



SUSTAINABLE TRANSPORT FORUM: SUB-GROUP ON GOVERNANCE AND STANDARDS FOR COMMUNICATION EXCHANGE IN THE ELECTROMOBILITY ECOSYSTEM

TERMS OF REFERENCE

1. INTRODUCTION

On 23 April 2015, the European Commission established the Sustainable Transport Forum ('the STF') by Commission Decision C(2015)2583 (the 'STF establishment decision')¹. By Commission Decision of 9 December 2020², the STF has been renewed until 31/12/2030 (the 'STF renewal decision'). The STF supports the implementation of Directive 2014/94/EU on the deployment of alternative fuels infrastructure³ with technical expertise.

Under Article 5(2) of the STF establishment decision and Article 8 of the STF renewal decision, DG MOVE is entitled to set up sub-groups to prepare and support the work of the STF.

On this basis, DG MOVE has set up a sub-group on governance and standards for communication exchange in the electromobility ecosystem ('the sub-group').

Right now, a new market phase is taking place where increasingly new interoperability requirements are emerging from the development of new product features. In view of a mass market uptake the electro-mobility ecosystem will require to better connect users, bringing advanced digital services for better usability at the same time as closing connectivity gaps. On this basis, DG MOVE has decided to take action.

1.1. Current interoperability context between the EV and the recharging infrastructure

In the electro-mobility ecosystem, the bidirectional communication between the electric vehicle (EV) and the recharging infrastructure is of key importance. The unique and mutual identification and authentication of the electric vehicle (EV) and the recharging point represents the first and fundamental step in the recharging process. In search of a seamless user experience, new solutions have appeared, where EV users could simply identify themselves by plugging the connector into the vehicle (known as "Plug & Charge") and start a recharging session without the need of a RFID⁴ card or a specific mobile application. In addition, under this communication scheme, e-roaming providers, electro-mobility services providers (EMSPs) and

¹ Commission Decision C(2015)2583 final of 23 April 2015 on setting-up an expert group on alternative transport fuels ('the Sustainable Transport Forum').

² Commission Decision of 9 December 2020 on renewing the group of experts on alternative transport fuels ('the Sustainable Transport Forum') – C(2020)8535 final.

³ OJ L 307, 28.10.2014, p. 1, Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure.

⁴ RFID: Radio Frequency Identification

distribution systems operators (DSOs) have also the possibility to offer new payment mechanisms and smart recharging features, providing greater flexibility to the user.

There are several solutions defining the underlying communication technology. One of them is outlined in the standard ISO 15118, which enables the exchange of cryptographic keys and digital certificates to secure the automatic identification and authentication of the recharging process by means of an overall IT management architecture, denominated public key infrastructure (PKI). Other alternatives exist, such as “Autocharge”, proposed by the Open Charge Alliance (OCA), where the identification of the vehicle by the recharging station is made through the unique MAC⁵ address of the specific vehicle's communication device. However, the different possible IT governance architectures, the incompleteness of standards, the lack of coupling with other areas of the electromobility ecosystem and the different degree of cyber protection offered by the different alternatives are still subject to discussion. In addition, there exist different views with regard to principles of open market access and competition among the different market players.

Advanced technical explanations of these two alternatives have been published^{6,7}, where it can be concluded that “*Currently, ISO 15118's Plug & Charge is the most secure and future-proof solution on the market*”⁸. The sub-group can independently evaluate further and depart from this situation upon agreement.

1.2. Leveraging political and technical consensus

This sub-group should help with identifying the principal components of an European governance and IT architecture for smart charging and vehicle-to-grid communication, which is coherent with the objective of an open and transparent ecosystem that is easily accessible for all relevant players.

In this respect, the sub-group shall benefit from the work already initiated by several market players, including International and European standardisation organizations, establishing a solid collaboration between the industry, standardization committee experts, and public authorities, leveraging the political and technical expertise as a pivotal factor for this subject to succeed.

2. SUBJECT MATTER

The sub-group on governance and standards for communication exchange in the electromobility ecosystem (‘the sub-group’) is set up.

⁵ MAC: Media Access Control

⁶ Antoun, J., Ekramul, M., Moussa, B., Atallah, R., Assi, C. (2020). A Detailed Security Assessment of the EV Charging Ecosystem. IEEE Network, Vol. 34(3), p. 200-207.

⁷ Baker, R., Martinovic, I. (2019). Losing the Car Keys: Wireless PHY-Layer Insecurity in EV Charging. Proceedings of the 28th USENIX Security Symposium. Santa Clara, CA, USA. 978-1-939133-06-9.

