Just Transition in Silesia: from coal-centric to coal-exit development pathways

The history of coal in the Silesian region reaches the XVIII century. Given that coal mining has shaped both the economic development of the region and local identity of Silesia for several centuries, it is understandable that transformation of the region and the process of decoupling its growth from coal is a contentious topic. The restructuring of the Silesian economy is a long-term process which has started in the 1990s. It includes not only a gradual phase-out of coal mining but also much broader sectoral realignment from traditional industries towards modern manufacturing and services, in line with a broader transition which Poland has been undergoing since abandoning centrally planned economy and launching the process of integrating with the European Union. Today, these processes are already advanced, but significant challenges remain. 2021 is a crucial year for charting further transition pathways for the region, as two stakeholder processes are set to conclude in the coming months. The first one is the preparation of Territorial Just Transition Plan, and the second is developing mining restructuring strategy.

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Historical background: trans-formational challenges for Upper Silesia

Upper Silesia is one of the oldest industrial regions in Poland. Coal for the heating purposes was mined in the region as early as the late Middle Ages. With the clearing of forests in the 17th and 18th centuries, it began to increasingly replace wood in the local metallurgy, which developed early on thanks to the availability of iron and zinc ores in the region. At that time, however, it was a poorly organized activity, carried out not by professional miners, but rather by peasants, who usually worked as farmers. The industrial mining of hard coal and smelting of metals in the region can be traced back to the mid-18th century when relatively large mines were established to support the development of the iron industry. Due to the infrastructural bottlenecks Upper Silesian coal mining was relatively small then, with production not exceeding several thousand tons per year in both the German (later Oberschlesien) and Polish (later Zagłębie Dąbrowskie and Zagłębie Krakowskie) region. Coal mining was much better developed in the German Lower Silesia, which had at its disposal relatively well-developed water transport infrastructure. In consequence, tens of thousands of tons of coal per year were mined in this region, not only for the local market but also for Wroclaw and Berlin (Jeżowski, 1961). The turn of the eighteenth and nineteenth centuries were also the beginnings of the Upper Silesian mining culture. Its development was stimulated by the emergence of a class of professional miners and the Prussian regulations dedicated to mining, that – among

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others - guaranteed people working in the mining industry the privilege of personal freedom together with the exemption from serfdom and military service or taxes (Michalkiewicz, 1984). Miners unable to work due to old age or disability were also granted small pensions and widow allowances. In the territories of the former Polish-Lithuanian Commonwealth (in the Kingdom of Poland) this type of reform was carried out in 1817 when the Mining Corps was established. Corps' member, like in Prussia, were exempted from serfdom, taxes and military service, while at the same time they were being guaranteed funds for medical treatment as well as payments of allowances and pensions for widows and orphans from the special fund established for this purpose (Michalkiewicz, 1984). During that time, in both parts of Upper Silesia, the custom - guaranteed by law and continued to this day - of wearing a special miner's uniform began to take shape.

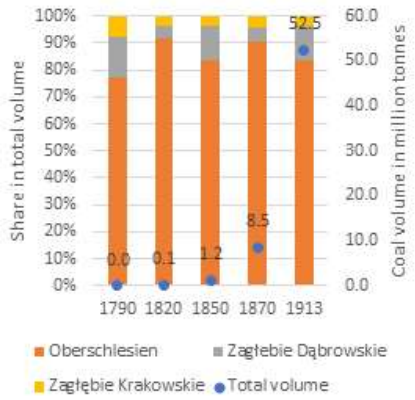

Figure 9 Coal production in Upper Silesia 1790-1913

Source: WiseEuropa based on data compiled from Frużyński (2012)

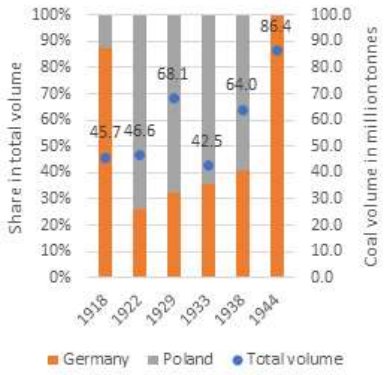

Figure 10 Coal production in Upper Silesia 1918-1944

Source: WiseEuropa based on data compiled from Frużyński (2012)

