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MICRO-DETERMINANTS OF THE INDIVIDUALS WILLING TO SUPPORT PROJECTS RELATED TO RENEWABLE ENERGY SOURCES

Abstract

As the 21st-century paradigm, sustainable development implies, among other things, the need to ensure environmental sustainability through replacement of traditional energy sources with environmentally acceptable renewable ones. Economic literature identifies a number of prerequisites and determinants needed for the successful use of renewable energy sources. The purpose of this study is to deepen our understanding of the determinants of an individual's willingness to support the implementation of energy-saving measures. A nation-wide citizen perception survey of 3,024 respondents was carried out in Bosnia and Herzegovina in 2018 to collect data for this study. The paper takes a micro-level approach focusing on the behaviour of an individual. The respondents were found to have a positive attitude toward renewable energy projects. Most of them (72.78%) support such projects. Logistic regression (maximum-likelihood estimation) was employed to test the proposed hypotheses. The results of the study show that there are several important predictors of an individual's support for projects related to renewable energy sources, including age, gender, income, satisfaction with the standard of living, religiousness, living in a male-dominated household, and ethnicity. The results of the study can help policymakers to design and adopt adequate policy measures for promoting financial investments in renewable energy sources, and project developers to tailor their communication and promotion strategies to the needs of specific population segments to better achieve the goals and benefits of such projects.

Keywords: Renewable energy sources, social acceptance, Bosnia-Herzegovina, logistic regression

1. Introduction

The energy intensity (a measure of the energy inefficiency of an economy) in Bosnia and Herzegovina (B&H) is the highest in the Western Balkan region (World Bank, 2018)[1]. It is also 37 percent higher than the average in Europe and Central Asia (ECA) and more than double the average in the European Union (EU). Unlike other ECA countries, energy intensity in B&H has increased by around 30 per-

cent since 2005. Partly mirroring the high energy intensity and reliance on coal, the country emits about six times more CO_2 per US$ GDP compared to the EU and almost 60 percent more than the average in ECA. The high energy and carbon intensity adversely affects the country's economic competitiveness, represents an important environmental challenge, constrains the ability to efficiently meet growing energy demand in a sustainable way and impacts the potential for optimising revenues from energy exports. In order to improve energy intensity, there is a growing need for projects supporting renewable energy sources. Such projects demonstrate strong energy savings, associated benefits such as economic and financial viability of projects, and environmental and social co-benefits. For example, if the average normative energy consumption is reduced by up to 50 percent, the average payback period of investment is less than ten years, and the comfort levels, measured by indoor temperature levels and lighting conditions, are significantly improved. The number of projects related to renewable energy initiatives, which are primarily financed by different governmental levels, is increasing. Initiative for the implementation of such projects should also come from individuals. However, not much is known about public perception and willingness to support projects related to renewable energy sources in the context of such a high level of energy intensity. Understanding which micro-level determinants influence willingness to support projects related to renewable energy sources can provide valuable inputs for policy decision making.

As the 21st century paradigm sustainable development implies, among other things, the need to ensure environmental sustainability through replacement of traditional energy sources with environmentally acceptable renewable ones. Successful transition to renewable sources requires comprehensive legal, social, and technical changes, i.e., "requires re-engineering technologies and changing the ways people interact with energy" (Peterson et al., 2015). Contemporary economic literature describes a number of prerequisites and determinants needed for the successful use of renewable energy sources. Financial, technical, and legislative prerequisites must be in place. However, the aim of this paper is to test whether age, gender, marital status, household income, education, satisfaction with the standard of living, perception of an opportunity, religiousness, and ethnicity are associated with the willingness to support projects related to renewable energy sources. Instead of focusing on the conditions that must exist within the country, our study aims at understanding the micro-level behavioural economics. In other words, the purpose of this study is to deepen the understanding of micro-determinants shaping public perception of renewable energy sources and investigate their willingness to support the implementation of energy-saving measures.

2. Literature Review

Motivational factors can be viewed from the "macro" and "micro" level. "Macro" level implies "external" motivational factors that affect willingness to deploy renewable energy sources at a country level. Thus, the existing literature identifies political factors, socio-economic factors, and country-specific factors (Marques et al., 2010).

