

Norway's Promotion of Electric Vehicles

Updated in August, 2021

Tools of Change Illustrated

- ▶ Incentives
- ▶ Overcoming Specific Barriers

Results

- ▶ Achieved the highest market penetration of electric vehicles per capita in the world

Initiated by

- ▶ Norwegian Government

Location

- ▶ Norway

Introduction

Several policies / incentives, in place over an extended period, have made Norwegians more likely to purchase electric vehicles (EVs) than people in any other country. These incentives have included: exemption from vehicle registration and high purchase taxes, reduced road tolls, free parking, and access to some bus lanes. A similar long-term approach could be adapted for other big-ticket purchasing behaviors where the impact justifies the expense – for example energy-efficient home / building retrofits and appliances.

Background

Note: To minimize site maintenance costs, all case studies on this site are written in the past tense, even if they are ongoing as is the case with this particular program.

Norway actively supported the adoption of zero emission vehicles since the 1990's. Its electric cars were close to zero-emission as 98% of its electricity came from hydropower. Switching to vehicles powered by electricity rather than fossil fuels was therefore a practical option for reducing air pollution, including greenhouse gas emissions.

Getting Informed

Barriers

Consumer surveys indicated that the key barriers to Norwegians purchasing an electric vehicle were the additional purchase cost and lack of information. Range anxiety was less important, and Norwegians had a strong preference for home charging. This was corroborated by the relatively low use of the public charging infrastructure, once in place.

Motivators

According to surveys, lower operating costs, followed by environmental concerns were the two most important motivators. However, norm appeals and/or word-of-mouth (social diffusion) were also important; a 2017 survey found that on average each electric car owner had inspired 2.4 other people to purchase an electric car.

Targeting the Audience

This program focused on people who bought new cars.

Delivering the Program

Incentives

Norway provided a number of financial incentives for battery-powered vehicles. These generally paid for themselves, with taxes on standard cars generally covering the cost of the financial incentives.

The following taxes were charged on standard vehicles. Electric cars were partly of fully exempt from the first nine.

1. 25% Value Added Tax (VAT) (exempt)
2. Graduated vehicle registration tax (exempt)
3. Reregistration tax on second hand sales (exempt)
4. Annual circulation (ownership) tax (exempt)
5. Fuel tax (not applicable)
6. Road tolls (exempt or partly exempt)
7. Ferry fares (lower fees)
8. Public parking fees (often fully exempt)
9. Income tax on private use of company cars (lower rates)
10. Weight and Euro-class-graduated annual ownership tax on heavy-duty freight vehicles

These ten funds paid for the following financial incentives.

1. Exemption from the above taxes for electric vehicles, set to more than compensate for the higher price of an electric vehicle compared with a conventional one.
2. Government support for fast charging and hydrogen refueling facilities
3. Free recharging of electric vehicles at public parking lots
4. Subsidy on new battery or fuel cell electric light commercial vehicles
5. Subsidies on zero emission heavy-duty vehicles and machinery

In addition, gas taxes and gas prices were relatively high in Norway, making it relatively costly to drive a gas-fueled car, and battery-powered vehicles were able to use bus lanes.

Key milestones are outlined below (based largely on Wikipedia).

1990	<ul style="list-style-type: none"> • Temporary (trial) exemption from import tax
1996	<ul style="list-style-type: none"> • Import tax exemption made permanent • Annual registration tax reduction introduced
1997	<ul style="list-style-type: none"> • Exemption from road tolls introduced
1999	<ul style="list-style-type: none"> • Identifying letters ("EL", "EK" and "EV") introduced on license plates of electric vehicles to facilitate the enforcement of EV incentives and perks. It had the added benefit of raising the visibility of these vehicles (norm appeal, word of mouth) • Free parking in public places introduced • Free passage through toll booths introduced
2000	<ul style="list-style-type: none"> • Reduced company car tax introduced
2001	<ul style="list-style-type: none"> • VAT tax reduced from 25% to 0
2003	<ul style="list-style-type: none"> • Access to bus lanes tested in Oslo
2005	<ul style="list-style-type: none"> • Access to bus lanes launched nation-wide
2009	<ul style="list-style-type: none"> • Free access to road ferries introduced
2012	<ul style="list-style-type: none"> • Incentives extended until 2018, or when the 50,000 EV target is achieved
2015	<ul style="list-style-type: none"> • Incentives extended through 2017 after achieving 50,000 EV target, with a gradual reduction of incentives gradually starting in 2018 • Local authorities got the right to decide for their own regions if EVs could use bus lanes and get free parking

