Faster farewell to coal - why, how and when?

BRIEFING

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Polish Green Network

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SUMMARY

1. Coal mining and coal power on a downward slope

The COVID-19 pandemic has further fleshed out the problems of hard coal mining in Poland, and the unprofitability of mines is no longer something that can be swept under the rug. A downward trend for hard coal mining in Poland can be observed since the early 1990s, while the prices of coal-based energy are increasing due to the rising costs of CO_2 emission allowances. Commercial power plants and CHP plants have, in the first three quarters of 2020, already generated PLN 44 million in losses on energy operations and find it increasingly difficult to compete with renewable energy sources, gas or energy imports from abroad.

2. Plans to maintain them through subsidies are unjustified and based on incorrect assumptions.

Under the so-called social contract pertaining to continued operations of the hard coal mining industry, mining trade unions and the government have agreed to close down the last mine in 2049. In addition, the agreement assumes state aid for the ongoing production operations of polish mining, amounting to PLN 2 billion per year. These plans seem to ignore the European Union's climate policy and the trend of phasing out coal in power plants over the next 10 years. Poland's Energy Policy until 2040 assumes an excessively slow increase in prices of CO_2 emission allowances, whose current price already means that coal-based energy and heating may become insolvent.

3. Disbursing public funds (EU funds or national state aid) to extend the status quo is pointless - they need to be urgently directed to building alternatives to coal-based energy and jobs in the mining sector

Any funds spent on hard coal mining in the coming years would be lost, as indicated by numerous forecasts regarding the development potential of coal-based energy. Prolonging coal mining is economically unfounded and its only possible outcome is a delay and hindrance to the just transition process. Funds from the state budget should be allocated to building an alternative, diversified economy, as well as creating new jobs for those leaving the coal mining and mining-related industries.

4. What is the alternative and how should it be implemented?

Coal mining should be phased out faster, preferably by 2035. The implementation of aid instruments adjusted to the number of employees gradually leaving the mining industry has to be planned immediately. Miners need to be provided with training and retraining programmes with subsequent internships, relocations to other mines and bridge pension benefits.

The mine closure schedule has to be grounded in economic realities and adjusted to the European Union's climate policy. Coal mining in Poland has demonstrated a significant downward trend over the last 30 years and – if it were to continue unchanged, at the same pace – hard coal mining would end in the 2030s. In keeping with the government's assurances on the possibility of introducing changes to PEP 2040, it would be a good practice to adapt the strategy's provisions to EU objectives, and then revise the mine closure schedule every 5 years according to the climate policy and economic situation.

A realistic mine closure schedule needs to be established as soon as possible to properly prepare the National Recovery Plan (NRP), Partnership Agreement (PA) and Regional Operational Programmes (ROP), to more effectively finance the energy transition. The NRP, PA and RPO, as well as the Territorial Just Transition Plans should feature projects and programmes ensuring that EU funds will lead to new jobs in regions economically dependent on coal. A strong impulse for job creation comes with the implementation of the Renovation Wave (increasing the pace and scale of the Clean Air programme and other measures aimed at improving the energy efficiency of buildings) in the construction sector (in particular in terms of the necessary development of low-emission and energy-saving buildings), the expansion of industries related to circular economy, public transport, investments in the production of heat pumps, components for solar and wind farms, batteries for electric cars and energy storage devices.

The energy transition process cannot be discussed with representatives of just one social group. Debates on the future of Poland's energy sector and the economy of coal-dependent regions should include experts, local governments, local businesses, social organisations, universities and all groups affected by the coal mining sector. The aforementioned groups dispose of extensive regional knowledge, which is crucial for developing solutions tailored to the given region. Broad dialogue with all stakeholders is essential in planning a just transition.

Timeline of the downward slope in hard coal mining

For several years, coal mining in Poland has been under a protective bubble, constantly subsidised and restructured to temporarily hide its unprofitability. The COVID-19 pandemic has rendered the consequences of this situation all the more visible and subjected them to constant media scrutiny. With the announcement of the European Green Deal and the Just Transition Fund, which aim to bring Europe closer to climate neutrality, and launch environmentally and socially friendly investments in mining regions, the issue of just transition and the end of mining is becoming increasingly clear.

In March 2020, the Polish government introduced restrictions due to the spreading COVID-19 pandemic, leading to a temporary suspension of manufacturing in some industries. The closure of cultural and entertainment venues, as well as restaurants, has led to an increase in energy demand in households, but this failed to compensate for the overall fall in electricity consumption. The situation had an obvious effect - a reduction in demand for coal in power plants - which exacerbated the existing poor financial condition of the mines.

The COVID-19 pandemic has only underlined the issue of unprofitability in Polish coal mining. Overall, support for mining and coal-based power between 1990 and 2016 amounted to almost PLN 230 billion, giving an average of PLN 8.5 billion annually.[1] In recent years, the industry has been engulfed in a crisis caused by the low efficiency of coal extraction in Poland and the decline of this commodity's prices on the global market. Support for hard coal mining not only takes on the form of subsidies for mine closures, but also of rescuing unprofitable mining companies by companies controlled by the State Treasury.

The poor financial condition of mining companies and the expected mine closures have resulted in a tense atmosphere between the mining trade unions and the government. Ever since the outbreak of the COVID-19 pandemic, miners have been expecting the government to present a recovery plan for the mining industry, guarantee profitable mining and maintain jobs. The Ministry of State Assets, which is responsible for restructuring the mining industry, delayed decisions on the industry's future for months, which fanned the flames of the conflict.

21 September marked the beginning of underground miner protests, with up to 400 employees of hard coal mines participating. They were a reaction to the difficult situation the mining industry finds itself in and to the draft "Poland's energy policy until 2040" presented by the Minister of Climate and Environment on 7 September, which will force the closure of many mines in the coming years. On 25 September, Artur Soboń, Deputy Minister of State Assets and government officer for the transformation of energy and mining companies, and Dominik Kolorz, head of the Solidarność trade union for Silesia-Dąbrowa, signed an agreement under which the last mine in Silesia will stop mining coal in 2049. Until then, Polska Grupa

[1] WiseEuropa, *Ukryty rachunek za węgiel 2017. Wsparcie górnictwa i energetyki węglowej w Polsce - wczoraj, dziś i jutro* (The hidden bill for coal 2017. Support for mining and coal energy in Poland - past, present and future)

Górnicza, with 40,000 employees, is to receive subsidies from the state. The necessary support for polish mining is estimated at 2 billion per year.

