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Energy transformation of the Silesian Coal Region in the context of defavorization

Introduction

The global energy transition, driven by the urgent need to address climate change, has become an absolute necessity rather than a mere choice. Climate change is escalating a wide range of challenges, from polar ice melt and rising sea levels to more frequent hurricanes, wildfires, and intense heatwaves. It also accelerates land degradation and deforestation, putting increased pressure on ecosystems and essential natural resources. According to the United Nations Framework Convention on Climate Change (UNFCCC 2023), climate change encompasses alterations in the global atmosphere driven directly or indirectly by human activity, adding to the natural variability observed over similar timescales (UNFCCC 2023). Beyond environmental impacts, climate change is reshaping population dynamics, prompting

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climate migration, and posing substantial social and economic challenges. Numerous reports on the current state of human civilization offer a stark, sometimes catastrophic, outlook – especially as global megatrends threaten the very existence of humanity (Gawor 2006). Reducing greenhouse gas emissions is essential not only to safeguard our present but also to secure the well-being of future generations.

The International Energy Agency (IEA 2021) describes the energy transition as a shift away from a system centered on fossil fuels – such as coal, oil, and natural gas – toward one dominated by renewable energy sources like wind, solar, hydropower, and geothermal energy. This transition also involves improving energy efficiency, decarbonizing key sectors like transportation and industry, and integrating cleaner technologies into power grids. The primary aim of the energy transition is to reduce greenhouse gas emissions, combat climate change, and establish a more sustainable, resilient energy system. Additional goals include enhancing energy security, reducing dependence on finite resources, and promoting environmental and social well-being (IEA 2021). Like any large-scale transformation, the energy transition calls for the gradual restructuring of systems, institutions, and processes through stages of adaptation, reorganization, and innovation to meet evolving conditions and objectives (Tsoukas and Chia 2002). This transition poses unique complexities for mining regions. On the one hand, it offers opportunities to mitigate climate change, reduce poverty, and address social inequalities. On the other, it disrupts local economies and labour markets. Mining regions often economically reliant on fossil fuels, may find it difficult to diversify their industries or attract new investments. Furthermore, much of their infrastructure is outdated and unfit for modern energy technologies. In economically distressed areas, the considerable capital needed to develop renewable energy infrastructure and new industries creates another barrier (Pietrzak et al. 2021).

Additionally, these regions must address environmental issues like contaminated land, soil, and water, which require costly and time-intensive remediation. Reclaiming these lands for renewable energy projects or other purposes is challenging due to the environmental degradation caused by mining activities. The social costs for mining regions undergoing the energy transition are significant. Many of these communities are deeply tied to mining, both culturally and socially (ECFR 2023). Moving away from fossil fuels can incite resistance, social unrest, and even dysfunction as local identities is altered. Successful energy transition in these regions requires retraining and skill development, as the skills needed in renewable energy sectors differ considerably from those in traditional mining (Stala-Szlugaj 2019).

While the energy transition promises a more sustainable future, it presents considerable challenges, particularly for mining regions facing economic, infrastructural, and social barriers. Addressing these challenges will be essential for an inclusive and successful transition (Luty 2022). Disadvantage or disfavorization describes the condition where individuals or groups experience social, economic, or educational disadvantages linked to social exclusion, marginalization, and disaffiliation, standing in contrast to privilege (Silver 1994; Sen 2000; Burchardt et al. 2002).

The principle of a Just Transition holds that disadvantaged groups should receive particular attention during the energy transition. This article examines the current state and prospects for disadvantaged groups within the Silesian Coal Region, with the goal of understanding their challenges and opportunities in the energy transition process.

1. Methodology

To initiate the research, a baseline review was conducted using a combination of critical literature review methods, online literature searches, and an examination of multidisciplinary academic databases, including Scopus and Google Scholar. Key terms such as “Energy Transformation,” “Just Transition,” and “Defavorization” were employed. The literature review revealed that defavorization is commonly defined as the process or condition where specific individuals, groups, or areas become less favored or privileged, leading to social, economic, or political marginalization. Additionally, the energy transition – understood as



Fig. 1. Diagram with applied methodology
Source: own study

Rys. 1. Diagram z zastosowaną metodologią

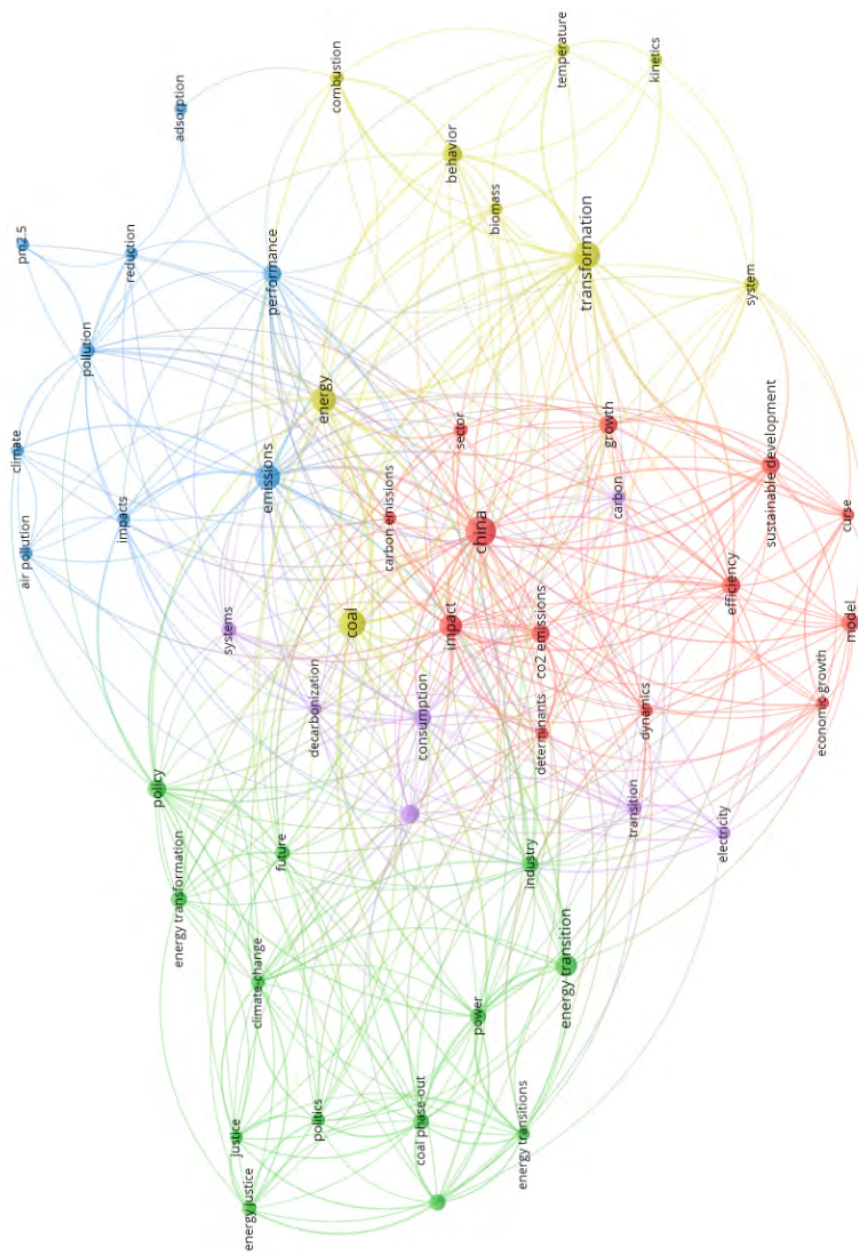


Fig. 2. Literature review of Energy Transformation in Coal Regions
Source: VOS viewer

