Rocznik Ochrona Środowiska

Volume 27 Year 2025 ISSN 2720-7501 pp. 799-815

https://doi.org/10.54740/ros.2025.064 open access

Received: December 2025 Accepted: December 2025 Published: December 2025

The Importance of Environmental Protection in Identifying Consumer Behavior Among the Young Population in the Area of Sustainable Energy Development

Marcin Olkiewicz[1], Joanna Alicja Dyczkowska[2]*

[1]Faculty of Economic Sciences, Koszalin University of Technology, Poland
https://orcid.org/0000-0001-6181-6829
[2]Faculty of Economic Sciences, Koszalin University of Technology, Poland
https://orcid.org/0000-0001-9866-3897

corresponding author's e-mail: marcin.olkiewicz@tu.koszalin.pl

Abstract: Consumer behaviors determine, among other things, the scale and pace of consumption in the market, including the energy sector. The manner in which purchasing decisions are executed may have significant implications for the future, particularly in terms of environmental protection and the utilization of natural resource sources. This article aims to identify and analyze the factors shaping the consumer behaviors of the younger generation from the perspective of environmental awareness. Results of a survey conducted using the CAWI method among 98 young respondents revealed variability in the perceived importance of factors influencing conscious consumption. The importance attributed to factors that act as triggers for decision-making (opinions of friends, family, etc.) differed from that assigned to factors determining the actual purchase (ecology, quality, purchase price, etc.). Nevertheless, the economic aspect (51.7%) exerted the greatest influence on purchasing decisions. An important observation is the indication of responsible decision-making, as the majority of the younger generation tends to focus on devices that provide energy in accordance with renewable energy sources (RES). When evaluating various forms of energy acquisition, 42% of respondents expressed a strong preference for photovoltaic panels, while 40% indicated that they would not purchase a universal combustion furnace.

Keywords: consumer behaviors, young consumer generation, sustainable energy development, environmentally responsiveness

1. Introduction

Consumer behaviors, particularly in the areas of environmental protection, sustainable energy development, and eco-friendly purchasing, attract the interest of both researchers and entities offering products or services in this domain. Literature analysis and numerous studies indicate differences in the behaviors of younger and older consumer generations (Błoński et al. 2023). Young consumers have different perspectives regarding media usage, purchasing methods, financing, adoption of innovations, and environmental considerations (Gupta & Agrawal 2018, Joshi & Rahman 2015). Therefore, understanding the factors and their influence (determinants) on the consumption process, especially among the younger generation, is crucial, as it enables entities to plan development strategies and shape sales policies or mobile communication tools in line with identified needs. It should be noted, however, that research results do not always reflect individual consumer behaviors, as they are generalized depending on the sample size, yet they still indicate certain behavioral patterns and tendencies of specific generations. On a global scale, changes in Poland are becoming visible in the market for energy-supplying devices, confirming growing interest and demand for products such as solar panels, heat pumps, or wind turbines. It is also worth mentioning that energy devices like electric vehicles or electric scooters contribute to sustainable energy development and environmental protection. Conscious consumption, supported by appropriate purchasing capabilities, raises the standard of living and shapes trends across generations (Moisander 2007). The young consumer society, shaped by the digital revolution and globalization, establishes its requirements and expectations, diverging from the standard approach to consumption and market behaviors compared to older generations.

The research aim of the article is to identify and assess the consumption behaviors of the young population in the context of sustainable energy development. Based on this aim, the following research hypotheses were formulated:

- H1. Younger generations tend to consume devices that enable the use of various forms of energy generation.
- H2. The young consumer society, despite being aware of the need to care for the natural environment, does not focus on actions that guarantee this success.
- H3. The young consumer society makes purchasing decisions consciously, in accordance with contemporary trends, regarding sustainable energy development.

The research process was based on the following stages: analysis of the literature on consumer behavior, along with the identification of the young consumer society and sustainable energy development. Next, the factors determining and stimulating the purchasing process were identified. This allowed for the identification and assessment of preferences in energy-supplying devices and awareness of social responsibility for natural resources. Additionally, the study identified which elements and purchasing conveniences could be utilized by respondents during the consumption process.

2. Literature Review

2.1. Consumer Behaviors – Selected Issues

The contemporary consumer market represents an intriguing area of research (Jarosz 2006, Dąbrowska 2015), as purchasing decisions resulting from the conscious and active participation of different generations reflect their values, attitudes, expectations, requirements, and needs, while also identifying factors influencing changes in consumer and market behaviors (Borgardt 2017). The transformation of consumer attitudes is shaped in two primary ways. On one hand, it results from external (environmental) market changes – such as socio-economic, geopolitical, technological, and cultural developments – while on the other, it stems from evolving needs and expectations aimed at increasing consumer satisfaction in purchasing processes. Consumption, understood as the phenomenon (process) of acquiring goods or services to satisfy needs and shape macroeconomic behaviors, is analyzed from the perspective of various disciplines, including economics, philosophy, psychology, and sociology. In other words, consumption has become a medium for market communication within both consumerism (activities strengthening competitiveness, globalization, and the free market, shaping trends, and fostering the emergence and implementation of innovations and advanced technologies) and consumptionism (a social system based on emotions, needs, desires, attitudes, concern for personal potential, and living standards – quality of life, etc.) (Furmanek 2010, Roach et al. 2019), engaging all market stakeholders. The information obtained allows entities to shape, within their own beliefs – arising from economic analysis, strategic goals, emotions, and other factors – their field of decision-making activity in purchasing processes (Garczarek-Bąk 2016). It should be emphasized that decision-making processes are influenced by several interrelated components, including (Taranko 2016):

- Cognitive aspect – related to the knowledge shaping the evaluation of a given phenomenon, good, or service, determined by beliefs, direct observations, experiences, and information (from media, advisors, social networks, etc.),
- Behavioral aspect – defining conscious or unconscious (subconscious) investment attitudes arising from rationality, necessity, or habit,
- Emotional aspect – generating and shaping emotions and feelings—positive, negative, or ambivalent – that directly determine purchasing attitudes.

Considering the variability, scale, and development of consumer purchasing behavior, researchers have proposed various classifications of determinants influencing buyer behavior. The most frequently identified factors include (Błoński et al. 2023, Sobczyk 2018, Mazurek-Łopacińska & Sobocińska 2018, Fandrejewska 2017):

- Demographic – age, gender, education, place of residence, etc.,
- Economic – purchasing power,
- Social – affiliation, culture, social values,
- Technological – internet, mobile devices, digitalization, innovations, new technologies,
- Psychological – emotions, motivation, perception, learning process,
- Legal – legal conditions, consumer rights, cybersecurity.

Researchers analyze consumer behavior determinants in diverse ways, enabling them to identify and study trends (Kucner et al. 2018), typologies of consumer attitudes (Kotler et al. 2024), and construct models of consumer behavior, such as the Howard-Sheth Model or the Nicosia Model (Aziewicz 2023). The number of factors (variables), both significant and insignificant, that influence consumer behavior to varying degrees is substantial, allowing for in-depth scientific exploration of this phenomenon. In their analysis, the authors sought to demonstrate – illustrated in Figure 1 – that consumer behaviors evolve over time under the varying influence of key factors.

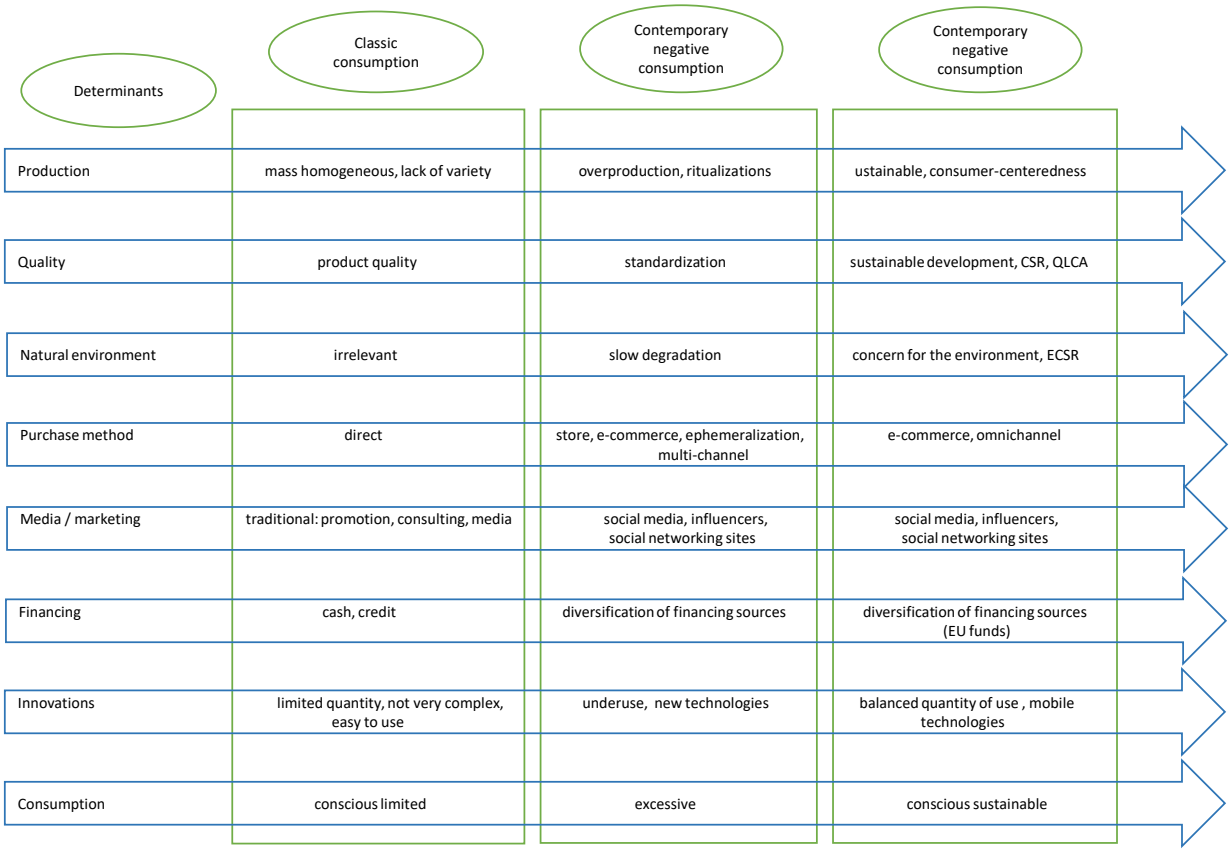


Fig. 1. Evolution in selected areas of consumer trends

In summary, it is worth emphasizing that the development of consumption began to accelerate after the Industrial Revolution and continues to this day. Technological advancements, the ability to reach potential customers worldwide, globalization, improvements in product quality, and various forms of marketing have all contributed to the diversification of purchasing impulsiveness (Reshetnikova et al. 2021, Roszkowska 2001, Olkiewicz et al. 2019), which now varies depending on consumer segments, particularly generational affiliation (Paczka 2020).