The agreement breeds controversy, as it has little in common with the conditions stemming from the economic and climate policy of the European Union. Pursuant to the provisions of the agreement, the government side declared it would apply to the European Commission for approval for public aid to finance ongoing production with the objective of ensuring stable operations of coal companies. Pursuant to the decision of the European Council of 10 December 2010 on state aid facilitating the closure of uncompetitive coal mines, public aid may only be allocated to plants that plan to shut down completely and the funds cannot be used to finance manufacturing costs.

On 13 January, the social contract with miners was to be renegotiated, but trade unions rejected the government's draft, saying it was an "insult to Silesia", as no solutions specifically referring to the phase out process for mining were included. The union side presented its own draft a week later. This includes a detailed system of subsidies for mines, the closure dates of individual facilities and a demand for PLN 120,000 severance pays for employees. The document also contains a provision on aid in the form of miner's leave, under which a former miner would receive 80% of their salary for 4 years, if continued employment is not guaranteed. In addition, the draft social contract also states that "the parties agree to establish a special purpose vehicle for implementing CCS carbon-free technology projects or technologies for producing hydrogen from coke oven gas". The Polish government is also meant to pursue the construction of a coal gasification system for SNG and methanol, as well as one using IGCC technology, and to complete the carbon dioxide capture and utilisation (CCU) system at the Łaziska Power Plant. The aforementioned facilities are to be put into use by 2025 at the latest.

On 25 January, talks lasting 7 hours were held between Artur Soboń, Deputy Minister of State Assets, and the social side representatives. In their course, the trade unions upheld the dates for closing mines in Silesia proposed 4 months earlier. According to trade unionists, one mine will close this year, one in 8 years, and another one in 9 years. This would be followed by a 5-year period with no closures. Three mines would stop work in 2035-40. Then, one in 2041, one in 2043, and the last four in 2049. The demands of trade unions also included the reinstatement of the plan to construct a coal-fired unit at the Ostrołęka C power plant, which is to be gas-powered according to current plans. This proposal is unfeasible given that the demolition of previously built parts of the coal-fired unit is already underway.

On 2 February, the government adopted a resolution on the Energy policy of Poland until 2040. It assumes a 37-56% share of coal in Poland's energy mix in 2030 and 11-28% in 2040. The document links coal's percentage share in the energy sector to the price of emission allowances (ETS). A day after the government adopted the resolution, the price of ETS allowances reached EUR 38 per tonne of CO_2. The officially adopted version of the document provides for such a price of the allowances in a dozen or so years. This shows that Poland's energy strategy is maladapted to the reality of the European Union's climate policy. High ETS prices will reduce coal consumption in power plants and, consequently, lead to a decrease in demand for this raw material, causing the financial situation of mines to deteriorate. Such a situation will force the state to provide even greater subsidies to the mines, or to close them significantly faster than stated in the agreement between the government and the mining trade unions.

On 5 February 2021, trade unions from PGG sent a letter to the Minister of State Assets, Jacek Sasin, asking for financial support for this largest mining company in Poland. They claim that without state support PGG may lose financial liquidity even before the start of talks with the European Commission regarding the possibility of obtaining state aid from the treasury. Meanwhile, PGG's management board announced that annual awards, called fourteenth salaries, for which the company will allocate PLN 300 million, will be paid to its employees on time.

In the resolution of the management board of Tauron Wytwarzanie on 24 February 2021, the company decided on the dates of decommissioning of coal-fired units. Most of the blocks would be shut down in 2025, and the last one in 2035.

Trends in coal production and consumption

During the twelve months of last year, domestic hard coal extraction reached approx. 54.4 million tonnes, and sales were approx. 53 million tonnes. A year earlier, the mines produced 61.6 million tonnes of hard coal and sold 58.4 million tonnes.

A downward trend for hard coal mining in Poland can be observed since the beginning of the 1990s. If the current trend in extraction were to be maintained, the last tonnes of coal should be extracted before 2040 (Fig. 1.).

