



Publisher

<http://jssidoi.org/esc/home>



**THE IMPACT OF ECONOMIC INTERESTS ON ECO-CONSUMPTION: THE CASE OF THE
RUSSIAN ARCTIC ZONE OF KARELIA***

Valentina Karginova-Gubinova^{1*}, Alexander Volkov², Sergey Tishkov³, Anton Shcherbak⁴

^{1,2,3,4} *Institute of Economics, Karelian Research Centre, Russian Academy of Science, A. Nevsky Avenue, 50, Petrozavodsk, Russia*

E-mails: ^{1*} vkarginowa@yandex.ru (Corresponding author); ² kov8vol@gmail.com; ³ insteco_85@mail.ru;
⁴ shcherbaka@mail.ru

Received 15 August 2020; accepted 26 February 2021; published 30 June 2021

Abstract. The transition to the use of eco-products is one of the directions for ensuring the sustainable economic development and security of territories. This makes it relevant to study the influence of various factors on environmentally responsible consumer behavior. The goal of this article was to determine the importance of economic interests in the system of factors that determine consumer behavior in relation to eco-friendly products. The results of a survey of 1102 residents of the Arctic zone of the Republic of Karelia (Russian Federation) served as the research data. The work was structured within the framework of the reasoned action approach and Maslow's theory, using the methods of descriptive statistics and confirmatory factor analysis. It was found that economic interests are one of the factors that determine consumption behavior; however, the significance of economic interests is less than that of ecological interests. The willingness to pay an increased price for renewable electric energy shows that economic interests mostly control the environmental consumption behavior of those with a low level of education, low living standards, and short-term budget planning (regardless of gender and age). Taking into account the identified connections, we propose tools to stimulate the purchase of environmental products. The study findings are of interest to authorities in order to popularize and distribute eco-friendly products, as well as their manufacturers to choose the best strategy for promoting the products to the market.

Keywords: eco-friendly products; purchase of eco-friendly products; ecological consumer behaviour; renewable energy; willingness to pay; the importance of the price of a product; behavioral beliefs; economic characteristics of an individual; sustainable development; environmental and economic safety

Reference to this paper should be made as follows: Karginova-Gubinova, V., Volkov, A., Tishkov, S., Shcherbak, A. 2021. The impact of economic interests on eco-consumption: The case of the Russian Arctic Zone of Karelia. *Entrepreneurship and Sustainability Issues*, 8(4), 68-84. [https://doi.org/10.9770/jesi.2021.8.4\(4\)](https://doi.org/10.9770/jesi.2021.8.4(4))

JEL Classifications: O13, O44, P18, Q21, Q41, Q56, R11

* *The reported study was funded by RFBR, project number 20-010-00245 A.*

1. Introduction

The depletion of fossil resources, an increase in waste generation, and the disease rates of the population caused by the industrialization of agriculture make it urgent to abandon traditional products and switch to the use of their ecological alternatives—i.e., eco-friendly products. These products are made from natural ingredients, and they have a less negative impact on both the environment and human health during their production and consumption. In a number of cases, such products can be completely safe.

However, despite all of the advantages of eco-friendly products, their distribution presents significant difficulties: Eco-friendly products are less accessible, and consumers are not well acquainted with their brands or not always satisfied with the quality. One of the key problems is the price of such goods, which often exceeds—sometimes significantly so—the price of the usual products (Karginova-Gubinova, Shcherbak, et al., 2020).

It is known that each person acts based on their interests, which can be egotistical (maximizing personal gain), altruistic (maximizing the benefits of society) or biospheric, expressed in pro-ecological behavior, such as preserving and restoring the environment (Imaningsih et al., 2020) from previously accumulated damage. Sometimes, pro-ecological behavior is considered as a type of altruistic behavior (Groot et al., 2012), but there is no connection between such altruistic interests of the individual as, for example, peace and social justice, and the purchase and use of green goods (Imaningsih et al., 2020). If, in accordance with their biospheric interests, an individual strives to take care of nature and to carry out conscious consumption, then their economic interests can lead to a refusal to purchase eco-friendly products due to the fact that they are more expensive than existing analogues.

The purpose of this study was to estimate the significance of economic interests in the system of factors that affect consumer behavior in relation to eco-friendly products. The research tasks were as follows:

- (1) to analyze the relationship between economic interests and the purchase of eco-friendly products;
- (2) to estimate a degree of influence of economic interests on environmental consumer behavior in comparison to the influence of other groups of factors;
- (3) to identify the characteristics of individuals for whom economic interests are of the greatest importance when purchasing eco-friendly products.

Thus, the following research questions are raised in this article:

- (1) Is there a relationship between the economic interests of the population and the purchase of eco-friendly products?
- (2) How much do the economic interests of consumer affect environmental behavior?
- (3) For which individuals economic interests are of the greatest importance in buying eco-friendly products?

Consumer behavior of the population of the Arctic zone of the Republic of Karelia in relation to eco-friendly products was chosen as the object of this study. The subject was the role of economic interests in purchasing eco-friendly products. The willingness to pay an increased price for eco-products was examined using the example of renewable electricity.

Previously, the factors determining the purchase of eco-friendly products have been studied among consumers from different countries (e.g., the USA (Milovantseva, 2016), China (Tong et al., 2020; L. Wang et al., 2019; Yue et al., 2020), India (Aindrila Biswas, 2016), and northern countries such as Finland (Hartikainen et al., 2014), Sweden, Norway, etc.) and of different goods (food products: minced beef (Greibitus et al., 2013), potatoes (Greibitus et al., 2013), fruit (L. Wang et al., 2019), rice (Tong et al., 2020); electronics: mobile phones (Grankvist et al., 2019; Milovantseva, 2016), televisions (Min et al., 2017), etc.). However, these works mainly studied eco-friendly products in general or food products (Bangsa & Schlegelmilch, 2020; Zhang & Dong, 2020). The following analysis of these works showed that the predictors of consumer behavior in relation to green products

differ significantly by region and product group. For the Arctic zone of the Russian Federation, in-depth studies of the factors of ecological behavior have not previously been conducted. This, as well as the importance of the distribution of eco-friendly products for a sustainable development of the territory, determine the relevance of this work.

The novelty of the research is: the first, analysis of the environmental consumer behavior of the inhabitants of the Arctic zone of the Republic of Karelia embraces previously unexplored consumer group; the second, a comprehensive examination of the individual characteristics that shape their economic interests is performed.

The results obtained can be used by manufacturers of eco-friendly products for their successful promotion to the market, as well as by government entities and public organizations in order to form the conscious and responsible consumption of citizens. Ultimately, this will allow the production of competitive goods while minimizing harm to the environment, and, therefore, will enhance both the ecological and economic security of the regions.

