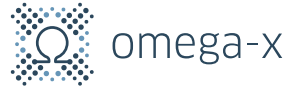
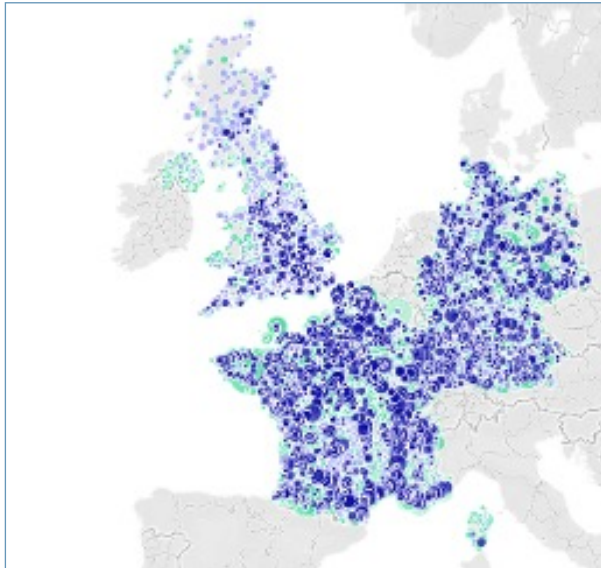


Electromobility



ROAMING OF BOOKING SERVICES FOR CHARGING ELECTRIC VEHICLES (EV)



PUBLIC CHARGE SITUATION IN EUROPE

Cartographic representation of the Gireve database in France, Germany and UK.

At the end of 2023 in Europe there are +7.6 million charge points among which +750,000 public charge points +1,000 operators

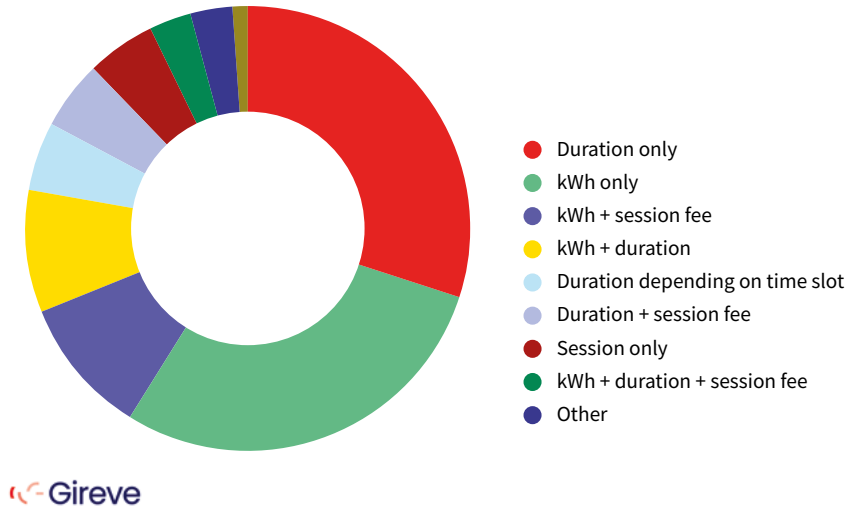
GENERAL OVERVIEW OF OMEGA-X AND MAIN GOAL OF THE ELECTROBILITY MOBILITY PILOT

OMEGA-X is creating an interoperable sovereign federated multi-vector energy data space based on open standards to facilitate different actors and stakeholders in the energy value chain to exchange data and create value. The project set up 4 use case families, with in total 9 pilots, that showcases the value of having a common energy data space for problems identified by energy stakeholders: renewables, local energy communities, electromobility and flexibility.

The pilot within the electromobility use case family concerns charging networks in France and Belgium and aims in managing the roaming of electric vehicle (EV) charge booking services. The aim of this use case is to provide a service to EV users for booking charge points at their destination by offering the largest possible number of charging points available to the user, regardless the country in which he or she is located, the country to which he or she is travelling, and the E-Mobility Service Provider (EMSP) with which he or she is making the booking.

Tariff structures in Europe

Based on Gireve's data - 481 tariffs on 143 CPO



Challenge 2 - Rationalisation of data exchanges between energy and e-mobility sectors

Practically, the roaming services offered to EV drivers already imply several millions of daily messages exchanged between roaming partners (availability of the charging station, power delivered, etc.), most of them in real-time. In the same way, with the massive deployment of smart-charging, Vehicle-to-Everything (V2X)* services or self-consumption of own electricity, the charging ecosystem will need to collect and exchange more and more data.

To exchange these datasets, e-mobility players -Charge Point Operators (CPO) and E-Mobility Service Providers (EMSP)- have built technical connections either via a roaming platform or in a peer-to-peer environment. In both cases, the usual way of exchanging data consists in duplication of all these datasets from one system to the other (partner) one. This data duplication is widely generalized: it is a de-

facto standard.

In a context of blooming EV adoption, the e-mobility sector will soon have to deal with an exponential duplication of exchanged data (static and dynamic) among all roaming partners, which will not be acceptable for the following reasons:

- Massive duplication of data generating a disproportionate and irrational overall cost for the ecosystem
- Risk of low-quality/inconsistent data
- Risk of cybersecurity breaches including personal data protection risks
- Disparity of SLA according to data sources
- Barriers to the large-scale deployment of new value-added charging services.

*V2X: Vehicle-to-everything (V2X) technology uses sensors, cameras and wireless connectivity so cars can connect to and communicate with their drivers and surroundings.



