

## MAIN OBJECTIVES OF THE STRATEGY, AS WELL AS MOTIVATIONS FOR THE TRANSFORMATION OF HARD COAL MINING IN POLAND

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Your goal must be to get everything  
without destroying anything.  
*Sun Zi*

**Purpose:** in the cognitive space, the article focuses on the issue of dynamically growing social awareness of the impact of hard coal on climate change - which determines the need to implement a strategy to abandon this raw material. The authors of the article also point out that in connection with this process - as the world strives for sustainable and more ecological development - the transformation of the hard coal mining sector becomes an inevitable challenge.

**Methodology:** the theses presented in the article were verified using the following methods: literature review, critical analysis of literature, analysis and comparison of documents and an example of good practices.

**Resultat:** properly managing the transformation of the hard coal mining sector is key to ensuring that it delivers long-term social and economic benefits - while minimizing the negative impact of the transformation on mining communities and workers in the hard coal mining sector. Therefore, a holistic approach is important in this space, taking into account the ecological, economic, political and social context of transformation.

**Originality:** the transformation of mining is necessary due to the sustainable development goals, environmental protection and the fight against climate change. It is also a political challenge that requires well-thought-out investments, policies and regulations to minimize the negative socio-economic effects of the transformation and to use the development potential of the transformed areas in all their dimensions.

**Keywords:** mining, strategy, transforming.

## 1. Introduction

The global energy and ecological context has changed dramatically in recent years. As awareness of the impact of hard coal on climate change increases, more and more countries are seeking to develop and implement strategies to phase out this raw material. The strategies aim to reduce greenhouse gas emissions, protect the environment and resources, and energy diversification (Gawlikowska-Fyk, 2022). However, as the world strives for sustainable and more ecological development, the transformation of the hard coal mining sector becomes an inevitable challenge (Wojtkowska-Łodej, 2022). One of the key aspects of this process is the development of policies and regulations aimed at minimizing negative socio-economic effects, the most important of which are (Variantowe Ramy Transformation..., 2022):

- Losses in the number of jobs. The transition from traditional coal mining to other economic sectors may lead to job losses, which may pose important challenges for communities in mining areas.
- The need to retrain employees. Workers in coal mining and coal-related industries need to retrain to work in new sectors, requiring investment in education and training.
- Impact on regional economies. In some hard coal mining regions, the transition may have a serious impact on the economy in the mining areas, which may lead to social and political problems.
- Investment costs. Investments in new technologies and infrastructure can be expensive, posing a challenge for governments and businesses.
- Social and political issues. The transformation of the hard coal mining sector is often accompanied by protests and social tensions related to concerns about the work and existence of traditional mining communities.
- Social equality. There is a risk that some social groups in mining areas may suffer more than others during the transition, which may increase social inequalities.

Given this prospect, properly managing these challenges is key to ensuring that the transformation of the hard coal mining sector delivers long-term social and economic benefits - while minimizing its negative impact on mining communities and workers in the hard coal mining sector. Therefore, a holistic approach is important in this space, taking into account the ecological, economic, political and social aspects of the transformation of the hard coal mining sector.

