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eDossier

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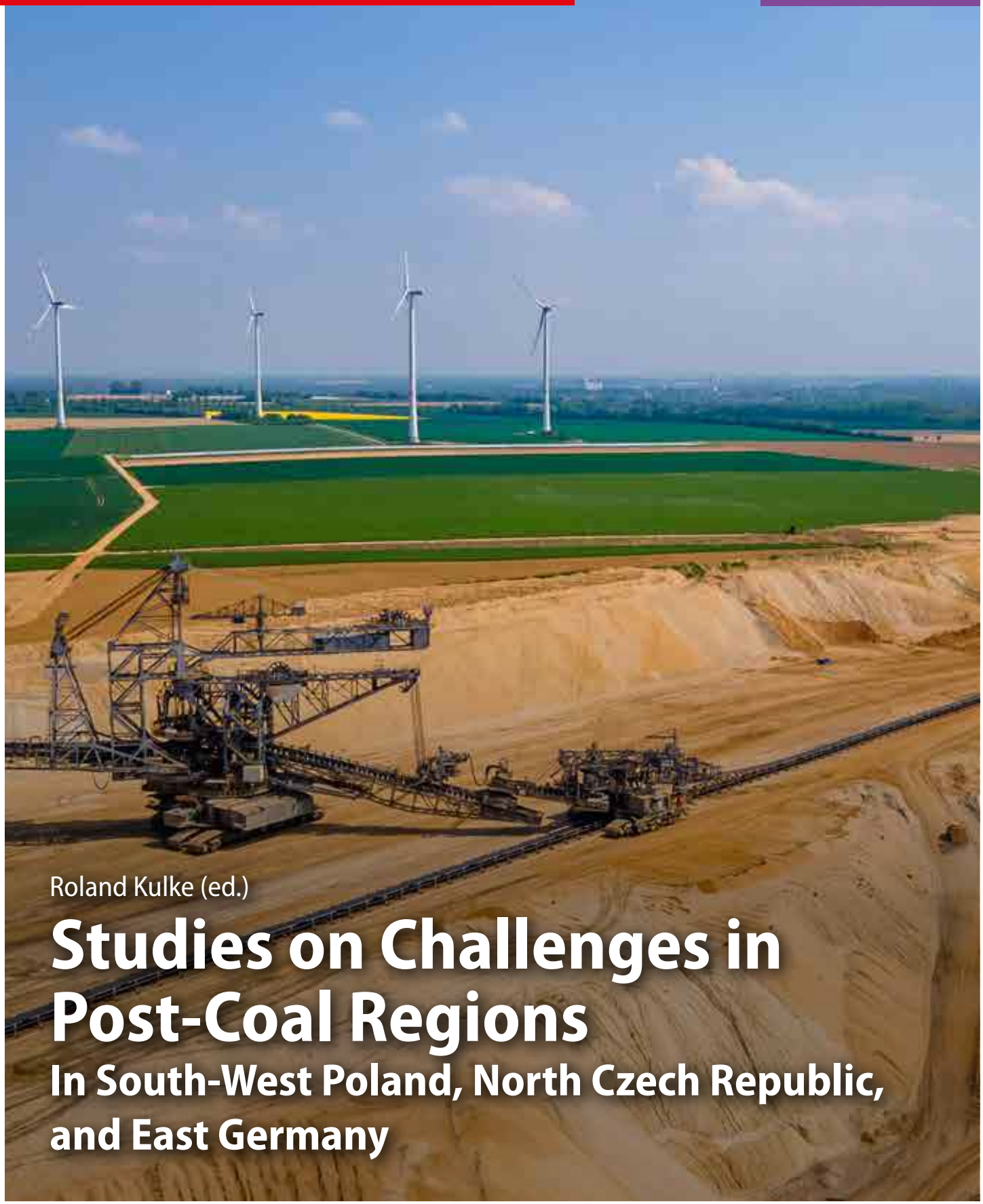

Roland Kulke (ed.)

Studies on Challenges in Post-Coal Regions

In South-West Poland, North Czech Republic, and East Germany

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Preface – A Just Transition for Coal Regions in Central Europe

In 2019 Fundacja Naprzód had organised a series of meetings in Warsaw and Wrocław where current economic challenges in Poland and its neighbouring countries were discussed. They had invited colleagues and comrades from Germany and Czech Republic to Wrocław. At one meeting comrades from Wrocław discussed in detail the challenges of re-industrialising their region and the need to come up with pro-worker post-fossil economic structures in West and South Poland. Out of this impulse a lively discussion emerged as both, German and Czech participants underlined their feelings that the same challenges would confront political and economic actors in the regions of East Germany and the North of the Czech Republic.

We decided to follow-up this result of our discussion. The whole area between Southern-East Germany, West and South Poland and Northern Czech Republic is a huge economy, that traditionally gained much of its success by exploiting local coal deposits. This economic model is now under pressure due to climate heating and the EU's decision to be a net zero economy in 2050. But also, by purely economic reasons the coal industry is under pressure by rising production costs due to the depletion of the coal deposits and decreasing prices for renewable energies.

It is not enough just to pay off the current workers if mines are closed. A real "Just Transition" for the whole region is needed. We need good and unionised jobs in the industry also for future generations. One reason for our project is our understanding that the region we focus on needs a wholistic approach which also needs to implement trans-border cooperation. We ask for example the German government if it was a wise choice to convene the "coal commission" in 2018 and 2019 without inviting a single representative to it from Poland or Czech Republic.

We gathered a team of authors and asked them for help. We asked them to present to us and other left and progressive actors' basic knowledge about the three national coal areas which are the focus of this publication.

