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Government Consultation Response

Data for AI in the energy system II

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Written Response to the Department for Energy Security and Net Zero Call for Evidence: Data for AI in the energy system

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About the Authors

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All authors have jointly worked on an EPSRC-funded Programme Grant on Future Electric Vehicle Energy networks supporting Renewables (FEVER, EP/W005883/1). Dr Arcanjo, Dr Buermann and Prof Stein also represent the views of the Citizen-Centric AI Systems team (https://ccais.ac.uk/).

Executive Summary

This response advocates for the provision of a government facilitated and governed interface (API) for live charge point data to enable the development of software and research addressing electric vehicle (EV) driver concerns when planning journeys. While regulations like the Public Charge Point Regulations 2023 mandate that charge point operators make certain data freely available, the current arrangements are impractical for real-world use. Each operator publishes data only for its own network, but this is often inconsistent, unreliable and in non-standard formats, requiring researchers and developers to negotiate access and maintain integrations on a per-operator basis.

Commercial aggregators, such as EcoMovement [1], address this fragmentation by packaging these data sources and selling access as a service. While this provides a workable solution, it falls short of enabling the Government's objective of open, freely available charge point data that can be readily used to improve the EV charging experience. In practice, the fragmented and operator-specific nature of current data publication makes large-scale reuse costly and continues to constrain research and innovation.

By enabling reliable, standardised and openly accessible live charge point data on a national scale, the Government would unlock significant benefits across industry, academia and the EV user community. Improved data access would support the development of more accurate driver-facing services, better evidence-based infrastructure planning, and higher-quality research outcomes. Collectively, these improvements would enhance confidence in the public charging network, reduce friction for EV drivers, and support wider EV adoption - helping to advance the UK's transport decarbonisation and net-zero objectives.

Policy Recommendations

1. The government should facilitate and govern the creation of a single, open and free interface for serving live charge point data aggregated across all charge point operators. This interface should be reliable, standardised and easy to access, enabling scalable reuse of charge point data and fostering innovation across industry and academia.

Detailed Response to Questions

Q1. What energy problem do you want to solve?

UK EV drivers must currently navigate a rapidly expanding but still immature public charge point infrastructure, which continues to create significant friction in the driving experience. Despite ongoing investment and regulatory efforts, EV drivers report persistent dissatisfaction with the public charging network, commonly citing issues related to reliability, availability and the quality of on-site facilities.

Access to comprehensive, up-to-date availability data, consistent with regulatory requirements, on the status of all public charge points in the UK, has the potential to mitigate many of these challenges. However, the absence of a single, useable data service means that anyone seeking to make use of such data must individually engage with each charge point operator, integrate multiple data standards and formats, and continually maintain these integrations as systems change. These requirements introduce substantial technical and administrative overheads, making many potential applications and research activities unfeasible.

In practice, the only viable alternative is to rely on commercial aggregators, such as EcoMovement [1] and ZapMap [2], which consolidate this data and sell access as a service. While effective, this model raises barriers to entry and limits the scale of innovation that can occur. Thus the current situation not only constrains progress within the EV ecosystem but also falls short of the Government's stated ambition for an open and interoperable charge point data landscape [3].

Q2. What kind of data is needed?

The data interface should provide both reference data and availability data for all publicly accessible charge points in the UK, across all charge point operators, in line with existing regulations. Reference data should include relatively static information such as location, connector

type, charging speed, pricing structure and payment methods, while availability data should reflect the current operational status of charge points, for example - whether a unit is available, in use or out of service.

Availability data should be provided at a temporal resolution consistent with regulatory requirements, such that changes in charge point status are reflected promptly and can be used to support driver-facing applications and operational monitoring. Access to the data should be free and straightforward to maximise reuse across industry and academia. A lightweight registration or access-control mechanism may be appropriate to prevent misuse or excessive demand, provided this does not introduce barriers to legitimate use, similar to the approach adopted for the Landsat satellite data programme [4].

Q3. What work is needed to create or enable a useable dataset?

To create a useable national dataset, coordinated action is required to ensure that charge point data from all operators can be accessed in a consistent, reliable and scalable manner. This includes establishing clear expectations for required data fields, units and update behaviour, aligned with existing regulatory obligations, and ensuring that these expectations are implemented uniformly across the sector. Effective engagement with charge point operators, and where appropriate relevant technical and standards organisations, will be necessary to support integration, address implementation challenges and ensure accurate and timely reporting.