The semi-industrial nature of Upper Silesia was shaken during the Napoleonic Wars when the region lived through its brief economic collapse, partial depopulation and the bankruptcy of some of the early industrial plants and mines. However, France's defeat in the Russian campaign and Prussia's post-1810 armaments program led to a rapid economic recovery and – in a few years - increased coal production to around 100,000 tons per year – a level well above the results recorded at the end of the 18th century, but still slightly inferior to the performance of the mining sector in the nearby Lower Silesia (around 150,000). Mining also developed in the Dąbrowskie Basin (Przemasza-Zieliński, 2006). The region belongs to the Silesian Voivodeship today, and during this period it was located within the borders of the Russian dependent Kingdom of Poland. Around 1820, only 5,000 tons of coal were mined there per year, but by the mid-nineteenth century, almost 150,000 tons were already being used mainly in the heavily supported iron industry. The real revolution for Upper Silesia – both in the part controlled by Prussia (Oberschlesien), Russia (Dąbrowskie Basin) and Austria (Cracow Basin) – turned out to be the railway boom of the 1840-1870 period (Dylewski, 2012). Over the course of several years, the region has been

connected to the fast-growing industrial cities: Wroclaw, Berlin, Krakow, Vienna and Warsaw, which have become an absorbent market for Silesian coal, iron and zinc. This period was, therefore, a time of great boom in mining, which benefited both from the increasing demand for coal and from doubling its price. In 1873, almost 8 million tons of coal were mined in 142 mines in the Prussian part of the region – almost four times more than in neighbouring Lower Silesia and twenty times more than in the Dąbrowskie Basin, which industrialization during this period was slower due to competition from coal imported from parts of the Prussian region and the delayed modernization of the Russian partition.

A significant acceleration of economic development in the Kingdom of Poland began after 1870 thanks to the rapid industrialization of Łódź and Warsaw districts initiated by the expropriation reforms in the countryside and the introduction of protective duties on the border with Prussia on industrial goods. This changed the situation in the Dąbrowskie Basin, causing a rapid increase in coal mining, which in 1913 mined almost 7 million tons employing 25,000 people. During this time, 63 mines located in the Prussian province of Oberschlesien employed 123,000 miners extracting 43.8 million tons of coal per year (Frużyński, 2012). Thanks to the development of mining, iron and zinc metallurgy, and after 1870 also the chemical and metal industry just before the outbreak of the First World War, the Prussian part of Upper Silesia became one of the richest regions of Germany. The development of the Dąbrowskie Basin was less spectacular and diverse, but at the end of the nineteenth century, it also gained the status of one of the most industrialized regions of Tsarist Russia, while providing basic raw materials for the well-developed – compared to the rest of the Romanov empire – Warsaw and Łódź districts. A much less economically significant region was the Cracow Basin, which, as a part of Austrian Silesia, was clearly second in terms of the development of its Czech part. Simultaneously, thanks to large-scale immigration from less industrialized neighbouring areas, the development of mining, iron and zinc smelting, and chemical industries, as well as the intensive development of railway infrastructure, all three parts of Upper Silesia became some of the most heavily urbanized parts of Europe. Strong urbanization and the industrialization of the region are features that distinguish it from other parts of Poland, constituting its relative advantage over some post-mining districts in Europe like Welsh Glamorgan County.

The years 1914-1946 were a breakthrough for Upper Silesia both economically and politically. Back then, the region was of key strategic importance both for reborn Poland, for which coal became a major export commodity (Kaliński, 2000), and for Germany, because of its position on the map, away from the front lines for much of the First and Second World Wars. Industrial production in Silesia was also fluctuating in the wake of the political and economic events of the period. It was booming between 1914-1917 and 1940-1944 when the strong fuel demand of much of the German economy had to be met and during the so-called roaring 20s from 1922 to 1929, when both Germany and, to a lesser extent, Poland, were experiencing a period of relative prosperity. However, after these short-lasting episodes of prosperity, there were sharp production collapses during the chaos surrounding the end of both wars and the Great Depression of the 1930s. As a result, between 1918 and 1922 Silesian mines extracted about 10%, and in 1933 even 20% less coal than before the Great War. However, preparations for the Second World War in 1933-1939 and the War itself in the period of 1939-1944 led to an overrun of the amount of coal produced in Upper Silesia compared to

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1913 by 20% and 65% respectively. During that period, there were significant technological changes in the mining industry itself, which resulted in a noticeable increase in the mining efficiency not only during the war but also after 1945, when the whole region, for the first time, fell within the borders of one country – the Polish People's Republic.

