Eur. Transp. Res. Rev. (2015) 7: 34
DOI 10.1007/s12544-015-0182-4

ORIGINAL PAPER

The increase of electric vehicle usage in Norway—incentives and adverse effects

Marie Aarestrup Aasness[1,2] **· James Odeck**[1]

Received: 30 December 2014 / Accepted: 22 September 2015 / Published online: 8 October 2015

Abstract
Purpose Norway has been named the "capital" of Electric Vehicles (EVs) because the purchase and use of EVs in Norway has increased tremendously over the last few years. Currently, the fleet of EVs in Norway is the largest per capita in the world. From a transportation research perspective, the questions immediately asked are (i) what economic incentives make the purchase and use of EVs in Norway so attractive to road users; (ii) do these incentives have any adverse effects and, if so, how large are they; and (iii) how does the marginal external cost of EVs compare to that of conventional vehicles.
Method We explore the above questions using available data, the literature and personal observations while relating to the city of Oslo as a case study.
Results We find that the tremendous increase in the use of EVs is the result of multiple economic incentives, such as exemption from toll charges, exemption from purchase duties and permission to use transit lanes that induce road users to purchase and use EVs. The increase in EVs has led to a reduction in CO2 emissions. However, some of the EV incentives have adverse effects, the most serious of which is the exemption from toll charges, which has led to a sizable loss of toll revenue. We find that the marginal external cost of EVs' road use is approximately the same as that for a conventional vehicle.
Conclusions The incentives for EVs should consider the adverse effects and how electricity is produced; the Norwegian approach should not be followed by other countries without due consideration of these factors.

Keywords Electric vehicle · Norway · Incentives · Adverse effects

This article is part of the Topical Collection on Driving Societal Changes towards an Electro-mobility Future

✉ Marie Aarestrup Aasness
marie.aasness@vegvesen.no

James Odeck
James.odeck@vegvesen.no

1 Department of Civil Engineering and Transport, The Norwegian University of Science and Technology, 7491 Trondheim, Norway

2 SVV-Region Øst, Østensjøveien 34, 0667 Oslo, Norway

1 Introduction

Governments throughout the western world are currently concerned with how to motivate people to start using electric vehicles (EVs). EVs can deliver a more environmentally friendly form of transport while simultaneously reducing dependence on oil. Emissions, e.g., CO2, NOx, or particulate matter, can be reduced locally and overall if the efficiency of power generating plants is improved. In addition, the use of EVs may lead to a reduction in noise exposure compared to traditional vehicles. While EVs offer benefits to society, their restrictions, such as a limited travel range or higher prices, have not been accepted by consumers in different parts of the world; thus, their sales volume has been very low.

In Norway, however, the situation with regards to the purchase and use of EVs is quite different from that observed elsewhere in the world. In fact, there is currently EV "fever" in Norway. Tesla S and Nissan Leaf, both EVs, are at the top of car sales statistics in Norway. Figure 1 gives an overview of developments in the purchase of EVs in Norway. As it is clear from the figure, the purchase of EVs has almost doubled annually since 2012, and this trend is expected to continue, since the government still encourages the use of EVs. It is these observations that have given Norway its status as the capital

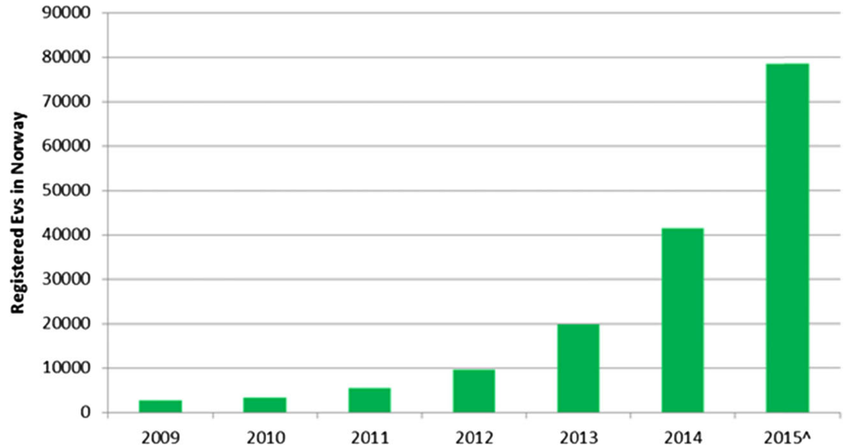

Fig. 1 Registered EVs in Norway. Source. http://www.gronnbil.no/statistikk?lang=en_US). ^Estimated for 2015

of EVs and that demonstrate the need for further study into the drivers behind this increase, which we investigate in this paper.

