FORUM PEDAGOGICZNE

2024, 14, 2.1: 243–254
p-ISSN 2083-6325; e-ISSN 2449-7142
DOI http://doi.org/10.21697/fp.2024.2.1.18

MARCIN KLIMSKI[1]
Cardinal Stefan Wyszynski University in Warsaw, Poland
ORCID 0000-0002-9118-1673
SYLWIA CHORCHOS[2]
ORCID 0009-0001-6171-4344

Received: 15.08.2024; revised: 23.08.2024; accepted: 29.08.2024

ENERGY EDUCATION IN VIEW OF THE PURSUIT OF CLIMATE NEUTRALITY

EDUKACJA ENERGETYCZNA W PERSPEKTYWIE DĄŻENIA DO NEUTRALNOŚCI KLIMATYCZNEJ

Streszczenie: Dążenie do osiągnięcia neutralność klimatycznej jest procesem, a jednocześnie wyzwaniem, które wyznacza społeczeństwu pewne konieczne do podjęcia zadania. Jest ona procesem, który zakłada działania zorientowane na ograniczenie zmiany klimatu. Wśród złożonych przyczyn zmian klimatycznych są m.in. te, które człowiek wciąż podtrzymuje, gdyż wynikają one z procesów takich jak np. ciągle postępujący i często niezrównoważony rozwój. Jednym z nich jest niewątpliwie konsumpcjonizm, który zakłada nabywanie dóbr materialnych bądź korzystanie z usług w celu zaspokojenia swoich potrzeb. W artykule przedstawiona zostanie kwestia potrzeby włączenia w proces edukacyjny zagadnień związanych z energetyką. Zaproponowana edukacja energetyczna ukazująca zalety transformacji energetycznej jest jedną z propozycji pozwalającej społeczeństwu oswoić się z tym wyzwaniem, a jednocześnie zmienić swoje dotychczasowe nawyki w celu zbliżenia się do neutralności klimatycznej.

Słowa kluczowe: Edukacja energetyczna, transformacja energetyczna, zrównoważona energetyka, neutralność klimatyczna

---

1 **Marcin Klimski** – PhD, Institute of Pedagogy, Cardinal Stefan Wyszynski University in Warsaw, assistant professor, interested in global education, environmental education, multimedia issues in education, and the education of gifted children. He is the author of workshop and lesson scenarios in the field of environmental education, multimedia, peer exclusion, and a member of *RCE Warsaw Metropolitan*—Expert Center for Education for Sustainable Development. E-mail address: m.klimski@uksw.edu.pl

2 **Sylwia Chorchos** – Environmental Impact Assessment Specialist at a company which operates as a consultancy, design and engineering firm specialising in transport, municipal infrastructure, environment protection and construction, providing clients with advice from the stage of planning to design and construction supervision. E-mail address: sylwia.chorchos@o2.pl

Abstract: The pursuit of climate neutrality is a process and, at the same time, a challenge that sets certain tasks which society needs to undertake. It is a process which assumes actions aimed at the mitigation of the climate change. The complex reasons for that change include, among other things, those which the human being keeps maintaining, as they result from such processes, as, for example, progressing and often unsustainable development. One of them is, undoubtedly, consumerism, which involves acquisition of material goods or using services, in order to satisfy one's needs. The article will present the need to include energy-related issues into the educational process. The energy education proposed, which demonstrates the advantages of the energy transition, is one of the proposals allowing society to become familiar with that challenge, and, at the same time, change its existing habits, in order to move closer to climate neutrality.

