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Standardisation of EV Charging Signs in Europe

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Improving EV Charger Visibility for Travel

Using electric vehicles (EVs) can be challenging when looking for chargers during long-distance and cross-border travel. Chargers are already available but difficult to locate and not easily visible to the public. While highways clearly mark traditional fuel stations at rest areas, such signage for EV chargers is rare. In some countries, signs have started to appear but vary significantly in iconography, adding further confusion.

This paper highlights these issues and offers guidance toward a viable solution. It reviews the current situation, examines previous proposals, and defines the problems needing immediate attention. The final section proposes an easy-to-implement standardisation strategy and explains why some solutions are more effective while others create confusion.

Effective, easy-to-understand signage will not only assist EV drivers in locating chargers but also increase awareness among drivers of internal combustion engine vehicles about existing EV charging infrastructure — a critical factor in public policy and promoting EV adoption.

Keywords: Electric Vehicles, Standardisation, Public Policy & Promotion

1 Problem Definition and Context

The signage and guidance systems indicating the location of EV charging stations are markedly differently across European countries and can vary from region to region within a country as well. Certain countries boast well-defined and easily identifiable symbols, whereas others suffer from an almost complete absence of proper and consistent signage. Such inconsistencies pose significant challenges for drivers, particularly those on international journeys, as it complicates the process of finding charging stations and exacerbates range anxiety. Additionally, for users of electric vehicles, it's not just about locating the nearest charging point; it's also crucial to be aware of the distance to the next available station beyond the one currently in view. This knowledge is vital for planning longer trips, ensuring that drivers can always reach a charging station without the fear of running out of energy.

The increasing uptake of electric heavy-duty vehicles (trucks and buses) presents another dimension of this problem. Distinguishing charging points suitable for heavy duty vehicles from those only suitable for cars and cars and light duty vehicles is crucial. Locating the charging stations in a complicated outline of a rest area or a parking garage can also be challenging without a universally accepted and understood signing and marking system. Additional information provided in textual form in the local language, such as unique, non-standardized signs or local parking rules, can also complicate the situation.

Without well-known and universally used signs and road markings, non-EV drivers will not notice the charging infrastructure, no matter how much of it is already available. They will not see how well their regularly visited routes or regions are covered. They will have the impression that the charging infrastructure is not ready yet.

2 Historical overview – how standardized road signs were established

The need for standardisation of road signs across multiple countries, especially in the context of cross-border travelling was recognized early and can be traced back to the International Convention on Motor Traffic concluded in Paris on 11 October 1909. Building on standards established in Europe (1926 Paris Convention) and America (1943 Inter-American Convention) and further revisions, countries of the entire world were gathered in October and November 1968 in Vienna resulting in the Convention on Road Signs and Signals (E/CONF.56/17/Rev.1).

This agreement resulted in a basic set of road signs and signals which are the same in many countries. The agreement is still in place, but over time several countries have developed additional symbols, signs and signals outside of international standards and specific to their country.

2.1 Vienna Convention on Road Signs and Signals[1][2]

In most countries in Europe (Ireland, Cyprus, Malta and Albania being notable exceptions) the road traffic, signs and road markings are regulated by the Vienna Convention on Road Signs and Signals (Nov 8, 1968). This regulation is maintained by the UNECE Inland Transport Comittee (ITC), WP.1 Global Forum for Road Traffic workgroup.

2.1.1 Signage Categories

Per Annex 1, the Convention categorises signs as:

- **Danger Warning Signs:** Triangular, red-bordered, for hazards (e.g., curves, crossings).
- **Regulatory Signs:** Circular, for rules (e.g., speed limits, no entry).
- **Informative Signs:** Include:
    - Advance Direction Signs
    - Direction Signs
    - Road/Place Identification Signs
    - Confirmatory Signs
    - Information, Facilities, or Service Signs: Show amenities (e.g., fuel stations).