Rys. 2. Przegląd literatury Transformacja Energetyczna Regionów Górniczych

a shift toward clean and sustainable energy sources – has been highlighted in the literature for its potential to address not only climate change but also reduce poverty and foster social equity. The next step in the research involved mapping the literature landscape surrounding Energy Transformation. For this purpose, VOSviewer software was used. VOSviewer is a specialized tool for visualizing and constructing bibliometric networks, including networks of journals, researchers, or individual publications, based on citation, bibliographic coupling, co-citation, or co-authorship relationships.

The term “Energy Transformation in Coal Regions” was used for mapping purposes (see Figure 2). This mapping identified 216 relevant papers, with a major flow of literature focused on themes such as energy, coal, emissions, consumption, efficiency, and transformation. Additionally, data were collected from various sources, including the Central Statistical Office of Poland, Eurostat, and regional data repositories of the Silesian Voivodeship. Key data points collected include employment rates in the mining and renewable energy sectors, energy poverty rates, income levels, demographic information on vulnerable populations, and environmental data related to pollution and land degradation. In the second phase of research, a focused analysis was conducted on the energy transformation of the Silesian coal region, particularly in relation to defavorization. This phase aimed to deepen the understanding of the socio-economic and environmental impacts of the energy transition within the region, with a particular emphasis on the unique challenges faced by disadvantaged communities in Silesia.

Additionally, a PESTEL analysis (Political, Economic, Social, Technological, Environmental, and Legal factors) of the energy transition in Silesia was conducted to assess the critical external factors influencing the region’s transition from coal to renewable and sustainable energy sources.

2. Energy transformation in Poland

Poland’s energy sector has been undergoing a significant transformation over recent decades. The mining industry remains a cornerstone of the economy, especially in regions like Silesia, despite its substantial contributions to CO₂ emissions. In 2022, Poland produced approximately 53.2 million metric tons of hard coal, a decrease from the higher production levels seen in previous decades as the nation gradually shifts away from coal dependency (Central Statistical Office of Poland 2022). The reduction in coal production reflects Poland’s response to both economic pressures and environmental commitments, with the coal sector’s contribution to the national energy mix declining as renewable energy sources gain prominence. Despite these reductions, the coal sector still employs around 80,000 people, primarily in traditional mining areas, underscoring its social and economic importance (Euracoal 2022). Coal-burning power plants account for approximately 70% of Poland’s electricity production, although this reliance is steadily decreasing due to EU climate mandates and global decarbonization pressures (International Trade Administration 2022).

Following the political shift in 1989, Poland transitioned from a centrally planned to a market-driven economy, leading to profound impacts on the mining sector. In the early 1990s, Poland's coal industry was among the largest in the world. However, inefficiencies, overproduction, and outdated infrastructure created an urgent need for reform, which included a progressive reduction in coal output. Between 1990 and 2005, a series of government programs aimed at restructuring the sector significantly reduced coal production and employment, with the workforce shrinking by nearly 70% (World Bank 2005). While these reforms led to the closure of unprofitable mines, they also improved the sector's profitability by aligning the remaining mines with market demands and efficiency standards. The continued decrease in coal production is projected to align with Poland's long-term climate goals, including the complete phase-out of coal by 2049 (Euracoal 2022). Despite coal's shrinking role in energy production, it remains a critical component of Poland's energy sector. In 2022, coal generated approximately 70% of the nation's electricity; however, this share is expected to decline sharply as Poland increases its renewable energy capacity and meets EU climate targets (Ministry of Climate and Environment 2021). This transition marks a significant shift in the country's energy landscape and highlights Poland's gradual move towards a more sustainable energy future.

Poland has enacted legislation to support renewable energy, such as the 2015 Act on Renewable Energy Sources (RES Act 2015), which provides incentives for wind and solar projects. By 2021, Poland's renewable energy capacity will reach 16.9 GW, with further targets of achieving 32% renewable energy by 2030 (Ministry of Climate and Environment 2021). Offshore wind energy is also a priority, with plans for 5.9 GW by 2030 and 11 GW by 2040, further reducing dependence on coal. These efforts aim to meet EU climate targets, including a 55% reduction in emissions by 2030 compared to 1990 levels, while also diversifying the energy mix and expanding renewable sources. In 2018, Poland adopted its Strategy for the Coal Sector until 2030, establishing a roadmap for gradually phasing out coal, particularly in power generation, while ensuring energy security. This was followed by the approval of the National Energy and Climate Plan (NECP 2019) for 2021–2030 in 2019, which set specific goals to improve energy efficiency and cut greenhouse gas emissions. Key targets included a 23% improvement in energy efficiency by 2030, compared to a business-as-usual scenario, and increasing the share of renewables in the energy mix to at least 23% by 2030 (Ministry of Climate and Environment, 2021). In February 2021, Poland unveiled its long-term energy strategy, Energy Policy 2040 (PEP2040), projecting a sharp decline in coal's role in electricity generation – from around 70% in 2020 to between 11% and 28% by 2040, depending on circumstances (Ministry of Climate and Environment, 2021). The policy includes a Just Transition plan to support coal-dependent regions, such as Silesia, by creating new job opportunities and providing retraining options. PEP2040 also focuses on reducing energy poverty by ensuring affordable access to energy during the transition to cleaner sources, such as offshore wind, solar, and nuclear energy (PEP 2040, 2021).

According to the draft National Energy and Climate Plan (KPEiK), developed under Regulation (EU) 2018/1999 of the European Parliament and the Council of December 11, 2018,

on the governance of the energy union and climate action, several regions in Poland remain heavily dependent on the extraction, processing, transportation, and utilization of hard coal and lignite. Poland's past experience with mine closures has shown that such transitions can lead to significant socio-economic challenges. Therefore, an accelerated energy transition must carefully address the risks faced by regions that are dependent on coal. However, with proper management, this transition also presents an opportunity to create new jobs in industries and sectors essential to the shift toward sustainable energy. As a fundamental transformation of both the economic and energy systems, the energy transition has wide-ranging distributional effects, which may lead to new income and regional disparities. Traditional coal-reliant areas risk economic decline and job losses, while emerging green economy sectors may develop elsewhere, potentially deepening regional inequalities. To mitigate these effects, it is essential to monitor the socio-economic impact of the transition and identify the communities most vulnerable to its negative consequences. This requires proactive policy measures, such as subsidies, tax incentives, and investments in local development, to ensure a fair and equitable transformation. Beyond economic considerations, the energy transition aims to improve citizens' quality of life by reducing environmental pollution and enhancing public health. Advancing energy efficiency and sustainability will lead to cleaner air, a reduced impact of climate change, and lower energy costs. However, it is equally crucial to ensure that no social group experiences a decline in living standards as a result of these changes (KPEiK 2019).

