

The Transformation of the Polish Coal Sector

GSI REPORT



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Introduction

The restructuring of the coal mining sector in Poland is directly linked with the general political and economic reforms that started in 1989. The closing of the least profitable collieries, reduction of coal production and the size of the workforce in the sector were relatively successful parts of this process, especially during its first decade. The main failure was the sector's continued lack of profitability, despite numerous debt adjustments. The instrument which is widely recognized as the most successful during that period (the Mining Social Package) did not prevent substantial social costs, mostly inactivity or unemployment among former miners. Although the mining regions regained a relative prosperity, selected local communities still suffer from unemployment, poverty or social exclusion.

In the first section, we outline the importance of the coal sector in Poland and briefly describe its development as a part of today's Poland from the 19th century¹ until the end of the 20th. In the second section, we focus on the main economic trends of the coal sector transformation that began in 1989 and continues today. We explain its political context and present approaches to the main problems adopted in governmental programs. We assess the role of the main political actors of that process and the reforms implemented. We argue that, although some of the transformation outcomes are remarkable, the overall process can be seen as neither finalized nor successful. In the third section, we discuss two instruments—the Mining Social Package and special privileges for the mining communes.² The Mining Social Package was particularly effective in reducing employment and the number of collieries. The privileges for the mining communes offered a new situation in which mining restructuring started to be perceived as a challenge for the economy of mining regions. Both instruments, despite their positive aspects, turned out to also have significant deficiencies. In the last section, we offer suggestions on how these deficiencies can be overcome to improve the restructuring.

¹ From 1795 to 1918 Poland was divided between three empires—Austria-Hungary, Prussia and Russia. The Upper Silesia Region was a subject of territorial disputes between Czechoslovakia, Germany and Poland, which were resolved in 1921 when a majority of the industrialized cities became part of the autonomous Silesia region within Poland.

² See Box 4, p. 16, for a definition of “mining commune.”



1.0 Development of the Polish Coal Industry

Coal mining has a long tradition in Poland and played an important role in its development. Coal was used in Poland from the Middle Ages onward, but only on a small scale initially due to cheap and easily available wood. The production of coal for industry started in Lower Silesia and Upper Silesia in the 18th century, and in the 19th century it became the main driver of regional growth (Soliński, 2012; Gwosdz, 2013).

The discovery of new coal reserves, particularly in Upper Silesia (Box 1), attracted investments in construction of collieries. Initially, this investment was mainly for zinc and iron smelting, but this was later expanded to include lead and non-ferrous metals. In the middle of the 19th century, annual production of coal was approximately 1.5 million tonnes (Soliński, 2012). Its growing production was also connected to the development of transport, especially railroads, and increased use of steam engines and electrification, both in industry and the residential sector.

Industrialization initiated parallel processes that transformed the spatial, economic and social structure of this region. Urbanization took place around the emerging industrial centres, most prominently the Silesian conurbation. It was built on rapidly modernizing (e.g., Gliwice, Bytom) or new villages turning into cities (e.g., Katowice, Zabrze) (Gwosdz, 2013). The rapid progress of this region was associated also with the development of social rights and workers' movements. These processes contributed to the creation of a new cultural identity with a strong ethos of work (Swadźba, 2001). Together, these factors built the foundation of the image of coal mining as the engine and guarantor of Polish prosperity.

Box 1

Upper Silesia is a historical and geographical region with a strong heritage of Polish, German and Czech culture. The Upper-Silesian coal field spans the territory of four regions (NUTS 2): Silesian, Opole, Lesser Poland and Silesian-Moravian (the latter in Czechia).

In the 20th century, Poland established a strong position among the world's coal-producing countries. From 1900 to 1984, together with the United States, USSR, United Kingdom and Germany it was among top five global producers (Gordon, 1987). However, whereas coal production in the 1920s and 1930s was economically justified, during the post-World War II period, it became unviable after the inclusion of Poland in the Eastern Bloc (1945 to 1989) and the consequent nationalization of companies and implementation of central planning.

Although coal production grew steadily until the late 1970s, the sector and related industries became dysfunctional. In 1979, production reached its peak of 201 million tonnes. However, the main reason for growing coal production was that, within the Eastern Bloc,³ countries that delivered a surplus of their planned production could expect additional investments (Blaschke, 2002). Combined with the lack of free market (with its price signals) this situation led to a suboptimal economic structure. Shortages in domestic production of consumer goods are believed to be one of the economic reasons for the collapse of the communism in Poland. In the coal sector, the falling efficiency of collieries and lack of access to global markets were the main reasons for their catastrophic condition in the 1980s.

³ Formally, the economic organization including the Eastern Bloc but also other communist countries under the Soviet umbrella was the Council for Mutual Economic Assistance.



2.0 Transformation of the Polish Coal and Energy Sector (1989–2015)

Replacing central planning with the free market was the most important economic priority of the Polish democratic transition that started in 1989. Large industrial companies underwent restructuring. Those that were not shut down due to their weakness, were mainly commercialized or privatized. The restructuring processes contributed greatly to rationalization (economization) of production processes. In the case of state-owned or state-controlled related companies, it ensured also the transfer of management from the government level closer to the level of companies. However, the difficult situation of the sector and its strategic position for energy security still make it vulnerable to political pressure.

2.1 Main Trends in the Transformation

The two main priorities for the coal sector transformation were to increase its productivity and profitability. This was to be achieved by reduction of the workforce and liquidation of unprofitable collieries. Together with the adjustment of production to demand, investments in infrastructure and machinery as well as debt reduction, the coal mining sector was meant to once again become an important part of the Polish economy (Karbownik & Bijańska, 2000; Korski, Tobór–Osadnik, & Wyganowska, 2016).

The radical employment reduction in the hard coal mining sector was conducted mostly during the first decade of transformation. The number of miners fell from 388,000 in 1990 to 98,000 in 2015: 85 per cent of this reduction occurred prior to 2002 (Figure 1). Between 1990 and 1995, employment reduction was achieved almost entirely through a hiring freeze. Since the mid-1990s, this process was increasingly supported by additional incentives (see Section 2) in order to keep the pace of reforms. Reduction of the underground workforce within collieries decreased slower than among office employees. In 2002, reduction of the workforce slowed down and the proportion of underground workers and office employees remained steady (Korski, 2016). In recent years, a widening generational and qualification gap in the sector led to reopening of some mining schools and new hiring (Bluszcz, 2014).

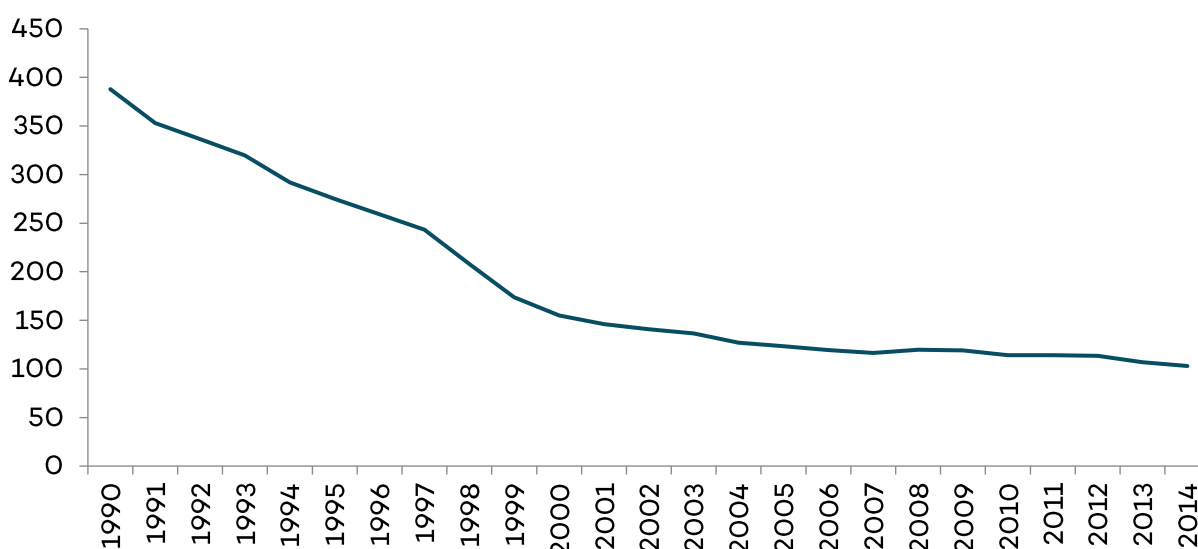


Figure 1. Employment in the hard coal mining sector in Poland (miners, '000)

Source: Authors' graph based on Zych, 2015.