Key words: energy education, energy transition, sustainable energy sector, climate neutrality

Introduction

In the era of developing civilization, and, first of all, its negative consequences for the socio-natural environment, it is education that is a process which allows the reversal of the negative trend or, at least, limiting it effectively. The growing need for energy, which is necessary to carry out economic processes, imposes numerous challenges on decision makers. What seems to be the most urgent is actions aimed at conducting the energy transition. It is a complex process which covers numerous sectors of life, starting from regional changes and ending with those at the local and individual level. The process will succeed, if it results in a society with raised awareness, which, thanks to educational activities, will be properly prepared for that. The energy education introduced since the early years, which constitutes part of broader environmental education, helps understand various aspects of the energy sector and energy transition. Responsible use of energy, minimising its consumption in households by using energy-saving equipment and technologies, may be of crucial importance for the future generations. Generations which will live in a different, changed climate, which scientists who explore the processes of changes in question warn about. (Gutteres 2021). Specialists believe that the actual energy consumption in Europe can be reduced thanks to the introduction of certain good habits into everyday life. It will be achieved by, among other things, changing consumers' behaviour, as well as implementing more efficient technologies. The change of a way of thinking from the pro-consumption one into one which helps achieve sustainable consumption (Niedek, Krajewski 2021) is one of the elements addressed by the environmental education, together with the specific energy-related areas it includes. It should be pointed out that the changes in question will benefit enterprises, households and individual energy customers. In the end, smaller energy consumption means smaller greenhouse gas emissions, and, consequently, lower costs, which may improve the economic

balance of each household budget.[3] The aim of this article is to draw public attention to the legitimacy of including energy-related issues into the educational process. People should, first of all, be aware of how much energy they consume, and take appropriate steps on the basis of that knowledge. Skilful use of energy brings numerous benefits, including environmental and economic ones. It is a necessary contribution to the pursuit of climate neutrality, which is still a current challenge faced by 21st century societies.

Towards the energy transition

Analysing the current geopolitical situation, one can conclude that it has forced comprehensive rethinking of the energy transition. It is yet another reason to make this transition a fact, rather than just a wish of selected groups. It is estimated that the future, but also present generations will have to face numerous energy challenges which include, for example, the consequences of the armed conflict in Ukraine and of the climate change. As a result, they will be forced to look for new energy sources or to import more and more energy, since fossil fuels are becoming an increasingly expensive energy raw material. Apart from that, the pursuit of climate neutrality assumes the departure from fossil fuels in favour of renewable energy sources (RES). Majority of society believe that it is not able to deal with those formidable challenges individually. However, it is important to have the environmental awareness aimed at issues connected with mitigation of the climate change with small steps in the so-called everyday life. Everyday choices of each human being interfere, to some extent, in the socio-natural environment. That interference may be negative, but also positive. Individuals can do something to a limited extent, but if their efforts are combined, they can make great changes, in order to manage energy more effectively (Web-01).

Currently, the energy transition is not only justified by environmental protection issues, but is also an undertaking whose magnitude is similar to that of the contemporary technological revolution. The society's pursuit of climate neutrality is not w whim of technocracy, but a genuine need to make changes which are determined by various environmental, technical, social and political factors. The level of societies' affluence as well as the development of civilization are the factors responsible for the growing energy demand. The ongoing armed conflict behind Poland's eastern border is a perfect example of the urgent need to consider searching for new energy sources, in order to achieve energy stability of the countries which are a party to e.g. gas agreements. In this case, the energy sector based on gas fuel is becoming a bargaining card in the hands of those countries which have deposits of this energy

3 As early as at the beginning of the 21st century, various documents prepared as part of the cooperation among the EU member states pointed out to that issue. Cf. Publication Office of the European Union, *Energy Education – Shaping Attitudes of Future Energy Users,* Luxembourg 2006.