2. Theoretical background

The theoretical framework of this research is represented by three blocks of works: the propensity to buy eco-products, the willingness to pay an increased price for eco-friendly products, and renewable electricity as an eco-product.

2.1. Propensity to buy eco-products

Factors affecting the purchase of eco-friendly products include the individual characteristics of the buyer (in particular, their values and beliefs), existing social norms and relationships, as well as the characteristics of the eco-products (Zhang & Dong, 2020).

Consumers with higher levels of environmental awareness (Al Mamun et al., 2018; Boztepe, 2012; Kanchanapibul et al., 2014) and environmental responsibility (Yue et al., 2020) are more likely to purchase green products. Long-term planning (Halder et al., 2020) and collectivism as a social norm (Halder et al., 2020; Sreen et al., 2018) also have a positive effect. Moreover, those buyers for whom interpersonal values are more important than intrapersonal ones (more social rather than personal orientation) demonstrate more stable behaviour (Grebitus et al., 2013). However, a high level of generalized trust does not lead to a greater propensity to buy eco-products.

Younger consumers are more committed to choosing eco-labeled products (Grebitus et al., 2015). However, the age factor is only relevant to certain types of eco-products, such as cosmetics, packaging, and bags (Kucher et al., 2019). In addition, buyers of ecological goods are distinguished by a higher income, their level of education (bachelor's degree and above), and concern for their health, particularly food safety (Golnaz Rezai, 2012).

Less inclined to purchase eco-friendly products are those customers who believe that it is the government that should be primarily concerned with environmental protection (Tong et al., 2020). Moreover, the reason for choosing traditional products may be that customers are more familiar with their brands (Wheeler et al., 2013).

2.2. Willingness to pay an increased price for eco-friendly products

The preferences regarding the price, as well as the quality, of eco-friendly products differ, while a number of consumers are ready to buy eco-products, even if they are more expensive than their less environmentally friendly

counterparts and/or are of lower quality (D'Souza et al., 2007). Overall, price sensitivity reduces the consumption of environmental goods (Hartikainen et al., 2014; Yue et al., 2020).

The willingness to pay an increased premium for the purchase of an eco-friendly product is associated with involvement in pro-ecological behavior, environmental beliefs (Milovantseva, 2016), the level of environmental awareness (X. Wang et al., 2020), and orientation toward product safety, as well as having a higher income (L. Wang et al., 2019) (i.e., a higher purchasing power (Kucher et al., 2019)). According to the study by Wang et al., the willingness to pay an increased price for organic products is primarily dependent on the household income (X. Wang et al., 2020). In addition, a 2010 analysis of British households showed that those with higher incomes spend more on groceries and buy healthier food (Pechey & Monsivais, 2016). This can be seen as one of the reasons why wealthy consumers are willing to pay more for organic food.

Women (Chekima et al., 2016; Grankvist et al., 2019) (especially housewives (X. Wang et al., 2020) and mothers (Min et al., 2017)) are willing to pay higher prices than men are. Therefore, the decision to purchase an eco-friendly product among men depends on its cost more often than it does among women (Kucher et al., 2019). Additionally, people with a good education (Min et al., 2017; X. Wang et al., 2020) and with certain types of occupations (e.g., civil servants (Chekima et al., 2016; X. Wang et al., 2020)) demonstrate a higher willingness to pay a higher price.

There is a correlation between the willingness to pay for organic products and age, but some studies show that the willingness to pay is higher among young people (Hersch & Viscusi, 2006; Min et al., 2017), and sometimes among older people (Shahsavari et al., 2020). For example, older consumers are less ready for an increase in gasoline prices to protect the environment than younger consumers. Moreover, it has been established that this difference cannot be explained by economic and social characteristics, differences in information, health risk assessments, or the degree of concern about climate change (Hersch & Viscusi, 2006). Conversely, it has been confirmed that Czech youths are reluctant to purchase eco-friendly furniture (Shahsavari et al., 2020). Based on this, we can draw a conclusion about the existence of different predictors and about their multidirectional impact on different environmental products.

There are also cross-country differences in the willingness to pay more for organic products. For example, a study of attitudes toward green mobile phones showed that, on average, students in Sweden and Norway were willing to pay more for them than students in Germany (Grankvist et al., 2019). In 2012, in the European Union, the smallest shares of those willing to pay for eco-friendly products was in Lithuania (64%), Portugal (64%) and Estonia (65%), while the largest was in Austria (88%). The size of the premium to the price that buyers are willing to pay also differs: in the European Union, the predominant share is ready for a premium of 5%, but in countries such as Austria, Bulgaria, Germany, Denmark, Luxembourg, Slovenia, and Sweden, most residents are ready to pay a premium of 6%–10%. This discrepancy can be partially explained by the frequency of purchases: the more often eco-friendly products are purchased, the higher the willingness to pay an increased premium for them, but this correlation cannot be called all-encompassing or strong. Rather, in this case, it is more correct to state that consumers who do not choose ecological goods do not trust their quality and are therefore not ready to pay more for them than for other goods (European Commission, 2013).

The desire for self-improvement (in social status, power, etc.) has a negative impact on the willingness to pay more (Grankvist et al., 2019). In a number of countries, particularly India, for buyers, the functional characteristics of eco-friendly products dominate the willingness to pay for them (A. Biswas & Roy, 2016).

2.3. Renewable (green) energy as an eco-product

For consumers in Shanghai (China), low income and poor awareness of the benefits and features of green energy are the primary obstacles to the spread of clean energy (Vand et al., 2019). In Poland, age, income level, education, competence, attitude toward the environment, and peer support are named as factors determining the willingness of the population to pay an increased price for green energy. Polish consumers show a relatively low willingness to pay a premium for clean electricity, and this is due to the low level of GDP per capita, the lack of knowledge about green energy, and the experience in using its tariffs (Kowalska-Pyzalska, 2019).

Interestingly, the willingness to pay an increased price for renewable energy also differs in relation to the sources of its generation. Therefore, for example, solar energy is the most valuable from the point of view of consumers, while the least valuable are biomass, agricultural methane (Borchers et al., 2007) and hydropower (Sundt & Rehdanz, 2015).

2.4. Generalization of the theoretical framework

Since the purchase of an eco-product is impossible without agreeing with its higher price, the identified factors affecting the willingness to buy environmental products are certainly similar to the factors of the willingness to pay an increased price for an eco-friendly product. Thus, among the common factors are a high level of education and income, an orientation toward the safety of goods, etc.

Nevertheless, buying an eco-product requires not only the willingness to pay for it, but also satisfaction with its quality, access to the product, and much more. According to this, it can be assumed that the group of factors for the purchase of eco-friendly products should be larger than the set of factors affecting the willingness to pay for an eco-friendly product.