2.1.2 Fuel Station Signs under the Convention

Fuel station signs fall under the **information, facilities or service signs** found in Annex 1, Section E, of the Vienna Convention. These indicators are supposed to let drivers know whether, along the route, rest spots, gas stations, restaurants, or emergency services are accessible. The Convention states that typically these signs have a rectangular form with a blue or green backdrop. These signs can also precisely depict the type of service using symbols or pictograms. For a petrol station, for instance, the logo usually consists of a basic depiction of a petrol pump so drivers can quickly identify it. These signals are extremely important for people who use the roads, especially in places they are not familiar with. They enable individuals to get facilities they require, therefore simplifying and guaranteeing safety.

The convention's principles of clarity and exposure direct where information, facilities, or service signs go and how they are created. Petrol station signage, for instance, might be erected ahead of the service station to give vehicles time to make decisions, including abandoning the route. The Convention specifies what these signs

are and what they should be used for, but it also permits the Contracting Parties to choose the particular symbols or additional features most suited for their respective nation. This procedure guarantees that the Convention's general guidelines are followed and that the signs remain easily comprehensible.

2.1.3 EV Charging Station Signs

As of April 2025, EV charging stations signs are not regulated within the Vienna Convention.

3 Where we are now – confusing

3.1 Germany

The German law "Allgemeine Verwaltungsvorschrift zur Straßenverkehrs-Ordnung (VwV-StVO)"[3][4] includes several information signs and supplemental signs dedicated to EV charging.

Figure 1: Germany – Charging station in 2 km

Highway directional signs are sometimes separate from EV charging information signs, with EV information signs appearing a short distance before the blue or yellow highway directional signs. On other occasions, blue highway directional signs can be seen with integrated charging symbols. Blue directional signs are used for highways (Autobahn); yellow directional signs are used for "highway-like" roads (autobahnähnliche Straße).

Germany's road traffic law (Straßenverkehrs-Ordnung) does not include provisions to dedicate parking spaces towards EV charging only; the official German charging station sign 365-65 has a pure informal character. Therefore, parking prohibition signs amended with supplemental signs are frequently used. However, these signs are only applicable to roads and do not apply to parking lots.

It is necessary to amend a blue parking sign (P) in parking lots to include additional signs designating those spaces for EV charging.

Different cities in Germany interpret the hierarchy of supplemental signs differently, leading to confusion (e.g. duration limit signs combined with specific times of day).

Germany's e-mobility law "Elektromobilitätsgesetz (EmoG) - Gesetz zur Bevorrechtigung der Verwendung elektrisch betriebener Fahrzeuge"[5] introduced EV symbols intended to make it easier to enforce reservations for dedicated EV parking spaces, but these symbols come with a catch. It is only valid for German license plates ending in "E" (BEV, HEV, PHEV, FCEV) or with a special sticker for non-German license plates. Thus, it is theoretically legal for an FCEV to block an EV charging spot. When charging at this location, a BEV with a foreign license plate may incur a fine.

Figure 2: Germany – EV symbols introduced in EmoG

Gernany's EmoG went into effect in 2015 and is only valid until 31 December 2026.

3.2 Austria

Street signs and street markings for charging stations in Austria are, for the most part, unregulated as of April 2025, resulting in a broad variety of signs deployed in the country.

In June 2022 a new guidance sign ("Hinweiszeichen") named "E-Ladestelle" was introduced in Austria's law "Straßenverkehrsordnung 1960 – StVO. 1960"[6] that can optionally include the distance to the

upcoming charging station. Currently, its use is not widespread.

Figure 3: Austria – Charging station in 300m

The "Straßenverkehrsordnung 1960 – StVO. 1960" doesn't regulate any other charging station signage. Nevertheless, Austria's highway authority ASFINAG has introduced symbols for highway service stations signposts which are used for most of Austria's highway stations that offer EV charging – see example in figure 4.

Figure 4: Austria – Highway, charging station in 2km

Street paintings are frequently used in Austria to highlight parking spaces dedicated to EV charging, but those paintings are purely informal (can't be enforced), and there is no guidance on the colours or symbols that should be used. Sometimes a battery symbol is used; sometimes an EV symbol is used, sometimes an EV symbol and sometimes the symbol on the street painting is the logo of the CPO.