## 2. Discussion

### 2.1. Main strategic goals

One of the main goals of the strategy to phase out hard coal is to reduce greenhouse gas emissions, especially carbon dioxide. Coal is one of the main sources of CO<sub>2</sub> emissions in the world. Switching to more sustainable energy sources, such as renewable energy, helps reduce the energy sector's impact on climate change. From this perspective, climate change is one of the most serious challenges facing humanity. Scientific evidence shows that the increase in global temperature is mainly the result of greenhouse gas emissions that result from human activities, in particular the burning of coal, oil and natural gas (Climate Change in the Light of Law..., 2021). The effects of this climate change are becoming more and more visible, including extreme weather events, rising sea levels, melting glaciers and much more. Coal phase-out strategies are based on replacing traditional energy sources, such as coal, with more ecological alternatives, such as renewable energy (e.g., solar, wind, water) or energy efficiency. As has already been noted, the main goal of these strategies is to reduce CO<sub>2</sub> emissions into the atmosphere. Here are some key ways carbon transition strategies help reduce greenhouse gas emissions. Investments in renewable energy sources that allow the production of energy without emitting CO<sub>2</sub>. Solar panels, wind turbines and hydroelectric power plants constitute an increasing share of the global energy mix. Another example is reducing energy consumption through the use of effective technologies and practices, which contributes to reducing greenhouse gas emissions. The indicated action includes, among others: building insulation, more energy-efficient vehicles and developing smart energy networks. It is important to develop public transport, electromobility and other low-emission means of transport, which contributes to reducing greenhouse gas emissions from the transport sector, which is one of the main sources of emissions. In these perspectives, education and public awareness are a very important factor. Shaping the attitudes of society and business towards a sustainable and greener lifestyle is crucial. Improving public awareness can reduce energy consumption and promote sustainable practices (Greenhouse Gas Emissions, 2020).

It is worth emphasizing the benefits resulting from the reduction of greenhouse gas emissions. Firstly, reduction contributes to limiting climate change, which may reduce the risk of extreme weather phenomena and natural disasters. Secondly, improve air quality, which has a positive impact on human health. Third, it creates new business opportunities in sectors related to renewable energy and energy efficiency (Environmental benefits from reducing..., 2019). To conclude, reducing greenhouse gas emissions is one of the main goals of the coal phase-out strategy. This is a necessary goal in the fight against the global climate crisis and is of great importance for the future of our planet. Actions taken under these strategies contribute to creating a more sustainable, ecological and healthier environment for current and future generations.

Environmental protection is an equally important strategic goal. Hard coal mining has serious negative effects on the environment. Coal mining is associated with the erosion of nature, soil degradation, water and air pollution, as well as the degradation of urban areas. Carbon phase-out strategies seek to reduce these negative impacts and restore ecosystems to their original state. In this light, as awareness of the impact of human activities on the climate and environment increases, coal transition strategies are becoming a key tool in the effort to protect our ecosystem. One of the primary goals of these strategies is environmental protection (Territorial Plan for Just Transformation..., 2022).

To understand why environmental protection is so important in the context of phasing out coal, it is important to realize the negative impact of coal on our environment. Coal mining and combustion of this raw material in power plants are associated with many unfavorable effects, such as greenhouse gas emissions. As has already been noted, coal combustion is one of the main sources of carbon dioxide (CO<sub>2</sub>) emissions, which is the main greenhouse gas responsible for global warming and climate change. Another adverse effect is air pollution. Coal contains pollutants such as sulfur, nitrogen and particulate matter, which lead to smog, acid rain and negatively impact human health and ecosystems. Soil degradation is another negative effect of mining activities, which can lead to loss of natural habitats and reduced soil quality. Finally, water pollution. The process of coal mining and storage of mining waste can lead to contamination of ground and surface waters, which has a negative impact on aquatic ecosystems and the quality of drinking water. In turn, transforming coal mining can help protect these valuable ecosystems and biodiversity. Reducing air pollution caused by coal burning helps improve human health by reducing the risk of respiratory diseases and other health problems. As a result, the transformation of coal mining opens up space for sustainable development, creating jobs in sectors with a lower environmental impact and promoting more sustainable social development (State ecological policy 2030..., 2019). In summary, the energy transition and reducing greenhouse gas emissions are key to preserving our planet and reducing the effects of climate change. However, achieving this goal requires cooperation at many levels, including governments, industry and society, to create a more sustainable and greener society.