resource. It is an example of a geopolitical determinant, and, at the same time, it demonstrates the need for energy diversification (Web-02). The energy demand in question also manifests itself when various forms of consumerism take place, as goods which are so gladly consumed by the individual need to be first manufactured as part of an energy-intensive technological process. Furthermore, one should not forget about its disposal, which also involves the demand for energy. Specific examples include processes involved in the production of, for example, everyday items in the form of white goods, audio/video devices or energy necessary to power them (Spiller 2023). Manufacturers are willing to tempt their potential clients with various promotions aimed at purchasing new equipment or replacing one which still works for, simply, a newer model. It is a certain marketing trend implemented by manufacturers of the above-mentioned equipment. Consequently, the energy transition process needs to be carried out on the basis of well-thought-out strategies. Those strategies have to include all levels of the economic and social development, with consideration given to the educational dimension. The entire energy transition process takes the form of an improved strategy of actions, among other things, in order to make its course more effective and increase the society's approval. What is, consequently, desirable is to smoothly implement pro-environmental solutions and develop a correct consumption model. The above-mentioned goals cannot be achieved, if actions aimed at raising environmental awareness of all Poles are not taken. What is crucial for succeeding in this respect is, first and foremost, the environmental education, conducted in the system of formal and informal education. Furthermore, the values passed on at various educational levels in the schools system should be reflected in the everyday life of a specific person, their family and the nearest vicinity. On the other hand, the informal education should be aimed at children and adults in parallel with the formal education process. In order to ensure successful implementation of this process, it is a good idea to include in it such non-governmental organisations, as the Global Catholic Climate Movement (GCCM) (Klimski 2022), whose actions include initiatives for protection of the environment, local authorities, organisations which operate in a specific area and taking advantage of mass media. The correctly conducted energy education could result in a successful energy transition, although initially to a limited extent.

Discussing the education in the ongoing energy transition process, one should also indicate the systemic relationship among the individual elements of the energy sector's development, departure from coal and investment mainly in RES. Furthermore, that relationship should be combined with the need to reasonably manage natural resources, increase energy awareness, and aim for sustainable development. The educational dimension of the energy transition in Poland should be also based on the most important assumptions of Poland's transition strategy, the challenges faced by the education concerning that subject matter and its practical dimension.

Assumptions and goals of energy education

Analysing the topic of energy education, we should draw attention to its scope. It generally seems that it is a relatively new perspective. Energy issues, and, at least, the consequences of its production depending on the technologies used, affect the quality of the socio-natural environment. That information comes from various sources which include those with the biggest social impact, i.e. mass media.

Trying to find the foundations of energy education, one should point out to the recommendations for environmental education which were formulated at the First UNESCO International Conference in Tbilisi in 1977. At that time, its participants called for creating a dictionary of terms demonstrating issues connected with broadly-understood ecology. The terms include those which define the scope of environmental education, understood as a process which determines the development of the appropriate relationship between the human being and environment (UNESCO-UNEP 1983). Environmental education, which is often referred to as eco-education, should, as a matter of principle, shape the subject of the process, i.e. human beings in terms of equipping them with adequate awareness of the problems encountered in the socio-natural environment. One of the four problem areas of that education is protection of the environment. The literature of the subject indicates the term "climate education", being a specific proposal in the area of environmental education. Climate education concerns shaping appropriate social attitudes which, on the basis of the knowledge acquired, will translate themselves into actions aimed at protection of the environment. In order to achieve that goal, it is necessary to understand all variables which determine the climate change together with its consequences (Bokwa et al. 2022). In that context, climate education involves the need to shape appropriate consumer attitudes, as it is them that are the manifestation of the human activity affecting the climate. The issue of the rational use of the achievements of civilization, which include the production and consumption of energy, must, in the current situation, be an object of educational reflection. In this context, a question should be asked about the role of pedagogy, or rather the necessity of building an appropriate language in pedagogy, focused on the need for human beings' self restraint, giving thought to their consumerism, which is devoid of ethical reflection (Gola 2023). This specific area of exerting influence for protection of the environment is part of a narrower aspect of climate education, namely energy education. The assumptions of the education formulated in such a way include equipping the human being with reliable knowledge concerning energy, the manner in which it is produced, rationally used, and consequences of its misuse. The aim of the energy education is the need to understand the energy transition, which contributes to protection of the socio-natural environment. The environment, which without the climate, could not exist on Earth. What is more, energy education is a principal tool for social change, expressed in understanding the need to protect the environment

through the energy transition process. Society may accept new energy technologies, once it is prepared for it, when common fear of what is new, unknown and not understood has disappeared (Jennings 2009). The most commonly chosen sources of information, focused on the topic of environmental protection, which include mass media, may play a really important role in this respect. They must be based on reliable information, with particular attention given to the values which lie behind energy education. The values shared by the entire environmental education, which support a very important goal, i.e. shaping a human being who is a good host of the socio-natural environment (Klimski 2021).

