

# Incentivizing Electric Vehicle Adoption in Ride-Hailing

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As a promising technology to reduce carbon emissions from the transportation sector, electric vehicles (EVs) have received extensive attention from customers, car manufacturers, utility firms, service providers, and governments. Ride-hailing platforms like Uber and Lyft have proposed ambitious green initiatives to facilitate EV adoption. For example, Uber has committed to becoming a zero-emission platform in the US, Canada, and European cities by 2030. Therefore, Uber has offered various incentives to help drivers go electric, including extra premium paid by riders in an EV that the driver receives, additional monetary rewards for completed EV rides, EV fast charging discounts, and EV purchase incentives. However, there is little understanding in the literature about **how the ride-hailing platform should design its incentives smartly. To achieve a certain target level of EV adoption, which incentive is more profitable (cost-efficient) for the platform? Under which incentive do customers pay a higher ride price? Which incentive gives participating EV drivers a higher total surplus?**

To address the research questions, we *introduce an analytical framework tailored to analyzing the interplay between the platform's (incentive and pricing) decisions and drivers' behavior in transitioning to EVs. To the best of our knowledge, our model is the first theoretical model to explicitly focus on the incentive design problem for ride-hailing platforms to improve EV adoption.* Then, we compare two categories of incentives—customer-funded incentives and platform-funded incentives—regarding their impact on the equilibrium ride price, platform profit, and drivers' surplus. While customer-funded incentives are defined as directly sourcing from the premium paid by EV riders, platform-funded incentives come from the platform's fund. We derive interesting insights about the platform's choice between incentives. For instance, when drivers take a relatively small fraction of revenue generated by each ride, the platform-funded incentive will give the platform a higher overall expected profit. Conversely, when drivers' share of revenue per ride is relatively large, the platform will make more profit by employing the customer-funded incentive. Furthermore, the platform's choice of incentive can switch as the target level of EV adoption varies.

*Our results reveal practical insights for ride-hailing platforms to balance their profitability and social responsibility, which contributes to the literature on private sector sustainable operations management.*