

Summary:

Ebikes – who wants to buy them and what effect do they have?

TOI Report 1325/2014

Author(s) Aslak Fybri and Hanne Beate Sundfor:

Oslo 2012, 58 pages Norwegian language

While sales of electric bicycles has increased in several European countries, the sale figures in the Norwegian market has so far been low. In a regional survey in Oslo and Akershus a number of people were recruited to try an ebike over a few weeks. The results show that ebikers have a very positive experience of using the ebike, that they ride their bike far more than they otherwise would, and that the willingness to pay for an ebike increases once you have experienced its benefits. Knowledge of the ebike and the price level affects the desire to buy an ebike, and if you can convince people that they can save time and have a comfortable journey with an ebike, there will be great opportunities to get new travelers over to the bicycle.

In several European countries, sales of electric bicycles (ebikes, pedelecs) has grown tremendously in recent years. In Norway, with our steep slopes, sales figures have so far been low. We have little knowledge of why this is the case. In order to learn more about this, it is of interest to know who the potential customers are, what kind of transportation they would otherwise have chosen and how ebikes are used. Through data collected in a survey, and through a practical experiment in following research questions related to electric bike are addressed:

- Who is interested in buying ebikes, and what are the characteristics of potential customers?
- How much increased cycling can ebikes lead to and to what extent can they help to reduce motorized traffic?
- What role can ebikes play to overcome people's barriers to cycling?

In June 2013 a web survey was conducted. 5466 people in Oslo and Akershus responded about their daily travels and about practical and psychological barriers to cycling. Of these, 61 were randomly selected to try an ebike for two or four weeks, and their daily travels and experiences were compared with a control group of 160 people.

How do people perceive cycling?

Respondents were asked to list any obstacles they might have to cycling. The most mentioned factors were structural conditions, such as poor cycling infrastructure and that it is unsafe. That it is physically strenuous / steep slopes, the need to carry goods and sweating / lacking shower facilities were mentioned by between 14 and 22 percent. These are all obstacles that are potentially overcome by ebikes. A total of 56 percent of respondents mentioned any of these four conditions. There was a gender

difference, in that 61 percent of the women report these barriers compared to 54 percent of the men.

The aspect of cycling people are most positive to, is that it helps to improve fitness. This is also a factor that many of the respondents rank high among factors influencing their choice of transport mode (average rating 4.6, on a scale ranging from 1 to 7). Monetary savings and that it gives a freedom either mentally or factually are also positive aspects of the bike. At the other end of the scale, we see that the bicycle scores low on time savings and comfort. Particular time is important for people, and is the aspect most respondents had on top of their list of important factors for their mode choice. If the ebike can help convincing people that they save time and have a comfortable journey, it can therefore be a remarkable tool to shift people away from motorized travel.

Who are the potential customers?

We asked the question "If you were to buy a bike today, would you consider an ebike?". Broadly speaking, the participants were divided into three groups. One third were interested, one third was doubting, and one third were categorically opposed to buying an ebike. Six percent of the participants said they definitely would consider an ebike. More women (33 percent) than men (25 percent) say they would consider (perhaps or absolutely) to buy an ebike.

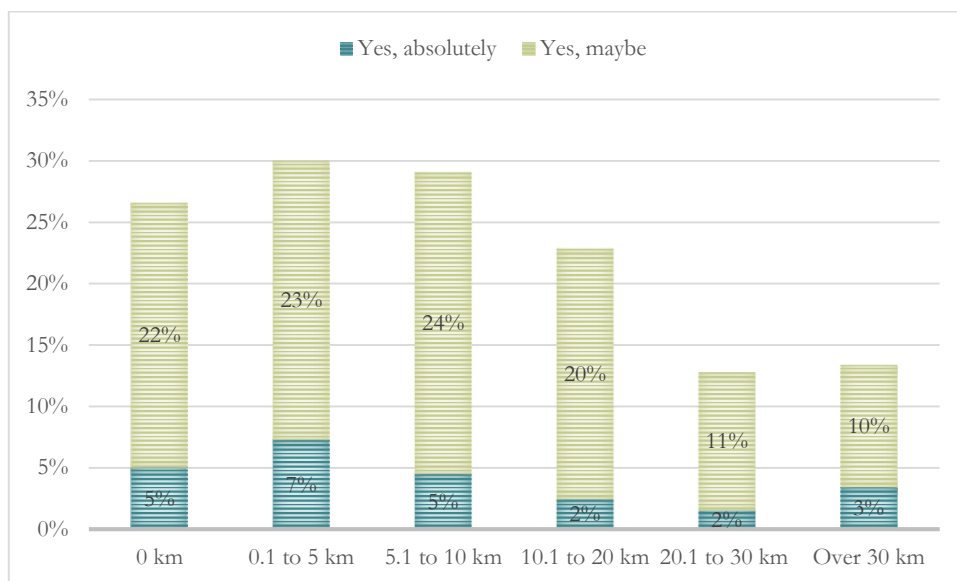


Figure 1: interest in buying an ebike according to weekly cycling length. Percent.

Those who cycle the least are most interested in buying an electric bike. Those who do not cycle at all are a little less interested than those who are infrequent cyclists (see Figure 1). This can therefore be taken as an indication that the ebikes are unlikely to lead to a large reduction in normal cycling, but that they are more likely to result in shifting people away from using motorized transport.

A majority of the respondents, particularly among women, say they know little or nothing about electric bikes. Only one-third (about one-sixth of the women) of

those asked said they know something, or more than anything about electric bikes. There was a high correlation between people's self-report about what they knew, and how little they actually knew in terms of some specific knowledge questions about ebikes. Only 18 percent knew that the motor is only activated when pedaling, and 33 percent thought (wrongly) that the motor is recharged by braking. Because we see that prior knowledge influences the desire to buy an ebike, an important task for those who want to increase the use of such bicycles is to spread knowledge among the wider population.