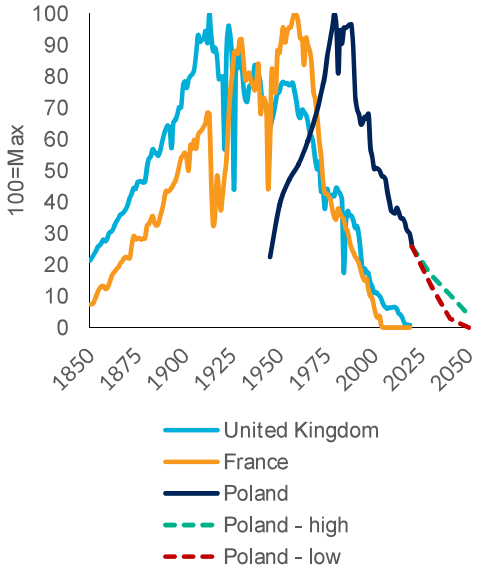

Figure 11 Steam coal extraction in Poland and selected EU countries during 1850-2020

Source: WiseEuropa based on Eurostat and Bukowski et al. (2015)

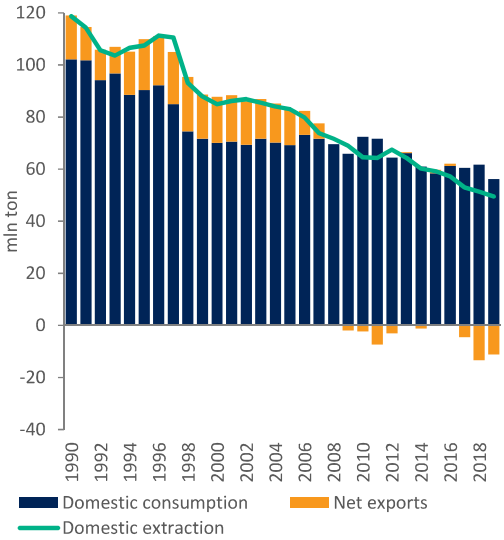

Figure 12 Extraction, domestic use and net export of steam coal in Poland, 1990-2018

Source: WiseEuropa based on Eurostat and ARP

In the economic landscape of The Polish People's Republic, Upper Silesia occupied a central place. This was due to the very high internal demand for coal from the rapidly electrifying economy and the soviet-based heavy industry patterns. Strenuous industrialization required the authorities of the People's Republic of Poland to purchase a number of licenses, machines and equipment from the western European countries. This translated into a sufficiently high export revenue, which could only be sourced from natural resources – especially hard coal. The rank of Upper Silesia on the economic and political map has therefore increased significantly, and the region has begun to enjoy relatively high prosperity compared to the rest of the country: higher wages, better supply of basic goods and improved infrastructure while becoming the site of many flagship central investments - both industrial (e.g. in energy and metallurgy) and social (health, sport and culture). Many privileges were also enjoyed by the miners themselves, who – compared to the employees of other industries - received from the Polish People's Republic special allowances for salaries, better holiday conditions, dedicated pension plans and even entertainment in the form of domination of sports leagues by the heavily subsidized mining clubs. However, export pressures and the inherent characteristics of the centrally planned economy meant that the exploitation

