An initial study of the opinions of car purchasers in Poland: do they choose electric vehicles?

Bienias K.[1,*], Kowalska- Pyzalska A.[1], Ramsey D.[1]

[1]Department of Operations Research, Faculty of Computer Science and Management, Wrocław University of Science and Technology, Wrocław, Poland

*corresponding author: e-mail: karolina.bienias@pwr.edu.pl

Abstract

Road transport causes one fifth of the EU's total emissions of carbon dioxide (CO_2), which are especially high in cities. A suggested solution to this situation is the introduction of electric vehicles (EV). However, evidence from European countries shows that, the sales of EVs are low in comparison to other vehicles, especially without any governmental support. Our pilot study, conducted in Wrocław (Poland), shows that car purchasers in Poland are aware of the difference between pure electric and hybrid vehicles (HEVs). However, the potential for sales of EVs and HEVs still seems limited as most car purchasers buy on the second-hand market. Our study shows that consumers have a generally positive opinion about EVs. However, they see strong barriers in adopting EV as none of 52 respondents decided to buy an EV.

Keywords: electric vehicle, hybrid electric vehicle, consumers, willingness to pay, survey

1. Introduction and Literature Review

According to data published by the European Automobile Manufacturers Association, in 2018 only 620 battery electric vehicles, 704 plug-in hybrids and 22 821 hybrid electric vehicles were sold in Poland (ACEA, 2018). These numbers are not sufficient to claim the successful diffusion of EVs in Poland. The research conducted so far in Poland shows that 75% of Poles think that EVs are too expensive and 92% declare that accessibility to charging stations is limited (PwC, 2017). A survey carried out by the Polish Alternative Fuels Association found that only 17% of Poles were considering buying an EV in the next 3 years (PSPA, 2018). The European Union has proposed various tools, such as: financial incentives, infrastructure developments, and strategies to encourage people to purchase EVs (Hawkins, 2013, Sierzchula, 2014, Pasaoglu, 2012). Although there are many barriers to adopting EVs, there are already positive examples of their diffusion across Europe. Norway, Germany, France, Great Britain and the Netherlands together account for more than 80% of the EV sales in the EU. According to the International Energy Agency, the number of EVs should continue to grow globally, because of changes in the preferences and attitudes of customers, technical progress in constructing cars and ways of charging, global economic and environmental trends, together with strong incentives from government subsidies (IEA, 2013). Research shows that the diffusion of EVs is hard to achieve without government subsidies (Rahmani, 2018) and incentives play a crucial role in the first stage of the diffusion of an innovation (Davies, 2016, Figenbaum, 2015, Phillips, 2015, Praetorius, 2011, Bakker, 2012).

2. Characteristics of the Sample

To learn more about the preferences of Polish car purchasers living in or just outside one of the largest Polish cities – Wrocław - we conducted a pilot study, where 52 valid questionnaires were collected. The survey was conducted in January- March 2019 in Wrocław city hall. The survey was focused on people who had recently purchased a car, as we assume that this is the best moment to check their true preferences. Respondents were asked to fill in the questionnaire while waiting for the procedures connected with vehicle registration. The questionnaire includes 25 closed-ended questions. Within the questionnaire, the following blocks of questions were included: demographic variables, basic knowledge about EVs, transportation and environmental behavior, attitudes towards EVs, willingness to pay for EVs and HEVs and, finally, factors that would motivate respondents to buy an EV.

3. Results of Survey

57.7% of respondents were male. The majority were relatively young, between 25 – 35 years old (36.5%) and between 36 – 45 years old (32.7%) with secondary (34.6%) or higher education (57.7%). The respondents evaluate their current material situation with respect to the average in Poland fairly positively. 71.2% of respondents stated that they lived in a village.

82.7% of respondents were registering a vehicle for private purposes, not for the needs of a company. Approximately two thirds of the respondents (67.3%) had purchased a car on the second-hand market, whereas 11.5% had purchased a new car, and 7.7% were leasing a car. 13.5% claimed to have not purchased a car at all.

Most of the respondents have some basic knowledge that allows them to distinguish EVs and HEVs from each other. However, at the same time, there are many respondents who either chose a wrong answer or did not answer the question at all. For approximately two thirds of the respondents (67.3%), the vehicle being registered is

not the only one used in the household or company. Almost half of the respondents (46.3%) stated that they do not have access to recharging points (i.e. charging stations or private garages), while 42.3% stated that they have such access. At the same time, 10.2% were either unsure about whether they have access or did not want to answer this question. The majority of respondents drive more than 50 km in a day several times a week (42.3% every day, and 28.3% several times a week). Free parking areas, the use of bus lanes and parking in zero-emission zones (in the city centre) are most often perceived by respondents to be the most important factors facilitating the use of EVs. Generally, respondents reported that they exhibit a relatively high level of environmentally friendly behaviour.

Respondents rather agree that EVs are beneficial to the environment and should be introduced onto the market on a large scale, but at the same time they doubt whether EVs are really safer than CVs or whether possessing an EV is associated with greater social prestige. It was observed that in most cases respondents assessed the opinions of their peers to be similar to their own.

Finally, the respondents were asked to choose not more than 3 important factors that would motivate them to purchase an EV. The largest share of the responses, 26%, indicated that a financial subsidy is necessary. Second, the possibility of using free parking zones and exemption from excise tax (i.e. lowering the purchase price) constituted 19% of the responses. Extended warranties and access to recharging stations composed 15% and 13% of responses, respectively. The use of zero-emission zones and bus lanes are not so important to respondents (in both cases, mentioned by only 4% of responses).

We used the contingent valuation method to evaluate respondents' willingness to pay (WTP) for an electric vehicle and for a hybrid electric vehicle. The respondents chose how much more they would pay for an EV/ HEV than for a similar car with a combustion engine (CV) from an ordered price scale. The majority of respondents were not ready to pay more for an EV or HEV than for a conventional car with a combustion engine in the same class (similar design and/or other technical parameters).

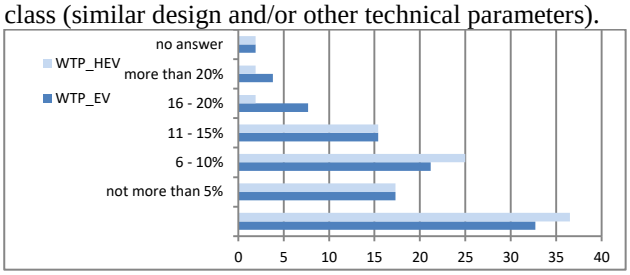

Figure 1. Willingness to pay more for a EV/ HEV.

4. Conclusions

Our study has indicated that as most Polish consumers purchase cars on the second-hand market, the potential for the diffusion of EVs and HEVs seems limited. The cost of EVs and HEVs seems to be the most important obstacle. Consumers expect to obtain a subsidy or tax exemption that would lower the financial burden. At the same time, our study has shown that consumers have rather positive opinions about EVs and generally are able to distinguish between EVs and HEVs.

This initial study has enabled us to draw some basic conclusions regarding consumers' opinions and purchasing behaviors on the EV market and to design an improved study to be applied on a much larger sample of respondents.

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