ACCESS TO IN-VEHICLE DATA FOR EV CHARGING: CONSUMER AND GRID BENEFITS

ChargeUp Europe strongly supports the upcoming Commission's proposal on access to in-vehicle data. Significant benefits to both drivers and energy system will be unlocked as a result of fairer and better sharing of vehicle data with third parties. Effective legislation could ensure an improved experience for consumers, and at the same time enable value-added services to help balance the electricity grid and manage energy consumption.

ChargeUp Europe calls the European Commission to:

- Establish EU Regulation that creates a level playing field for access to in-vehicle data, improving consumer choice and experience by enabling CPOs and other third parties to offer high-quality charging services.
- Consider the devastating disadvantage of a lack of such level playing field to the EU consumers and the electricity grid, resulting in slower uptake of EVs and inefficient grid upgrades.

1. Introduction

Digitalisation is increasing at an unprecedented rate in the automotive field. There are currently around 56 million connected vehicles on the road globally. By 2030, this number will reach 115 million. An electric vehicle (EV) is a connected vehicle – in effect, a 'battery on wheels' as well as a 'computer on wheels'. It generates vast amounts of data, which is not only essential to be able to provide an efficient and tailored charging experience but can also enable new value-added services, which would make driving an EV more attractive to consumers.

Today's legislation grants car manufacturers unrestricted access to EV-generated data, allowing them the discretion to withhold such information from third-party service providers. Such preferential treatment of access to in-vehicle data distorts competition and prevents the EV charging sector from providing the most optimised charging experience. This further restricts consumers' choice in selecting services, as original equipment manufacturers (OEMs) are today in control of every data aspect of the car, starting with the State of Charge (SoC) and ending with which charging locations appear in the onboard navigation system of the vehicles, potentially directing the consumers to pre-defined locations.

2. Benefits to the Consumer

EU Regulation should create a level playing field for access to in-vehicle data, improving consumer choice and experience by enabling CPOs and other third parties to offer similar services as OEMs.

External charging networks cannot compete with OEM-owned or contracted networks absent (access to) this information. Already today, this results in limitations in consumer choice and experience. A few examples (not an exhaustive list):

Data	Consumer benefits
Specific vehicle data	Optimisation of charging sessions and reducing costs for consumers
Vehicle master data (battery size and max charging power)	Optimisation of the charging speed for the consumers
Dynamic data (e.g. state of charge)	Better communication to the consumer on charging session details (e.g. current state of charge, time until charge is finished, etc.)
Fault information for charging errors	Improved/targeted troubleshooting

In a well-operating Digital Single Market, all operators should enjoy equal opportunities. The differentiation between different actors creates various detrimental effects, preventing these stakeholders from enhancing their services or developing new ones and, as a result, hindering consumers' experience.

As an example, the data generated by vehicles can be very useful to maintenance and repair services. Continuing to favour large corporations in data ownership also increases the market entry threshold, further distorting the competition and increasing the risk of unfair market practices, uncompetitive pricing and a decrease in innovation.

Legislation on access to in-vehicle data should ensure that vehicle OEMs cannot prevent vehicle owners from allowing third parties to access vehicle information if the vehicle owner opts to share that information. Accordingly, regulations should further provide the means to enable the consumer to configure her data-sharing preferences.

Legislation should stipulate in detail if, how and when a charge point operator (CPO) or mobility service provider (MSP) gets access to in-vehicle data. It should also recognise that access to data in itself is not sufficient, but the successful exchange of data in a seamless and timely manner is required. In addition, support has to be provided for communication protocols which are based on existing and open standards while preventing the development of vertically integrated ecosystems which ultimately limit consumer choice and freedom.

3. Benefits to the Grid

According to the recently adopted EU Action Plan for Grid Rollout,[1] it will be paramount to make the existing grid smarter and more digital in the coming years. This can only be done through effective grid management by smart and bidirectional EV charging. Without having sufficient access to in-vehicle data, this task will continue to be unmanageable. Vehicle telematics data allows charging service providers to evaluate charging patterns and behaviours, which in turn permits to effectively employ smart charging and thus help manage the grid.

Smart and bidirectional charging works based on signals from the vehicle to the charger, which, in turn, can regulate the power flow in and out of the vehicle. Although the benefits of smart and bidirectional charging are clear and outlined in the EU's communications, today, most CPOs and MSPs do not have access to the data generated in the EVs. Hence, the chargers, although technically feasible and ready, cannot provide optimised smart and bidirectional charging due to missing data from the EV.

IMPACT

Without access to in-vehicle data, the operator cannot enable the consumers to make use of some functions, such as (non-exhaustive):

- Reliably allowing the driver to start the charging session at an off-peak time to help ease the pressure on the grid;
- Shifting charging to hours with a high percentage of renewable electricity generation to decrease associated CO2 emissions;
- Optimized charging experience (adapted to the driver's desired time of departure and state of charge they want to depart with).

