatial reference system in the Cartesian coordinate system;
2. coordinates of public charging stations, up to the national spatial reference system in the Cartesian coordinate system;
3. current prices of alternative fuels at the above-mentioned locations;
4. availability of charging points installed at public charging stations.

This information is presented on an interactive map (UDT, 2019) with the symbol of an inverted teardrop: blue teardrops indicate charging stations and orange teardrops indicate CNG and LNG refuelling stations (Fig. 3).

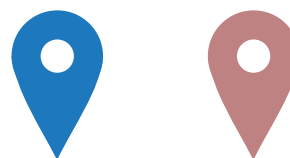


Fig. 3. Marking of charging station (left) and CNG and LNG refuelling station (right) in the Alternative Fuels Infrastructure Register map

Source: own elaboration based on UDT (2019).

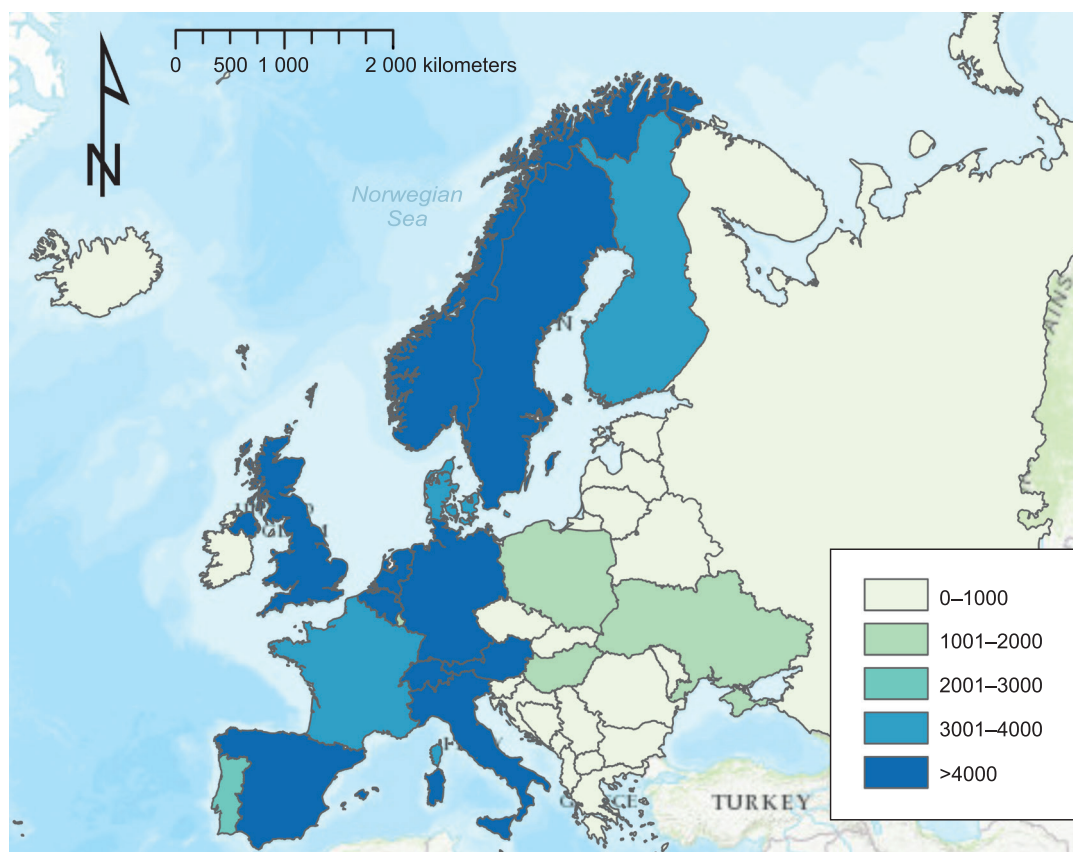
When you move the mouse cursor over a selected symbol you get information about the location of the station, its opening hours and prices. The website also displays a counter with the number of currently free and occupied charging points (near real-time data). The Act in Article 42 imposes on the operator of a public charging network the obligation to send information on charging points, among others, on the availability of a charging point installed at a public charging station immediately after a change in the availability status of this point, within the time resulting from the operation of the network service,

as well as current prices of charging services – within one hour from the change in this price. The Regulation of the Minister of Energy of 10 December 2018 on the templates of notifications made to the Alternative Fuel Infrastructure Register by the operator of a public charging station and the operator of a natural gas station (2018) contains detailed guidelines on the form and content of the notification.