The workforce reduction was strongly related to the closing of unprofitable collieries. Again, the most spectacular drop took place during the first decade, when 30 out of 70 collieries were closed. In the following six years, another 12 collieries were closed, until this process stopped (Figure 2). Closure processes were driven



mainly by the falling profitability of particular collieries and through negotiations between social partners. No mines have been closed since 2007. However, in 2016, an additional seven mines (out of which three were collieries) were scheduled to be shut down in coming years through an agreement between the European Commission and the Polish government.

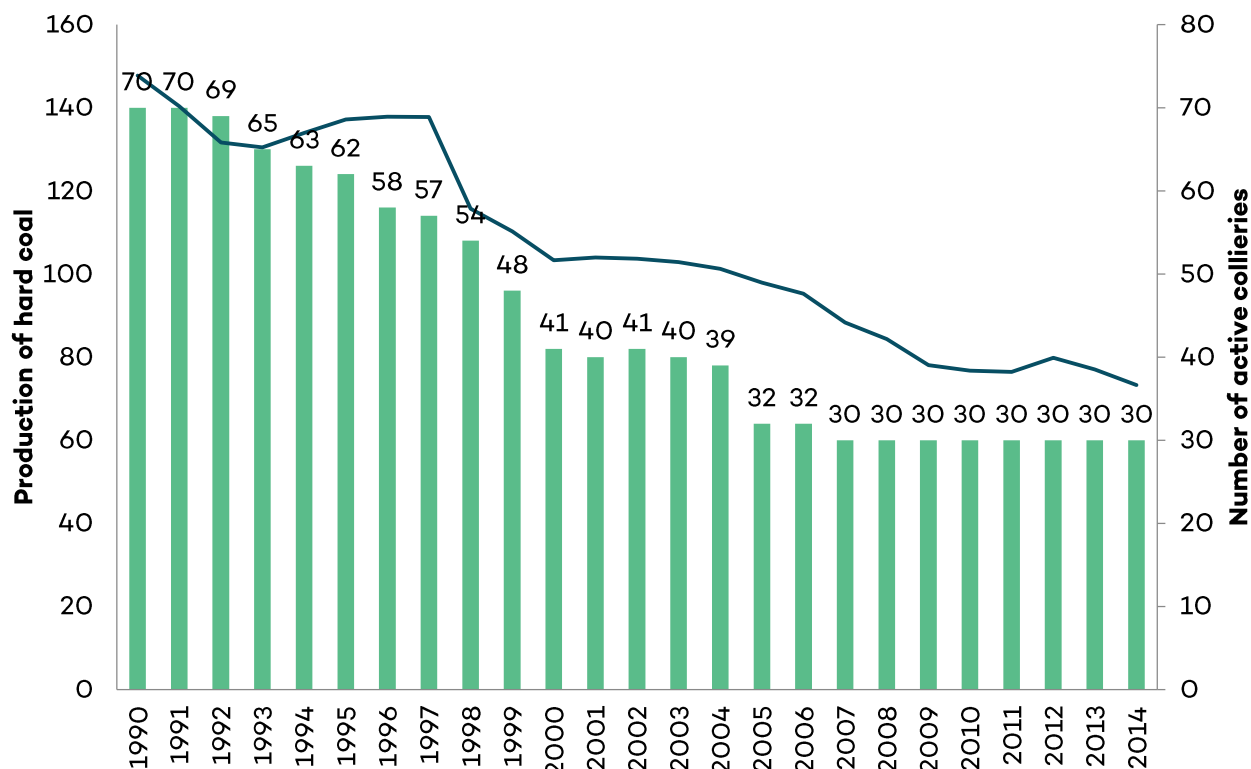


Figure 2. Production of hard coal (millions of tonnes) and number of collieries

Source: Authors' graph elaboration based on IEA.

Production of hard coal in Poland dropped drastically during the 25 years of transformation. Although in the 1980s the growth of production to the level of 300–320 million tonnes was considered possible (Blaschke, 2002), between 1990 and 2014, it dropped more than two times, to 73 million tonnes. Still, among the current EU member states, Poland remains the largest hard coal producer, though its share of world production decreased from 4.7 per cent in 1990 to 1.2 per cent in 2014.

A symbolic breakthrough for the sector was the fall of both the volume and value of coal exports below the level of imports (Figure 3). The volume of exports decreased rather progressively during the first two decades of the transformation, although its value remained fairly steady. At the same, coal imports, most particularly from Russia (where lower VAT and transport subsidies additionally favour its competitive price), grew, and in 2011 it was twice the volume of coal export. Imports of coal to Poland were profitable mostly for two reasons. Firstly, it met the demand in northern and eastern regions of Poland, where the geographical rent for imports was lowered due to new seaports in northern Poland and new railway hubs close to Polish eastern border. Secondly it was the result of the environmental requirements for lower sulphur and ash content in coal, which in Poland is generally relatively high.

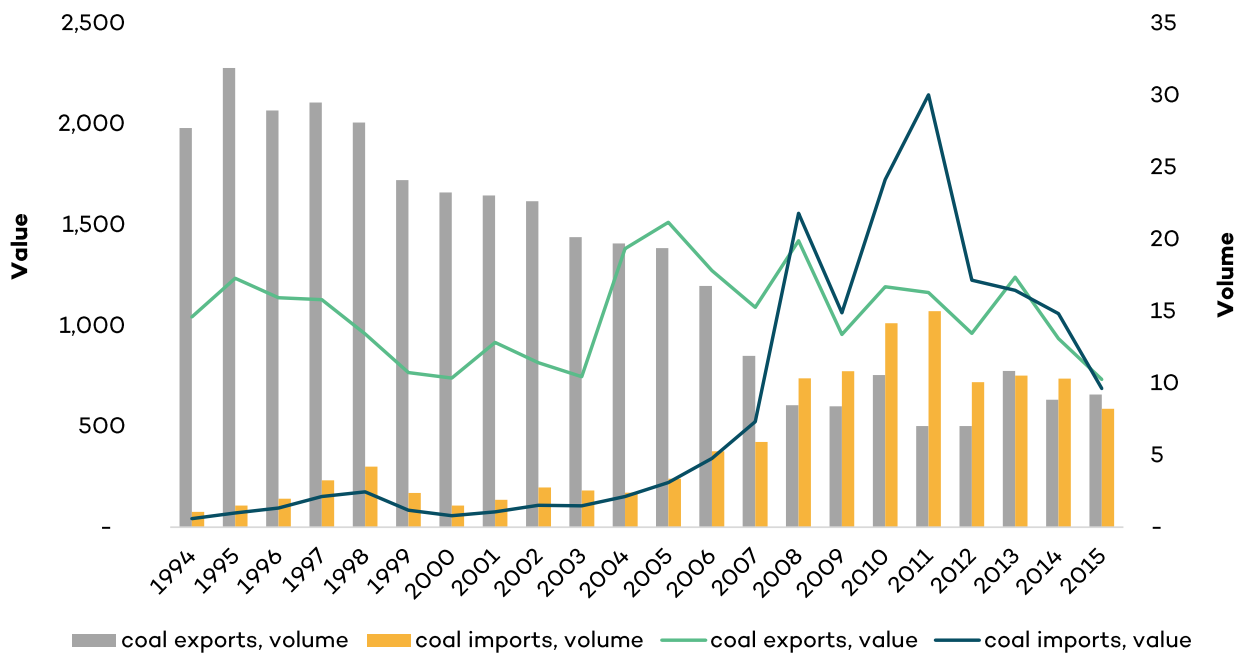


Figure 3. Trade in coal: value (USD million) and volume (million tonnes)

Source: Authors' graph based on Comtrade.

The restructuring process faces several technical and geological problems. The quality of coal produced in Poland is decreasing and the average depth of mines is growing. Both factors negatively affect mine profitability. Additionally, the number of underground workers per long wall is increasing, which is a sign of growing labour intensity. At the same time, a positive trend of increasing productivity of underground workers has been slower than in other countries using the same mining technologies (Korski et al., 2015). Despite numerous plans to build new mines able to reach better-quality coal, the most recent Polish mine is over 20 years old.



Map 1. Employment in coal mines (thousand, 2014) and consumption of coal (million tonnes, 2015) in Polish regions

Note: Employment in coal mines (thousand, 2014 - right data series), consumption of coal (million tonnes, 2015 - left data series)

Source: Hibner, 2016 (employment in coal mines); GUS, 2016 (consumption of coal).