2.2. Young consumer society

Modern society, benefiting from globalization, digitalization, free market mechanisms, and the pursuit of standardization and quality of products and services, places changing expectations and demands on economic entities. The attitude toward consumption, identified in the form of demand, influences the economic development of market stakeholders and the country. There are many classifications identifying stakeholders: internal and external (Korneta & Lotko 2021, Freeman et al. 2007, Kostera & Śliwa 2012, Werther & Chandler 2011), society, shareholders, employees, customers, prosumers, suppliers, government, as well as local, regional, national, and international (Garoui & Jarboui 2012). However, it should be remembered that the impact of individual groups may have different aspects, such as organizational, social, or economic. This means that the increase in interest and the level of consumption activities may affect and influence various spheres of quality of life, economic development (of business entities) (Lenort et al. 2019), the state of the natural environment, etc., in other words, every sphere of human life and activity. In other words, a person, as an entity purchasing a given good or service, becomes one of the main links in the value chain (economic, cultural, social, or organizational). However, the literature indicates that it is not always necessary to be a buyer to play a relevant role in the consumer process. It is enough to be an initiator (an entity suggesting a purchase transaction), an advisor (an entity influencing the final purchasing decision), or sometimes a decision-maker (an entity approving or making the final purchasing decision) (Janoś-Kresło & Mróz 2015, Perchla-Włosik & Wardzała 2015). Identifying the entity of the purchasing process is therefore not so easy, as the literature also uses terms such as customer (an entity expressing purchasing interest), consumer (the buyer of goods or services, remains affected by the product), prosumer (an entity making a purchase and oriented toward increasing consumption, indicating potential improvements enhancing purchasing satisfaction), user (an entity benefiting from the effects of purchase transactions), or purchaser (an entity making a purchase but not necessarily using the acquired

good or service) (Olkiewicz 2020). Such terminological diversity has led to the adoption of the term consumers for the purposes of this study, as this concept identifies an entity that purchases goods or services for a specific price, at a specific time, and of a specific quality. From an economic point of view (Samson 2013), the consumer is also identified as a user shaping the demand–supply function, combining the characteristics of a customer, purchaser, and user (Samson 2013). In the legal aspect, Article 22 of the Civil Code defines a consumer as a natural person who performs a legal act with an entrepreneur that is not directly related to their business or professional activity (KC 2025). Both national (PK 2024) and international consumer rights have been defined (TofUE 2004). This means that consumers are active, conscious participants in the market, and their needs reflect individual values, emotions, beliefs, and interests. The young consumer society, as a part of the broader population, is characterized by different values, beliefs, potential, expectations, and requirements than other generations, although some shared values may exist. This often results from purchasing power, lifestyle, and quality of life within specific time frames, and particularly from the age of the population. The ability to identify generational differences has become increasingly important, as these are distinct groups of individuals born within a given period who grew up and matured within the same cultural, political, economic, and social environment, sharing similar experiences of civilizational change and subjective similarities (Barczykowska & Pawełek 2021, Rogozińska-Pawełczyk et al. 2019). A review of the literature indicates a generational classification that is widely accepted and frequently referenced by researchers, allowing for extensive studies and analyses. The classification includes (Rauvola 2019, Gruchoła 2016, Costanza et al. 2023, Appelbaum et al. 2005, Twenge 2023, Costanza et al. 2012):

- Lost Generation – individuals born between 1833 and 1900.
- Greatest Generation (also referred to as "the Great Depression Generation" or "the Grand Generation") – individuals born between 1901 and 1924.
- Traditionalist Generation (also referred to as "the World War II Generation," "the Silent Generation," or "the Quiet Generation") – individuals born between 1925 and 1945.
- Baby Boomer Generation (also referred to as "Boomers" or "BB Generation") – individuals born between 1946 and 1964.
- Generation X (also referred to as "the Activist Generation") – individuals born between 1965 and 1980.
- Generation Y (also referred to as "the Millennial Generation," "Millennials," or "Digital Natives") – individuals born between 1981 and 2000.
- Generation Z (also referred to as "iGen," "the Multitasking Generation," or "Zoomers") – individuals born between 2001 and 2013.
- Generation Alpha (also referred to as "Generation Alpha") – individuals born between 2014 and 2025.
- Generation Beta (also referred to as "Generation Beta") – individuals born from 2025 onward.

The knowledge developed about generational groups, despite its usefulness, has a generalizing character and may lead to overinterpretation or even stereotyping. Therefore, it is crucial to correctly identify the common values, traits, and norms of individual age groups, despite existing individual differences. For the purposes of this study, the young consumer society has been defined as comprising Generation "Y" and Generation "Z," as these groups will, in the near future, determine the directions of development, including in the areas of energy and environmental protection. Table 1 presents selected areas of identification of the analyzed groups within the young consumer society.

Individuals belonging to Generation "Y" were born during the digital revolution and are therefore often referred to as "digital natives." This social group marks a life transition between "before" and "after" the digital revolution. It is noted that this generation, through participation in rapid technological development – which initiated new forms of mobile communication, the beginnings of globalization, and increasingly intense competition – has significantly influenced the shape, pace, and manner of personal development (Plichta & Pyżalski 2013, Hennelly & Schurman 2023, Korczyk-Ulman 2023, Suvalova et al. 2021, Parzonko 2015, Drzewiecki & Głębicka-Giza 2018, Rudolph et al. 2018, Czarnecka 2018, Biesbroek et al. 2010, Hagen et al. 2016, Cecchin et al. 2021, Hariram et al. 2023). Access to the Internet and social media platforms (Facebook, followed by YouTube and Instagram) has become the primary source of information about products, services, and brand creation. Access to ubiquitous knowledge has fostered a highly empathetic and progressive society with strong ambitions and proactive engagement in achieving personal goals. It is also observed that this generation is the first to integrate their moral values into the workplace; they often choose to work only in environments that align with their socio-political values, even at the expense of lower compensation (Korczyk-Ulman 2023, Suvalova et al. 2021).

Table 1. Characteristics of the Young Consumer Generation (Cochoy et al. 2020, Jankowiak & Czerwińska-Lubszczyk, 2024, Morris 2021, Muszyńska 2020)

	Generation Y	Generation Z
Characteristic Features	- ambitious - focused on their achievements - socially conscious	- progressive - entrepreneurial - less goal-oriented (compared to other generations)
Values Held	- expect opportunities to use technology to facilitate work and increase efficiency - seek jobs that allow them to apply their creative skills - expect work that enables personal and professional development	- expect honesty and authenticity - value connection and communication between coworkers as well as between employer and employee - appreciate interpersonal interactions, but due to growing up in the digital era, they often struggle to build relationships in person
Approach to Work	- eager to learn new things - expect mentoring to achieve a permanent position in the company - focused on personal development	- expect flexibility in the workplace - curious about new solutions - willing to work in multiple positions to find the right career path and role - offer unconventional solutions
Expectations Toward the Employer	- the employer should act as a mentor - the employer should be flexible regarding scheduling - the employer should provide immediate feedback	- the employer should allow independence and autonomy - the employer should ensure a balance between personal and professional life
Motivating Factors at Work	- responsibility, diligence - need for guidance from a supervisor (e.g., manager) - focus on personal development and interests rather than the company's interests	- individuality - creativity - diversity
Communication Style	- instant messages - e-mails - SMS - MMS	- instant messages - e-mails - SMS - MMS - messaging apps - social media

Another group within the young consumer generation is Generation "Z". This social group, mastering and focusing on digital technology, leverages its capabilities particularly for information exchange, communication, and knowledge acquisition – using social media platforms or portals such as Facebook, Twitter, Instagram, and YouTube. This generation may experience difficulties in establishing direct, in-person interpersonal relationships, as "online life" in some ways shapes their functioning in reality. This is largely influenced by advertising and digital environment advisors or initiators (Parzonko 2015), such as influencers and YouTubers (Drzewiecki & Głębicka-Giza 2018). For Generation "Z", access to the Internet, the volume and speed of information received, and the actions they undertake shape a lifestyle characterized by frequent changes in the pursuit of success and achieving optimal results (Rudolph et al. 2018). Exclusivity and prestige serve as indicators of their social status. This generation is conscious, often described as entitled, and seeks to utilize innovations, luxury (branded) products, and economically justified solutions, including those related to the energy sector (Czarnecka 2018).

