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## Energy transformation of the Silesia coal region – Challenges and coping strategies

### Introduction

The global shift towards sustainable energy sources has highlighted the urgent need for energy transformation in coal-dependent regions. Hard coal, once a cornerstone of industrial growth, is now recognized as a major contributor to environmental degradation and climate change. This transformation is critical not only for meeting international climate targets but

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also for ensuring long-term economic and social stability in regions historically reliant on coal mining. Transitioning to cleaner energy sources poses significant challenges, including economic restructuring, social adjustments, and environmental rehabilitation. However, it also presents opportunities for innovation, investment in new technologies, and the creation of sustainable jobs.

Poland has historically been one of the largest producers of hard coal in Europe. The country's coal mining industry has deep roots dating back to the 19th century, contributing significantly to the progress of the country's industrialization (Bijańska and Wodarski 2024). This industry became particularly prominent during the post-World War II era when Poland, then under socialist rule, heavily invested in coal mining as a cornerstone of its economic strategy.

Poland's coal production peaked in the late 20th century. By the 1980s, Poland produced over two hundred million tons of coal annually, making it the second-largest producer in Europe after the Soviet Union (Mills 2007). Most of this production came from the Upper Silesian Basin, which remains one of the richest coal deposits in the world.

This study is part of the “Energy Transitions from Coal and Carbon: Effects on Societies” project, also known as ENTRANCES. The project aimed to analyze the challenges faced by thirteen European regions that heavily depend on fossil fuels in the process of transitioning to cleaner energy. The project divided the regions into coal territories (producing fossil fuels) and high-emission territories (largely dependent on the use of fossil fuels). The dependence of these regions on technological and environmental factors was examined. Still, the main area of interest was the socio-economic and psychological aspects of transformation, i.e., those factors that are very important for local communities (ENTRANCES 2020). The Polish case study selected for this research is the Silesia region. Some analyses of various sociological dimensions of the transformation of this region can be found in published materials (Komorowska et al. 2022; Hubert et al. 2023; Kowalik et al. 2024).

Other coal-intensive regions that were analyzed in the ENTRANCES project are:

- ◆ Lusatia – in Germany (Barret 2022),
- ◆ Rhineland – in Germany (Bartl et al. 2022a),
- ◆ Central Germany region (Bartl et al. 2022b),
- ◆ Jiu Valley Region – in Romania (Holman and Popușoi 2022),
- ◆ Sulcis – at Sardinia (Italy) (Caiati et al. 2022),
- ◆ Horná Nitra – in Slovakia (Filčák et al. 2022).

The case studies considered concern the liquidation of large industries to transform coal regions into regions developing based on clean technologies. Each region is different and, although the EU declares support for changes with various financial mechanisms and initiatives, it is extremely important to individually diagnose local problems and match the applied strategies to the expected political responses that affect the pace of decarbonization.

## 1. Overview of Silesia as the coal territory

Silesia, a region located in southwestern Poland, has a rich history and significant economic importance, particularly due to its abundant natural resources (Malec 2022). There were once two hard coal regions in this part of Poland: Lower and Upper Silesia. In the era of economic changes, the Lower Silesia region was liquidated, but Upper Silesia is still the main hub for hard coal mining (Peplowska 2021). Silesia boasts some of the largest coal reserves in Europe. Coal deposits in this region are large, which prompts their intensive use. Poland's economy has historically been heavily reliant on coal, and Silesia plays a crucial role in this sector (Jonek-Kowalska and Turek 2022). There are several large coal mines in the region, which in 2023, despite a significant reduction in production compared to previous years, produced approximately 41 million tons of thermal and coking coal. Coal mining in Silesia is a cornerstone of the local economy, employing thousands. The industry supports numerous ancillary businesses, called mining-supported companies, including machinery manufacturing, engineering services, and transportation. Despite these benefits, coal mining in Silesia poses many environmental and social challenges (Peplowska and Gawlik 2019). Intensive mining has caused land subsidence, water pollution, and air quality issues, adversely affecting the health and well-being of local communities. Additionally, the heavy reliance on coal presents major environmental concerns, especially related to greenhouse gas emissions and climate change. Silesia is therefore the area where energy transformation is needed, but its implementation will involve many difficulties.