This combination of incentives enabled Norway to meet its target (50,000 EV), in the process becoming the worlds' greatest per-capita purchaser of EVs.

Charging Infrastructure and Overcoming Barriers

While range anxiety was a lower barrier than others, Norway still saw public charging points as important, as they ensured interregional access and were essential for electric car owners that do not have access to a reserved parking place. Norway therefore ensured an adequate distribution of charging stations early in the program. (*Overcoming Specific Barriers*)

The following table lists the key barriers to action and how they were addressed.

Barriers	How they were addressed
Higher cost of electric cars compares to conventional ones	<ul style="list-style-type: none"> Reduced the up-front cost of purchasing a new vehicle by exempting new electric vehicles from vehicle registration and high purchase taxes
Entrenched car purchasing habits	<ul style="list-style-type: none"> Reduced relative operating costs by keeping taxes high on gasoline, and by providing some free parking and lowering road tolls for electric vehicles Provided time savings by allowing these vehicles access to some bus lanes

Critiques

Criticisms of the approach have included the following.

- High public subsidy compared to the value of the reduced [carbon footprint](#) of electric vehicles
- Traffic congestion in some bus lanes due to the increased number of electric cars
- Some people bought an electric vehicle as a second car instead of taking buses and trains

- Loss of revenue for some ferry operators due to the large number of electric cars exempted from payment

Shortage of parking spaces for owners of conventional cars

Measuring Achievements

Two measures were used.

1. EV share of new car sales
2. EV share of cars on the road

Results

Impacts - Individual participants

- In 2018 and 2019, Norwegians were much more likely to buy an electric car than people in other countries (see details below).
- In March 2019, Norwegians were more likely to buy an electric car than a gasoline-powered one. This is the first time it has happened in any country world-wide.

Impacts - Overall

- In March 2014, Norway became the first country with at least 1 in every 100 passenger cars on the road that were battery-powered.
- In 2015, Norway achieved its target of selling 50,000 EVs
- By December 2016, 5 in every 100 passenger cars on the road in Norway were battery-powered.
- By December 2018, 10.7 in every 100 passenger cars on the road in Norway were battery-powered. In comparison, the USA had 0.45 cars (California had 2.1), Sweden had 0.6 cars, and Europe on average had 0.5 cars per 100 passengers.
- In March 2018, Norway had the world's largest plug-in segment market share of new car sales at 49.1%. The next highest

share for new cars was Iceland at 19%. Canada had 2.1% B.C. was third in North American jurisdictions at 4.0%, behind California at 7.8%, and Washington state at about 4%).

- In March 2019, Norway recorded the first ever month where electric vehicle sales had a majority market share (58%) over traditional petrol and diesel vehicles. Norway had the highest market penetration of electric vehicles per capita in the world (10% of all passenger cars on the road).

Notes

This approach can be used elsewhere to promote electric vehicles. That said, Norway has had the added advantage that Norwegians drive relatively short distances, so relatively inexpensive electric cars with relatively short ranges have been more practical than in countries like Canada and the USA. However, this difference is becoming less important as technologies evolve (e.g. affordable new batteries that allow for greater ranges.)