Coal is the most important primary energy fuel in Poland. Apart from historical reasons, it is also because of the relative scarcity of other energy sources. Oil, the second biggest source of primary energy, is entirely imported. Of the third biggest source of energy—natural gas—almost 30 per cent is produced domestically with just over 70 per cent imported. In the face of difficult political relations with Russia—the main exporter of energy to Poland—there is concern about any radical transformation of the energy mix which could lead to increasing dependence on Russian supplies. The fourth-biggest source is wood—the main part within the “biofuels and waste” category. It is used largely in the process of co-firing as a supporting fuel in traditional coal power plants, but overall it makes up only a minor part of supply.

Although coal’s role in primary energy supply remains essential during transition, its use declined faster than any other fuel. Between 1990 and 2014 its share dropped from 76 per cent to 53 per cent. This can be attributed mostly to the improving efficiency of industry. The second-most important fuel, crude oil, experienced significant growth in the same period, from 13 per cent to 23 per cent. This trend was mainly due to development of the transport sector but also the growing number of private cars.

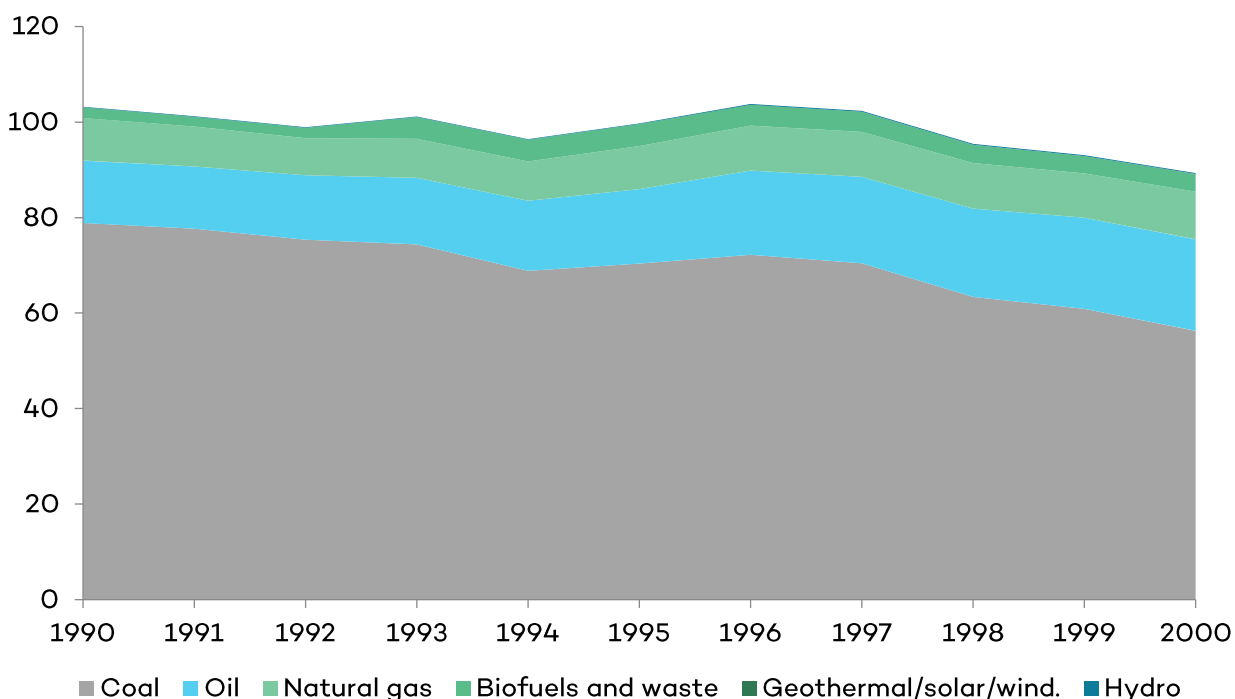


Figure 4. Total primary energy supply (excluding electricity) (million kilotonne of oil equivalent [ktoe])

Source: Author’s graph based on IEA.

The energy sector was and still is the biggest consumer of coal domestically. It is currently responsible for almost 59 per cent of coal consumption, ahead of industry and buildings (23 per cent) and the residential sector (13 per cent) (GUS, 2016). Despite this high rate, the importance of coal in the economy during transformation steadily decreased (Figures 2 and 4). It was mainly due to improvements in energy efficiency—from the modernization of infrastructure—but also from the collapse of many inefficient companies, including energy-intensive industries. During the fast and durable economic growth observed in Poland since 1992, the two trends were permanently decoupled (Figure 5).

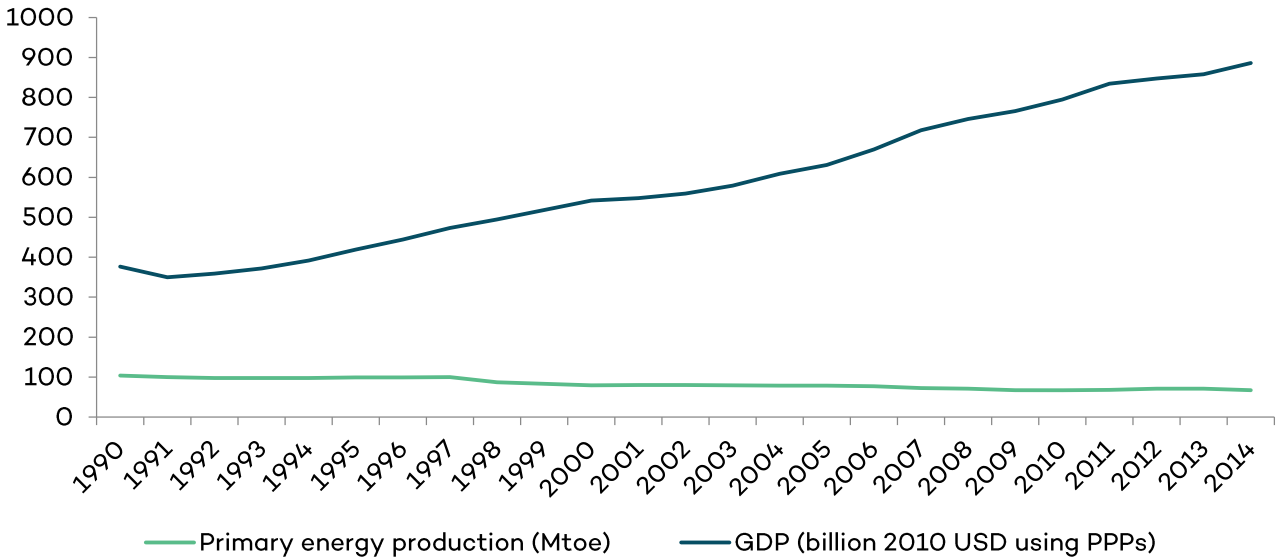


Figure 5. Primary energy production (megatonne of oil equivalent [Mtoe]) and GDP (2010 USD billion using PPPs)

Source: Authors' graph based on IEA.

Coal plays an even more prominent role in electricity production. Throughout the 1990s, it delivered annually around 95 per cent of total electricity production. The share of other fuels—such as biofuels, gas, wind, and solar—grew since the mid-2000s and partially replaced coal. This change is, to a large degree, a result of EU climate and energy policies which enforced the use of renewables. Poland is expected to reach a 15 per cent share of renewables in 2020.

After the economic transformation from 1989 to 1991, along with rather fast and steady economic growth came increased demand for electricity, from around 132 to 164 terawatt hours (TWh). Import and export of electricity were marginal, mostly due to weak interconnections and old transmission grids. In the coming decade, as GDP growth is expected to grow steadily at around 3 per cent, electricity demand is also expected to increase. An important part of debate on the future of the energy mix is the introduction of nuclear energy, which would allow energy producers to meet demand without increasing CO₂ emissions.