A standardised user-facing data access mechanism should be made available, supported by clear documentation describing how authorised users can obtain access and make requests. Proportionate access controls, such as rate limiting, should be applied to safeguard the service while remaining sufficiently flexible to support legitimate near-real-time applications. Where feasible, historical datasets should also be made available through a complementary access route to support retrospective analysis and research, alongside any live or near-live data services.

From a technical perspective, the dataset should be delivered using widely adopted, machine-readable data formats and interface conventions. Charge point data can be collected, validated and harmonised to address inconsistencies and timing issues, before being made available through a consistent interface for downstream use. The use of common standards and practices would ensure that the dataset can be readily integrated into applications and easily combined with other relevant datasets, maximising its value across industry, academia and the public sector.

Q4. Who would the users of the dataset be?

The primary users of the dataset would be researchers and industry developers working in the EV and wider transport and energy sectors such as routing service providers, car manufacturers, fleet managers, and delivery companies. Access to comprehensive, up-to-date charge point data would enable these users to incorporate realistic network conditions into applications, simulations and

testing environments, leading to more robust software tools and research outcomes that better reflect real-world usage.

Downstream, EV drivers would benefit through products and services built on top of the dataset. For example, driver-facing applications could make use of current charge point availability and status information to support routing and charging decisions, reducing uncertainty and helping drivers plan longer journeys more effectively.

Overall, whether through direct analytical use or indirectly via third-party services, the dataset would contribute to alleviating many of the practical challenges currently faced by EV drivers in the UK, improving confidence in the public charging network and supporting wider adoption of electric vehicles.

Q5. What scale does the dataset need to be?

The dataset would need to operate on a national scale, incorporating data from all charge point operators subject to current UK regulation [3]. At the time of writing, this corresponds to approximately 119,000 publicly accessible charge points across the UK [5]. Full coverage at this scale is essential to ensure the dataset is representative, supports reliable downstream applications and provides meaningful insight for research and infrastructure planning. Partial or operator-specific coverage would significantly limit the usefulness of the dataset for both driver-facing applications and system-level analysis.

Q6. What would enabling AI use of this dataset unlock?

Access to reliable, up-to-date charge point data would significantly enhance the effectiveness of AI-enabled tools across the EV ecosystem by improving their ability to model, predict and respond to real-world conditions. For researchers and businesses working with AI in the EV space, consistent access to free and accurate availability and reference data would support the development of more robust algorithms and data-driven services. For example, AI-based systems recommending charge point options or routes to drivers could better account for current network conditions, resulting in guidance that more closely reflects the lived experience of drivers. Using live data would enable these systems to better predict queueing times, anticipate the risk of a route being impacted by an out-of-service charger, and even plan ahead for fallback options if such a case occurs.

More broadly, AI-enabled analysis of aggregated charge point data could support improved operational decision-making and infrastructure planning. Charge point operators could use such insights to understand patterns of usage, identify persistent reliability issues and optimise maintenance and deployment strategies. Researchers developing EV demand models or transport simulations could test their approaches against realistic, up-to-date representations of the charging network, increasing confidence that their findings will translate effectively beyond the laboratory.

Collectively, improvements in driver-facing software, infrastructure research and operational management would contribute to a more reliable and user-friendly public charging experience. As driver's confidence and satisfaction are critical to the adoption of any emerging technology, enhancing the EV charging experience has clear potential to support increased EV uptake in the UK. In turn, open and accessible charge point data would stimulate innovation across industry and academia, contributing to the UK's research base, economic activity and progress towards environmental and decarbonisation goals.

Q7. What would be the arrangements for ongoing maintenance, governance and curation?

The data interface would require ongoing maintenance, governance and curation to remain reliable and valuable over time. Data formats and reporting requirements should be kept robust and periodically reviewed to accommodate changes in charging technologies, network operation and regulatory requirements. Clear ownership of governance processes would be needed to manage updates, handle exceptions and respond to emerging issues affecting data quality or consistency. Governance arrangements should prioritise continuity and long-term stability to ensure confidence among downstream users.

Operators of charge points covered by existing regulation [3] should continue to be overseen to ensure compliance with their data reporting obligations, including the accuracy and timeliness of submitted information. Ongoing monitoring and proportionate enforcement would be important to maintain trust in the dataset and to ensure that the benefits of the service are realised in practice.

References

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