

STRATEGIC PLANNING AND PRINCIPLES OF INCLUSIVE JUST TRANSITION AND THE ECONOMIC TRANSFORMATION OF THE SILESIAN VOIVODESHIP

Sylwia JAROSŁAWSKA-SOBÓR¹, Ryszard MARSZOWSKI^{2*}, Piotr HETMAŃCZYK³

¹ Central Mining Institute National Research Institute Katowice; sjaroislawska@gig.eu,
ORCID: 0000-0003-0920-6518

² Central Mining Institute National Research Institute Katowice; rmarszowski@gig.eu,
ORCID: 0000-0002-2855-7121

³ Central Mining Institute National Research Institute Katowice; phetmanczyk@gig.eu,
ORCID: 0000-0001-8816-6037

*Correspondence author

Purpose: The article discusses the results of the SWOT analysis, which concerns the results of research conducted by the Central Mining Institute (GIG-PIB) and the Miners' Union of the Republic of Poland (ZZG), and relating to the transformation process¹.

Methodology: The SWOT analysis was based on the results of qualitative and quantitative research conducted as part of the project by GIG-PIB and ZZG. The qualitative research tools were: desk research, group interviews and in-depth interviews.

Findings: the research indicates that one of the key elements supporting the transformation process is investing in education and training. This research also shows that it is to provide financial support and social dialogue, which enables the involvement of various stakeholders in the transformation process.

Research limitations/implications: the scope of data used in the SWOT analysis may not include all identifiable strengths and weaknesses of the Silesian Voivodship, but only those that appeared in the responses of the respondents to the aforementioned study.

Practical implications: the SWOT analysis indicates that in the case of transformation, there is a need for a long-term, planned transition to a new model of economic development. However, the level of preparedness of enterprises, especially those related to mining, is still too low, especially from a financial perspective.

Social implications: in the social dimension, the main problem in the transformation is the threat resulting from the possibility of losing jobs and the related possibility of increasing unemployment and social exclusion in the region.

Originality: the economic transformation of the Silesian Voivodship is a huge challenge, but also an opportunity for the development and modernization of the region. The SWOT analysis identifies key strengths and weaknesses, opportunities and threats related to the

¹ This article presents the results of the qualitative research conducted by the Central Mining Institute – National Research Institute as an input to the Regional Observatory of the Transformation Process (ROPT) project, co-financed by the European Union through the Just Transition Fund.

decarbonization process. Social research emphasizes the need to invest in education, retraining and social dialogue in order to ensure a fair and effective transformation.

Keywords: just transition, coal dependent region, coal phase-out, economic changes.

Category of the paper: research paper.

1. Introduction

The concept of Just Transition is closely related to the long-term process of decarbonization and moving away from coal, which is the basis of the European Union's climate policy. The concept of a Just Transition has gained significant traction in recent years, especially within the European Union as it strives to address climate change and shift towards sustainable development.

The impulse to think about a just and energy transition is the environmental pressure that has been growing for decades, expressed in international declarations and political documents related to, among others, the 2030 Agenda (United Nations, 2015) the Paris Agreements (United Nations Climate Change, 2015) or the European Green Deal. The European Green Deal, adopted in 2019 (European Commission, 2019), incorporates the Just Transition Mechanism, which aims to provide financial support and technical assistance to regions heavily dependent on fossil fuels. The mechanism is designed to mitigate the social and economic impacts of the transition toward the declaration "...no one left behind" (Timmermans, 2021).

The concept of a Just Transition is crucial for ensuring that the shift towards a low-carbon economy is equitable and inclusive. The United Nations Framework Convention on Climate Change has consistently emphasized the importance of Just Transition in its annual climate conferences (COPs). The 2018 "Solidarity and Just Transition Silesia Declaration" adopted at COP24 in Katowice, Poland, called for a transition that respects the rights of workers and promotes social justice (UNFCCC, 2018).

As countries and regions worldwide adopt policies to tackle climate change, it is essential to incorporate Just Transition principles to protect workers and communities affected by these changes. Literature and case studies highlight the importance of economic diversification and social dialogue, (Kapetaki, Ruiz, 2020; Kimimbi, 2023), skills development (European Commission, 2020; Promea, 2021; Bianchi et al., 2022), social protection, and environmental sustainability in achieving a Just Transition (Fankhauser et al., 2008; Caldecott, 2017; Stanley et al., 2018; Casano, 2019). By prioritizing these principles, policymakers can help ensure that the benefits of the green economy are shared broadly, fostering a more just and sustainable future (Nowakowska et al., 2021). Within the EU context, a Just Transition encompasses both the creation of decent work opportunities and the protection of workers' rights, particularly those in industries directly affected by decarbonization efforts (ILO, 2015; ETUI, 2020).