Political factors include the creation of political climate and conditions for the successful deployment of renewable energy sources, which in turn implies creating appropriate public policies and providing various incentives and benefits for investing in renewable sources (Wang, 2006; Johnstone et al., 2010; Lasco, Chernyakhovskiy, 2017; Schelly, Letzelter, 2019; Moghadam et al., 2020).

Socio-economic factors pertain to prices of renewable energy sources, the effects of carbon dioxide emission, total energy balance, history of using traditional energy sources, and the correlation between GDP and the use of renewable energy sources (Marques et al., 2010; Valadkhani et al., 2019).

Country-specific factors include the production potential of the given region/country, continuity of using renewable energy sources, and culture/customs (Marques et al., 2010; Ruiz-Fuensanta et al., 2019). Renewable energy sources require significant investments, and therefore countries with a higher GDP that give financial benefits and promote renewable energy sources have significant electrical energy consumption, are dependent on power import, are highly aware of the need to reduce CO_2 emissions, and produce a smaller share of energy from traditional energy sources that pollute the environment (thermal power stations, etc.) are more inclined to deploy renewable energy sources (Wang, 2006; Menz, Vachon, 2006; Sadorsky, 2009; Marques, 2010; Frazer, 2020). Furthermore, countries that have a greater potential for using renewable energy sources and the continuity of taking measures for promoting and using renewable sources tend to use them more (Menz, Vachon, 2006; Marques, 2010).

Factors at the micro-level include personal factors that affect individuals' motivation for deploying renewable energy sources. The literature identifies demographic factors: age, gender, level of education, place of residence, income level (Shallo et al., 2020; Frazer, 2020), as well as psychological factors that find their expression in behaviour, beliefs and values (Gustafson et al., 2020). Behaviour, values, and beliefs are significantly affected by media and individuals' previous experiences.

Shallo et al. (2020) found that the level of education, level of income and access to credit have a significantly positive influence on the motivation and adoption of renewable sources (biogas technology). Frazer (2020) evidences the link between income level (and unemployment rate), the strength of social ties and motivation for employing renewable different energy sources. The results of Gustafson et al. (2020) show that political beliefs influence motivation for deploying renewable energy sources: Republicans' support for renewable energy is driven more by economic costs, whereas Democrats' support is driven more by concern about global warming.

It is believed that younger people, women, individuals with a higher level of education and higher income, as well as those that had previous positive experiences with renewable energy sources are more inclined to use them (Black et al., 1985; Zimmer et al., 1994; Getzner, Grabner-Kräuter, 2004; Cleveland et al., 2005; Paço, Varejao, 2014; Ameli, Brandt, 2015; Parrish et al., 2020).

Parrish et al. (2020) identified motivations and barriers to implementation of renewable energy sources – familiarity and trust, perceived risk and control, complexity and effort, and consumer characteristics and routines.

Ameli and Brandt (2015) classify factors that can affect the deployment of renewable energy sources into four groups: socio-economic characteristics of the household, the characteristics of their dwelling, household's attitudes, knowledge and behaviour regarding the environment and households, knowledge about their energy spending and use. Socio-economic characteristics of household pertain to demographic characteristics, i.e., the above-listed personal factors. The characteristics of dwelling supplement personal factors and observe the view on the deployment of renewable energy sources by house owners versus renters, the significance of the type of dwelling (apartment or house), household size, years lived in the residence, and location of household (village or city). Household's attitudes pertain to psychological factors which are expressed through attitudes, beliefs, and behaviour, in this case, related to renewable energy sources. Households' knowledge about their energy spending and use pertains to whether house owners know the amount of their energy bills. The results of the study show that younger and middle-aged individuals are likely to invest more in renewable sources, while older individuals are likely to invest less. In addition, households with a larger number of members were more likely to invest, and the same is true of apartment and house owners, as opposed to renters, which is expected. These authors proved that individuals who have moved into their house/apartment recently were more likely to invest in renewable energy sources. The same was found for individuals who knew the amount of their energy bills and used the energy sparingly. Psychological factors were also found to be important – individuals who were active in non-governmental organizations were more willing to invest. The socio-psychological context proved to be a significant factor when deciding about the use of renewable energy sources.