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of coal deposits in Silesia took place at increasing environmental and economic costs. As early as the 1980s, many functioning mines were so low-performing that their operation had no economic justification. Given the high position of the industry in the struggling economy of the Polish People's Republic, high bargaining power of miners and the distorted price signals (low energy prices in the internal market), became evident problems just before the collapse of the socialist system in 1989. The stabilization reforms carried out between 1989 and 1990 under the so-called Balcerowicz's plan, revealed the real structure of costs and revenues at the company level and the real form of supply and demand curves at the level of the national economy. These pointed to many structural challenges that the region was facing: too large and unproductive capacity in the steel industry, very energy-intensive manufacturing, as well as a huge variation in the efficiency of mining between different coal mines. In 1990, Upper Silesia was therefore in a similar situation to many regions of the traditional industry in North America or Western Europe 20 years earlier. Domestic energy demand has fallen, many companies have reduced production and employment, and a number of mining towns faced the need to close their 100-year-old mines and struggle with high unemployment.

This situation changed in about 2000 when many investments of international corporations have started to flow into Upper Silesia. They have chosen the region based on the depth of the regional labour market, good infrastructure, the existing industrial base and its location relative to other industrial centres in Poland, the Czech Republic and the Federal Republic of Germany. This largely mitigated the effects of the restructuring of mining and heavy industry, which, despite 30 years of reforms, is still far from being completed. Although the region has undergone major changes since the early 1990s, it still faces serious problems: mining damages, high levels of environmental pollution, the rapid ageing of the population of major cities, mass youth emigration, and low territorial cohesion. At the same time, the still-functioning mining companies are so weak organizationally and financially that they are unable to carry out their restructuring programs on their own. As they continue to employ around 100-150 000 people in the region (combined with the related industries), this problem is one of the most serious structural challenges of the modern Polish economy, strongly impacting how the country approaches EU climate policy.

Current developments: new strategic dimensions

2020: a new chapter for Polish coal-exit discussions (?)

Lack of sectoral reforms focusing on downsizing extraction and shifting it towards most efficient mines, even despite the ever-increasing climate ambition at the EU level and gradually decreasing competitiveness of Polish mines, have left the sector on the verge of another crisis in 2020 even before the COVID-19 pandemic shock. Most of the sector recorded losses, with the key producer – Polish Mining Group, PGG – finding itself on the brink of insolvency (Oksińska, 2020). Similarly to other companies, PGG was able to secure aid in May via a short-term, small-scale furlough-support scheme which was a part of initial anti-crisis measures provided by the Polish government to all enterprises in response to the first wave of pandemic (“PGG has lost 5x”, 2020). However, the structural problems with high costs and low productivity of mining posed challenges for the Group to obtain further financing from the governmental cross-cutting support package

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(so-called Anti-Crisis Shield). In mid-2020, it became clear that short-term fixes are no longer viable and the sector requires a long-overdue mining restructuring strategy. The access to the governmental support has thus been made conditional upon presentation of such strategy to the Polish Development Bank and its notification by the European Commission (Mieżejewski, 2021).

As a result, the new chapter for the Polish coal-exit discussions has been opened, offering a chance to address both the short-term crisis-related- and deeply-rooted structural problems of the mining sector (Bukowski & Śniegocki, 2020). However, the initial phases of the process do not offer solutions needed to realise that potential. Although, given that it is not possible to subsidize mines under the current EU's state aid rules, in the summer of 2020 it seemed that the crisis would be resolved by presentation of the strategy for closure of unprofitable Silesian mines and operation plan for economically viable ones, the situation developed differently. The suggested approach has met with strong opposition from the trade unions, which led to the start of the prolonged political negotiation process between the unions and the government. This has shifted the focus of the restructuring strategy from adjusting the economic situation of Silesian coal mines to market realities, towards securing the unions' priorities – especially maintaining operations of mines and delaying decline of employment in the sector as long as possible, even via subsidies if necessary. Despite the risks associated with the need to take into account EU state aid rules, a long negotiation process and far-reaching demands from the unions, the negotiations between the government and the unions on the final shape of restructuring strategy began in Q3 of 2020 (Ministry of State Assets, 2020). Neither the pace nor the scale of the solutions that have been put on the table by the end of January 2021 will, however, allow for the preparation of the sector for the challenges associated with the decarbonisation of the Polish economy in line with the 2030 and 2050 EU climate targets.