## CONDITION OF POLISH ELECTROMOBILITY

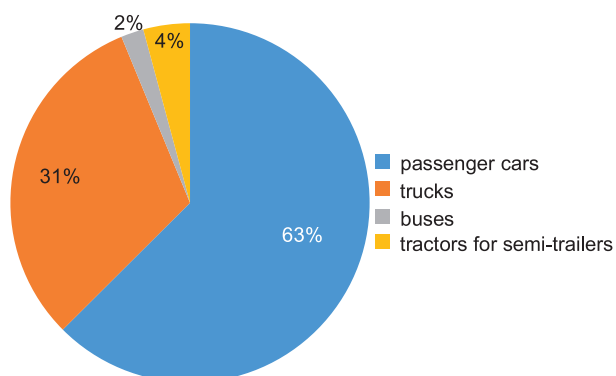
In 2019 the European Parliament and the Council have adopted the Regulation setting CO<sub>2</sub> emission performance standards for new passenger cars and new light commercial vehicles (2019). The target for 2025 is to reduce CO<sub>2</sub> emissions per kilometre by 15%, and by 2030 – by 37.5% (for cars), and 31% for

vans. Therefore, there is a need for the Member States to monitor the annual progress of car manufacturers in this regard, primarily using the information on new registrations and laboratory test results, under the WLTP procedure (Worldwide Harmonised Light-duty Vehicles Test Procedure) (PZPM & EAMA, 2020). In order to ensure a complete transition to zero- and low-emission vehicles in the EU, it is necessary to invest more in the charging and refuelling infrastructure for alternative-propulsion vehicles – hence, the development of this type of infrastructure has also become a subject of interest. The results of this monitoring of the number and type of electric vehicle charging stations are published in the form of reports by, among others, the European Automobile Manufacturers Association (Fr. Association des Constructeurs Européens d’Automobiles – ACEA) (Fig. 4, Fig. 5).



**Fig. 4.** Number of charging stations in Europe

Source: own elaboration based on ACEA (2021), Chargemap (2009), Electromaps (2009).



**Fig. 5.** Share of each type of vehicle in the number of all vehicles using fuels other than gasoline, diesel, or LPG in Poland

Source: own elaboration based on GUS (2021).

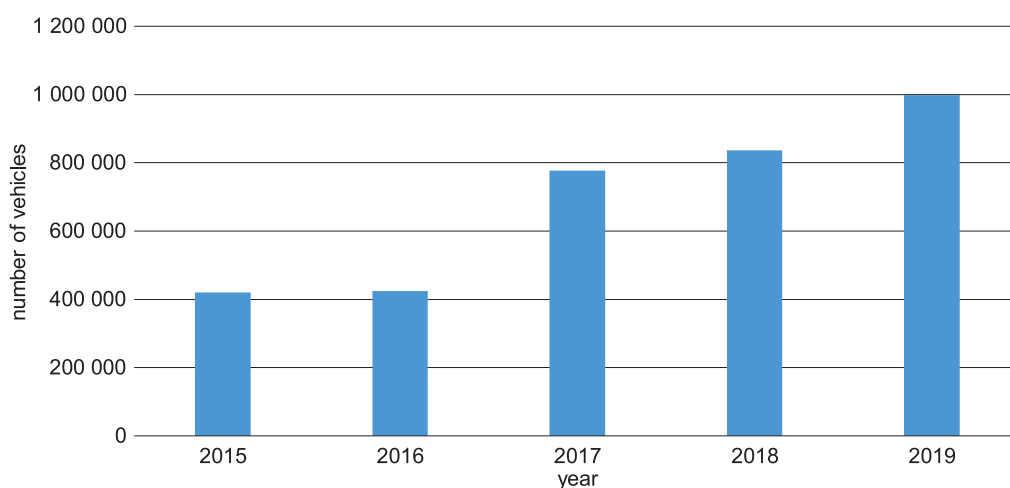
According to Statistics Poland (2021), there were nearly one million vehicles registered in Poland in 2019 that use fuels other than gasoline, diesel, or LPG (as of 23.09.2019). The vast majority of these types of vehicles are passenger cars (Fig. 5). A systematic increase in their number has been observed for several years (Fig. 6). The biggest one has occurred in the Silesian Voivodeship (1059% in 5 years), Podlaskie Voivodeship (737%) and Lublin Voivodeship (705%), while in the Masovian Voivodeship (with the capital city of Poland) the number of alternative-powered passenger cars has increased by 284%. In the Warmian-Masurian Voivodeship (with the capital

in Olsztyn, given as an example above) there are ca. 95% more of these than 5 years ago (GUS, 2021). It is important to bear in mind, as noted by ACEA (2018), that although there is an increase in the number of alternative-powered cars sold, this is related to an increase in the number of total vehicles sold, and their share of total cars sold remains more or less stable.