Forms in which energy education is implemented

Analysing the issue of energy education, one might ask the question: why should various age groups of society, such as children, be included in broadly-understood educational initiatives concerning the energy transition? It seems that those issues concern the generation of adults. This is due to the fact that educational undertakings are an important part of actions aimed at raising social awareness of energy issues. Experience of teachers or persons who analyse effectiveness of educational activities indicated huge influence of such initiatives on students at various stages of the education process (Web-03). It is important to be aware of the fact that it is children that may be a major inspiration for pro-environmental activities in the family environment, and give a great example to others, including adults. Furthermore, improving energy effectiveness does not mean that society must resign from specific activities. What will help persons interested achieve more without the need to lower the living standard is widespread, new technologies and energy-saving attitudes. Experts in the report entitled "*Factor Four*" indicate that effectiveness of natural resources can be increased even fourfold. (Weizsäcker et al., 1999). For this reason, an improvement in energy efficiency does not only reduce costs and guides us towards renewables, but also creates more energy efficient devices powered even by conventional sources of energy. It is a good opportunity to boost the economic growth and create numerous new jobs. Progress in rational use of energy is the priority of the European Union's energy policy.

What is the crucial factor in the period of searching for "new energy", which begins to develop gradually, is society's energy awareness, namely its correct development. Consequently, educational and information initiatives at schools play an important role in this process, so they should be correctly and regularly conducted. Education in the area of the energy transition is a process as part of which attitudes are shaped on the basis of which society begins to operate in line with rational energy efficiency. Education oriented towards such a goal is, first and foremost, of strategic importance in the effective use of energy. Taking advantage of various initiatives to promote and inspire changes of the existing behaviour offers numerous opportunities of applying them in formal school syllabuses.

The content in question may be integrated into the school subjects taught. What is also indicated in this aspect is the ability to inspire young people and influence the social environment through contact with the family and peers Gola 2023). Education is, by all means, an area of activity in which decisions concerning certain syllabus content and allocation of financial resources are taken at the national as well as regional level. It is important that energy issues and problems related to them appear throughout Europe, which is why they should be included into educational programmes at the European level. Nevertheless, teaching still needs to focus on activities appropriate for the student's changing environment.

Thanks to education, students can acquire knowledge and verify information, which will help them make rational choices and prevent the waste of, for example, energy necessary to manufacture a given product. Each person has a role to play in the selection of the most energy-saving technologies used at work and home, ensuring they are really energy-saving. Furthermore, students need to be encouraged to develop strategies for dealing with society's energy problems, and, in this context, the family household becomes a good place for it.

As for awareness raising, the main goal is to indicate to students the important role played by energy in the human being's life, as well as how it is produced and used. It obliges them to develop understanding of nature and reasons of energy crises. Understanding the potential, costs and impacts of different types of renewable and non-renewable energy sources, taking place now or in the future, and being aware of the consequences of choosing one of them, develops valuable skills in students. Such reasoning should include all aspects, starting from socio-cultural ones, through economic and, finally, environmental ones. Consequently, educational content must comply with national and international priorities, as well as embody the "think globally-act locally" motto. Developing awareness of the impact of the current energy policy, students will be able to identify holistic solutions appropriate for their environment which are reasonable, useful and achievable. Moreover, older students may also propose alternative energy policy solutions. Depending on the funds available and local requirements, educational programmes should ensure balance between theory and practical aspects, and include in their scope, among other things, lectures, teaching practical skills, demonstrations, designing and generating. Due to the fact that it is a relatively new initiative, it is recommended that the programme of classes should enable flexibility, intensive implementation of changes together with a change of conditions, technologies and skills. Energy education should also take into account developing skills which are useful in the future, potential work. Another important matter is benefits. Educational initiatives should unambiguously indicate positive consequences of a behavioural change and the influence of the increased energy awareness on the quality of the socio-natural environment (Web-01).

