

# Science for Environment Policy

## Link between total cost of ownership and market share of hybrid and electric vehicles

**Hybrid and electric vehicles emit lower levels of carbon dioxide and air pollutants than conventional petrol and diesel vehicles, yet their market uptake in the EU remains limited.** New research provides an assessment of the Total Cost of Ownership (TCO) — which combines purchase and operating expenses — of different vehicle types. By comparing historical data on hybrid, petrol and diesel vehicles in three countries (Japan, the UK and the USA), researchers found a strong link between TCO and market share of those vehicles. They also identified a number of ways in which policymakers may promote the adoption of cleaner vehicles through the provision of financial incentives.

**Promoting the adoption of zero- and low-emission vehicles is a pressing policy concern as this offers a plethora of environmental and health benefits, through lower carbon-dioxide and air-pollutant emissions.** It also helps to reduce the economy's dependency on oil. Up to the end of the period investigated by the researchers (ending 2015), however, the market uptake of such vehicles in the EU was rather limited.

Given that ownership costs are an important consideration in vehicle purchasing decisions, it is vital that policymakers consider the costs of purchasing and operating zero- and low-emission vehicles, also in relation to those of conventional vehicles. Importantly, while zero- and low-emission vehicles generally have higher manufacturing costs, their running costs are lower thanks to lower fuel costs and, to a lesser extent, lower maintenance costs. Subsidies and reduced taxes for zero- and low-emission vehicles can serve as additional financial incentives for private and business buyers.

To elucidate how ownership costs may influence market share, researchers in the UK have assessed the TCOs of battery electric, hybrid electric and plug-in hybrid electric vehicles in Japan, the UK and the USA (using California and Texas as case studies) over the time period 1997–2015. The study looked at the initial vehicle costs and subsidies, fuel costs, maintenance and insurance costs, and vehicle tax over the first three years of ownership. The study also used regression analysis (statistical processes for estimating relationships among variables) to assess the link between the historic TCO of hybrid electric vehicles and their market share across the different geographic regions.

The research revealed a clear connection between changing hybrid electric vehicle TCO and market share, isolating (depreciated) purchase costs as the most important factor affecting adoption rates. While the research fails to account for other relevant factors influencing hybrid and electric vehicle market share, the findings nonetheless provide valuable evidence demonstrating that long-term government support aimed at addressing financial barriers can increase adoption rates.

From a policy perspective, this research highlights the need to tailor government support, including elements accounting both for the greater upfront vehicle cost of zero- and low-emission vehicles, and for fuel price variation. Support should be phased out as cost parity is achieved. The research also identifies a lack of reliable information on vehicle TCO as an additional purchase barrier and highlights the need for other, non-financial incentives.



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