⁸Secure and User-Friendly EV Charging. A Comparison of Autocharge and ISO 15118's Plug & Charge. <https://v2g-clarity.com/wp-content/uploads/2019/06/Whitepaper-Autocharge-vs-ISO15118-Plug-and-Charge.pdf>

3. MISSION

The sub-group's mission shall be to assist the Commission in defining the principal components of governance and IT architecture for vehicle-to-grid communication between the different actors in the electromobility ecosystem.

The main focus of the sub-group shall be the development of a governance structure and, to propose an implementation strategy for the operation of a public key infrastructure (PKI), or similar IT solution, that allows an open, single, secure and economically efficient management of the digital communications between the electric vehicle and the recharging infrastructure.

In addition, the sub-group should also aim to ensure that the proposed governance and IT architecture is fully coherent with the different areas of communication within the EV recharging ecosystem, which can be divided in:

1. communication between the electric vehicle and the recharging point;
2. communication between the recharging point and the recharging software management system (back-end);
3. communication related to the electric vehicle roaming service;
4. communication with the electricity grid.

To achieve this mission, the sub-group shall consider the European and global orientation of the different markets and enablers around the EV market itself (AC and DC charging, payment systems, energy distribution, grid equipment, stationary storage, etc.). Practically, this situation shall be materialised through the alignment of the different ongoing standardisation developments at both International and European level, including ISO with regard to ISO 15118, and at IEC with regard to expanding and synergistically developing IEC 63110 (Protocol for the management of EVs charging and discharging infrastructures), IEC 63119 (Information exchange for electric vehicle charging roaming service) and IEC 61850 (Exchange of information with distributed energy resources). The results of the sub-group should contribute to spur the European positions within these standardisation processes.

4. TASKS

The sub-group's tasks shall non-exclusively encompass:

1. to establish a mapping of the current discussion concerning interoperability, standards and communication exchange in the electromobility ecosystem.
2. to identify and recommend to the Commission options for an IT governance architecture for vehicle-to-grid communication, and to determine the most suitable implementation scheme that ensures a robust communication framework for all actors within the different areas of the EV recharging ecosystem. As condition required, any technical specification and its governance framework should meet the following requirements:
 - (a) It is trusted and accepted by the widest possible, overwhelming majority of EU market players. It is able to base itself on technologies that find the widest possible international agreement at global market level, and the support of international electro-technical standardisation.

- (b) It stirs a clear commitment from the different market players to comply with its requirements.
 - (c) It implies unique bi- and multi-lateral authentication of different market players.
 - (d) It provides an adequate level of security protection against cyber attacks.
 - (e) It can be set up in an easy manner by each market player according to their needs.
 - (f) It is operationally efficient and user-friendly.
 - (g) It does not imply unacceptable costs to set it up or maintain it for any market player;
 - (h) It respects all legal requirements concerning data protection and data privacy.
 - (i) It is beneficial to the end consumer, does not entail any lock-in effects and does not limit the end consumer's right to freely choose an EMSP (or not choose any EMSP), nor does it limit the consumer's ownership of the data generated as a result of the EV usage.
 - (j) It creates a level playing field between all market players in the EV recharging ecosystem, and allows for fair competition between them, avoiding any risk of competitive advantage by one or several market players;
3. to provide the Commission with advice and expertise with a view to building consensus between the stakeholders concerned on the choice of a governance framework and IT architecture for vehicle-to-grid communication, defining its ownership model as well as the roles and responsibilities of every market player.
 4. to discuss and advice the Commission on EU-wide governance rules common to the entire EV charging ecosystem for the preferred IT governance architecture.
 5. to assist the Commission in order to support international standardisation, identifying and covering existing gaps among the different areas of communication within the EV recharging ecosystem.
 6. to assist the Commission in the preparation of secondary legislation which could be considered in support of the chosen standard and IT governance architecture as well as its continuity model.

5. DELIVERABLES AND TIMETABLE

The sub-group's work is expected to start in the first quarter of 2021. The duration to achieve the aforementioned mission is 3 years. In the event of technical issues or duly justified reasons that could delay the progress of the activities, the duration could be adjusted accordingly.

The sub-group shall report to the plenary meetings of the STF. The reporting shall consist of a concise description of the progress of the tasks, escalating all relevant technical and political aspects which might benefit from a wider discussion with the members of the plenary of the STF. To facilitate this process, the sub-group shall appoint a rapporteur who shall participate in the STF plenary meetings, informing about the progress and issues encountered.