There are two main axes of the ongoing discussions – the overarching framework outlining pace and the rules of restructuring and the Social Contract that will enable operationalisation and implementation of the framework:

- **The framework:**
  On 25th September 2020, the mining unions and the government signed an agreement on the transformation of the mining industry. According to the document, the last steam coal mine in Silesia is to close in 2049 and underground miners will have a guarantee of employment in the sector until retirement. The agreement gives a mandate for the preparation of the Social Contract and safeguards that the provisions of the Contract will govern the provisions of the final version of the Energy Policy of Poland until 2040, that is currently being prepared by the government (Baca-Pogorzelska, 2020). Importantly, it is being emphasised that the implementation of the actions outlined by the framework is conditional upon the approval from the European Commission for the state-aid needed to support operations of the Polish mines.
- **The Social Contract:**
  Despite the initial deadline for the publication of the Contract on 15th of December 2020, the discussions have been postponed to January 2021 and are still ongoing beyond the initially planned schedule. At the beginning of 2021, both sites have presented their own proposals

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of the Social Contract – the document submitted by the Ministry of State Assets has been rejected by the unions' representatives, who tabled their response for the Ministry ("Unions have presented their vision", 2021). The proposal for the Contract prepared by the unions indicated that the majority of mines will be operating until 2035 and establishment of the investment fund that would support their current operations. In the document, the focus was also being placed on the system of social protections for employees of the mining sector as well as on the development and investments in the "clean coal" technologies. The unions' proposal envisages that the activities will be financed inter alia from the EU ETS revenues and the European Recovery and Resilience Facility. Currently, further talks in the form of working meetings with representatives of several ministries are being planned for early February and according to the announcements the agreement is expected to be reached by mid-February.

From the economic perspective, given the stagnation of coal prices on the international market, the low efficiency of Silesian mines and the high generation costs in old coal-fired plants coupled with their inability to compete on the international market, such efforts to maintain operations of Silesian coal mines well into the 2040s cannot be justified. Simultaneously, from the legal perspective, in the current shape, provisions of both the framework and the Social Contract entail actions, which are explicitly prohibited by *inter alia* the EU state aid rules (which in current shape allow for coal financing until 2040) and the rules governing the disbursement of the EU funds (i.a. do no significant harm rule associated with Recovery and Resilience Facility) (European Commission, 2020c). Thus, it is highly unlikely that the agreement will materialise in the near future, and both sides will have to return to the negotiating table.

Current provisions entailed in the restructuring strategy do not scale up the pace of the coal-exit in Silesia and more generally in Poland. Conversely, they aim to sustain the current status quo of the mining sector and counteract market forces, which, without such state intervention, would lead to a much faster decline of the mining sector in Poland following the trends recorded by other EU countries. Such inherently flawed process of designing the restructuring strategy for the sector hinders not only the process of Just Transition of the Silesian coal region but also allows for a disproportionate impact of trade unions on the final shape of the national energy strategy, threatening the possibility to decarbonise Polish economy in the economically effective and efficient manner.

Territorial Just Transition Plans: Silesia

Currently, at the strategic level, measures regarding the Just Transition of Polish coal regions are included in the National Energy and Climate Plan (NECP) and in the draft Polish Energy Policy until 2040. Both documents identify the most important categories of challenges related to the transformation of mining regions, however, the recently presented assessment of the Polish NECP prepared by the European Commission highlights the need to refine and provide additional information on the effects of the transformation (European Commission, 2020b).

At the same time, the NECP presents only the national-level overarching framework for the transformation of coal regions, leaving a detailed plan of actions necessary to be

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implemented in individual voivodeships to be specified in the Territorial Just Transition Plans (TJTP). The role of TJTP is to determine the transformation strategy of a given coal region, which should be consistent with the NECP and the goal of climate neutrality in 2050 (European Commission, 2020a). Plans should focus on supporting the most severely affected areas by identifying key socio-economic and environmental challenges and by precisely defining restructuring tools and methods. Preparation of TJTP is a condition that has to be met in order to access the European Just Transition Fund, from which Poland will receive the largest share of funds.

