



ONE STEP CLOSER TO AN OPEN AND INTEROPERABLE EU PKI ECOSYSTEM THAT ENSURES FAIRNESS AND A LEVEL PLAYING FIELD

NB: This paper assumes knowledge of Plug&Charge, and Public Key Infrastructure. For an introduction to the topic, you can review previous positions of ChargeUp Europe on the topic, which include:

- [ChargeUp Europe: A vision for Public Key Infrastructure \(PKI\) for EV Charging](#)
- [Public Key Infrastructure Market Principles](#)

1. Background

Plug&Charge¹, based on ISO15118, will play an important part in ensuring that in Europe, an EV driver can charge at any (publicly accessible) charging station using any service provider. It can be a step change in making the experience of EV drivers of all types smooth and seamless. Successful implementation and operationalisation of Plug&Charge will require adoption by, and collaboration between,

many actors across the value chain, from Mobility Service Providers (MSP) to Charge Point Operators (CPO), EV manufacturers (OEMs) and Roaming Service Providers (RSP – also known as “hubs”).

A ChargeUp Europe survey shows that a quarter of its members are already implementing Plug&Charge, while 2/3 of its members will implement it over the next three years².

The ChargeUp Europe vision:

An open and interoperable EU PKI EcoSystem that ensures fairness and a level playing field

As Plug&Charge becomes more widely available for EV drivers, it is critical that the Public Key Infrastructure (PKI) security framework underlying these services is developed in a way which ensures the highest level of security, interoperability, and fair competition. The same applies to the EU PKI EcoSystem, and the market rules that should govern it. ChargeUp Europe advocates for EU regulation and governance that ensure that driver choice is prioritized, delivering a level playing field between MSP offers and ensuring that every MSP (third-party, or EV-OEM or CPO-owned) can provide an equal, seamless (in-vehicle) user experience and functionalities for Plug&Charge and no "self-preferencing" occurs whereby the driver is bundled or locked-in to a specific service. Such bundling undermines the ability of EV drivers to choose and can lead to the market being dominated by a small number of large players, reducing competition on innovation, services, and pricing and reducing choice for the driver.

Recognising the opportunities offered by Plug&Charge, but also the critical need to work towards an open and interoperable EU PKI EcoSystem that ensures fairness and a level playing field, the European Commission has commissioned a study³ to assist it in identifying the principal components of a European governance and IT architecture for the EU PKI. The study examines the high-level governance, architecture, and market rules for the future EU

PKI EcoSystem crucial to catalyse a competitive electromobility market in the coming years and sets out recommendations for the functioning and operation of that EcoSystem.

The study is the foundation for future regulatory action by the European Commission. Work is actively ongoing for the development of legislation on “standards and EU PKI EcoSystem for e-mobility” in the course of Q4 2023 and Q1 2024.

¹ Plug & Charge is a function that allows automated communication and billing processes between the electric vehicle and the charging station without any need external identification (e.g. RFID cards, Debit/credit cards or charging apps)

² ChargeUP Europe, 2023 State of the Industry Report, <https://www.chargeupeurope.eu/2023-state-of-the-industry>

³ Support study on the development of a governance framework for the EU Public Key Infrastructure (PKI) based on the standard ISO 15118, PwC, <https://op.europa.eu/en/publication-detail/-/publication/0d84b5b6-6f03-11ee-9220-01aa75ed71a1/language-en>

Main principles of the eMobility PKI EcoSystem

- There is one eMobility PKI EcoSystem Governance and Management Body with full control and mandate to onboard and offboard PKI Systems within the eMobility PKI EcoSystem.
- The eMobility PKI EcoSystem consists of multiple PKI Systems, each with a Root CA.
- A PKI System and Root CA must be accredited by the eMobility PKI EcoSystem Governance and Management Body.
- Every accredited Root CA will be operated and maintained by and within each PKI System.
- There are no limitations in the number of PKI Systems operating in the eMobility PKI EcoSystem unless otherwise determined by the eMobility PKI EcoSystem Governance and Management Body.
- The individual PKI systems shall necessarily interact with the Certificate Trust List.
- The eMobility PKI EcoSystem Governance and Management Body is responsible for operating the Certificate Trust List via a Trust List Manager, the accreditation, on- and offboarding, and audit process of every PKI System and Root CA.