While Norway has been in a unique position to pioneer the introduction of electric vehicles, its model of providing a range of suitable incentives to overcome key barriers, paid for by taxing more polluting vehicles, is nonetheless widely replicable for the following reasons. This is not to say that all their policies would work in all other contexts.

- The overall approach is to use taxes on standard vehicles to pay for incentives for purchasing electric vehicles. Such programs can cover their own costs this way, or at least reduce public funding required.
- Large incentives were required initially to offset the higher initial cost of electric cars. However, this cost difference has

narrowed over time as more electric vehicles are manufactured and is expected to become insignificant soon.

- While travel distances tend to be shorter in Norway than in regions like North America and Australia, battery innovations have more than doubled the distance that an average electric vehicle can go before needing to be recharged. This, combined with well-distributed public charging stations and much shorter recharge times, is helping to minimize range anxiety.
- Multiple countries are now collaborating to foster the spread of electric vehicles. The Electric Vehicle Initiative is a multi-government policy forum established in 2009. In 2017, its 13 member countries set a collective aspirational goal of 30% market share for electric vehicles (for passenger cars, light commercial vehicles, buses and trucks) by 2030. Eight members, including Norway, committed to electrify their own fleets (Government Fleet Declaration.)
- While Norway is contextually unique and its approach required multiple levels of buy-in/support, the following table reflects the growing number of countries, operating under different conditions, that have been able to achieve effective policies and incentive/disincentive structures.

Country	Incentives for Electric Vehicles / Disincentives for Other Vehicles	Impact as of 2021
China	Purchase incentives, scaled to car range. The incentives were reduced in 2019 and were to expire in 2020 at the height of the COVID pandemic. However, when sales started to plummet the	Sells more electric vehicles than any other country – roughly half of sales worldwide; also has a huge population

	incentive was extended for two more years and sales rebounded.	
France	Purchase incentive – initially 6,000 Euros, up to 27% of vehicle value Scrappage incentive for retiring older petrol or diesel models - up to 2,500 Euros. Surcharge for highest emitting cars – up to 10,000 Euros	Fourth in terms of number of electric vehicles sold each year
Germany	Purchase incentive – initially 4,000 Euros Exempt from vehicle tax for up to 10 years 50% reduction in income tax assessed on vehicle ownership Tax bonus based on battery size; amount per battery was reduced each year	Next to China, sells the most electric vehicles each year
Iceland	Like Norway, Iceland has low electricity prices paired with high fossil-fuel prices VAT sales tax discounts and exemption until 2020 The City of Reykjavik offers free charging as well as time-limited free parking for low-emission vehicles. Excise tax based on CO2 emissions and waived for pure electric cars	Third most electric vehicles per capita Starting in 2020, the majority of new car sales have been electric vehicles
Netherlands	No vehicle tax until	Fifth most

	2020 Company car drivers who also use the vehicles privately, pay income tax of only 4% of the sales value when selling an electric car, rather than 22%. Vehicle registration tax based on CO2 emissions and waived for pure electric cars	electric vehicles per capita
Sweden	Purchase incentive – initially 60,000 Swedish Krona (5,700 Euros) up to 25% of vehicle value For companies, the purchase incentive cap is 35% of the increased cost compared with a similar petrol or diesel vehicle. The incentive is reduced for every gram of CO2 emitted per km	Fourth most electric vehicles per capita
USA	Federal taxes that depend on fuel consumption are waived Tax credit of up to 7,500 US dollars per buyer for up to 200,000 units per manufacturer Some US cities gave HOV access to low-emission vehicles until they became more common	Second to Norway in number of electric vehicles per capita Third in terms of number of electric vehicles sold each year

Further Reading

https://en.wikipedia.org/wiki/Plug-in_electric_vehicles_in_Norway

<https://www.nsenegybusiness.com/news/electric-vehicle-registrations-europe-norway/>

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This case study is also available online at <http://www.toolsofchange.com/en/case-studies/detail/729>

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