The region is facing significant pressure to modernize and diversify its economy as global energy markets shift towards more sustainable sources. Transitioning from coal to renewable energy poses both opportunities and challenges for Silesia, requiring substantial investment in innovative technologies and infrastructure. Efforts are being made to retrain the local workforce, equipping them with skills necessary for jobs in emerging sectors like renewable energy, digital technologies, and green manufacturing. Moreover, there are initiatives aimed at restoring and repurposing former mining sites, turning them into green spaces or hubs for innovation and entrepreneurship. Despite these efforts, the social and economic transition remains complex, requiring careful management to balance economic growth with environmental sustainability and social equity.

## 2. Materials and methods

The challenges and strategies for dealing with them identified and described in this article are the result of the method of region analysis using the multidimensional analytical framework (MAF) developed as part of the project. The method involves a broad look at the region undergoing transition and a detailed analysis of its changes within five components: socio-cultural, socio-psychological, socio-political, socio-economic, and socio-ecological-technical. Each component uses a diverse set of research methods, specific

Table 1. Synoptic table of the five components of the Multidimensional Analytical Framework (MAF)

Tabela 1. Tabela synoptyczna pięciu komponentów Wielowymiarowych Ram Analitycznych (MAF)

Component	Research focus	Unit of analysis	Domain of enquiry	Unit of observation	Methodology
Socio-Cultural	Territorial change	Coal & Carbon territory	Stress strains in the territorial organization	Strain Situations	Focus group mapping
Socio-Psychological	Territorial change	Coal & Carbon territory	Place attachment, Decarbonization, Resilience and Coping	Citizens	Online survey
Socio-Economic	Structural change	Labor-Market Area	Change in the socio-economic structure	The area as a whole	Quantitative data collection
Socio-Political	The clean-energy transition	Political Administrative Region	Narrative battles to determine the meaning and "appropriation" of the energy transition	Statements & Counterstatements	Text research
Socio-Ecological & Technical	The clean-energy transition	Political Administrative Region	Capacity available in the region to shape its decarbonization pathway	Multilevel System interaction	Semi-structured interviews

Source: Komorowska et al. 2022.

to the research subject, research field, selected units of observation, and units of analysis (see Table 1).

The use of triangulation, i.e. testing a hypothesis using different methods as well as different data (on different populations and at different times), and different theories, ensures higher quality of research. Comparing and combining results enables a better understanding of the complex and multidimensional dynamics characterizing regions in the transition phase.

The analysis of all five components allowed us to capture the problems facing regions undergoing transition from the point of view of social actors and stakeholders of these regions. This approach means that the results obtained represent the point of view of the studied region. The region is treated as a social construct. i.e., it is treated as if it existed only in a specifically defined social context. The meaning, logic and, above all, the significance and importance of the situations described depend on the perception of the social actors themselves, operating in a specific socio-cultural or territorial space. Thus, the territorial challenges identified in this article are presented from the perspective of the coal territory itself.

The analysis of challenges in the coal area in Silesia was based on research material collected from August 2020 to May 2022. The result is a set of challenges facing Silesia and coping strategies for dealing with these challenges.

Challenges are defined as how the current situation of the region is perceived (i.e. how the region understands it) or the desired effect (result) of the process of changing the current situation. Therefore, these are important problems for the Silesian community and stakeholders. The work also analyses how the region can properly counteract the negative effects of changes that arise primarily as a result of the ongoing decarbonization process. Therefore, possible strategies for dealing with emerging challenges were suggested.

