

Factors affecting acceptance and use of electric vehicles

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INTRODUCTION

The use of electric vehicles has increased in recent years. Previous research has examined several factors influencing the adoption of electric vehicles and related sustainability issues. Li et al. [1] reviewed the key determinants shaping consumers’ intentions to adopt battery electric vehicles. In Greece, studies have explored environmental attitudes [2], evaluated national energy and climate policies [3], and analyzed public perceptions of green growth and renewable energy sources [4-5]. Additionally, the conceptual distinction between green growth and sustainable development provides a theoretical framework for understanding policies that support electric mobility [6].The present study aims to investigate the factors that affect the acceptance and use of electric vehicles in Greece and, based on these, to propose promotion policies that will enhance the acceptance of electric vehicles and contribute to their easier penetration into the market.

METHODOLOGY

The paper applies quantitative analysis. A self-report questionnaire was used to collect data. A total of 177 questionnaires were collected, which were statistically processed using the SPSS Statistics 25 program and the multiple logistic regression method.

RESULTS

1. *Intention to purchase an electric vehicle.*

The overall questionnaire responses show that the longer the goal of purchasing an electric vehicle is set, the more positive the attitude of the respondents. Regarding the initial cost of purchasing a new vehicle, 51% of the sample declares unwillingness to invest more money to acquire an electric vehicle, when they can buy a conventional vehicle for considerably less money. Also, regarding the trend observed for a shift to electric mobility, almost 60% of the respondents maintain a positive attitude towards the idea of the gradual intensive penetration of electric vehicles in the market. As shown in Table 1, the most important factors influencing the intention to purchase an electric vehicle are the costs (purchase cost, operating cost) and the infrastructure required for the operation of electric vehicles (charging stations).

Table 1. Ranking of factors influencing the acceptance of electric vehicles.

Factors	Mean (Standard Deviation)	Series
Purchase cost	4.30 (1.037)	1
Charging stations in public areas	4.23 (1.052)	2
Operating cost	4.18 (0.983)	3
Safety, reliability	4.05 (1.094)	4
Charging stations in private areas	4.03 (1.084)	5
Environmental benefits	4.02 (1.138)	6
Driving autonomy	4.00 (1.044)	7
Charging time	3.93(1.045)	8
Energetic policies	3.80 (1.078)	9

2. Model development

With the help of the SPSS statistical package and the multiple logistic regression command, the correlation model of the intention to purchase an electric vehicle, as a dependent variable, with various independent variables was created, as shown in Table 2.

Table 2. Results Model 1 and Model 2.

Independent variables	Model 1 (purchase intention in the next 2 years)		Model 2 (purchase intention in the next 5 years)	
	B	Sig.	B	Sig.
Gender	-	-	-	-
Age	-	-	-0.187	0.113
Education	0.335	0.096	-	-
Income	-	-	-	-
Occupation	0.555	0.111	-	-
Driving range	-	-	0.418	0.333
Charging time	-	-	-	-
Public charging stations	-	-	-	-
Private charging stations	0.454	0.025	-	-
Purchase cost	-	-	-0.331	0.095
Operating cost	-0.558	0.006	-	-
Government policies	-	-	-	-
Safety	-	-	-	-
Environmental benefits	0.590	0.001	0.656	0.000
Main mode of transport	0.426	0.137	-	-
Nagelkerke R2	0.155		0.152	
- 2 log likelihood	361.235		311.053	
Chi - square	27.618		27.031	

Figures 1 and 2 below show citizens' intention to purchase an electric vehicle for the next 2 and 5 years and the percentages of each response respectively (1=strongly unwilling and 5=strong willing).