These formidable increases in the purchase and use of EVs have been prevalent in the city of Oslo to such an extent that Oslo has been named the electric vehicle capital of the world [1]. This is particularly interesting because Oslo has a cordon toll system, where motorists pay tolls yet the impact of increasing EV usage given that one incentive for purchase is exempting EVs from tolls has not been previously studied in the literature. From a transportation research perspective, the prevailing situation in Norway, and in Oslo in particular, with regards to the purchase and use of EVs raises several questions e.g., whether the incentives to EV purchase and use are economically effective and efficient. In this paper we examine such questions as follows: we (1) address the incentives behind the observed developments and how these have been received by travelers in Oslo case study and, (2) examine and broadly assess the adverse effects caused by the incentives in the case of the Oslo toll ring.

The rest of the paper is organized as follows. Section 2 is brief literature review of EV policy in Norway. Section 3 gives a short description of the methodology and data used. Section 4 presents EV incentives and how they have worked in Norway. Section 5 discusses the adverse effects of the incentives. Concluding remarks are given in Section 6.

2 Literature review

There are several reports and seminar papers in the literature that have addressed EV policy in Norway. Hannisdahl et al. [4] addressed the future of EVs in Norway and lessons learnt to date. They observed that it is not the car producing nations such as Sweden and Germany that have engaged aggressively with EVs. Instead, Norway has led the rest of the pack in terms of both implementing policy incentives and increasing the number of EVs on the road compared to its total car population. These authors observed that the EV technology was good enough and that a set of incentives was necessary to achieving successful expansion of EV usage. Figenbaum and Kolbenstvedt [2] in their research report considered electromobility with regards to the experience in Norway. Their major finding was that the Norwegian EV policy, with its many incentives and the establishment of Transnova (a body giving financial support to charging facilities), has reduced the barriers for E-mobility, i.e., the purchase and use of EVs. They further observed that EV users are typically men in multi-car households located in the largest city suburbs. In addition to these studies, there are a plethora of websites that both monitor and encourage the use of EVs in Norway and abroad; hence they often produce short articles about EVs in Norway; see, for instance, *Gronnbil.no*; *elbil.no* and; *Eurocitie.eu*.

Another interesting issue in the literature is a disagreement on whether Norwegian EV policy works as intended. Holtsmark [5] addresses this question. He concludes that EV owners should not be exempted from paying for road use, parking fees and the energy they use and that it is difficult to see why EVs should have access to bus lanes. Figenbaum and Kolbenstvedt [2], however, disagrees with Holtsmark [5] and concludes that the Norwegian EV policy does work as intended. In another critical study of Norwegian EV policy, Holtsmark and Skonhoft [6] investigated the Norwegian support and subsidy policy for EVs. They found that the usage of EVs implies very low costs to users on the margin and that it leads more driving at the expense of public transport and cycling. Moreover, because most EVs have a short driving range, the policy gives households incentives to purchase a second car, again stimulating the use of private cars instead of public transport and cycling. Their conclusion is that the Norwegian EV policy should be terminated as soon as possible and that this policy should not be implemented by other countries. Others dispute these conclusions from the perspective of reaching climatic goals. For instance, Figenbaum and Kolbenstvedt [2] find that not only Norwegian but also European climatic goals for average emissions from new cars can be reached with increased electro-mobility i.e., extensive use of EVs. The dispute among these Norwegian authors can be further explored by examining the international literature addressing similar situations in countries comparable to Norway such as Sweden. Hultkratz and Liu [7] make a before–after comparison that indicates that the impact of the road toll in Stockholm on traffic volumes was smaller when the system was re-opened in 2007 compared to the effect during the trial period in 2006. They found that the growth in the share of exempted "green" cars and the decision to make charges deductible from income taxes would considerably reduce the positive welfare effect of the toll at the time when the "green" car exemption was abolished. What can be deduced from the literature is that socio-economically, Norway's EV policy is not optimal, but may be the way forward to meet climate change.

3 Methodology and data

The nature of this study implies a methodological approach that combines the analysis of source data and the inherent incentives in the Norwegian EV policy, and relatively simple statistical procedures to examine the adverse effects of those incentives with respect to the Oslo toll ring case study. Figure 2 illustrates the effects of those incentives and their data sources.