### **3. Challenges resulting from the transition process of Silesia region**

Problems related to climate change are common and concern many regions of the world and, of course, Poland. However, the research conducted here focused on the specific problems of the Silesia region resulting from its differences from the rest of the country. They are concerned not only with the fact that historically the development of the region was focused on the production and use of coal and therefore the dynamics of economic and social development were specific here, but also the processes of transformation towards the use of clean energy affect this region to a greater extent, creating many problems for local communities.

To understand what challenges the Silesia community faces, it is necessary to conduct a detailed analysis of the social and economic conditions that currently exist in the region, as well as an analysis of the impact of the energy transformation on what the future may look like there.

Changes in Silesia depend largely on how Poland's energy transition will proceed. The energy system in Poland, previously largely based on coal, is being modified to use cleaner energy sources. Poland's Energy Policy until 2040 (PEP2040) – a document that is no longer substantially valid, but has not yet been replaced by a newer one – provided that the process of moving away from coal would be supported by the stage of replacing it with natural gas. Gas is a fuel of lower emission than coal and can easily replace coal in the energy and heating industry (replacement of coal-fired units with gas units) as well as for heating and cooking purposes in households. Mostly because of the deep modernization of coal units, gas-fired power plants, and heating plants that have already been built and are still being built. Many households have invested in replacing their heating systems from coal to gas.

When it comes to supplying the market with coal, significant amounts of coal have been imported from Russia in recent years. There were several reasons for this. First, Russian coal was cheaper than Polish one. Moreover, mining restructuring processes carried out in conditions of high extraction inefficiency and losses incurred by mining companies led to the reduction of production to a level below the demand of the domestic market. The interests of coal importers who made money by importing coal from Russia were also important.

These two phenomena related to the change in the structure of the energy mix contributed to the sudden energy crisis at the outbreak of the war in Ukraine. The government then made two decisions – to immediately stop the import of Russian coal and to (slightly later) stop the import of natural gas from Russia.

The decision to stop importing Russian natural gas resulted in supply difficulties and a significant increase in gas prices. The government's decision to ban coal imports from Russia resulted in coal shortages both in power plants and in households. In the fall and winter of 2022, the situation only worsened. During the peak heating season, shortages were critical, necessitating government intervention. World markets reacted to the war in Ukraine with a sharp increase in the prices of steam coal. Emergency purchases of coal did not improve the situation because coal was expensive and of inadequate quality.

This energy crisis concerns the entire country, but Silesia is affected to a greater extent due to the higher industrialization and population density of the region, as well as for socio-logical reasons – because it is accompanied by the prospect of loss of employment stability in the mining industry, which was unable to deal with the growing shortage of coal on the market.

The Silesian community is becoming increasingly aware that the reform of the coal industry is not being carried out in a coherent, consistent, and rational manner. Changes and corrections introduced from time to time often simply consider the short-term interests of the authorities, not a long-term policy consistent with the interests of local communities. PEP2040 assumes that the last mine in Poland will be closed in 2049. Such setting of deadlines is contrary to the EU's decarbonization policy. However, no other agreement can be reached between the trade unions and the government.

The problem of mine closure and the related problems with employing miners concern not only mining families but also a full range of people employed in companies that work

for the needs of coal companies (we call them “mining supporting companies”). These are companies that supply coal mines in many ways: with materials, services, and equipment, as well as companies providing consulting and legal support. Their activities are directly dependent on the operation of mines. Omitting them in the mining reform process will result in market problems, the need to re-branding, transfer of operations to other regions of the world (e.g. to China) or even bankruptcy. Preventing such a development is an additional challenge for the region.