In this paper, ChargeUp Europe has selected 5 features and recommendations from the study that are deemed essential to the delivery of our vision of an open and interoperable EU PKI EcoSystem that ensures fair access and a level playing field.

2. Selected highlights from the study⁴

a. The starting point and mindset: centring “choice” in the future EU PKI EcoSystem

The study creates a high-level, foundational frame for the overall functioning of the PKI market and the future EU PKI EcoSystem. The critical objective of shaping an open market, where CPOs, OEMs, MSP and EV drivers are able to choose from different providers, and market participants can switch provider, avoiding vendor lock-in, is woven throughout the study deliverables. Several

recommendations will help anchor openness, interoperability and choice.

Example 1: *“The in-vehicle interface with the EV driver should provide an open and user-friendly channel to enable the driver to pick alternative service providers to prevent vendor lock-in effects for essential services such as certificate installation, including the [EV] OEM proprietary API’s themselves if are not working or are not desired by the EV driver.”*

Example 2: *“Market rules for EV OEMs: Any EV shall be handed over to the end user without any installed contract from any given pre-selected EMSP contract, unless the consumer provides explicit agreement based on an informed choice. Without a consumer’s choice, the EV is delivered without any installed contract. (...) In the delivery process, OEMs are responsible for informing the consumer about the possibility of installing a plug and charge contract of an EMSP of his/her choice.”*

⁴ These are selected highlights only – ChargeUp Europe supports many other aspects in the study. Lack of mention in this paper should not be construed as lack of support to other recommendations by ChargeUp Europe.

b. Interaction between PKIs and the European Certificate Trust List (EU-CTL)

The study (Deliverable 3) puts forward the principle that PKI systems shall necessarily interact with the European Certificate Trust List (EU-CTL). This is concretely reflected in market rule 3.2.1 (Root CAs in a PKI system), which defines that vendors must interact with the EU CTL. The expected effect of this requirement is that independent (commercial) actors will be prevented from establishing their own PKI, isolated from the rest of the EU PKI system, which would reduce interoperability and portability.

c. A single open protocol for data interfacing between the market actors across the EU EcoSystem

The study recommends having a single standard protocol for data interfacing between the various market actors across the entire EU EcoSystem. Deliverable 2 mentions that *"It has been agreed that the Commission or a delegate (i.e., JRC) will be granted access to the Open Protocol for Plug and Charge (OPNC) taskforce to monitor the protocol development, contribute to its evolution as well as initiating the discussion for its formal adoption through a standardisation organisation."* This is expected to guarantee interoperability and greatly reduce the risk of vendor lock-in. This open protocol will also have to guarantee innovation and allow future evolutions required by market actors.

d. Trust guaranteed by an independent, centralised mechanism.

The study recommends setting up a central system that validates the market rules, audits PKIs and governs the interoperability, non-discrimination, and usability of the trusted PKIs in their PKI EcoSystem. Trust is thus ensured by an independent, centralized mechanism, with independent checks. Governance by a central, independent system is expected to help underpin trust and confidence throughout the EcoSystem.