To describe the incentives behind the observed increase in the purchase and use of EVs, we simply use information available on Norwegian EV organizations' websites such as the Norwegian Electric Vehicle Association (elbil.no) and the Norwegian Green Vehicle organization (gronnbil.no). Further, we supplement this information with previous studies such as Figenbaum and Kolbenstvedt [2].

To examine the adverse effects of the EV policy and to estimate the external costs to society in the case of Oslo, we use relatively simple statistical procedures. For instance, to calculate the revenue loss for the Oslo toll ring, we multiply the number of EVs crossing the toll by the toll rates they would have paid. Furthermore much of the message that this paper conveys is obtained by comparing data on costs between conventional vehicles and EVs that is readily available from the Norwegian Electric Vehicles Association (Elbil.no).

Data on traffic were mainly gathered from the Oslo toll ring company. The data included toll rates and the number of vehicles crossing the tolls divided by different vehicle categories, e.g., EVs, non-EVs, heavy passenger vehicles, etc. Data on congestion costs was taken from Rekdahl et al. [11]. These costs were then multiplied by the number of EVs in the toll ring to derive the external cost of EVs. Data on CO_2 emissions were taken from the NPRA's handbook for impact assessment.

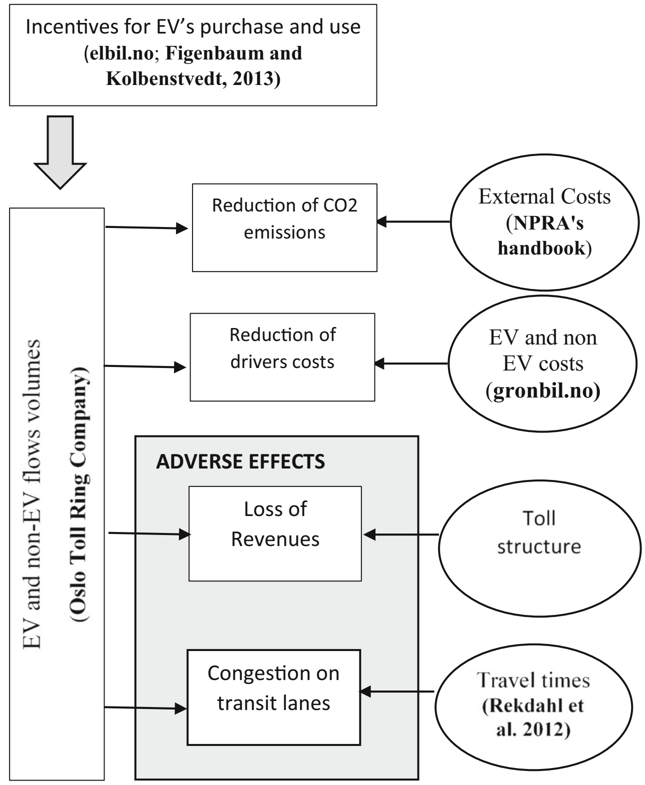

Fig. 2 Illustrating the effects of EV incentives and their data sources

4 Benefits of incentives to purchase and use EVs in Norway

The Norwegian EV incentive scheme has gradually developed over the years and dates back to 1990, when the government exempted EVs from import and value added tax on a trial basis. This exemption became permanent in 1996. In the following year, 1997, EVs were exempted from road tolls in Norway. From this point on, a host of incentives have been implemented including exemption from using transit lanes, reduced company car tax, and exemption from car ferry fares. The overall goal of these EV incentives has been to bring the purchase and use of EVs up to or beyond par with that for similar conventional vehicles in Norway. An objective of the government has been to achieve a proportion for the EV fleet in the Norwegian road network of approximately 10 % by 2020. A list of the incentives in place to meet these government objectives and the time that they became permanent is shown in Table 1 below.

4.1 Savings for EV users

To understand how powerful the above incentives are, consider first the exemption from taxes. Conventional vehicles are heavily taxed in Norway compared other comparable European countries. Import duties on vehicles are charged according to their weight, CO_2 emissions, motor effects and

Table 1 The implemented EV incentives

Incentive	Trial-period	Permanent year
Temporary Exemption from on-off registration tax	1990–1995	1996
Exemption from annual vehicle tax	–	1996
Exemption from road tolls	–	1997
Exemption from parking fees on municipal owned parking facilties	–	1999
Reduced company car tax	–	2000
Exemption from VAT		2001
Temporary use of transit lanes	2003–2005	2005
Parmanent use of transit lanes	–	2005
Further reduction in company car tax		2009
Exemptionion from paying car ferry fees	–	2009

NOx emissions. In addition, there is an additional Valued Added Tax (VAT) of 25 % of the purchase value. EVs are completely exempted from these import duties (taxes) and the VAT; see Table 1. The impact of these tax exemptions is that the total cost of vehicle ownership for EVs generally compares favorably with that of conventional vehicles.