2.3. Sustainable Energy Development

In the second half of the 20th century, the European Union introduced climate policy changes among its member states. All directives were outlined in the European Climate Change Programme, adopted in June 2001. EU countries implement environmental policies based on sustainable development, which has resulted in improvements in environmental indicators (Biesbroek et al. 2010, Hagen et al. 2016). The concept of

sustainable development is a component of not only international policy but also the policies of individual countries (Cecchin et al. 2021, Hariram et al. 2023). In Poland, it is reflected in the Environmental Protection Law. This document defines sustainable development as socio-economic development aimed at balancing access to the environment for different societies or their citizens (POŚ 2001). At the enterprise level, sustainable development involves striving for balance in operations by integrating economic, ecological, and social objectives (Mishra et al. 2010, Olkiewicz & Wolniak 2020). This integration is reflected in the efficient production of socially desirable goods and services while simultaneously reducing the consumption of natural resources and ensuring the fulfillment of expectations of various stakeholder groups associated with the enterprise (Biermann et al. 2022).

The processes of meeting energy demand are accompanied by the emission of greenhouse gases (Maraveas et al. 2023). According to data from the Polish Power Grid (Polskie Sieci Elektroenergetyczne), electricity production in Poland in 2024 amounted to 166,990 GWh, which is 2.05% higher than the previous year. Domestic consumption was 0.86% higher year-on-year, reaching 168,956 GWh (Figure 2).

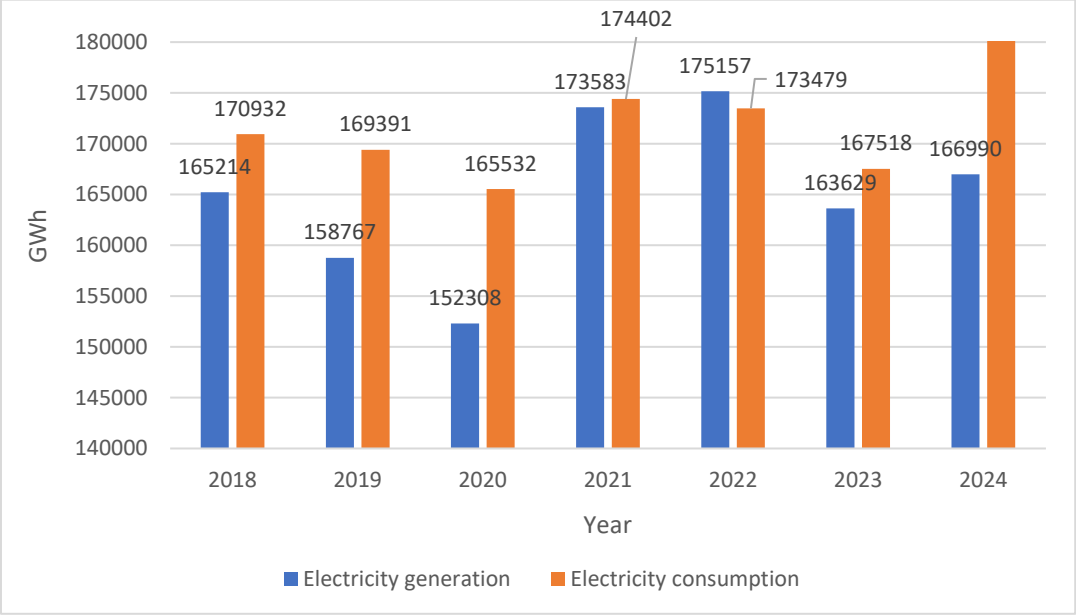


Fig. 2. Electricity Production and Demand in 2018-2024 [GWh] (PSE 2021)

Electricity production in 2024 was lower than domestic consumption. As a result, the foreign trade balance was positive, amounting to 1,966 GWh. Electricity is primarily generated in conventional power plants. In 2024, production in these facilities reached 124,781 GWh, representing nearly 75% of total electricity production. The remainder came from wind power plants and other renewable energy sources, totaling 42,208 GWh. The most important fuel for electricity generation in 2024 was hard coal, with a share of 41.4%, followed by lignite at 21.5%. Renewable energy sources produced 42,208 GWh, with their share increasing to 25.3%.

The percentage share of installed capacity from conventional and renewable sources does not correspond to their percentage share in electricity production. Renewable sources account for 44.08% of installed capacity, yet only 25.3% of total production.

The primary contributor to greenhouse gases is carbon dioxide (CO_2), emitted especially in the energy sector, but also in other areas of production and service provision (da Fonseca-Soares et al. 2024, Gabryelewicz et al. 2021). Environmental use should be conducted in a manner that maximizes the net benefits of economic development while simultaneously protecting and ensuring the regeneration of the utility and quality of natural resources over the long term. Greenhouse gas emissions have been reduced, and the energy intensity of the economy has been minimized, achievements made possible by changes in the energy and industrial sectors (Miklautsch & Woschank 2022). By 2040, an almost entirely new power system will be constructed, with a strong foundation in low- and zero-emission energy sources. Forecasting for Poland in 2050 is challenging due to the dynamic nature of changes in the country (Rybak et al. 2022). Nevertheless, there is a requirement to develop a plan that accounts for climate specifics and the EU obligation to prepare long-term assumptions. Within the European Union, the PRIMES program is responsible for assessing the impacts of selected energy sector programs (Höglund-Isaksson et al. 2023). PRIMES forecasts that by 2050, CO_2 emissions in Poland will be reduced by half, from 13,000,000 Mg/year to 5,000,000 Mg/year. In connection with the modernization

and technological reconstruction of Poland's power sector, the share of hard coal in electricity production will be reduced from the current 42% to 28% by 2050, and the role of lignite will also be diminished (Fotiou et al. 2023, Bluszcz et al. 2025).

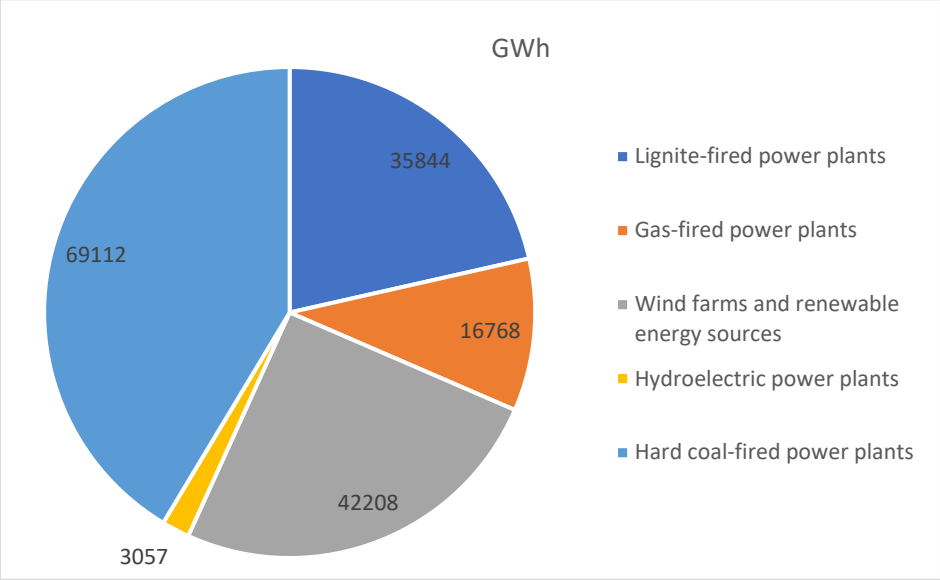


Fig. 3. Electricity Structure in 2024

An increase in the importance of renewable energy sources (RES) in the structure of national primary energy demand is anticipated, resulting from the dynamic development of large-scale wind power plants as well as distributed electricity and heat generation from renewable sources (Fonseca-Soares et al. 2024, Mammadov et al. 2022). Poland intends to fulfill EU obligations regarding the share of RES in final energy consumption. By utilizing the existing strategic potential in renewable energy based on RES, which operate across many regions of the country but do not engage in joint economic activities in energy production from RES regulated by the Renewable Energy Sources Act, Poland aims to strengthen its renewable energy sector. Technological solutions considered the most sustainable are RES installations, characterized by not depleting available energy sources. However, the use of RES depends on various boundary conditions, including (Razmjoo et al. 2021):

- access to energy resources,
- the scale of regional energy demand,
- production capacities.

The slowest rate of development among renewable energy sources (RES) is observed in biomass and hydropower, which is due to their already significant share in the national energy balance (Harper et al. 2022). The highest positions in estimated average annual growth rates are occupied by those renewable energy carriers that are only beginning to establish themselves in the RES sector, consistent with trends observed in other EU member states. Production capacity depends on geographical location. The success of a solar collector (Kuczynski et al. 2021) and photovoltaic installation is conditioned by the solar irradiation of a given area (Chamier-Gliszczynski et al. 2023). Hydropower relies on water resources, making terrain with abundant rivers a key factor. Geothermal installations depend on local geological conditions, specifically the type of soil. Wind energy is influenced by the location of installations and the wind conditions in the selected area. Biomass energy, in turn, is dependent on economic conditions (Spiru 2023).