Poland's draft National Energy and Climate Plan (KPEiK) outlines updated objectives to align with the European Union's goal of climate neutrality by 2050. The key objectives include:

1. Reduction of Greenhouse Gas Emissions: Achieve a 50.4% reduction in greenhouse gas emissions by 2030 compared to 1990 levels.
2. Increase in Renewable Energy Sources (RES):
 - ◆ Overall, RES Share Aims to Target a 29.8% share of renewables in final gross energy consumption by 2030.
 - ◆ Electricity Generation: Aim for a 56% share of renewables in the electricity mix by 2030.
 - ◆ Heating and Cooling: Set a 32.1% RES share in the heating and cooling sector by 2030.
 - ◆ Transport: Achieve a 17.7% RES share in the transport sector by 2030.
3. Enhancement of Energy Efficiency: Reduce primary energy consumption by 16.7% by 2030 compared to 2020 levels.
4. Strengthening Energy Security: Diversify energy sources and reduce dependence on coal with significant investments in renewable energy infrastructure.
5. Promotion of Research, Innovation, and Competitiveness: Encourage technological advancements and innovation to support the energy transition and enhance competitiveness in the energy sector (KPEiK 2019).

These objectives are designed to guide Poland's energy transition, contributing to the EU's overarching climate goals while addressing national energy security and economic considerations.

3. Energy transformation of the Silesian Coal Region

The Silesian Voivodeship, or Województwo Śląskie, is a province in Poland with a unique status, with the city of Katowice as its capital. This region, one of Poland's most densely populated and industrialized, plays a pivotal role in the nation's economy, especially in mining, heavy industry, and energy production. Silesia is responsible for approximately 40% of Poland's coal output, highlighting its strategic importance amid the current energy transition (Central Statistical Office of Poland, 2022).

Administratively, the Silesian Voivodeship is organized into:

- ◆ 36 districts:
 - ◆ 17 land districts,
 - ◆ 19 city districts;
- ◆ 167 communes:
 - ◆ 49 urban communes,
 - ◆ 22 urban-rural communes,
 - ◆ 96 rural communes.

Seventy-one towns in the voivodeship hold city rights, emphasizing Silesia's urbanized character (Central Statistical Office of Poland 2022). With a population of around 4.635 million as of 2022, the voivodeship accounts for 12.14% of Poland's total population. It spans 12,334 km², or 3.9% of Poland's territory, with a population density of 370 people per km², making it one of the country's most densely populated regions. Katowice serves as a central hub for business and industry, reinforcing Silesia's industrial significance within Poland's economy (Central Statistical Office of Poland 2022). The Silesian Voivodeship is integral to Poland's economic and energy sectors. The region's economy is diverse, with strengths in manufacturing, automotive production, technology, and services, generating around 13% of Poland's GDP, reflecting its considerable economic importance (Ministry



Fig. 3. Silesian Voivodeship on administrative map of Poland
Source: <https://geoportal.orsip.pl/app/PodzialAdministracyjny.html>

Rys. 3. Województwo śląskie na mapie administracyjnej Polski

of Climate and Environment 2021). The Territorial Just Transition Plan (TJTP) underpins the allocation of funds from the Just Transition Fund (JTF) and other EU financial mechanisms for 2021–2027, aiming to mitigate the social and economic impacts of the energy transition in coal-dependent regions (Silesian Voivodeship 2022). This strategic initiative aims to help affected areas diversify their economies, provide retraining for workers, and promote investment in green technologies, with a particular focus on mining regions most impacted by the shift away from coal. Poland is set to receive about €3.5 billion from the Just Transition Fund, as part of a €17.5 billion EU allocation under the JTF, to support the transition to a low-carbon economy, with funding directed towards economic diversification, job creation, and retraining programs, especially in coal-reliant regions (Silesian Voivodeship 2022).

The TJTP specifically targets seven sub-regions within the Silesian Voivodeship – one of Europe’s largest coal-producing areas. These sub-regions include:

- ◆ Katowice,
- ◆ Bytom,
- ◆ Sosnowiec,
- ◆ Gliwice,
- ◆ Tychy,
- ◆ Rybnik,
- ◆ Bielsko-Biała.

These areas host some of Poland’s largest coal mines, providing thousands of jobs directly tied to the coal industry. Under TJTP, these sub-regions will receive investment in renewable energy projects, infrastructure upgrades, and sustainable industry development. The plan also prioritizes retraining programs for the approximately 80,000 workers in the mining sector (Central Statistical Office of Poland 2022), equipping them for roles in emerging green industries.

The Silesian Voivodeship faces significant socio-economic challenges as coal is phased out. TJTP provides a framework to address energy poverty, improve energy efficiency, and ensure that affected communities have access to new economic opportunities. Investments will focus on clean energy technologies like solar and wind, aiming to position Silesia as a renewable energy production center. This plan not only ensures an environmentally sustainable transition but also fosters social inclusivity, working to ensure no community is left behind as Poland transitions from coal reliance.

The 2019 Regional Transformation Action Plan for the Silesian Voivodeship established a foundation for comprehensive regional transformation during the 2014–2020 period (Silesian Voivodeship 2019). This plan integrated various regional strategies into the development of the Territorial Plan for Just Transition (TPST), creating a coordinated policy framework. Key regional documents that shaped the TPST include:

- ◆ Low Carbon Economy Policy for the Silesian Voivodeship (Regional Energy Policy until 2030);
- ◆ Regional Innovation Strategy of the Silesian Voivodeship 2030;

- ◆ Social Policy Strategy of the Silesian Voivodeship for 2020–2030;
- ◆ Regional Urban Policy of the Silesian Voivodeship;
- ◆ Regional Revitalization Policy of the Silesian Voivodeship.

The guiding strategic document for the region's transformation, the “Silesia 2030 – Green Silesia” Strategy, was adopted by the Silesian Regional Assembly through Resolution No. VI/24/1/2020 on October 19, 2020 (Silesian Voivodeship 2020). This strategy envisions a sustainable, green future, focusing on reducing carbon emissions while promoting economic growth (Silesian Regional Assembly 2020).

In 2019, the Silesian Voivodeship's Board established the Regional Team for Mining Regions in Transition to lead discussions and initiatives related to transformation challenges. Initially, the team coordinated activities within the European Commission's Platform for Coal Regions in Transition. Its role later expanded to include consultations with regional authorities to plan activities funded by the Just Transition Fund (European Commission 2021). To promote a bottom-up, participatory approach, the Marshal's Office of the Silesian Voivodeship organized 33 workshops between September 2020 and May 2021, attended by nearly 1,850 participants (Marshal's Office of the Silesian Voivodeship 2021). These workshops aimed to gather insights into the socio-economic challenges and opportunities of the transition.