According to the government program, the current tax benefits for the purchase and use of EVs will be sustained until the year 2017, as long as the number of EVs in road traffic does not exceed 50 000 vehicles. Perhaps because of this limit, the last 3 years have seen an explosion in the purchase and use of EVs in Norway, as observed in Fig. 1; consumers are striving to enjoy the tax benefits of EVs while they still can, and they are not necessarily being environmentally friendly. With the entry of Tesla in the EV market and the emerging battery technology that allows EVs to continually cover longer distances, the total cost of owning an EV is also becoming favorable in terms of distance covered compared to conventional vehicles.

Yet another powerful EV incentive shown in Table 1 is related to cities and thus may be another factor in Oslo's status as the capital city of EVs. EVs are allowed to access transit lanes and, in addition, are exempted from paying road tolls, which are very common in the larger cities of Norway. The use of transit lanes is convenient and readily converts to time savings, especially during rush hour. Because time saved is equivalent to money, this too is an economic benefit. Adding these benefits to the exemption of road tolls, the economic benefits of owning and using EVs represents a formidable cost savings that further induces the purchase and use of EVs in cities.

There are other additional powerful economic incentives reported in Table 1 that encourage the purchase and use of EVs within and outside of cities in Norway. These are as follows: (1) EVs are exempted from paying the numerous car ferry fares on the national road network, (2) EVs have only a 50 % taxable benefit if used as a company car, (3) EVs are exempted from parking fees in all municipality-owned parking spaces, and (4) in municipality owned parking spaces, battery charging is free.

From the discussion above, it is quite clear that the sole incentive behind the formidable increase in the purchase and use of EVs in Norway is economic motivations, whereby EV road transport users (EV car users) obtain financial gains that would not be possible with the use of a conventional vehicle.

This is confirmed by a comparison between users' attitudes towards purchasing an EV in Norway with Sweden and Denmark, where such benefits are not available. Figure 3, shows results from a survey by Michelin [9], asking about the main reasons for buying an electric car including the price of EVs compared to conventional vehicles, differences in taxes, whether or not free parking was available for EVs, etc.

The responses are revealing and are in accordance with the EV incentives in Norway: Norwegian respondents would, more than their Scandinavian counterparts, consider purchasing an EV because overall costs such as purchase price, taxes, parking, and tolls are low or equal to zero. This enforces our earlier observation that EVs are purchased and used because of the incentives put in place by the government and economic motivations.

To underline the observations above with regards to the available EV incentives in Norway, the operational cost of using an EV is compared to that of using a conventional vehicle through a 5-year period in Table 2.

Based on Table 2, consider a Norwegian vehicle user as a rational consumer who wants to save on the operational costs of using his vehicle. Per year, the EV user saves 3 275 euros: 273 euros monthly and 16 375 over a 5-year period. This is a large amount of savings that certainly encourages Norwegians to buy and use in EVs, especially in cities with scarce parking spaces and costly road tolls. Finally, consider a Norwegian study conducted in July 2014 to infer why Norwegians buy EVs. Figure 4 summarizes the results of that study.

Figure 4 confirms the results in Table 2 to the extent that the main reason for buying EVs is that they are cheaper to purchase and use compared to conventional vehicles. From these

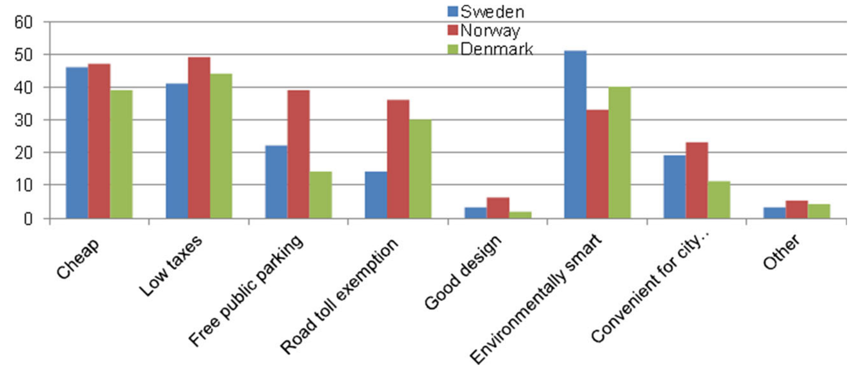

Fig. 3 Reasons for wanting to buy an electric car at next vehicle purchase in Sweden, Denmark and Norway. Source: Michelin [9]

results, we conclude that economic incentives have led to the observed explosion of EV purchase and use in Norway.