Analysis of the theoretical basis shows that the willingness to pay an increased price for eco-products varies by age group, but there are conflicting conclusions about the effect of age on the willingness to pay more. The presence of these contradictions necessitates clarification of the importance of age. Intercountry discrepancies in the willingness to pay an increased price show that separate studies are required for individual territories, with their socio-cultural characteristics and traditions.

Based on the analysis of previous studies, the following hypotheses were formulated:

H0: The economic interests of individuals are one of the factors that determine their consumer behavior.

H1: Behavioral beliefs shaped by economic interests have a greater impact on purchasing eco-friendly products than beliefs shaped by environmental interests.

H2: In ecological consumer behavior, economic interests are the most constraining factor for men, older people, and people with a low level of education, a low standard of living, and a short-term budget planning period.

3. Methodology

Research on consumer behavior in relation to eco-friendly products is mainly based on the assumption of linear and rational decision-making (Bangsa & Schlegelmilch, 2020). A special characteristic of this work was the consideration of consumer behavior within the framework of the reasoned action approach and Maslow's theory.

According to the reasoned action approach, behavioral beliefs and beliefs about norms and control respectively form attitudes toward behavior and perceptions of norms and control, which, in turn, lead to the emergence of behavioral intentions. However, the intentions of the behavior determine the behavior itself, but it is constrained by the presence of effective control (Fishbein & Ajzen, 2009).

In this study, we focused on examining the influence of beliefs about behavior and norms. Due to the fact that, in the Russian Federation, a forced transition to a widespread use of eco-friendly products is still only being discussed, there is no control over the purchase of eco-friendly products and thus it was not included in this study.

Abraham Maslow compiled a hierarchy of basic human needs: physiological needs, needs for security, love, and respect, and self-actualization (Maslow, 1970). Later, he emphasized transcendence in self-actualization, defined in a broad sense as the actualization of the entire society, nature (Maslow, 1976). Thus, in the framework of Maslow's theory, pro-ecological behavior and the purchase of eco-friendly products are possible only when an individual reaches a certain level of income that allows satisfying the needs of a lower level.

The data required for the study were obtained through a questionnaire survey. Among the works that form the methodological and informational basis of the questionnaire used in this study, worth noting are the questionnaires from the Eurobarometer Surveys and (Liobikienė et al., 2017).

A total of 1102 residents of six municipalities of the Republic of Karelia included in the Arctic zone of the Russian Federation were interviewed: Belomorsky municipal district, 241 people; Kalevalsky municipal district, 120; Kemsy municipal district, 188; Loukhsky municipal district, 125; Segezha municipal district, 220; the urban district of Kostomuksha, 208. The sample was represented by the population aged 18–72 years, displaying information on gender, age, area of residence, and living conditions (private house or apartment building). The sampling error did not exceed 3%.

The required calculations were made in Microsoft Excel.

Within the framework of the selected methodological provisions to achieve the set goal, we conducted the following:

1. Analyzed the frequency of various forms of consumer behavior in relation to eco-friendly products and behavioral beliefs formed by economic interests by methods of descriptive statistics, revealing the most common relationships.
2. Studied the existence of a correlation between the frequency of purchasing eco-products/willingness to pay an increased price for eco-friendly products and the following:
 1. Sociodemographic characteristics of the population: Gender, age (up to 35 years old, 36–54 years old, 55 years old and older), and educational level (elementary vocational and lower, vocational education, incomplete higher education and higher).
 2. Economic characteristics: The standard of living of the family and the period of family income planning.
 3. Behavioral beliefs:
 - 2.3.1. Formed by environmental interests: The concern for the generation of household waste, the concern for the depletion of natural resources, and the assessment of the degree of environmental impact of eco-friendly products (to analyze the frequency of purchasing eco-products)/the assessment of the possibility of reducing the negative impact of energy on the environment and climate in the production of renewable energy (for the willingness to pay an increased price for eco-friendly products).
 - 2.3.2. Formed by economic interests: The importance of the price of a product, the willingness to pay an increased price for eco-friendly products using the example of green energy (only for analyzing the frequency of purchasing eco-products), and the assessment of the positive impact of environmental protection on economic growth.
 4. Beliefs about norms: Environmental policies should not cost extra money, and family and friends would approve of buying and using eco-friendly products.

To investigate the presence of these dependencies, a confirmatory factor analysis was carried out, involving chi-square, *p*-value, and the root-mean-square error of approximation (RMSEA(Cramer, D., 2003)) calculation. The

acceptable level of RMSEA significance for the model was taken as 0.05 or higher (in accordance with(Brown, 2006)).

4. Results

The survey showed that more than half of the inhabitants of the Arctic zone of the Republic of Karelia, namely, 51.3%, sometimes bought eco-friendly products; however, the percentage of those who make such purchases often was almost 4times less (Figure 1). At the same time, almost a third of the population reported not currently purchasing eco-friendly products and not planning to in the future. A small share (5.9%) used to buy eco-friendly products earlier, but had stopped.

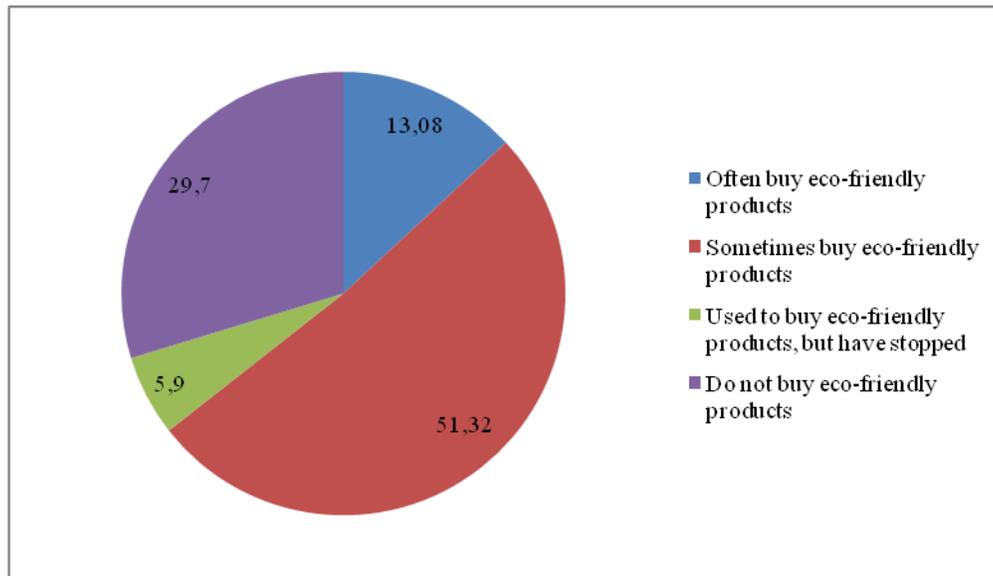


Figure 1. Distribution of the residents of the Arctic zone of the Republic of Karelia by frequency of purchasing eco-friendly products(%).Source of data: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

When choosing products, the price is a significant factor: it was ranked as very important for 57.7% of the respondents and as moderately important for 33.9%, played a secondary role for 5.7% and was absolutely not important for only 2.6%.