The described endogenous and exogenous motivators cannot be viewed as isolated categories. They have a synergetic effect on individuals' motivation and intention to use renewable energy sources. Peterson et al. (2015) give a significant contribution to the synthetisation of motives and factors that affect acceptance and deployment of renewable energy projects by linking endogenous and exogenous motivators. They argue that place in spatial, social and historical contexts and formal and informal processes influence people's willingness to introduce and accept renewable energy sources. "The context of place, including cultural, economic, environmental, historical, political, social and technological characteristics of a place, all have the potential to influence how individuals and communities perceive low-carbon energy technologies and how they engage in their development" (Peterson et al., 2015: 2-3). The authors relate place to aesthetics, proximity, demographics and history. Relating perception to an actual project, the authors believe that personal experience of the place where people live ("aesthetics") affects their willingness to accept renewable energy sources. Projects which have negative aesthetic effects on the landscape, cause noise pollution, endanger wildlife or are potentially dangerous for people, or are only perceived as such, have a negative effect on the individual and public perception of such projects and their willingness to support them. The proximity implies that people are familiar with the actual project, i.e., that it is im-

plemented in their local community. Proximity of an actual renewable energy source can be the cause of its acceptance or opposition, again depending on the community perception. Demographics pertains to individuals' demographic characteristics (gender, age, race, income, level of awareness of the project, etc.), while history pertains to historical and cultural significance the location has for (local) population. If the location has a special historical and cultural significance, the willingness to deploy renewable energy sources in this location decreases. With respect to processes, the authors argue that "those who wish to develop, deploy and site low-carbon energy technologies need to develop appropriate social processes for engaging host communities and other individuals who live in or care about the place" (Peterson et al., 2015: 5). Deployer's specific action toward the public and the local community is necessary for the successful deployment of projects. This action implies the creation of a positive climate for project deployment, which in turn includes stakeholders' participation in the process (Endres et al., 2009; Davis, Selin, 2012; Karjalainen, Ahvenniemi, 2019), proper informing of stakeholders on the nature and benefits of renewable energy sources (and the actual project), and media support to the deployment process (Chewning, 2014).

Karjalainen and Ahvenniemi (2019) found that people have overcome the barriers to the adoption of renewable energy sources with the help of trustworthy information and advice from experts and from other adopters.

Even the positive view on renewable energy sources and actual projects – awareness of the significance of using renewable energy sources, need to protect the environment and reduce earth and air pollution – does not necessarily result in individuals' willingness to behave environmentally friendly (Ameli, Brandt, 2015). "Consumers do not always translate their concerns into effective purchasing behaviour. The levels of concern displayed by individuals are not reflected in their environmental purchasing habits, or even in other environmental behaviours" (Yam-Tang, Chan, 1998, in Paço, Varejao, 2014). Economic reasons and high costs of deploying and using renewable energy sources are some of the reasons for non-deployment of renewable sources, despite the motivation and willingness to have them (Paço et al., 2009; Rowlands et al., 2002). The intention to deploy renewable energy sources in households decreases with the size of investment – willingness to invest in energy-saving light bulbs, thermal insulation, and energy-efficient windows was greater than willingness for higher investments in solar panels and heat pumps (Ameli, Brandt, 2015; Zander, 2020).

Zander (2020) concluded that economic motivations for the adoption of renewable energy sources are predominant.

Subsidies for the deployment and use of renewable energy sources and granting favourable loans are some of the solutions.

Inclusion of participants in all stages of the project of the renewable energy sources deployment, information on characteristics, advantages, and drawbacks of the actual project and on long-term benefits of investing in renewable energy sources are significant factors of influence on people's existing attitudes, beliefs and behaviour.

Therefore, it is necessary to support the overall processes – build trust both in authorities and in investors, i.e., in all major actors in the entire process of deploying renewable energy sources (Devine-Wright, Howes, 2010).

3. Methods and Sample

A nation-wide citizen perception survey was carried out in Bosnia and Herzegovina in 2018 to collect data for this study. A total of 3,024 respondents (stratified random sample) were interviewed. Face-to-face computer-assisted personal interviews were conducted in 2018 by MEASURE-BiH (USAID project). The paper takes a micro-level approach focusing on the behaviour of an individual. Table 1 summarizes sample characteristics and shows the total number and percentage of individuals supporting projects related to renewable energy sources. Male individuals are more represented in the sample (52.6%), as well as among individuals supporting projects related to renewable energy sources (38.3%). The largest proportion of individuals in the sample belong to the 55+ age group (38.1%), and the largest proportion of individuals supporting projects related to renewable energy sources are in this group (26.8%). The most represented level of education in the sample is secondary education (63.9%), as well as among individuals supporting projects related to renewable energy sources (46.7%). Service and sales workers are the most common occupation in the sample and among individuals supporting projects related to renewable energy sources (15.9% and 4.7%, respectively). Finally, the middle income is the most frequent income level in both categories. We should also note a large percentage of missing data on the occupation and monthly net income of respondents.