In the document entitled *"Laboratorium EEB w Polsce. Wspólne działanie w celu zwiększenia bezpieczeństwa energetycznego Polski" [EEB Laboratory in Poland.*

Shared Actions Aimed at Increasing Poland's Energy Security] it was pointed out that it is worth creating united actions and initiatives aimed at improving the energy security, a coordinated and long-term awareness-raising campaign, supported by the public and private sector, dedicated at various sectors of society. Information points which could be part of such campaigns would be created in communes. Furthermore, in view of the complex financial situation of numerous Polish communes, one can come to the conclusion that not all of them will be able to afford to create varied information points.

Such information could be posted on the communes' websites, and disseminated in the form of posters, brochures and leaflets. The idea of information points fits well with the project currently being implemented as part of the Infrastructure and Environment Operational Programme (Web-04). It consists in creating a nation-wide network of advisors who actively operate in all provinces. The far-reaching activities planned in the project include numerous educational issues, mainly:

- training sessions as well as information and educational activities in the field of energy efficiency;
- advisory services concerning investment possibilities aimed at efficiency;
- support in creating a complex network of commune power engineers.

Consequently, public institutions are recommended to disseminate, to a bigger extent, information about possibilities of more efficient energy use and implementation of appropriate educational activities to that aim. First of all, information about the right to one's own heat and hot water meter should be promoted at a large scale. Furthermore, work on adoption of smart software should be continued, in order to declare achievement of the biggest possible benefits for end users in households. Therefore, it is necessary to supplement technical solutions with tariffs which create favourable conditions for changing habits and limiting electricity consumption during peak demand periods. Apart from that, it is recommended that the legal term of the energy service is introduced into the national law. It would indicate activities aimed at improving energy efficiency, and would be, to a bigger extent, focused on the desired effect (Bator, Kukuła 2016).

Significance of energy education in the context of social problem prevention

Currently, fossil fuels are one of the main resources used for producing electricity all over the world. Achieving the climate goals, in particular reducing greenhouse gas emissions as a result of EU regulations, will require a gradual departure from burning coal. It is a significant problem for the Polish energy sector, where most electricity is generated from hard or brown coal. Consequently, the issue of retraining workers from the mining sector is examined in a comprehensive forum, where varied solutions are sought. For this reason, it is necessary to develop a transition strategy in the coal area, not only because of the energy policy goals, but also

because of the decreasing profitability of the coal mining sector. What is, therefore, crucial is cooperation at various administration levels, in order to properly prepare coal mining sector employees to be retrained, as a result of adoption of a new energy policy. A problematic issue in the sector is the insufficient mobility of employees and the nature of men's role as breadwinners. Due to the miners' vocational preparation, their situation on the labour market will be much more difficult in comparison with other employees. They can undergo career transition and find new jobs, e.g. in the construction or automotive sector. Reduction of coal mining to the minimum will force lowering the employment level at mines and provision of alternative jobs. New employment opportunities are anticipated in the industrial, transportation, vehicle repair and construction sectors, as the demand for workers is expected to increase there. Furthermore, society faces numerous ambitious goals due to the energy policy. Consequently, the sector's active education is really important, including in terms of "green" jobs (Tarasewicz 2021). According to the data provided by the Institute for Structural Research, by the end of 2030 approximately 14-36 thousand miners are expected to need, among other things, to be supported on the labour market, change the sector or retire early. Therefore, there is a possibility of creating up to approximately 84 thousand new jobs by that time, and, for example, the construction or RES-based energy sector stand a bigger chance of replacing the mining positions (Web-05).

What poses a significant obstacle is the aspect of adjusting the skills of the employees from the lower-demand sectors to the requirements of other professions whose importance on the labour market is on the rise. The global experience indicates that the most relevant option for managing labour resources released as a consequence of economic changes is one in which the worker moves smoothly from one job to another, and is supported in terms of education and information. In that job-to-job transition a number of issues related to broadly-understood education arise (Web-06). They, primarily, include:

- training sessions and professional courses;
- paid internship which helps acquire new skills;
- post-graduate studies in various fields;
- grants awarded during the job transition period;
- training courses devoted to starting and conducting business activity;
- educational vouchers to be used for training selected on the basis of one's preferences;
- subsidies to create jobs in a sector to which employment restrictions apply;
- ongoing career counselling;
- regular psychological support;
- guaranteed early retirement;
- prevention of employees' location-based exclusion.

