Deliverable D1.2: Solutions and strategies for gaps in hardware installation configurations, communications and regulatory frameworks

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Executive Summary

The scope of the analysis presented in this document is to define the “gap” – if any – existing between current practices in EVs charging adoption and management considering the potential of smart charging (so called “V1G”) and bidirectional charging (so called “V2G”).

To do so, the analysis done during Task 1.2 of the XL-Connect project started with an analysis of charging management according to the needs of all the stakeholders, identifying a typical energy management framework in accordance with the adoption of the requirements and the standards described in D1.1. This part described the need for interaction of different control system, from low-level (vehicle communication) to local level (parking lot aggregator), and from this to system-of-system level (larger aggregator) and grid operator.

The application of ideal energy management control then is subjected to the solution of technical, economic, organization and legislative issues, which currently define the gap between the potential of EVs charging solutions for best integration in energy grid - as described in literature - and the implementation of such practices in real-world cases.

Amongst these gaps, the analysis focused on a subgroup of relevant issues which will be further analysed and faced during the execution of XL-Connect demonstration, such as the analysis of real system efficiency (performed through an internal survey with XL-Connect hardware experts), the analysis of potential issues on battery degradation and the need for proper economic incentives for final users. Evidence arising from the analysis are that most solutions are viable and relatively mature from a technological point of view thanks to the high efficiency overall achieved in vehicle charging, so that implementation is technically feasible.

Finally, considering that a large number of V1G and V2G implementation projects have been running worldwide, an insight into such experiences is provided; a relevant remark arising from the analysis is the prevalence of non-updated standards for charging connectors and technologies in such projects, suggesting that new projects should explore the potential of latest CCS solutions, including both DC and AC bidirectional charging.

Keywords: V1G, V2G, V2X, aggregator, stakeholders, charging technologies, liabilities.