Institute of Transport Economics
Norwegian Centre for Transport Research

Executive summary:

E-vehicle policies and incentives - assessment and recommendations

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This report documents state and regional electromobility incentives across Europe with strong emphasis on 1) battery electric vehicle (BEV) incentives and 2) the two countries Austria and Norway. We find that electromobility incentives can be effective in growing e-vehicle markets, but a substantial growth comes only at a high budget cost for the government. Only the Norwegian bus lane access for BEVs stands out as a low cost incentive (ignoring congestion costs to bus operators and their passengers). Free BEV parking is found to be the least cost effective policy. It has no significant impact on BEV sales and is costly. A scenario analysis emphasises the importance of the supply side, or technology improvements, for a thriving e-vehicle market.

The report identifies a strong and clear relationship between the amount and intensity–i.e. money used–of incentives on the one side, and market penetration of BEVs on the other side. Figure S.1 illustrates how the user value of local benefits bus lane access, free ferries, free parking, and toll road exemptions are associated with BEV market penetration in Norway.

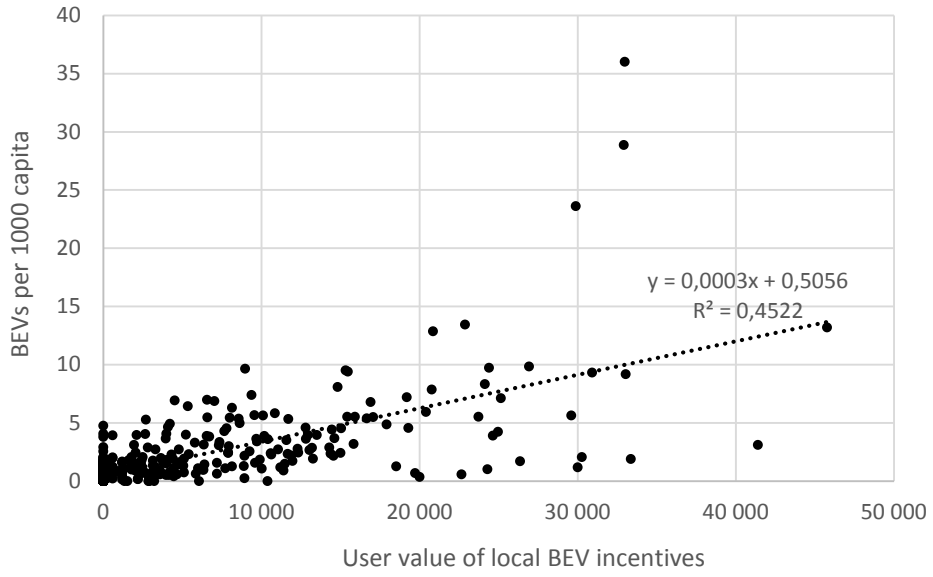

Figure S.1: BEVs per 1,000 capita in Norwegian municipalities, compared with the annual value (NOK) of local benefits. Values are based on annual money and time savings as reported by BEV owners. NOK 1 = EUR 0.12 at time of survey.

In addition to these local incentives, come the national incentives of VAT and registration tax exemption and reduced annual tax. Incentives that directly reduce the purchase price of an EV are particularly effective in growing the BEV market. In Norway, also bus lane access contributes considerably to BEV sales.

National BEV incentives appear to out-perform local and regional incentives and are, usually, appreciated by the market as more stable and predictable. The fact that Norwegian policies enjoy state backing and apply to all parts of the country has probably reduced the perceived risk for market players, like car importers. However, the great benefit of local incentives lie in the way they can be tailored to local circumstance: access to bus lanes can have huge effects on BEV sales in some areas; in other places, free ferry rides have large effect. This fact highlights an important aspect of the Norwegian success. Since the users have different needs, national and local stakeholders and the industry should use a broad package of incentives in marketing this new technology in order to speed up its diffusion. In total, the package of incentives sums to a forceful and reinforcing combination market stimuli.

Compared with Norway, Austria has followed a path which relies less on market mechanisms and which is more top-down in the sense that much responsibility and initiative lies with the e-mobility regions rather than general incentives in the market. So far, this strategy has not resulted in any significant market expansion of EVs.