Mostly, the surveyed population (60.4%) was not ready to pay more for renewable electricity that would reduce the burden on the environment. Less than a third (26.4%) were willing to pay a little more, with 1.7% willing to pay one and a half times more and 0.8% willing to pay twice as much. The remaining 10.6% were undecided.

It is evident that the price importance factor correlates with the willingness to pay an increased price for eco-friendly products. For approximately the same share of the population, the purchase price was very important (57.7%) and they were not ready to pay more for renewable electricity (60.4%). In addition, the shares of those for whom the price was moderately important (33.9%) and who were willing to pay a little more for electricity (26.4%) practically coincided as well.

Among those who buy eco-friendly products, the significance of the price was lower; the price played a secondary role or was absolutely not important (Table 1). Among those who do not purchase eco-friendly products, the largest share was composed of those for whom the price was very important—70.6%.

Table 1. Frequency of the combinations of various forms of consumer behavior in relation to eco-friendly products and behavioral beliefs regarding the price of the product

Behavioral belief	Frequency of purchasing eco-friendly products			
	Often	Sometimes	Used to buy but stopped	Never
Price importance when choosing goods:	37.50	54.87	63.08	70.64
Very important				
Moderately important	38.19	39.65	32.31	22.32
Plays a secondary role	13.89	4.60	3.08	4.59
Absolutely not important	10.42	0.88	1.54	2.45
Willingness to pay more for renewable energy:	2.08	0.71	0.00	0.61
Ready to pay 2 times more				
Ready to pay 1.5 times more	6.25	1.24	3.08	0.31
Ready to pay a little more	43.06	29.73	23.08	14.07
Not ready to pay more	40.28	56.64	64.62	74.92
Undecided	8.33	11.68	9.23	10.09

Source: Compiled on the basis of the conducted questionnaire survey.

At the same time, 40.3% of those who often buy eco-products were not ready to pay more for renewable electricity in comparison to its traditional alternative. For those purchasing eco-friendly products less often or not purchasing them at all, this percentage was even higher. Thus, the less often eco-friendly products are purchased, the lower the willingness to pay an increased price.

Next, we analyzed the existence of a relationship between the frequency of purchasing eco-friendly products and the various characteristics and beliefs of individuals.

Based on the data in Table 2, we can conclude that not all of the selected characteristics were factors that influence the purchase of eco-friendly products. Taking into account the established level of significance of the RMSEA, among the economic characteristics, we can observe that the living standard had a reasonable degree of influence, but the period of budget planning did not. For example, of those who believed that they live in full prosperity, without denying themselves anything, 61.3% bought eco-friendly products, which is 4.7 percentage points more than in the group of people living from paycheck to paycheck, and 36.3 percentage points more than in the group borrowing money even for food.

Table 2. Results of a confirmatory factor analysis for the frequency of purchase of eco-products

Factors	Chi-square of the sample	Critical value at $\alpha=0.05$	p-Value
1.Sociodemographic characteristics			
Gender	13.97	7.81	0.0029
Age	18.58	12.59	0.0049
Education	11.36	12.59	0.0779
2. Economic characteristics			
Standard of living	72.65	21.03	0.0000
Income planning period	44.56	25.00	0.0001
3. Behavioral beliefs			
3.1. Formed by ecological interests			
Concern for generation of household waste	43.58	21.03	0.0000
Concern for depletion of natural resources	41.70	21.03	0.0000
Assessment of the degree of environmental impact of eco-friendly products	215.41	16.92	0.0000
3.2. Formed by economic interests			
Importance of the price of the product	99.61	16.92	0.0000
Willingness to pay an increased price for eco-friendly products using the example of green energy	86.65	21.03	0.0000
Assessment of the positive impact of environmental protection on economic growth	17.06	21.03	0.1475
4. Beliefs about norms			
Environmental policies should not cost extra money	37.19	21.03	0.0002
Family and friends would approve of buying and using eco-friendly products	236.29	16.92	0.0000

Source: Calculated based on the data of the conducted questionnaire survey.

The degree of significance of the standard of living was comparable to the significance of such a sociodemographic characteristic as gender (the influence of age was insignificant and the frequency of purchasing ecological goods did not depend on the level of education). Men were somewhat more likely to purchase eco-friendly products than women (68.3% versus 59.0%), although more women made such purchases frequently (15.7% versus 12.2%). Moreover, 31.7% of men and 41.0% of women neither bought nor intended to buy eco-friendly products.

Among the considered behavioral beliefs based on both environmental and economic interests, there were insignificantly influencing and non-influencing factors; however, in general, the degree of significance of environmental interests (the assessment of the degree of influence of eco-friendly products on the environment) can be recognized as being higher than that of economic interests (the significance of product prices). However, environmental consumer behavior was observed to depend only on individual economic interests, and not on public ones.

Thus, the lack of growth in demand for eco-friendly products, although being due to the individual economic interests of citizens, can primarily be associated with low environmental literacy, lack of knowledge about reducing generated household waste and saving natural resources in the production and use of eco-friendly products, and failure to realize the possibility of achieving economic growth through transition to the production and consumption of eco-friendly products. However, the average assessment by the population of the concern for the generation of household waste on a five-point scale was 4.34, and the average assessment of the concern for depletion of natural resources was 4.26. Assessing whether environmental protection contributes to economic growth, 25.4% of respondents found it difficult to give an answer, while the majority of the remaining respondents agreed with this statement (35.4% agreed completely and 45.9% agreed rather than disagreed).

The lack of approval of purchasing eco-friendly products by the immediate circle, i.e., family and friends, also played a significant role. Similarly, we considered the results of the analysis of consumers' willingness to pay an increased price for renewable electricity (Table 3).

Table 3. Results of a confirmatory factor analysis for the willingness to pay an increased price for renewable electricity of consumers

Factors	Chi-square of the sample	Critical value at $\alpha=0.05$	p-Value
1.Sociodemographic characteristics			
Gender	4.14	9.49	0.3879
Age	10.41	15.51	0.2376
Education	32.22	15.51	0.0001
2. Economic characteristics			
Standard of living	113.30	26.30	0.0000
Income planning period	180.67	31.41	0.0000
3. Behavioral beliefs			
3.1. Formed by ecological interests			
Concern for generation of household waste	48.48	26.30	0.0000
Concern for depletion of natural resources	49.61	26.30	0.0000
Assessment of the degree of environmental impact of eco-friendly products	50.74	26.30	0.0000
3.2. Formed by economic interests			
Importance of the price of the product	185.34	21.03	0.0000
Willingness to pay an increased price for eco-friendly products using the example of green energy	22.60	26.30	0.1250
Assessment of the positive impact of environmental protection on economic growth	96.43	26.30	0.0000
4. Beliefs about norms			
Environmental policies should not cost extra money	45.17	21.03	0.0000
Family and friends would approve of buying and using eco-friendly products	4.14	9.49	0.3879

Source: Calculated based on the data of the conducted questionnaire survey.