Figure 5: Austria – Road markings for EVs with inconsistent use of colours and symbols

There are no dedicated rules within Austria's laws to regulate the reservation of parking spaces for EV charging. Therefore, general parking prohibited signs are used, amended with supplemental text and symbols. There is no formal guidance, so those supplemental symbols and texts are inconsistent across Austria. Some cities grant exceptions from short-term parking fees while a charging session is active, while in most Austrian cities short-term parking fees still apply.

Figure 6: Austria – Example of supplemental signs restricting parking to charging an EV

3.3 Slovenia

In the Republic of Slovenia, road markings and traffic signs are regulated by laws[7] that include specific provisions for electric vehicles. The following rules apply:

A traffic sign indicating the availability of designated electric vehicle parking spaces.

Figure 7: Slovenia – Parking only for EV

A traffic sign mandating charging at an electric vehicle charging station.

Figure 8: Slovenia – Parking only for charging EV

A traffic sign directing to an electric vehicle charging station, positioned before the turnoff for vehicle service areas.

Figure 9: Slovenia – Info sign with sign for charging EV

A road marking designating a parking space specifically for charging electric vehicles.

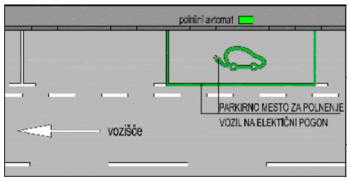

Figure 10: Slovenia – Road markings for charging station

The enforcement of fines for those who park incorrectly or fail to charge their vehicles in areas reserved for charging electric vehicles relies on proper traffic signs and road markings.

3.4 Hungary

Hungary has not yet regulated the marking of charging stations in rest areas. In a few places, the public road management company has added the sign of the car outline (like the one used in Slovenia) to the boards, but it is still not common, and it is not among the officially recognised symbols yet. Most locations lack official markings. Some charging station operators started to use the same symbol to mark their charging stations within the parking lots based on “Érvényben lévő útügyi műszaki előírások” (current road technical regulations)[8].

Figure 11: Hungary – Info sign with symbol for EV charging

Figure 12: Hungary – Parking only for charging EV

Road markings of the parking spot assigned to the charger have been regulated since 2022[9]. The road technical regulation lists the outline car with the electric cord tail as the standard. The use of this sign is not enforced in any way; therefore, it highly depends on the charge point operator whether they obey the rule or use their symbol on the pavement.

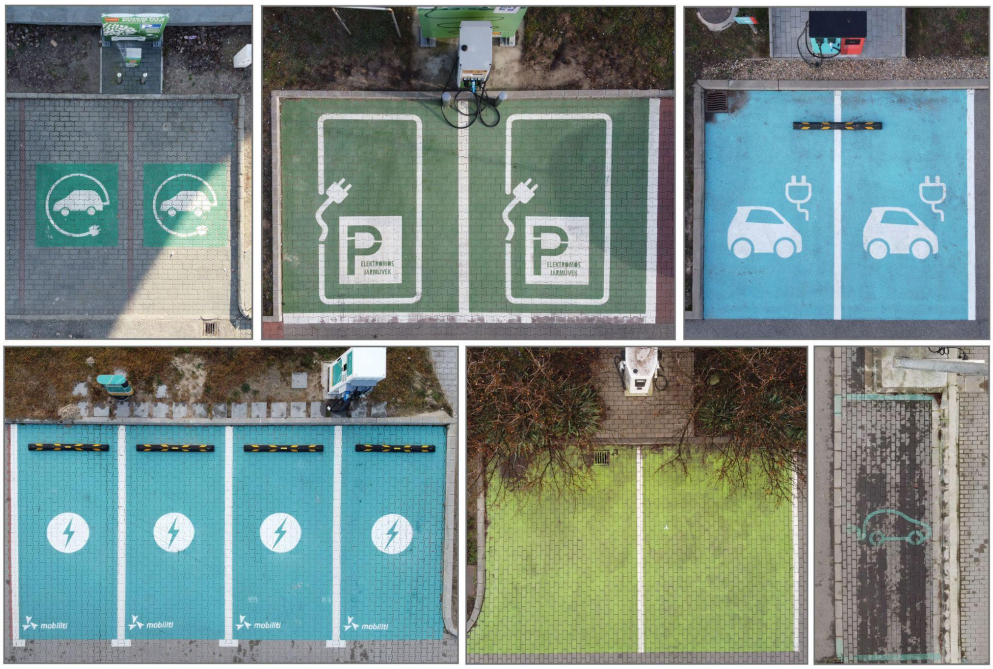
Figure 13: Hungary – Road markings, part one

