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More electric cars at lower cost by adapting incentives

The Swiss government aims to encourage more people to make the switch to electric vehicles, but current incentive policies are not efficient. Economists supported by the SNSF are proposing improvements.

The electrification of the car fleet is one of the solutions proposed to combat greenhouse gas emissions. Economists supported by the Swiss National Science Foundation (SNSF) have assessed the financial incentive schemes available when purchasing new electric vehicles. "The current approach to encourage the transition to electric cars is not efficient. Our calculations, based on the canton of Bern, show that you can do more with the same amount of money, or the same for less," says Patrick Bigler, who conducted the study as part of his doctoral research at the University of Bern. This work, which will be published in the Journal of the Association of Environmental and Resource Economists (*), evaluates four factors: public spending, the share of electric vehicles among new cars, household costs and social equity.

Restructuring incentives for greater efficiency

Bigler emphasises the non-partisan character of the study: "Our aim isn't to determine the best mobility for the future, but to understand how best to allocate public funds by considering anticipated car purchases."

In the canton of Bern, the annual vehicle tax is currently calculated based on weight, with electric cars benefiting from a rate that is twice as low. New low-emission vehicles qualify for an additional reduction on the car tax in the first four years after purchase – which amounts to 60 percent for electric vehicles. Bigler's calculations indicate that replacing this reduction with direct purchase subsidies would increase the proportion of electric vehicles among new car sales. This reallocation of incentives could reduce annual CO_2 emissions in the canton of Bern by 70 tonnes.

However, the primary purpose of the annual vehicle tax is to finance road infrastructure, a priority compromised by this solution. The study explores alternative ways of sustaining road funds by combining subsidies with a bonus or a penalty on the vehicle tax according to the energy efficiency of new vehicles. So, in addition to a purchase bonus, motorists choosing an electric car would benefit from lower car tax for four years. On the other hand, those opting for a petrol model benefit from lower taxes if they opt for a relatively efficient model but are charged increased annual taxes when purchasing a relatively inefficient vehicle. Depending on the scenario, annual CO_2 emissions in the canton of Bern could decrease by 110 to 517 tonnes. Financial projections of public funds over 15 years indicate potential outcomes ranging from a loss of 1.5 million to a gain of 60,000 Swiss francs.

High-income households' interest in electric vehicles goes beyond price

For this study, the team from the University of Bern analysed household income data in relation to new car purchases to explore social impacts. "This unique data set enabled the research group to consider equity aspects, which had never before been done before in this context," says Doina Radulescu, the economics professor leading the research. Radulescu and her team examined the combined effect of various policy instruments, including subsidies and alternate

vehicle tax schedules, on households across different income groups. Their findings revealed that even in models placing greater emphasis on the utility of low-income households, high-income households receive a large share of subsidies.

This disparity is tied to the fact that affluent households are more likely to buy electric vehicles, independent of financial reasons. “Even when accounting for factors such as vehicle characteristics, homeownership and the availability of public charging stations, lower-income households adopt electric vehicles at a lower rate than affluent ones,” Radulescu notes. “Our data does not fully explain this resistance to electric vehicles by lower-income groups. There are likely psychological or sociological barriers at play,” suggests Bigler.

Even without knowing the full reasons behind these preferences, the study predicts the influence of different financial incentive policies on public funds, consumers' wallets and CO_2 emissions. “These scenarios offer policymakers a scientific basis for decision-making,” concludes Radulescu. While the optimal approach remains a matter of debate, the research highlights multiple pathways to increase the proportion of new electric vehicles.

Study limitations

This research focuses on 2019 and the canton of Bern, the only region for which it was possible to collect the necessary data. The economists accessed this information through energy suppliers and the Bern tax and road traffic offices. Doina Radulescu details two further limitations of the study: the data only concerns new vehicles, and the impact of investment in electrical infrastructure such as charging stations is not considered, though its importance is acknowledged. Despite these caveats, Patrick Bigler says, “the market for new cars exists and remains relevant, and that's what we concentrated on.”

Support for research in all disciplines

This study was supported by SNSF project funding. Following a competition-based selection process, this scheme enables researchers to independently conduct projects on topics and research objectives of their own choosing.

The text of this press release and further information are available on the website of the Swiss National Science Foundation.

wissenschaftliche Ansprechpartner:

Doina Radulescu
University of Bern
Competence Center for Public Management
Phone: +41 31 684 40 07
Email: doina.radulescu@unibe.ch

Patrick Bigler
University of Lausanne
HEC – Department of Economics
Email: patrick.bigler@unil.ch

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