The workshops took place in multiple stages:

1. Expert Workshops (September 2020) identified key socio-economic transformation challenges.
2. Geographical Workshops (October–November 2020) focused on transformation issues specific to each sub-region.
3. Consultation Meetings (January–February 2021) engaged stakeholders in the creation of programming documents and regional project plans.
4. Consultation Workshop (April 2021) reviewed the initial TPST draft, involving experts from municipalities, the Regional Energy Council, trade unions, NGOs, and business groups.

Following these consultations, the Territorial Plan for Just Transition of the Silesian Voivodeship 2030 (v.02) was adopted by the Board of Directors of the Silesian Voivodeship via Resolution No. 1463/241/VI/2021 on June 15, 2021. It opened for public consultation (Silesian Voivodeship Board, 2021). Local governments, economic partners, and residents were invited to participate in this inclusive process. Additional public consultations on the European Funds for Silesia 2021–2027 program were held from April 1 to May 6, 2022, including an Environmental Impact Assessment and the Territorial Plan for Just Transition 2030. These documents were submitted to the European Commission's SFC 2021 electronic system (European Commission 2022).

A conference on April 12, 2022, introduced the European funding plans for Silesia, encouraging public participation in the region's transformation. Public hearings also gathered feedback from social and economic partners, civil society organizations, and the Joint Commission of Government and Local Self-Government. The Silesian State Regional

Sanitary Inspector and the Regional Director of Environmental Protection in Katowice provided positive feedback on the draft program and its environmental assessment (Marshal's Office of the Silesian Voivodeship 2022).

4. Energy transformation of the Silesian Coal Region in the context of defavorization

The ongoing energy transformation in the Silesian region, which entails a shift from a coal-dependent economy to a more sustainable energy system, presents significant socio-economic and cultural challenges. These challenges are further exacerbated by complex issues related to gender, socio-cultural identity, political divisions, and the flow of knowledge, which collectively contribute to the process of *disfavorization*. The term *disfavorization* refers to the marginalization of specific groups or regions, rendering them more vulnerable to the adverse effects of large-scale structural changes.

An ecofeminist analysis by Iwińska and Bukowska (2021) on the energy transformation in Upper Silesia highlights the critical importance of integrating gender perspectives when addressing socio-political shifts associated with the transition from coal to renewable energy sources. The decline of the coal industry in the region is not merely an economic or environmental issue but also has profound implications for gender relations and the role of women within the community. Historically, the coal industry has been a male-dominated sector, and its decline can be interpreted not only as a loss of economic stability but also as the erosion of male identities and power structures. For women, this transformation may present an opportunity for empowerment, particularly if the renewable energy sector offers new professional opportunities.

However, without gender-sensitive policies, this transformation may inadvertently deepen existing inequalities. The marginalization of women in decision-making processes, coupled with insufficient support for their inclusion in emerging sectors, risks exacerbating *disfavorization*, where women become disproportionately disadvantaged by the energy transition. Consequently, it is imperative to incorporate gender-responsive policies within the broader framework of energy transition to ensure a just and equitable transformation for women in coal-dependent regions (Iwińska and Bukowska 2021). Moreover, the socio-cultural attachment of mining communities to the coal industry plays a pivotal role in understanding the process of *disfavorization* experienced by these groups during the transformation. As noted by Peplowska et al. (2024), the identity of the Silesian communities is deeply intertwined with the coal industry. Therefore, the decline of coal emerges not only as an economic concern but also as a cultural one. Coal is more than just an occupation; it is an integral element of local identity, social structure, and community cohesion. For many individuals, the energy transformation signifies the loss of a critical socio-cultural anchor. The psychological impacts of this shift, coupled with economic instability, compound the *disfavorization* that these communities face. This phenomenon is particularly pronounced

in regions with strong historical ties to coal, where the adaptation to new economic realities is often met with resistance due to attachment to the past and the loss of jobs and identity (Peplowska et al. 2024).

The energy transition in Silesia is further complicated by deep-seated political divisions, which significantly contribute to the process of disfavorization. According to research by Iwińska and Bukowska (2021), political polarization regarding energy policy in Poland plays a crucial role in shaping public attitudes toward coal and renewable energy sources. These ideological divisions exacerbate the disfavorization of coal-dependent communities, as they are frequently aligned with political parties that resist the transformation. The political alienation of these communities is further intensified by national energy policies that prioritize urban areas and more liberal constituencies, leaving coal-dependent communities in the Silesian region underrepresented and unsupported during the transformation process (Iwińska & Bukowska, 2021). This political fragmentation creates significant barriers to coordinated regional responses to the energy transformation. The divergence in political approaches to energy policy results in fragmented governance, where each political faction implements policies aligned with its ideological stance, failing to address the integrated needs of all stakeholders. As a result, coal-dependent communities not only endure economic destabilization but also experience political exclusion, further heightening their vulnerability to the negative consequences of the transformation. To mitigate disfavorization, it is crucial to address political divisions within Silesia and promote policies that ensure all communities are adequately represented and supported.

The concept of disfavorization is also highly relevant in the context of knowledge flows and technological adaptation. Research by Cappellano, Kurowski-Pysza, and Ciszewska (2023) emphasizes the significance of effective knowledge exchange and collaboration among various stakeholders involved in the energy transition in Silesia. The transition from coal to renewable energy is not only a technical challenge but also one that requires extensive knowledge exchange between diverse groups, including policymakers, businesses, research institutions, and local communities. In regions such as Silesia, where the local workforce has historically been employed in mining, the shift to a green economy demands significant efforts in reskilling and workforce retraining (Cappellano et al. 2023).

The risk of disfavorization emerges when knowledge flows are neither inclusive nor equitably distributed. If local communities and workers are excluded from accessing new technologies or participating in the green economy, they may become further marginalized. Such technological disfavorization can deepen the divide between those who can adapt to the new energy landscape and those who cannot, resulting in heightened socio-economic disparities. For the energy transition to be effective, it is essential that knowledge dissemination encompasses all sectors of society, particularly those in coal-dependent regions that are most vulnerable to economic exclusion.

The concept of social defavorization is intricately linked to terms such as social exclusion, marginalization, and disaffiliation, standing in stark contrast to the notion of privilege (Szarfenberg 2008). In the context of the energy transition in the Silesian region, several

vulnerable groups can already be identified, particularly those facing social, economic, or educational challenges. Disadvantaged groups in Silesia potentially include:

Tabela 1. Disadvantaged groups in Silesia

Tabela 1. Grupy defaworyzowane na Śląsku

Mining industry workers	In the context of the energy transition and the gradual phase-out of coal, mining sector workers represent one of the most vulnerable groups. The anticipated job losses, combined with the need for extensive reskilling, place these workers in a precarious socio-economic position.
Unemployed and long-term unemployed individuals	Silesia, despite being a major industrial hub in Poland, continues to struggle with notable unemployment challenges, particularly in regions that were once dependent on industries like mining and steel production.
Elderly individuals	Due to Poland’s aging population, older adults are increasingly facing significant challenges related to healthcare access, social services, and social isolation, particularly in smaller towns and rural areas.
People with disabilities	People with disabilities frequently face significant challenges in accessing employment, education, and public infrastructure, despite the existence of support and integration programs. In Silesia, these barriers are particularly evident in certain regions where infrastructure remains inadequately adapted to meet their needs.
Youth from rural areas	Young people from rural areas often face significant barriers in accessing education, vocational training, and employment opportunities, which can lead to higher levels of unemployment and social exclusion.
Individuals in difficult financial situations	Due to limited incomes, many families face significant challenges in accessing vital services, such as education, healthcare, and necessities.
Migrants and ethnic minorities	In certain areas of Silesia, though relatively small, there are national and ethnic minorities that may face challenges in fully integrating socially, educationally, and professionally. These groups often encounter difficulties in accessing equal opportunities in education and employment, as well as in building strong social networks, which can lead to marginalization and limit their prospects for upward mobility within the community.