Additionally, improving the energy efficiency of district heating systems is based on several key measures. These include the use of heat storage, modernization of networks, and connection of new buildings, investments in installations that reduce emissions, and low-temperature networks. Cogeneration and trigeneration increase efficiency, while digitalization and weather-based automation optimize system operations. The use of industrial waste heat and investment in renewable energy sources (RES), such as biomass and solar energy, are also important. These actions support the transformation toward low-emission heating systems. Polish authorities plan to guide the transformation of the heating sector through three key documents: the Strategy for District Heating until 2030 (with a perspective to 2040) (RM 2023), Poland's Energy Policy until 2040 (PEP 2021), and the National Energy and Climate Plan for 2021–2030 (KPEiK 2019). A particularly significant document is PEP 2040, which is based on three key pillars of the energy transition. The first pillar assumes

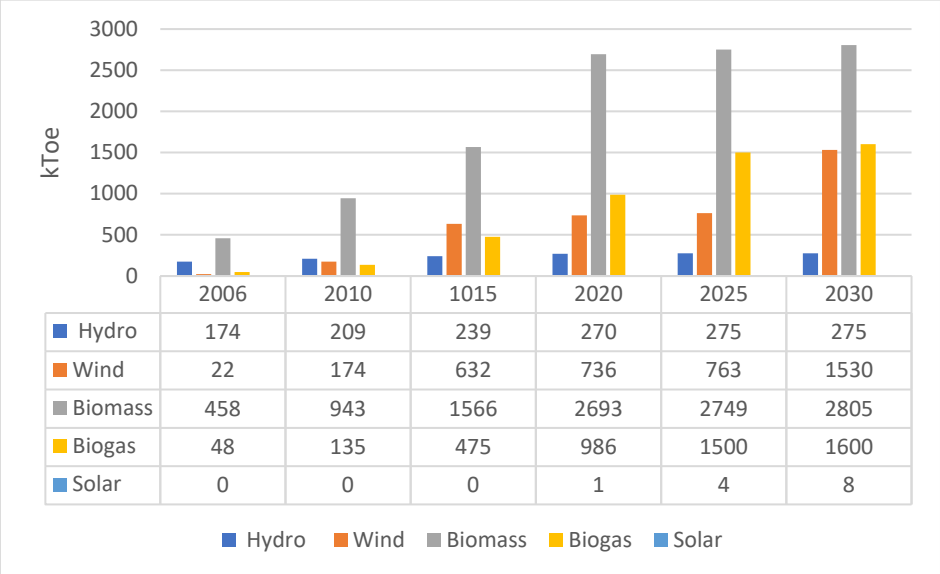
that the process must simultaneously eliminate energy poverty and replace jobs related to fossil fuel extraction with new employment in the renewable energy sector (RES) and nuclear energy, including in district heating. The second pillar promotes the creation of a zero-emission energy system, in which local and municipal energy plays an important role, potentially stimulating prosumer heat production, similar to electricity generation. The third pillar emphasizes air quality, necessitating the modernization of heating systems, particularly those based on domestic stoves. Ultimately, PEP 2040 envisions a comprehensive modernization of Polish district heating through greater use of RES. In the urban heating sector, three directives are particularly critical: the Energy Efficiency Directive (EED) (EED 2012), the Renewable Energy Directive (RED III) (RED 2018), and the Energy Performance of Buildings Directive (EPBD) (EPBD 2024).

Increasing the role of cogeneration and renewable energy sources (RES), such as biomass and geothermal energy, is crucial for meeting emission standards and achieving Poland's energy targets. Cogeneration allows for the simultaneous production of heat and electricity, improving efficiency, stabilizing energy prices, and enhancing energy security. Equally important are investments in energy storage technologies and network modernization, which enable better management of variable sources like RES. Poland possesses significant renewable energy potential.

The study was based on the sustainable development index and its key pillars, using the following formula:

$$\boldsymbol{Zri = Ei + Si + Śri = \frac{1}{n}\sum_{i=j}^{n} Zij}$$

where:
Zri – Sustainable development index in the j-th year,
Ei – Economic development index in the i-th year,
Si – Social development index in the i-th year,
Śri – Environmental development index in the i-th year, n – number of indicators in the model,
Zij – denotes the normalized value of the j-th variable in the i-th year.



	2006	2010	1015	2020	2025	2030
Hydro	174	209	239	270	275	275
Wind	22	174	632	736	763	1530
Biomass	458	943	1566	2693	2749	2805
Biogas	48	135	475	986	1500	1600
Solar	0	0	0	1	4	8

Fig. 4. Fuel consumption for renewable electricity generation

Achieving the EU targets for renewable energy will require gross electricity production from RES in 2020 at approximately 31 TWh, representing 18.4% of total production, and in 2030 at 39.5 TWh, which corresponds to about 18.2% of total production. The largest share will come from wind power plants – in 2030, around 18 TWh, accounting for approximately 8.2% of the projected total gross production.

3. Materials and Methods

The aim of the study was to identify and assess the consumption behaviors of the young population in the context of concern for sustainable energy development. The term "concern" should be understood as recognizing the current state of awareness of existing threats and ongoing pro-environmental actions, particularly in the area of energy sources. The empirical study was conducted in Poland between September and October

2025 using the CAWI method (Computer-Assisted Web Interview). The questionnaire included 15 closed-ended questions (excluding demographic questions) with single- and multiple-choice response options, as well as a 7-point rating scale. In total, 98 completed questionnaires were obtained; all respondents answered every question, which were subsequently subjected to further analysis. The study targeted respondents representing the young consumer society, classified as Generation Y and Generation Z. The characteristics of the study sample are presented in Table 2.

Table 2. Identification of respondents

Specification		Respondents	
		Number	Procent
Gender of respondents	Female	45	45.9
	Male	53	54.1
Residence	Village	21	21.4
	City with up to 5,000 inhabitants	3	3.1
	City 5,001 to 10,000 inhabitants	9	9.2
	City 10,000 to 20,000 inhabitants	9	9.2
	City 20,000 to 50,000 inhabitants	10	10.2
	City 50,000 to 100,000 inhabitants	19	19.4
	City with an area of 100,000 inhabitants	27	27.6
Mrs. / Mr. Status	I am employed (professionally, in a permanent job)	19	19.4
	I am a student	50	51.0
	I am employed (professionally, in a permanent job) + I am a student	26	26.5
	I am not employed or in education	1	1.0
	I run a sole proprietorship (sole proprietorship)	2	2.0
Age	Under 18	0	0.0
	19-21	37	37.8
	22-23	24	24.5
	24-25	17	17.3
	26 and older	20	20.4

The distribution of responses obtained from the demographic section indicates that 61 participants (62.3%) belonged to Generation Z, while 37 participants were from Generation Y. This means that the study results cannot be generalized to the entire populations of these consumer groups and should be considered only as a basis for further research, serving as a survey study.

For the purposes of the study, the research problem was formulated as follows: To what extent does the young consumer generation perceive the need to take actions to ensure sustainable energy development and environmental security? The research gap lies in the lack of knowledge and study results regarding the awareness and consumer preferences related to ensuring the security of sustainable energy development and the natural environment. The following hypotheses were proposed:

- H1. Younger generations tend to consume devices that enable the use of various forms of energy supply (generation).
- H2. The young consumer society, while aware of the need to protect the natural environment, does not focus on actions that guarantee this success.
- H3. The young consumer society consciously makes purchasing decisions in line with contemporary trends in terms of sustainable energy development

4. Results

In response to the need to identify the consumption behaviors of the young population, the first step was to determine their level of awareness regarding changes in the natural environment and their consequences. The study showed that more than half of the respondents, i.e., 60 individuals (21 "yes" and 39 "rather yes"),

noticed global changes in the natural environment. Twelve respondents did not perceive such changes (4 "no" and 8 "rather no"), while 26 found it difficult to determine, as they did not possess the necessary knowledge. Analysis of the results indicated that the young generation most noticeably experiences changes related to heatwaves, droughts, and heavy rains (Figure 5). The impact of floods (42.9%), smog (45.9%), or increased CO_2 levels (43.9%) is perceived moderately, while hailstorms (56%), tornadoes and hurricanes (68.4%), and glacier melting (63%) are largely not felt by the majority of respondents.

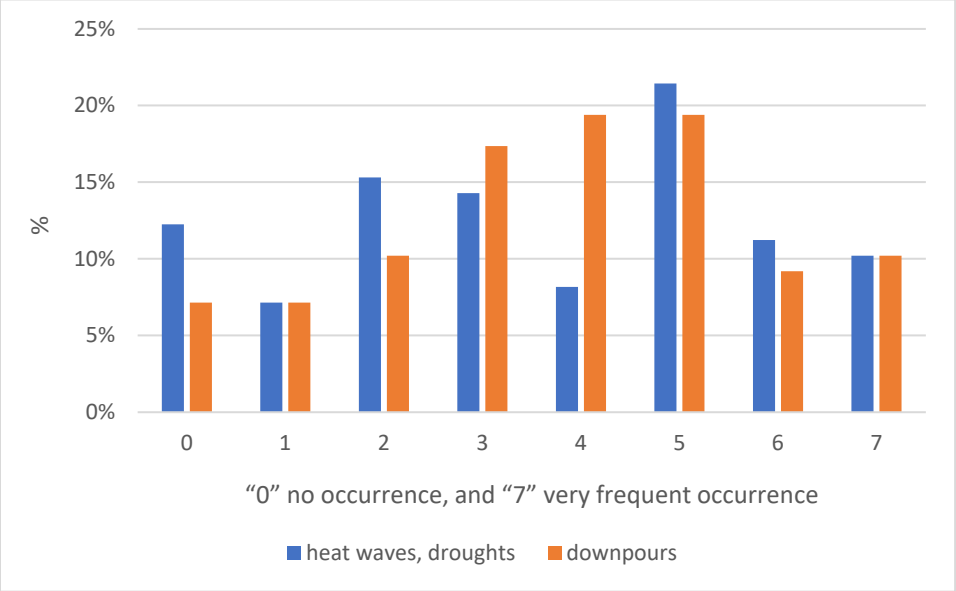


Fig. 5. Most frequently perceived changes in the natural environment

The obtained data indicate (Table 3) that despite not perceiving a significant impact of environmental changes, young consumers identify with aspects related to sustainable energy development. Slightly more than half of the respondents stated that they are familiar with the sustainable energy development policy.

Table 3. Level of knowledge regarding sustainable energy development

	No	Rather no	I don't know / I don't have an opinion	Rather yes	Yes
I know about sustainable energy development policy	6.1%	25.5%	23.5%	42.9%	12.2%
Sustainable energy development increases business opportunities for SMEs	5.1%	13.3%	38.8%	24.5%	18.4%
Sustainable energy development increases the potential of large entities	5.1%	12.2%	25.5%	37.8%	19.4%
Sustainable energy development increases benefits for individual customers (society)	9.2%	10.2%	27.6%	39.8%	13.3%
Sustainable energy development forces a reduction in CO_2 emissions	6.1%	10.2%	20.4%	36.7%	26.5%

The respondents also indicated which factors, and to what degree of importance, influenced their decision to purchase the respective energy-supplying devices (Figure 6).