The work organisation and the corresponding deliverables shall be divided into two different strands: first, the assessment of the possible options to design an IT governance framework under the standard ISO 15118 or any other mature standard or technological solution concluded

to this end; second, based on the proposed solution by the sub-group, the development of an EU-wide IT architecture, operationalising the governance framework previously proposed by the sub-group.

The sub-group's deliverables shall non-exclusively include:

1. a report of maximum 30 pages with the analysis of the possible architectural and ownership options for the implementation of an IT governance system for vehicle-to-grid communication at EU level, including the necessary resources and impacts to the different players involved; deadline: 31 September 2021;
2. the required technical and security documents that shall set forth the operational and legal requirements for approving, issuing, managing, using, revoking and renewing digital certificates within the proposed IT architecture, ensuring open, secure and reliable services for all involved participants in the EV charging ecosystem. Deadline: 30 April 2022;
3. a document with the necessary market rules to ensure a transparent and non-discriminatory functioning of the IT governance architecture, ensuring an open communication on contractual information among electromobility service providers, electric vehicles and recharging infrastructure driven by free consumer selection; deadline: 31 September 2022;
4. a document setting out the proposed onboarding guidelines for those markets players who are either to be designated a specific role in the governing process of the IT architecture or who are to become end-users of the IT architecture; deadline: 31 March 2023.

A detailed roadmap with a set of deliverables based on the specific needs identified by the sub-group members shall be defined, in agreement with DG MOVE, and attached to the Terms of Reference of this sub-group. The roadmap shall be drawn up following the first meeting of this sub-group, and will be updated every year in accordance with the deliberations at the first meeting of the sub-group in that calendar year.

6. CONSULTATION

1. DG MOVE may consult the sub-group on any technical matter relating to the interoperability and communication exchange of the recharging infrastructure for vehicle-to-grid communication.
2. DG MOVE may consult the sub-group on standardisation needs for vehicle-to-grid communication, including the development of new standards and protocols as well as the harmonization and convergence of existing ones.

7. MEMBERSHIP

1. The sub-group shall be composed of up to 30 members.
2. Members of the sub-group are:
 - (a) organisations in the broad sense of the word, including companies, associations, Non-Governmental Organisations, trade unions, universities, research institutes,

law firms and consultancies, active in or working on electromobility and/or active in or working on relevant interoperability solutions and/or active in or working on relevant IT infrastructure such as communication standards and protocols or public key infrastructure ('Type C members');

(b) Member States' authorities, at national, regional or local level ('Type D members');

(c) other public entities, such as Union bodies, offices or agencies and international organisations ('Type E members').

3. The sub-group can have up to a maximum of 20 Type C members; DG MOVE reserves the right to appoint fewer than 20 Type C members.
4. Organisations, Member States' authorities and other public entities shall nominate their representatives considering their suitability with regard to the purpose of the sub-group and ensuring that their representatives provide a high level of expertise. DG MOVE may refuse the nomination by an organisation of a representative if it considers this nomination inappropriate in the light of the requirements specified in the call for applications. In such case, the organisation concerned shall be asked to appoint another representative.
5. Member organisations which are no longer capable of contributing effectively to the expert group's deliberations, which, in the opinion of DG MOVE, do not comply with the conditions set out in Article 339 of the Treaty on the Functioning of the European Union or which resign, shall no longer be invited to participate in any meetings of the group and may be replaced for the remainder of their term of office.

8. SELECTION PROCESS

1. The selection of the sub-group's Type C members shall be carried out via a public call for applications, to be published on the Register of Commission expert groups and other similar entities ('the Register of expert groups'). In addition, the call for applications may be published through other means, including on dedicated websites. The call for applications shall clearly outline the selection criteria, including the required expertise and the interests to be represented in relation to the work to be performed. The minimum deadline for applications shall be four weeks.
2. Registration in the Transparency Register is required in order for organisations to be appointed.
3. Organisations shall be appointed as Type C members by the the Director General of DG MOVE from applicants with competence in the areas referred to in point 4 and which have responded to the call for applications.
4. Type D and E members shall be appointed by the Director General of DG MOVE by direct invitation.
5. Members eligible shall be appointed for a maximum of 3 years. They shall remain in office until replaced/until the end of their term of office. Their term of office may be renewed.