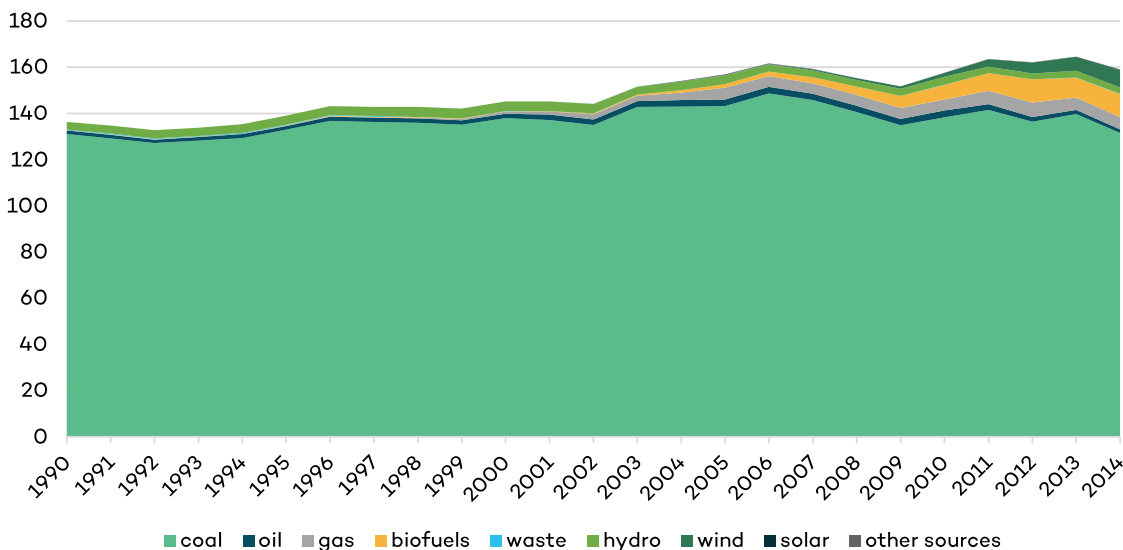


Figure 6. Electricity generation by fuel (TWh)

Source: Authors' graph based on IEA.



2.2 The Political Context of Transformation

Unlike many other industrial sectors, the mining industry was never fully commercialized or privatized and remained under state control. The autonomy given to collieries in the first three years of transformation soon turned out to be a mistake in the absence of proper market regulations and state supervision. Competition between collieries led to increasing production, but below the level of profitability. The growth of this problem induced the government in 1993 to group the existing 63 collieries into seven mining companies, leaving two collieries outside of this process. (Karbownik & Bijańska, 2000) Ten years later, further grouping took place, and five mining companies were united. In 2009, the shares of one of the ungrouped mining companies and one of the collieries (also privatized) were floated on the stock exchange. State control over the majority of the sector (directly or through state-controlled banks and energy companies) persists. It leaves little space for the positive influence of the free market, which was observed in other industry sectors such as metallurgy, shipping or energy.

State control over the majority of the coal sector aligned with the expectations of the trade unions. Privatization processes from the early 1990s were—and still are—regarded as part of the international institutions (i.e., International Monetary Fund and World Bank) effort aiming at taking over the remaining profitable companies in developing and indebted countries (Błasiak, 2011). Thus, state control was regarded as protection from speculative takeovers, undermining the profitability of the coal sector as well as safeguarding Polish energy security based on coal.

A controversial aspect of the early transformation was the price regulation system for the coal sector introduced in Poland in 1990. One widely circulated explanation was the necessity to incentivize investments of collieries in coal processing technologies. Opening to global markets in 1989 required that Poland improve its generally low quality of domestic coal production (Lorenz, 2011). More importantly, however, the price regulation system has also had a general economic dimension. Fixing the prices at a steady level became the so-called “inflation anchor” aiming at limiting hyperinflation. For some experts, this was a reason why coal exports remained unprofitable for a long time and the coal sector deteriorated.⁴

The transformation of the coal sector in Poland was particularly turbulent during its first decade (1989–1999). From 1989 until now, 15 central governments were formed, including eight in the first 10 years (Table 1). The lack of political stability during the first decade⁵ translated into rapidly changing approaches to coal restructuring. Just between 1993 and 1998 five governmental programs to rescue the sector were adopted (Table 2). With rapidly changing governments, the persistent pressure of trade unions on wages and sustaining employment in collieries was very effective. One of the most visible examples is the cost structure in the largest state companies, which is currently around 50 per cent related to wages.

Box 2

Coal mining trade unions in Poland are traditionally one of the strongest labour organizations. Their strength originated in the 1970s and 1980s when *Solidarność*—a trade union but also a social movement—became the driving force of democratic transformation. That is why their political mandate at the beginning of transformation was very strong. It was in opposition to the second biggest trade union (OPZZ) which was created during the communist regime.

Until the end of the 1990s, the main actors in that process were the government (the minister or his deputies responsible for mining often came from the mining region), the management of the companies (most often graduates of either the AGH University of Science and Technology in Kraków, Economic University in Katowice or Silesian University of Technology) and the trade unions, which were particularly influential in the mining sector (Grodzicki, 2012). This configuration, formally gathering in the commission for the social

⁴ The price regulation after certain correction in 1993 was used as a reference price for trade negotiations between the coal and energy sectors, in some cases for more than another 10 years. Since the EU accession, it became a common practice among coal producers to negotiate the price with large consumers individually. Intermediary companies which earlier played an important role were reduced to retail market (Lorenz, 2011).

⁵ The first full term of the government was between 1997–2001.



dialogue, shaped the transformation of the sector. It soon led to revealing problems in the system, mainly its exposure to the phenomenon of clientelism—exchange of goods and services for political support (Gadowska, 2003). Importantly, however, this dialogue was opened for regional perspective after the decentralization of public administration in 1999. Regional governments provided with pre-accession and then regional funds were better able to tackle certain issues like the environment, transport, social capital more accurately. The involvement of a greater number of actors helped to develop regional strategies and kept Silesia one of the wealthiest of the Polish regions.

Although the NGO sector is steadily developing in Silesia, it also consistently struggles with a number of problems. The main are high costs of employment, a lack of experience in application for grants, and accounting. Silesian NGOs rarely engage in social economy activity—they are not willing to create social companies or undertake economic activity. To positive aspects one can include support from local governments which are the most frequent providers of premises for NGOs (Regionalny Ośrodek Polityki Społecznej Województwa Śląskiego [ROPS], 2012).

2.3 Instruments and Programs for Restructuring the Coal Sector—Overview

In the first years of the transformation, the range of instruments was very limited. The first two social protection instruments, introduced in 1993, were the miners' leave and the welfare allowance. The miners' leave was a form of early retirement. It was offered to employees working underground who were scheduled to be laid off or who were being laid off due to liquidation of mines or their parts. To be eligible for this program, the worker was to be less than three years from obtaining a pension due to age or job seniority. It was paid for a maximum of three years at 50 per cent of salary. It could be paid in one upfront payment or monthly. Miners eligible for this instrument were also allowed to maintain the standard privilege for active miners, which is the right to a yearly bonus (13th monthly payment owing generally to the public-sector's employees and the 14th monthly payment paid exclusively to miners as well as the coal allowance). The second main instrument—the welfare allowance instrument—was a form of voluntary redundancy. It was directed to miners with more than three years left to retirement age, and it could be paid for only a maximum of two years, in monthly instalments. Both instruments were paid in the amount of 50 per cent if the beneficiary found the job during that period (Karbownik & Bijańska, 2000).

The program, adopted in 1998 thanks to the backing of the government by a wide spectrum of political parties grouped under one umbrella, ensured further economization of the sector. Low-hanging fruits of employment reduction through redundancy and the hiring freeze were collected mostly in the first four years of transformation. This program introduced new instruments such as free retraining as well as golden handshakes (a lump sum payment with the requirement of only five years' seniority) and thus it reinforced incentives for the employment reduction of miners and allowed the further closure of the most unprofitable mines.

**Table 1. The Polish governments in 1990s, with their Prime Ministers and forming parties**

Duration of the government	24 VIII 1989 – 25 XI 1990	12 I 1991 – 5 XII 1991	23 XIII 1991 – 10 VII 1992	11 VII 1992 – 18 X 1993	26 X 1993 – 1 III 1995	6 III 1995 – 26 I 1996	7 II 1996 – 17 X 1997	31 X 1997 – 19 X 2001
Prime Minister	Tadeusz Mazowiecki	Jan Krzysztof Bielecki	Jan Olszewski	Hanna Suchocka	Waldemar Pawlak	Józef Oleksy	Włodzimierz Cimoszewicz	Jerzy Buzek
Political parties	Solidarność, ZSL, PZPR, SD	KLD, ZChN, PC, SD	PC, ZChN, PSL, PL	UD, KLD, ZChN, PChD, PPPP, PSL, PL	SLD, PSL, BBWR	SLD, PSL	SLD, PSL	AWS, UW
Political background	Agreement of communists and “Solidarność”	Different fractions of former “Solidarność” political camp			Post-communist governments			Former “Solidarność” political camp

Source: Authors.

The period following 2002—especially after Polish EU accession in 2004—saw greater stability in Polish governments as well as the stabilizing impact of the EU on strategic planning. However, it did not bring any spectacular improvement to the coal mining sector. Constant indebtedness from the 1990s was overcome, but the liquidation of unprofitable mines ended and thus workforce reduction slowed down. Under EU law, subsidizing of the sector ended in 2003. Since then, the only acceptable state aid is related to the colliery closure process.