The willingness to pay an increased price for renewable electricity to the greatest extent unsurprisingly depended on the importance of the price (the individual economic interests), but public economic interests, as well as the frequency of purchasing eco-friendly products, did not have any influence. Moreover, significant were the economic characteristics of the individual (the living standards and the period of budget planning), the beliefs about norms, and the level of education. It is worth noting that gender and age in this case were not influencing factors. The environmental interests were not significant.

Consequently, increasing the financial literacy of the population for the transition to long-term planning of the household budget can be considered as a special direction of the formation of readiness for a higher price of eco-friendly products. In addition, it is in the long-term perspective that the benefits of purchasing certain types of eco-friendly products (e.g., care products) can be assessed.

Based on the above, hypothesis H0 can be confirmed: economic interests are one of the factors that determine the consumer behavior of individuals.

Hypothesis H1 can be rejected: the importance of environmental interests exceeds the importance of economic interests. Among the individuals who agreed that eco-friendly products have a positive impact on the

environment, and at the same time who considered the price of a product to be very or moderately important, 72.5% stated that they bought eco-friendly products, while 27.5% did not (Figure 2).

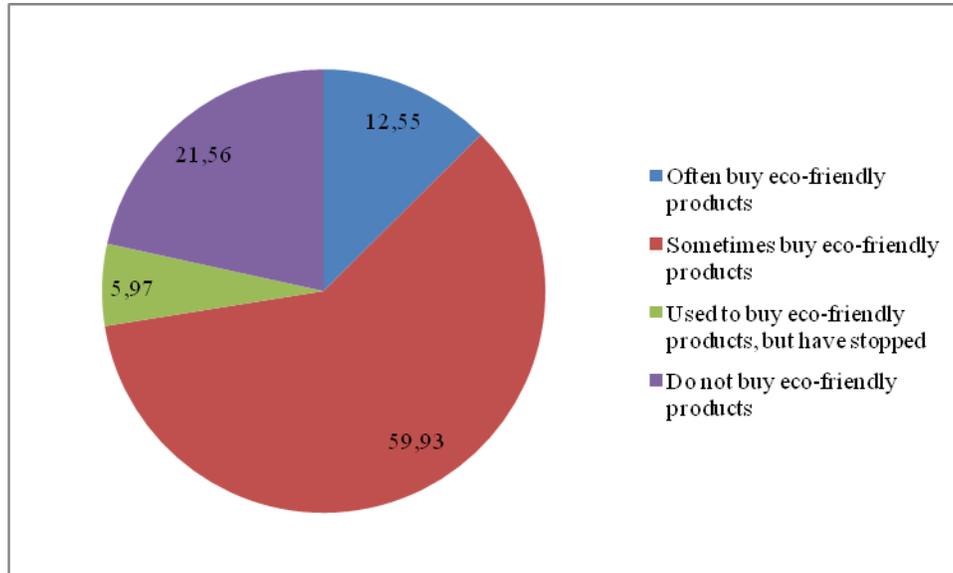


Figure 2. Distribution by the frequency of purchasing eco-friendly products of those who believe that they have a positive impact on the environment and who consider the price to be very or moderately significant(%). Source: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

Based on the data regarding renewable electricity, hypothesis H2 can be confirmed only partially: economic interests mostly constrain the ecological consumer behavior of people with a low level of education, a low standard of living, and a short-term budget planning period, but not men or older people.

4. Discussion

Authors should discuss their results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted.

As shown in this study, for most individuals, behavioral beliefs based on environmental interests had a greater impact on the purchase of eco-friendly products compared to beliefs shaped by economic interests. This conclusion contradicts Maslow's theory of the satisfaction of physiological needs overriding safety and transcendence. However, this discrepancy can be explained by a higher standard of living. Among those who believed that eco-friendly products have a positive impact on the environment and at the same time believed that the price is very or moderately significant, as well as those who rated their living standards higher, were more likely to buy environmental products, while those who rated them lower were not (Figure 3). For example, 64.2% of those living in prosperity purchased eco-friendly products, and so did only 36.4% of those who borrow money even for food (the presence of low-income buyers of environmental goods may be due to the rural nature of the surveyed territories, where purchases of products from local farmers are quite common). Thus, with the possibility of satisfying the needs of a higher level, the satisfaction of the needs of a lower level changes.