The 21<sup>st</sup> century is a time of decreasing the country’s population and aging of society. And again – this phenomenon affects the whole of Poland, but the problem of decreasing the number of inhabitants and the increase in the average age of people living in the region is particularly intense in Silesia. It is forecast that in 2035 the population of the Silesian Province will decrease to four million, while 50 years earlier it was about five million. The depopulation of the region began in the 1990s with the change in the country’s economic system. Young people no longer perceive the region as a place where life is easier and better (especially in the coal industry and companies related to coal mining). The process of economic transformation of the entire country, which was accompanied by an intensive, although still unfinished, reform of the hard coal mining industry aimed at achieving the economic efficiency of the industry, resulted in an increase in unemployment and growing frustration due to economic uncertainty. Young people are increasingly willing to go to study outside the region. Many people do not return to the places where they were born and raised, finding other places to live. A large part of them goes outside the country. Civilization factors also contribute to the aging of society, such as getting married later, postponing the date of birth of the first child, and the tendency to have only one child (or not to have any children).

Therefore, the problem of population aging is a significant challenge for the region, including ensuring enough people working in the region and providing care for the elderly.

To summarize the above-described phenomena, it should be stated that a coal region such as Silesia, to successfully undergo the process of changes involving the abandonment of coal, must face and positively solve the following challenges:

- I. Energy crisis – dependency on natural gas.
- II. Energy crisis – the lack of hard coal.
- III. Lack of mining industry reform.
- IV. Mining supporting companies.
- V. Ageing and population shrinking.

These challenges are interdependent and grouped around issues related to the transformation of a region in which coal has played a dominant role – primarily its extraction, but also its use. The direction of the transition is the main problem that will determine the shape and importance of the region in the future, as well as the quality of life of its inhabitants.

The factors that intensify the region’s problems are important phenomena also in other parts of Poland, but manifest themselves more acutely in Silesia, such as decisions made in connection with the war in Ukraine, or the nationwide trend of population aging.

## 4. Coping strategies

The identification of the main problems of Silesia related to the change in the basic direction of development was carried out during multi-aspect sociological research arising from the adopted Multidimensional Analytical Framework. As part of this research, among others, a survey was carried out in which representatives of the entire community of the region commented on various aspects of life in Silesia. Focus groups and semi-structured interviews with a group of stakeholders were also held. After identifying the main challenges that may determine the region's success or failure in the challenging task of transformation, the search for appropriate strategies for dealing with the challenges began. People with a keen interest in the success of the transformation due to their emotional attachment to the region were immensely helpful.

There are two challenges connected with the lack of appropriate fuels, sharing the common diagnosis: the energy crisis. However, the approach to solving the problem is different for coal than for gas.

Due to the dependence on natural gas, the following strategies have been developed to deal with this problem.

- I.1. Diversification of gas imports thanks to establishing cooperation with other (outside of Russia) natural gas suppliers.
- I.2. Reducing the expected future consumption of natural gas by increasing the share of renewable fuels in the economy.
- I.3. Increasing contracts for LNG supplies from various suppliers – thanks to full use of the capacity of the LNG gas terminal.

Apart from striving to establish new trade cooperation agreements in the field of gas supplies, as well as the related need to invest intensively in transmission infrastructure, the implementation of these strategies is a task for the entire country, not just the region. However, dependence on natural gas is higher in Silesia than on average across the country, so the key strategy in the region is to convince national decision-makers of the need to take these actions. It is also extremely important that local energy transformation strategies take into account changes in the structure of fuel consumption that reduce dependence on gas.

To achieve this, Poland needs to establish new partnerships and trade agreements with various countries to import natural gas. Investment in infrastructure such as LNG terminals and pipelines will also be key to facilitating the operation of these new import routes. Additionally, promoting energy efficiency and supporting the development of renewable energy sources in the region can further reduce dependence on a single energy source. Diversifying natural gas imports is a strategic move aimed at increasing energy security, stabilizing prices, and supporting the region's transition toward a more sustainable energy system.

The second challenge that Silesia (as well as many other regions of the country) must face after the outbreak of the war in Ukraine is the shortage of hard coal supplies. It should



be noted that the data and diagnoses concerned the year 2022 and partly 2023. On this basis, the following strategies for dealing with this problem were developed:

- II.1. Considering the possibility of a temporary increase in domestic coal mining.
- II.2. Increasing imports of hard coal from recognized global importers of this raw material (excluding imports from Russia), ensuring demand coverage and a guarantee of proper quality of the raw material at rational prices.
- II.3. Reducing the expected consumption of hard coal in the country in the future by increasing the share of renewable fuels in the economy.