Since 2015, Poland has had no official strategy for the coal sector. The first attempts to create a new strategy were undertaken by the government in 2014. This program, although relying strongly on a holistic (regional) approach, did not offer many new solutions but merely reshuffled existing instruments. However, in 2015 the work on this strategy was first delayed and—following a change of government—completely cancelled. The current government (in power since the fall of 2015) prepared a new program but it has yet to be brought to public consultation.

**Table 2. Programs for restructuring of the hard coal mining sector—Summary**

Years	Title of the document	Character of the document
1993	<i>Program for restructuring of the hard coal sector.</i>	Designed as the first of three phases of the restructuring process, focused on the profitability of the sector. It was implemented for only few months before the basic assumptions related to the coal production and export turned out to be too optimistic.
1993–1994	<i>Program for staving off the bankruptcy of the hard coal sector</i>	In the face of the rapidly deteriorating situation in the sector, a correction of the previous program was necessary. Although it was never officially adopted by the government, it formed the basis for further actions. This plan laid out the grounds for instruments of social protection for early retirements in mining.
1994–1995	<i>Restructuring hard coal sector. Program for the accomplishment of the Phase II in years 1994–1995</i>	In the second phase of restructuring, the ecologic and social aspects were included. The sector (only after taxation) almost achieved profitability in 1994, but this was not maintained. In the following year, due to a lower-than-expected increase in coal prices, wage increases and slow employment reduction, the sector's results were again falling. The third phase was never implemented. Growth of wages and slower-than-expected reduction of employment.
1996–1998	<i>Hard coal mining sector—Public and sector policy for the years 1996–2000. Program for adaptation of the hard coal mining sector to market economy and international competition</i>	This program accomplished only a technical part of the restructuring process. It failed to deliver positive results in all other areas, namely in ownership, employment, finance and organization. An increase of production without sufficient demand, and indecision about closure of collieries were among the reasons why the European Bank for Reconstruction and Development (EBRD) and World Bank refused financial support to the sector.
1998–2002	<i>Reform of the hard coal mining sector in Poland in the years 1998–2002.</i>	The most complex and ambitious program, it extended the number of available instruments and introduced new, broader frameworks of support (See Section 3 below).
2002–2003	<i>Program for restructuring of the hard coal mining sector in Poland in years 2003–2006 with implementation of anti-crisis Acts and initiation of privatization of certain collieries</i>	This program, apart from continuing the privatization processes, also implemented further reduction of the workforce. After less than one year, it was replaced by other actualization and supplementing documents.
2003–2006	<i>Restructuring of the hard coal sector in years 2004–2006 and Strategy for 2007–2010.</i>	Soon after another strategic document was adopted to regulate access to coal resources in years 2004–2006 and close some of the collieries.
2007–2015	<i>Strategy for the functioning of the hard coal mining sector in Poland in years 2007–2015</i>	Updated in 2011 as the Program of Mining Sector Activity in 2007–2015, it concentrated on ownership restructuring, R&D investments and increasing production efficiency. For the first time since the beginning of transformation, employment in collieries was increased due to the growing generation gap among the skilled workers. This process, however, last only for two years.

Sources: Makieła, 2002; Paszcza, 2010; Przybyłka, 2013.



3.0 Case Studies of Two Selected Mitigation Measures

The restructuring program adopted in 1998 was the broadest and the strictest of all the programs after 1989 (Table 2). Its two selected instruments will be outlined and analyzed in this section in more detail to assess their main strengths and weaknesses.

The drive toward restructuring in the coal sector decreased in the years directly preceding the reform (1995–1997). The previous strategy of limiting employment in the sector—mainly through the restriction of new workers' inflow—turned out to be insufficient. In order to speed up the profitability of the sector, there was a need to introduce stronger motivators for workers to leave the coal sector (Faliszek, 2011). At the same time, the preparatory process for EU accession accelerated, and the need to reduce the scale of government subsidies for the mining sector became even more urgent due to EU competition laws.

The program was introduced shortly after a new coalition of liberals and right-wing parties was formed. The new government originated from the same political camp (Solidarność) as the largest and most influential unions active in the mining sector (Table 1 and Box 2). This constituted an important factor facilitating the conducting of the reforms, considering the high unionization rate (85 per cent) in the mining industry⁶ (Kaczorowski & Gajewski, 2008). During previous attempts to reduce the mining industry workforce, unions showed their strength, organizing massive strikes and protests. This time the representatives of the most influential unions offered trust to the new government and were involved in the formulation of the restructuring program.

In all the previous restructuring programs, mitigation measures in the form of early retirement or welfare allowances were dedicated almost exclusively to miners whose jobs were endangered due to liquidation of the collieries. Besides, the sums offered were not high enough to attract many miners. The importance of social mitigation measures introduced before 1998 should therefore be considered as negligible. The authors of the program introduced in 1998 chose a different strategy—the offer of voluntary departure was dedicated to a broad group of miners, and the applied financial incentives much stronger than in all previous attempts.

The program differed from the others in two more important aspects:

- **Special Law:** For the first time, the governmental restructuring program was not an internal government document, but was confirmed by a special Mining Law adopted by the Parliament. It specified objectives, social mitigation instruments, the sources and conditions of the financing of the program, as well as supervision of its implementation.
- **Broad objectives:** The program included priorities such as environmental protection, cooperation with mining communes and regions, and the adoption of EU standards in view of Poland's EU accession. However, like all previous reforms, the economic viability of the coal sector remained the main goal of the program.

According to the program, the viability of the sector was to be achieved above all through the employment reduction encompassing about 105,000 employees (out of 243,300 mineworkers in 1997) by 2002. The program's authors assumed that this aim would be achieved through voluntary layoffs as a result of the adoption of the Mining Social Package (approximately 65,000 workers) and independent processes of reaching the retirement age (approximately 40,000 workers). These objectives were almost fully achieved: the overall number of beneficiaries of the Mining Social Package from 1998 to 2002 amounted to 67,000 workers, and the overall employment reduction totalled 102,600 employees.

An important role in mitigating the social consequences of this employment reduction was given to local authorities in the selected “mining communes,” which were supposed to contribute to the creation of new jobs in the region. The two groups of mitigation measures introduced in 1998—the **Mining Social Package** and the **new entitlements of mining communes**—will be described in detail later in this section.

⁶ The high unionization rate in the mining sector is atypical for Poland, which is generally characterized by a low average unionization rate.



Box 3. The labour market in Upper Silesia

Throughout the Communist period (1945–1989) the Silesian labour market was developing dynamically and attracted numerous immigrants from all over Poland. The regional economy was dominated by heavy industry. New economic circumstances after 1989 influenced local labour markets in many ways and sometimes forced a complete metamorphosis of Silesian cities and towns. In 1993, for the first time since World War Two, net migration in the region became negative. At the same time, Silesia experienced a rise of unemployment as the Polish economic transition resulted in abandonment of the socialist full-employment policy. However, apart from the period 2000–2006, the unemployment rate in the region did not exceed average levels in Poland (Figure 7).

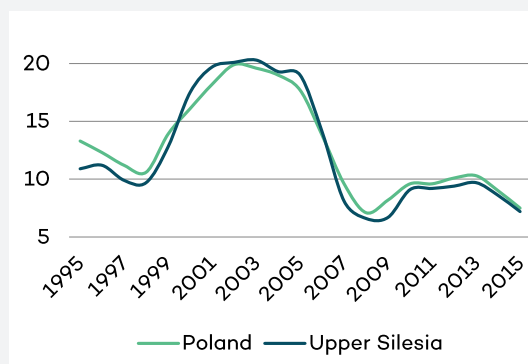


Figure 7. Unemployment rate in Poland and in Upper Silesia, 1995–2015, (%).

Source: Authors’ graph based on GUS.

Today, Silesia sees good average economic results in comparison with the rest of the country, but the region is heterogeneous. Some cities and towns did not find a way forward after deindustrialization and the liquidation of local mines and steelworks.

A characteristic problem of the Silesian labour market is the very low employment rate among women and among older men and women (Figure 8). The main reason for women’s inactivity is the traditional model of family deeply rooted in Silesian culture, in which the husband worked in a mine and the wife was responsible for the housework. The low economic activity of older generations is a result of the phenomenon of the so-called “young pensioners.” Underground mineworkers are eligible for retirement after 25 years of work, which for many of them translated into retiring at the age of 45 or 55. Social protection measures in form of mining leaves have further deepened this phenomenon (Sitek et al., 2013).