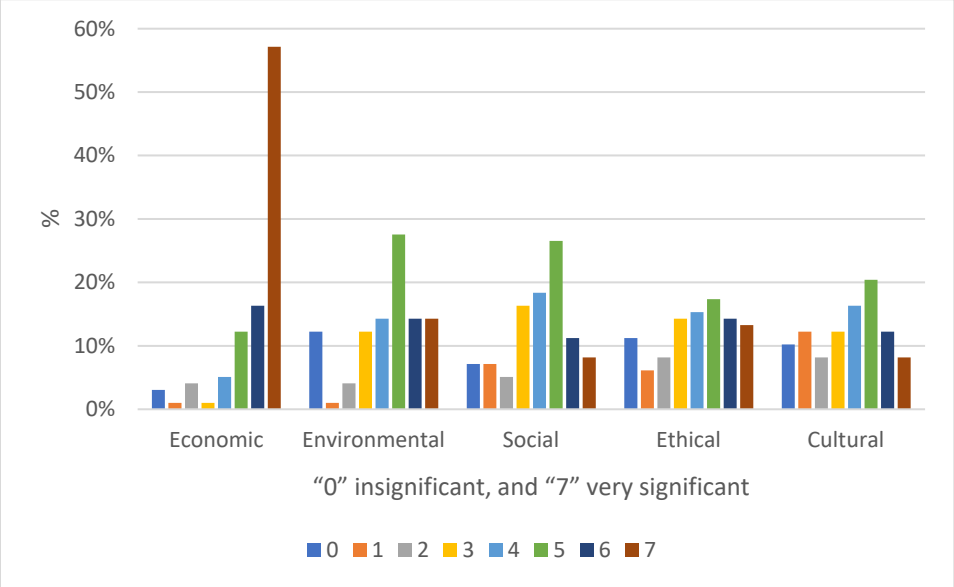


Fig. 6. Nature of factors influencing the consumer decision-making process

The distribution of responses from the respondents clearly indicates the significance of the economic factor. Distributions of responses for the remaining factors show more variability. However, each of the examined factors exhibits a degree of "importance" with limited strength, while the other factors lack consensus, which may indicate an absence of strong determinants. The study demonstrated that social media is important for the young consumer generation. The data indicate that content published on social media increases interest in taking action (37.8%), and trust in a brand when making purchase decisions was confirmed by as many as 49% of respondents. This appears to have significant relevance for investment (consumption) decisions regarding the choice of energy-supplying devices (Table 4).

Table 4. Assessment of potential energy source groups [%]

	No	Rather no	I don't know / I don't have an opinion	Rather yes	Yes
Wind turbine (home)	21	15	17	24	21
Photovoltaic panels (energy)	12	10	8	27	41
Water heating panels (solar panels)	17	13	18	24	26
Pellet stove	21	23	24	16	14
Ground source heat pump	14	13	25	21	25
Air source heat pump	21	17	26	18	16
Gas stove	23	18	19	22	16
Wood-burning fireplace	21	18	16	21	22
Universal combustion stove	39	21	18	10	10

5. Discussion

Consumer behaviors of the young society in the area of sustainable energy development may result from several factors. The main ones include: knowledge of sustainable energy development policies, directions of innovative actions in various forms of energy generation, which consequently translates into product identification, and purchase-related factors (directly shaping purchasing decisions). It is also important to assess the already implemented actions aimed at improving or minimizing the impact on the natural environment. Analysis of familiarity with specific aspects of sustainable energy development (data from Table 3) indicates that the young generation (over 55%) knows the provisions of sustainable development policy, which in turn drives actions related to technological progress, modernization of energy systems, and CO_2 reduction. Research in this area also showed that they are not entirely convinced or lack knowledge of whether the implementation of sustainable development policies translates into the business sphere (approximately 39% of respondents indicated this), i.e., whether it increases business opportunities for economic entities. The distribution of responses in this area may result from the respondents' status, as only a small percentage are employed or run their own

business. Nevertheless, respondents believe that all actions within the framework of sustainable energy development should be targeted and utilize natural potential, particularly wind (49% of responses) and solar energy (40.8% of responses) (Figure 7).

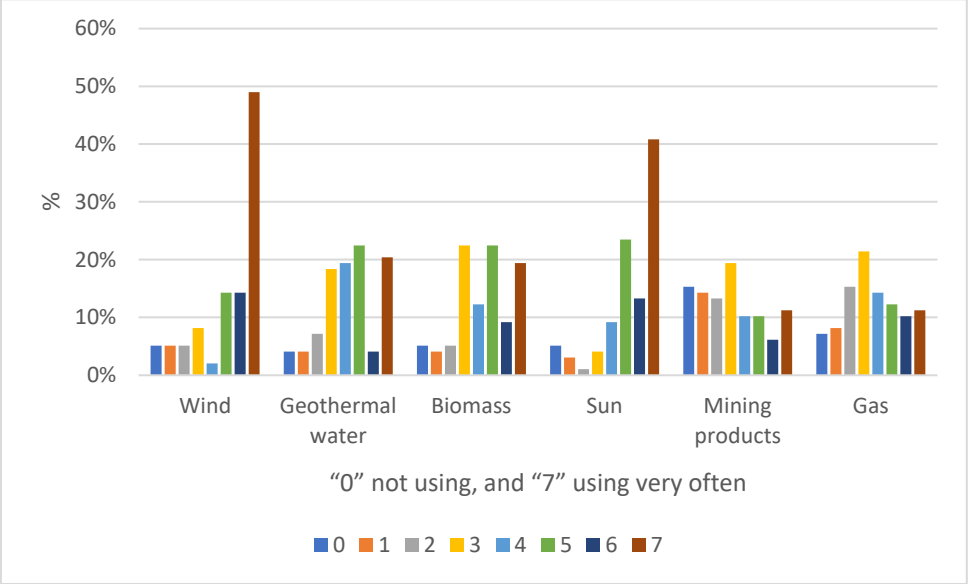


Fig. 7. Assessment of Consumer Action Directions in the Field of Renewable Energy Sources

In the case of other types of energy sources, the distribution is uneven. The data presented in Figure 7 indicate that the younger consumer generation is oriented toward and identifies with the necessity of actions in the direction of renewable energy sources (RES). It is evident that fossil-based products, perceived as coal and its derivatives, are not viewed positively by the younger generation, which is also consistent with EU policy. The identification of desirable directions for the development of types of energy generation sources is directly related to the development of end-use devices. Table 4 presents data indicating which end-use devices are preferred by the younger consumer generation. The high consumer awareness of young people (as shown in Table 4) confirms hypothesis 3, that "the young consumer society makes purchasing decisions consciously, in accordance with contemporary trends, regarding sustainable energy development". Solar panels have gained the highest interest and consideration for purchase (42%). Other devices under consideration received positive evaluations, though not as high. Regardless of the type of "preferred" device indicated, the lowest level of interest—reported by as many as 40% of respondents who stated it would not be considered at all—was attributed to the universal combustion furnace. The results obtained positively verify hypothesis 1, that "younger generations tend to use devices that enable the use of various forms of energy generation." The study also confirmed the analysis of "eco-friendly behavior" (Joshi & Rahman 2015), as it showed the premises (criteria) that guide young consumers. It was found that the main criteria (evaluated independently) were: quality (58.2%), maintenance costs (52%), purchase price (46.9%), device lifespan (42.9%), and technical specifications (41.8%). Other significant factors included: availability (28.6%), warranty period (25.5%), and ease of use (including, for example, the possibility of remote management) (23.5%). The remaining parameters (brand, additional services, media opinion) were found to be less dominant. This is rather surprising, as "media opinion" and "brand" were not considered as important, which diverges from theoretical considerations in the relevant literature. Nevertheless, as previously mentioned, the study demonstrated that trust in a brand on social media is crucial when making purchasing decisions (49% of respondents). This discrepancy may have arisen from the way "brand" and "media opinion" were identified as factors within the group of purchase determinants. It is also worth noting that media are not the only impulse for the younger generation to make purchases. As indicated by the data in Figure 8, the most significant impulse for purchasing new solutions (devices) is personal experience (47%).