A Just Transition involves several key principles, one of them being economic diversification and resilience, supported by promoting economic policies that foster diversification and resilience in affected regions and create new opportunities for sustainable employment. A just transition should also refer to the creation of new development pathways in coal regions or in areas dependent on traditional industries. From this perspective, far-reaching structural reform is needed if these places are to continue to act as growth hubs (Drobniak, 2022).

Closing mines is a process that always arouses a lot of emotions and controversy. On the one hand, it aims environmental protection, but on the other hand, it can lead to serious economic and social consequences. The Just Transition of the mining industry is a process of change aimed at reducing the negative effects of the extraction of raw materials on the environment and human health, but introducing changes always carries certain risks. They may be particularly important in areas such as the outflow of employees from the region, decrease in the income of mining-related enterprises, decrease in the income of residents and deepening of areas of social exclusion. However, a change in industrial structure can also open up new growth opportunities and stimulate investment in new technologies, such as renewable energy or digital technologies, which can attract investors and create new jobs.

2. Regional context of the Silesian Voivodship

Poland, as EU member states aim to reduce carbon emissions and adopt greener practices, the principle of a Just Transition emphasizes the importance of ensuring that these changes are equitable and inclusive, protecting the livelihoods of workers and communities affected by the transition. Poland's Silesian region, heavily dependent on coal mining, has been a focal point for EU Just Transition funding. The region has received significant support to develop renewable energy projects, retraining programs, and economic diversification initiatives (European Commission, 2020). Toward the long-term goal of climate neutrality adopted by the European Union by 2050, the Silesian Voivodship is facing a huge challenge to carry out a just transition that will require changes at the social, economic and environmental levels (Ślimko, 2019).

The Silesian Voivodship is located in the southern part of Poland and is in second place in terms of the number of inhabitants. The region is inhabited by 4346.7 thousand inhabitants, which is 11.5% of the country's population. The Silesian Voivodship is the most industrialized region in Poland and one of the most industrialized areas in Europe. It is characterized by the largest employment in the country, which amounts to 11.5 per cent of the national employment in the national economy. The value of the GDP of the Silesian Voivodship is PLN 313,592 million, which means that the Silesian Voivodship ranks 4th in terms of the amount of PK

per 1 inhabitant. The economy of the province is dominated by the following industries: coal in Silesian mines producing 90.2% of the sold production of hard coal mining in Poland) and metallurgy, as well as the electromechanical, metal, chemical and food industries (GUS, 2023).

The Silesian Voivodship is also the most coal-dependent region in the European Union. 22 of 25 operating coal mines are placed here. Since the beginning of the 90s of the twentieth century, coal production in Poland has decreased by half (from almost 150 million tons to about 73 million tons), and employment in the mining sector has decreased fourfold) between 1990 and 2015 from about 388 thousand to about 98 thousand), but the Silesian Voivodship is still recorded by the largest number of employees in the mining industry (Terytorialny Plan..., 2022). The number of mining-related enterprises varies depending on the sources from about 370 to over 900, and they create from 110 to 130 thousand stable jobs (Górnictwo Chamber..., 2020). It is estimated that as a result of the green transformation, about 36 thousand jobs will be lost in the mining and mining-related sectors in the Silesian Voivodship by 2030. In total, in this process, the scale of job losses will affect about 145 thousand people. The economic transformation of the Silesian Voivodship is in line with the assumptions of the Territorial Just Transition Plan of the Silesian Voivodship 2030 (TPST 2022) and other regional strategies, such as the Development Strategy of the Silesian Voivodship "Śląskie 2030 - Zielone Śląskie" (Marshal's Office of the Silesian..., 2020). The Territorial Just Transition Plan of the Silesian Voivodship 2030 is a key operational action plan in the area of transformation. The Plan emphasizes the need to change the generation structure and develop the energy sector in the region, as well as supporting the labor market. Mitigating the social, economic and environmental impacts of the transition towards climate neutrality is the most important objective of the Plan. The implementation of the Plan TPST provisions are to be ensured by a dedicated source of financing included in the European Funds for Silesia 2021-2027 and other sources of financing.