6. In order to ensure continuity and the smooth functioning of the group, DG MOVE may establish a reserve list of suitable candidates that may be used to appoint replacements. DG MOVE shall ask applicants for their consent before including their names on the reserve list. The reserve list shall have a maximum validity of four years.

9. CHAIR

The sub-group shall be chaired by a representative of DG MOVE (hereinafter referred to as ‘the Chair’).

10. OPERATION

1. The sub-group shall act at the request of DG MOVE in compliance with the Commission’s horizontal rules on expert groups⁹.
2. Meetings of the sub-group shall, in principle, be held on Commission premises or in virtual form, as decided by the Chair.
3. DG MOVE shall provide secretarial services. Commission officials from other departments with an interest in the proceedings may attend meetings of the sub-groups.
4. In agreement with DG MOVE, the sub-group may, by simple majority of its members, decide that deliberations shall be public.
5. Minutes on the discussion on each point on the agenda and on the opinions delivered by the group shall be meaningful and complete. Minutes shall be drafted by the secretariat under the responsibility of the Chair.
6. The sub-group shall adopt its opinions, recommendations or reports by consensus. In agreement with the Chair, the sub-group may adopt its opinions, recommendations or reports by voting. In the event of a vote, the outcome of the vote shall be decided by simple majority of the members. Members who have voted against or abstained shall have the right to have a document summarising the reasons for their position annexed to the opinions, recommendations or reports.

11. INVITED EXPERTS

DG MOVE may invite experts with specific expertise with respect to a subject matter on the agenda to take part in the work of the sub-groups on an *ad hoc* basis.

12. OBSERVERS

1. Individuals, organisations and public entities other than Member States’ authorities may be granted an observer status, in compliance with the horizontal rules, by direct invitation.
2. Organisations and public entities appointed as observers shall nominate their representatives.

⁹ C(2016) 3301, Article 13.1.

3. Observers and their representatives may be permitted by the Chair to take part in discussions and provide expertise. However, they shall not have voting rights and shall not participate in the formulation of recommendations or advice of the sub-group.

13. RULES OF PROCEDURE

On a proposal by and in agreement with DG MOVE, the sub-group shall adopt its rules of procedure by simple majority of its members, on the basis of the standard rules of procedure for expert groups, in compliance with the horizontal rules and in line with the present terms of reference.

14. PROFESSIONAL SECRECY AND HANDLING OF CLASSIFIED INFORMATION

The members of the sub-group and their representatives, as well as invited experts and observers, are subject to the obligation of professional secrecy, which by virtue of the Treaties and the rules implementing them applies to all members of the institutions and their staff, as well as to the Commission's rules on security regarding the protection of Union classified information, laid down in Commission Decisions (EU, Euratom) 2015/443¹⁰ and 2015/444¹¹. Should they fail to respect these obligations, the Commission may take all appropriate measures.

15. TRANSPARENCY

1. The sub-groups shall be registered in the Register of expert groups.
2. As concerns the sub-groups composition, the following data shall be published on the Register of expert groups:
 - (a) the name of Member States' authorities;
 - (b) the name of other public entities, including the name of third countries' authorities;
 - (c) the name of member organisations; the interest represented shall be disclosed;
 - (d) the name of observers.
3. All relevant documents, including the agendas, the minutes and the participants' submissions, shall be made available on the Register of expert groups or *via* a link from the Register to a dedicated website, where this information can be found. Access to dedicated websites shall not be submitted to user registration or any other restriction. In particular, DG MOVE shall publish the agenda and other relevant background documents in due time ahead of the meeting, followed by timely publication of minutes. Exceptions to publication shall only be foreseen where it is deemed that

¹⁰ Commission Decision (EU, Euratom) 2015/443 of 13 March 2015 on Security in the Commission (OJ L 72, 17.3.2015, p. 41).

¹¹ Commission Decision (EU, Euratom) 2015/444 of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

disclosure of a document would undermine the protection of a public or private interest as defined in Article 4 of Regulation (EC) N° 1049/2001¹².

16. MEETING EXPENSES

1. Participants in the activities of the sub-groups shall not be remunerated for the services they offer.
2. Travel and subsistence expenses incurred by participants in the activities of the sub-group shall not be reimbursed by the Commission.

Done in Brussels, on 17 March 2021.

¹² These exceptions are intended to protect public security, military affairs, international relations, financial, monetary or economic policy, privacy and integrity of the individual, commercial interests, court proceedings and legal advice, inspections/investigations/audits and the institution's decision-making process.