Transition to Electric Vehicles: Stimulating Local Authorities to address charging infrastructure challenges June 2019

Executive summary

- Britain's 'road to zero' aims to attain zero emissions by 2040, but research has exposed barriers to delivering an efficient electric vehicle (EV) charging infrastructure including: urban versus rural charging infrastructure divide; EV affordability and consumer acceptance, range anxiety, lack of spaces installing charging points in some Local Authorities (LAs), lack of educational programmes and views on electricity pressure/demand on the National Grid.
- Key recommendations include: innovation in consumer experience on EV technologies; transition plan from petrol and diesel cars (ICE) to EVs; bridging urban-rural charging infrastructure gap; improving EV incentives; investment in disadvantaged and low-income communities and measures decarbonizing the National Grid towards a low-carbon economy.

Introduction

Britain's Road to Zero strategy', aims to attain zero emission by 2040 and achieving the Ultra-Low Emission Vehicle (ULEV) standard by 2050, - a move away from the traditional internal combustion engines - ICE to EVs, currently powered by Lithium-Ion batteries. An efficient and sustainable charging infrastructure networks across the UK is vital to achieve this and yet there are currently significant challenges. Research from the University of Birmingham has explored EV infrastructure network challenges and best practices to improve ULEV uptake. Through global value chain analysis, this project, via interviews included LAs; vehicle manufacturers (OEMs); EV fleet operators; policy think tanks; non-profit organisations; EV policy shapers; academics, energy and raw minerals companies.

EV Charging Points Challenges

From the data collected, it emerged that there are a number of key barriers in achieving a holistic and efficient country-wide EV charging infrastructure. These included:

Urban vs. Rural EV Charging Infrastructure

There is general concern regarding the geopolitics of current EV adoption business case. Stakeholders believe current business case and charging infrastructure development aims to only tackle air pollution from ICE tailpipe emissions, which they believe is more of an urban problem as opposed to a rural strategic policy priority. Reflecting the notion that current plans do not integrate the entire EV ecosystem on a country-wide level enough, limiting the reduction in emissions from the overall EV value chain.

EV Acceptance and Affordability Challenge- The Rich vs. Poor

Even with a country-wide charging infrastructure network scenario, consumer acceptance and affordability remains crucial for EV adoption. Substantive issues such as EV price premium and affordability currently remains a growing concern. OEMs, including auto traders, are concerned about the lack of a government transitioning plan from ICE to EVs. This was described as: *"Diesel is now the devil, and the government has created a mass panic about residual rates on existing ICE vehicles, so no one wants to buy a new ICE vehicle".*

EV Charging Points vs. Lack of Spaces for Charging Infrastructure

Identifying spaces to deploy charging points in some cities, has been challenging due to barriers such as *heritage constraints.* Departments within LAs are hesitant to convert or take out public parking spaces for charging points. Particularly considering the income generated from public car parking, as many LAs are enduring significant budget cuts and restructuring. Some LAs outside the Greater London Authority, are experiencing *"real push back from developers, as they are now required to provide charging points for large developments".*

On-street and Home off-street Charging Challenge

The on-street charging points mechanisms aim to address charging spaces challenges in urban areas, especially, where access to home off-street parking is limited or where houses are built with no driveways. LAs, such as the West Midlands Combined Authority, Surrey County Council and Oxford County Councils sees *"public charging infrastructure to be essential"* and are working towards on-street charge points. However, there is lack of appetite from some LAs, applying for the on-street residential charge point scheme. Energy Saving Trust, affirmed their role administering a government On-Street Residential Grant Scheme encouraging LAs to put charging points in residential roads.

Range Anxiety vs. EV Adoption

Many stakeholders believe EVs do need regular charging, and appreciate the need to bridge the rural-urban charging infrastructure networks gaps. Although range amongst EVs is improving, as some EVs are having an average range of 150 to 250 kilometres, the fear of running out of battery/ range anxiety remains a primary barrier. An LA participant *affirmed that "there is that problem for a lot of our residents,they see range as a barrier buying their first electric vehicle, because, they fear running out and don't want to be in the middle of the road".*

Consumer EV charging and what zero emission could mean?

