Understanding the Drivers of Sustainable Car Adoption in Serbia: The Role of Society, Environment, and Policy

Aleksandra Fedajev

University of Belgrade,

Technical faculty in Bor

SHIFTing Gears: The Future of Electric Car Production in CEE Countries
May 9, 2025

Institute of Economic Sciences, Belgrade

Introduction

- The rising economic activity, combined with increased consumption and rapid globalization, industrialization, and urbanization, can intensify existing environmental challenges and potentially create new ones
- The automotive industry has a central role in reducing environmental issues and improve socio-economic landscape
- Electric and hybrid vehicles (EHVs) are becoming strategic players in shaping the future of transportation

E-mobility in numbers

- Transport in Europe accounts for approximately one-fourth of all GHG emissions, with a **33.5%** increase observed between 1990 and 2019 (European Commission, 2024)
- The adoption of electric vehicles in Europe is steadily rising, with electric car registrations comprising **21.6%** of all new registrations in 2022 (EEA, 2024)
- Forecasts for Republic of Serbia indicate a annual growth rate of **12.61%**, predicting a market volume of **€26.1** million by 2028 (Statista, 2024)

Regulatory framework in the Republic of Serbia

- The updated Nationally Determined Contribution (NDC) for 2021-2030 was adopted in 2020 with ambition to reduce GHG emissions by **33.3%** by 2030 compared to 1990 levels (UNFCCC, 2022)
- The Republic of Serbia signed the Sofia Declaration on the Green Agenda for the Western Balkans in 2020
- Electromobility has not yet fully arrived in Serbian legislation (some of the crucial legislative documents have not yet been officially adopted)

- The **primary objective** of this study is to comprehensively investigate the factors influencing the intention to purchase EHVs in Serbia
- The holistic approach allows to identify potential obstacles and opportunities for the widespread adoption of sustainable transportation alternatives in Serbia

Literature review

- Most of existing research in this area focuses on developed countries, while studies conducted in developing countries are much less present
- Based on the existing literature, a wide range of factors influencing individuals' attitudes and intentions towards adopting EHVs are identified : socio-demographic characteristics, social influence, perceived enjoyment, range anxiety, environmental concern, and policy interventions

Data collection

- The data gathering was based on online survey using a questionnaire developed for an internal project at the Institute of Economic Sciences in Belgrade entitled "Subsidies for the Purchase of Electric and Hybrid Vehicles„
- 1004 valid responses were obtained
- The questionnaire consisted of a combination of closed-ended and 4-point Likert-scale items focusing on factors identified as the most influential in previous literature.

Methodology

- The **independent sample t-test** and **Chi-square test** was applied to evaluate the influence of each analyzed respondents' characteristics on intention to purchase EHVs individually

- Two classification models, a **decision tree** and a **binary logistic regression**, were used to ensure that influence of the examined characteristics was evaluated as a whole, considering their interconnections.

Results and disscusion

- **29.3%** of participants (294 respondents) expressed a definite interest in purchasing an EHV in the next 5 years
- **70.7%** (710 respondents) stated that they were reluctant or lacked the intention to purchase such a vehicle
- The respondents' answers to this question served as the basis for conducting the mentioned tests

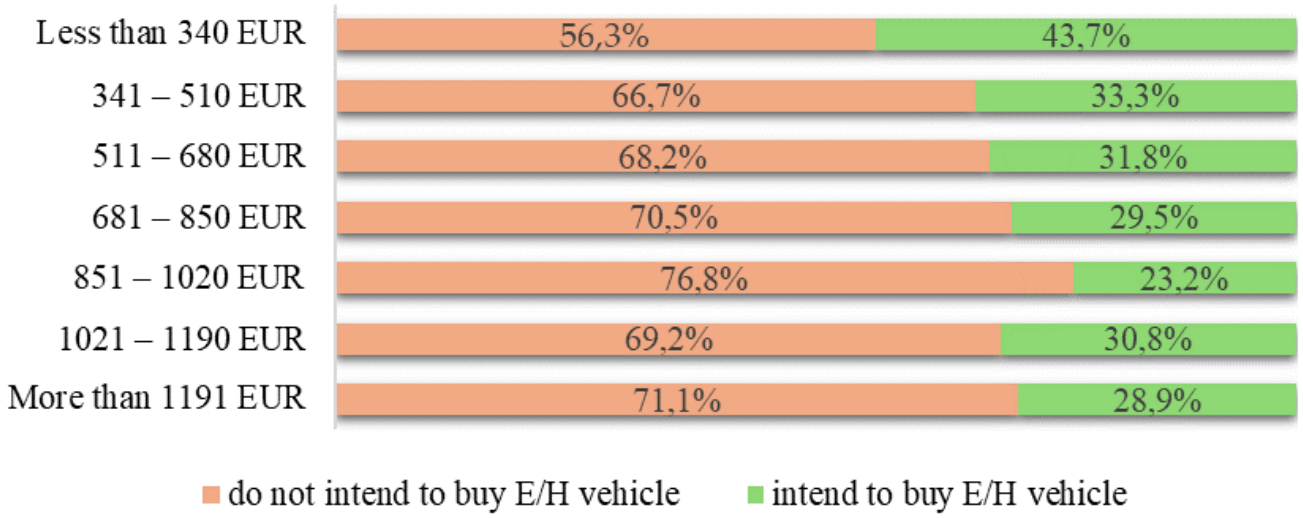
Demographic characteristics

- The average age of participants was **39.41** years
- Only this characteristic was numerical, an independent t-test was used to assess the influence of age on intention for EHVs purchase
- The average age of participants who do not intend to purchase an EHV is **38.96** years, than those who intend to buy such a vehicle, at **40.48** years on average (this difference is not statistically significant, with a p-value of 0.069).