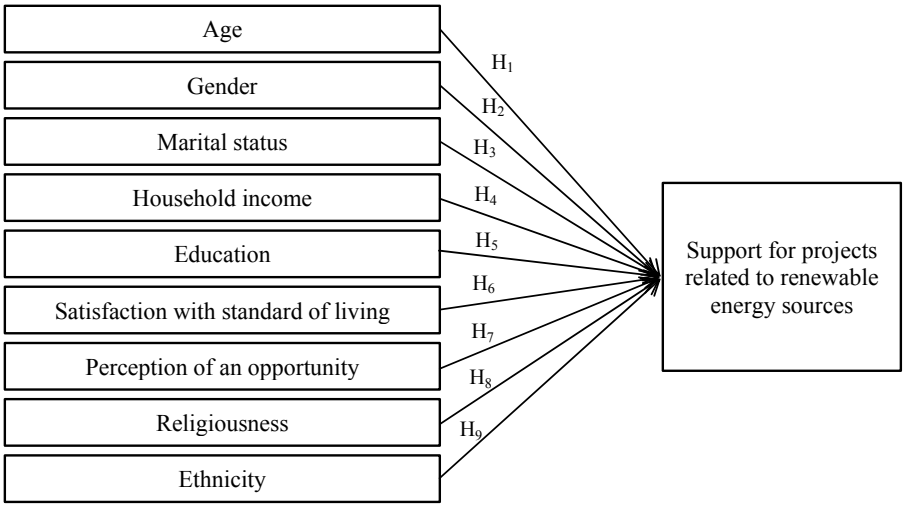
Table 1 Sample characteristics

		Total Sample		Individuals supporting projects related to renewable energy sources	
		Frequency	**Percentage**	**Frequency**	**Percentage**
Total	**Total sample size**	**3,024**	**100%**	**2,201**	**72.8%**
Gender	Male	1,589	52.6%	1,158	38.3%
	Female	1,433	47.4%	1,042	34.5%
Age	18–24	408	13.5%	282	9.3%
	25–34	488	16.1%	359	11.9%
	35–44	469	15.5%	368	12.2%
	45–54	506	16.7%	381	12.6%
	55+	1,153	38.1%	811	26.8%
Marital status	Single, divorced or widowed	1,246	41.2%	923	30.5%
	Married or in a cohabiting partnership	1,778	58.8%	1,278	42.3%
The highest level of education completed	No or uncompleted primary education	145	4.8%	97	3.2%
	Primary education	508	16.8%	339	11.2%
	Secondary education	1,931	63.9%	1,411	46.7%
	Postsecondary education	440	14.6%	354	11.7%
Ethnicity	Bosniak	1,589	52.6%	1,143	37.8%
	Croat	313	10.4%	202	6.7%
	Serb	1,034	34.2%	791	26.2%
	Other, Did not declare, or Missing	88	2.9%	65	2.2%
Current occupation	Legislators, senior officials, chief executives	22	2.0%	15	0.5%
	Scientists, engineers, and other professionals	76	6.9%	58	1.9%
	Technicians and associate professionals	133	12.0%	94	3.1%
	Clerical support workers	119	10.7%	81	2.7%
	Service and sales workers	176	15.9%	141	4.7%
	Skilled agricultural, forestry and fishery workers	14	1.3%	7	0.2%
	Craft and related trades workers	71	6.4%	48	1.6%
	Plant and machine operators and assemblers	53	4.8%	41	1.4%
	Elementary occupations	143	12.9%	117	3.9%
	Armed forces occupations	9	0.8%	6	0.2%
	Does not know/Refuses to answer	63	5.7%	53	1.8%
	Missing	231	20.8%	141	4.7%
Monthly net income of household	No income in this month	127	4.2%	69	2.3%
	1–500 BAM	563	18.6%	484	16.0%
	501–1,000 BAM	671	22.2%	490	16.2%
	>1,000 BAM	512	16.9%	383	12.7%
	Does not know/Refuses to answer	1,151	38.1%	844	27.9%