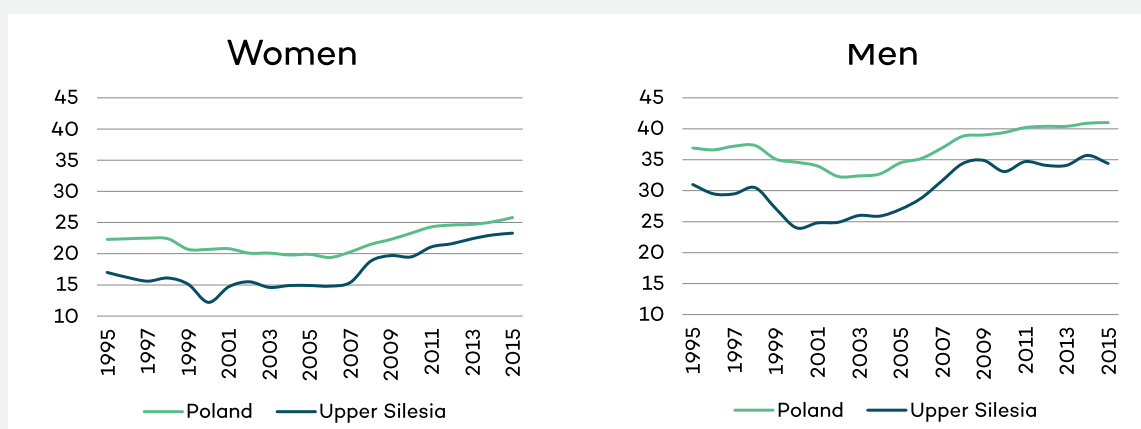


Figure 8. Employment rate of the population aged 50+ in Poland and in Upper Silesia, 1995–2015, (%).

3.1 The Mining Social Package

The Mining Social Package (MSP) was aimed at encouraging mineworkers to accept voluntary layoffs and contained several different instruments. The offer attracted tens of thousands of workers, but the rapid pace of the changes and insufficient support in the process of job seeking contributed to a large-scale retreat from the labour market.

3.1.1 Conditions of Eligibility

The Mining Social Package (MSP) was aimed at all underground mineworkers who had worked in the coal sector for at least five years and decided to leave the job voluntarily. Some minor elements of the package encompassed non-underground workers as well. Unlike all previous mitigation instruments, the MSP was not limited to the miners working in collieries being liquidated.



The package contained three types of instruments, distinguished as “protective” and “activating” ones (Karbownik & Bijańska, 2000):

- **Miners’ leave:** The main “protective” instrument was the miners’ leave, in the form of early retirement. To be eligible for this instrument, a miner was to be within five years of retirement due to age or job seniority. It was paid in the amount of 75 per cent of monthly salary. Upon achieving retirement rights, the beneficiaries began to receive full retirement benefits. Importantly, miners are one of the few professional groups that still have special retirement privileges obtained during Communist times. The generally applicable retirement age—65 years for men and 60 years for women—does not apply to this group. Underground miners are eligible for retirement after only 25 years of work experience, which means for the majority of them reaching pension rights already at the age of around 45. Workers on miners’ leave could take up a job outside of the colliery, but the amount of leave would be then cut by half.
- **Redundancy payment:** A single, unconditional redundancy payment in the form of a “golden handshake” was the most widespread “activating” instrument. It amounted to 24 months of average salary in the mining sector. The redundancy payment was limited to workers not eligible for miner’s leave and could not be combined with the welfare allowance.
- **Welfare allowance:** Another “activating” instrument—a welfare allowance taking the form of voluntary redundancy—was paid on a monthly basis during the period of retraining and job seeking, but for no longer than two years. It amounted to 65 per cent of average monthly salary. After taking up employment outside of the mining sector, recipients of the welfare allowance were granted a single payment in the amount of 14.4 months average salary. The offer related to workers who gained new employment within two years after leaving a colliery.
- **Retraining course:** All of the former mineworkers, both underground and non-underground, were eligible for a single retraining course in order to improve their employability outside of the mining sector.

3.1.2 Funding

The financing of the program proved to be a considerable burden on the government budget. The overall cost of employment restructuring during the five years from 1998 to 2002 amounted to PLN 5.4 billion or approximately USD 1.4 billion (for comparison, the yearly government budget in 2002 amounted to PLN 173 billion or USD 43.6 billion) out of which about 70 per cent was funded by government budget, and the remaining 30 per cent mainly by the collieries themselves.

3.1.3 Evaluation of the MSP

Successes

- Representatives of important trade unions were involved in the process of preparing the MSP. This allowed the implementation of this fast and large-scale program of employment reduction without significant social turmoil.
- The incentives to leave voluntarily proved successful—the number of miners who benefitted from the offer proved even slightly higher than expected. Almost 37,000 workers benefitted from miners’ leave, with nearly 30,000 choosing the unconditional redundancy payment. Overall, the MSP reduced employment by 67,000 workers. Labour productivity in the sector (tonnes of coal/person) rose by 40 per cent from 1998 to 2002 (Figure 9) (Kaczorowski & Gajewski, 2008).

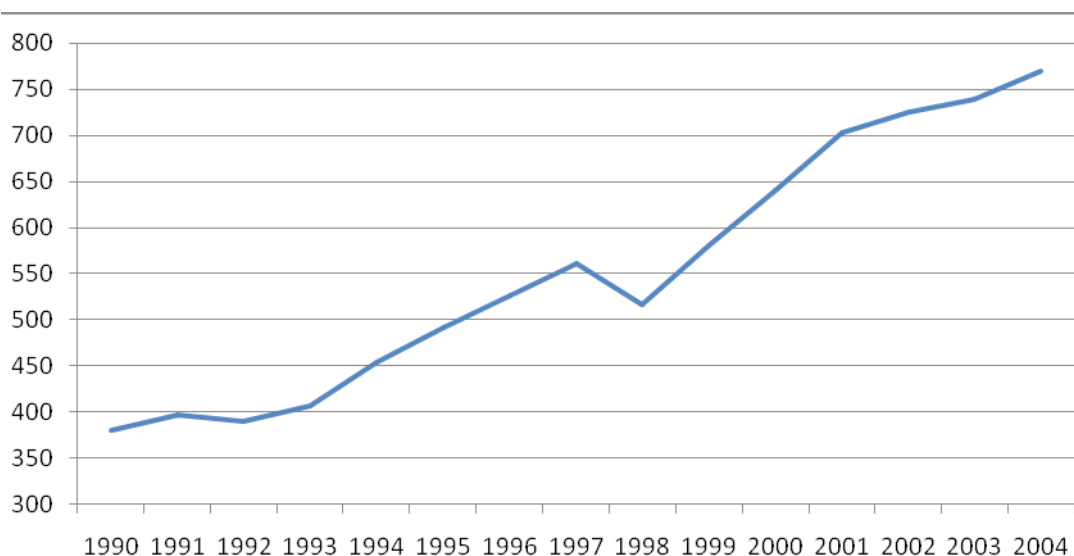


Figure 9. Labour productivity in the mining sector (tonnes of coal/person)

Source: Authors' graph based on Kaczorowski & Gajewski, 2008.

Failures

- The “active labour market policy” in the form of redundancy payments was only theoretically “active.” The idea behind this measure was that the ex-miners would invest in their own new businesses or at least would be financially supported during the period of retraining. However, apart from one optional retraining course, there was no comprehensive support of beneficiaries in the difficult process of job seeking included as an intrinsic component of this instrument. As a result, redundancy payments led to a large-scale retreat from the labour market. The most recent survey of the fates of former mineworkers in 2004 (five to six years after leaving the mine), showed that 35 per cent of the redundancy payment recipients were not employed (Karbownik, 2005).
- A benefit in the form of a single lump sum payment may be difficult to manage in a rational way. The first wave of the evaluating survey (conducted in 2001) showed that many of the ex-workers spent the benefit on current consumption—few invested or saved the money. The average economic situation of the beneficiaries' households worsened systematically after leaving the job: in 2001 5.8 per cent declared they could not afford to cover expenditures on the most basic needs (food, electricity, clothes), whereas three years later 12.8 per cent stated they encountered this problem. In 2001, 17.6 per cent stated that they were able to meet only their most basic needs: in 2004 this percentage increased to almost 30 per cent (Karbownik, 2005).
- The welfare allowance proved to be unsuccessful, as it did not gain any significant attention among mineworkers—in total only 419 persons chose this option. This was contrary to the expectations of the program's authors, who considered the welfare allowance combined with the bonus payment (conditional upon taking up employment) to be both the most attractive and the most motivating option (Karbownik, 2014). However, the necessity of finding new employment within two years was probably perceived by workers as an excessive risk considering their lack of experience in job hunting, lack of professional competence (a low level of education is very common among former miners) and the uncertainties in the local labour market.