The participants were asked what they were willing to pay extra for an ebike vs. a regular bike. Of the respondents were not willing to pay anything extra. Men had a higher willingness to pay than women, but the differences were less than a normal bike. On average, men were willing to pay a maximum of NOK 1863 more for an ebike, while women would pay NOK 1534.

What effect do ebikes have on transport modes choice?

In the survey a series of questions that captures bike use and daily travel were asked. Based on these we can both see if bicycle use has increased as a result of the experiment, and what transport modes this has happened at the expense of. Since we have a control group that did not receive an ebike, we can also say with great certainty that the change we find is due to the ebike and nothing else.

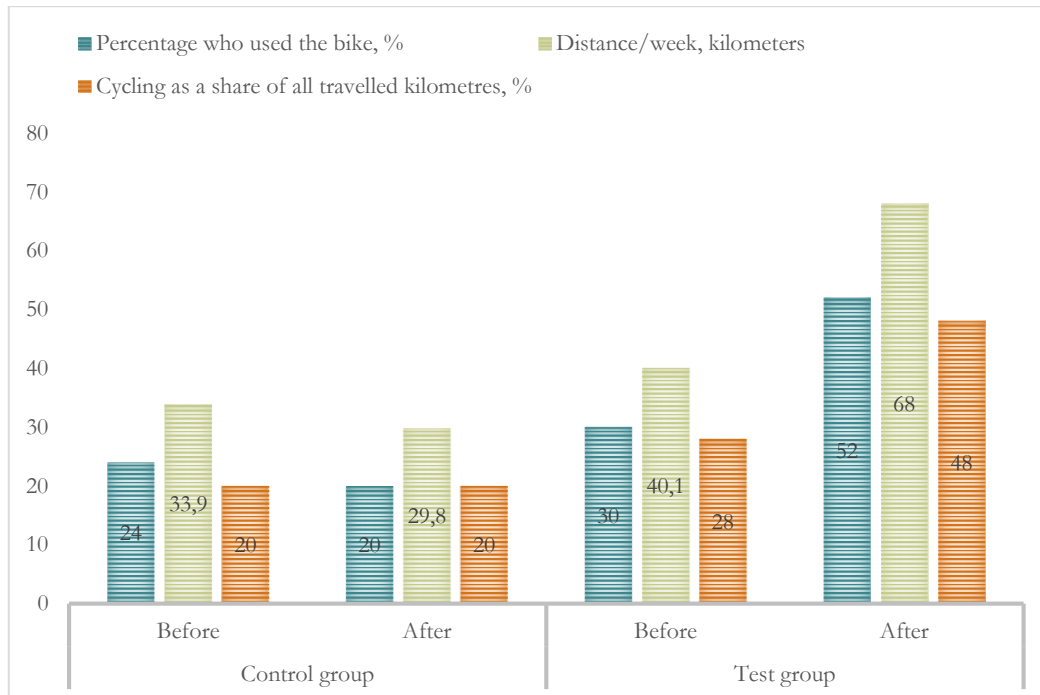


Figure 2 Bicycle use – as percentage who used the bike, distance per week and cycling as a share of all travelled kilometres in the control group and the test group, before and after the trial.

Figure 2 shows the use of bicycle in the control group and the test group in the before situation and in the after situation. In the test group there were 30 percent of those surveyed who had cycled on the day before the experiment. This percentage increased to 52 percent by the situation. We also see that the number of kilometers

and cycling as a proportion of all kilometers traveled per day increased in the test group. In the control group there were no such changes in the same time period. We can therefore conclude with certainty that it is the ebike that has created the change we have noted in bicycle use. The biggest transition occurred in the form of less public transport, but also car trips decreased as a result of the experiment. Those who borrowed electric bike had naturally enough, few regular bike trips in the period.

What other effect does the ebike have?

Most of the participants in the test group (72 percent) had used the bike primarily for work trips. 77 percent stated that the ebike had made them cycled more often than before, and 56 percent said that the bike meant that they rode longer trips than before.

The extra power from the engine was mostly used to ride faster uphill. The second way it was exploited was to cycle as before, but with less energy consumption. There were few who had taken advantage of the bicycle to carry extra luggage, and to ride faster on flat ground.

Price was the only significant barrier for those who had tried the ebike to in the end go out and buy one. There was also some concern that it might be stolen, but this was not seen as a major issue.

All in all, we have seen that the subjects had a very positive experience of using the ebike, and that they had cycled far more than they otherwise would. A question that then arises is whether these positive experiences have affected their overall perceptions of cycling. Surprisingly enough, the answer to this question is "no". Neither attitudes nor intentions to cycle more, were affected by the experiment. The fact that we did not see any changes in these variables may indicate that the experiment did not last long enough to create such changes. Both habits, intentions and attitudes are all relatively stable characteristics, and they do not change overnight. We must also take into account that those who tried an ebike responded to these questions in a situation where they knew they would no longer have an it available. So it makes a certain sense that their habit strength and intentions of cycling has not been affected by trying an ebike.

One thing that *was* changed, and significantly so, was the participants' willingness to pay. This increased with more than NOK 1 500 from approx. NOK 2600 to approx. NOK 415 as a result of the experiment. This change is significantly greater than the change we see in the control group (who for some reason also increased their willingness to pay). So letting people try an ebike can be a simple but effective strategy to get more people to buy them, and subsequently to get more people to use bicycles on their daily travels.