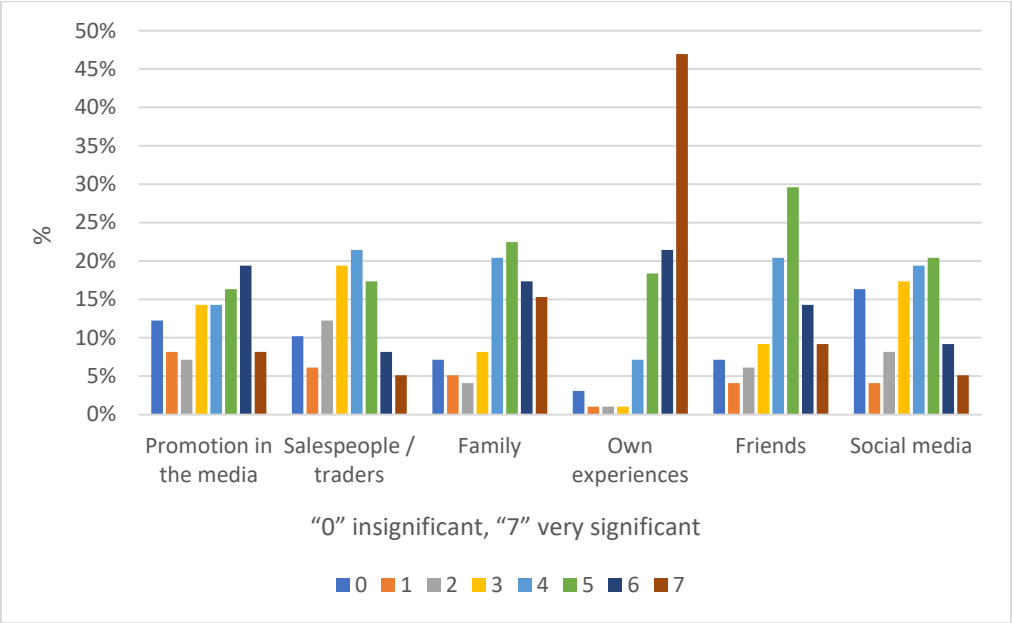


Fig. 8. Significance of Factors Stimulating the Decision-Making Process

The remaining factors exhibit a varied distribution. It is evident that the opinions of family and friends carry significant weight. Media, particularly social media platforms, also play an important role in shaping knowledge and providing information, for example, by verifying the experiences of others regarding the use or purchase of devices – similarly states (Parzonko 2015). A fairly significant impulse for consumer action identified by respondents includes "media promotions" and "activities of sales representatives/retailers." It should be noted that the younger consumer society is aware of its actions, which are clearly influenced by economic factors, as illustrated in Figure 6. Economic considerations determine purchasing capabilities, which is why they are so frequently prioritized. Nevertheless, awareness of the decisions being made also indicates behavior aligned with ethical or ecological considerations. This also positively verifies hypothesis 2, that "the young consumer society, despite being aware of the need to care for the natural environment, does not focus on actions that guarantee this success". The least significant factor, according to the study data, is the cultural aspect. When respondents were asked to what extent they would take advantage of the indicated purchasing incentives, answers were highly varied. The majority would use supportive measures (e.g., EU funds) but would not utilize loans, credits, or advisory services (Figure 9). The figure highlights the extreme values for each of the respective incentives.

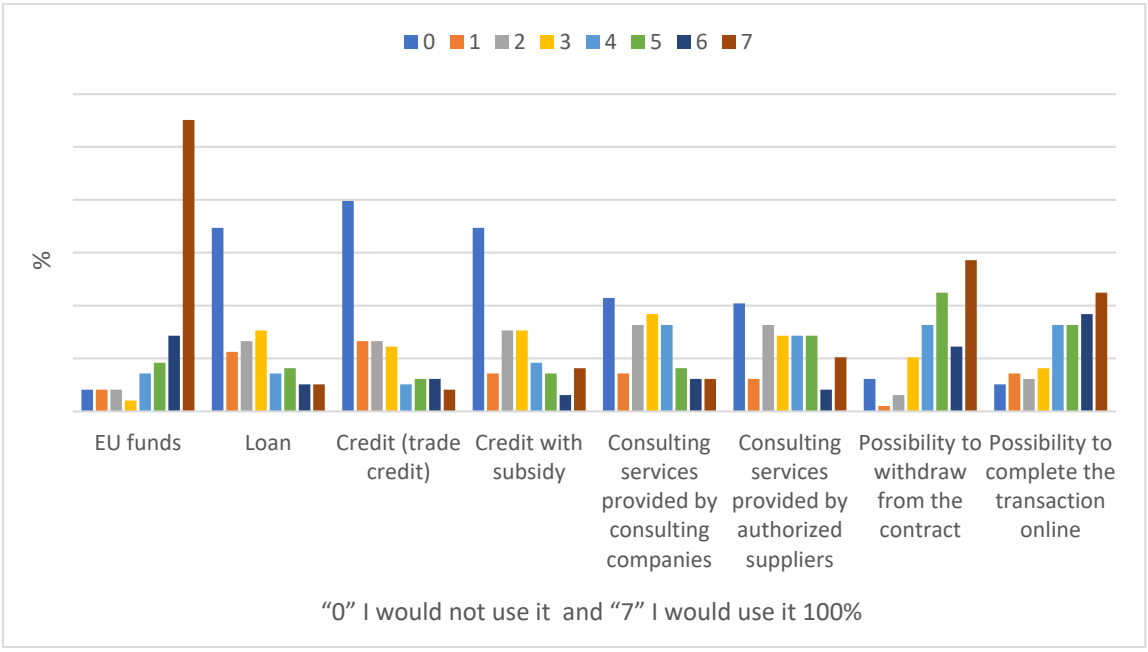


Fig. 9. Incentives Influencing Consumer Behavior

The data indicate a lack of trust in external advisory and financial firms. Only EU funds, as investment support, are perceived positively. This confirms the cognitive-theoretical thesis that the younger consumer society relies more on knowledge obtained from media than from professional advisory entities. In other words, they constitute a society oriented toward digitalization and mobile solutions rather than traditional methods of reaching clients and building relationships, which is further evidenced by the highest preference for the possibility of conducting transactions online.

6. Conclusions

A review of both domestic and international literature indicated a varied identification of factors shaping the behavior of the younger consumer generation. The identification of areas and variable factors, within the framework of the proposed scheme for analyzing the phenomenon of young consumers' behavior, enabled the conduction of the study. The study was carried out using an original survey questionnaire, through which an attempt was made to assess which variables, and with what intensity, influence the decision-making process in the area of sustainable energy development. The shaded areas presented in Figure 10 represent the domains that the authors were able to examine in terms of the significance of factor influence.

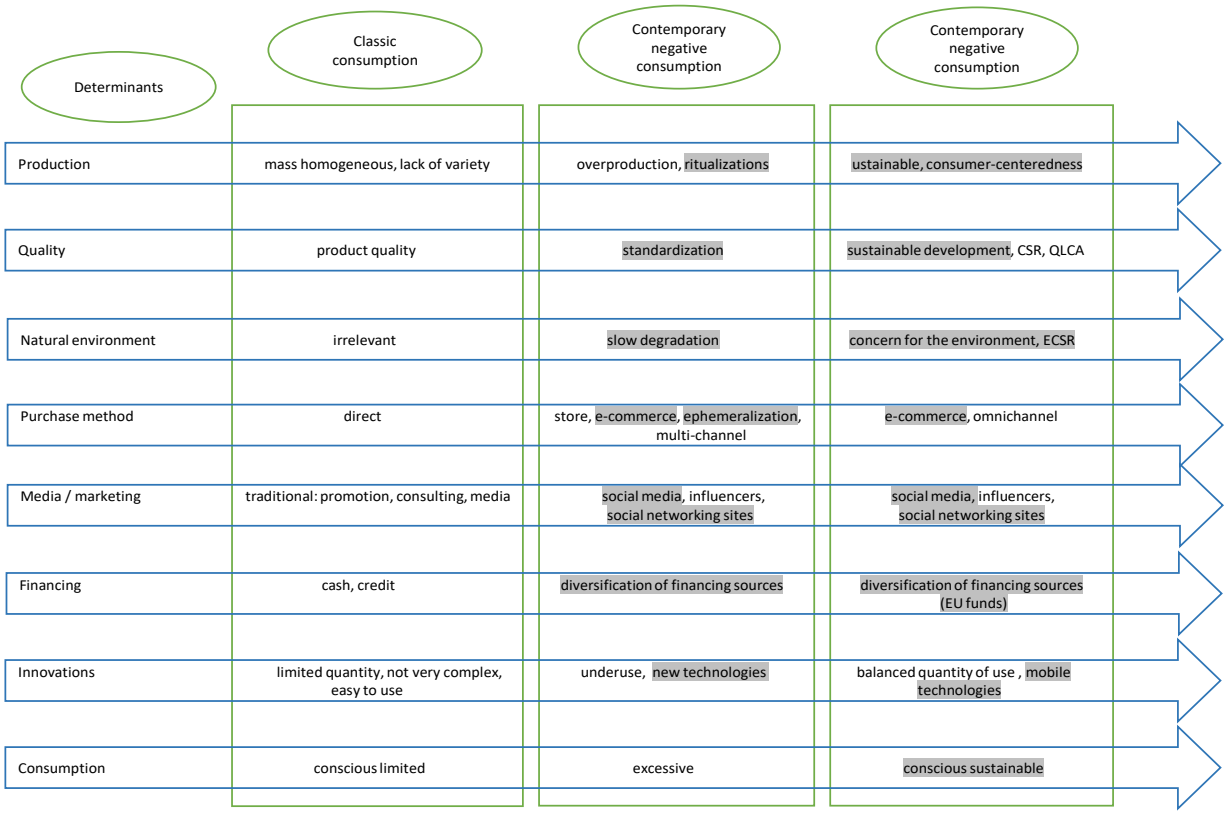


Fig. 10. Identification of research on the evolution of selected areas of consumer trends

The study demonstrated that the younger generation makes conscious choices. Their knowledge of sustainable energy development, across various aspects, is moderate but satisfactory. Over 55% of respondents indicated that they are familiar with sustainable development policies and the actions implemented under the corresponding guidelines. The awareness of the younger generation reflects a willingness to undertake investment actions aligned with renewable energy sources (RES), particularly in the purchase of end-use devices, while unequivocally rejecting the purchase of a universal combustion furnace (40% of responses), the use of which negatively impacts the natural environment. The research results indicate that numerous factors influence the decision-making process, and many of them also initiate the process itself. Based on the presented content and research findings, the proposed hypotheses are confirmed.

References

Appelbaum, S. H., Serena, M., & Shapiro, B. T. (2005). Generation "X" and the boomers: an analysis of realities and myths. *Management Research News*, *28*(1), 1-33.