3.2 Special Privileges for Mining Communes

The Mining Law of 1998 introduced a new legal definition of a “mining commune”—a commune in which there was a functioning hard coal mine in 1999 or later. According to an announcement of the Minister of Economy in 2008, there were 73 mining communes in Poland located in four regions, of which 60 were located in the Silesia region.

Box 4

A commune is the principal unit of administrative division of Poland. A commune has numerous prerogatives in the Polish political system, including the implementation of social policy on its territory.

Perception of local authorities as important partners in the process of coal restructuring should be appreciated. However, the offer was insufficient and did not take into account the diversity of needs and problems among the communes.

3.2.1 Conditions of Support

Mining communes received some special entitlements and privileges aimed at supporting the creation of new jobs on the commune’s territory (Faliszek, 2011):

- **Colliery–commune cooperation:** Mining communes were entitled to create a new enterprise along with the mining company in order to create new jobs outside of the coal sector—a kind of public-private-partnership). Mining companies were supposed to bring to the newly established companies the redundant real estate as their contribution.
- **Acquisition of property:** Mines that reduced the scope of mining activity or were put into liquidation could hand their superfluous real estate over to the mining commune. It could then be used by the commune to support economic activity on its territory. Apart from the land and some closed industrial facilities, mining companies often owned non-productive assets such as hotels, sport facilities, residential buildings or kindergartens—the legacy of socialist welfare typically organized within enterprise. The program obliged companies to cooperate with mining communes, but the terms of the cooperation were not precisely specified. The Mining Law implemented in 1998 introduced a free form of property transfer from companies to communes, but the Tax Law of 1997 gave the companies the chance to pass on property in exchange for remitting debts that mines owed to communes. At the same time, companies could sell the superfluous property on the free market. Decisions on these options differed from case to case, and depended mainly on the outcome of negotiations between companies and communes.
- **Additional tax revenue:** Mining communes were getting a slightly increased percentage of the personal income tax compared to other communes (in Poland the income from personal income tax is divided between communes and the national budget).
- **Preferential loans:** The mining communes could apply for a preferential loan from the government budget to increase economic activity in the commune. The loan could encompass up to 75 per cent (80 per cent after revision in 1999) of the planned investment.

3.2.2 Evaluation

The outcomes of introducing privileges for the mining communes have never been thoroughly evaluated by a government agency or any other institution. Available sources indicate that the funds reserved in the national budget for the preferential loans remained largely unused, as communes lacked know-how to prepare investment plans as well as the financial resources for the obligatory contribution to investments (Mitręga, 2001).

As for the property acquisition, from 1998 to 2001 several mining communes did take over real estate from liquidated mines. Typically, the mining company received debt relief in return. In the majority of cases (more



than 80 per cent) acquired buildings and land were used by local authorities to perform different public utility functions rather than to initiate economic activity (Sorychta-Wojczyk, 2007). However, there are some positive examples of property acquisition by a mining commune, which led to a complex revitalization of the former mining areas and to the creation of new workplaces in modern business centres.

One of the earliest and most well-known initiatives of this kind comes from the city of Gliwice, with the “New Gliwice” Education and Business Centre located in the restored buildings of a shuttered mine. After Polish accession to the EU in 2004, new financial opportunities opened up, and today Silesia hosts over a dozen industrial and technology parks initiated by mining companies together with local authorities. EU funds constitute an important source of coverage for the investments after 2004. These initiatives, however, operate on the basis of other legal frameworks and have no direct connection to the Mining Law from the previous period.

The example of Gliwice—one of the main academic centres of the region—shows that success stories generally took place in the communes, where social resources were rich enough and local actors (authorities, universities, NGOs) had adequate know-how to take effective action (Wódz & Wódz, 2005).

Successes

- For the first time, the intervention included the regional aspect of coal sector restructuring. The authors of the reform noticed the need to go beyond narrow sectoral thinking and defined the problem of coal phase-out as a regional issue. This was an important shift in conceptualizing the problem. Workforce reduction in the mining industry affects not only former miners and their families, but the whole regional economy. These effects also extend to the younger generation entering the Silesian labour market. Therefore, coal sector restructuring requires finding new pathways of development for the whole region, which had previously been dominated by heavy industry.

Failures

- The regional social policy in the mining region was introduced too late—in the years 1989 to 1998 the processes of social exclusion of some former miners and their families had already accumulated (Faliszek, 2011). During the years of transition, families with long mining traditions, who lived together on housing estates belonging to mines, experienced a dissolution of old social bonds. Economic impoverishment was accompanied by the disintegration of group identity (Mandrysz, 2011).
- The reform did not take into account the differentiation of mining communes in terms of their economic potential and social situation. Some cities and towns in Silesia were among the most neglected in the whole country (e.g., Bytom). Brownfields caused by mining damage often covered vast areas of these places and made them unattractive for both inhabitants and investors (Krzysztofik, Runge & Kantor-Pietraga, 2012). The entitlements defined by the reform were insufficient to enable the local authorities to undertake the complex revitalization activities in the most devastated cities. In this context, the level of intervention chosen by the policy-makers also should be considered controversial—a wider regional policy for Silesia, rather than the local, commune-based intervention, could have a bigger potential for alleviating the negative social consequences of employment restructuring.
- There was a significant lack of know-how among some of the local authorities about how to cope with the social challenges related to mining restructuring. Local authorities, especially in smaller communes, often were not prepared to take on new responsibilities and propose effective policies to support economic activity in their commune. The reform did not include any measures that would involve other stakeholders with the necessary experience and knowledge, such as NGOs or universities. As a result, the funds reserved in the national budget for the preferential loans remained largely unused.



4.0 Lessons Learned for Policy-Makers Considering Coal Phase-Out

The restructuring of Poland's coal sector that began in 1989 is still not complete. It was part of the general economic transition from an ineffective socialist system to a free-market economy. Although the country as a whole had seen consistent economic growth, the social costs of this development were high, particularly for the coal mining workers.

Political instability, the fragmentation of political parties and the strong social tensions that accompanied the first period of transformation created barriers for the long-term sustainable programs. On top of that, the lack of comparable experiences in other countries of the Eastern Bloc (Poland was the first country to implement democratic and economic reforms) forced policy-makers to constantly experiment, which made this process much more difficult.

Reduction of employment which initially took the form of attrition (reducing new hiring) — soon had to be complemented with other instruments to increase the rate of departure. The early retirement schemes and the generous redundancy payments allowed for the closing of the most unprofitable mines, but at the same time these (especially the latter) were responsible for greater social problems—professional inactivity or unemployment among the miners.

The territorial aspect of coal exploration was also an important part of the problem. The concentration of mines and related industry around the Upper Silesia region—the biggest Polish agglomeration, with 4.5 million inhabitants—was a factor that delayed the whole process. Unlike the United Kingdom, where the mines were more dispersed, the restructuring process was deeply rooted in an urban, densely populated space with a strong cultural identity.

In addition, the late recognition of the role of regions and local communities, their low financial support and lack of bottom-up initiatives related with low social capital were an important part of the problem. Even with the implementation of territorial reforms in 1999 that restored the importance of local governments, the major players in the restructuring process were the social partners—government, trade unions and mine management.

Although the coal phase-out was never an explicit goal in Polish transformation, a major downsizing of the sector's role was conducted successfully, particularly in the first decade. Within a quarter of a century employment in the mining sector fell from around 400,000 to less than 100,000, production of coal dropped from around 150 to 70 million of tonnes, and 40 out of 70 mines were closed.