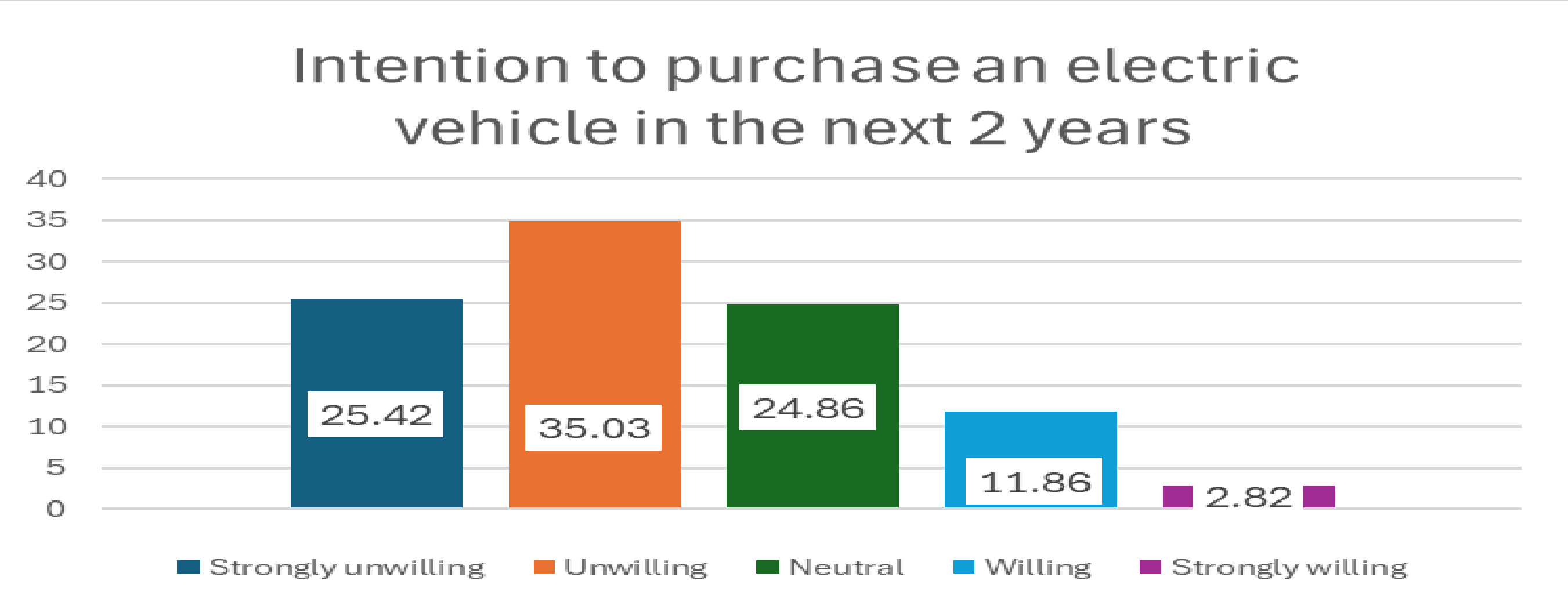


Figure 1. Intention to purchase an electric vehicle in the next 2 years

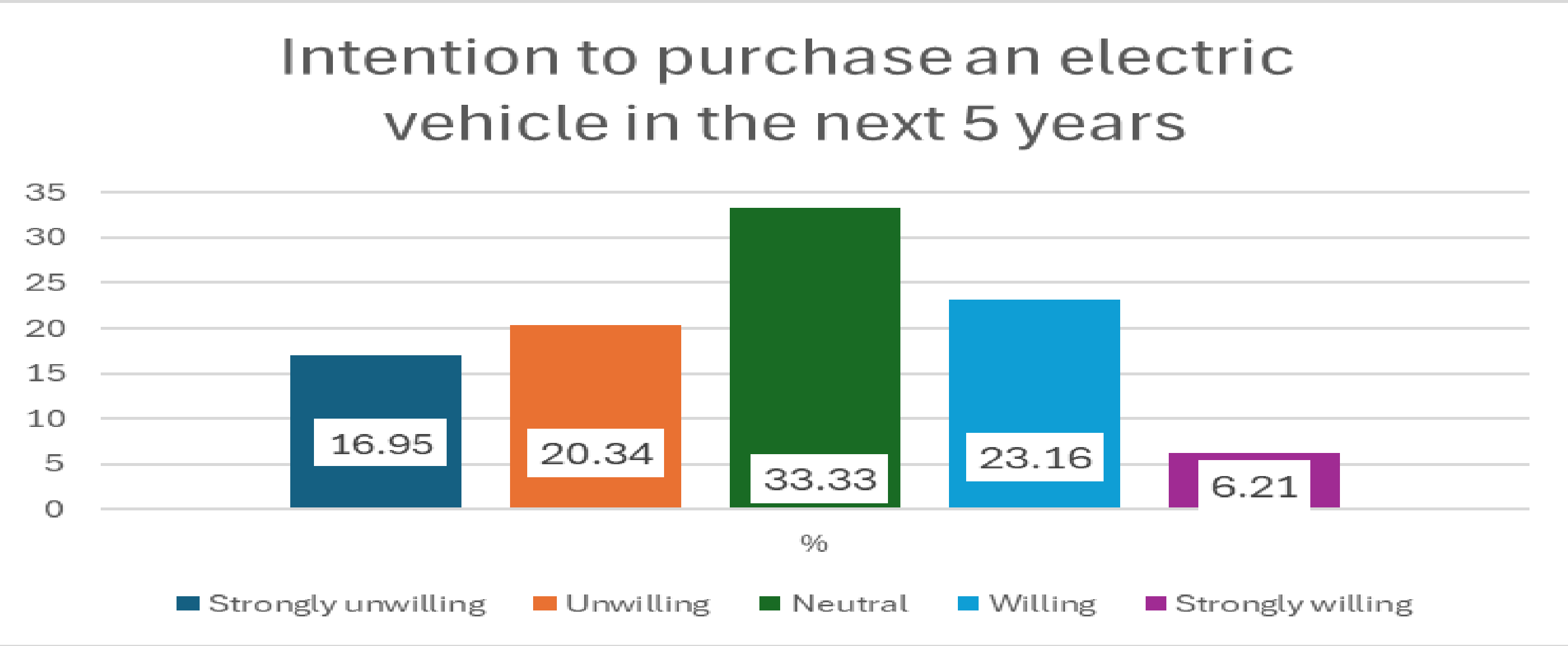


Figure 2. Intention to purchase an electric vehicle in the next 5 years

The results of figures 1 and 2, show that 3 out of 5 citizens are not willing to purchase an electric vehicle in the next 2 years (25.42% strongly unwilling and 35.03 unwilling), while they are more likely to purchase electric vehicles in the next 5 years (23.16% willing and 6.21 strongly willing).

CONCLUSIONS

As the analysis shows, there is partial adequacy of citizens in relation to electric vehicles, although the majority considers that they know a lot about electromobility. Also, the perception of citizens in relation to the imminent penetration of electric vehicles in the market is positive, and it is found that over time, the degree of acceptance of electric vehicles increases. The main factors affecting the acceptance of electric vehicles are the costs and infrastructure required for charging electric vehicles. The proposed promotion policies include: providing subsidies for the purchase of electric vehicles, construction of charging stations in public areas and providing subsidies for the construction of charging stations in private areas, providing driving privileges (e.g. zero traffic fees,...), information campaigns on electric vehicles and their benefits, providing test electric vehicles.

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