

# Science for Environment Policy

## What are the most effective ways of promoting electric cars?

**Norway has the highest battery-electric vehicle market share of any country worldwide.** A new study investigated the incentives that have persuaded consumers to purchase electric vehicles in Norway, revealing that up-front price reductions (such as exemptions from purchase tax) are the most powerful incentives.

**An astounding 80% of increases in CO<sub>2</sub> emissions in the past 45 years have come from road transport.** Electromobility — a road transport system in which vehicles use electricity for propulsion — has been proposed as a method of reducing greenhouse gas emissions from the transport sector.

Indeed, electric vehicles emit less CO<sub>2</sub> than conventional, internal combustion engine-powered cars but also provide enhanced energy efficiency, lower user costs and reduced noise and air pollution.

Norway, where this study was conducted, has become a global leader in electromobility. It has the highest market share of Battery Electric Vehicles (BEVs, which use chemical energy stored in rechargeable battery packs to power electric motors) of any country worldwide. Over 70 000 BEVs are registered in the country, and they accounted for almost 20% of new car sales in 2015.

One reason for Norway's high electric-vehicle market share is the incentives the Norwegian government offers, which make BEVs more or less the same price as conventional vehicles. Government policy in Norway also offers incentives such as free parking to make electric vehicles more convenient and cost-efficient to use. The success of the incentives in Norway makes it a valuable case study for regions aiming to achieve similar.

This study used the results of a survey of almost 3 400 BEV owners in Norway to investigate which incentives are the most important in deciding to buy a BEV, and which groups of buyers are most likely to respond to which incentives.

The researchers investigated the effect of seven different incentives: exemption from purchase tax, exemption from VAT, vehicle license-fee reduction, exemption from road tolling, free parking, bus-lane access and free ferry tickets. They asked respondents to rate the incentives on a scale of 1 to 10, from *not important* to *very important*. They also asked the BEV owners whether they would have purchased a BEV today if a given incentive was not in place.

The results showed that exemptions from purchase tax and VAT were critical incentives for over 80% of respondents. Exemption from road tolling, and reducing the vehicle license fee were critical to half of the sample, while the remaining incentives were critical for particular groups.

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*(continued)*

There were differences in which incentives people responded to most based on their age, gender and education. However, because of the similar price of BEVs and conventional vehicles in Norway, income was of less importance. There were also differences based on the location of respondents. For example, residents in Trondheim — where road tolling is extensive — were keen on incentives that reduce the costs of usage, while respondents living near to the capital of Oslo gave priority to bus-lane access (which provides significant time savings for commuters during rush-hour traffic). This suggests local management of incentives is important.

Overall, and in line with past research, the findings show that reduction of purchase cost is the strongest method of promoting BEV adoption where taxes are high. However, this is not the only important incentive. To some users, bus-lane access and exemptions from road tolls were the only decisive incentive. These incentives should not be used for the recruitment of lots of users, but could be useful for potential buyers who are not responsive to typical economic incentives.

This study investigated the role of incentives using data from a diverse group of users and from a market where electric vehicles are popular. It provides insight into the incentives that have successfully promoted BEVs in Norway and that may help increase market shares of electric vehicles in other countries where taxes are high.



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