

Summary:

The cost of free parking for electric vehicles

In order to increase the number of vehicles operated by electricity or hydrogen the Norwegian central government and local authorities offer certain advantages like the right to use bus lanes, free battery charging, free passing of toll stations etc. Such vehicles may also park for free in publicly owned parking spaces. This usually means the regular street parking. It has now been proposed that these vehicles be allowed free parking even in private, off-street parking structures and lots.

The purpose of this project is to estimate what the cost would be, in terms of foregone revenue, to private and public parking operators.

The introduction of such regulations may have many effects, most of them difficult to foresee. They will vary with how the regulation is practiced. A number of spaces in private parking facilities may be reserved for certain vehicles or they must "compete" with regular cars running on petrol or diesel. It is a question how the advantages also influence on the choice of destination. We assume that the privileges given to electric and hydrogen driven vehicles will increase the share of such vehicles in the central business district (CBD) of a city.

The basis for an estimate of the future number of vehicles driven by electricity or hydrogen is the national program for achieving climate goals by 2020 (Climate Cure 2020). The program provides a basic estimate for the number of electric vehicles, stating that free parking for electric vehicles is a prerequisite for achieving goals for reduced greenhouse gas emissions.

The calculations in this project are based on a number of assumptions. We have to assume how the rolling stock will be used. We assume that the number of parking spaces is constant in the period 2010-2020. This means that the competition for finding a parking space will increase, which further may influence the fees being charged.

Two CBDs are used to illustrate possible effects. In the central part of Oslo, parking is scarce. There are few parking spaces on the streets. In private off-street structures there are many more spaces. However, even if these facilities are in heavy demand, they are seldom fully occupied. The cost of parking is assumed to balance the demand.

In the centre of the smaller city of Sarpsborg (appr. 52000 inhabitants) it is easy to find a parking space, and the cost of using the spaces is low.

The calculations are done for two alternatives:

A: Electric and hydrogen vehicles may use any parking space – the demand for such parking is not limited.

B: 3 % of the existing parking spaces are reserved for electric or hydrogen vehicles. These are assumed to be reserved spaces with facilities for battery charging.

Table S1. Oslo. Aggregated loss of revenue from parking in central Oslo (inside Ring road 1) for the period 2012-2020. Millions NOK - 2010 value

Alternative	City	Private	Sum
A	356	1055	1411
B	267	56	323

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Table S2. Sarpsborg. Aggregated loss of revenue from parking in central Sarpsborg (inside the zone where a fee is charged today) for the period 2012-2020.

Millions NOK - 2010 value

Alternative	City	Private	Sum
A	1.9	1.6	3.5
B	0	0	0

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In Oslo the loss may become significant. Under alternative A, it is especially the private operators/owners who will experience the impact. Under alternative B, the city will incur the greater loss. This is explained by the limited access to free parking in the private facilities, while all spaces on the street level will, as they are today, be available to electric and hydrogen driven vehicles for free.

In Sarpsborg there will be a small impact with alternative A. Because a large part of the spaces are owned by the city, the city itself will be harder hit than the private operators. Alternative B is not found to entail any loss, as there are a lot of empty spaces today. Supply exceeds demand.

The calculations are made by an Excel spreadsheet, that could easily be adjusted through improved input data, or it could be expanded to become a more advanced program. We have tested the sensitivity of the spreadsheet by comparing loss of revenue under alternative assumptions regarding growth of demand. We use a factor describing the relationship between the rate of growth of demand for parking spaces from users of electric vehicles and the rate of growth of ownership of such vehicles. For the case of Oslo the results shown are based on a factor of 0.4. If instead we use factors 0.3 or 0.5, we find great differences. The total loss under alternative B is, for example, more than doubled if we use the factor 0.5 instead of 0.4.

There are considerable uncertainties surrounding these calculations. The results should therefore only be considered as indications of possible financial effects. There are a host of other factors which may influence the total financial result, that are not considered in this report.