4.2 External cost reductions

Incentives to use EV can have also a positive effect in terms of greenhouse gas emissions. By considering the CO2 emission by type of vehicle multiplied by the cost of CO2 per ton emitted according the Norwegian Handbook for impact assessment, the gains of changing from a conventional vehicle to an EV can be derived. Table 3 provides such a calculation; data for emissions by different vehicles were obtained from ofvas.no.

As is evident from Table 3, moving from a conventional vehicle to an EV represents an average cost savings in terms of CO2 emissions. Note the low cost savings from moving from an Opel Ampera to an EV (Nissan Leaf); this is because Opel Ampera is plug-in hybrid and thus does not emit as much as a conventional vehicle such as the Volvo V60. Further note that these costs are per km; to derive the cost per year for each car, the figures must be multiplied by the average distance covered, which is assumed to be 13,300 per year. For instance, the per year CO2 cost for Volvo V40 is 13,300*0.0024 = 32 Euro. The last column of Table 3 shows the estimated annual savings for 2015.

A caution is now necessary with regards to the potential reduction in CO2 emissions by EVs. This reduction depends on how the electricity used in EVs is generated. In areas where coal dominates in the production of electricity, such as China, EVs perform more poorly than the most fuel-efficient gasoline cars; see, for instance, Ji et al. [8] and Holtsmark [5]. Therefore, the Norwegian strategy for EVs should not be implemented by other countries without considering the main source of electricity production. For Norway, the strategy is reasonable in this respect because electricity is produced through hydropower.

Marginal external costs—or the negative externalities of road transport—refer to the costs that vehicles inflict on other agents or on the environment. Typically, such external costs include air pollution, noise, congestion, accidents, infrastructure damage (wear), operations and, of course, CO2 or greenhouse emissions.

It is often difficult to quantify all of the elements of marginal external costs for vehicles because such costs vary by, e.g., vehicle type, where the transportation occurs, and the geographic position of vehicles. However, in many European countries, attempts are often made to

Table 2 Comparing the operational cost of an EV and a conventional vehicle through a 5-year period (source gronnbil.no period)

Values in Euros (1 Euro = 8.8 NOK 2015)					
Cost	Nissan LEAF	VAT share	Conventional vehicle	VAT share	Difference
Loss of value	12 516	0	13 091	2 618	−575
Financing	3 830	0	5 182	0	−1 351
Annual tax	230	0	1 639	0	−1 409
Maintenance	2 273	455	2 614	523	−341
Energy	1 705	341	8 949	1 790	−7 244
Parking	0	0	1 364	2 727	−1 364
Road tolls	0	0	4 091	0	−4 091
Sum	20 554	795	36 929	7 658	−16 375
Per year	4 111	159	7 386	1 532	−3 275
Per month	343	13	615	128	−273

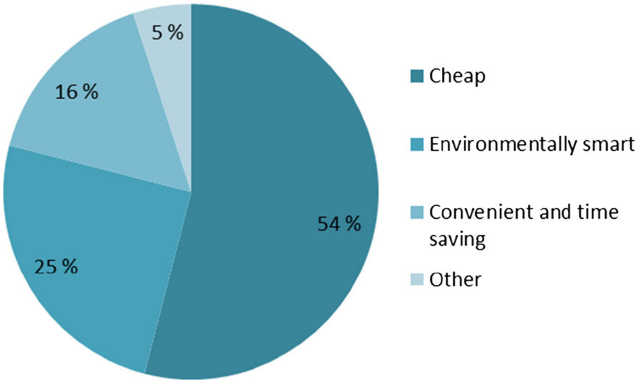

Fig. 4 Main reasons for buying an EV. Source: elbil.no

derive such marginal external costs per kilometer driven and by vehicle type. In the case of Norway, such derivation was recently made by Thune-Larsen et al. [13]. In that report, however, EVs were not included because the calculation of the marginal cost of CO2 was not possible at the time. The report concluded that the marginal external cost for EVs would not be too different from that for conventional vehicles because the marginal external cost of CO2 is expected to be small. In Table 4, we report the results from Thune-Larsen et al. [13].