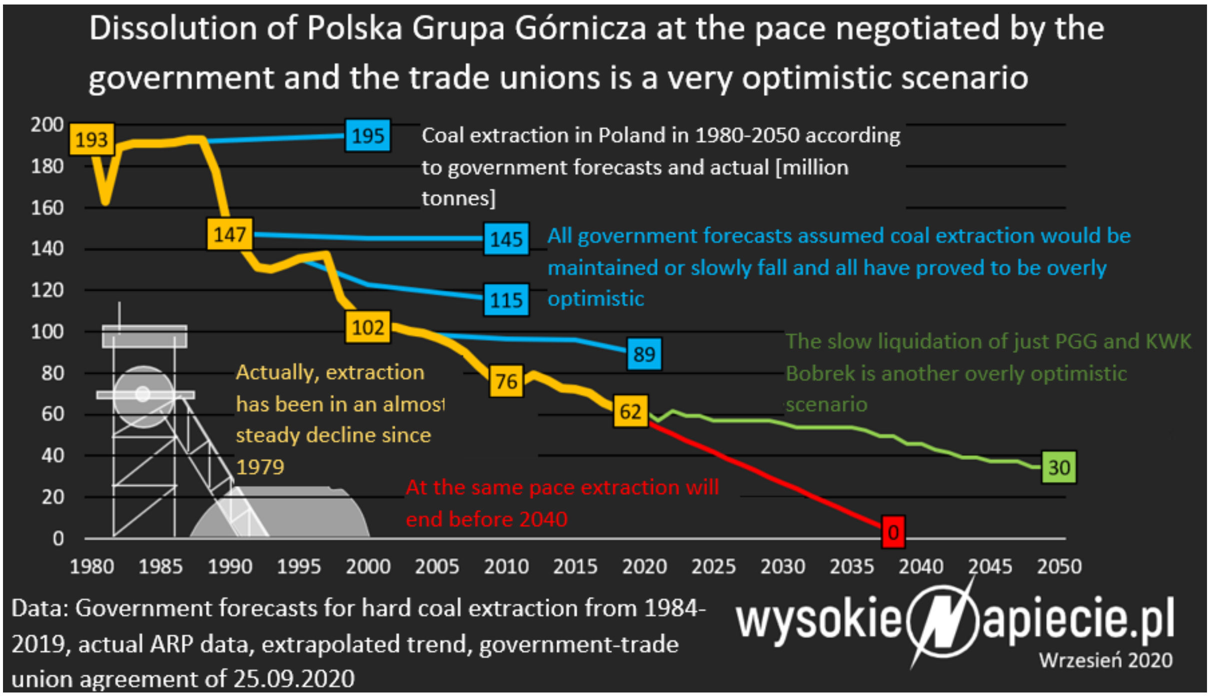

Fig. 1. Trend for hard coal mining in Poland since the 1980s (wysokienapiecie.pl)

In 2019, hard coal had a 48.1% share in electricity production and lignite 25.5%. The total share of coal in electricity production in 2019 was 73.6%, 4.8 percentage points lower than a year earlier.

When analysing changes in Poland's energy mix, a slowly growing share of renewable energy sources, amounting to 25.2 TWh, or 15.4% in 2019, can be observed. ⅗ of this is energy from onshore wind farms (Fig. 2. and 3.).

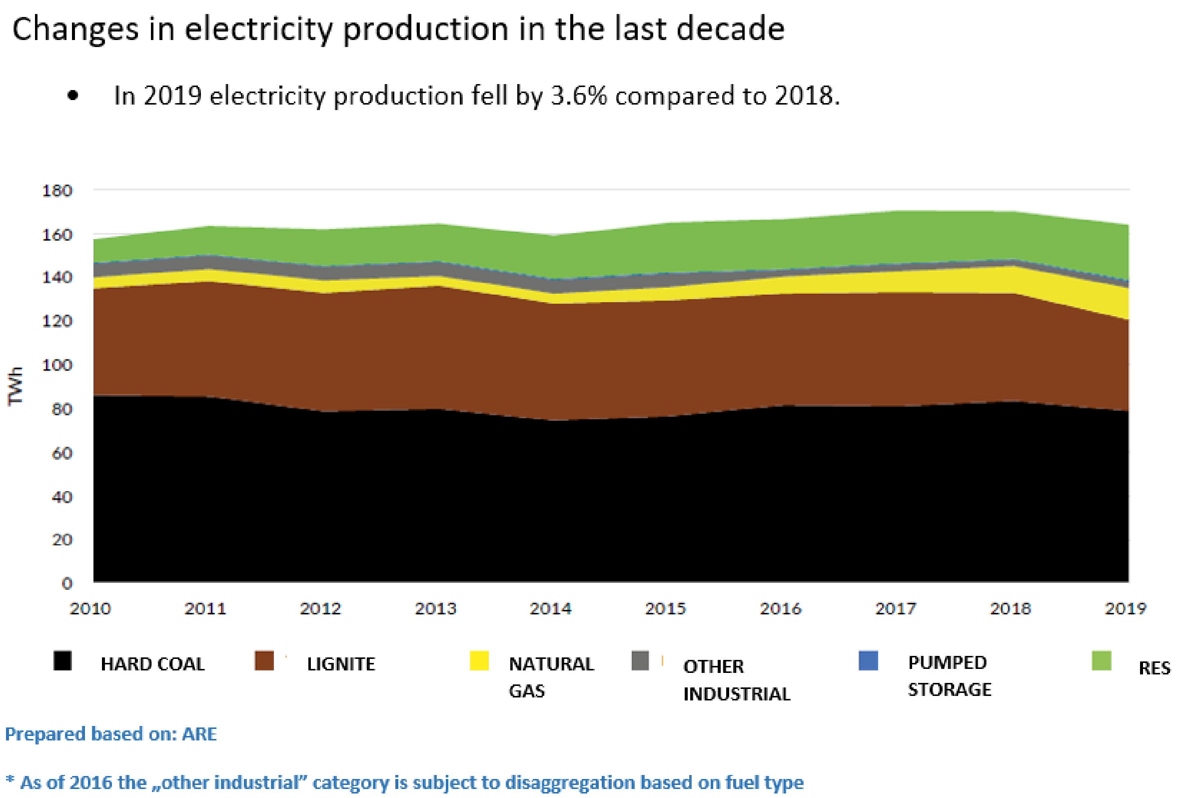

Fig. 2. Electricity production in Poland in 2010-2019 (Forum Energii)

Electricity production in 2019

- The share of coal in electricity generation in 2019 was 73.6%, 4.8% less than the year before).
- Gas continues to gain significance. Its share in the energy mix was 8.8% against 7.2% in 2018.
- The share of RES in electricity generation was 15.4% and the highest in history.