The third key goal of the coal phase-out strategy is energy diversification. Basing energy security on coal as the main energy source carries the risk of energy homogeneity, which may lead to instability of supplies and an increase in energy prices. However, diversification of energy sources, including investments in renewable energy sources - contrary to energy homogeneity - ensures greater energy independence and stability of energy supplies. To understand the need and importance of diversifying energy sources, it is worth looking at the role of coal as the dominant energy source. Coal has traditionally been one of the world's main energy sources, especially in the energy sector. However, coal burning is associated with numerous negative effects, such as the already mentioned greenhouse gas emissions, air pollution and environmental degradation. These are also the main premises determining the need to diversify energy sources (Energy Security of Poland..., 2019). In this perspective,

diversification of energy sources means diversifying the sources from which we obtain energy. This is a key goal of the coal transition strategy for several reasons. To achieve the goal of diversifying energy sources, specific actions are necessary, examples of which are:

- Investing in renewable energy sources: Governments and businesses should invest in developing and deploying renewable energy technologies such as solar panels, wind turbines and hydropower.
- Promoting energy efficiency. Improving energy efficiency in buildings, industry and transport is crucial. This includes modernizing infrastructure, using more efficient technologies and educating the public on energy efficiency.
- Support for research and development. Investments in research into new technologies and energy solutions are necessary to develop new, greener technologies and increase energy efficiency.
- Promoting pro-ecological policies. Governments should introduce regulations and policies that promote the production of energy from renewable sources, reduce greenhouse gas emissions and provide an appropriate legal framework for the development of an energy sector based on sustainable energy sources.

To sum up, diversification of energy sources is another key goal of the coal phase-out strategy. In this space, the energy transition aims to reduce greenhouse gas emissions, increase energy independence, protect the environment and public health, and stimulate innovation and the economy. With the right investments, regulations and promotion of green technologies, we can achieve this goal while contributing to a more sustainable and greener future for our globe. Diversification of energy sources is not only an ecological necessity, but also an economic and strategic one that will benefit societies around the world (Popławska, 2018).

In view of the above strategic goals of moving away from coal, the political motivations determining the transformation of mining are extremely important. One of the first motivations are international obligations. As part of the Paris Agreement, numerous countries have committed to limiting global warming to below 2 degrees Celsius (Selosse, 2019). To achieve this goal, it is necessary to drastically reduce greenhouse gas emissions, which requires phasing out coal. The indicated space includes the factor of social pressure. As public awareness of climate change and the impact of coal on public health increases, public pressure on governments to take action to phase out coal also increases. Protests and social campaigns put pressure on politicians to introduce greener energy solutions. Social pressure determines numerous premises shaping political motivation related to the need to transform mining, the most important of which are (Marszowski, 2021):

- Public health. The coal industry is often associated with serious health problems for residents of mining areas, such as asthma, respiratory diseases and cancer. The transition to cleaner energy sources aims to improve people's quality of life and reduce negative impacts on public health.

- **Creating jobs.** The transformation of mining may be an opportunity to create new jobs in sectors related to renewable energy, technology and innovation. This could contribute to economic growth and reduce unemployment in mining areas.
- **Long-term savings.** Investments in renewable energy sources can lead to long-term savings. Renewable energy sources have lower operating costs and do not require constant access to raw materials such as coal.
- **New business opportunities.** The mining transformation opens the door to new business opportunities related to renewable energy, energy storage technology and energy efficiency. Companies that engage in these areas early can benefit from a growing market.

To conclude, strategies to phase out coal are aimed - as already mentioned several times - not only at reducing greenhouse gas emissions, but also at environmental protection, energy diversification and generating political, social and economic benefits. As the world moves towards a sustainable future, the transformation of coal mining becomes an inevitable step towards a greener and more sustainable society.

In the already mentioned political area, strategic planning is key (Yegorov, 2020). Politics plays a key role in planning the transformation of the hard coal mining industry. Governments and local government institutions should cooperate with representatives of the hard coal mining sector and independent experts to develop strategic solutions in the transformation space. The solutions and strategies developed should take into account sustainable development goals and determine the introduction of strict environmental protection regulations in mining activities. Mining companies should be obliged to apply best ecological practices and bear responsibility for the reconstruction of degraded areas (Polluter Pays..., 2021). Governments should promote the mining transformation by investing in the development of new renewable energy sources that can replace traditional coal-based energy sources. This not only reduces emissions, but also creates new jobs in the renewable energy sector. The policy should support educational and retraining programs for employees of the transformed mining industry, because - as has already been noted - the mining transformation may lead to job losses in the coal sector, therefore it is important to provide employees with the skills needed to work in other economic sectors.