Aziewicz, A. (2023). Modele postępowania konsumentów na rynku a wybrane czynniki wpływające na zachowania konsumentów na rynku energii elektrycznej w Polsce. *Ekonomia Międzynarodowa*, *44*, 5-26. (in Polish) https://doi.org/10.18778/2082-4440.44.01

Barczykowska, A., & Pawełek, K. (2021). Pokolenia wobec pandemii Covid-19. *Lubelski Rocznik Pedagogiczny*, *4*, 28. (in Polish)

Biermann, F., Hickmann, T., Sénit, C. A., Beisheim, M., Bernstein, S., Chasek, P., Grob, L., Kim, R. E., Kotzé, L. J., Nilsson, M., Llanos, A. O., Okereke, C., Pradhan, P., Raven, R., Sun, Y., Vijge, M. J., van Vuuren, D., & Wicke, B. (2022). Scientific evidence on the political impact of the Sustainable Development Goals. *Nature Sustainability*, *5*(9), 795-800. https://doi.org/10.1038/s41893-022-00909-5

Biesbroek, G. R., Swart, R. J., Carter, T. R., Cowan, C., Henrichs, T., Mela, H., Morecroft, M. D., & Rey, D. (2010). Europe adapts to climate change: comparing national adaptation strategies. *Global Environmental Change*, *20*(3), 440-450. https://doi.org/10.1016/j.gloenvcha.2010.03.005

Błoński, K., Dąbrowska, A., & Shulhina, L. (2023). Similarities and differences in the green attitudes of consumers from different age generations – international comparisons. *Acta Sci. Pol. Oeconomia*, *22*(4), 15-30, https://doi.org/10.22630/ASPE.2023.22.4.22

Bluszcz, A., Manowska, A., & Mansor, N. S. (2025). Decoupling Economy Growth and Emissions: Energy Transition Pathways Under the European Agenda for Climate Action. *Energies*, *18*(19), 5096. https://doi.org/10.3390/en 18195096

Borgardt, E. (2017). Motivation and Consumer Behaviour. *Konsumpcja i Rozwój*, *4*(21), 5-22.

Cecchin, A., Salomone, R., Deutz, P., Raggi, A., & Cutaia, L. (2021). What is in a name? The rising star of the circular economy as a resource-related concept for sustainable development. *Circular Economy and Sustainability*, *1*(1), 83-97. https://doi.org/10.1007/s43615-021-00021-4

Chamier-Gliszczynski, N., Trzmiel, G., Jajczyk, J., Juszczak, A., Woźniak, W., Wasiak, M., Wojtachnik, R., & Santarek, K. (2023). The Influence of Distributed Generation on the Operation of the Power System, Based on the Example of PV Micro-Installations. *Energies*, *16*(3), 1267. https://doi.org/10.3390/en16031267

Cochoy, F., Licoppe, Ch., Petersson McIntyre, M., & Sörum, N. (2020). Digitalizing consumer society: equipment and devices of digital consumption. *Journal of Cultural Economy*, *13*(1), 1-11. https://doi.org/10.1080/17530350.2019.1702576

Costanza, D. P., Badger, J. M., Fraser, R. L., & Severt, J. (2012). Generational Differences in Work-Related Attitudes: A Meta-analysis. *Journal of Business and Psychology*, *27*(4), 375-392.

Costanza, D. P., Rudolph, C. W., & Zacher, H. (2023). Are generations a useful concept? *Acta Psychologica*, *241*, 104-159. https://doi.org/10.1016/j.actpsy.2023.104059 (16.05.2025)

Czarnecka, M. (2018). Information sources affecting consumer behaviour in the electricity market. *Management Sciences*, *23*(2), 4-11. https://doi.org/10.15611/ms.2018.2.01

da Fonseca-Soares, D., Eliziário, S. A., Galvincio, J. D., & Ramos-Ridao, A. F. (2024). Greenhouse gas emissions in railways: systematic review of research progress. *Buildings*, *14*(2), 539. https://doi.org/10.3390/buildings14020539

Dąbrowska, A. (2015). Postawy polskich konsumentów – od konsumpcjonizmu do zrównoważonej konsumpcji. *Handel Wewnętrzny*, *3*, 91-92. (in Polish)

Drzewiecki, P., & Głębicka-Giza, B. (2018). Mały Leksykon Postprawdy. Fake news. Narodowy Instytut Wolności – Centrum Rozwoju Społeczeństwa Obywatelskiego. https://wid.org.pl/wp-content/uploads/E_wydanie-Ma%C5%82y-Leksykon-Postprawdy.pdf (18.05.2025))

Fandrejewska, A. (2017). The Cultural and Social Context in an Analysis of Contemporary Consumer Behaviour. *Konsumpcja i Rozwój*, *2*(19), 88-103.

Fotiou, T., Fragkos, P., & Zisarou, E. (2024). Decarbonising the EU Buildings| Model-Based Insights from European Countries. *Climate*, *12*(6), 85. https://doi.org/10.3390/cli12060085

Freeman, R. E., Harrison, J. S., & Wicks, A. C. (2007). Managing for stakeholders. Survival, reputation and success. New Haven-London: Pub. Yale University Press.

Furmanek, W. (2010). Konsumeryzm, konsupcjonizm, wyzwania dla edukacji. *Edukacja – Technika – Informatyka*, *1*(1), 13-16.

Gabryelewicz, I., Lenort, R., Wędrychowicz, M., Krupa, P., & Woźniak, W. (2021). Environmental Loads Resulting from Manufacturing Technology. *Rocznik Ochrona Środowiska*, *23*, 613-628.

Garczarek-Bąk, U. (2016). Jawne i utajone postawy młodych konsumentów wobec produktów marek własnych sieci handlowych. Poland Poznań: Uniwersytet Ekonomiczny w Poznaniu. (in Polish)

Garoui, N., & Jarboui, A. (2012). Stakeholder theory, corporate governance, and cognitive mapping techniques. *International Refereed Research Journal*, *2*(2), 50-61.

Gruchoła, M. (2016). Pokolenie Alpha – nowy wymiar tożsamości? *Rozprawy Społeczne*, *3*, 8-9. (in Polish)

Gupta, S., & Agrawal, R. (2018). Environmentally responsible consumption: Construct definitio, scale development, and validation. *Corporate Social Responsibility and Environmental Management*, *25*(4), 17-24.

Hagen, B., Middel, A., & Pijawka, D. (2016). European climate change perceptions: Public support for mitigation and adaptation policies. *Environmental Policy and Governance*, *26*(3), 170-183. https://doi.org/10.1002/eet.1701

Hariram, N. P., Mekha, K. B., Suganthan, V., & Sudhakar, K. (2023). Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability. *Sustainability*, *15*(13), 10682. https://doi.org/10.3390/su151310682

Harper, M., Rytwinski, T., Taylor, J. J., Bennett, J. R., Smokorowski, K. E., Olden, J. D., Clarke, K. D., Pratt, T., Fisher, N., Leake, A., & Cooke, S. J. (2022). How do changes in flow magnitude due to hydropower operations affect fish abundance and biomass in temperate regions? A systematic review. *Environmental Evidence*, *11*(1), 3. https://doi.org/10.1186/s13750-021-00254-8

Hennelly, D. S., & Schurman, B. (2023). *Bridging Generational Divides in Your Workplace*. UK London: Harvard Business Review. https://hbr.org/2023/01/bridging-generational-divides-in-your-workplace

Höglund-Isaksson, L., Purohit, P., Gomez-Sanabria, A., Kaltenegger, K., Pauls, A., Rafaj, P., Sander, R., Srivastava, P., Warnecke, L., & Winiwarter, W. (2023). *Non-CO2 greenhouse gas emissions in the EU-27 from 2005 to 2070 with mitigation potentials and costs: GAINS model methodology*. IIASA. 2023. https://pure.iiasa.ac.at/id/eprint/19546/1/GAINS_Methodology_nonCO2_EU27_10oct2023_Final.pdf

Jankowiak, N., & Czerwińska-Lubszczyk, A. (2024). Pokolenia na rynku pracy – podejście teoretyczne. Zeszyty Naukowe. *Systemy Wspomagania w Inżynierii Produkcji*, *2*(13), 123-134. (in Polish)

Janoś-Kresło, M., & Mróz, B. (2006). *Konsument i konsumpcja we współczesnej gospodarce*. Poland, Warszawa: Szkoła Główna Handlowa w Warszawie. (in Polish)

Joshi, Y., & Rahman, Z. (2015). Factors affecting green purchase behaviour and future research directions. *International Strategic Management Review*, *3*(1-2), 128-143.

Korczyk-Ulman, J. (2023). *Pokolenia konsumentów. Jak do nich mówić, żeby nas słuchali i kupowali?* Poland Kraków: Veneo, 34-43. (in Polish)

Korneta, P. A., & Lotko, A. (2021). Determinanty i modele zachowań konsumenta. Wnioski z przeglądu literatury. *Marketing i Rynek*, *9*, 3-13. (in Polish)

Kostera, M., & Śliwa, M. (2012). *Zarządzanie w XXI wieku: Jakość, twórczość, kultura*. Warszawa: Wolters Kluwer Business.

Kotler, P., Hermawan, K., & Iwan, S. (2024). *Marketing 6.0 Przyszłość jest immersyjna*. Warszawa: MT Biznes. (in Polish)

Kucner, A., Sierocki, R., & Wasiluk, P. (Ed.). (2018). *Trendy. Interpretacje i konfrontacje*. Poland Olsztyn: Instytut Filozofii UWM. (in Polish)

Kuczyński, W., Kaminski, K., Znaczko, P., Chamier-Gliszczynski, N., & Piatkowski, P. (2021). On the correlation between the geometrical features and thermal efficiency of flat-plate solar collectors. *Energies*, *14*(2), 261. https://doi.org/10.3390/en14020261

Lenort, R., Baran, J., Wysokiński, M., Gołasa, P., Bieńkowska-Gołasa, W., Golonko, M., & Chamier-Gliszczyński, N. (2019). Economic and Environmental Efficiency of the Chemical Industry in Europe in 2010-2016. *Rocznik Ochrona Srodowiska*, *21*(2), 1398-1404. https://ros.edu.pl/images/roczniki/2019/086_ROS_V21_R2019.pdf

Mammadov, N. S., Ganiyeva, N. A., & Aliyeva, G. A. (2022). Role of renewable energy sources in the world. *Journal of Renewable Energy, Electrical, and Computer Engineering*, *2*(2), 63-67. https://doi.org/10.29103/jreece.v2i2.8779

Maraveas, C., Karavas, C. S., Loukatos, D., Bartzanas, T., Arvanitis, K. G., & Symeonaki, E. (2023). Agricultural greenhouses: Resource management technologies and perspectives for zero greenhouse gas emissions. *Agriculture*, *13*(7), 1464. https://doi.org/10.3390/agriculture13071464

Mazurek-Łopacińska, K., & Sobocińska, M. (2018). Ecologisation of consumption as a trend in consumer behaviour – implications for future research. *International Business and Global Economy*, *37*, 409-420.