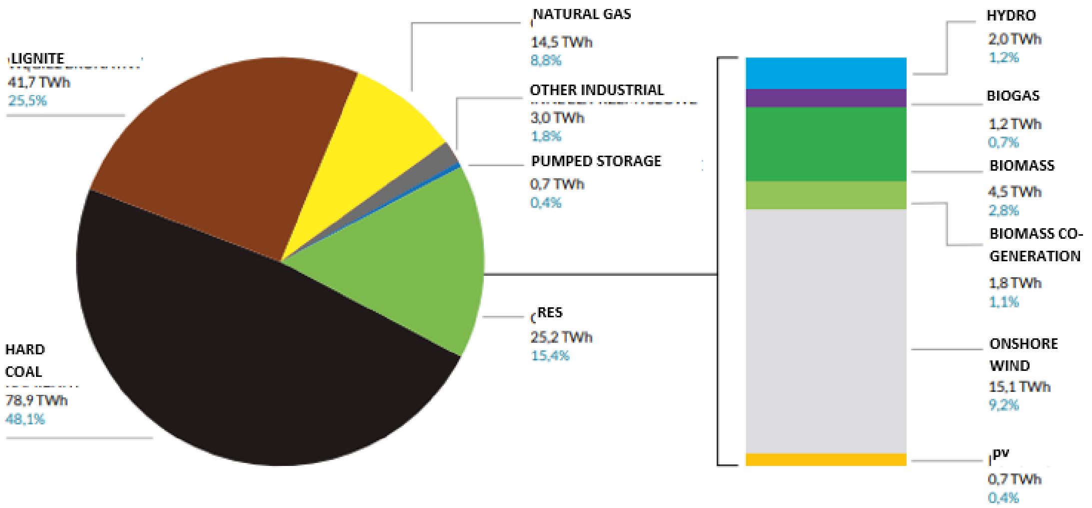

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Fig. 3. Electricity production in Poland in 2019 (Forum Energii)

The price of thermal coal per tonne fell by 1.4% and the price of coking coal by 31.4%. From January to October, over 10.3 tonnes of coal were imported (8.9 million tonnes of thermal coal and 1.4 million tonnes of coking coal). Imports saw a record-breaking 2018, when approx. 19.7 million tonnes of coal were delivered.

Increasing prices of emission allowances and their impact on demand for coal

A new, higher EU climate target to reduce greenhouse gases by 55% compared to 1990 levels will lead to higher prices in the Emissions Trading System (ETS), which hit a record level of EUR 38 per tonne of CO_2 on 3 February. In its report from March 2020, the Polish Centre for Climate and Energy Analyses CAKE evaluated that increasing the emissions reduction target to 55% will result in greenhouse gas emission allowances increasing to EUR 41 in 2025 and EUR 76 in 2030[2] (Fig. 4.). Should another increase in the EU's climate ambitions come and the target for greenhouse gas emission reductions rise, ETS prices may become even higher. The European Commission is also considering including methane-related emissions in the EU ETS in the coming years. 80% of Polish mines are methane mines. Covering the costs of methane

[2] Centrum Analiz Klimatyczno-Energetycznych, *Zmiana celów redukcyjnych oraz cen uprawnień do emisji wynikająca z komunikatu „Europejski Zielony Ład"* (Change of reduction targets and prices of emission allowances resulting from the "European Green Deal" communique), 2020

emissions would bury this sector financially, when the costs of coal production including the costs related to greenhouse gas emissions are considered.

Fig. 5.4. *Comparison of CO_2 price forecasts (2020 EUR/t)*

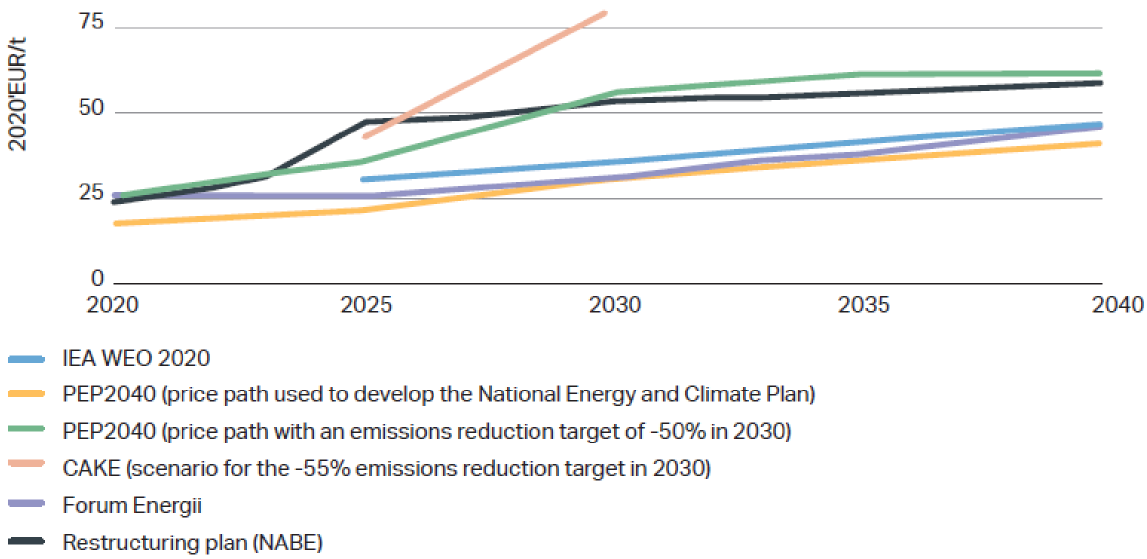


Fig. 4. ETS price growth forecasts (P. Czyżak, W. Kukuła, eds., *Monopol węglowy z problemami. Analiza restrukturyzacji polskiego sektora energetycznego* (A coal monopoly with issues. An analysis of the Polish energy sector's restructurisation), ClientEarth & Instrat, 2020)

Rising ETS prices will be a hard blow for the Polish energy sector, which is 82% reliant on fossil fuels. The standard way to obtain allowances is through an auction, but some are also allocated free of charge. The change in the reduction target will mean the EU ETS system will see fewer allowances at auctions and allowances allocated for free to industrial sectors. Currently, free allowances account for approx. 40% of all emissions allowances.

For the Polish energy sector, based on coal and large facilities, this entails huge costs and lost competitiveness, as power plants have to pay more for emissions allowances. This constitutes a significant problem for domestic energy companies, which still produce 70% of electricity and heating from coal. In just the first three quarters of 2020, commercial power plants and CHP plants spent almost PLN 8 billion on the purchase of CO_2 emission allowances. For comparison, their total revenues from the sale of electricity and heat did not exceed PLN 35 billion over the same period. While the energy sector transfers some of these costs onto its customers, growing competition (renewable energy sources, gas, and imports) and the fact that some of the prices are regulated, mean that it is unable to pass them on in their entirety. For this reason commercial power plants and CHP plants generated losses of PLN 44 million on energy-related activities in the first three quarters of last year, even though in the corresponding period of 2019 they saw PLN 2 billion in profits.