Source: own study based on Central Statistical Office

In the context of a just transition, the primary goal is to ensure that the social, economic, and environmental changes resulting from the decline of sectors like coal mining do not disproportionately harm vulnerable groups. A just transition is centered on ensuring equality, inclusion, and support for those most affected in order to prevent exacerbating existing inequalities. Therefore, it is crucial to address how the specific needs and challenges of different vulnerable groups intersect with the ongoing transformation process. Workers in the coal industry are among those most directly impacted by the decline of coal mining in Silesia.

Many of these workers have spent decades in the mining sector, developing specialized skills that are often difficult to transfer to other industries. A just transition should include

targeted retraining programs designed to equip coal workers with the skills required for new, growing sectors, such as renewable energy, technology, or sustainable production. These programs must be tailored to the specific needs of the region and ensure that workers are not left behind in the face of economic change. Additionally, for elder workers, early retirement options or sufficient pension security are essential to alleviate the economic pressures caused by the loss of long-term employment. These workers must have pathways to transition with dignity, which includes access to proper financial and social support (Peplowska et al. 2022).

Long-term unemployed individuals, particularly in regions where mining once served as the primary source of employment, also face significant challenges. For these individuals, access to retraining and skill development programs is critical to facilitate their shift into new industries. These programs should be aligned with the region's emerging economic priorities, such as the growth of renewable energy in Silesia, to help people acquire the skills needed for new and sustainable job opportunities. Beyond retraining, long-term unemployed individuals also need job placement support, career counseling, and networking opportunities to mitigate the risk of continued unemployment. In addition, strengthening social safety nets, including unemployment benefits and other forms of financial assistance, will be crucial to prevent the deepening of poverty during this transitional period. Elderly individuals, particularly those who have spent many years working in the mining sector, face unique challenges in the face of industrial transformation (World Bank 2021). Many may not have sufficient retirement savings and will rely heavily on pension support. Ensuring adequate pension security for these individuals is crucial, as retraining and re-entering the workforce at an older age may not be a viable option.

Alongside financial security, access to healthcare is particularly important, as many older individuals may struggle with health issues related to the physical demands of mining work. Additionally, efforts to combat social isolation among older individuals—through community-building programs and policies that foster their participation in local life—will help mitigate the emotional impacts of the transformation and promote social inclusion.

People with disabilities encounter particular challenges within the context of this transformation. A just transition must ensure that the new economy is inclusive and offers accessible employment opportunities for individuals with disabilities. This includes creating work environments that are physically accessible and developing employment policies that prioritize inclusion. Furthermore, supporting independent living is vital, and this may involve providing access to assistive technologies, caregiving services, and personal development programs. These services are crucial in enabling individuals with disabilities to participate in society and the workforce fully. Youth from rural areas often face the challenge of migration in search of better opportunities, which contributes to the depopulation of rural communities. A just transition in these regions must focus on creating attractive career paths to retain young people and counter the brain drain.

Transformations in industries such as renewable energy, sustainable agriculture, and small-scale production could offer appealing career options in rural areas. Educational

programs should be aligned with future job markets, with an emphasis on sectors critical to the region's sustainable development (RFF 2022). Moreover, involving young people in the design and implementation of the transition process is essential to ensure that their voices and aspirations are heard. Enabling youth to shape their future actively will not only empower them but also ensure that the transformation meets their needs and allows them to build a prosperous future within their local communities. Individuals in financial hardship are particularly vulnerable to the adverse effects of industrial transformation. Many of them may experience unemployment or loss of income as a result of the changes occurring in the region. These individuals require exceptional financial support during the transition period. Providing robust social assistance, such as unemployment benefits and other forms of economic support, is essential to help them manage the transition into new career paths.

Programs offering debt relief, financial literacy training, and budget counseling can ease financial burdens and restore stability. Moreover, ensuring access to affordable housing, healthcare, and education is critical in helping people in financial distress navigate the challenges of this transformation and rebuild their economic security. Migrants and ethnic minorities face unique challenges during industrial transformations, as they often encounter discrimination, social exclusion, and barriers to accessing new employment opportunities. A just transition must prioritize the social integration of migrants and ethnic minorities, ensuring their inclusion in the emerging economy while protecting their rights. This includes combating discrimination and fostering an inclusive labor market. To address language and cultural barriers, programs that support migrants in acquiring language and integrating culturally will be necessary. It is also essential to ensure that migrants and ethnic minorities are not pushed into low-paying, precarious jobs but instead have access to fair wages and secure working conditions.

Through targeted anti-discrimination policies, integration initiatives, and fair labor practices, a just transition can ensure that these groups are neither marginalized nor exploited during the transformation. Defavored groups should be considered at the forefront of the energy transition because doing so promotes greater equity and social justice, reduces the risks of economic displacement, prevents social exclusion, and fosters public support for the transition.

These groups should be given special attention during the energy transition process because they:

- ◆ are at risk of losing jobs in traditional industries, especially in regions like Silesia, where sectors such as coal mining are central to the economy. The energy transition can lead to job losses in industries where disadvantaged groups may be overrepresented;
- ◆ are vulnerable to energy poverty due to low income. Rising energy prices or changes in energy systems can disproportionately affect these groups, pushing them further into energy poverty;
- ◆ can struggle with limited access to renewable technologies as transitioning to renewable energy often requires upfront investments in energy-efficient appliances, solar panels, or electric vehicles;

- ◆ are at the risk of social inequity and marginalization, as they already face social, economic, and educational disadvantages. Ignoring their needs in the energy transition may lead to further deepening of inequality and marginalization;
- ◆ are at the risk of exclusion from the health and environmental benefits, as they often live in areas more exposed to environmental degradation, pollution, or poor housing conditions.

To effectively support defavorized groups during energy transformation, a comprehensive series of actions should be implemented. These measures can be categorized into three key areas: economic, social, and political initiatives. In terms of economic support for defavorized groups should include:

- ◆ job retraining and education programs – for a successful transformation in Silesia, upskilling for new industries is crucial. These programs should be accessible, free, or subsidized for defavorized groups;
- ◆ subsidies and financial support – in the form of energy efficiency upgrades subsidies or low-interest loans for energy efficiency improvements should be offered for the defavorized groups, as well as affordable renewable energy access in the form of financial support for solar panels, heat pumps, and other renewable technologies;
- ◆ support for small businesses and cooperatives – in terms of energy transformation, local energy cooperatives should be supported where defavorized groups can invest in and benefit from renewable energy projects. Additionally financial support should be provided for green start-up in the form of grants, subsidies, and tax incentives;
- ◆ EU support – The European Union's Just Transition Fund should be used to benefit defavorized groups, in such form as retraining initiatives, affordable energy access, and social infrastructure improvements. Additionally, in green infrastructure investments like sustainable transportation and renewable energy plants.