Optimised grid utilisation will be decisive in road transport electrification. With the current state of the grid and the foreseen investments, smart and digital grid management of the existing grid capacity will be instrumental in not delaying EV charging infrastructure deployment across the EU as the operators and distribution system operators (DSOs) battle congestion and the need for grid upgrades. Making informed decisions about grid management, especially in the fragmented[2] distribution segment, will be vital in ensuring EV charging infrastructure rollout and connection to the grid in the coming years.

With smart and bidirectional charging in place, EVs could alleviate the pressure on the grid and ensure that the consumers charge in the most economical way possible, at the best time and the best price. However, none of this is currently possible due to a lack of access to in-vehicle data.

Regulations should specify what data should be available and how it must be made available, formulating a set of minimum requirements to deliver improved EV charging services.

To achieve a level playing field and maximise benefits to the consumers and the grid, it is critical that any legislation is clear on definitions and implications and consistent with separate but adjacent legislation covering vehicle data/data sharing requirements. Moreover, access to data must be made consistent and easy. In October 2023, Tesla published[3] its API documentation to support the integration of third-party applications. This example sets a positive trend for the rest of the automotive industry.

The legislation should mandate the OEMs to publish the list of vehicle data, functions and resources accessible on a specific model/version of a vehicle to provide transparency on the data that the EVs generate.

Ultimately, the driver/owner of the vehicle should decide which data, with whom and how is shared. However, the legislation should define a baseline of data that shall be available to CPOs and MSPs to be able to provide a good quality charging experience to the EV driver. Most importantly, transparent communication and driver education on the benefits of the data being shared with third parties should be enabled as part of the transition into driving an EV.

4. Conclusion

The European Commission has a chance, with the upcoming legislation, to ensure that the data ownership lies with the owner or driver of the car and that only the driver/owner can decide how, with whom and when the data is shared. The driver/owner should be sufficiently informed of all the data generated by the EV and the consequences of sharing and not sharing this data.

By enabling in-vehicle data to be shared on a level playing field, the EU can:

- Create more opportunities for the consumers to benefit from the highest quality EV charging service, which creates trust in the EV technology and gives confidence to switch to driving an EV.
- Allow smart and digital grid management in the short-medium term, to alleviate pressure on congested grids and increase the efficiency of the existing grid, as prescribed by the EU Action Plan for Grid Rollout.

ECJ upholds the rights of independent car services firms to vehicle data in a dispute with Scania.

Earlier in 2023, the European Court of Justice ruled that independent vehicle repair and maintenance service providers should have access to the necessary data from the vehicles they are servicing, to ensure competition in the sector and prevent vehicle manufacturers from monopolizing (by themselves or through their authorized dealers and workshops) the supply of those services.

The decision requires automotive manufacturers to provide 'independent operators' with unrestricted, standardized and non-discriminatory access to information on certain vehicle systems, equipment and tools and their repair and maintenance.

In this case, Scania argued that it is not allowed to share the 'vehicle identification number' (VIN) with independent service providers, as that would be in breach of the General Data Protection Regulation (GDPR). However, reading the Type Approval Regulation (2018/858) in conjunction with GDPR, it becomes clear that, while VINs do constitute personal data, they are also needed to provide a service, which obliges vehicle manufacturers to share them with independent service providers.

Footnotes

1. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023DC0757
2. There are 2,560 DSOs in Europe according to the Grid Action Plan
3. https://www.infoq.com/news/2023/10/tesla-developer-apis/

Annex I

Annex I lists the data that is needed for EV charging to create an optimal experience for the consumer and facilitate smart grid management.

Type of Data	Justification
Battery	
Battery size/capacity (max. usable energy of the EV battery)	Allows CPOs to calculate the range the consumer has in kilometers rather than % which is much more consumer friendly (coupled with some other parameters in this Annex).
Battery temperature, incl. information on optimal battery temperature for charging (charge or discharge performance)	Battery temperature is one of the parameters that has the most influence on charge speed. The number one consumer complaint when it comes to DC chargers is that their chargng speed is lower than expected. In the vast majority of cases, this is because their vehicle's battery temperature is too low. Having this information will allow CPOs to inform consumers correctly when the charging speed is lower than the respective vehicle type/model is capable to produce. It will also allow CPOs to indicate to the consumer or predict which element is limiting the charging power and calculate a reliable remaining charging time.
Current vehicle consumption (vehicle calculated, alt. prev. 100km, kWh/100km)/ Information on range per kWh	This is, in combination with other parameters, is needed to calculate the available range for the consumer in kilometers rather than in percentage of battery as kilometers are a better indicator for consumers of remaining range.
State of Charge (SoC)	Exists for DC charging but not for AC. However, it can help to perform better energy management. It can contribute to: - Smart charging use cases - Flexibility services - Grid services It is the most crucial information for smart charging, since it permits CPOs to shift consumption to times of low-carbon electricity being available or times without grid congestion.
Required energy till minimum, maximum & target SOC	For calculating and communicating to the consumer the time remaining for a charging session, based on consumer-defined inputs, to help plan how time is spent while charging; meanwhile, optimise for throughput (e.g. using timely push notifications informing on charge progression).