Despite the detailed framework provided by the Territorial Just Transition Plan (TPST 2030) and access to resources such as the Just Transition Fund, implementation progress has been uneven. Local actors have raised concerns about bureaucratic delays, insufficient coordination between local and national levels and the under-utilisation of allocated EU funds. Monitoring reports also indicate that while planning is advanced, the actual disbursement of investments and support measures on the ground lag behind. These observations suggest a gap between political ambition and the capacity to deliver, which requires improved governance mechanisms and stakeholder alignment. A comparative perspective of EU coal regions

Compared to other EU coal regions in transition – such as North Rhine-Westphalia in Germany or Western Macedonia in Greece – the Silesian Voivodeship shows both strengths and areas lagging behind. Unlike Germany, which has built strong innovation ecosystems and early investments in renewable energy, Silesia still demonstrates a strong economic dependence on mining. However, the region benefits from a stronger industrial infrastructure than some other regions, offering latent transformation opportunities. Lessons from more advanced

transformations in Germany and Spain suggest the need for earlier diversification strategies, more active engagement of SMEs and stronger regional innovation policies.

3. Methodology

In 2022-2023, the Marshal's Office of the Silesian Voivodship together with its partners: the Central Mining Institute – National Research Institute (GIG-PIB), the Mining Chamber of Industry and Commerce and the Trade Union of Miners in Poland (ZZG) implemented a project entitled the Regional Observatory of the Transformation Process (ROPT), co-financed by the European Union under the European Regional Development Fund. As part of the project, GIG-NRI developed a Strategic Balance for the priorities of just transition in the Silesian Voivodship, which is a summary of the results of social research by GIG-NRI and ZZG. The research concerned 8 thematic areas:

I. Research areas carried out by the ZZG:

1. Expectations of employees of mines and mining-related companies regarding the outplacement offer in connection with the planned decarbonization.
2. Vision and plans of the main stakeholders in the face of the challenges of decarbonization of the region.
3. The role of trade union leaders in the process of changes determined by the transformation of the Polish mining industry.
4. Attitudes of employees of mines and mining-related companies towards changes in their activity and professional career.

II. Research areas carried out by GIG-NRI:

5. Anticipating future skills and the intrinsic potential of entrepreneurs.
6. The impact of the closure of coal mines on the local environment, entrepreneurs, the labor market, among others.
7. Involving stakeholders in social dialogue in the process of closing a mining plant to reduce the possibility of social conflicts.
8. Predicting and mitigating the possibility of negative social effects related to the process of mine closures and protecting employees from dismissal.

The research carried out as part of the ROPT project covered the following groups of stakeholders in the transformation process: employees of mining and mining-related plants, entrepreneurs and employers, leaders of trade unions in the mining sector, representatives of local governments and their organizational units, representatives of employers' organizations, employees, economic self-governments, business environment institutions and representatives of non-governmental organizations. The tool used to develop the Strategic Balance was a SWOT analysis in three areas: economic, social and environmental, in line with the TPST areas.

The SWOT methodology, which stands for Strengths, Weaknesses, Opportunities and Threats, is a strategic planning tool used to identify and analyze the internal and external factors that can impact the success of a project, organization, or business venture (Minsky, Aron, 2021). The SWOT analysis is distinguished primarily by its versatility and simplicity, which helps in the assessment of the analyzed factors and allows for a more complete understanding of its situation in the environment, in this case in the socio-economic environment. Therefore, SWOT analysis is very often the basis for the strategic planning process and is a valuable tool that allows you to better understand the environment and make informed strategic decisions (David, 2011; Tomski, 2017).

This article discusses the results of the SWOT analysis, which concerns the results of research carried out by the Central Mining Institute and ZZG and relating to the area of economy. The SWOT analysis was based on the results of qualitative and quantitative research carried out as part of the project by the GIG-PIB and the Trade Union of Miners in Poland. Qualitative research tools included: desk research analyses, focus group interviews (FGI) and in-depth interviews (IDI). Qualitative research was carried out in the form of quantitative research (CAWI). The scope of data that was used in the SWOT analysis may not take into account all identifiable strengths and weaknesses of the Silesian Voivodship, but only those that appeared in the responses of the respondents to the above-mentioned survey.