In terms of social support for defavorized groups should include:

- ◆ promoting gender and social inclusion by supporting women, elderly workers, and ethnic minorities in the way to energy transformation. Special programs or targeted financial aid should be created;
- ◆ public consultations and engagement – to make transformation successful, it is critical to engage defavorized groups in the decision-making process. It can be preceded by deliberation consultations with local unions;
- ◆ cooperation with local NGOs- non-governmental organizations should be able to work with vulnerable populations.

In terms of political support for defavorized groups should include:

- ◆ inclusive policy design and implementation, during the transformation process it should ensure that no one is left behind during the energy transformation;
- ◆ tailored legislation – the needs of defavorized groups during the energy transformation should be quartered by the laws;
- ◆ deliberative democracy – democratic participation should be promoted to ensure that defavorized groups have a voice in the decision-making process;

Table 2. PESTEL analysis of the energy transition in Silesia

Table 2. Analiza PESTEL transformacji energetycznej na Śląsku

Political factors	Government Support & Policy: Poland’s membership in the EU requires adjusting policies to meet the EU’s climate goals, making the development of renewable energy sources necessary. However, it should be considered that policies may change depending on government priorities. EU Regulations: Poland is a member of the EU, which mandates progressive climate and energy targets. Compliance with the European Green Deal and Fit for 55 package necessitates a shift towards renewable sources. Local Political Pressure: In Silesia, trade unions and local politicians are actively working to protect jobs in the coal industry. This can slow down the energy transition and increase resistance to change.
Economic factors	Job Market Impact: The coal industry has long been a key source of employment, meaning that a shift to renewable energy could lead to economic disruptions unless alternative job opportunities are developed. Energy Prices and Competitiveness: The costs associated with renewable energy, infrastructure, and grid modernization drive up energy prices, potentially increasing energy poverty. Additionally, high energy costs could undermine Silesia’s competitiveness, particularly in industries dependent on affordable energy. Cost of Transition: Transitioning from coal to renewable energy sources requires significant investment. Poland’s government is expected to balance economic stability with environmental objectives, and EU funding can help offset costs.
Social factors	Labor Market Transition: Retraining programs and robust social support systems are essential to help former coal industry workers transition into new roles within the renewable energy sector, reducing the risk of social unrest and resistance. Public Opinion and Awareness: Public support for renewable energy is on the rise, though coal-dependent communities in Silesia may remain more skeptical. Educational campaigns and active community engagement can help increase acceptance. Health Impacts: Dependence on coal has resulted in significant pollution, negatively impacting the health of the local population. Transitioning to renewable energy promises a cleaner environment, which could boost local support for the shift.
Technological factors	Carbon Capture and Storage (CCS): Given Silesia’s dependence on coal, CCS technology could provide a temporary solution by reducing emissions from existing coal plants, although this is a controversial and costly alternative to complete transition. Grid Modernization: Integrating renewable energy requires upgrading Poland’s grid infrastructure. Smart grid technology can improve reliability and accommodate renewable sources, although this is costly and requires technical expertise. Renewable Technology Development: Advancements in solar, wind, and battery storage technology make renewable energy more viable in Poland. Silesia’s landscape may support certain renewable technologies, like wind and geothermal, although solar and small-scale biomass could also be impactful.
Environmental factors	Air Quality Issues: Silesia has some of the worst air quality in Europe due to coal combustion. Transitioning to renewables could significantly improve air quality and reduce greenhouse gas emissions, benefiting public health and aligning EU environmental goals. Resource Availability: Renewable energy sources like wind, solar, and biomass are limited by geographic factors. Silesia’s coal resources are abundant but declining, making renewables an attractive alternative to avoid future energy shortages. Climate Change Pressures: Poland, like other EU countries, is facing pressures to reduce its carbon footprint. Transitioning to renewable energy is essential for the country to meet international climate commitments and reduce vulnerabilities to climate change.
Legal factors	EU Emissions Regulations: Poland is subject to strict EU emission standards, which penalize high carbon outputs. This adds financial pressure on coal-dependent regions like Silesia and incentivizes a shift to cleaner energy. Renewable Energy Incentives: EU policies and funding mechanisms support renewable energy investment, making it easier for Poland to finance the transition. Coal Phase-Out Timelines: The government’s coal phase-out timelines impact Silesia directly. Clear deadlines for coal reduction and closure of coal plants will drive local energy transition strategies and workforce planning.

Source: own study

- ◆ decentralization and empowerment of local governments – decision-making should empower regional and local governments to develop and implement localized energy transition strategies that reflect the unique needs of their communities.

For the successful energy transition political, economic, social, technological, environmental, and legal factors should be taken under consideration. As such the PESTEL analysis of the energy transition in Silesia should be performed (Table 2).

Conclusions

The energy transition in the Silesian coal region presents both significant challenges and transformative opportunities. As the region moves away from coal, it faces economic disruptions, job losses, and the need for large-scale social and infrastructural adjustments. The decline of the coal industry threatens the livelihoods of thousands of workers, not only in mining but also in related sectors such as energy production, transportation, and heavy industry. Without well-planned alternative employment opportunities, this transition could lead to long-term economic stagnation, increasing poverty rates and social inequalities. Beyond economic concerns, the transition introduces substantial territorial stress as the region's identity, social structure, and economy have historically been built around coal mining. The shift away from this long-standing economic foundation risks creating divisions within communities, where resistance to change may emerge due to a deep-rooted cultural attachment to coal.

Additionally, energy poverty poses a serious risk, as modernization efforts and infrastructure investments could lead to higher energy prices, which would disproportionately affect low-income households and vulnerable populations. Another critical challenge is the environmental remediation required to repurpose former mining sites. Many of these areas suffer from extensive land degradation, groundwater contamination, and air pollution, necessitating significant financial resources and long-term efforts to restore them for new economic activities. The transition also highlights the issue of skills mismatches, as many coal industry workers lack the qualifications needed for jobs in renewable energy and other emerging industries. Without comprehensive retraining and upskilling programs, a large portion of the workforce could face long-term unemployment and social exclusion.

Despite these challenges, the energy transition opens numerous opportunities for economic diversification, innovation, and sustainable development. Shifting away from coal allows the region to invest in new industries, such as renewable energy, green manufacturing, and digital technologies, fostering a more resilient and future-oriented economy. The development of solar and wind energy infrastructure, along with advancements in energy storage and efficiency technologies, has the potential to create thousands of new jobs, particularly when supported by EU initiatives such as the Just Transition Fund.

Furthermore, the transition provides an opportunity to promote social equity and reduce poverty by ensuring that disadvantaged groups, including former coal workers, the long-term unemployed, and marginalized communities, have access to new economic opportunities.

