

Problem Description

In a Vehicle-to-Grid (V2G) setup, plug-in electric vehicles (EVs) can both consume electricity for charging and supply it to the grid, potentially stabilising electricity prices by optimising charging during surpluses and providing power during shortages. Presently, there exist significant challenges related to the broader acceptance of V2G technology among consumers. Consumer perceptions regarding the potential risk of battery degradation stemming from increased charging cycles represent a key impediment to the widespread adoption of V2G. In light of the limited engagement in readily accessible and cost-effective energy market mechanisms, the question is:

How can we effectively address the aforementioned obstacles hindering consumer involvement in intricate V2G services to facilitate widespread adoption of V2G technology among the general population?

Proposed Solutions

Battery Warranty Scheme

Nudge: The nudge aims to persuade individuals that a battery warranty will effectively address their worries regarding battery degradation and help correct any misinformation they may have about electric vehicle batteries.

Li et al. disclosed that, in addition to the primary product attributes, the battery warranty exerts a noteworthy positive influence on encouraging mainstream consumers to embrace Battery Electric Vehicles (BEVs). However, no discernible preference distinction arises among existing policy incentives once post-purchase subsidies have been eliminated [1]. Lee and Venkataraman found that consumers who purchase a vehicle with a base warranty are more likely to buy an extended warranty compared to those without a base warranty. Additionally, consumers opting for vehicles with larger base warranties are more inclined to invest in extended warranty coverage. Those starting with a base warranty tend to favour more comprehensive extended warranty options over limited ones. Lastly, consumers buying vehicles with larger base warranties are more likely to choose comprehensive extended warranty coverage over those with depleted base warranties. These findings highlight the influence of reference points on consumer decisions regarding warranty choices in the automotive market [2].

Drawing from the research mentioned earlier, we suggest that modifying the existing terms and conditions of electric vehicle battery warranties represents a viable strategy for implementing the nudge and influencing the behaviour of EV customers to enhance V2G acceptance. Utilising the EAST framework, we've devised a straightforward blueprint for leveraging Behavioural Insights to encourage EV consumers to embrace V2G technology. This framework is designed to be uncomplicated, appealing, socially oriented, and time-sensitive, all with the aim of optimising the adoption of V2G.

- **Why warranty will be convenient for the customer?**
 - o Battery warranty must be prescribed for V2G technology in terms and condition of vehicle or battery purchase. Thus, customer does not require to take any action.
- **How warranty will be attractive for the customer?**
 - o Dependent on manufactures recommendation for warranty (e.g., 5 years could be a valid period to attract customers), warranty could be an effective incentive to reduce the risk of financial loss to the consumer. In the instance of battery failure, the consumer is assured that the warranty will cover the loss.
 - o As the warranty reducing the risk of monetary loss associated with battery failure, improved usage of V2G technology can provide additional income to consumers.
 - o Implementing the warranty encourages the risk-free usage of V2G technology, thus real-time data and key information (e.g., mobile application with V2G income data,

stay informed about opportunities to boost their earnings with regular notifications etc.) provides an attractive engagement tool for the end-user to become more involved in the use of the technology.

- **How social norms will be influenced by warranty?**
 - It can be displayed to customers that the benefits of receiving a warranty far outweighs the negatives. By doing so, the inclusion of the updated warranty conditions can be seen as an essential part of the car purchase.
 - Demonstrate that people who use V2G technology are saving on their monthly electricity bill. Kiaee et al. demonstrated that V2G is able to reduce the charging cost of EVs by 13.6 % while satisfying the minimum requirement for state of charge of the EV batteries to complete their next journey [3].
 - Display testimonials from satisfied users and display through marketing campaigns (TV, Youtube, FB etc.). Ge et al. suggests that the social media can be effectively used as an advertising platform for informing customers on new rules and regulations [4]. Zhang et al. says that the Facebook users' interaction with brands' advertisement by comments on the ad posts suggests that it improves sales [5]. In addition to the ideas presented above, social media marketing presents an opportunity to increase the awareness of V2G amongst the public.
 - Battery replacement services/warranty/incentives to be displayed in all types of car related stores (e.g., bunnings, supercheap auto, repco, car dealerships etc.). As a result of this, consistent reinforcement will imprint V2G technology on the subconscious of consumers.

- **What is the best time to introduce new warranty terms & conditions?**
 - Purchasing of a new car represents a time when people are most receptive to new information.
 - Battery replacement warranty to be advertised to used car owners who are upgrading their battery.
 - Advertising to be focused on times when cost of living and inflation are front of mind. People will be more likely to take up V2G as a way of earning additional income.

In conclusion, as outlined in the framework discussed earlier, modifying the terms and conditions of electric vehicle (and their batteries) warranties can effectively shift consumer behaviour, fostering increased adoption of V2G technology. By providing essential battery information and conducting well-timed advertising campaigns, we can effectively tackle concerns related to battery degradation and raise public awareness regarding the utilisation of V2G technology.

References

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