In addition, quickly growing ETS prices are hitting heating plants in Poland, which are mostly owned by cities and devoid of large capital needed to cover costs related to CO_2 emissions and upgrades. An increasing number of heating plants are trying to avoid ETS-related costs. The EU directive states that the ETS system covers facilities with a capacity exceeding 20 MW. Therefore, heating plants lower their capacity to leave the system and sidestep costs associated with their emissions.

Bad condition of mining companies

Polish coal is not competitive with imported coal due to its high extraction costs. This stems from the fact that readily available deposits have been exhausted, leading to more difficult extraction conditions at greater depths. In addition, miners maintain their demands for ever higher wages, which also affect extraction costs. In 2020 – in exchange for suspending strikes before the presidential election – employees of Polska Grupa Górnicza received a 6% raise.

Over the past three years, global thermal coal prices have fallen by more than half, while in Poland they have increased by over 30%, reaching their highest level in history. Potential growth of demand for Polish coal will not improve profitability due to extraction costs rising as a result of geological conditions and the never decreasing financial demands of employees in the mining industry.

On 4 February 2021, the Ministry of State Assets announced that the Polish hard coal mining industry closed 11 months of the preceding year with a 3 billion 843 million net loss. In 2019, this loss was PLN 1 087 million (Fig. 5.).

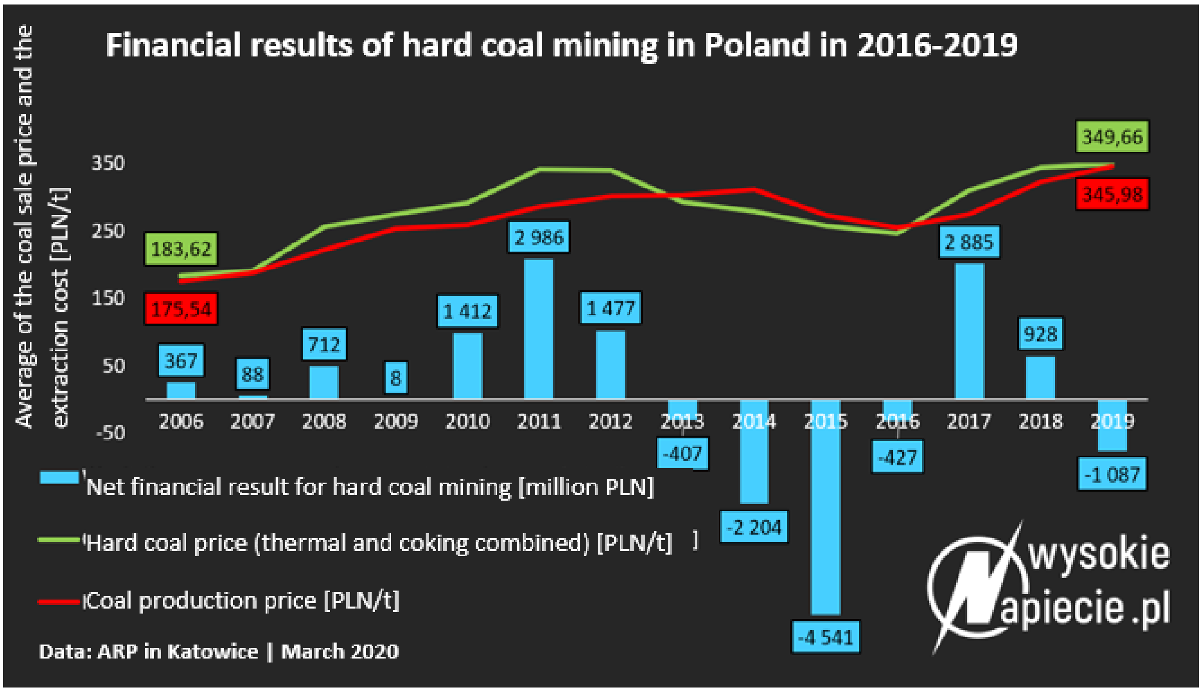


Fig. 5. Results of hard coal mining in Poland (Wysokienapiecie.pl)

Polska Grupa Górnicza (PGG), the largest mining company in Poland and Europe, with 40,000 employees, finished 2020 with coal production lower by more than 5 million tonnes compared to the previous year. The largest domestic coal producer estimated losses of approx. PLN 2 billion due to 6-7 million tonnes of coal going uncollected. The company announced that it intends to conduct group layoffs of 260 employees of retirement age. On 15 March, it was announced that the Polish Development Fund intended to lend one billion zlotys to the company.

The company also received over PLN 200 million from the Guaranteed Employee Benefits Fund due to a temporary reduction in personnel working time this spring caused by the COVID-19 pandemic. Currently, PGG is waiting for decisions to be issued by the Polish Development Fund, to which it applied for over PLN 1.7 billion in support from the financial shield for large companies.

At the turn of 2020 and 2021, Tauron, Elektrociepłownia Będzin and Grupa Azoty terminated contracts with PGG for coal supply. Polska Grupa Energetyczna also wishes to change the terms of the contract with PGG. These decisions are apparently the result of reduced demand for coal in the companies and its excessively high price in relation to market prices.

Jastrzębska Spółka Węglowa (JSW), which employs approx. 22,000 people, ended 2020 with losses of over a billion zlotys as a result of various factors, including the COVID-19 pandemic and the economic difficulties it entailed. JSW concluded an agreement with the Polish Development Fund for a PLN 1 billion liquidity loan under its PFR Financial Shield for large companies. The company also received a preferential loan of PLN 173.6 million from the Polish Development Fund.

Clutching at straws

The Polish energy system requires in-depth restructuring and reconstruction. Investments in RES and withdrawal from obsolete, loss-generating coal technologies are necessary. In May 2020, the Minister of State Assets, Jacek Sasin, announced that the ministry was working on a project to spin off coal assets from the PGE, Tauron and Enea energy groups. They, in turn, are to be combined into one entity. This is meant to facilitate financing for energy groups wishing to invest in more profitable renewable energy sources.