Targeted support measures, including retraining programs, financial assistance, and incentives for local businesses, can help bridge economic disparities and create a more inclusive workforce. Improved air quality and reduced pollution will also yield significant public health benefits, decreasing respiratory illnesses and enhancing the overall quality of life in the region. The environmental restoration of former mining sites presents another major opportunity. Repurposing these areas for green infrastructure, renewable energy projects, and recreational spaces can not only mitigate past environmental damage but also enhance the region's appeal for investment and tourism. Sustainable urban planning and the promotion of eco-friendly industries can further drive economic revitalization while preserving the region's environmental integrity.

Crucially, the success of this transition depends on the effective implementation of national and regional policies, including Poland's Energy Policy 2040 and the Silesian Territorial Just Transition Plan. These strategies must prioritize vulnerable communities, ensuring that financial support, job training programs, and economic development initiatives reach those most affected by the decline of the coal industry. Transparent governance, strong institutional frameworks, and active engagement with local stakeholders – including trade unions, businesses, and civil society organizations – will be essential in shaping a transition that is both just and sustainable. Beyond the local context, Silesia's energy transition aligns with broader global climate initiatives and the European Union's commitment to achieving carbon neutrality. By reducing its reliance on coal, the region can position itself as a leader in sustainable energy and contribute to international efforts in combating climate change. Enhanced energy security, through the diversification of energy sources, will also reduce dependence on fossil fuel imports and protect the region from price volatility and supply disruptions.

Ultimately, the energy transformation in Silesia is more than just a shift in energy sources – it is a profound socio-economic transformation that requires an inclusive and well-coordinated approach. Moving beyond fossil fuels must be accompanied by comprehensive measures that support workers, protect vulnerable populations, and promote sustainable economic growth. When managed effectively, this transition presents an opportunity not only to reduce greenhouse gas emissions and mitigate climate change but also to foster long-term regional prosperity, reduce social inequalities, and build a cleaner, more sustainable future for generations to come. A successful transition requires a multi-stakeholder approach, with governments, businesses, educational institutions, and local communities working together to ensure that the benefits are widely shared and that no one is left behind. By embracing innovation, investing in human capital, and leveraging available policy and financial support, the Silesian coal region can emerge from this transition as a model for sustainable development and economic resilience.

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REFERENCES

- Burchardt et al. 2002 – Burchardt, T., Le Grand, J. and Piachaud, D. 2002. Degrees of Exclusion: Developing a Dynamic, Multidimensional Measure. [In:] Hills, J., Le Grand, J. and Piachaud, D. (eds.) *Understanding Social Exclusion*. Oxford: Oxford University Press, pp. 30–43.
- Central Statistical Office of Poland 2022 – *Energy Statistics*. [Online:] <https://stat.gov.pl/en/> [Accessed: 2024-09-13].
- Cappellano et al. 2023 – Cappellano, F., Kurowska-Pysz, J. and Ciszewska, K. 2023. Energy transition and knowledge flows in the border region of Silesia. [In:] *Networks, Markets & People*. pp. 20–29, DOI: 10.1007/978-3-031-74704-5_3.
- European Commission 2021 – *Platform for Coal Regions in Transition: Silesian Voivodeship's Regional Team Initiatives*. [Online:] https://ec.europa.eu/energy/topics/oil-gas-and-coal/coal-regions-transition_en [Accessed: 2024-11-15].
- European Council on Foreign Relations (ECFR) 2023 – *From Coal to Consensus: Poland's Energy Transition and its European Future*.
- Euracoal 2022 – *Country Profiles: Poland*. [Online:] <https://euracoal.eu/info/country-profiles/poland-8/> [Accessed: 2024-11-04].
- Gawor, L. 2006. The idea of sustainable development as a project for a new universal civilization (*Idea zrównoważonego rozwoju jako projekt nowej ogólnoludzkiej cywilizacji*). *Diametros* 9, pp. 84–104 (in Polish).
- Government of Poland 2015 – *Act on Renewable Energy Sources (RES Act)*. Dz.U. 2015 poz. 478. [Online:] https://climate-laws.org/document/act-on-renewable-energy-sources-res-act-dz-u-2015-poz-478_5b4d [Accessed: 2024-11-05].
- Government of Poland 2019 – *National Energy and Climate Plan for 2021-2030 (NECP)*. Ministry of State Assets, Poland. [Online:] <https://energy.ec.europa.eu> [Accessed: 2024-11-02].
- International Energy Agency 2021 – *Energy transition*. [Online:] <https://www.iea.org/topics/energy-transition> [Accessed: 2024-09-13].
- International Trade Administration 2022 – *Poland – Energy Sector*. [Online:] <https://www.trade.gov/country-commercial-guides/poland-energy-sector> [Accessed: 2024-11-05].
- Iwińska, K. and Bukowska, X. 2021. *Gender and Energy Transition: Ecofeminist Studies in Coal-mining Regions*. Cham: Springer.
- Kowalik et al. 2024 – Kowalik, W., Hubert, W., Pełowska, M., Kryzia, D., Gawlik, L. and Komorowska, A. 2024. Socio-cultural challenges of coal regions and their transformative capacities – a case study of Silesia. *Gospodarka Surowcami Mineralnymi – Mineral Resources Management* 40(1), pp. 167–186, DOI: 10.24425/gsm.2024.149304.
- Luty, M. 2022. Renewable Energy Potential and Economic Implications for Poland's Energy Transition. *Polish Journal of Environmental Studies* 31(2), pp. 1123–1135.
- Marshal's Office of the Silesian Voivodeship 2021 – *Territorial Just Transition Plan of Silesian Voivodeship by 2030*. [Online:] https://transformacja.slaskie.pl/images/Dokumenty/1683275795_sfc_tjtp_eng.pdf [Accessed: 2024-11-09].
- Marshal's Office of the Silesian Voivodeship 2022 – *European Funds for Silesia 2021-2027: Public Consultations and Environmental Assessments*. [Online:] <https://rpo.slaskie.pl/file/download/9668> [Accessed: 2024-09-02].
- Ministry of Climate and Environment 2021 – *Energy Policy of Poland until 2040 (PEP2040) (Polityka energetyczna Polski do 2040 roku)* Warsaw: Ministry of Climate and Environment (in Polish).
- Ministry of Climate and Environment, Republic of Poland 2019 – *National Energy and Climate Plan for the years 2021–2030*. Warsaw: Ministry of Climate and Environment. [Online:] <https://www.gov.pl/web/climate/national-energy-and-climate-plan> [Accessed: 2025-02-25] (in Polish).
- Pełowska, M. 2024. Energy transformation of the Silesia coal region – challenges and coping strategies. *Gospodarka Surowcami Mineralnymi – Mineral Resources Management* 40(3), pp. 169–183, DOI: 10.24425/gsm.2024.151533.
- Pietrzak et al. 2021 – Pietrzak, M.B., Igliński, B., Kujawski, W. and Iwański, P. 2021. Energy transition in Poland – assessment of the renewable energy sector. *Energies* 14(8), DOI: 10.3390/en14082046.

