Response to 'Supercharging the EV transition'

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Response authors

This response is on behalf of the 'Future Electric Vehicle Energy Networks supporting Renewables (FEVER)' project team (www.fever-ev.ac.uk), funded by the Engineering and Physical Sciences Research Council (EPSRC) Programme Grant, grant reference EP/W005883/1. This project is focused on developing a solution to grid-independent, renewable energy-powered, EV charging stations, based around the utilisation of novel hybrid energy storage systems. FEVER unites a diverse team of academics, engineers, economists and social scientists from the **Universities of Southampton, Sheffield, Surrey and Portsmouth.**

Executive Summary

This response from the FEVER project team advocates for **government support of grid-independent EV charging solutions** to accelerate infrastructure rollout and address **geographical and socio-economic disparities in charging access.** The team recommends that the government formally include off grid charging options in policy and funding. While welcoming the Department for Transport's recent £10 million innovation competition for off-grid ultra-rapid chargers on motorways, the authors recommend extending this approach to local settings such as car parks, where lower-power chargers (22kW or less) can serve vehicles with longer dwell times. Grid-independent solutions offer key benefits: they bypass lengthy grid connection queues and costs, can be deployed more rapidly, support community energy schemes, and help address charging availability concerns that discourage EV adoption. The FEVER team calls for better integration between NESO's Connections Reform and EV charging infrastructure planning to ensure a balanced approach that includes both grid-connected and grid-independent charging solutions.

Policy Recommendations

The authors believe the development and utilisation of **grid-independent** EV charging solutions offer the following benefits:

1. They avoid the grid connection queue and related costs and hence provide capability, capacity and accessibility to meet EV infrastructure targets, particularly addressing geographical and socio-economic disparities.
2. Such grid-independent charging solutions can be delivered more rapidly and can directly support local and community energy schemes (in addition to commercially led developments).

Given this, we recommend:

3. Extend the current DfT/OZEV innovation led competition seeking off-grid solutions for EV charging, for further application areas e.g. local car parks where longer average vehicle dwelling times enable the utilisation of cheaper and lower power charge points.
4. Better integrated analysis and policy are needed between the NESO led Connections Reform[1] aiming to secure quicker and more targeted generation (including renewables) connection and capacity, and planning and accommodation for new electric vehicle charge points (and heat pumps)[2]. Better integration could identify opportunities to co-locate renewable generation with EV charging needs, avoid duplicated grid upgrade costs, and ensure that as renewable capacity is added, it's strategically placed to also serve growing EV charging demand

Detailed Response to Questions

- Question (g): "What further action is required to ensure that the rollout of EV charging infrastructure facilitates transition at the necessary rate?"

The authors believe the Government is required to accept and formally include in written policy and funding support, the option to permit grid-independent (or off-grid/non-grid connected) solutions to provide EV charging infrastructure. The current Government, NESO and Mission Control focus solely on a grid connected solution for our future electrical energy system is both short-sighted and skewed towards existing energy and electrical supply companies.

[1] https://www.neso.energy/industry-information/connections-reform
[2] https://network-maps.ssen.co.uk/

There are companies promoting off-grid EV charging[3,4] in the UK, as well as overseas e.g. in Japan[5] and Australia[6], and off-grid EV charging solutions is a core element of the FEVER research project[7] hence there is a growing awareness of both the capability and equipment to deliver such solutions.

Off-grid EV charging will directly enable a strategy to address the geographical and socio-economic disparities in the availability of EV charging points by supporting local, community, or private enterprise solutions to provide EV charging points in a greater number of locations than the grid can currently service. This is also relevant to addressing disparities in the availability and cost of charging infrastructure in poorer areas[8].

Such an off-grid approach has been recently supported by an innovation led approach by the DfT via the recently announced (3rd Nov 2025) £10 million funding competition to encourage cutting-edge technology to enable chargers to run off-grid, speeding up the charge point rollout on motorways and major A-roads[9]. This funding competition specifically states "Solutions could include combinations of renewable energy sources such as solar, alongside energy storage systems like batteries, to avoid the need for expensive grid upgrades at 'harder-to-power' locations." however requires projects to deliver charge points to charge "at least 12 EVs to access ultra-rapid charging" which requires >150 kW charging units, and capability to deliver a maximum charging power of some 1.8 MW. This is a considerable target for new, innovative, grid independent technology and the authors believe that more appropriate targets would be to also seek innovative grid independent solutions for local EV charging hubs offering, for example, 22kW chargers (or lower power) of appropriate number for local car parks (e.g. shopping centre or rail station) or other sites (e.g. tourist site/seaside car parks etc.) where longer average vehicle dwell times enable the utilisation of cheaper and lower power charge points.

The perceived availability and compatibility of charging infrastructure is used by some prospective adopters as a reason for delaying their purchase of an EV. It also increases 'competition' among

[3] https://www.electriccarscheme.com/blog/off-grid-ev-charging?what-should-you-consider-before-installing-off-grid-ev-charging=
[4] https://ev-off-grid.co.uk/ Note: uses HVO fuelled generator to recharge charge point battery store.
[5] https://www.gbp-global.com/en/general/offgrid_ev_charging/
[6] https://thedriven.io/2025/07/17/nrma-totally-rebuilds-world-first-off-grid-ev-fast-charger-and-it-appears-to-be-working-fine/
[7] www.fever-ev.ac.uk
[8] https://www.theguardian.com/environment/2024/dec/29/ev-electric-cars-vehicles-charging-points-uk-report
[9] https://www.gov.uk/government/news/10-million-for-cutting-edge-tech-to-help-futureproof-englands-electric-vehicle-chargepoint-supply-and-keep-drivers-moving

existing EV users for the available chargers, which can cause social friction where there is conscious or accidental blocking of charging infrastructure. By expediting the roll-out of EV chargers, off-grid solutions can help to address low-uptake grounded in concern about the availability of charging infrastructure and ease social tensions around charging created by increased penetration of EVs on UK roads[10,11].

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[10] https://doi.org/10.4337/9781035348756.00015
[11] https://doi.org/10.3390/en17061405