Furthermore, what is important in the period during which numerous employees undergo dynamic professional changes, is to ensure that professional burnout

is prevented, and actions aimed at increasing the broadly-understood mental resistance are taken (Web-06). Moreover, another aspect which can be pointed out is the local level and actions possible as part of it, such as information campaigns aimed at households, educational campaigns, vocational training sessions for engineers or inclusion of a local programme for increasing the desired energy efficiency, as well as combining it with education and information campaigns.

Summary

Implementation of the energy transition takes the form of various strategies of actions aimed at moving closer to climate neutrality. Increasing the effectiveness of this process depends on numerous criteria which include, among other things, geopolitically motivated interrelationships, strategic actions and social expectations. The issue of climate change is a bargaining card for numerous circles, including political ones, so it must not be forgotten that what sands at the end of these activities is the social commodity, being the environment understood as socio-natural space. For this reason, it is desirable to implement environmental solutions as efficiently as possible, as well as promote and develop the right consumption model. Such actions will not be possible, if efforts aimed at raising the broadly-understood environmental awareness of all Poles are not made. The awareness, which will help understand the processes and mechanisms necessary to achieve climate neutrality. Each action undertaken to that aim has to take into account all components making up the environment and human beings themselves. They are subjects of the energy education process, who due to their abilities in the form of judiciousness and prudence, may take right decisions and make appropriate choices. Energy education, which also includes in its content the issues of environmental ethics, being the regulator of the human being's moral points of reference to the surrounding reality, may shape appropriate social awareness in the area of the legitimacy of the pursuit of climate neutrality.

What is also important is support of green investment projects, based on non-conventional energy sources or those which generate energy from RES. Consequently, it may be assumed that what constitutes one of the keys to the success is the above-mentioned environmental education, which includes an important aspect, i.e. energy issues, conducted in an appropriate way at each stage of the individual's life. It might become an indispensable foundation of Poland's correct energy transition process.

It is also noticeable that education of society conducted by competent and well-prepared persons is one of the crucial elements in the energy transition process. It must be emphasised that education should be adjusted to the age and needs of all citizens. As a result of the progress of civilization, growing demand for such a form of support for society is visible. It is a crucial step towards the beginning of the energy transition process. In the future, education at an appropriate level,

which allows developing desired initiatives, may evolve even more intensively. Consequently, society would gain the possibility of understanding the fact that its own contribution to the promotion of green energy and protection of the entire socio-natural environment is indispensable for maintaining the human beings' health at the correct level. Furthermore, providing future generations with the possibility of living in a less polluted environment corresponds to the assumptions of the sustainable development concept. The concept which was created in the last century, but is still up to date and manifests itself in the 2030 Agenda for Sustainable Development (Klimska 2021). For this reason, it is justified to make every effort to ensure that the approach to the pursuit of climate neutrality in the area of education is properly addressed and diligently implemented. Making society aware of the gravity of that challenge increases energy efficiency, and finally contributes to the implementation of the transition. It is also worth pointing out that the issue of the need to conduct energy education in the context of pursuit of climate neutrality, analysed here, is a global challenge, and, consequently, sets out certain new research horizons. Residents of the continental Europe, despite their best efforts, will not be able to prevent progressing climate change. Air does not have fixed borders, and harmful substances produced, for example, in the energy generation process, move around through this route. Europe cannot be separated from the influence of the pollution coming from other continents, which is why energy education should become a priority to be implemented by other countries, including those from outside the European Union.

References

Bator, A., Kukuła W. (2016), Rola konsumenta w transformacji energetycznej, Warsaw; Fundacja ClientEarth Prawnicy dla Ziemi.

Bokwa, A., Kicińska, B., Kurowski, Ł., Wieczorek, L. (2022). Zmiana klimatu jako wyzwanie edukacyjne. "Czasopismo Geograficzne", 93(4): 703–730. https://doi.org/10.12657/czageo-93-27

Gola, B. (2023). Współczesne wyzwania edukacyjne w kontekście kryzysu ekologiczno-klimatycznego. Edukacja klimatyczna w polsce „w toku". "Forum Pedagogiczne", *13*(1), 169–183. https://doi.org/10.21697/fp.2023.1.12

Guterres A. (2021). The Glasgow Climate Test, 26 October 2021, available on: https://www.unic.un.org.pl/oionz/test-klimatyczny-w-glasgow-sekretarz-generalny-onz/3438# (opened: 2.08.2024).

