The Governance of Net-Zero Emission Urban Bus Transitions in the United Kingdom: Insight from a Transition Visioning Stakeholder Workshop

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Abstract : The transition to net-zero emission urban bus (ZEB) systems is receiving increased attention in research and policymaking throughout the globe. Most studies in this area tend to address techno-economic aspects and the perspectives of a narrow group of stakeholders, while they largely overlook analysis of current bus system dynamics. This offers limited insight into the types of ZEB governance challenges and opportunities that are encountered in real-world contexts, as well as into some of the immediate actions that need to be taken to set off the transition over the longer term. This research offers a multi-stakeholder perspective into both the technical and non-technical factors that influence ZEB transitions within a particular context, the UK. It does so by drawing from a recent transition visioning stakeholder workshop (June 2023) with key public, private and civic actors of the urban bus transportation system. Using NVivo software to qualitatively analyze the workshop discussions, the research examines the key technological and funding aspects, as well as the short-term actions (over the next five years), that need to be addressed for supporting the ZEB transition in UK cities. It finds that ZEB technology has reached a mature stage (i.e., high efficiency of batteries, motors and inverters), but important improvements can be pursued through greater control and integration of ZEB technological components and systems. In this regard, telemetry, predictive maintenance and adaptive control strategies pertinent to the performance and operation of ZEB vehicles have a key role to play in the techno-economic advancement of the transition. Yet, more pressing gaps were identified in the current ZEB funding regime. Whereas the UK central government supports greater ZEB adoption through a series of grants and subsidies, the scale of the funding and its fragmented nature do not match the needs for a UK-wide transition. Funding devolution arrangements (i.e., stable funding settlement deals between the central government and the devolved administrations/local authorities), as well as locally-driven schemes (i.e., congestion charging/workplace parking levy), could then enhance the financial prospects of the transition. As for short-term action, three areas were identified as critical: (1) the creation of whole value chains around the supply, use and recycling of ZEB components; (2) the ZEB retrofitting of existing fleets; and (3) integrated transportation that prioritizes buses as a first-choice, convenient and reliable mode while it simultaneously reduces car dependency in urban areas. Taken together, the findings point to the need for place-based transition approaches that create a viable techno-economic ecosystem for ZEB development but at the same time adopt a broader governance perspective beyond a 'net-zero' and 'bus sectoral' focus. As such, multi-actor collaborations and the coordination of wider resources and agency, both vertically across institutional scales and horizontally across transport, energy and urban planning, become fundamental features of comprehensive ZEB responses. The lessons from the UK case can inform a broader body of empirical contextual knowledge of ZEB transition governance within domestic political economies of public transportation.

Keywords : net-zero emission transition, stakeholders, transition governance, UK, urban bus transportation
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