Thus, using an Energy Data Space is a solution to scale up these services and face the technical limit of exponential duplication of exchanged data among partners. Indeed, it will allow a change from data duplication model to data sharing model, avoiding exponential increase of data volumes, securing data ex-

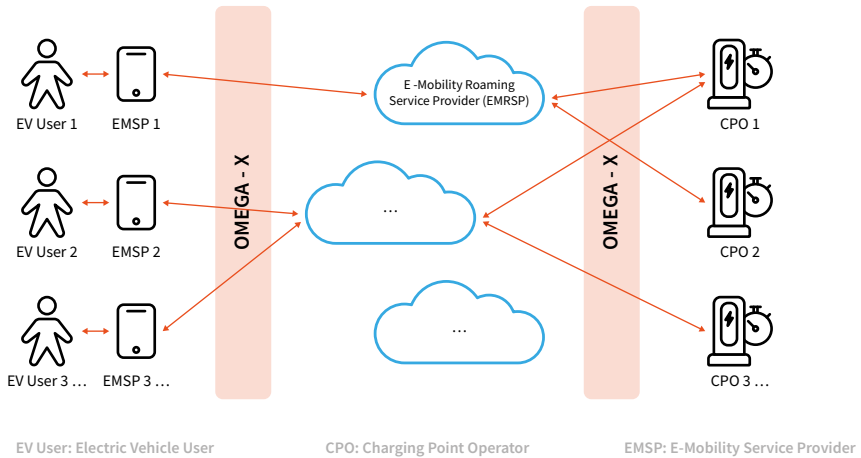
change and enabling synergies that will foster the creation of new services (e.g. in line with Renewable Energy Directive 3, article 20xiii enabling access to real-time data coming from EV for consumers or service providers acting on behalf of the consumer at no cost).

MAIN GOAL

The pilot solution aims to transpose the principles of EV charge roaming services to data spaces enabling the booking of charging services from third parties willing to interact

with the current electromobility ecosystem, Charge Point Operators (CPO) and E-Mobility Service Providers (EMSP).

Main data & services exchanges through OMEGA-X data space



EV user book and access a charging service at a public charging infrastructure in two ways:

1

Ad-hoc/ Direct payments



Anonymous - No prior subscription
Payment Card, QR code

2

Contract based (multiple possible EMSP)



Prior subscription needed
EMSP means of authentication
(RFID, Remote App, Plug&Charge)

EMSP: E-Mobility Service Provider

This pilot is focused on the enhancement of user experience for EV drivers planning a journey, to ensure access to charging infrastructure whenever they go, wherever they are, by offering booking services. In this pilot, an EV user who wants to benefit from a guaranteed access to the charge point

would be able to use the service of a third party “Booker” to book a charging service on any charging network, at any time. Once connected to the application of such “Booker”, EV users can search for available charge points filtered by criteria of location, time and technical specifications for charging.

They would be able to book a charging slot by specifying the information required for accessing the charging pool, charging their car, and paying for the session (physical characteristics, means of authentication at the charge point, preferred means of payment, etc.). They would be provided with an estimate of the final charge price (calculation based on the provided information).
Subscribers can choose the duration of their

booking and once accepted, they benefit from a guaranteed access to the charge point. Once the charge has been completed, the user will be able to access his detailed invoice from its EMSP application and will be charged the final amount due.
This pilot also intends to manage different situations where a booking needs to be cancelled, whether by the EV user or the Booker or even the CPO.

MAIN BENEFITS & IMPACT

Using a European energy data space, following GAIA-X secured framework, provides opportunities for innovation and research in this domain: enhanced visibility into charging infrastructure location, access, and consumption allows grid operators (TSO/ DSO) to optimize congestion management, and grid reinforcement plans. Regarding the development of new forms of mobility driven by the emergence of MaaS (Mobility-as-a-Service), the same enhanced visibility into a wide range of charging infrastructures throughout Europe will enrich the experience of EV drivers by guaranteeing them access to charging services whenever

they go, wherever they are.
OMEGA-X intends to support electromobility in making possible the exchange of data and services between heterogeneous and multiple charging networks and third parties willing to interact with them. These third parties could either be in relation to MaaS domain (e.g. EMSP offering EV charge booking to EV drivers) or grid domain (e.g. flexibility aggregator offering services to the TSO or DSO, Granular Certificate of origin Registry offering the ability for an EV driver to match its charging session with a green production of electricity).



INVOLVED PARTNERS AND ROLES

This pilot will involve a dozen of charging networks, covering 2 countries, France and Belgium, with a wide variety of ways of accessing these charging services, whether via a subscription to an EMSP or via ad hoc payment (card payment). The booking services itself will be demonstrated on test infrastructure involving virtual charge points. The Roaming of EV Charge Booking Services Pilot is developed through the joint action of:



OMEGA-X Data & Service Provider.

Gireve has developed data space connectors to enable any of the Charge Point Operators connected to its roaming platform to exchange data and booking services with third parties via OMEGA-X data space.

Gireve has also brought expertise in the semantic modelling of e-Mobility concepts as a contribution to the development of the OMEGA-X CSDM (Common Semantic Data Model).



in partnership with



Virtual Charging Point Operator for the purpose of testing and demonstration of booking services.

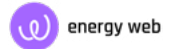


OMEGA-X e-Mobility Roaming Service Provider.

Worldgrid has developed data space connectors to enable any e-Mobility Service Provider to access OMEGA-X data space, and to book charging services with any of the Charge Point Operators proposing such booking services through OMEGA-X data space. Worldgrid has also brought expertise to the definition of the business and system use case modelling as well as to the ontology and data model of the solution.



EDF R&D has brought various expertise on the pilot scoping (Business and system use case modelling), Semantic Modelling, integration with European energy data spaces sister projects and initiatives, and alignment with European normalisation working groups such as BRIDGE initiative.



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