- Resources for the Future (RFF) 2022 – *Just Transition in Poland: A Review of Public Policies to Assist Polish Coal Communities in Transition*. [Online:] <https://www.rff.org/publications/reports/just-transition-in-poland> [Accessed: 2025-02-25].
- Silver, H. 1994. Social Exclusion and Social Solidarity: Three Paradigms. *International Labour Review* 133(5–6), pp. 531–578.
- Silesian Regional Assembly 2020 – *Resolution No. VI/24/1/2020: Silesia 2030 – Green Silesia Strategy*. Katowice: Silesian Regional Assembly.
- Silesian Voivodeship 2019 – *Technology Development Program of the Silesian Voivodeship for 2019–2030*. [Online:] <https://ris.slaskie.pl/file/download/1848> [Accessed: 2024-11-10].
- Silesian Voivodeship 2020 – *Strategy for the Development of the Silesian Voivodeship “Silesia 2030” – Green Silesia*. [Online:] https://bip.slaskie.pl/wojewodztwo/programy_plany_i_strategie_wojewodztwa/strategia_rozwoju/strategia-rozwoju-wojewodztwa.html [Accessed: 2024-11-09].
- Silesian Voivodeship 2022 – *Territorial Just Transition Plan of Silesian Voivodeship by 2030*. [Online:] https://transformacja.slaskie.pl/images/Dokumenty/1671795836_projekt_terytorialny_.2022%20-%20Copy%20.pdf [Accessed: 2024-11-05].
- Silesian Voivodeship Board 2021 – *Resolution No. 1463/241/VI/2021 of June 15, 2021, on the Adoption and Public Consultation of the Territorial Plan for Just Transition of the Silesian Voivodeship 2030 (v.02)*. [Online:] https://bip.slaskie.pl/samorzad_wojewodztwa/zarzad_wojewodztwa/uchwaly_zarzadu/uchwala-zarzadu-nr-1463-241-vi-2021-z-dnia-2021-06-15.html [Accessed: 2024-11-19].
- Stala-Szlugaj, K. 2019. Analysis on a regional basis of trends in hard coal prices for Polish households. *Polityka Energetyczna – Energy Policy Journal* 22(3), pp. 57–70, DOI: 10.33223/epj/112086.
- Szarfenberg, R. 2008. *Critique and affirmation of social policy (Krytyka i afirmacja polityki społecznej)*. Warszawa: IFiS PAN (in Polish).
- Tsoukas, H. and Chia, R. 2002. On organizational becoming: Rethinking organizational change. *Organization Science* 13(5), pp. 567–582, DOI: 10.1287/orsc.13.5.567.7810.
- United Nations Framework Convention on Climate Change (n.d.) *What is climate change?* [Online:] <https://unfccc.int/what-is-climate-change> [Accessed: 2024-09-13].
- World Bank 2005 – *Restructuring Poland's coal mining sector*. Washington, D.C.: The World Bank.
- World Bank 2021 – *Towards a Just Coal Transition: Labor Market Challenges and People's Perspectives from Silesia*. Publisher. [Online:] <https://documents1.worldbank.org/curated/en/099721210062220918/pdf/IDU0766a573c0e7bd040930a81b095ae2377689f.pdf> [Accessed: 2024-09-13].
- Żuk et al. 2021 – Żuk, P., Żuk, P. and Pluciński, P. 2021. Coal basin in Upper Silesia and energy transition in Poland in the context of pandemic: The socio-political diversity of preferences in energy and environmental policy. *Resources Policy* 71, DOI: 10.1016/j.resourpol.2021.101987.

ENERGY TRANSFORMATION OF THE SILESIA COAL REGION IN THE CONTEXT OF DEFAVORIZATION

Keywords

energy transformation, just transition, defavorization, mining regions

Abstract

Disadvantaged groups refer to individuals or social communities that are in unfavorable social, economic, or educational circumstances, making them particularly vulnerable to social exclusion. These groups gain significant importance in the context of the energy transition, which is one of the

most pressing challenges of the Anthropocene era. The urgency to transform our energy systems has never been greater. The energy transition, defined as the shift to clean, sustainable energy sources, offers the promise not only of mitigating the impacts of climate change but also of reducing poverty and enhancing social equity. However, the energy transition requires a holistic approach that considers the intricate interconnections between social, political, and environmental factors, especially in terms of its consequences. These consequences will be particularly pronounced in coal-dependent regions, where both industry and social life have historically revolved around coal mining. Moving away from coal extraction and exploitation in post-mining regions will lead to profound changes in the labor market, potentially causing what is termed “territorial stress,” resulting from deep economic and social transformations. In this context, the principles of a Just Transition emphasize the need to prioritize disadvantaged groups, who are likely to be most affected by the energy transition. This article aims to analyze the opportunities and challenges that the energy transition presents for disadvantaged groups in Silesian Coal Region.

TRANSFORMACJA ENERGETYCZNA ŚLĄSKIEGO REGIONU WĘGLOWEGO W KONTEKŚCIE DEFAWORYZACJI

Słowa kluczowe

transformacja energetyczna, sprawiedliwa transformacja, defaworyzacja, regiony górnicze

Streszczenie

Defaworyzacja odnosi się do sytuacji, w której jednostki lub grupy społeczne są w niekorzystnej pozycji w porównaniu z innymi w sferze społecznej, ekonomicznej lub edukacyjnej. Tym samym grupy defaworyzowane zagrożone są wykluczeniem społecznym. Stają się one szczególnie istotne w kontekście transformacji energetycznej, która stanowi jedno z najważniejszych wyzwań epoki antropocenu. Jak się wydaje, potrzeba transformacji naszych systemów energetycznych nigdy nie była bardziej nagląca. Transformacja energetyczna, która rozumiana jest jako przejście na czyste, zrównoważone źródła energii, niesie za sobą obietnicę nie tylko złagodzenia skutków zmian klimatycznych, lecz także złagodzenia ubóstwa i zwiększenia równości społecznej. Transformacja energetyczna oznacza jednocześnie konieczność podejścia holistycznego i zrozumienia wzajemnych interrelacji między łańcem społecznym, politycznym a kwestiami środowiskowymi, szczególnie w aspekcie jej konsekwencji. Te bowiem będą szczególnie odczuwalne w regionach kotwicy węglowej, gdzie zarówno przemysł, jak i życie społeczne od wieków tradycyjnie oparte były o wydobywanie węgla. Odejście od wydobywania i eksploatacji węgla w regionach post-górnich wiązać się będzie z głębokimi przeobrażeniami na rynku pracy, co implikować może tak zwany „stres terytorialny”, wynikający z głębokich przeobrażeń zarówno w sferze ekonomicznej, jak i społecznej. Tym samym, zgodnie z założeniami Just Transition, szczególną troską powinny zostać objęte grupy defaworyzowane, które w największym stopniu narażone będą na konsekwencje transformacji energetycznej. Celem artykułu jest analiza szans i zagrożeń wynikających z transformacji energetycznej dla grup defaworyzowanych w Śląskim Regionie Węglowym.