Figure S.2 illustrates the modelled individual and combined contributions of BEV incentives in Norway in 2020. On the x-axis, incentives increase the Norwegian BEV stock and on the y-axis, they contribute to government net revenue losses. Budget costs are the net effect on fuel and electricity taxes, VAT, registration tax, annual tax, road charging, and parking fees. In terms of fiscal cost effectiveness, access to bus lanes generates most BEVs per public budget cost. However, the effect is limited to just under 20,000 vehicles. Larger market penetration requires additional (and less cost effective) incentives. Free parking is the least cost effective policy.

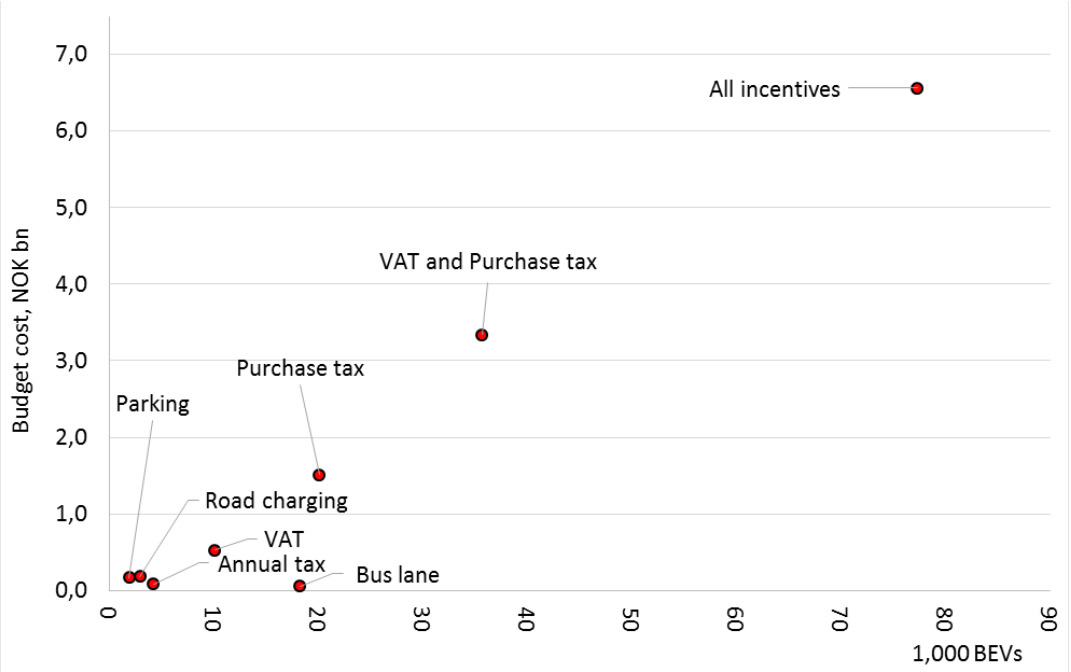

Figure S.2: Effects in 2020 of individual BEV incentives: Budget cost (in NOK) and effect in terms of BEV stock generated (in thousands), and a linear trend.

In terms of CO_2 emission reductions, the government budget cost per tonne of CO_2 follows the same pattern: bus lane access is the most cost effective policy, whereas free BEV parking is the least cost effective policy.

The fact that BEV incentives strongly affect government revenues, suggests that an effective package of BEV incentives will be perceived as costly for the government. However, it is possible to recoup these revenues by relatively modest adjustments to the car taxation regime. The following adjustments to a likely future base scenario make the BEV incentives revenue-neutral: An annual real increase in the annual tax of 2.5 percent; about one percent higher fuel tax increases per year; and a gradual steepening of the car registration tax. Together, these adjustments secure a stable stream of government revenues despite the presence of strong and costly BEV incentives.

In this way, substantial domestic CO_2 reductions can be achieved at no government cost. However, the package of BEV carrots and conventionally fuelled car sticks cause considerable transfers from fuel car owners to BEV owners.

A scenario assessment identifies two main dimensions that affect the BEV market: 1) technology and supply-side factors, and 2) policy factors. In Norway as well as in Austria, the role of supply side developments is particularly important. The main contribution of favourable BEV policies is to support and speed up technological development. This fact suggests free rider problems: Countries with generous policies bear a high cost, while any country can reap the benefits of technological advances.