As the table shows, most of these marginal external costs will also be caused by EVs. For instance, accidents are by far the largest component of marginal external costs, and there is no reason to believe that EVs are less prone to accidents compared to their conventional counterparts. In fact, due to the noiseless characteristic of an EV, some believe that EVs are more prone to accidents involving pedestrians and especially those who are blind, visually and hearing impaired. Therefore, we believe that the marginal external costs of EVs are almost the same as those of conventional vehicles; our calculation for CO2 cost per km gave a value of 0.0024 Euro, which should be added in the table above for the conventional vehicle. However, this is a small value and barely has an effect on the sum of the marginal external costs.

Table 3 Marginal external cost per km with regards to CO2. Source: ofvas.no and SINTEF [12]. (*1Euro = 8.8NOK 2015*)

	g/km	Cost/km	Average cost per car per year	Annual savings 2015[a]
Nissan Leaf	0	0	0	0
Opel Ampera	27	0.0006	9	671,682
Volvo V40	101	0.0024	32	2,512,587
VW Golf	114	0.0027	36	2,835,989
Volvo V60	118	0.0028	37	2,935,497

[a] Estimated number of EVs

5 The adverse effects of EV incentives

The Norwegian EV incentive was initiated to promote the use of alternative fuels and more environmentally friendly technology. To this end, the incentives must be regarded as highly successful in the sense that they have led to the increased purchase and use of EVs in Norway and hence have led to a reduction in greenhouse gas emissions. From this and strictly speaking, the only economically efficient incentive to achieve greenhouse gas reduction should be the gasoline tax, which is presumably set to account for emissions ([10]:8). However, because EVs do not consume gasoline and hence are already exempted from gasoline taxes, exemptions from purchase duties may be regarded as just enough to induce their use. All other forms of incentives, such as in the Norwegian case, have severe adverse effects as follows:

- *Exemption from tolls*. Tolls are meant to finance road infrastructure, which is needed by all types of vehicles including EVs. Exempting EVs from tolls has an adverse effect because it reduces toll income, leading to the insufficient and untimely supply of road infrastructure; it is counter-intuitive. The same argument can be used against exemptions from paying for ferry services.
- *Exemption from parking fees*. Parking fees are meant to reflect the alternative cost of parking spaces. EVs occupy parking spaces just like any other vehicle and, hence, should pay for their use of the parking space. Free parking for EVs amounts to economic loss; the incentive is hence an adverse effect.
- *Use of transit lanes*. Transit lanes are reserved for public transport in urban areas as a means of encouraging the use of this transport. All other users of transit lanes, especially during rush hour, will lead to adverse effects in terms of congesting transit lanes, incurring additional travel costs for public transport users.

Below, we illustrate the magnitudes of some of these adverse effects.

5.1 The study case of Oslo toll ring

The adverse effects of EV incentives discussed above can be elaborated by using observations from the Oslo toll ring. Consider, first, the use of transit lanes by EVs. Figure 5 shows the percentage delay in travel time on transit lanes by week of the year and number of EVs on two road segments along route E18 in the Oslo region. It is clear from the figure that the travel time on transit lanes has increased and is proportional to the increase in EVs using transit lanes; in week 10, the travel time in transit increased by a formidable 15 and 30 %, respectively, for the two road segments from 2013 to 2015. For the 90th percentiles, i.e., the point below which 90 % of the

Table 4 Marginal external costs (Euro) in Norway without CO2 (source: Thune-Larsen et al. [13]) (*1Euro = 8,8NOK 2015*)

	Air pollution	Noise	Congestion	Accidents	Infstrastructure damage	Operations	Sum
Petrol	0.01	0.00	0.01	0.04	0.00	0.01	0.06
Diesel	0.02	0.00	0.01	0.06	0.01	0.01	0.11
LPG	0.01	0.00	0.01	0.04	0.00	0.01	0.07
CNG	0.07	0.01	0.04	0.04	0.03	0.01	0.19

observations fall, the travel time delay is even higher, as it has increased by 40 and 50 %, respectively, in week 10 from 2013 to 2015.

This clearly illustrates that allowing EVs to use transit lanes has an adverse effect on road-based public transport.

