TRA2022

TRANSPORT RESEARCH ARENA
LISBON 2022

POSTER SESSION

Katharina Csillak, Mariana Moreno Kuhnke

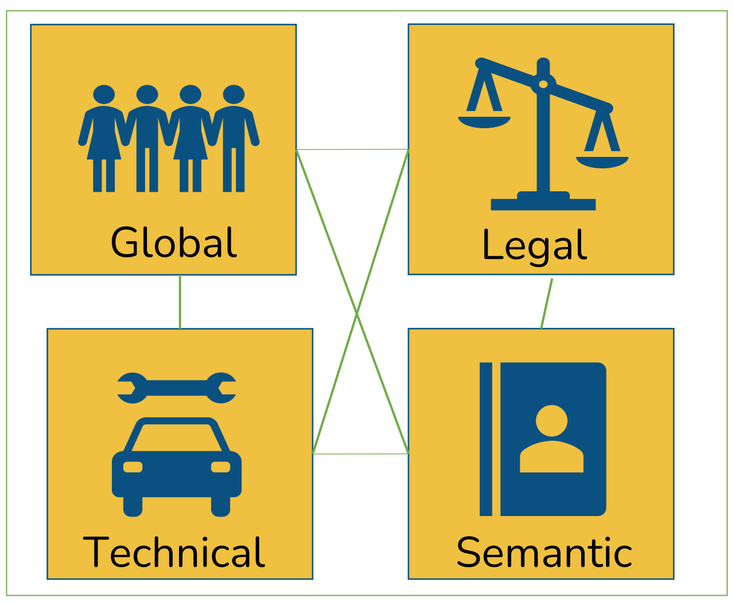
Interoperability Framework for Electromobility (INFRA)

The main results from the USER-CHI-framework

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

PROJECT BACKGROUND

The Horizon-2020 project “Innovative solutions for USER centric CHarging Infrastructure” (USER-CHI) targets the development of guidelines for a user-friendly charging infrastructure. The goal is for every EV driver to have access to an interoperable charging infrastructure anywhere and anytime across the EU. USER-CHI supports the mentioned large-scale e-mobility market roll out with the development of smart solutions and business models while working on the necessary framework conditions. One out of eight products is INFRA - the Interoperability Framework for Electromobility.



THE FOUR LAYERS OF INFRA AND THEIR RESULTS

As a consequence of the CO2 emission reduction targets, the number of EVs in the EU will increase considerably in the next years. This presents a challenge for the EV charging infrastructure and for the national and European electric grids. To make sure that the charging infrastructure is interoperable, a set of minimum requirements is necessary. These minimum requirements are structured in INFRA in four layers.

GLOBAL LAYER

The global layer gave an organizational overview of the essential stakeholders involved in the project. In summary, 21 roles were found. Some stakeholders had more than one role and not every role was represented in every city. The involvement of each stakeholder in the implementation process could be a challenge when there is a high dynamic but could also be successful if it is integrated early in the process of network creation.

TECHNICAL LAYER

INFRA identified three minimum requirements. The last minimum requirement has a high importance as there are no unified standards established yet.

- The prerequisites for the physical connection of the charging points to the distribution grid and location of measurement devices on regional and international level
- The use of uniform charging plug components
- The use of standardized plug components for light electric vehicles (LEVs)

SEMANTIC LAYER

The semantic layer describes different communication aspects between the beforementioned stakeholders of electromobility. In this sense, seven minimum requirements for syntax communication have been identified e.g., the use of open charging protocols.

LEGAL LAYER

- The harmonized transposition of the requirements of the Alternative Fuels Infrastructure Directive (AFID)
- The establishment of minimum requirements for charging points operated by different CPOs, including the option to recharge on ad-hoc basis
- The harmonized and complete national transposition of the Measuring Instrument Directive (MID)
- The administrative approval proceeding for public charging points
- The legal enablement of the reservation of parking spots and charging spots in (semi-) public spaces
- The regulation of vehicle-to-grid charging/reverse charging
- The compliance of the regulations on data protection
- A unified requirement on data sharing processes for e-roaming (platforms)

CONCLUSION

The interoperability of EV charging infrastructure across the EU can only be ensured if all EU member states include the minimum set standards into their legal frameworks and all engaged players across the EU adhere to them. The establishment of these minimal conditions must be pursued and enforced at the highest degree by the EU for it to happen in a uniform manner over time.
Furthermore, the relevant interoperability requirements (technical and semantic) must be incorporated into the European legal framework. For example, interoperability necessitates that the essential data for better EV use is generated and communicated uniformly. To ensure a convenient use of EV the accessibility issues (e.g., of data, hard- and software) need to be addressed uniformly. If these requirements are not implemented, achieving interoperability of the EV charging infrastructure in the EU (apart from those countries that are included in European projects) is going to be a challenge. Because of the continuous technological developments, regulation must have the right scope to allow innovations, e.g., new technology solutions but as well-set relevant standards. Alongside all before mentioned aspects, EV drivers need to be considered more widely. Their convenience when charging and their acceptance of new technologies and regulations is essential for the needed uptake of EV.

MORE INFORMATION: https://www.userchi.eu/products/infra-interoperability-framework/

HOSTED AND ORGANISED BY: ANI Agência Nacional de Inovação

CO-ORGANISED BY: European Commission

IN COOPERATION WITH: IMT Instituto da Mobilidade e dos Transportes, I.P.; Consórcio de Escolas de Engenharia (FEUP • FCTUC • IST • EEUM • UA • FCTNOVA); LNEC Laboratório Nacional de Engenharia Civil; magellan European Affairs Consultancy

TOGETHER WITH: ACARE; alice Alliance for Logistics Innovation through Collaboration in Europe; CEDR; ECTP Innovative Built Environment; ERTRAC; ERRAC The European Rail Research Advisory Council; ETRA European Transport Research Alliance; WATERBORNE

This research was financially supported by the European Union’s Horizon 2020 research and innovation programme under the grant agreement No 875187 (innovative solutions for USER centric CHarging Infrastructure [USER-CHI]).
The paper reflects the authors views. The European Commission is not in any way responsible for any use that may be made of the information it contains.