The decline in coal mining, especially in Silesia, is due to many partially objective factors that result in high costs of coal production and the general unprofitability of mining activities in Poland. One of the main reasons for excessive costs is difficult operating conditions (large mining depth, complicated geological conditions, methane and explosion hazards, etc., operations under urbanized areas). Therefore, there is a tendency and recommendations supported by subsequent mining restructuring programs to reduce domestic hard coal mining. As a result, there is a significant shortage of hard coal on the domestic market, which affects both enterprises and individual consumers who use it for energy and heat. Despite calls from some groups to increase domestic hard coal mining, this is not possible in the short term, especially due to the lengthy process involved in preparing new mining fields.

To solve the problem of a shortage of coal Poland must explore alternative strategies. These could include investing in new technologies to make mining more efficient and profitable, seeking international coal suppliers to meet immediate demand, and accelerating the transition to renewable energy sources to reduce dependence on coal. Additionally, strengthening energy efficiency measures and promoting the use of alternative fuels for heating can help alleviate pressure on the supply of hard coal. Finding a sustainable solution is crucial to ensuring energy security and stability in the domestic market.

The challenge indicated above: the lack of mining industry reform is a large and long-lasting problem. This is, of course, also related to the previously described challenge, because the lack of coal on the market is a phenomenon that results from the weakness of the mining reform program. The times when there were doubts about whether coal should be the basic fuel to ensure energy security are over. We now know that cleaner energy sources are needed (Mišík and Prachárová 2023). Meanwhile, the mining reform should be implemented consistently and by the state's energy policy, so that the demand for individual energy carriers, including the sectors of the economy where they are used and their shares, are consistent with the possible ways of the country's development and the state's long-term policy, also resulting from the European strategies adopted by the country.

The coping strategy here is the only one:

- III.1. Prepare, implement and consistently carry out a reform of hard coal mining.

This reform should be closely linked to the state's energy policy stretching forward at least to 2050 when the European Union assumed achieving a zero-emission economy. The mining reform should consider local issues, especially those related to the development of the region, to avoid its de-territorialization. It would be worth considering the elements of

social balance, which can be achieved by using the elements of support provided by the EU, including financial ones (Jones-Kowalska 2024).

Minimizing the negative effects of the decreased demand for services provided by enterprises working in mining is a difficult issue and requires a broader approach to social issues. These are many small enterprises, but they employ many people in the Silesian region. The liquidation of mines will inevitably affect these companies, causing a deterioration of the mood in the region. It is necessary to develop and implement the following measures to counteract the negative effects of these phenomena:

IV.1. Change of production and service profile (re-branding).

IV.2. Staff training – adaptation of employees to new professions and company profile.

IV.3. Expansion of business into new markets.

The decline of coal mining in the country will significantly impact mining-supporting companies by reducing their revenue streams. This financial strain will force entrepreneurs to restructure their businesses, potentially leading to downsizing, seeking new markets for their products, and changing the nature of their production and services. Additionally, this situation will affect the public payments these companies make to the state treasury, further straining the economy. There is also a possibility that some of these businesses might relocate their operations outside of the country (Frankowski et al. 2023). The coping strategies rely on the assistance in supporting entrepreneurs to find new niches for their development, as well as for employees to help them find new jobs in newly established enterprises, contributing to positive restructuring of the labor market in the region.

The challenge of aging and decreasing the population can be coped only if the rapid changes of phasing out of coal will not cause the de-territorialization process. As such the coping strategies are:

V.1. Development of the cities in the region.

V.2. Support for older persons.

V.3. Development of new workplaces.