In December 2020, Marshal Office of the Silesian Voivodeship has informed that it aims to present TJTP to the European Commission by June 2021 and will be prepared to present its project already at the beginning of 2021 ("Presentation from the 6th meeting", 2020). Local authorities emphasise that TJTP for Silesia will not only guide the investments supported from the Just Transition Fund allocated to the region (EUR 2 bln) but also from ERDF and ESF+. Importantly, according to the announcements made by the Ministry of European and Development Funds, in 2021-2027 Silesia will receive the largest share of EU funds (EUR 4.4 bln) when comparing to other European regions ("Billions of the region", 2021).

Awaiting the official document, several organisations are calling for the Plan to prioritise the following investment challenges:

1. expansion and diversification of the local industrial base with highly productive low-emission sectors and development of an advanced services segment.
   Recent estimates show that expansion and diversification of the regional economic activity can lead to the creation of 75-85 thousand new vacancies. For comparison, it is estimated that in 2019 ca. 75 thousand employees worked in the mining sector in Silesia (IBS & WWF, 2021).
2. improvement of competitiveness of higher education institutions and research institutes coupled with reskilling of the mining sector employees
   This means increasing the academic status of regional higher education institutions and research institutes, as well as reprofiling some of them to support sectors not connected directly with the mining sector as a necessary step to ensure the creation of modern industrial commons, i.e. networks of close connections between the centres generating human, social, and physical capital (Bukowski, Śniegocki, & Wetmańska, 2020).

The announcements regarding the TJTP released to date, allow to assume that the planned structure of spending so far will resemble the priorities known from previous cross-cutting Regional Operational Programs. On one hand, this is beneficial as it will allow for the Plan to tackle a wide range of challenges whilst taking into account social aspects of the regional development, but on the other hand, it remains to be seen to what extent the Plan will manage to offer solutions tailored to the specificity of the given regions in transition. This will be especially challenging given the uncertain impact of parallel talks between the government and trade unions on the future of Silesian mining. Without a realistic timeline of further mine closures, it is still not known which local communities will face the transition shocks in the near future, when will these shocks happen and what will be their scale. This is currently the key obstacle to designed well-tailored, coordinated and timely support within the Silesian TJTP.

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Conclusions

The future of just transition in Silesia is currently being determined by two parallel processes. The first of them is the development of the Territorial Just Transition Plan by regional authorities in cooperation with the broad range of stakeholders. The Plan focuses on the mitigation of the negative consequences of the decline of carbon-intensive industries by supporting economic diversification and social inclusion in the affected local communities. The second process focuses on determining the pathway for coal mining restructuring, and in particular specific dates for mine closures as well as potential subsidy schemes which may allow extending the timeline of coal mining exit up to 2049. The latter process is dominated by the mining trade unions, which have been engaged in an extensive negotiation process with the government.

Both processes were launched in response to long-term structural challenges, and are being implemented at the time when the significant resources for supporting the just transition formation are abundant. While both processes could be designed in a way which is mutually reinforcing and aiming to reduce the dependency of the region's economic development on the mining sector, this has not been the case. While the preparation of the TJTP is following EC's guidance and build on well-established regional capacities in inclusive management of the EU funds, the preparation of the mining sector deal is being dominated by the mining trade unions which are focused on extending the functioning of the sector for as long as possible, despite legal barriers and economic costs of introducing continued sectoral support up to 2049.

While both processes are yet to conclude in 2021, they already offer an important example of both good and bad practices in managing transition on the regional level. Resulting delays and uncertainties around the future of transition in Silesia highlight the need to ensure that any discussions on regional just transition are inclusive, covering not only representatives of declining carbon-intensive industries (in Polish case: trade unions and the national government, which holds the controlling stake in all the major mining companies), but also regional and local authorities, representatives of other sectors and civil society.

