cerre Centre on Regulation in Europe

ENERGY DATA SHARING: THE CASE OF ELECTRIC VEHICLE SMART CHARGING

Report Presentation

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19 October 2022

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AGENDA

1. **14:05 – Keynote speech**
2. **14:15 – Report presentation**
3. **14:35 – Panel discussion**
4. **15:15 – Q&A**
5. **15:25 – Conclusion**

KEYNOTE SPEAKER

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OBJECTIVE & APPROACH

Objective: Identify business cases and guiding principles for **European energy data space** by looking at a concrete use case: **smart charging.**

Approach:

- Assess respective **data needs** and the related **data-governed transactions** of uni/bidirectional smart charging;
- Examine broad and energy-specific **regulatory framework** on data sharing in the EU;
- Point out main **regulatory challenges** for data charging in smart charging;
- Develop **data flows and contracting scenarios.**

SMART CHARGING AND ITS DATA NEEDS

- **Bidirectional** smart charging allows batteries to charge efficiently and feed energy into the system;
- **Variety of potential market participants**; at different times of day, the **buyers** could become **sellers**; and breadth of possible **contracting relationships** is enormous;
- **Lack of interoperability** limits user choice, and extent of data sharing and interoperability are likely to impact the **efficiency of the energy system;**
- Models that govern the system will likely differ from one country to another and evolve over time to reflect **differing incentives of different players;**
- Innovation at the grid, charging station, battery and customer levels must interact, complement each other and **align interests** to support the roll-out of smart charging.

CRITERIA FOR SUCCESSFUL USE OF DATA

1. **Information** provided in one format **can be read** by all other users eligible to access the data;
2. **Information** required for **energy optimisation** are sent by the vehicle to **other parties** legitimately linked to the battery recharging process;
3. **Smart charging data** and **vehicle-to-grid** functionality is **accessible** to any third party upon final customer decision;
4. **Energy sources** that are viable are given an incentive to produce as long as **storage** is expected to be profitable;
5. **Profitable storage is incentivised** to occur and for batteries to be purchased;
6. Battery charging stations earn a **sufficient return** to also be incentivised to build out in line with expected future demand.

EU DATA SHARING REGIMES

- Several **legislative initiatives**, different **approaches and scopes** (horizontal v. sector-specific; mandatory v. voluntary data sharing; general data rights v. asymmetric data access rights).
- Common feature: **Application Programming Interfaces (APIs)** as a key enabler.
- Limits of data portability, the emergence of *in situ* access right, and progressive shift towards interoperability.
- A **vendor lock-in** problem in the EV smart charging?

EV/SMART CHARTING DATA SHARING REGIMES

- **Deployment of Alternative Fuels Infrastructure Directive** (2014): recharging of Evs at recharging points should make use of intelligent metering systems.
- **Regulation on electricity transmission system operation** (2017): data-sharing obligations for electricity network operators to ensure system security.
- **Electricity Directive** (2019): deployment of interoperable smart metering systems.
- **RED revision proposal** (2021): access to real-time basic battery information for facilitating integration-related operations of domestic batteries and Evs.
- **AFIR proposal** (2021): new publicly-accessible charging stations must be digitally connected and capable of smart charging.
- **EPBD proposal** (2021): access to building systems data, which shall include data related to the energy performance of building elements, the energy performance of building services, building automation and control systems, meters and charging points for e-mobility.

KEY REGULATORY CHALLENGES

- **APIs, standardisation**, and **interoperability.**
- **Privacy** and **cybersecurity.**

  - The relevance of defining common and open API standards, data formats, and security protocols, and the difficult trade-off between competition, innovation, and standardisation:

    - The **UK experience** [Open Banking, EV (Smart Charge Points) Regulations]: minimum set of mandatory requirements for new private charge points
    - The **US experience** (National EV charging network): minimum standards, e.g., for the interoperability of EV charging infrastructure and for the network connectivity of EV charging infrastructure

BI-DIRECTIONAL SMART CHARGING SCENARIOS (1/2)

- **Scenario 1**: Vehicle To Grid (hypothetical)
  - Individual car owner contracts directly with open market for small scale purchase and sale of electricity.
  - Likely to provide increased comfort on the part of the car owner and increased willingness to transact.
  - Provides escape valve in case intermediaries seek to unduly control transactions and appropriate the gains from the sunk costs of the battery investment.

- **Scenario 2**: Vehicle To Aggregator To Grid
  - Individual car owners transact with “aggregators” or “virtual power plants”.
  - Competition between aggregators would help create multiple options for car owners to reap benefits from initial battery investment.
  - Charging stations may be “closed” or “open”.

BI-DIRECTIONAL SMART CHARGING SCENARIOS (2/2)

- **Scenario 3**: Vehicle To Car Manufacturer To Grid
  - Individual car owners transact with virtual power plants organised by car manufacturers.
  - Very likely to achieve high penetration of implemented bi-directional smart charging.
  - OEMs can keep exclusive control over the arbitrage gains from bidirectional smart charging if no third-party access to data and standards.

- **Scenario 4**: Vehicle To User: Grid Bypass
  - Car owner transacts directly with a user and provides power that does not use the facilities of the grid (microgeneration).
  - Sale of electricity from the vehicle could occur via direct contract with the user.
  - Could increase grid costs by reducing the number of grid users.

REGULATORY RECOMMENDATIONS

1. Requiring **car manufacturers** to adopt **open and portable standards** for battery charging;

2. Ensuring that **customers** with no reasonable alternative choice **are not locked by data systems** into purchasing energy from one charger that does not offer competitive rates (though guaranteeing a fair return for charger installers) both for charging and selling of energy;

3. Ensuring that **privacy safeguards** are in place to protect consumer information about their movements (and that these are not displaced by open data requirements);

4. Ensuring **sufficient transactional standards** are in place for payment and volume monitoring to ensure energy payments are secure and going to or from the relevant battery in a secure manner;

5. **Avoid imposing obligations** to suppliers to buy from EVs so that EVs must compete with other sources of energy and would not be guaranteed to provide energy when the economic conditions were not desirable nor be guaranteed prices above the market rate.

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