According to the government's plan for an in-depth restructuring of the energy sector, coal assets from state-owned companies are to be spun off to the National Energy Security Agency (NABE). The transfer of coal assets to NABE is to consist of the State Treasury purchasing old coal-fired power plants, while the consolidated PGE becomes the owner of grid infrastructure, wind, hydro and solar power plants, as well as energy trading companies - valuable parts of the current groups. An Early Decommissioning Mechanism (EDM) is also foreseen under NABE, tasked with purchasing unprofitable coal assets from NABE for the last two years of their operation and gradually shutting them down. However, the operation will result in NABE generating losses of PLN 31 billion for the State Treasury, which will become the owner of the energy companies' debts.[3] Under NABE and EDM coal production capacity is to be shut down in the 2026-2037 period.

Numerous coal units, which should be excluded from the coal budget (the total amount of CO_2 that our country can release into the atmosphere and remain within the threshold for an average increase of the planet's temperature by 1.5 °C) will be working more than a dozen years too long, while receiving state subsidies. The restructuring plan does not include updated EU CO_2 emission reduction targets and is unambitious in terms of the pace of decommissioning coal assets. The European Commission's energy mix scenarios included in the evaluation of the 2030 targets revision indicate that the share of coal in electricity generation in the EU as a whole in 2030 will be only 2% - 65 TWh, i.e. about half of coal power generation in Poland in 2019. Assuming that Poland's share in the generation of energy from coal within the EU will in 2030 remain unchanged when compared to 2019 (i.e. approx. 25%), Poland should be generating only 16.7 TWh of electric power from coal, which is a more than fivefold decrease versus the restructuring plan.

Poland has the highest wholesale electricity prices in Europe due to its coal-based energy mix. In 2020, electric power imports to Poland amounted to 13.1 TWh, which cost approx. PLN 3 billion. Imported energy led to a fall in energy prices on the Polish exchange.

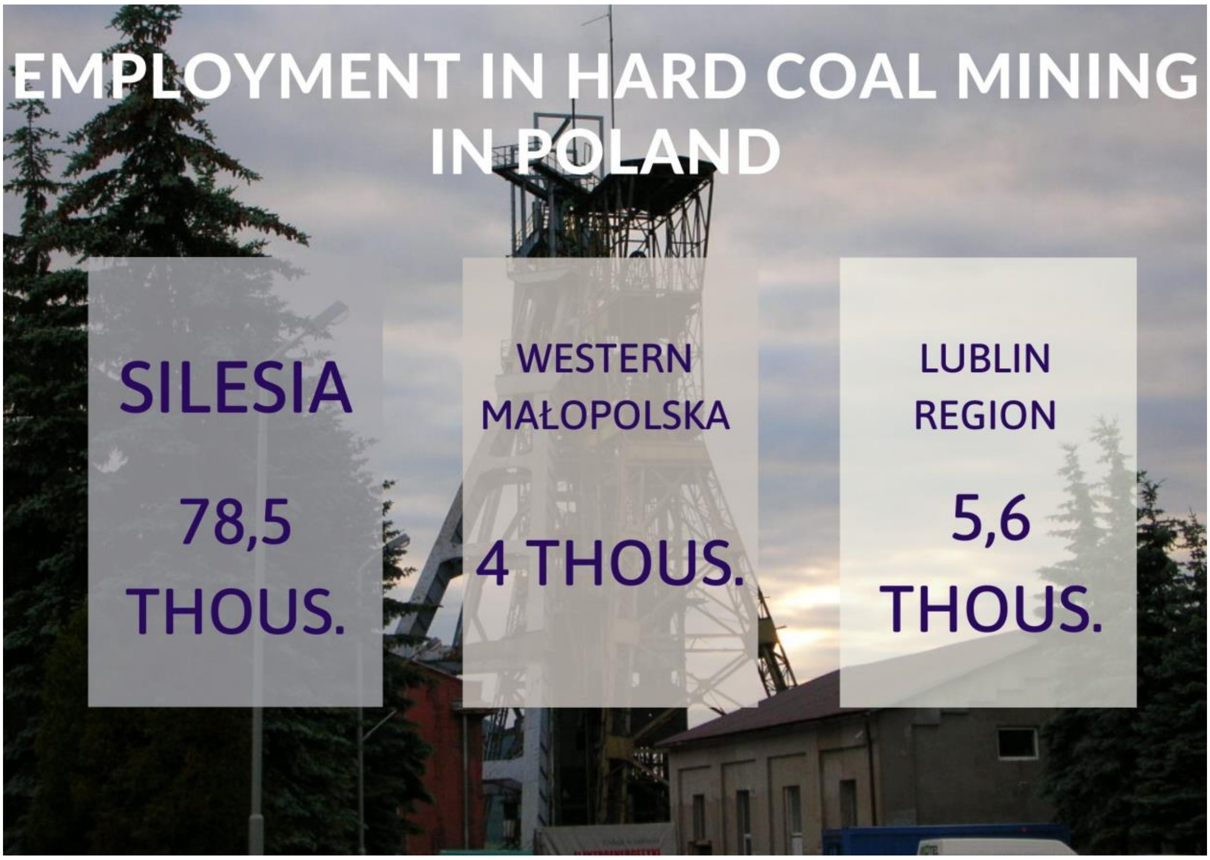
In Q2 2021, the government plans to abolish the full exchange obligation, which requires state-owned electricity producers to sell 100% of energy produced on the exchange, with the objective being to reduce energy imports to Poland. With the exchange obligation abolished, energy companies will be able to impose prices unrelated to market conditions based on competition. This will lead to the conclusion of individually negotiated long-term contracts for the purchase of energy between energy companies and their customers. Either way, experts believe that companies will still look for cheaper offers for electricity and this will not reduce electricity imports to Poland.