Source: Authors' calculations

Logistic regression (maximum-likelihood estimation) was employed to test the proposed hypotheses (see Figure 1). Logistic regression models allowed us to make predictions about the likelihood of an individual to support projects related to renewable energy sources. The analysis was conducted in Stata. We reported Exp(B), i.e., the odds ratio, in order to provide a more intuitive way of result interpretation. We performed collinearity diagnostics (VIF) and Hosmer–Lemeshow goodness of fit test before running regression, which showed no problems. The dependent variable measures whether individuals support projects related to renewable energy sources on a Likert scale from 1 (strongly agree) to 7 (strongly disagree). However, we recoded this variable into binary: only those individuals who selected 7 (strongly agree) and 6 (agree) were considered to support projects related to renewable energy sources entirely. Based on the literature review and available data, we used several predictors: age, gender, level of education, income, marital status, religiousness, satisfaction with the standard of living, and ethnicity. The dependent variable was recoded into binary questions to provide a more intuitive way of result interpretation: individuals that strongly agreed (1) and agreed (2) were considered to be supportive of renewable energy projects. Continuous variable 'age' was recoded into categorical (five age groups), and monthly net income was reduced to four categories, as presented in Table 1.

Figure 1 Model and hypotheses



Source: Authors

The following hypotheses were developed based on the discussion above (Figure 1):

H_1: Age is associated with the willingness to support projects related to renewable energy sources

H_2: Gender is associated with the willingness to support projects related to renewable energy sources

H_3: Marital status is associated with the willingness to support projects related to renewable energy sources

H_4: Household income is associated with the willingness to support projects related to renewable energy sources

H_5: Education is associated with the willingness to support projects related to renewable energy sources

H_6: Satisfaction with the standard of living is associated with the willingness to support projects related to renewable energy sources

H_7: Perception of an opportunity is associated with the willingness to support projects related to renewable energy sources

H_8: Religiousness is associated with the willingness to support projects related to renewable energy sources

H_9: Ethnicity is associated with the willingness to support projects related to renewable energy sources

The selection of predictors was limited by the survey design created by the MEASURE-BiH project team. As such, the main limitation is the unavailability of all predictors that might play an important role in predicting the dependent variable. However, in some cases, even when the variable was available, it was omitted because of the missing data. For example, the current occupation was not considered as it would have generated many missing cases. For future studies, the design of the surveys should be designed in such a way as to avoid such problems.

4. Results and Discussion

In this section, we present the results of the study and interpret them. Overall, the respondents have a positive attitude toward renewable energy projects (Table 2). Most respondents (72.8%) support such projects; 13.9% somewhat agree; 8.1% neither agree nor disagree; 3.7% disagree with such projects, and 1.5% of respondents refuse to answer or do not know the answer. As renewable energy sources are a better solution for the environment and sustainable development, we further examined the cross-tabulation of this variable and the variable that measures various meanings of energy efficiency. Most respondents (43.8% overall and 35.1% of individuals supporting renewable energy projects) identify energy efficiency as ways to save energy, money, and reduce emissions. Interestingly, only 9.6% overall and 4.2% of individuals supporting renewable projects indicated only emission reduction as the meaning of energy efficiency.

Table 2 Cross-tabulation of two variables: (1) energy efficiency meaning and (2) support for projects related to renewable energy sources

"Energy efficiency means:"	"I support projects related to renewable energy sources."						
	Somewhat agree or disagree		Strongly agree and agree		Does not know/ refuses to answer	Total	
	Frequency	Percentage	Frequency	Percentage		Frequency	Percentage
Energy-saving	109	3.6%	314	10.4%	10	433	14.3%
Money-saving	95	3.1%	193	6.4%	2	290	9.6%
Emission reduction	162	5.4%	128	4.2%	2	292	9.7%
All of the above	256	8.5%	1061	35.1%	9	1326	43.8%
I do not know what it means	156	5.2%	505	16.7%	22	683	22.6%
Total	**778**	**25.7%**	**2201**	**72.8%**	**45**	**3024**	**100%**

Source: Authors' calculations

Table 3 presents the results of the model. The following variables were found to be statistically significant predictors: age (35-44, 45-54), gender, marital status, household income, satisfaction, perception of an opportunity, religiousness and ethnicity.