When planning the transformation of mining, consultations with mining communities are necessary (Ślimko, 2019). Governments and companies should involve residents of mining areas in the decision-making process to take into account their needs and concerns - building a policy of participation and social solidarity. Mining communities that depend on mining may suffer from the transition. In this perspective, policies should include support measures such as infrastructure investments, job creation and social assistance programs to create an enabling environment for these communities to adapt to change. The need to learn from past mistakes is also important. Examples of past failures, such as environmental and social negligence related

to mining, should be used to develop better regulations and practices in the current mining transformation (Analysis of the consequences of liquidation..., 2022).

In conclusion, the transformation of mining is inevitable in the context of striving for a sustainable future (Territorial Plan for Just Transformation..., 2022). However, its success depends on appropriate policies and regulations that protect the interests of mining communities and workers in the hard coal mining sector. Governments, local governments, mining companies and mining communities should work together to shape a transformation that incorporates the Sustainable Development Goals, environmental protection and support for those most affected by transformational change. Only a policy shaped in this way will enable a long-term and fair process of mining transformation to be achieved.

## 2.2. Main motivations

In terms of key motivations determining the transformation of the hard coal mining industry, it should be clearly stated that these are extremely important social and economic issues in Poland. This issue is particularly related to the implementation of the European Green Deal. In the perspective of the plan, the green economy becomes particularly important, which is defined as an economy that improves human well-being and increases social justice - while reducing environmental risk and the consumption of natural resources (Environmental Indicator Report, 2012). From another perspective, the green economy is a low-emission economy, economical in the use of raw materials and socially inclusive (Measuring Progress Towards..., 2012). The importance and importance of activities developing the green economy are emphasized by the European Union and national policies - including Polish ones, which have some of the strictest environmental protection standards in the world. The EU and national governments have set clear goals to guide European environmental policy by 2020 and beyond, 2050. These goals include (A Greener and More Sustainable Europe, 2022):

- protecting, conserving and improving the EU's natural capital,
- transforming the EU economy into a resource-efficient, green and competitive low-emission economy,
- protecting Europeans from environmental pressures and threats to health and well-being.

A milestone in the transformation of EU countries towards a green economy - which assumes the need to decarbonize the energy industry - is the Horizon Europe program (Horizon Europe - a new program..., 2022). Horizon Europe promotes excellence and provides valuable support to the best scientists and innovators, thereby driving the systemic changes needed to ensure a Europe that is green, healthy and resilient.

In turn, the already mentioned European Green Deal plan is the path to the first climate-neutral continent. The European Green Deal is:

- plan to build a sustainable economy,
- resource efficiency and clean economy,
- covering all sectors of the economy,
- the need for additional investments and a fair transition mechanism,
- citizens' voice and international cooperation,
- transition to a clean and circular economy,
- stopping climate change,
- counteracting the loss of biodiversity and reducing the level of emitted pollutants.

In turn, in the area of national documents that outline medium- and long-term goals and tasks in the field of energy transformation and the Just Transition Plan, there is the National Recovery and Resilience Plan (National Reconstruction Plan..., 2021), in which in the part devoted to green energy and reducing energy intensity the key goal is clean air. The indicated goal should be achieved, among others: thanks (<https://www.funduszeuropee.gov.pl>, 2022):

- faster replacement of old mining furnaces with more ecological ones,
- purchase of photovoltaic panels and solar track collectors,
- wind farms in the Baltic Sea,
- intelligent energy grid,
- hydrogen technology,
- green cities.