The end of coal is not the end of the world

The hard coal mining industry in Silesia employs 78,500 people, with another up to 130,000 working in hard coal and lignite mining-related industries . According to forecasts, the labour surplus in mining, in scenarios assuming the economy will be decarbonised by 2050, will be between 14 and 36 thousand people in 2030, depending on the pace of decarbonisation.[4] This is the number of people who should leave the hard coal mining industry within a decade, regardless of those retiring in this period.

[3] P. Czyżak, W. Kukuła, eds., *Monopol węglowy z problemami. Analiza restrukturyzacji polskiego sektora energetycznego* (A coal monopoly with issues. An analysis of the Polish energy sector's restructurisation), ClientEarth & Instrat, 2020.

[4] Instytut Badań Strukturalnych, *Dekarbonizacja i zatrudnienie w górnictwie węgla kamiennego w Polsce* (Decarbonisation and employment in hard coal mining in Poland), 2021



The labour market will have to accommodate those workers, which entails retraining or aid, as the mining sector will not be able to provide them with employment. Therefore, it is crucial to launch voluntary training programmes and to provide miners with a comprehensive retraining offer as soon as possible. Economic development aligned with the European Green Deal will create new jobs in sectors that contribute to sustainable growth, and it is there that employees of the mining and related sectors can find employment. Considering the technical skills of mining workers, following appropriate training they can find employment in, for example, the construction or automotive industries, or the RES sector.

The European Commission's new strategy, called the "Renovation Wave", aims to double the number of buildings undergoing energy retrofits in the next decade and, in effect, increasing their energy efficiency and reducing energy consumption. According to the WWF report *Directions for the territorial just transition plan and development for the Silesian voivodeship*, 11 to 22 thousand workers will find employment in the construction sector in the coming decade. The automotive industry in Silesia may create 6 to 9 thousand new jobs over the next 10 years. Between 3 and 4 thousand are expected in a new electric car factory, while the rest (from 1 to 2 thousand) in automotive supplies. New jobs can also be created in the energy sector (4 to 6 thousand), logistics (2 to 3 thousand) and in rehabilitation of land (0.5 to 1 thousand). There is a chance for another 43-55 thousand jobs to be created in businesses diversifying the regional economy, such as the development of business services, industries related to circular economy, tourism, food processing, medicine and specialised administration.

As shown in the report of the Institute for Structural Research (*Instytut Badań Strukturalnych*; IBS), *The Silesian voivodeship at a turning point in its transition* ("Województwo śląskie w punkcie zwrotnym transformacji"), companies from the mining support sector have a chance to develop in non-mining industries, such as energy, construction (underground, road, specialised), chemical, machine and automotive industries. Most of these areas fit into regional specialisations, which lays the groundwork for the transformation of mining-related companies, giving them the opportunity to use current skills and change their product range on the one hand, while on the other hand, the opportunity to target a geographically larger market.

Recommendations

1. Artificially extending the coal sector's life based on the wrong assumptions is risky for miners

Coal mining is a bottomless pit into which no more public funds should be thrown. These funds, both EU and national, have to be spent on creating alternatives: new jobs for miners along with comprehensive outplacement and upskilling programmes, new energy sources, thanks to which there would be no need to artificially support coal energy because of the lack of other electric power sources. The scenarios serving as the base for continually maintaining conventional energy are all justified by incorrectly set ETS prices, which means attempts at implementing them will end with a premature, unplanned and unprepared collapse of energy and mining enterprises, along with sudden redundancies.

The dynamic increase in the price of CO_2 emission allowances, the climate targets adopted by the EU, and the industry's difficult financial situation are factors that render the hard coal mining phasing out schedule in the form proposed by the mining trade unions, unrealistic. Delaying the sector's energy transformation and putting off the closures of unprofitable mines may result in a fast and unplanned collapse of mining companies, which would lead to a sudden and uncontrolled rise in unemployment.

2. Coherent social aid programme

Accelerating decarbonisation will allow problems with labour shortages in the hard coal mining sector to be avoided, while freezing employment levels and natural retirements will cause new problems with worker availability, in a declining industry, starting from the mid-2030s. This would, in turn, lead to an absurd situation, in which new miners need to be trained and hired. Therefore, a date for abandoning coal needs to be set and protective instruments planned, ones aligned with the number of employees that should receive support, in line with the pace and time perspective of the economy's decarbonisation.

In the current situation, necessary labour market instruments applicable in the mining industry consist of the complete limitation of new employee hires in the mining industry, relocating employees to other mines, ensuring skills and key positions are monitored, which serves the transition between posts within plants, and support in retraining.

As part of the social aid package, Artur Soboń, Deputy Minister of State Assets, offers miners mining leave, leave for employees of a coal processing plant and one-time severance pay. If an employee forgoes the above instruments, they will be allocated to work in another mine.

This proposal is greatly insufficient and will lead to higher unemployment among employees of the hard coal mining sector. Analyses clearly show that the most effective strategy for dealing with the problem of miners' employment (both in terms of a positive impact on the labour market and cost optimisation) will be retraining combined with the natural process of retirement of older employees. The retraining programme should first cover younger miners (due to their longer remaining professional activity period). Unlike their older colleagues, they will not have the prospect of a stable job in their learned profession and will be forced to switch. The retraining offer should be available to all mining industry and mining-related employees considering a different profession. The offer should be attractive and provide adequate compensation (e.g. paid leave for the period when qualifications are being obtained, financing of travel costs to the place of employment, relocation allowance).

The earliest possible start of the transition and, in particular, labour market instruments aimed at miners, is of great importance. Decisive action is needed in the form of voluntary programmes to retrain mining workers, which should start before notice periods are set. Encouraging a person to change jobs is easier when they have work and want to retrain than if they are already on notice. The offer should include a package of individually selected training courses, with a subsequent option of a smooth transition to an internship or another job.

3. Realistic schedule for mine closures and the end of coal combustion in energy sector until 2035

A clear decarbonisation path has to be drafted and this decision should be taken in 2021. The decarbonisation scenario should ensure mining workers and those in related industries have a transparent professional perspective, and are not dependent solely on fluctuations in CO_2 emission allowance prices. Without an unambiguous declaration radical measures will be needed to quickly address the problem of increasing surpluses, such as abrupt mine closures. This would contradict the very idea of a just transition.