Participants' raised challenges such as *"what is going to happen when everybody changes their car to EVs, and where is all the electricity will come from"?* However, policy shapers and low-carbon experts are very optimistic about the renewable energy content or low carbon sources contribution in decarbonizing the Grid, emphasising that the *"UK's grid is decarbonising faster, with renewable content".*

BREXIT and EVs Supply Chain

Direct correlations between Brexit versus EV charging infrastructure wasn't clearly established. However, almost all stakeholder groups are worried about how a Hard Brexit could negatively impact overseas investments in UK's low-carbon and new EV technologies. Brexit has potential impacts on EV parts and supply chain, with UK OEMs being required to meet the EU's 95g/km target for cars and problems balancing EV demand vs supply.

Low-Carbon Economy vs. EV Awareness Strategy

There is a view that current consumer education and the EV business propositions, *"are not good enough".* An LA policy lead highlighted that *"in terms of public education, there isn't anything yet we're doing for the public"*, which is inhibiting consumer EV uptake *"because of fear of the unknown, uncertainty, and consumers' do not understand the EV technologies properly".*

Standardisation and EV Battery Technologies Due Diligence

LAs hope to see current charging infrastructure made *"future proof"*, to avoid, a scenario where evolving and new battery technologies render current charging infrastructures inoperable. In understanding some ethical challenges within the EV Global Value Chain (e.g. human rights and child abuse cases sourcing Cobalt for battery raw materials), participants raised questions over the raw materials due diligence requirements in promoting EVs adoption.

EV Buses Charging Infrastructure and range challenge

Concerns remain regarding EV buses and drive range. Although, some LAs have a bus zero emission strategy, many are sceptical about range and the charging infrastructure operational model for buses.

Electrifying Heavy Duty Goods Vehicle (HGVs)

Electrifying and charging HGVs remains a major challenge. Stakeholders highlighted the need for considerable investment in battery technology.

Recommendations

For Government:

• Policy change is required to bridge the urban-rural EV charging infrastructure gap, to ensure that an electrification grant program can be utilized.
• Government need to assess what "Zero" and "ULEV" could mean in the Road to Zero strategy and offer low-carbon solutions country-wide to meet decarbonisation targets by 2050.
• There is a need for robust consumer-focused transition plans and business model from ICE to EVs, and education programmes, and a need to ensure jobs within the ICE supply chain are maintained.
• Current incentives for ULEVs should be made more attractive, by expanding and offering low-income consumers tax relief/taxation incentives on EVs, and in exchanging ICE vehicles on the Go Ultra Low scheme with auto dealers.
• Funding is required for interdisciplinary research and to support LAs and private investment within disadvantaged and low-income communities, towards a greater national road networks investment to make EV journeys around the entire country achievable.

For Local Authorities:

• LAs adaptation of the National Planning Policy Framework where possible, could demonstrate the integration of transportation electrification targets to meet climate goals by 2050, with actions to increase EV uptake, charging points and renewable energy mix to the grid.
• LAs could explore ultra-fast EV charging points via a concession business model with the private sector. However, potential risks mitigating a rural-urban divide, should be carefully thought out, as service providers could be more inclined prioritising new investments in profitable (urban) markets.
• Regardless of a Borough's population size, including local or regional conditions, LAs should work with diverse businesses ranging from popular supermarket chains to retail shopping centres, and EV fleet operators, to help expand the availability of ultra-fast EV charging and local incentives for consumers considering purchasing an EV, as a measure in decarbonizing the transports sector.
• LAs and Boroughs must embrace bottom-up and horizontal sectoral policy-making, harnessing synergies and tackling conflicting objectives of the different departments and professions.

The research project

A study has been undertaken as part of the Responsible Business Vehicle Electrification project to offer an in-depth understanding on policy views and programmes that accounts for EV batteries post-first-life applications within a circular economy value chain. The study explores views on specific actions to improve raw materials supply risks and battery technologies, as well as measures needed to tackle the ethical and sustainability concerns.

About the author

Dr. Nana O Bonsu is a research fellow in Sustainability at Birmingham Business School Lloyds Banking Group Centre for Responsible Business. His research examines Sustainable Development Goals, considering: Circular Economy, Sustainable Transportation, Global Value Chains, Land-Use & Sustainable Forestry and Biodiversity Management.

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