Cerre Centre on Regulation in Europe

ENERGY DATA SHARING: THE CASE OF ELECTRIC VEHICLE SMART CHARGING

Report Presentation

Sean Ennis Giuseppe Colangelo 19 October 2022



AGENDA

14:05 – Keynote speech

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14:15 – Report presentation

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14:35 – Panel discussion



15:15 – Q&A



15:25 – Conclusion



KEYNOTE SPEAKER



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George Paunescu Policy Officer DG Energy, European Commission



Energy data sharing

CERRE, 19 October 2022

George Paunescu

Policy Officer – Research, Innovation, Digitalisation

European Commission, Directorate-General for Energy



The European Green Deal



Fit for 55 Package

The Fit for 55 Package consists of a set of **interconnected proposals that strike a balance** between pricing, standards and support measures to achieve the energy and climate targets.







European Commission

REPowerEU: Joint European action for more affordable, secure and sustainable energy













Digitalising the energy system - EU action plan



A European framework for sharing data to support innovative energy services Opportunity / issue: The key enabler for a digitalised energy system is the availability of, access to, and sharing of energyrelated data.

Aim: To facilitate the development of innovative energy solutions and novel and inclusive services that will support grid developments, engage consumers/prosumers and lower bills, and further the integration of the energy market.

Means: Develop a European framework for sharing energy data. Establish a common European data space for energy.

Approach: Coordinate EU action and work in partnership, usecase driven, capitalize on building blocks, ensure interoperability (intra- and cross-sectoral).

...concluding:

- Data needs energy. And vice versa.
- EU twin green and digital transitions need to reinforce each other.
- A smart energy system is a key component in the energy transition, European Green Deal and REPowerEU.
- Sector integration and electrification are key for decarbonisation, mobility is (becoming) a success story.



Thank you



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PAPER PRESENTATION







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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 value 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 thirdparty 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.



PANELLISTS



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Improving network and digital industries regulation

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