Jennings, P. (2009). New directions in renewable energy education. "Renewable Energy" 34 (2009), 435–439.

Klimska, A. (2021). Education for security versus education for sustainable development. "Forum Pedagogiczne", *11*(1), 263–273. https://doi.org/10.21697/fp.2021.1.16

Klimski, M. (2021). The basics of education for environmentally responsible behaviour. "Forum Pedagogiczne", *11*(1), 275–283. https://doi.org/10.21697/fp.2021.1.17

Klimski, M. (2022). Common-sense cognition in the practice of environmental education of the Catholic Church, "Seminare. Poszukiwania Naukowe", *43*(4), 135–145. https://doi.org/10.21852/sem.2022.4.09

Niedek, M., Krajewski, K. (2021). *Frugalizm w kontekście ekonomicznych i aksjologicznych uwarunkowań zrównoważonego wzorca konsumpcji*. In: Sadowski R.F., Kosieradzka-Federczyk A., Klimska A. (ed.) *Antropologiczne i przyrodniczeaspekty konsumpcjinad-miaru i umiaru*. Warsaw: Wydawnictwo KSAP, pp. 40-58.

Spiller J., *AGD i ich wpływ na środowisko*, available onhttps://www.teraz-srodowisko.pl/aktualnosci/APPLiA-branza-agd-raport-2022-13014.html (opened: 3.08.2024)

Tarasewicz A. (2021). *Edukacja sektora energetycznego w dobie transformacji*, available on https://trendywenergetyce.pl/edukacja-sektora-energetycznego-w-dobie-transformacji (opened: 9.08.2024)

UNESCO-UNEP (1983). *Glossary of Environmental Education Terms* available on: http://specialcoll-ections.nust.na:8080/greenstone3/library/sites/localsite/collect/unesco/index/assoc/HASH01d9.dir/Glossary_of_environmental_education_terms.pdf;jsessionid=0239CE44256F49A37BE0AD4790A3C707; (opened: 8.08.2024)

Web.01 – Energy Education – Shaping Attitudes of Future Energy Users, (2006), Luxembourg; Publication Office of the European Union, available on: https://www.energia.rzeszow.pl/images/stories/pliki/edukacja%20energetyczna-pl.pdf (opened: 29.07.2024)

Web.02 – https://www.gov.pl/web/edukacja-ekologiczna/oszczedzamy-energie-kampania-spoleczna-ministerstwa-klimatu-i-srodowiska; (opened: 30.07.2024)

Web.03 – https://www.gov.pl/web/edukacja-ekologiczna/o-transformacji-energetycznej--glosem-dzieci--przyszlych-pokolen (opened: 6.08.2024)

Web.04 – Ministry of Funds and Regional Policy, Infrastructure and Environment Operational Programme for the years 2014-2020, Warsaw 2022, available on: https://www.pois.gov.pl/media/106951/POIiS_21_0_20220210.pdf; (opened 12.08.2024)

Web.05 – https://kadry.infor.pl/wiadomosci/5302493,Gornicy-znajda-zatrudnienie-w--energetyce-odnawialnej.html; (opened: 6.08.2024)

Web.06 – Anticipated changes on the labour market caused by the transition, Warsaw 2021, available on: (https://www.teraz-srodowisko.pl/media/pdf/aktualnosci/11484-rynek--pracy-transformacja-Konfederacja-Lewiatan.pdf; (opened: 12.08.2024)

Weizsäcker E.U., Lovins, A.B., Lovins, L.H. (1999). *Mnożnik cztery. Podwójny dobrobyt – dwukrotnie mniejsze zużycie zasobów naturalnych. Raport dla Klubu Rzymskiego*, traslated by Lis A., Toruń: Polskie Towarzystwo Współpracy z Klubem Rzymskim, ed. Rolewski.