The mine closure schedule should include all hard coal and lignite mines in Poland. Without a doubt, the hard coal mining phase out schedule proposed by the trade unions is dangerous for the miners themselves, because the climate policy and, consequently, the costs of producing energy from coal, will lead to the sudden closure of such facilities. For 30 years, a significant downward trend in coal extraction has been observed in Poland. Were this trend to continue, hard coal mining would end in the 2030s, regardless of the climate policy.

Poland may meet the EU's climate goals in the power sector, which are not compatible with the plan for the restructuring of the electricity and mining industry and PEP 2040. The date of abandonment of coal combustion in coal-fired power plants should be in 2035. In order to maintain the country's energy security, after 2030, the five lowest-emission coal units with a capacity of 4.2 GW may remain in the cold reserve od power until 2040, operating 300-400 hours per year. This scenario would cost PLN 14 billion, which is four times less than the estimated total costs of implementing the power restructuring plan prepared by energy companies and the government under NABE and EDM. Coal mines, with the exception of the Bogdanka mine, should be shut down by 2030. In the same year, the share of coal in electricity production is 13%, and RES is 76%. The proposal of such a scenario of coal phase out could lead the European Commission to agree to support the coal sector on its way to its shutdown, as opposed to the scenarios resulting from the PEP 2040 and the social agreement.

The government side declared that changes to PEP 2040 may be introduced. Therefore, the strategy's provisions should be adjusted to EU objectives and the schedule of mine closures should later be revised every 5 years, with consideration for the climate policy and economic conditions.

4. Territorial Just Transition Plans cohesive with the National Recovery Plan

A realistic mine closure schedule needs to be established as soon as possible in order to properly prepare a Polish National Recovery Plan and other instruments based on EU funds, which will allow more effective financing of the energy transformation. This schedule must not lead to the status quo being maintained or delays in decarbonisation. Expensive coal power will result in stagnating development of Polish enterprises investing in innovation, which could render the Polish economy uncompetitive on the European market.

The National Recovery Plan, construed as a combination of reforms and investments aimed at strengthening Poland's economy and ensuring its resilience to future shocks, such as pandemics and climate change, as well as providing security for Poles, should be part of the energy transformation and just transition. The NRP, as well as the Territorial Just Transition Plans, should feature projects and programmes that will translate support from the NRP into new jobs in regions economically dependent on coal. The Just Transition Fund cannot perform this alone due to its limited budget. A strong impulse for job creation comes with the implementation of the Renovation Wave (among others, increasing the pace and scale of the Clean Air programme), construction (in particular in terms of the necessary development of low-emission and energy-saving buildings), expansion of industries related to circular economy, public transport, investments in the production of heat pumps, components for solar and wind farms, batteries for electric cars and energy storage devices.

5. Reliable knowledge, information and dialogue

During the European Economic Congress, Jerzy Buzek, the former Prime Minister of the Republic of Poland and the President of the European Parliament, underlined the importance of extensive dialogue between stakeholders affected by the transformation. These groups include miners and their families, local entrepreneurs, trade unions, representatives of research centres and non-governmental organisations. The local community needs to be informed that the region is planning to phase out coal and, therefore, requires a new vision of development to be drawn up. Discussing the end of the coal mining era is a huge challenge, as most coal region inhabitants associate it with job losses and destabilisation, leading to increased crime rates and poverty. Preventing hostile attitudes towards the transformation of a region requires an information campaign aimed at familiarising the inhabitants with the reasoning behind the change and its consequences on their lives. *Mining families cannot imagine any industry other than mining. Social programmes and actions must be organised in a manner ensuring that society is ready for change*, said the mayor of Jastrzębie-Zdrój, Anna Hetman, during a seminar on the inclusion of cities in the programming of the Just Transition Fund organised in July by WWF Poland.

Currently, the energy transition process is being discussed with only one social group - miners. The energy transition does not concern only the mining sector or the Silesian voivodeship, and it should not be entirely subjugated to the demands of single social group. A true social contract needs to assume a broad consensus extending beyond trade union expectations and government concessions. Work on the document, which the government and trade unions refer to as the "social contract", is conducted in a very small group, without public consultations and inclusion of more representatives of the social side in the process. The phase out process of one of the most powerful industries in the country should not be discussed in the privacy of one office. Discussions on the future of Poland's energy sector and the economy of coal-dependent regions should include experts, local governments, local business, social organisations, universities and all groups affected by the coal mining sector.

The inclusion of all stakeholders in the decision-making process, as well as discussing their visions of the future and perceived problems, are all crucial from the perspective of understanding the nature of a region whose transformation is planned. Nobody knows a community's needs better than its members. They know the region, which is necessary to prepare solutions that consider all the limitations stemming from the nature of the location or resources. Talks with farmers from Greater Poland have provided information regarding a strong drought in the region, which resulted in the disappearance of lakes. Awareness of this problem makes it possible to develop appropriate solutions, thanks to which agriculture and tourism will be able to further develop in this region. Another risk is that without the participation of smaller players, such as local entrepreneurs or NGOs, support from the fund may be given to large entrepreneurs and corporations, for which it will be easy to join in the cash allocation process. Without extensive participation of all stakeholders with intellectual capital important for the course of the transformation planning process, we will not be able to take advantage of the region's full potential and maximise its chances for development and providing jobs. Public acceptance for the results of this process is of particular importance, as lack thereof may lead to protests and litigation that delay actions and sow discontent among citizens.

A just transformation will not occur without clear information about activities in a few years. The COVID-19 pandemic has clearly shown us that the era of coal mining and combustion is coming to an end faster than expected. Mining faces inevitable redundancies over the next few years. The people who have worked hard underground and their families cannot be left without any alternative employment, constantly deceived with talk of endless coal deposits and mining subsidies. The just transition needs to start in a manner open to all who look courageously into a future that no longer belongs to coal.