In the next document, the Strategy for Responsible Development, we read that the assumed transformation of the economy towards a low-emission economy will require a complete reevaluation and new market models allowing, among others, such features as power, availability, location of the generator, location of the recipient, demand characteristics, etc. However, due to the nature of energy services, changes must be evolutionary and it is necessary to reconcile a sufficiently strong base of conventional, large-scale production forces in the professional energy industry with distributed sources functioning as a complement to medium-sized agglomerations and clusters, energy cooperatives, etc. with a significant level of autonomy (Strategy for Responsible Development..., 2017).

Another important document in the area of transformation processes in the hard coal mining industry is the Polish Energy Policy. In this document, one of the primary goals is to ensure - for social, economic and environmental reasons - that a just energy transition will lead to economic strengthening, leaving no one behind and will serve future generations. This process will be supported by financial instruments under the EU Just Transition Mechanism, mobilizing support funds in the amount of PLN 60 billion. Detailed solutions in this area are included primarily in the national and territorial just transformation plans (Poland's Energy Policy..., 2021).



At the regional level, the key strategic document in the area of transformation processes in the hard coal mining industry is the Development Strategy of the Silesian Voivodeship "Śląskie 2030". This document clearly states that from the point of view of the Silesian Voivodeship, it will be important to implement the Program for Silesia, which aims to change the economic profile of the region, gradually replacing traditional economic sectors, such as mining and metallurgy, with new ventures in more productive, innovative and advanced sectors, technologically. The above-mentioned document assumes that after 2020 there will be full implementation of the Program for Silesia, correlated with government restructuring programs, expansion and modernization of transport infrastructure, implementation of a new, territorially sensitive, integrated urban and industrial policy, innovation and human resources development. It is planned to introduce additional instruments related to the adaptation of national operational programs to the objectives of the Program for Silesia, primarily in the area of investment promotion and innovation (Strategy for the Development of the Silesian Voivodeship..., 2020).

New directions and challenges are outlined in the Regional Innovation Strategy of the Silesian Voivodeship 2030. The strategy clearly indicates that in the coming years, entities from the Silesian Voivodeship will be the beneficiary of a special European Union instrument supporting the green transformation, which is the Just Transformation Fund. This support will enable: productive investments in SMEs, leading to economic diversification and economic restructuring; investments in the creation of new enterprises; investing in research and innovation activities and supporting the transfer of advanced technologies; investments in the implementation of technologies and infrastructures that provide affordable clean energy, in reducing greenhouse gas emissions, energy efficiency and renewable energy; investments in digitization and digital connectivity; investments in the regeneration, decontamination and renaturalization of areas and projects changing their purpose; investing in strengthening the circular economy; improving and changing employee qualifications. It should be noted that the allocation of funds will be carried out within the framework of a separate Territorial Just Transition Plan, which will be created for seven subregions of the voivodeship: Katowice, Bytom, Sosnowiec, Gliwice, Tychy, Rybnik and Bielsko (Regional Innovation Strategy..., 2021).

The key programs with an operational dimension in the area of transformation processes are the Regional Plan for the Just Transformation of the Silesian Voivodeship 2030 (Territorial Plan for Just Transformation..., 2021) and the Fund for Just Transformation. In the Regional Plan, expert attention was focused on the process of transformation of the hard coal mining industry. In this perspective, it is stated that the transformation of the voivodeship will require a change in the production structure and the development of the energy sector in the region. One of the actions being implemented will be the decommissioning of obsolete power units (built in the 1970s and 1980s) and replacing them with modern infrastructure that is friendly to the environment and the inhabitants of the region. (...) Renewable energy sources will play a key role in the region's energy system. The Territorial Just Transition Plan provides support

for this type of investment as an important element in the diversification of generation sources in the regional energy mix. The implementation of the indicated activities will contribute to achieving the national target of 21-23% share of Renewable Energy Sources in the final gross energy consumption.