The strategy for Silesia should therefore be based on the positive transition of cities and smaller towns into places friendly to young families, places where you can easily find a decent job, but also where older people have decent living conditions. Local municipalities should allocate funds to adapt public infrastructure to better serve an aging population. The development of cultural and sports centers as well as infrastructure for children (nurseries, kindergartens, schools) is a direction that will prevent young people from leaving the region. To ensure that people of post-working age have appropriate care and support, it will be necessary to create conditions that will encourage immigrants to live and work in the region. It is also necessary to pay attention to improving environmental conditions (Lechowicz and Kuchler 2024). Green cities and carbon-free air should change the perception of Silesia in the eyes of residents of other regions, which may encourage them to look for their place on earth there.

## Conclusions

The challenges facing the Silesian region are complex and closely interlinked, each affecting the other in a complex web of factors. At the forefront of these challenges is the recent energy crisis triggered by Russia's invasion of Ukraine (Gajdzik et al. 2024). This crisis has ushered in a pivotal moment for Silesia, in which the trajectory of its transformation toward clean energy is in question. The crisis may spur a faster transition to cleaner energy sources, but it also poses the risk of delaying such efforts, especially if energy security concerns lead to the postponement of plans to phase out coal. Moreover, there are also discussions in the country about the possibility of increasing coal mining in the country to alleviate energy supply concerns.

The energy transition in Silesia goes far more than coal mines only. The role of 'mining supporting companies' cannot be overestimated. These entities act as liaisons in the province's transition to cleaner energy sources, which requires careful consideration of their involvement and adaptation in the transition process.

However, Silesia faces additional obstacles beyond its energy landscape. The region faces depopulation and an aging demographic profile, factors that significantly complicate efforts to diversify industries, generate employment opportunities, and support the development of the clean energy sector. A shrinking population and aging workforce pose a huge challenge to Silesia's ability to attract new talent, create innovative industries, and sustain economic growth.

To effectively address these multifaceted challenges, a concerted effort is needed to make the region more attractive to potential immigrants. In addition, a robust and adaptive reform program for the mining industry that is constantly monitored and adapted to the evolving needs of the region and the imperatives of a changing energy landscape is essential. Such a comprehensive approach is essential to guide Silesia through its current challenges and ensure a sustainable and prosperous future.

To effectively address these multifaceted challenges, a concerted effort is needed to make the region more attractive to potential newcomers from other parts of Poland and from abroad. In addition, a robust and adaptive reform program for the mining industry that is constantly monitored and adapted to the evolving needs of the region and the imperatives of a changing energy landscape is essential. Such a comprehensive approach is necessary to guide Silesia through its current challenges and ensure a sustainable and prosperous future.

Moreover, it is crucial to invest in education and training programs that equip the local workforce with the skills necessary for emerging industries, particularly in the renewable energy and technology sectors. Collaboration between government, industry, and educational institutions can foster innovation and drive economic diversification. Encouraging public and private investment in green infrastructure projects can also stimulate job creation and promote environmental sustainability.

Involving local communities in decision-making processes is another key element. Ensuring that the voices and concerns of Silesia's residents are heard and addressed can

enhance social cohesion and support for the transition. Building a strong sense of community ownership over the transition process can help mitigate resistance and foster a collective commitment to a sustainable future.

Furthermore, targeted social policies aimed at supporting vulnerable populations, such as retraining programs for displaced workers and social safety nets for those affected by the transition, are vital. These measures can alleviate the social impacts of the energy transition and contribute to a more equitable distribution of its benefits.

Overall, a multi-dimensional strategy that integrates economic, social, and environmental considerations is essential for Silesia to navigate its current challenges and embrace a future-oriented towards sustainability and resilience.

From the point of view of the goals set by the European Union in the process of achieving a zero-emission Europe, the problems of Silesia constitute a challenge that cannot be solved solely by local forces. There is a clear mismatch between the general European goal and the local needs of residents. Such mismatches are also noticed in the other coal regions analyzed. This applies to both the management models and the foundations of the social policy applied in various countries, as well as in economic policy.