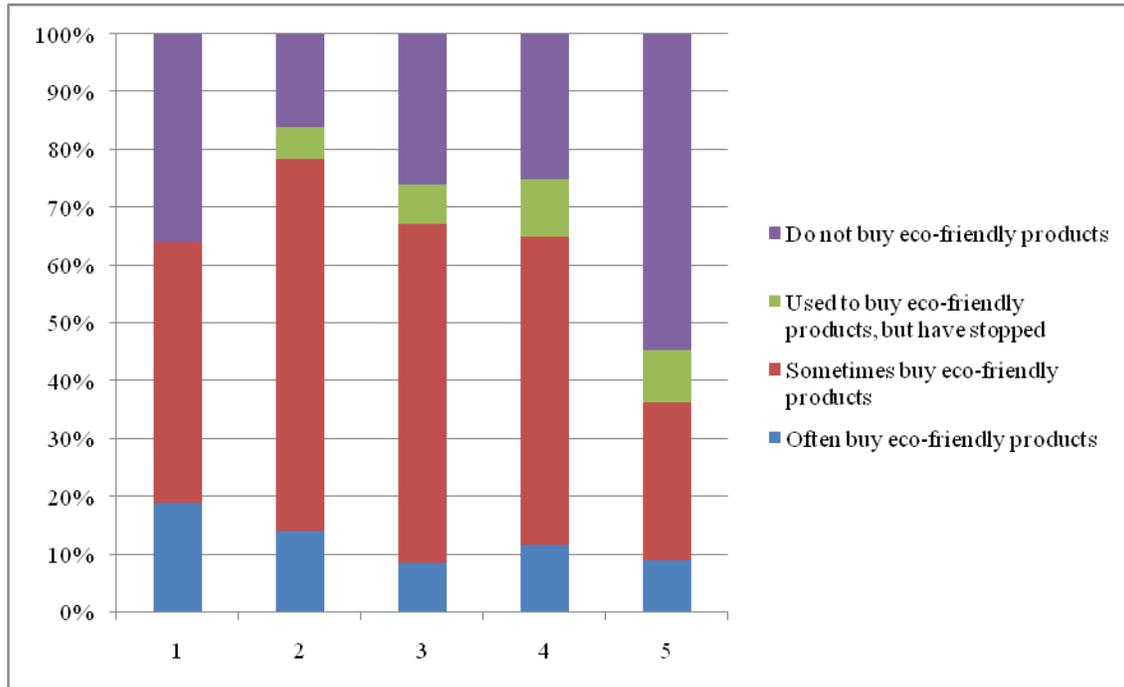


Figure 3. Frequency of the purchases of eco-friendly products and the living standards of those who believe that eco-friendly products have a positive impact on the environment and who consider the price to be very or moderately significant. (1) Living in full prosperity; (2) having to save up for larger purchases; (3) living from paycheck to paycheck, where the money is only enough for current expenses (food, maintenance bills, etc.); (4) having enough money only for food and the most necessary things, while maintenance and utility bills are often postponed; (5) having to borrow money for food from friends and acquaintances. Source of data: Calculated based on the data of the conducted questionnaire survey.

Source: Calculated based on the data of the conducted questionnaire survey.

Another interesting point is the greater propensity of men to buy eco-friendly products in comparison to women. Moreover, the more frequent purchases of eco-friendly products by men cannot be explained by a higher standard of living (the calculations showed no connection between these indicators). While most researchers conclude that women are more active in purchasing eco-friendly products (Liobikienė et al., 2017) and other forms of eco-consumption (e.g., reducing the amount of water used (Gilg & Barr, 2006)), there are studies showing that gender does not matter in shopping for eco-friendly products (Zhao et al., 2014). It can be assumed that the resulting discrepancies are explained by the different distribution of values in cultures, as well as by the different roles of men and women in organizing the household under different sociocultural conditions. Thus, in further research, it would be advisable to include the measurement of the degree of participation of individuals in the decisions and consumption practices of the household. It should also be noted that, according to the survey, men buy eco-friendly products more often than women do, but a larger proportion of women do it often. Accordingly, it can be assumed that, in the absolute amount, a greater number of eco-friendly products will be bought by women, not men. This assumption should be verified in further studies.

However, there is no connection between gender and the willingness to pay an increased price for renewable electricity. Women's acceptance of a higher price for eco-friendly products has been shown in other studies (Chekima et al., 2016; Grankvist et al., 2019; Min et al., 2017; X. Wang et al., 2020). This discrepancy can be explained by the existing asymmetry in the perception of the value of eco-friendly products not only by age, but also by gender.

A similar explanation is possible for the existence of a relationship between the level of education and the willingness to pay more for renewable electricity than for traditional electricity, while there is no relationship between the frequency of purchasing eco-friendly products and the level of education. This is due to the fact that, these days, there is an increasing number of sources of information on ecology, which allow people to significantly expand their knowledge in this area outside of the classical multi-stage education system. However, understanding the characteristics of such goods as electricity from renewable sources requires a certain knowledge base.

Thus, we can conclude that the identified factors that determine the consumer behavior in relation to eco-friendly products of the population of the Arctic zone of the Republic of Karelia correspond to most of the previously conducted studies. This increases the scientific value of the main conclusion—determining the degree of influence of the economic interests of individuals in comparison to other factors—in connection with the possibility of transferring this conclusion to other groups of consumers.

This research, however, is subject to several limitations. A number of the limitations are due to the fact that the collection of baseline data was carried out in the context of the unfolding coronavirus disease 2019 (COVID-19) pandemic. Despite the fact that at the time of data collection, the number of infections in the study region did not exceed 316 people per 100,000 people (with the total number of people living in the region as of 1 January 2020 being 113,572, the number of cases at the start date of the study on 8 July 2020 was 359 people), strict restrictive measures in the studied territories were introduced from 1 April 2020. These included both the introduction of a self-isolation regime for citizens and the restriction and suspension of the provision of services and commercial activities involving physical contact between consumers and workers or consumers with one another. These restrictions managed to have a certain impact on the economic activity and well-being of the inhabitants of Karelia, as well as on the level of their consumption and consumption habits. Nevertheless, the research toolkit was directed at identifying common practices, and three months is clearly not enough for the formation of new consumer habits of individuals. Moreover, at that time, people viewed the COVID-19 pandemic as a temporary phenomenon and, obviously, perceived its consequences as temporary. The interviewers took notes when people talked about a significant change in their habits and preferences due to the pandemic, but such an emphasis on the specifics of the current situation was rather an exception and was not widespread.

We also note that the study was conducted in compliance with all anti-epidemic and sanitary standards, which made it difficult for the interviewers and the respondents to interact directly, which could have some impact on the respondent's openness in answering questions.

Summarizing the results, it should be noted that each product has its own specific characteristics; therefore, the conclusions drawn based on the willingness of individuals to pay an increased price for renewable electricity cannot be fully transferred to their behavior in relation to other eco-friendly products. In addition, the lower interest in eco-friendly products in comparison to their existing traditional counterparts can be associated with a lower prevalence of eco-friendly products, a lack of knowledge about their brands, and dissatisfaction with their quality (it is known that certain types of eco-friendly products cannot fully functionally replace traditional counterparts (Karginova-Gubinova, Tishkov, et al., 2020)).

Promising in terms of further research are the following:

1. Studying the dynamics and factors of environmental consumption during the COVID-19 pandemic and the manifestation of its socioeconomic consequences.
2. Analysis of the reasons for the various results of ongoing research in the field of environmental consumption in a number of countries by organizing and conducting an intercountry international study with a single methodological toolkit.

Conclusions

The economic interests of individuals are one of the factors that significantly limits the distribution of eco-friendly products, but the importance of economic interests is less than importance of environmental interests (almost three quarters of individuals with both economic and environmental interests buy eco- products). First of all, economic interests are holding back the purchase of people with a low level of education, a low standard of living, and a short-term budget planning period, but not men or older people.

Accordingly, to ensure economic and environmental safety, the global community faces two urgent tasks: reducing the cost of eco-friendly products and reducing the negative impact of economic interests on environmental consumer behavior.

To ensure a lower cost of eco-friendly products, it is necessary to further develop the equipment and technologies, optimize the production and logistics chains, and improve cooperation. It is also possible to establish quotas for eco-friendly products within the framework of public procurement, to hold exhibitions and fairs, to organize access for eco-friendly products, especially local ones, to large retail chains and to put them on marketplaces, to subsidize them on a competitive basis for obtaining green labels, etc.