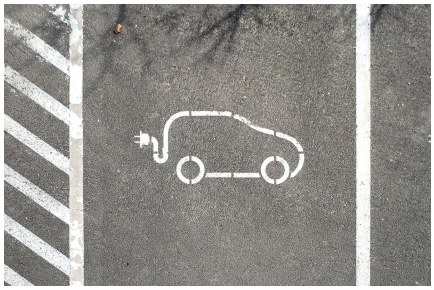

Figure 14: Hungary – Road markings, part two

4 Proposed solution

As the Vienna Convention on Road Signs and Signals does not mandate any specific design, we are not aiming to propose exact icons or signs. Most countries that have signed ratified the convention use the same symbols, shapes and colours, but the icons, the sizes and, in some cases, even the colour tones are slightly different in each country. We believe that this form of freedom should be given to the countries with the new signs related to EV charging, as the change would allow the countries to extend their signage collection with a matching icon.

4.1 Use cases to cover

4.1.1 Indication of EV charging ahead

The upcoming rest area on the highway should indicate the availability of electric vehicle charging stations, just as other fuelling options have done for decades. While fuel stations are a common service in rest areas, they have become the norm for regular cars. EV charging is still rare, and range is still limited in some cars, which makes it even more important for EV drivers to know in advance if they can find charging stations in an upcoming location.

4.1.2 Distance to the next EV charging station

When approaching a rest station on the highway, we often see the distance to the next rest station with a refuelling station. With the limited range of electric vehicles, it would be even more important to know the distance to the next EV charging station after the upcoming one. The new sign system should consider providing this information as well.

4.1.3 Types of vehicles the EV charging station is designed for

Most EV charging stations in spring 2025 are designed for passenger vehicles. In some regions, parts of the stations are designed to be compatible with trailers, but they are rarely compatible with heavy-duty electric trucks or buses. However, this situation will rapidly shift as an increasing number of stations cater to these larger vehicles. In the not-so-distant future, it will be crucial for truck and bus drivers to identify the stations that are designed for their vehicles and for passenger car drivers to be able to go to the right station.

4.1.4 Providing directions within the rest area

In larger rest areas or parking garages, it is often a challenge to find the charging stations. Sometimes the charging station operator places easily identifiable columns or canopies over the station, but most of the time, the chargers stand alone. In a new location, it can be challenging to find the exact location of the chargers. The universally agreed-upon sign should be used within the parking area, accompanied by the necessary arrows to show the route to the charging stations. In case there is more than one service provider operating in one rest area or parking garage, the signs should indicate the operator as well.

4.1.5 Signs marking the EV charging station and the dedicated parking spots that belong to the chargers

It should be clearly marked by the necessary road signs, which part of the parking lot is an EV charging station, and which parking spots belong to the chargers. It is still a problem in some parts of Europe that people don't recognise the EV chargers and park in front of them, blocking the chargers from the EV drivers.

4.1.6 Signs marking charging stations within cities (populated areas)

It is equally important to do the same in populated areas where the charging stations are sporadically spread across a larger area and the charging equipment is just installed next to the parking lots along the street. These stations should be recognised by non-EV drivers, too. This would not only provide better access to these stations but would also build awareness about the availability of EV charging.

4.1.7 Charging as a service availability is indicated near the entrance of large parking lots and parking garages

When looking for a parking facility in a big city, the EV driver should never guess whether the parking garage or large parking area has EV charging equipment installed or not. The availability of EV charging equipment should be clearly indicated at the entrance of the parking garage. There should be a new sign indicating the service's availability. Giving guidance to the chargers within the parking lot and displaying the name of the provider would also help EV drivers.