Table 3 Logistic regression results

Variable	Levels and/or explanation	B (S.E.)	EXP (B)
Age Reference group 18–24	25–34	0.05 (0.23)	1.05
	35–44	0.58 (0.24**)	1.79
	45–54	0.49 (0.23**)	1.63
	55+	0.25 (0.21)	1.28
Gender	Male	0.30 (0.12**)	1.35
Marital status Reference category: Single. divorced or widowed	Married or in a cohabiting partnership	-0.28 (0.13**)	0.76
Household Income Reference category: No income	Low income (0–500)	0.69 (0.22***)	1.99
	Middle income (501–1000)	0.60 (0.22***)	1.82
	High income (>1000)	0.59 (0.23***)	1.80
Education Reference category: No education or uncompleted education	Primary education	-0.01 (0.26)	0.99
	Secondary education	0.29 (0.25)	1.34
	Postsecondary education	0.77 (0.31**)	2.16
Satisfaction	To what degree are you satisfied with your standard of living?	0.3 (0.17*)	1.35
Perception of an opportunity	Economic conditions in the country are getting better	-0.32 (0.15**)	0.73
Religiousness	How important is religion in your life?	0.55 (0.12***)	1.73
Male dominance	=1 if the person who makes most of the decisions regarding finances and expenditures is a man	-0.39 (0.35***)	0.68
Ethnicity	Croats	-0.29 (0.17*)	0.75
	Serbs	0.5 (0.14***)	1.65
	Others	0.4 (0.44)	1.49
Constant		-0.39 (0.12***)	0.68
N		**1,770**	

*** Significant at 0.01 level, ** Significant at 0.05 level, * Significant at 0.10 level.
Source: Authors' calculations

Our model shows that age is a statistically significant predictor (except for 25-34 and 55+ age categories). The odds that respondents in 35–44, 45–54 and 55+ age groups will support projects related to renewable energy sources are 79% (significant at 5%), 63% (significant at 5%) and 28% (not significant) higher than those for reference category (18-24), respectively. The odds are slightly decreasing as we move from one age category (younger) to another (older); but overall, individuals above 25 years of age are more likely to support projects related to renewable energy sources than the youngest (18-24) group. Younger individuals are more likely to use renewable energy sources (Kinnera et al., 1974; Getzner, Grabner-Kräuter, 2004; Mills, Schleich, 2012; Paço, Varejao, 2014). However, Roberts (1996) obtained results that suggest the opposite: older respondents were more willing to invest and support projects in renewable energy than younger individuals. Mills and Schleich (2010) concluded that middle-aged people were more likely to prefer renewable energy sources than younger individuals. The explanation for contradicting results might lie in the following: young people are more aware of environmental issues (Paço, Varejao, 2014) and are more likely to make riskier and larger investments

(Samdahl, Robertson 1989, as cited in Getzner, Grabner-Kräuter 2004; Ameli, Brandt, 2015). On the other hand, middle-aged people are more likely to have a family and are thus more inclined to use renewable energy as that allows them to make savings. Older (middle-aged) individuals, people who have a family (implies more household members), and people who own property (the home in which they live) are willing to invest more in household energy-saving sources (Mills, Schleich, 2010, 2012; Ameli, Brandt, 2015).

The odds that males will support projects related to renewable energy sources are 35% higher than for females. However, if an individual lives in a household where the person who makes most of the decisions regarding finances and expenditures is male, the odds are 32% lower than for individuals in households dominated by a woman. Numerous studies have shown that gender influences people's preferences for renewable energy. Women are thought to be more inclined to accept and promote renewable energy and adopt environmentally friendly behaviour (Black et al., 1985; Mainieri, Barnett, 1997; Laroche et al., 2001; Devine-Wright, 2010). However, research has shown that women, very often, support the use of renewable energy in principle, but are against specific projects. The reason lies in the greater tendency of women to avoid the risk of investing in renewable resources (Finucane, 2000), or in the lack of technological knowledge (Devine-Wright, 2010). Some studies, by contrast, have shown a greater tendency for men to use renewable energy (MacDonald, Hara, 1994), or have shown that there is no statistically significant gender difference (Samdahl, Robertson, 1989; Growth, Vogt, 2004). Preference also depends on the type of renewable energy. Devine-Wright (2009; 2010) has shown that women are less likely to prefer nuclear energy than men, while Groth and Vogt (2004) have shown that when it comes to using wind energy, there is no gender difference. Our results confirm that being a male increases the likelihood of supporting renewable energy sources, probably because of the higher technical knowledge. However, living in a traditional household (male-dominated) will reduce the odds of supporting such projects.