However, the data provided by Statistics Poland do not describe exactly what fuel types should be understood as “other”. The Local Data Bank also lacks information on vehicles powered by strictly alternative fuels, with a breakdown by type.

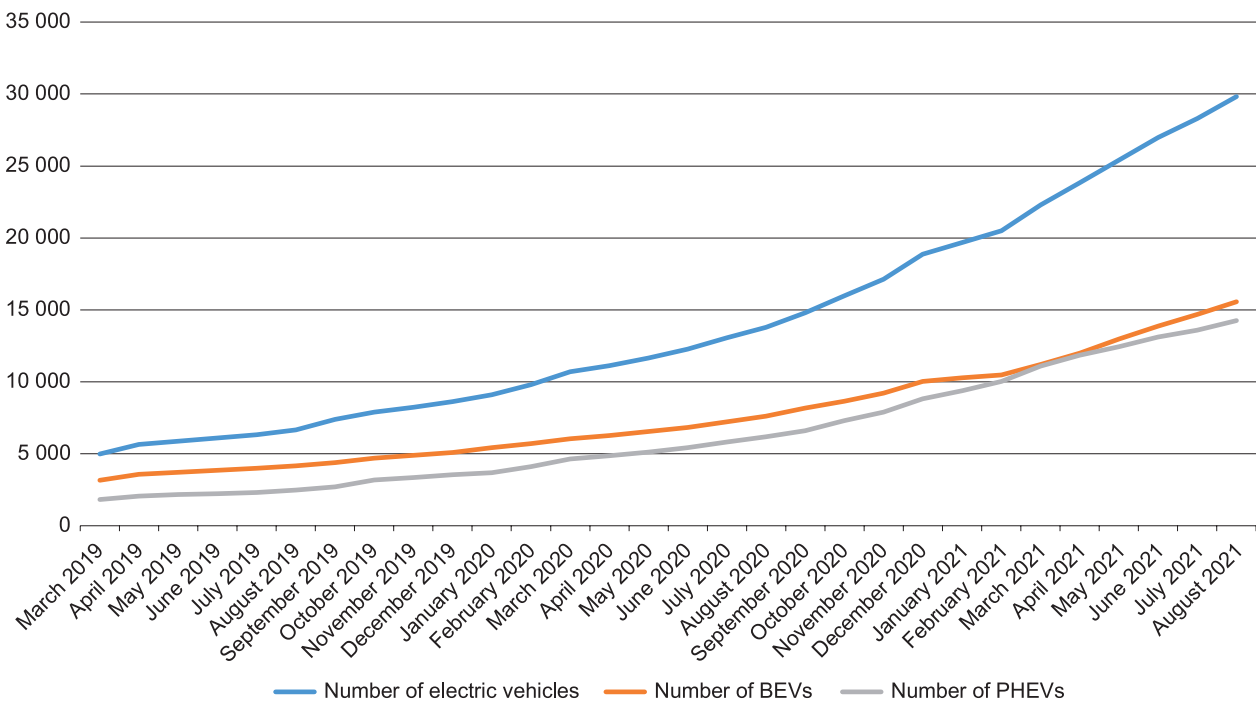
Information on registered electric vehicles is published by the Polish Alternative Fuels Association (PSPA) and the Polish Automotive Industry Association (PZPM) in the form of an Electromobility Counter. According to the latest press release (PSPA & PZPM, 2021), at the end of June 2021, the number of electric passenger cars in the country was 26,985, of which 49% were all-electric BEVs (Battery Electric Vehicles), and the remainder were plug-in hybrids PHEV (Plug-in Hybrid Electric Vehicles) – Fig. 7. The total number of electrically-powered vehicles registered in Poland is approximately 39 thousand (PSPA & PZPM, 2021).

Increasing the sales of electric vehicles in Poland was possible thanks to the introduction of tax exemptions for their purchase (for fully electric