4.1.8 Marking on the road surface for parking spot that belongs to the EV charging equipment

To prevent drivers from blocking the chargers, the road surface should be marked with the universal icon to show which parking spots are reserved for EV charging.

4.2 Information that should be excluded

While it may be tempting to include additional details such as the plug type, charging power, or the number of available chargers, doing so would clutter the boards and complicate maintenance. The name of the charging provider could be added as an extension, as it is already the case with regular refuelling station operators in some countries.

4.3 Characteristics of a good sign

4.3.1 Universally recognized

Designing the right sign for the above-detailed purpose is not easy. As a basic requirement, the sign should be easily recognised by all road users. Everyone should have a common understanding of what the sign is referring to.

4.3.2 Easy to recognise from a distance while driving

The sign should be easy to see and recognise from a distance when travelling at 130 km/h or faster. A thin line drawing is hard to see, just as much as a complicated drawing with many small details. Simple shapes with solid surfaces work the best; single-line shapes (outlines) are rarely used.

4.3.3 Should match the logic of the whole symbol set

The symbol should fit the logic of the other symbols in its category and the whole system. Information signs (usually square-shaped, with a black symbol on a white background and a thick blue or green border along the edges of the board), for example, usually show what the traveler will find at the location: a fork and spoon for a restaurant, a cup for a coffee place, an aeroplane for an airport, and, of course, a petrol pump for a refueling station. Therefore, drawing a car with a cord hanging on the side or at the end breaks this system. Ideally, we will find charging stalls at a charging station, not cars with hanging cables.

4.3.4 The same symbol should be used internationally

To achieve universal recognition, the logic behind the symbols should be the same in all countries. It is not necessary to have the same symbol in all countries, as we can recognise all variants of a refueling station, despite the different designs.

4.3.5 Should match the format of existing signs

The format should match that of the other signs for easier application on existing boards.

4.3.6 Avoid text

Well-designed signs should avoid text, as local language barriers could make the sign harder to understand. The use of self-explanatory symbols is preferred over textual descriptions.

4.4 What EV users are familiar with

What current EV users are highly familiar with depends on where they live and what car they use. In some countries (e.g., Germany, Italy, and Poland), the gas pump with a plug-ended electric cord became the norm on the road signs, while in others (e.g., France), the stylised car outline ending as an electric cord and a plug is more common. As we have discussed above, this latter symbol fails many of the criteria of a positive sign. Some countries (e.g., Denmark) mark EV charging stations with a coiled electric cord and a plug. While this is easy to understand and see from a distance, it fails to show what exactly we will find at the location and is not well known in most regions of Europe.

The other place where EV drivers see these symbols is in the car. Some cars, like the Nissan Leaf, have a button to open the charging port. Others, such as the Ford Puma Gen-E, display a symbol in the menu's charging section. The symbol can show up on the map of the navigation as well, marking the location of the chargers in the selected area (e.g., Skoda Enyaq). In cars, one of the most often-used symbols is the pump with a cord and plug. Most of the EV drivers have already connected this symbol with charging.

Figure 15: Example of a symbol in an EV dashboard

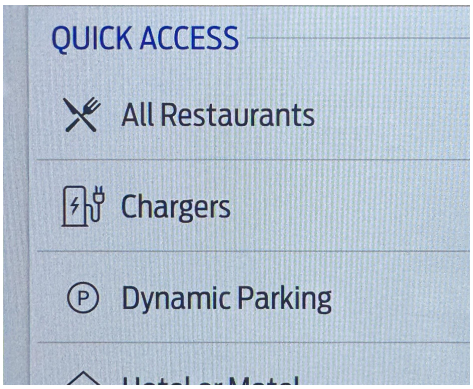

Figure 16: EV charging symbol in EV navigation

Figure 17: EV charging symbol in EV navigation

4.5 Proposal

Based on all the above, the modified gas pump appears to be the best candidate to become the standard in Europe for symbolising an EV charging station. Everyone recognises it because it looks like the regular gas

pump symbol used everywhere, fits in the widely used symbol systems, is easy to see from a distance, and shows what drivers will find at the marked location. Every country can draw the symbol in a way that matches the existing gas station symbol used in that country while maintaining the generally recognised look of the sign. The fact that most of the EV drivers see the same symbol inside their cars on interfaces related to charging can make the adoption of this symbol easier.