Chi-square test results

Characteristics	Categories	N	%	p-value
Gender	Male	501	50%	0.333
	Female	503	50%	
Residence	Urban	614	61%	0.164
	Rural	390	39%	
Education	Less than a high school diploma	17	2%	0.314
	High school graduate	452	45%	
	Bachelor's degree	406	41%	
	Master's degree	104	10%	
	Ph.D. degree	18	2%	
Employment status	Full time employed	607	62%	0.090
	Part time employed	97	10%	
	Unemployed	113	11%	
	Retired	71	7%	
	Student	83	8%	
	Homemaker	15	2%	
Number of people in a household	1	82	8%	0.265
	2	161	17%	
	3	262	27%	
	4	288	30%	
	5	106	11%	
	More than 6	67	7%	
Household income	Less than 340 EUR	87	11%	0.024
	341 – 510 EUR	87	11%	
	511 – 680 EUR	110	14%	
	681 – 850 EUR	149	18%	
	851 – 1020 EUR	125	15%	
	1021 – 1190 EUR	79	10%	
	More than 1191 EUR	166	21%	

Intention to buy EHV vs total monthly income



Social Influence, Perceived Enjoyment, Range Anxiety, and Environmental Concern

Attitudes and perceptions	Intention	Mean	Std. Dev.	t	Df	p
Social Influence						
Positive societal image of EHVs.	No	2.39	0.95	45.019	709.25	0.000
	Yes	4.00	0.00			
Positive evaluation from influential individuals regarding the use of EHVs.	No	2.32	0.96	25.790	789.28	0.000
	Yes	3.68	0.65			
Perceived Enjoyment						
Anticipation of enjoyable and pleasant experiences while driving an EHV.	No	2.66	1.05	24.473	1001.86	0.000
	Yes	3.81	0.44			
Range Anxiety						
Inadequate infrastructure for EHVs (e.g., insufficient charging stations, limited services).	No	3.12	1.04	6.578	743.90	0.000
	Yes	3.51	0.76			
Fear of not reaching the destination with an EHV.	No	2.37	1.20	-2.148	451.43	0.032
	Yes	2.15	1.51			
Environmental Concern						
Perception that EHVs cause less pollution.	No	2.95	1.05	18.771	990.84	0.000
	Yes	3.86	0.48			

Policy Interventions

Attitudes and perceptions	Intention	Mean	Std. Dev.	t	Df	p
Policy Interventions						
Adequacy of existing subsidies; whether additional incentives are deemed necessary.	No	1.72	1.15	5.873	490.73	0.000
	Yes	2.24	1.30			
Government's role in increasing public awareness of subsidies.	No	3.18	1.00	10.558	857.41	0.000
	Yes	3.73	0.61			
Government and local authorities as users of EHVs to highlight their importance.	No	2.97	1.07	8.802	655.33	0.000
	Yes	3.55	0.88			
Introduction of higher taxes on more polluting vehicles in favor of less polluting ones.	No	1.87	1.39	9.031	1002.00	0.000
	Yes	2.75	1.43			
Free parking available in areas where parking fees apply.	No	2.58	1.37	7.406	598.67	0.000
	Yes	3.23	1.24			
Toll exemption on highways in the Republic of Serbia.	No	2.47	1.42	8.421	627.40	0.000
	Yes	3.22	1.22			
Permission to use lanes designated for public transport and taxi vehicles.	No	1.72	1.41	4.876	482.59	0.000
	Yes	2.25	1.63			

Decision tree

- The results indicate following factors tho have effect on intention to purchase EHVs:

1. perception of the societal image of these vehicles (**78.0%**),
2. positive evaluation from influential individuals regarding EHVs (**89.0%**),
3. Introduction of higher taxes on more polluting vehicles (**90.0%**)

Logistic regression results

Variables in the Equation	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-0.829	0.412	4.04	1	0.044	0.436
Household income	-0.271	0.106	6.52	1	0.011	0.763
Positive evaluation from influential individuals regarding the use of EHVs.	0.821	0.229	12.88	1	0.000	2.272
Perception that EHVs cause less pollution.	1.009	0.306	10.92	1	0.001	2.742
Introduction of higher taxes on more polluting vehicles in favor of less polluting ones.	0.464	0.126	13.60	1	0.000	1.59

Policy recommendations

- The factors identified as important across all applied methods are:

  1. positive evaluations from influential individuals regarding using EHVs,

  2. introducing higher taxes on more polluting vehicles in favor of less polluting ones.

- Hence, special emphasis should be placed on measures targeting these aspects.

Policy recommendations

- The next characteristics that appear important according to the two applied methods are:

1. household income,
2. positive societal image of EHVs,
3. perception that EHVs cause less pollution.

Conclusion

- The mixed-methods approach enabled a rigorous investigation of the determinants influencing attitudes and intentions towards EHVs.
- Significant predictors of purchase intentions were identified, illustrating the complexity of consumer behavior in the Serbian context
- Accelerated exploitation of renewable energy sources (RES) in the future will transform this mode of transport into a fully eco-friendly solution

Thank you for attention!