Miklautsch, P., & Woschank, M. (2022). A framework of measures to mitigate greenhouse gas emissions in freight transport: systematic literature review from a Manufacturer's perspective. *Journal of Cleaner Production*, *366*. 132883. https://doi.org/10.1016/j.jclepro.2022.132883

Mishra, M., Desul, S., Santos, C. A. G., Mishra, S. K., Kamal, A. H. M., Goswami, S., Kalumba, A. M., Biswal, R., da Silva, R. M., Costa Dos Santos, C. A., & Baral, K. (2024). A bibliometric analysis of sustainable development goals (SDGs): a review of progress, challenges, and opportunities. *Environment, Development and Sustainability*, *26*(5), 11101-11143. https://doi.org/10.1007/s10668-023-03225-w

Moisander, J. (2007). Motivational complexity of green consumerism. *International Journal of Consumer Studies*, *31*(4), 404-409.

Morris, A. (2021). Generations in the workplace training: How to train employees in a multi-generation workplace. *Employee Experience Magazine*. https://www.emexmag.com/generations-in-the-workplace-training/ (17.05.2025)

Muszyńska, W. (2020). Stosunek przedstawicieli Pokolenia Y wobec praktyk budowania marki pracodawcy. *Zeszyty Naukowe Polskiego Towarzystwa Ekonomicznego w Zielonej Górze*, *7*(13), 108-122. (in Polish)

Olkiewicz, M., Wolniak, R., & Skotnicka-Zasadzień, B. (2019). Implementation of ISO 14001 standard in the European Union countries. *Rocznik Ochrona Środowiska*, *21*(2), 868-880.

Olkiewicz, M., & Wolniak, R. (2020). Responsible Pro-Environmental Management in an Organization: a Case Study, *Rocznik Ochrona Środowiska*, *22*, 763-780.

Olkiewicz, M. (2020). The role of the stakeholder in the quality improvement of an organization. *Scientific Papers Of Silesian University Of Technology*. *Organization And Management Series*, *143*, 235-245. http://dx.doi.org/10.29119/1641-3466.2020.143.19

Paczka, E. (2020). Zmiana zachowań rynkowych pokolenia Z. *Ekonomia – Wroclaw Economic Review*, *26*(1), 21-34. https://doi.org/10.19195/2658-1310.26.1.2

Parzonko, A. J. (2015). Wpływ mediów społecznościowych na zachowania konsumentów. *Handel Wewnętrzny*, *6*(359), 122-131.

Perchla-Włosik, A., & Wardzała, J. (2015). Młodzi członkowie gospodarstw domowych jako konsumenci mediów masowych w świetle badań jakościowych. *The Wroclaw School of Banking Research Journal*, *15*, 397-405.

Pietruszyńska, W. (2023). Comparative analysis of the X/Y/Z generations on the labor market in the European Union countries. *Catallaxy*, *8*(2), 81-101. https://doi.org/10.24136/cxy.2023.006

Plichta, P., & Pyżalski, J. (Ed.). (2013). *Wychowanie i kształcenie w erze cyfrowej*. Poland Łódź: Regionalne Centrum Polityki Społecznej w Łodzi. (in Polish)

Rauvola, R. S., Rudolph, C. W., & Zacher, H. (2019). Generationalism: Problems and implications. *Organizational Dynamics*, *48*(4), 160-166.

Razmjoo, A., Kaigutha, L. G., Rad, M. V., Marzband, M., Davarpanah, A., & Denai, M. J. R. (2021). A Technical analysis investigating energy sustainability utilizing reliable renewable energy sources to reduce CO_2 emissions in a high potential area. *Renewable Energy*, *164*, 46-57. https://doi.org/10.1016/j.renene.2020.09.042

Roach, B., Goodwin, N., & Nelson, J. (2019). *Consumption and the consumer society*. MA Medford: GDAE Institute. Tufts University.

Reshetnikova, O., Dyczkowska, J., Olkiewicz, M., & Paszkowska, D. (2021). Promoting pro-ecological behavior with logistics operators in Poland and Ukraine. *Rocznik Ochrona Środowiska*, *23*, 642-654. https://doi.org/10.54740/ros.2021.045

Rogozińska-Pawełczyk, A., Cewińska, J., Lubarańska, A., Oleksiak, P., & Striker, M. (2019). *Pokolenia wobec wartości i zagrożeń współczesnych organizacji*. Poland Łódź: Wydawnictwo Uniwersytetu Łódzkiego. (in Polish)

Roszkowska, E. (2001). *Typy zachowań konsumenta na rynku – ujęcie w teorii kompleksów reguł*. W: Rozwój regionalny cele i metody. A. F. Bociana (Ed.), Białystok: Wydawnictwo Uniwersytetu w Białymstoku, 43-158. (in Polish)

Rudolph, C. W., Rauvola, R. S., & Zacher, H. (2018). Leadership and generations at work: A critical review. *The Leadership Quarterly*, *29*(1), 44-49.

Rybak, A., Joostberens, J., Manowska, A., & Pielot, J. (2022). The impact of environmental taxes on the level of greenhouse gas emissions in Poland and Sweden. *Energies*, *15*(12), 4465. https://doi.org/10.3390/en15124465

Samson, M. (2013). Rozwój idei ochrony konsumenta po 1962 r. Konsument w ujęciu prawnym i ekonomicznym. Optimum. *Studia Ekonomiczne*, *3*, 169. (in Polish)

Sobczyk, G. (2018). Współczesne uwarunkowania konsumpcji w Polsce i ich implikacje na rynku. *Handel Wewnętrzny*, *3*(374), 347-357. (in Polish)

Spiru, P. (2023). Assessment of renewable energy generated by a hybrid system based on wind, hydro, solar, and biomass sources for decarbonizing the energy sector and achieving a sustainable energy transition. *Energy Reports*, *9*, 167-174. https://doi.org/10.1016/j.egyr.2023.04.316

Suvalova, T. V., Troitskiy, A. V., & Zhaxybayeva, G. Sh. (Ed.). (2021). *Digital Economy and the New Labor Market: Jobs, Competences and Innovative HR Technologies*. Springer. https://doi.org/10.1007/978-3-030-60926-9_11

Taranko, T. (2016). Czynniki determinujące postawy konsumentów wobec marki. *Handel Wewnętrzny*, *3*(362), 341-352. (in Polish)

Twenge, J. (2023). Generations: The Real Differences Between Gen Z, Millennials, Gen X, Boomers, and Silents and What The Mean for America's Future. Nowy Jork: Atria Books.

Werther, W., & Chandler, D. (2011). Strategic corporate social responsibility: Stakeholders in a global environment. California: Pub. Sage.

Wolanin-Jarosz, E. (2006). Zachowania konsumentów- przegląd wybranych badań i teorii. *Roczniki Wydziału Nauk Prawnych i Ekonomicznych*, *2*(2) 83-99. (in Polish)

Dyrektywa 2024/1275 z dnia 24 kwietnia 2024 r. w sprawie charakterystyki energetycznej budynków. https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=OJ:L_202401275 (19.09.2024)

Dyrektywa w sprawie efektywności energetycznej 2012/27/UE. https://eur-lex.europa.eu/legalcontent/EN/TXT/?qid=1399375464230&uri=CELEX:32012L0027. (19.09.2024)

Dyrektywa w sprawie odnawialnych źródeł energii 2018/2001/UE. https://eurlex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01 .0082.01.ENG&toc=OJ:L:2018:328:TOC (19.09.2024)

Kodeks cywilny Dz.U.2025.1071 t.j. z dnia 2025.08.06 (in Polish)

KPEiK 2019. Krajowy plan na rzecz energii i klimatu na lata 2021-2030. Wersja 2019. https://www.gov.pl/web/klimat/krajowy-plan-na-rzecz-energii-i-klimatu. (20.09.2024)

PEP2040 2021. Polityka Energetyczna Polski do 2024 r. Ministerstwo Klimatu i Środowiska. Załącznik do uchwały nr 22/2021 Rady Ministrów z dnia 2 lutego 2021 r. Warszawa. https://www.gov.pl/web/klimat/polityka-energetyczna-polski. (20.09.2024)

Prawa konsumenta. Dz.U.2024.1796 – 2024.12.06

Projekt uchwały Rady Ministrów w sprawie przyjęcia Strategii dla ciepłownictwa do 2030 r. z perspektywą do 2040 r. 2023. https://www.gov.pl/web/premier/projek-uchwaly-radyministrow-w-sprawie-przyjecia-strategii-dla-cieplownictwa-do-2030-r-z-perspektywado-2040-r2. Dostęp: 20.09.2024 r.

PSE. Raport Polskie Sieci Energetyczne. raporty.pse.pl

Traktat o funkcjonowaniu Unii Europejskiej. Rzym.1957.03.25. Dz.U.2004.90.864/2 z dnia 2004.04.30 art. 13, 39, 40, 107, 114, 169.

Ustawa z dnia 27 kwietnia 2001 r. Prawo ochrony środowiska, [Dz.U. 2001, nr 62, poz. 627]