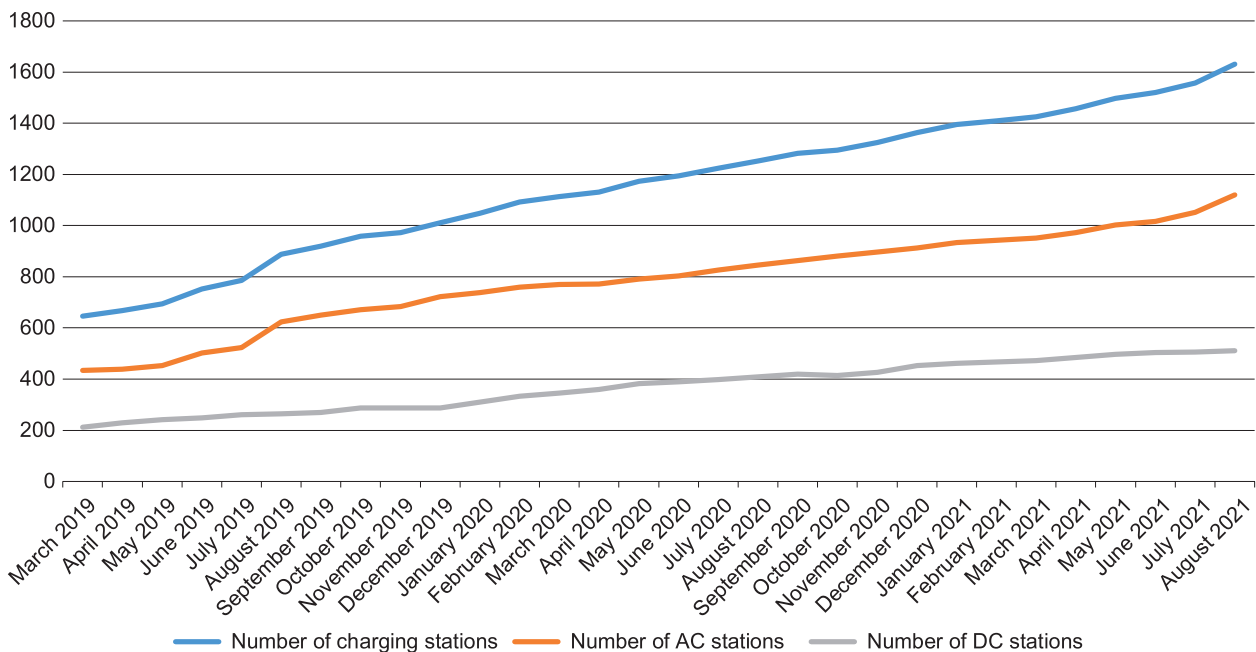


**Fig. 6.** Number of vehicles using fuels other than gasoline, diesel, or LPG in Poland

Source: own elaboration based on GUS (2021).



**Fig. 7.** Number of electric passenger cars in Poland  
 Source: own elaboration based on PSPA & PZPM (2021).



**Fig. 8.** Number and types of charging stations in Poland  
 Source: own elaboration based on PSPA & PZPM (2021).

or hybrid vehicles with a cylinder capacity of less than 2,000 cm<sup>3</sup>) and a programme of special incentives for individuals buying a car by the end of 2027 (up to 37,500 PLN for fully electric vehicles with a price ≤ 125,000 PLN and up to 90,000 PLN for electric vehicles using hydrogen fuel cells or CNG with a price ≤ 300,000 PLN) (ACEA, 2020d, 2020b). Unfortunately, this does not compare very favourably with European countries such as Germany, Greece, Austria, Hungary, Spain, Portugal, the Netherlands or Finland, where the purchase is encouraged through allowances also linked to car ownership or the introduction of cars to the company fleet (ACEA, 2020c, 2020a, 2021a).

According to the PSPA & PZPM report (2021), in addition to the increase in the number of electric vehicles, there has also been a development of the necessary infrastructure related primarily to their charging: “At the end of June, there were 1,521 publicly available electric vehicle charging stations in Poland (2,964 points). 33% of them were fast direct current (DC) charging stations and 67% were slow alternating current (AC) chargers with power less than or equal to 22 kW. On June, 23 new public access charging stations (33 points) were launched” (Fig. 8). Most stations are located in Warsaw, Katowice and Kraków.

## CONCLUSIONS

On the basis of the statistics mentioned above, we may observe that an increasing number of electric cars are registered in Poland, which implies the necessity to ensure appropriate infrastructure for charging them. There are also more and more organisations and initiatives in the world that focus, directly or indirectly, on issues related to this area. This interest in electromobility entails the need to introduce changes, both in legal regulations and road infrastructure.

As can be seen from the analysis of the legislation, Polish legislators have, for the most part, adopted the solutions contained in the Directive on the development of alternative fuel infrastructure. Thanks to this, the Polish solutions will be similar

to the solutions of other Member States, and the use of electric and hybrid cars will be on similar principles across the European Union.

Moreover, the presented research shows that the obligations contained in the legal acts analysed in the article are fulfilled in Poland by the Register of Alternative Fuel Infrastructure maintained by the Office of Technical Inspection. However, there is still no coherent, intelligent transport system providing up-to-date and comprehensive spatial and descriptive data on electromobility. Without appropriate technical and information infrastructure, as well as coherent legal regulations, a gradual transition to alternative fuels and clean energy sources to achieve climate neutrality of transport will be significantly hindered in Poland.

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