The odds that married individuals or individuals in a cohabiting partnership will support projects related to renewable energy sources are 24% lower than for single, divorced, or widowed ones. These results are not in line with the findings that people living in multi-member households are more likely to use renewable energy and show environmentally-friendly behaviour (Ameli, Brandt, 2015).

Our model shows that household income is a statistically significant predictor. The odds that respondents will support projects related to renewable energy sources are higher than those for the reference group (individuals with no income): 99% (low income), 82% (middle income and 80% (high income). These results are in line with existing literature: individuals with higher income are more inclined to use renewable energy sources (Black et al., 1985; Zimmer et al., 1994; Getzner, Grabner-Kräuter, 2004; Cleveland et al., 2005; Paço, Varejao, 2014; Ameli, Brandt, 2015). However, as our results show, individuals with an income are more inclined to use renewable energy sources, but this tendency toward such energy sources slightly differs between income categories.

The level of education is not a significant predictor in our model, except for the levels above secondary education. The odds that such respondents will support projects related to renewable energy sources are 116% (significant at 5%) higher than for respondents with no education or with uncompleted primary education. Although not significant, the coefficient for secondary education level indicates a higher support level for renewable projects than for individuals with a lower level of education. Existing research has confirmed that people with higher levels of education also have a greater propensity for renewable energy and environmentally-friendly behaviour (Zimmer et al., 1994; Roberts, 1996). The assumption is that more educated people also have a higher level of knowledge and awareness of environmental issues. Similarly, people with a higher level of education, on average, have higher incomes and thus a greater willingness to invest in (more expensive) organic products and to invest in renewable energy sources in addition. However, some other studies (Laroche et al., 2001; Getzner, Grabner-Kräuter, 2004) found that neither educational attainment, employment status, nor income level affect environmentally-friendly behaviour.

The odds are higher for individuals that are satisfied with their standard of living (35% higher) than for individuals that are not satisfied. Moreover, the odds that individuals holding a perception of a better future in terms of improvement in economic conditions of the country will support projects related to renewable energy sources are 27%

lower than the odds for respondents who expect the economic situation in the country to deteriorate. As Getzner and Grabner-Kräuter (2004: 264) note, "many authors agree that demographics are less important in explaining ecologically friendly consumer behaviour than psychographic variables, such as values, attitudes, and knowledge, and behavioural variables. A number of studies combine demographic characteristics with psychographic or behavioural variables". In that context, these two measure the level of satisfaction and perception of an opportunity in the future.

Religiousness is also a significant predictor. The odds that religious individuals will show greater support for projects related to renewable energy sources are 73% higher than the odds for non-religious individuals. Finally, the odds that Croats will support projects related to renewable energy sources are 25% lower; whereas for Serbs and others, the odds are 65% and 49% higher than for Bosniaks, respectively. Existing literature identifies religious beliefs as a variable that might help explain economic attitudes (Guiso et al., 2003). In the context of B&H, ethnicity is closely related to religion (every ethnic group represents one religion, although there are exceptions). Therefore, these two variables measure religion affiliation and religiousness within associated religion. As the results of this study show, religious people are more inclined to support renewable energy sources. This might be because of the values that religiousness promotes, which are manifested through attitude and behaviour.

5. Conclusion

Energy intensity is a measure of an economy's energy efficiency, in which a higher intensity indicates lower efficiency. The energy intensity of Bosnia and Herzegovina (B&H) is the highest in the Western Balkan region. The country's high energy and carbon intensity adversely affects its economic competitiveness, constrains its ability to meet the growing energy demand efficiently and sustainably, impacts the potential for optimizing revenues from energy exports, and presents a significant environmental challenge. To improve Bosnia and Herzegovina's energy intensity, there is a growing need for projects that support renewable energy sources. Although the number of renewable energy initiatives in the country is increasing, not much is known about the public perception of such projects, or the willingness to support them, in the context of such high per capita energy consumption. Understanding which micro-level determinants influence individuals' willingness to support renewable energy projects can provide a valuable input for policy and decision making.