e. A potential blueprint for other use cases

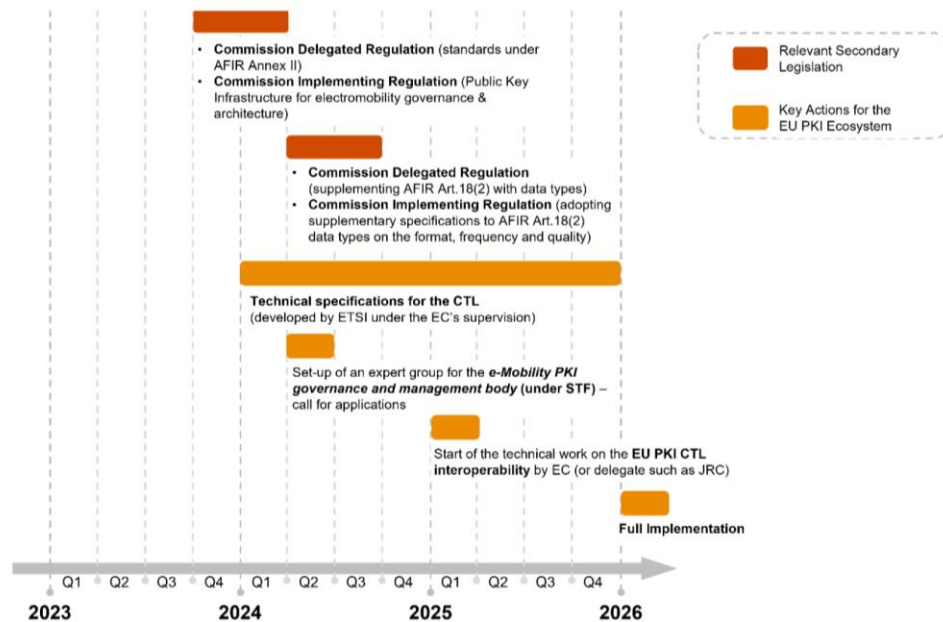
The study creates a structure that could be used at a later stage for other use cases (e.g. possibly Eichrecht certification). It starts with a specific use case (PKI EcoSystem) but creates a potential blueprint for more business cases that need security.

3. Next steps

a. Timeline of upcoming Regulatory action

The study provides the technical foundation for future regulatory action by the European Commission. Work is actively ongoing within the Sustainable Transport Forum for the development of legislation on "standards and EU PKI EcoSystem for e-mobility" in the course of Q4 2023 and Q1 2024. The actual operationalisation of the EU PKI EcoSystem itself, however, is not expected to take place before 2026⁵.

⁵ Support study on the development of a governance framework for the EU Public Key Infrastructure (PKI) based on the standard ISO 15118, PwC, <https://op.europa.eu/en/publication-detail/-/publication/0d84b5b6-6f03-11ee-9220-01aa75ed71a1/language-en>



The study goes in the right direction and is a welcome and necessary contribution towards the creation of a fully-fledged EU PKI EcoSystem. **The positive outcome reflects the active engagement of the experts representing ChargeUp Europe in the expert groups that shaped the study's**

recommendations. ChargeUp Europe members will continue to advocate for an open and interoperable EU PKI EcoSystem that ensures fairness and a level playing field and will invite the European Commission to reflect in the EU regulatory framework those elements in the study that support the delivery of this vision.

b. Next step for industry: designing the roadmap between today and 2026

The PwC study, in combination with the final report of the Sustainable Transport Forum Subgroup¹, Activity 2, Block 3 (Working Group report on regulatory needs and other outstanding technical aspects)⁶ lay out the foundation for a future EU PKI EcoSystem which will, however, not become operational before several years, leaving the market without a practical plan to operate between 2024 and 2026, as well as no clear roadmap on how to prepare ahead of the full implementation of the EcoSystem. The next task of industry actors will be to devise this roadmap. ChargeUp Europe will seek to assist its members in that endeavor, along with other partner organisations. ChargeUp Europe is closely monitoring the development of the EU PKI EcoSystem, and actively engaging in fora, such as the Sustainable Transport Forum chaired by the European Commission, where the EcoSystem is being shaped. **ChargeUp Europe reserves the right to advise its members and the broader EV charging industry to refuse to implement Plug&Charge if its vision for an open and interoperable EU PKI EcoSystem that ensures fairness and a level playing field is not realized and for as long as it is not realized.**

⁶ Which covers, among other topics, , Interoperability and Accessibility for multiple PKIs/certificates, Non-discriminatory Contract handling for Plug & Charge based on ISO15118, Anti-Competitive Behavior in Plug & Charge: Self-Preferencing of EMSFs). See “Development of a governance and architecture framework for the implementation and operation of a Public Key Infrastructure (PKI) ecosystem for e-mobility in the EU – Publications Office of the EU”