Next, consider the loss of toll revenues as a result of EVs being exempted from road tolls in the case of Oslo. The current Oslo toll ring system was implemented in 1990 to generate funds for road investments in the larger Oslo area. Currently, approximately 60 % of toll income is being used for investments and for the maintenance of public transport. The use of a large share of toll income on public transport may be seen as strategy to induce people to use public transport. It follows then that if EVs are exempted from paying tolls, toll revenue from the toll ring will decrease.

We estimated the expected revenue loss for the 2012–2020 period. We assumed that the number of EVs passing toll points will continue to double, i.e., increase by 100 % annually until 2017. After this point, the increase is expected to be less than double because we expect the government to remove some of the adverse incentives in 2017, leading to fewer people being willing to purchase EVs. Revenue loss in year *t* (RL_t) is calculated by multiplying the number of EVs (EV_t) with the toll price (p_t):

$$RL_t = EV_t \times p_t \tag{1}$$

Using the current toll price of 30 NOK, the calculated revenue loss in the year 2012 was

$$RL_{2012} = EV_{2012} * p_{2012} = 814047*30 = 24\,421\,410 \quad \text{NOK} = 2775160 \ \text{Euro} \tag{2}$$

Table 5 shows the annual revenue loss for the period 2012–2013 and the annual expected revenue loss for the period 2014–2020. It is clear from the table that exempting EVs from paying tolls leads to large revenue losses, which for the year 2012 was at 2,7 million Euro and which is expected to be a formidable 95 million Euro for the year 2020; based on the assumptions discussed above.

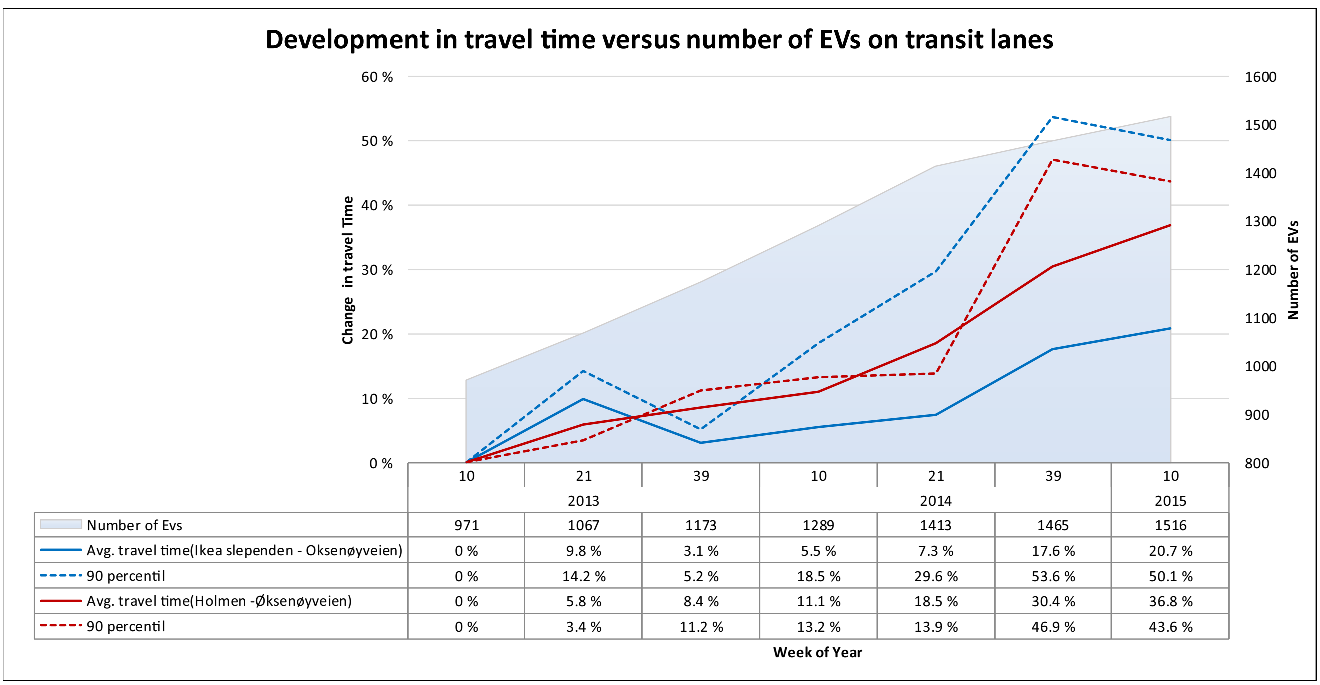

Fig. 5 The adverse effect of EV incentives on travel time in transit lanes (source: Unpublished traffic counts, Norwegian Public Roads Administration (This data is available on request to the authors.) (vegvesen.no))