The purpose of this study is to enhance the understanding of micro-determinants and ways in which they shape the public perception of renewable energy sources, and to investigate to what extent the public is willing to support the implementation of energy-saving measures. To this end, the study identified the characteristics of individuals that can increase their inclination to support such projects. This research included the statistical processing and analysis of a comprehensive base of questions answered by 3,024 respondents from all over Bosnia and Herzegovina, with a focus on the analysis of individual-level determinants. In addition to the identification of the relevant micro-level determinants, this research is the first of its kind in the country.

Available articles about energy efficiency in Bosnia and Herzegovina, as in other Western Balkan countries, focus primarily on providing an overview of renewable energy source usage, and analyse macroeconomic determinants and barriers to their use. This study focuses on individual determinants and the analysis of respondents' general willingness to support the use of renewable energy sources. Respondents in our study had a positive attitude toward renewable energy projects, with 72.8 percent supporting them. Several important predictors were included: age, gender, income, religiousness, and satisfaction with the standard of living. The results of the paper can help policymakers adopt adequate policy measures for promoting investments in renewable energy sources, as well as project developers to tailor their communication and promotional strategies to the needs of specific population segments with the aim of achieving the set goals and gaining benefits from such projects.

The main limitation of this research is that it should have included a larger number of psychographic and behavioural variables alongside the dominantly demographical ones presented. This should be taken into account in future research.

We know that behaviours, beliefs and values affect attitudes to the implementation of renewable energy sources, but it would be interesting to examine

the influence of a respondent's experiences on his/her willingness to use renewable energy sources: e.g. the influence of daily habits, routine, risk appetite or aversion, and his/her perception of the costs and benefits of implementation.

The link between an individual's social responsibility and his/her attitude to environmental protection and activism in non-governmental organisations is clear. We also found a link between political activism and attitudes and the use of renewable sources. In future research, it would be useful to add macro determinants (such as political and socioeconomic factors as country- and location-specific elements) to the analysis. The analysis of these additional factors, along with that of micro-level determinants, would provide a unique picture of factors that significantly contribute to the acceptance and implementation of renewable energy projects and contribute to the comprehensiveness of the presented analysis.

It would also be valuable to conduct a comparative study of this research problem in other Western Balkan countries. This would enable common determinants to be identified, and consequently contribute to the development of public policy and more efficient implementation of renewable energy sources in the Balkans.

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Mikrodeterminante pojedinaca koji su voljni podržati projekte u vezi s obnovljivim izvorima energije

Sažetak

Održivi razvoj kao paradigma 21. stoljeća implicira, između ostalog, potrebu ostvarenja okolišne održivosti i zamjenu tradicionalnih izvora energije ekološki prihvatljivim, obnovljivim izvorima energije. Ekonomska literatura identificira cijeli niz pretpostavki i odrednica neophodnih za uspješnu primjenu obnovljivih izvora energije. Svrha je ovoga istraživanja pružiti dodatno razumijevanje odrednica individualne spremnosti u davanju podrške implementaciji mjera energetske učinkovitosti. Podatci o percepciji građana Bosne i Hercegovine prikupljeni su putem anketnog upitnika. Anketiranje je obuhvatilo 3.024 ispitanika iz cijele Bosne i Hercegovine i provedeno je tijekom 2018. godine. U fokusu je bilo istraživanje na individualnom, mikronivou. Ispitanici su imali pozitivan stav prema projektima vezanim za primjene obnovljivih izvora energije. Većina ispitanika (72,78 %) podržava takve projekte. Istraživanje je pokazalo da postoji nekoliko značajnih čimbenika koji utječu na percepciju ispitanika: dob, spol, primanja, zadovoljstvo životnim standardom, religioznost, život u kućanstvu s dominacijom muškarca i etnička pripadnost. Ovi rezultati mogu poslužiti donositeljima odluka u dizajniranju primjerenih ekonomskih i političkih mjera koje bi ubrzale investicije u obnovljive izvore energije, a implementatorima projekata u primjeni segmentirane komunikacije i promotivnih strategija usmjerenih prema ostvarenju ciljeva i koristi od navedenih projekata.

Ključne riječi: obnovljivi izvori energije, društvena prihvatljivost, Bosna i Hercegovina, logistička regresija