

Exploring user intention for dynamic wireless charging facilities: Some insights from a survey in New Zealand

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Abstract: Dynamic wireless charging (DWC) facilities, as a type of electrified road infrastructure, offer a sustainable alternative to traditional plug-in charging stations and improve the operational aspect of EV charging. DWC technology has significant advantages over other charging solutions in terms of usability, convenience, and innovation. Understanding users' perceptions of this technology in terms of the factors influencing their decisions to accept or reject it allows for better formulation of necessary measures and policies for successful adoption. This paper reports a study conducted in New Zealand using an online stated preference survey and adopted a structural equation modelling approach. The users' intention and acceptance of DWC technology are investigated with diverse socioeconomic attributes by combining aspects of technological acceptance and the theory of planned behaviour in the modelling framework. The results indicate that 93% of the respondents are affirmative about using DWC facilities in the future. Perceived risk is observed to have a significant negative effect on users' intention to use (IU) DWC facilities as opposed to perceived usefulness (PU) based on ease of use and convenience while environmental awareness (EA) and social norms are positive indicators of IU. The results also show that IU plays a significant role in mediating the relationship between latent constructs and the dependent variable DWC acceptance (ACC). EV experience strengthens the relationship between PU and IU. A significant difference is observed among the respondent groups with different levels of technological awareness (i.e., more advanced versus less advanced) in terms of the impact of EA on IU and ACC. These findings can be useful to formulate an optimal strategy to improve DWC acceptance and design a business model based on users' behavioural intentions.

Keywords: Electric vehicle charging, structural equation modelling, perceived risk, social norms