The effect of fiscal incentives on market penetration of electric vehicles: A pairwise comparison of total cost of ownership

Abstract:
An important barrier to electric vehicle (EV) sales is their high purchase price compared to internal combustion engine (ICE) vehicles. We conducted total cost of ownership (TCO) calculations to study how costs and sales of EVs relate to each other and to examine the role of fiscal incentives in reducing TCO and increasing EV sales. We composed EV-ICE vehicle pairs that allowed cross-segment and cross-country comparison in eight European countries. Actual car prices were used to calculate the incentives for each model in each country. We found a negative TCO-sales relationship that differs across car segments. Compared to their ICE vehicle pair, big EVs have lower TCO, higher sales, and seem to be less price responsive than small EVs. Three country groups can be distinguished according to the level of fiscal incentives and their impact on TCO and EV sales. In Norway, incentives led to the lowest TCO for the EVs. In the Netherlands, France, and UK the TCO of EVs is close to the TCO of the ICE pairs. In the other countries the TCO of EVs exceeds that of the ICE vehicles. We found that exemptions from flat taxes favour big EVs, while lump-sum subsidies favour small EVs.


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