4. SWOT analysis

Research conducted by GIG and ZZG indicates that one of the key elements supporting the economic transformation process is investment in education and training, which enable the retraining of coal sector employees for new professions, especially in new, developing sectors such as the green economy. These studies also show that it is to provide financial support and social dialogue important that allows the involvement of various stakeholders in the process of economic transformation of the region. Table 1 presents the SWOT analysis of the Silesian Voivodship, based on the results of the ROPT project, about economic transformation (Jarosławska-Sobór et al., 2023).

Table 1.
SWOT analysis

Strengths	Weaknesses
A lower sense of risk of losing their jobs by employees of mining companies due to the adopted social contract for hard coal mining.	Poor financial condition of some enterprises, especially mining-related ones.
Acceptance of the process of diversification of business activity and no fear of entrepreneurs in the non-mining industry related to the need to reorganize the company and change its business profile.	Insufficient financial support for small businesses.
	Lack of alternative high-quality jobs (level of salaries, benefits, durability of employment, social prestige) in the mining sector.

A large number of enterprises in the region. Locating large, well-known companies in the region, generates new jobs and increases the level of competitiveness. There is a high demand for construction companies that can take over employees of mining plants. Qualified staff (workers, management) in the Silesian Voivodship. Good transport infrastructure strengthens the mobility of workers and creates an incentive effect for investors. Knowledge and experience of instruments motivating and demotivating employees to take up employment from the period of restructuring of the mining sector in the 1990s. Financial support and development programs in the field of transformation for entrepreneurs and employees. Taking actions in mining-related companies aimed at mitigating the negative effects of the transformation in the form of rebranding operations and improving the competencies of employees. Increase in innovation of non-mining companies. Development of the ecological services sector. The ability to work in difficult conditions is characteristic of employees of mining and mining-related companies. Loyalty and commitment of employees in the mining sector, the Silesian work ethos. Low number of unemployed in the Silesian Voivodship. Improving the image of companies and the region related to the energy transition. Access to global markets for entrepreneurs in the Silesian Voivodship, resulting from the development of technology. Increased social awareness of customers/consumers and increased demand for green services and technologies which are the driving forces behind companies' innovation. Innovation and research as new opportunities for the development of entrepreneurship.	Instability of working conditions and wages, especially in private companies. The problem with the recruitment of qualified employees is a significant limitation for the development of non-mining enterprises. A decrease in the revenues of local governments of mining municipalities and impoverishment of mining regions, resulting in lower quality of social services and an adverse impact on local communities. Poor entrepreneurial activity of the inhabitants of mining regions. Lack of prepared investment areas. Financial and administrative difficulties in the implementation of projects related to renewable energy sources. The complexity of the energy and socio-economic transformation process requires multidirectional actions. Time-consuming activities spread over decades of the energy transition process. High costs of energy and socio-economic transition causing an economic slowdown. A high degree of dependence of mining-related companies on mines due to the focus on providing services to coal mines which is a serious obstacle to the possibility of changing the business profile.
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Acceleration of technological progress in the Silesian Voivodship, related, among others, to the adoption of the Development Strategy of the Silesian Voivodship "Śląskie 2030". Green Silesia.	
Opportunities	Threats
Greater involvement of entrepreneurs in the transformation process as entities that know the local market best. A high degree of involvement of the regional government in providing support for transformation projects is recognized by mutual trust and direct contact. Support for non-mining entrepreneurs in the form of financial instruments intended for changing the business profile, introducing new technology, and refinancing the employment of employees. Non-financial support to train workers and stimulating the market through public works procurement. Development of vocational and vocational education addressed to both young people and adults. Re-skilling programs and professional development support. Energy efficiency and energy efficiency, meaning the development of the renewable energy sector. The development of new sectors of the economy brings new markets and export opportunities. Innovative technologies and solutions that affect the development of entrepreneurship in society. Financial support and subsidies for entrepreneurs. Investments in infrastructure, including post-mining infrastructure.	A need for long-term planning of adaptation measures, even before the final closure of the mining plant. Problems related to finding alternatives to mining, especially in the context of creating new jobs and retraining employees. Increase in the number of unemployed people. Concerns about the future of the workplace that demotivate and reduce productivity. There is no system of institutional assistance at the government level, addressed to mining-related companies. Regulations on granting state aid limit the possibilities of aid addressed to mining-related companies. Low involvement, results from the lack of an incentive system and a low sense of the need for entrepreneurs to be involved in the transformation process. The problem with maintaining the level of salaries of employees moving from large mining and mining-related companies to the SME sector. Lack of availability of energy at prices whose level will not adversely affect the possibility of development and competitiveness of the Polish economy. High financial and social costs of the green transition. The collapse of companies dependent on mining. Decrease in tax revenues in mining municipalities. Uncertainty related to political decisions and legal regulations. Social and political resistance to transformational changes.

