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Cross-border charging: The necessity of price transparency in EU

Price transparency is an essential precondition to realize carefree cross-border charging in Europe. Unfortunately, in many countries price transparency in EV charging is problematic. A lack of transparency can lead to unnecessary high costs of charging for EV drivers and makes it difficult to compare the total cost of ownership. Insight into the prices for public charging is a hurdle that has to be overcome for widespread adoption of EVs. An introductory overview is presented of the main regulations, challenges and opportunities regarding price transparency in important EV markets across Europe. This overview is presented to underscore the importance for the EU to take next steps.



EU regulation on alternative fuel infrastructure requires clear and comparable prices, yet this is not the case in most countries. Additionally, the regulations prescribe that ad hoc access should be available to the EV driver. With stricter EU regulations on new vehicle emissions and the subsequent rise of the number of EVs, price transparency at charging stations is becoming a prominent issue.

Insight into the pricing and the availability of ad hoc access differs across countries in Europe. Some markets are moving forward on providing clear prices (available on-site, online and easy to compare). Other countries are still at the early stages of getting the right information to the consumer. Despite the abundance of options, many countries have developed dominant pricing schemes and payment options due to different national regulations and historic developments. The following table provides a short overview of the current situation regarding price transparency in major EV markets in Europe.

Country	Dedicated legislation	Ad-hoc payment integration	Most used type of pricing scheme	Pricing clear at location	Easy to compare prices
The Netherlands	✗		kWh-based		
Germany	✓	 ¹	kWh-based/Time based		
France	✗	 ²	Mix		
Norway	✗	 ²	Time-based		
Austria	✗	 ¹	Mix		



¹ Ladepay: system for incidental charging session available on Ladenetz charging stations.
² SMS

Table 1: Overview current situation price transparency Europe

The Netherlands

The Netherlands mainly makes use of kWh-based prices. Public charging stations are often placed in a city or province by a single charging point operator (CPO) for a fixed amount of time. CPOs can compete on the lowest price per kWh during a tender or can be offered subsidies by the contracting parties to guarantee a fixed price.

The main payment method is through an e-mobility service provider (e-MSP) which provides a charging card or token. App-based solutions are also becoming more widespread. E-MSPs mainly offer a CPO-based price (or based on bilateral agreements) with a surcharge. Ad hoc payment systems are not widely used or offered. Larger charging networks offer on-site visual pricing and mobile prices are available in about 50% of the cases. Further availability of prices is expected in 2020.



Success 	Challenge 
Widespread adoption of roaming protocols	Availability of ad-hoc payment and large variety of combination of CPO and e-MSP prices

Germany

Until early 2019, Germany had many pricing strategies based upon a single fee per session. This allowed CPOs to avoid having to comply with the *Eichrecht* (certified metering). From the 1st of April this is no longer allowed. Therefore, many CPOs (and e-MSPs) have switched to either per hour or per kWh billing strategies.

There are several hundreds of e-MSPs active in Germany. Many of the utilities (nearly each city has one) offer charging stations and charging cards. Most e-MSPs offer a fixed price for all charging sessions. Ad hoc payments are often possible by scanning a QR code which connects to the *Ladepay* system. This system allows payments with Paypal. Ladepay however gives the opportunity to set different prices and price schemes for the same charging station. On-site pricing is mostly absent, with exception of fast charging networks. Mobile pricing is only moderately available.



Germany has adopted a specific regulation on charging stations. It specifies the technical details to which a public charging has to comply but also how payment should be regulated. It specifies ad hoc payment but also certified metering of fast charging stations to ensure that consumer are billed the right amount. This national EV regulation is a specification of the European Alternative Fuels Directive.

Success 	Challenge 
Specific regulation on EV charging stations, widespread adoption of ad-hoc payment	Lack of on-site price information availability and integration of large number of charging networks

Norway



Most EV-charging in Norway is done at home. AC Public charging stations (in Oslo) were offered for free until early 2019. Payments now happens per hour to prevent unnecessarily long charging and differs between the day and night. Access to the charging stations is granted with a token which is mainly distributed through the Norwegian EV-association. Ad-hoc access and payment at AC stations

is also possible through an SMS-payment system. DC fast charging is mainly billed per hour although various pricing models are also being developed in the Nordic area as a whole.¹ DC charging providers require registration with a mobile application (each provider requires their own app) which allows credit card payment. Pricing is available at fast charging sites, information about prices at public level 2 charging stations is less common. Payment for level 2 charging has only recently been introduced and correct information is often missing.

Success 	Challenge 
Clear pricing and ad-hoc access through SMS at fast charging stations	Pricing and access to AC-charging network



France

Much of the charging along highways is based upon a per hour price in France. Access is granted through an RFID card, mobile app or prepaid charging cards. For AC charging a lot of charging stations can be accessed with the Kiwhi charging card which offers an upfront payment and a per session fee. Different pricing schemes do exist, such as the per hour prices in Paris which vary depending on the time of day. Interoperability remains a problem across France as well as basic insight into pricing at charging stations.

Success 	Challenge 
Ad-hoc payment method reasonably well developed	Price information often lacking both on-site as online

Austria

Austria also has a highly segmented market when it comes to pricing mechanisms. The Austrian Arbeitskammer² concluded that the market had a great lack of transparency and big price differences could be found, although often not clear to the consumer. Ad-hoc access is reasonably available through the Ladepay system, but as in Germany it includes higher costs for the EV driver. The Austrian Arbeitskammer is steering towards simplified pricing models, either kWh- or time-bases. Pricing on-site is mainly absent, mobile visibility of prices is moderate.

Success 	Challenge 
Ad-hoc access widely available	Large variety of combination of CPO and e-MSP prices and on-site pricing information

Conclusion

Across these major markets in Europe price transparency in general is a significant challenge. Depending on the country some aspects are regulated and handled better than others. Ad hoc payment availability is better developed in most countries than in the Netherlands, but actual pricing on location or through web applications is often missing. Depending on how charging infrastructure was historically developed, there are few or many different pricing schemes. Regulations can help, as

¹ Nordic EV outlook 2018. P.45 <https://www.nordicenergy.org/wp-content/uploads/2018/05/NordicEVOutlook2018.pdf>

² https://wien.arbeiterkammer.at/service/presse/E-Tanken_Billig_aber_Preise_sind_intransparent.html

seen in Germany, to reduce the number of pricing models. Although the road to price transparency is not clear yet, countries can learn a lot from each other.

The Netherlands aims to pave the way to guarantee price transparency in the EV market. This summer the Netherlands Knowledge Platform for Public Charging Infrastructure (NKL) and the National Agenda of Charging Infrastructure (NAL) will publish a research about the current bottlenecks and essential steps to ensure price transparency in the Netherlands. Together with these insights an implementation plan will be suggested to make sure EV drivers have access to clear and transparent charging prices.

Do you want to be involved or do you have suggestions on how to guarantee price transparency? Feel free to get in touch: info@nklnederland.nl.

Are you interested in the results of this study? Make sure to keep an eye on the website of NKL (www.nklnederland.com), where the results will be shared this summer.