Type of Data	Justification
Battery	
Recharged range	This would allow communication with the consumer about what additional range has been added to the battery during the current charging session.
EV charging status, fault/error communication (including issue information to increase transparency to the end consumer on status and ensure equal service level)	Use issue information to increase transparency to the end consumer on status and ensure equal service level.
Possible and expected charging curve (charge point availability planning and load management)	The charging curve is an important variable for the calculation of expected charging duration, which, in turn, improves predictions of charge point availability on the CPO side. Additionally, the expected charging duration should be displayed to the consumer.
Current charging power (charge speed)	To communicate to the consumer at what speed the vehicle is currently being charged, which would give insight into expected charging time, battery performance and could signal a possible issue with the vehicle or charger in case the charging speed deviates from expected speed.
Capability for reverse power transfer	To assess if a vehicle is capable of bidirectional charging.
Time of departure	If the expected time of departure is specified by the consumer, it represents a valuable information for CPOs and MSPs to optimize charging schedules based on grid congestion and electricity market signals.
Plug&Charge	
Vehicle Plug & Charge capability	To inform consumers about Plug & Charge (in the future) if they don't have it activated yet (which is in everybody's interest since it will speed up the charging process and likely increase the charging success rate since authentication should (almost) never fail).
Installation status of Plug & Charge contract	If the CPO would have to facilitate certificate installation through the charger, over ISO15118, knowing the installation status (and possible installation errors) will help inform the consumer on how this is proceeding and completing successfully.
Installed & currently activated Plug & Charge contract (consumer information on charging error)	In the light of providing full pricing transparency, inform consumers what they will pay per kWh for these contracts at this charger so that they can choose the preferred contract for this charging session.

Type of Data	Justification
Vehicle	
Vehicle type, model, build year	This is the most impactful data point for CPOs as it allows them and charger manufacturers to debug issues. Currently, CPOs and charger manufacturers 'guess' which vehicle is charging from a combination of factors that make it (a) difficult and (b) inaccurate. In case of bugs/errors, this information is key in debugging and solving the problem. Solving the problem means a better consumer experience. Additionally, this will allow for a more customised experience for consumers, such as showing their vehicle picture on the charger screens, giving them accurate charging advices and helping them better in case of errors (see first point above).
Stable vehicle identifier over lifetime (in support of fraud detection and mitigation), e.g. VIN-number, ISO 15118 EVCCid or MAC address	This has three use cases: (a) create/improve alternative payment methods to Plug & Charge (i.e. there is currently Autocharge, but with this parameter, it will become more secure and available to more vehicle models), (b) fight fraud and (c) allow CPOs to understand better consumer behaviours, which in turn will make for better pricing and offers to consumers. Of course, given that this is sensitive information (as a unique vehicle identifier), it must be treated as such and in compliance with GDPR.
Vehicle preconditioning status (alternatively, maximum power the battery can take at this moment vs. optimal situation and the reason for explaining the difference)/Vehicle preconditioning activation	See battery temperature: this explains why the charging speed is lower than expected if the vehicle battery is at fault. It can also help CPOs suggest to the consumer to activate the preconditioning of the battery in case it is not on. Provides the ability to activate this remotely, e.g. from a third-party charging app in the vehicle so that the consumer benefits from faster charging while increasing charging pool throughput.
Vehicle geolocation (improved charging experience within charging parks)	Helps consumers navigate to an available charging spot within or in proximity to a charging pool. Additionally, combined with vector, this allows for recommending chargers nearby.
Vehicle climate control/air conditioning status	To factor in this impact on SoC for providing relevant charge stop recommendations.

Type of Data	Justification
Vehicle	
Access to onboard navigation function (provide charge stop recommendations)	Knowing where the consumer is heading and the current SoC allows for providing smart charge-stop recommendations en route.
Inlet/port number and location (back, front, side)	Useful for automated charging and autonomous EVs in the future.
Vehicle preconditioning status (alternatively, maximum power the battery can take at this moment vs. optimal situation and the reason for explaining the difference).	For explaining how to reach maximum charge speed to the consumer (addressing main consumer feedback) and how this is affected by (not) having preconditioning enabled.

Other data that is relevant for providing a high-quality charging service to the consumer is (justifications can be provided upon request):

- EV charge port status
- Real-time SoC
- Charging method
- Max/minimum charging power (to optimise charging speed for the consumer)
- Maximum charge/discharge current
- Remaining electric range

Annex II

Annex II lists data that the EV charging industry currently has access to:

- Limited availability of a vehicle identifier (i.e. MAC address). Supported by a subset of EVs, therefore limiting CPO anti-fraud capabilities.
- Limited Charging Status information:
    - Restricted to SoC
    - Power demand (current/voltage) and the time remaining to a threshold of its choice: charging service providers do not receive details on this threshold setting (e.g. 80%, 100%, or custom-defined). This limits their ability to inform consumers why charging speed is lower than expected, as well as the ability to help resolve charging issues if they occur due to unexpected vehicle behaviour