References

Baca-Pogorzelska, K. (2020, September 26). *Peculiar agreement between the government and mining trade unions*. OKO.press. https://oko.press/kuriozalne-porozumienie-rzadu-z-gorniczymi-zwiazkowcami-analizujemy-punkt-po-punkcie/

Billions for the region. (2021, January 20). *Silesian Voivodeship*. https://www.slaskie.pl/content/miliardy-na-rozwoj-regionu

Bukowski M., Maśnicki J., Śniegocki A., Trzeciakowski R. (2015). *Polish coal, Quo vadis? Perspectives of development of Polish coal mining sector.* WiseEuropa.http://wise-europa.eu/2015/06/15/polski-wegiel-quo-vadis-perspektywy-rozwoju-gornictwa-wegla-kamiennego-w-polsce/

Bukowski, M., & Śniegocki, A. (2020). *Restart: how to break the deadlock in the Polish energy sector*. WiseEuropa. http://wise-europa.eu/wp-content/uploads/2020/09/NOWY-%C5%81AD-policy-brief-ENG.pdf

Bukowski, M., Śniegocki, A., & Wetmańska, Z. (2020). *From restructuring to sustainable development. The case of Upper Silesia*. Report by WiseEuropa for WWF Poland Foundation. http://wise-europa.eu/wp-content/uploads/2018/11/From_restructurin

g_to_sustainable_development._The_case_of_Upper_Silesia-1.pdf

Dylewski, A. (2012). *Historia kolei w Polsce*. Warsaw, Poland: Carta Blanca.

European Commission. (2020a, May 28). *EU budget for recovery: Questions and answers on the Just Transition Mechanism.* https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_931

European Commission. (2020b). *Commission staff working document. Assessment of the final national energy and climate plan of Poland*.https://ec.europa.eu/energy/sites/ener/files/documents/staff_working_document_assessment_necp_poland.pdf

European Commission. (2020c, December 18). *Commission welcomes political agreement on Recovery and Resilience Facility* [Press release]. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2397

Frużyński, A. (2012). *Zarys dziejów górnictwa węglowego w Polsce*. Zabrze, Poland: MGW.

IBS & WWf. (2021). *Pathways for Just Transition of the Silesian Voivodeship – executive summary.* https://view.publitas.com/wwf-poland/kierunki-rozwoju-i-sprawiedliwej-transformacji-wojewodztwa-slaskiego-streszczenie-zarzadcze/page/1

Jeżowski, K. (1961). *Rozwój i rozmieszczenie przemysłu na Dolnym Śląsku w okresie kapitalizmu.* Wrocław, Poland: Ossolineum.

Kaliński, J. (2000). *Zarys historii gospodarczej XIX i XX w.* Kraków, Poland: PWE.

Michalkiewicz, S. (1984). *Przemysł i robotnicy na Śląsku do 1914 roku*. Katowice, Poland: Wyd. Śląsk.

Mieżejewski, J. (2021, January 25). *PGG faces problems*. Gazeta.pl. https://next.gazeta.pl/next/7,151003,26719740,pgg-z-problemami-przedstawiciel-solidarnosci-srodki-na-wyplaty.html

Ministry of State Assets. (2020, September 25). *Agreement on the restructuing of the mining sector and its future has been signed*. [Press release]

https://www.gov.pl/web/aktywa-panstwowe/porozumienie-w-sprawie-transformacji-i-przyszlosci-gornictwa-podpisane

Oksińska, B. (2020, July 16). *Miners don't have more patience, PGG doesn't have more money*. Rzeczpospolita. https://www.rp.pl/Wegiel/307169883-Gornikom-konczy-sie-cierpliwosc-a-PGG-pieniadze.html

PGG has lost 5x more money in 2020 than in 2019. (2020, December 30). *300gospodarka*. https://300gospodarka.pl/news/polska-grupa-gornicza-w-2020-roku-stracila-5x-wiecej-pieniedzy-niz-rok-temu

Presentation from the 6th meeting of the Regional Committee. (2020, December 7). Silesian Voivodeship. [Conference presentation]. https://transformacja.slaskie.pl/download/content/161

Przemsza-Zieliński, J. (2006). *Historia Zagłębia Dąbrowskiego*. Katowice, Poland: ASPiK.

Unions have presented their version of the Social Contract for the mining sector. (2021, January 18). *Puls Biznesu*. https://www.pb.pl/zwiazkowcy-przekazali-map-swoj-projekt-umowy-spolecznej-dla-gornictwa-1105834