To support the directions of changes in individual countries with the general EU guidelines, EU institutions and Member States engage in negotiations, dialogues, and coordination efforts. The European Commission plays a central role in monitoring compliance with EU policies by Member States, and Member States should make efforts to support the general direction and develop individually tailored support methods with the EU so that a balance is maintained between the sovereignty of Member States and the need for common policies (Garha and Mira 2022).

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## ENERGY TRANSFORMATION OF THE SILESIA COAL REGION – CHALLENGES AND COPING STRATEGIES

### Keywords

energy transition, decarbonization, Silesia, challenges, coping strategies

### Abstract

The article presents the results of research conducted as part of the ENTRANCES project (financed by the Horizon 2020 program), which focused on the analysis of sociological conditions in the transformation process involving the abandonment of coal production. The Polish research area in this project was the Silesian region. The research concerned the problems that will inevitably affect the region's community as the transformation towards the abandonment of coal becomes increasingly profound. The article identifies the main challenges facing this region in the context of adaptation to profound changes resulting from the liquidation of basic jobs in the region, which are coal mines. Moreover, the authors of the article propose strategies that can be used to effectively deal with these challenges. These strategy proposals include both actions at the public policy level and initiatives undertaken by the private sector and the local community.

The research method used included a broad analysis of many dimensions to which the region's society is subjected in transitional conditions within five components: socio-cultural, socio-psychological, socio-political, socio-economic, and socio-ecological-technical. The identified challenges and developed applicable strategies summarize this broad research. The obtained results allow for a deeper understanding of social processes during the energy transformation in coal regions, as well as the formulation of practical solutions for the Silesian region and other similar areas.

## TRANSFORMACJA ENERGETYCZNA REGIONU WĘGLOWEGO ŚLĄSKA – WYZWANIA I STRATEGIE RADZENIA SOBIE Z NIMI

### Słowa kluczowe

transformacja energetyczna, dekarbonizacja, Śląsk, wyzwania, strategie radzenia sobie

### Streszczenie

Artykuł przedstawia rezultaty badań przeprowadzonych w ramach projektu ENTRANCES (finansowanego ze środków programu Horyzont 2020), które skoncentrowały się na analizie uwarunkowań socjologicznych w procesie transformacji polegającej na rezygnacji z produkcji węgla. Polskim obszarem badawczym w tym projekcie był region Śląska. Badania dotyczyły problemów, jakie w sposób nieunikniony osiągną społeczność regionu w miarę coraz głębszych przeobrażeń na drodze do rezygnacji z węgla kamiennego. W artykule zidentyfikowane zostały główne wyzwania, przed którymi stoi ten region kraju, w kontekście adaptacji do głębokich zmian wynikających z likwidacji

podstawowych miejsc pracy, jakimi w regionie są kopalnie węgla. Ponadto, autorzy artykułu proponują strategię, które mogą być stosowane w celu skutecznego radzenia sobie z tymi wyzwaniami. Propozycje strategii obejmują zarówno działania na poziomie polityki publicznej, jak i inicjatywy podejmowane przez sektor prywatny oraz społeczność lokalną.

Zastosowana metoda badawcza objęła szeroką analizę wielu wymiarów, którym poddawane jest społeczeństwo regionu w warunkach przejściowych w ramach pięciu komponentów: socjo-kulturowego, socjo-psychologicznego, socjo-politycznego, socjo-ekonomicznego i socjo-ekologiczno-technicznego. Wyodrębnione wyzwania i opracowane możliwe do zastosowania strategię stanowią podsumowanie szerokich badań. Uzyskane wyniki pozwalają na głębsze zrozumienie procesów społecznych w trakcie transformacji energetycznej w regionach węglowych, a także sformułowanie praktycznych rozwiązań dla regionu śląskiego i innych obszarów.