Table 5 Revenue loss and expected revenue loss. (*1Euro = 8.8NOK 2015*)

	Euro in Mill
Annual revenue loss 2012–2013	
2012	2,7
2013	5,7
Annual expected revenue loss 2014–2020	
2014	11,3
2015	22,6
2016	45,2
2017	90,5
2020	95

It should be here noted that we are not the first to note the danger of these incentives. For instance, Halvorsen and Frøyen [3] noted that there is good reason to question whether maintaining these incentives in the form they have today is desirable for the urban transport situation and land use in the long term. To this, we add that the adverse effects of the Norwegian EV incentives are so many and so large that any country wishing to encourage the use of EVs should not follow them without care.

6 Concluding remarks

The objective of this paper has been to explore the reasons behind the tremendous increase of EVs in Norway that has led Norway to be the number 1 country for EVs. We find that the Norwegian government has used a wide range of economic incentives that have made EVs much cheaper to purchase and use. Among the incentives are exemptions from taxes, toll charges, parking fees and access to transit lanes. Translated into money, these incentives are a huge savings and naturally have induced Norwegians to buy and use EVs in large numbers. We also find that many of these incentives have some unintended effects. For instance, exemption from toll payments has resulted in a reduction in toll revenues, and access to transit lanes has resulted in congestion on those lanes, leading to increased travel time for public transport users. We note and illustrate why such types of incentives should not be given to EV users. Furthermore, the ability of EVs to reduce greenhouse gas emissions depends on how electricity is produced. Our conclusions are therefore that the incentives have helped increase the number of EVs and, as a consequence, reduced greenhouse gas emissions. However, we warn that the Norwegian incentives have led to adverse effects and should not be copied by other countries; it also matters how electricity, which is fuel for EVs, is produced—only hydropower produced electricity, as in Norway, offers a positive impact on greenhouse gas emissions.

Acknowledgments We thank Professor Pierluigi Coppola at the University of Rome Tor Vergata for very useful comments while writing this paper. Any shortcomings are however, ours. We also thank the Norwegian Public Roads Administration for sponsoring this study.

References

1. Euro Cities (2014) Oslo, electric vehicle capital of the world. http://wsdomino.eurocities.eu/eurocities/news/Oslo-electric-vehicle-capital-of-the-world-WSPO-9R6ECM
2. Figenbaum E, Kolbenstvedt M (2013) Electromobility in Norway-experiences and opportunities with Electric vehicles. Institute of Transport Economics, Norway. Report No. 1281/2013
3. Halvorsen B, Frøyen Y (2009) Trafikk i kollektivfelt. Kapasitet og avvikling. Elbilens rolle. Rapport fra Asplan Viak
4. Hannisdahl OH, Malvik HV, Wensaas GB (2013) The future is electric! The EV revolution in Norway–explanations and lessons learned. In: EVS27 International Battery, Hybrid and Fuel Cell Electric Vehicle Symposium. Barcelona
5. Holtsmark (2012) Elbilpolitikken – virker den etter hensikten? Samfunnsokonomen nr 5 2012
6. Holtsmark B, Skonhoft A (2014) The Norwegian support and subsidy policy of electric cars. Should it be adopted by other countries? Working paper series No. 2/2014. Norwegian University of Science and Technology
7. Hultkratz L, Liu X (2012) Green cars sterilize congestion charges: a model analysis of the reduced impact of Stockholm road tolls. Elsevier
8. Ji S, Cherry CR, Bechle MJ, Wu Y, Marshall JD (2012) Electric vehicles in China: emissions and health impacts. Environ Sci Technol 46:2018–2024
9. Michelin (2013) Intervjuundersøkelse om dekk og bilbruk. Datautskrifter fra PFM Research. Michelin Nordic, Oslo
10. NOU (2007:8) En vurdering av særavgiftene. Report appointed by the Ministry of Finance in Norway
11. Rekdal J, Larsen OI, Steinsland C, Zhang W (2012) Eksempler på analyser av køprising med TRAMOD_BY, rapport 1208. Møreforskning Møre AS
12. SINTEF (2011) Dokumentasjon av modul og beregning av energibruk og klimagassutslipp i EFFEKT.
13. Thune-Larsen H, Veisten K, Rødseth KL, Klæboe R (2014) Marginal external cost of road transport. Institute of Transport Economics, Norway. Report 1307/2014