Figure 18: Italy – Info sign with symbol for EV charging

In countries that use colours to indicate different fuel types, the symbol could optionally be green. Hungary used to mark unleaded gas with a green symbol, but since all gasoline is now unleaded, they presently use a black one instead. The green in this case could be reused for the new symbol to make it even easier to distinguish the EV charging sign from the refueling station sign.

For road surface marking, the same symbol should be used to avoid confusion. Introducing a different symbol there would force users to speculate. By learning the EV charging station symbol once, non-EV drivers will also recognise it on the road markings.

The EV charging station sign can be used in conjunction with a parking sign to mark the parking spots near the chargers that are dedicated for charging vehicles.

4.6 Countries already using this sign

This symbol (and its local variants) is already in use in several European countries, including Germany, Italy, Poland, the Czech Republic and Slovakia.

5 Conclusion

5.1 Moving Forward: Simplifying EV Charging

Our plan to standardize EV charging signage across Europe is clear and practical. Our proposal consists of four steps and one core rule. The simple rule is to consistently use the same sign across all locations. We divide the signage into four categories: roadside, on-property, at the charging station, and green-colored road markings.

Using a modified gas pump symbol, we'll create a recognizable sign that fits existing road conventions. This cuts confusion, makes chargers easy to find, and reduces range anxiety. It's a flexible plan that adapts to local styles while keeping the design consistent, encouraging more people to switch to EVs by making charging simple and familiar.

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Presenter Biography

Ignac Završnik has been involved in e-mobility since 2003, focusing on sustainable transportation and energy self-sufficiency. He's been testing electric vehicles in Slovenia since 2014 and collaborates with organizations like the Slovenia grid operator ELES d.o.o. and the Ministry of Environment, Climate, and Energy.

As an author, he's written many articles on e-mobility and served as the Chairman of the Slovenian e-Mobility Society since 2017. Within the society, he's actively involved in organizing e-mobility events, educational seminars, and awareness programs as an NGO.

Ignac is also a co-author of a white paper on road transport decarbonization for local decision makers in Slovenia. He's also actively engaged with the Global EV Alliance (GEVA) as well.

Co-Author Biographies

Tibor Antalóczy is a journalist who has been reporting on emerging technologies for the past 25 years. His education in economics and his interest in computer science, especially in software development, has played a key role in assessing new technical achievements and how these can impact the development of new products and services. After switching to electric vehicles in 2014, he has devoted most of his time to sharing insights and answering questions for those who are interested in e-mobility but have unanswered questions. He is the founder and editor-in-chief of Villanyautosok.hu, the most influential e-mobility website in Hungary, and also one of the founders of the Hungarian Electromobility Association (ELMOB). This NGO is the largest association in Hungary that represents end users.

Ellen Hiep is board member of the Dutch EV drivers' association (Vereniging Elektrische Rijders-VER) and CEO of HiePRactief, a Dutch communications agency specialized in smart eMobility. She is active in e-mobiity since 2011. She is also member of the Steering Committee of the Global EV Alliance (GEVA): a network of more than 65 national electric drivers' associations from almost 35 countries around the globe. GEVA facilitates global collaboration on best practices, policies, education, and other EV related initiatives.

Christian Peter studied at the Vienna University of Technology. Due to an interesting job offering at IBM, he dropped out of his studies and stayed with IBM in various national and international job assignments in Europe, USA, Africa, the Middle East and Asia until he retired. He is now intensively involved with electromobility as a volunteer director of the ElektroMobilitätsClub Österreich, gives lectures, organizes competence meetings, educates and gives advice at car, building and energy exhibitions and also writes on this topic. Christian is also a member of the Steering Committee of the Global EV Alliance (GEVA).