Based on these conclusions, several lessons on how to improve the restructuring processes can be drawn:

1. Quitting the coal mining sector is related to the loss of well-paid jobs requiring relatively low skill. In addition, in traditional coal mining regions these jobs are related to social status. These factors will hinder job activation of miners as achieving similar benefits from other jobs will require a substantial, long-term effort. As the Polish case study showed, diversification of employment restructuring instruments will lead at least some miners to choose short-term profits (lump sum redundancy payment) over long-term benefits from requalification. For that reason, **every instrument of labour restructuring in coal mining should include obligatory professional retraining, and the “golden handshakes” should be treated as the exceptions.**
2. In the highly confrontational discourse typical of the restructuring of sectors in difficulty, it is hard to achieve a long-term consensus among the social partners (government, trade unions, employers' associations) regarding the strategic directions of change. In such circumstances, negotiations will tend to be conducted discretely. In Poland, a plausible consequence of this fact was lack of viable evaluation instruments (apart from general weakness in policy evaluation) which could have been perceived as



undermining the chances for consensus. As a result, any improvement of policies which potentially could have been beneficial for the mining sector was impossible. Therefore, **the bottom line of such policies should be a thorough, scientific evaluation of miners' communities undergoing restructuring processes.**

3. In the case of coal-dependent economies, a quick reduction of this sector is virtually impossible. For that reason, regional development is necessary, and should include such things as support for alternative, labour-intensive industries, investment in transport infrastructure to stimulate labour mobility or improvement of the education system. In Poland, this was possible thanks to the attraction of foreign capital and the application of EU funds. It helped to develop strong automotive and information technology sectors, road transport, and improvements in the skills of young people. It is therefore important **to ensure the parallel pathways of development, both at the local and regional level, to follow up on reductions of the coal sector and those industries directly dependent on coal production.**



References

- Błaszke, W. (2002). Problematyka cen węgla kamiennego w polskim kompleksie paliwowo-energetycznym, *Przegląd Energetyczny*, No 6(945) June, Vol. 58(XCVIII).
- Bluszcz, A. (2014). Proces przemian struktury zatrudnienia w górnictwie węgla kamiennego, *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, No 196 (14), p. 103-113.
- Błasiak, W. (2011). Jak niszczone górnictwo węgla kamiennego w III Rzeczpospolitej, 05.08.2011, Retrieved from:
- Faliszek, K. (2011). Gmina górnicza jako podmiot polityki społecznej, *Górnośląskie Studia Socjologiczne. Seria Nowa 2*, 164-176.
- Franik, T. (2010). Analiza zmian udziału przemysłu wydobywczego w osiągniętych wynikach makroekonomicznych gospodarki w okresie przemian ustrojowych w Polsce.
- Hibner, M. (2016). Restrukturyzacja zatrudnienia w górnictwie węgla kamiennego w latach 2004 – 2014, *Zeszyty Naukowe Państwowej Wyższej Szkoły Zawodowej im. Witelona w Legnicy*, No 19 (2), 39-50.
- Gordon, L., R. (1987). *World Coal. Economics, Policies and Prospects*, Cambridge University Press.
- GUS. (2015) *Związki zawodowe w Polsce w 2014 r.*, Główny Urząd Statystyczny, Warszawa..
- GUS. (2016). *Zużycie paliw i nośników energii w 2015 r.*, Główny Urząd Statystyczny, Warszawa.
- Gwosdz, K. (2013). *Pomiędzy starą a nową ścieżką rozwojową*, Instytut Geografii i Gospodarki Przestrzennej Uniwersytetu Jagiellońskiego w Krakowie, Kraków.
- Statistic Research Report: Poland (1990-2015), International Energy Agency, Retrieved from: <http://www.iea.org/statistics/statisticssearch/report/?year=1990&country=POLAND&product=Coal>
- Kaczorowski, P., & Gajewski, P. (2008). Górnictwo węgla kamiennego w Polsce w okresie transformacji, *Acta Universitatis Lodzianensis, Folia Oeconomica* 219.
- Karbownik, A. (2005). Zarządzanie procesem dostosowawczym w górnictwie węgla kamiennego w świetle dotychczasowych doświadczeń: praca zbiorowa.
- Karbownik, A., & Bijańska J. (2000). *Restrukturyzacja polskiego górnictwa węgla kamiennego w latach 1990 – 1999*, Wydawnictwo Politechniki Śląskiej, Gliwice.
- Korski, J., Tobór–Osadnik, K., & Wyganowska, M. (2015). Assessment of competitive ability of the Polish mining industry in the light of historical data. *Przegląd Górniczy* No 6, p. 9-15.
- Korski, J. (2015). *Polskie Górnictwo Węglowe 2015 – wprowadzenie do debaty*, Presentation given in Bractwo Gwarków Związku Górnośląskiego, 11.03.2015. Available at: <http://www.gwarkowie.pl/pliki/polskie-gornictwo-weglowe-2015-jkorski-debata-11032015-r-685.pdf>
- Korski, J., Tobór–Osadnik, K., & Wyganowska, M. (2016). Reasons of problems of the polish hard coal mining in connection with restructuring changes in the period 1988–2014. *Resources Policy*, 48, p. 25–31.
- Krzysztofik, R., Runge, J., & Kantor-Pietraga, I. (2012). An introduction to governance of urban shrinkage. A case two Polish cities: Bytom and Sosnowiec, *Wydział Nauk o Ziemi Uniwersytetu Śląskiego, Sosnowiec*



- Lorenz, U. (2011). Ewolucja podejścia do cen węgla energetycznego w Polsce w latach 1989-2010, No 6(945) June, Vol. 58(XCVIII).
- Makiela, Z. (2002). Wyniki realizacji programów restrukturyzacji górnictwa węgla kamiennego po 1989 r., Prace Komisji Geografii Przemysłu PTG, Warszawa- Kraków-Rzeszów.
- Mandrysz, W. (2011). Restrukturyzacja przemysłu na terenie Górnego Śląska a przemiany tożsamości indywidualnej i zbiorowej jego mieszkańców : na przykładzie osiedli przyzakładowych, *Górnośląskie Studia Socjologiczne. Seria Nowa 2*, 103-112.
- Marcinkowska, I., Ruzik, A., Strawiński, P., & Walewski, M. (2008). Badanie struktury i zmian rozkładu wynagrodzeń w Polsce w latach 2000-2006, Departament Analiz Ekonomicznych i Prognoz, Ministerstwo Pracy i Polityki Społecznej, Warszawa.
- Mitrega, M. (2001). Restrukturyzacja umiejscowiona: socjalne i regionalne aspekty przemian w górnictwie węgla kamiennego, *Wydawnictwo Uniwersytetu Śląskiego*, Katowice.
- Paszczka, H. (2010). Procesy restrukturyzacyjne w polskim górnictwie węgla kamiennego w aspekcie zrealizowanych przemian i zmiany bazy zasobowej, *Górnictwo i Geoinżynieria*, 34(3).
- Polish Statistical Office. Local Data Bank. Retrieved from <https://bdl.stat.gov.pl/BDL/start>
- Przybyłka, A. (2013). Wpływ programów restrukturyzacji na ograniczenie zatrudnienia górników, *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, No 161, p. 102-112.
- ROPS, Regionalny Ośrodek Polityki Społecznej Województwa Śląskiego. (2012). Organizacje pozarządowe jako potencjał sektora ekonomii społecznej w województwie śląskim.
- Sitek, S., Runge, J., Kłosowski, F., Petryszyn, J., Pytel S., Sporna, T., Kurpanik M., & Zuzanska-Żyśko, E. (2013). Społeczno-gospodarcze oraz przestrzenne kierunki zmian regionalnego oraz lokalnych rynków pracy województwa śląskiego. Raport końcowy, Uniwersytet Śląski, Sosnowiec.
- Soliński, J. (2012). sektor energii Świata i Polski początki, rozwój, stan obecny *Instytut Gospodarki Surowcami Mineralnymi i Energi PAN — Wydawnictwo, Kraków*.
- Sorychta-Wojczyk, B. (2008). Model zagospodarowania majątku likwidowanych kopalń węgla kamiennego, *Wydawnictwo Politechniki Śląskiej*, Gliwice.
- Swadźba, U. (2001). Śląski etos pracy. Studium socjologiczne. Wydawnictwo Uniwersytetu Śląskiego, Katowice.
- Tkocz, M. (2006). Efekty restrukturyzacji górnictwa węgla kamiennego w Polsce, Prace Komisji Geografii Przemysłu, Warszawa-Kraków.
- Turek, M. Karbownik, A., (2005). Ocena skuteczności górniczego pakietu socjalnego w restrukturyzacji zatrudnienia w górnictwie. *Zeszyty Naukowe Politechniki Śląskiej*, seria: organizacja i zarządzanie. Z. 27.
- Wódz, J., Wódz, K. (2005). W poszukiwaniu nowej tożsamości. Miasta Śląska i Zagłębia w okresie przemian końca XX wieku. [in:] Kloch, B., Stawarz, A., (edt.), *Tożsamość społeczno-kulturowa miasta postindustrialnego w Europie Środkowej*. Rybnik-Warszawa.
- Zych, A., (2015). Polski węgiel w faktach, liczbach i procentach, press article in: Trybuna Górnicza, available at: <http://nettg.pl/news/132701/polski-wegiel-w-faktach-liczbach-i-procentach>

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