In order to reduce the negative impact of economic interests on environmental behavior, and the purchase of eco-friendly products in particular, it is necessary to popularize an ecological lifestyle, as well as to increase environmental literacy and consumer awareness of the long-term consequences of purchasing non-eco-friendly products for nature and public health. The population should understand not only the importance of reducing the volume of waste generated, but also the possibility of achieving this by switching to eco-friendly products. Currently, as shown above, the majority of consumers do not comprehend this connection. It also requires an understanding of the relationship between companies' transition to the production and consumption of environmental products and the economic growth of the territory. These measures will also increase the approval of eco-friendly purchases by family and friends. Improving financial literacy and stimulating the transition to long-term budget planning can be considered a separate approach for increasing the willingness to pay a higher price for eco-friendly products.

At the same time, there should also be economic incentives for consumers to purchase eco-friendly products. Thus, for example, currently in the study area, the payment for waste collection does not depend on the volume of its production. In the case of using eco-friendly products, the volume of waste generated by households will decrease. Consequently, the fee for the collected waste should also decrease. Ecological goods can also be recycled. Therefore, it is required to ensure the possibility of delivering waste for recycling. Currently, the organization of the mass collection of sorted waste, especially in remote areas, is only being planned.

Manufacturers, first of all, can be recommended to focus their products on the consumer groups least susceptible to the negative influence of economic interests: men, young people, and highly educated people (the latter in relation to goods that have the greatest price difference to their traditional counterparts).

We assume that the measures described above will increase the demand for eco-friendly products and, accordingly, their supply. Thus, the economy will come closer to achieving sustainable development without additional harm to the environment, and ensuring the ecological and economic security of the territories.

References

- Al Mamun, A., Mohamad, Mohd. R., Yaacob, Mohd. R. B., & Mohiuddin, M. (2018). Intention and behavior towards green consumption among low-income households. *Journal of Environmental Management*, 227, 73–86. <https://doi.org/10.1016/j.jenvman.2018.08.061>
- Bangsa, A. B., & Schlegelmilch, B. B. (2020). Linking sustainable product attributes and consumer decision-making: Insights from a systematic review. *Journal of Cleaner Production*, 245, 118902. <https://doi.org/10.1016/j.jclepro.2019.118902>
- Biswas, A., & Roy, M. (2016). *A Study of Consumers' Willingness to Pay for Green Products*. <https://doi.org/10.12720/joams.4.3.211-215>
- Biswas, Aindrila. (2016). A Study of Consumers' Willingness to Pay for Green Products. *Journal of Advanced Management Science*, 211–215. <https://doi.org/10.12720/joams.4.3.211-215>
- Borchers, A. M., Duke, J. M., & Parsons, G. R. (2007). Does willingness to pay for green energy differ by source? *Energy Policy*, 35(6), 3327–3334. <https://doi.org/10.1016/j.enpol.2006.12.009>
- Boztepe, A. (2012). Green Marketing and Its Impact on Consumer Buying Behavior. *European Journal of Economic and Political Studies*, 5, 5–21.
- Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. The Guilford press.
- Chekima, B., Syed Khalid Wafa, S. A. W., Igau, O. A., Chekima, S., & Sondoh, S. L. (2016). Examining green consumerism motivational drivers: Does premium price and demographics matter to green purchasing? *Journal of Cleaner Production*, 112, 3436–3450. <https://doi.org/10.1016/j.jclepro.2015.09.102>
- Cramer, D. (2003). *Advanced Quantitative Data Analysis (Understanding Social Research)*. Open University Press.
- D'Souza, C., Taghian, M., & Khosla, R. (2007). Examination of environmental beliefs and its impact on the influence of price, quality and demographic characteristics with respect to green purchase intention. *Journal of Targeting, Measurement and Analysis for Marketing*, 15(2), 69–78. <https://doi.org/10.1057/palgrave.jt.5750039>
- European Commission. (2013). *Attitudes of Europeans towards Building the Single Market for Green Products* (p. 174). https://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_367_en.pdf
- Fishbein, M., & Ajzen, I. (2009). *Predicting and Changing Behavior: The Reasoned Action Approach*. Psychology Press; <https://doi.org/10.4324/9780203838020>.
- Gilg, A., & Barr, S. (2006). Behavioural attitudes towards water saving? Evidence from a study of environmental actions. *Ecological Economics*, 57(3), 400–414. <https://doi.org/10.1016/j.ecolecon.2005.04.010>
- Golnaz Rezaei. (2012). Consumers' awareness and consumption intention towards green foods. *African Journal of Business Management*, 6(12), 4496–4503. <https://doi.org/10.5897/AJBM11.1414>
- Grankvist, G., Johnsen, S. Å. K., & Hanss, D. (2019). Values and willingness-to-pay for sustainability-certified mobile phones. *International Journal of Sustainable Development & World Ecology*, 26(7), 657–664. <https://doi.org/10.1080/13504509.2019.1652212>
- Grebitus, C., Steiner, B., & Veeman, M. (2013). Personal Values and Decision Making: Evidence from Environmental Footprint Labeling in Canada. *American Journal of Agricultural Economics*, 95(2), 397–403. <https://doi.org/10.1093/ajae/aas109>
- Grebitus, C., Steiner, B., & Veeman, M. (2015). The roles of human values and generalized trust on stated preferences when food is labeled with environmental footprints: Insights from Germany. *Food Policy*, 52, 84–91. <https://doi.org/10.1016/j.foodpol.2014.06.011>
- Groot, J., Steg, L., Keizer, M., Farsang, A., & Watt, A. (2012). *Environmental Values in Post-socialist Hungary: Is It Useful to Distinguish Egoistic, Altruistic and Biospheric Values?**. <https://doi.org/10.13060/00380288.2012.48.3.02>
- Halder, P., Hansen, E. N., Kangas, J., & Laukkanen, T. (2020). How national culture and ethics matter in consumers' green consumption values. *Journal of Cleaner Production*, 265, 121754. <https://doi.org/10.1016/j.jclepro.2020.121754>