Source: GIG-PIB own research.

In summary, the SWOT analysis provides a comprehensive understanding of the internal opportunities and external conditions shaping the economic transformation of the Silesian Voivodeship. The combination of a strong industrial infrastructure, a strong workforce and EU financial mechanisms creates a unique opportunity for growth. However, challenges such as over-reliance on coal and social resistance to change require coordinated strategies and

targeted investments. These results underline the critical role of proactive planning, education and stakeholder engagement in ensuring a successful and just transition.

5. Key conclusions and recommendations resulting from the SWOT analysis

Research conducted by GIG and ZZG indicates that one of the key elements supporting the economic transformation process is investing in education and training, which enable the retraining of coal sector employees for new professions in the green economy sector. These studies also show that it is important to provide financial support and social dialogue, which enables the involvement of various stakeholders in the transformation process. The SWOT analysis indicates that in the case of the transformation of mining regions, there is a need for a long-term, planned transition to a new model of economic development. However, the degree of preparation of enterprises, especially those related to mining, is still too low, especially from a financial perspective. The analysis of the degree of preparation of key staff to carry out restructuring processes is also insufficient. The key conclusions resulting from the SWOT analysis are presented below.

6. Conclusions

1. Key strengths are:

- Well-developed industrial infrastructure. The Silesian Voivodship has a well-developed industrial infrastructure, which provides a solid basis for businesses transforming into greener enterprises.
- Skilled workforce. The region has a highly skilled workforce, particularly in the mining and industrial sectors, which enables the retraining of workers for new green economy professions.
- Financial support from the European Union: Access to EU funds, such as the Just Transition Fund, supports coal regions in the transition process, enabling the financing of investments in new technologies and sectors of the economy.

2. Key weaknesses are:

- Strong dependence on the coal industry. The economy of the Silesian Voivodship is heavily dependent on the coal industry, which hinders a quick and effective transition.

- Social and economic problems. The closure of mines and mining-related companies carries the risk of increased unemployment and social exclusion, which may lead to economic destabilization of the region.
- Insufficient infrastructure for new sectors. Existing infrastructure is not fully adapted to the needs of new technologies and low-emission economy sectors, requiring additional investment.

3. Key opportunities are:

- Development of the renewable energy sector. Investments in renewable energy, such as wind, solar or geothermal, can create new jobs and reduce greenhouse gas emissions.
- Increase in innovation. Promoting technological innovation and supporting research and development can contribute to the diversification of the region's economy and increase its competitiveness in the international market.
- Education and training programs. Introduction of education and training programs enabling the retraining of employees from the coal sector for new professions in the green economy sector.

4. Key threats are:

- Social resistance to change. Social opposition to the closure of mines and the transformation of the economy may slow down the transformation process and increase social tensions.
- Potential economic losses. The closure of the coal industry may lead to significant economic losses and difficulties in attracting new investments.
- Lack of a coherent support policy. Insufficient policy support and a lack of a long-term strategy can lead to inefficiencies and delays in achieving the transformation goals.

The proposed recommendations highlight the basic strategies for implementing a just transition in Silesia. They emphasize the importance of aligning education, innovation, infrastructure and policy to mitigate the socio-economic risks associated with coal phase-out. These guidelines aim to support regional authorities, policymakers, trade unions and business leaders in organizing a coherent and resilient transition framework.

7. Recommendations

Based on the SWOT analysis and the conclusions drawn from it, key recommendations for supporting the Just Transition process have been developed, which are presented in table 2.