The second of the documents mentioned, the Just Transition Fund in the Silesian Voivodeship, will serve to achieve the main goal, i.e., mitigating the social, economic and environmental effects of the transition to a climate-neutral economy. In combination with other sources of financing, in particular funds from the Cohesion Policy 2021-2027, funds from the remaining pillars of the Just Transition Mechanism and other public and private funds dedicated to complementary activities and projects, this fund will give a new impetus to the region's economy and open better development prospects for its inhabitants. , especially those most affected by the negative consequences of the inevitable process of transformation of the hard coal mining industry (Fund for the Just..., 2020).

In the described space, a very important document is the "Social Agreement on the transformation of the hard coal mining sector and selected transformation processes of the Silesian Voivodeship" regarding the transformation of the hard coal mining sector, which aims to ensure a gradual withdrawal from hard coal mining and transform it in an ecologically and sustainable manner. socially, taking into account the interests of employees, the economy and the environment. The Social Agreement defines the objectives of the transformation of the hard coal mining sector, including (<https://www.gov.pl/web/aktywa-panstwowe...>, 2023):

- reducing greenhouse gas emissions. The social contract assumes reducing greenhouse gas emissions by phasing out coal-fired energy production and improving energy efficiency, as well as introducing other renewable energy sources, such as solar, wind and geothermal energy,
- reducing energy dependence. The transformation of the hard coal mining sector aims to reduce the country's dependence on a single energy raw material by diversifying energy sources, increasing the use of renewable energy and introducing new technologies and innovative solutions,
- retraining of employees. As part of the social contract, plans are established to retrain employees in the hard coal mining sector to ensure that they can take up work in other sectors of the economy,
- ensuring employee safety. The social contract imposes on employers the obligation to ensure occupational health and safety and to protect the health and life of employees in the hard coal mining sector,
- development of regions. The transformation of the hard coal mining sector also aims to develop the regions affected by its effects, through investments in infrastructure, creation of new jobs and development of entrepreneurship.

The social contract regarding the transformation of the hard coal mining sector is an important step towards achieving sustainable development goals, including environmental protection and ensuring decent working conditions and a future for workers in the hard coal mining sector.

Documents, plans, strategies and theses corresponding to the goal of achieving a green economy in the EU, at the same time determining - especially at the level of mining communities - the need to recognize the social reception of the just transformation process, which may have an important impact on the condition and development prospects of the transformed mining areas and be an essential recommendation for the creation of programs aimed at strengthening the country's energy policy based on clean technologies. Bearing in mind the effects that have occurred over many years of transformation, e.g., of the hard coal mining industry in Poland, we should not ignore the fact that further reform of this important sector of the national economy may result in social acceptance or rejection of the directions of its further transformation. This is particularly important for the sector and its environment, which are systematically subjected to pressure resulting from its adaptation to changing economic, political and social conditions. The selected thematic areas presented in this article, which clearly fit into the transformation processes - especially the transformation of the hard coal mining industry - are key challenges for EU policies shaped by the European Green Deal plan, which is gaining particular importance both in the cognitive and utilitarian areas.

### **3. Summary**

Taking into account all of the above content, it should be emphasized that the coal industry in Poland has an impact on the economy and development of regions. Moving away from hard coal may lead to job losses and changes in the country's economic structure. This poses a political challenge as politicians must deal with public resistance - including from numerous mining-related occupational groups - and seek sustainable plans for transitioning these communities to other economic sectors. To sum up, moving away from hard coal is both a necessity due to the protection of the environment and public health, and a political challenge due to the economic, infrastructural and social implications of this process. Putting in place effective transition policies and strategies can help manage this challenge to achieve the Sustainable Development Goals and ensure that no community or worker is left behind as the social and economic landscape of transformed mining areas changes. The transformation of mining is necessary due to the sustainable development goals, environmental protection and the fight against climate change. It is also a political challenge that requires well-thought-out investments, policies and regulations to minimize the negative socio-economic effects of the

transformation and to use the development potential of the transformed areas in all their dimensions (Skubida, 2023)

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