- Hartikainen, H., Roininen, T., Katajajuuri, J.-M., & Pulkkinen, H. (2014). Finnish consumer perceptions of carbon footprints and carbon labelling of food products. *Journal of Cleaner Production*, 73, 285–293. <https://doi.org/10.1016/j.jclepro.2013.09.018>
- Hersch, J., & Viscusi, W. K. (2006). The Generational Divide in Support for Environmental Policies: European Evidence. *Climatic Change*, 77(1), 121–136. <https://doi.org/10.1007/s10584-006-9074-x>
- Imaningsih, E. S., Tjiptoherijanto, P., Heruwasto, I., & Aruan, D. T. H. (2020). Exploring values orientation to build green loyalty: The role of egoistic, supply chain management, and biospheric. *International Journal of Supply Chain Management*, 9(2), 656–663.
- Kanchanapibul, M., Lacka, E., Wang, X., & Chan, H. K. (2014). An empirical investigation of green purchase behaviour among the young generation. *Journal of Cleaner Production*, 66, 528–536. <https://doi.org/10.1016/j.jclepro.2013.10.062>
- Karginova-Gubinova, V. V., Shcherbak, A. P., & Tishkov, S. V. (2020). Opportunistic behavior of business entities: Manipulating environmental responsibility in economic interests. *Modern science: topical problems of theory and practice. Series "Economics and Law"*, 5. <https://doi.org/10.37882/2223-2974.2020.05.18>
- Karginova-Gubinova, V. V., Tishkov, S. V., Shcherbak, A. P., & Volkov, A. D. (2020). The nature and methods of resolution of conflicts of environmental and economic interests. *Economics and Environmental Management*, 2, 3–10. <https://doi.org/10.17586/2310-1172-2020-13-2-3-10>
- Kowalska-Pyzalska, A. (2019). Do Consumers Want to Pay for Green Electricity? A Case Study from Poland. *Sustainability*, 11(5), 1310. <https://doi.org/10.3390/su11051310>
- Kucher, A., Heldak, M., Kucher, L., & Raszka, B. (2019). Factors Forming the Consumers' Willingness to Pay a Price Premium for Ecological Goods in Ukraine. *International Journal of Environmental Research and Public Health*, 16(5), 859. <https://doi.org/10.3390/ijerph16050859>
- Liobikienė, G., Grincevičienė, Š., & Bernatoniene, J. (2017). Environmentally friendly behaviour and green purchase in Austria and Lithuania. *Journal of Cleaner Production*, 142, 3789–3797. <https://doi.org/10.1016/j.jclepro.2016.10.084>
- Maslow, A. (1970). *Motivation and personality*. Harper and Row
- Maslow, A. (1976). *The farther reaches of human nature*. Penguin
- Milovantseva, N. (2016). Are American households willing to pay a premium for greening consumption of Information and Communication Technologies? *Journal of Cleaner Production*, 127, 282–288. <https://doi.org/10.1016/j.jclepro.2016.04.001>
- Min, S.-H., Lim, S.-Y., & Yoo, S.-H. (2017). Consumers' Willingness to Pay a Premium for Eco-Labeled LED TVs in Korea: A Contingent Valuation Study. *Sustainability*, 9(5), 814. <https://doi.org/10.3390/su9050814>
- Pechey, R., & Monsivais, P. (2016). Socioeconomic inequalities in the healthiness of food choices: Exploring the contributions of food expenditures. *Preventive Medicine*, 88, 203–209. <https://doi.org/10.1016/j.ypmed.2016.04.012>
- Shahsavari, T., Kubeš, V., & Baran, D. (2020). Willingness to pay for eco-friendly furniture based on demographic factors. *Journal of Cleaner Production*, 250, 119466. <https://doi.org/10.1016/j.jclepro.2019.119466>
- Sreen, N., Purbey, S., & Sadarangani, P. (2018). Impact of culture, behavior and gender on green purchase intention. *Journal of Retailing and Consumer Services*, 41, 177–189. <https://doi.org/10.1016/j.jretconser.2017.12.002>
- Sundt, S., & Rehdanz, K. (2015). Consumers' willingness to pay for green electricity: A meta-analysis of the literature. *Energy Economics*, 51, 1–8. <https://doi.org/10.1016/j.eneco.2015.06.005>
- Tong, Q., Anders, S., Zhang, J., & Zhang, L. (2020). The roles of pollution concerns and environmental knowledge in making green food choices: Evidence from Chinese consumers. *Food Research International*, 130, 108881. <https://doi.org/10.1016/j.foodres.2019.108881>
- Vand, B., Hast, A., Bozorg, S., Li, Z., Syri, S., & Deng, S. (2019). Consumers' Attitudes to Support Green Energy: A Case Study in Shanghai. *Energies*, 12(12), 2379. <https://doi.org/10.3390/en12122379>
- Wang, L., Wang, J., & Huo, X. (2019). Consumer's Willingness to Pay a Premium for Organic Fruits in China: A Double-Hurdle Analysis. *International Journal of Environmental Research and Public Health*, 16(1), 126. <https://doi.org/10.3390/ijerph16010126>

Wang, X., Li, W., Song, J., Duan, H., Fang, K., & Diao, W. (2020). Urban consumers' willingness to pay for higher-level energy-saving appliances: Focusing on a less developed region. *Resources, Conservation and Recycling*, 157, 104760. <https://doi.org/10.1016/j.resconrec.2020.104760>

Wheeler, M., Sharp, A., & Nenycz-Thiel, M. (2013). The Effect of 'Green' Messages on Brand Purchase and Brand Rejection. *Australasian Marketing Journal*, 21(2), 105–110. <https://doi.org/10.1016/j.ausmj.2013.02.007>

Yue, B., Sheng, G., She, S., & Xu, J. (2020). Impact of Consumer Environmental Responsibility on Green Consumption Behavior in China: The Role of Environmental Concern and Price Sensitivity. *Sustainability*, 12(5), 2074. <https://doi.org/10.3390/su12052074>

Zhang, X., & Dong, F. (2020). Why Do Consumers Make Green Purchase Decisions? Insights from a Systematic Review. *International Journal of Environmental Research and Public Health*, 17(18), 6607. <https://doi.org/10.3390/ijerph17186607>

Zhao, H., Gao, Q., Wu, Y., Wang, Y., & Zhu, X. (2014). What affects green consumer behavior in China? A case study from Qingdao. *Journal of Cleaner Production*, 63, 143–151. <https://doi.org/10.1016/j.jclepro.2013.05.021>

Acknowledgements

The reported study was funded by RFBR, project number 20-010-00245 A.

Valentina KARGINOVA-GUBINOVA is the Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: economic security, environmental economics, conflicts of interest, and regional economics. **ORCID ID:** orcid.org/0000-0002-8630-3621

Aleksander VOLKOV is the Junior Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. Research interests: environmental behavior, green purchase, sustainable environmental and economic development, environmental and social responsibility of businesses, consumption and human capital. **ORCID ID:** orcid.org/0000-0003-0451-8483

Sergey TISHKOV is Secretary for Science in the Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: innovation development, renewable energy, spatial economic, regional innovation systems. **ORCID ID:** orcid.org/0000-0002-6061-4165

Anton SHCHERBAK is the Researcher in Institute of Economics, Karelian Research Centre, Russian Academy of Science. PhD in Economics. Research interests: energy efficiency, renewable energy, economic security, waste management, and regional economics. **ORCID ID:** orcid.org/0000-0002-2259-9953

Make your research more visible, join the Twitter account of ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES: @Entrepr69728810

Copyright © 2021 by author(s) and Vsi Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
<http://creativecommons.org/licenses/by/4.0/>