Table 2.
SWOT analysis recommendations

	Recommendation	Characteristic
1.	Increasing investment in education and training.	Extensive training programs need to be put in place to enable coal workers to be retrained for new jobs in the green economy. Education and training are key to ensuring the competitiveness of the region's economy and reducing the risk of unemployment and social exclusion.
2.	Long-term planning of adaptation activities.	It is necessary to carry out such activities even before the final closure of the mining plant. The plans should concern specific actions, primarily in the areas of employment requalification and change in the use of infrastructure and mining land located in a given mining municipality, taking into account social participation, along with determining the possibility of financing the necessary changes.
3.	Development of infrastructure supporting new technologies.	Investments in technological and industrial infrastructure are essential to attract new investments and support the development of innovative sectors of the economy. Modernization of existing infrastructure and the construction of new technological facilities can contribute to the creation of new jobs and increase the competitiveness of the region.
4.	Promoting renewable energy.	Investments in renewable energy sources, such as wind, solar and geothermal, can help reduce greenhouse gas emissions and create new jobs in the green economy. Promoting renewable energy can also increase the region's energy security and reduce its dependence on fossil fuels.
5.	Fostering technological innovation.	Promoting technological innovation and supporting research and development are key to diversifying the region's economy and increasing its competitiveness. Investments in new technologies and support for entrepreneurship can contribute to the creation of new jobs and increase the attractiveness of the region for investors. It is important to increase the attractiveness of the Silesian Voivodship for investors who may be interested in the development of new technologies and industries in the region.
6.	Activation of entrepreneurs.	Tools should be introduced that would involve entrepreneurs to a greater extent and a strong emphasis should be placed on showing the opportunities offered by the transformation process. An example may be the creation of banks of ideas and new development opportunities for transformed areas, such as investing in new sectors and industries, in infrastructure, in the creation of new jobs, the use of local resources, including with the participation of local communities.
7.	Providing financial and political support.	Government must provide coherent and long-term financial and policy support for the economic transition process. This support should include funds for investment in new technologies and education and training programs, as well as actions to foster social dialogue and partnerships between different stakeholders.
8.	Silver economy as a trigger for new economy.	The developing and increasingly important "silver economy" can be one of the alternatives to employing workers from declining sectors and at the same time an impulse for development in transformation.

Source: GIG-PIB own research.

8. Summary

Decarbonization energy transition involves a transition from an economy based on traditional fossil fuels to a sustainable, low-carbon and circular economy. Striving for a green transition of coal regions is an opportunity to build a more sustainable future. The key to success will be to coordinate efforts at all levels, from international organizations to national governments to local communities. Only then will it be possible to achieve the goals of Just Transition, environmental protection and creating better prospects for future generations.

One of the most important elements of Just Transition is the need to protect employees at risk of losing their jobs, but also the need to create an alternative development alternative for coal-dependent companies, for which the changes pose a threat of collapse and liquidation. Just transition is also an opportunity for the regions. The implemented just transition mechanisms are aimed at supporting activities for investments in renewable energy sources and the creation of new markets related to the green economy or sustainable transport.

The economic transformation of the Silesian Voivodship is a huge challenge, but also an opportunity for the development and modernization of the region. A SWOT analysis identifies key strengths, weaknesses, opportunities and threats related to the decarbonization process. Social research highlights the need to invest in education, retraining and social dialogue to ensure a just and effective transition.

The conducted research and analyzes show that in the aspect of planning and conducting transformation in the Silesian Voivodship, the priority should be to use the potential of the region itself, i.e. human capital and its qualifications, innovations, implementation of green energy, the potential of post-industrial areas and the development of tourist services using local environmental resources. It is necessary to develop new industries and enterprises that could use the resources and capabilities of the Silesian Voivodship, such as the chemical industry or tourism. This development is of great importance for stimulating the region's economy and increasing attractiveness for investors and thus will have an impact on improving competitiveness.

In the social dimension, the main issue is the threat resulting from the possibility of losing a job in connection with the liquidation of mines and mining-related companies and the related possibility of an increase in unemployment and social exclusion in the region. Transformation is a long-term process for which it is necessary to prepare and plan its course even before the final closure of the mining plant. It is necessary to support employees and local communities dependent on the mining industry by creating new jobs, eg in the sectors of renewable energy sources, energy efficiency and new technologies, employment in new positions (redeployment, re-skilling) or the use of effective social support instruments.

Importantly, the successful economic transformation of the Silesian Voivodeship can become a model for other coal regions worldwide, showing that decarbonization and regional development are not mutually exclusive. To fully leverage the lessons learned from this research, practical steps should include resource mobilisation through cross-sector partnerships, regional incentive schemes and targeted training programmes for future-proof professions. The findings presented here will support policymakers designing transition strategies, institutions managing EU and national funds, local governments driving structural reforms and businesses exploring opportunities in green growth sectors. SMEs and stronger regional innovation policies.

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