We asked them to present facts on the history of their specific national coal and energy industries, the role of the industries for jobs and value creation and plans to restructure the coal industry in the coming years and decades. We also asked for an overview on the field of political actors in the specific Czech, German, and Polish regions. Who is guiding the transformation and who might be critical civil societies movements?

In 2021 and 2022 we had several internal meetings until we were able to present the findings at the Summer University of the European Left Party in Aveiro, Portugal in July and at the Economic Seminar of transform! europe in Athens in October the same year.

When Russia started its war against the rest of the free Ukraine in February 2022 the texts were basically finished. Since then, the topic of the energy systems in the EU countries have gained even stronger prominence than before. Nearly on a daily basis we read about latest descission in our capitals and in Brussels how to cope with the impact of the war, the sanctions of the West and the escalating climate crisis. We decided to publish the text as they have been written before the invasion of the Ukraine, nevertheless. Why? Because we think that the original question how to establish a sustainable and pro-workers industrial and energy system in our region remains as topical as some years ago.

We, the project leaders Dagmar Švendová and Czeslaw Kulesza and I are immensely grateful to the authors of the three studies. As we know this political field rather well, we know which great work the authors achieved

Roland Kulke, May 2023

Introdcution

transform! europe, Fundacja Naprzód

Mining for Profit
Scientific Mining, Geognostic Mining
Can there also be a beautiful mining?
(Novalis, 1800 in ‚Vermischte Fragmente')

INTRODUCTION TO OUR RESEARCH

On February 28th, 2022, the 6th IPCC report was published and once again described in simple terms that humanity need to stop the productivist model of more and more production and consumption. Capitalism developed in Europe, and so its societies are the biggest climate debtors of the world. Following this understanding *transform! europe* focuses on this European climate debt before making suggestions what others could or should do.

Our fossil-based economies followed very different development paths. While some economies are more based on nuclear energy, other rely heavily on coal, very often because this was a local raw material, easily available for the infant industries of the emerging nation states. This is the case with Poland, Czechia, and Germany. All three countries are now faced with the same challenges: how to get out of coal production while simultaneously securing good and decent jobs and prosperous economies in the former coal producing regions.

Since February 2022 much has changed. Four days before the IPCC report was published, Russia invaded Ukraine and started the first full-fledged large-scale war in Europe after 1945. This war has dramatic impacts on the countries West of Ukraine, most of them members of the EU. In the weeks after the Russian war started, the EU and its member states organised coordinated sanctions against Russia. One of the central fields of political contestation are fossil fuels which are imported from Russia. In May the EU is still negotiating among itself how fast a total decoupling from Russian fossil fuels can be achieved. If in two or three years or later is not clear, but the direction is clear: the energy systems of the EU and its member states will be reconstructed in an unprecedented way in the next years.

Much now is being discussed if the coal production in the European countries should be prolonged, if the implementation of the Green Deal in the EU should be postponed. Indeed, the coal production in our three countries might be prolonged – but this will not change the fundamental challenges we are facing.

Therefore, the research team of *transform! europe* on the post-coal regions decided to go on with our work and publish our research from the last years. We think that the war in Ukraine unfortunately supports our basic arguments. Even with additional funding for the coal industries in our countries, we fear that this just might just lead to a "cold turkey" once the coal pits are depleted, and the climate catastrophe will finally have real impact in our lives.

Our main argument, which has unfortunately been strengthened by the war in Eastern Europe, is that we need democratic planning for the coal regions. If the people and their regions are not taken seriously in the processes of energy transition, then it won't work, or as a well-known saying goes, we will see transformation either by design, or by disaster.

What are we focusing on with our research?

The aim of the research is to develop basic knowledge on the challenges of the "coal-exit" for the areas of North Czech Republic, East Germany and large parts of Southern-Western and Central Poland.

In the first step we publish here, we aim at mapping economic challenges, relevant actors and political issues.

The whole project behind this should stimulate a transnational debate between critical and left actors in our countries. The aim is to strengthen the pro-people forces in the socio-ecological transformation of these regions towards a post-fossil society.

We want to show that the three countries in the coal regions all face similar challenges of regional structural change and that we can learn from each other. Organising beyond the nation state might help us in the endeavour for developing our regions.

It is also about crossing the border regions which are perceived as belonging to "West" and "Central-Eastern" Europe.

This research is aimed at "mapping" the areas for joint discussions on the three coal regions. What is also important in our considerations are the consequences of the changes made in other industrial plants related to mining (in Poland, the best example is the steel industry) and the related service sector.

The four axes of our research

The first field of research is the Socio-Economic History of the Region. Coal Mining in our area is hundreds of years old and influenced not only the economy. Cultural questions were historically intertwined with this emerging sector.

Our research shows various waves of structural changes in the coal sector. The time after the second world war and the end of the real existing socialist economies are the two strongest watersheds in the development. That means that the coal industry has already lost much of its economic impact compared to the 1970 and 1980s. In all the areas we studied the re-introduction of capitalism was the biggest break in the historical development of the sector. With the mass redundancies of tens of thousands of workers a dog-eat-dog transformation was initiated which left hardly any room for rational planning. The only real goal was to keep energy supply stable. The social gains of the traditional miner's job were lost for the now unemployed people, and so their family and their regions lost dramatic purchasing power. Until today these regions cope with these dramatic losses.

In the second area of research, we focused on the current existing coal economy. We looked at the conditions of the coal industry in the regions. How many workers are still employed? We tried to gain knowledge about the ownership structures to understand who make the decisions. We also looked at the wider regions, their economic structures regarding sectoral structures.

The third focus of our work is the political one. How are the energy transformation and energy independence of the countries being discussed and how are they changing? What political powers do the regions have? What can the regions actually "do"? Whom do left actors need to address? Can decisions been taken regionally, or are the national capitals deciding everything? How is political power structured locally? Which parties are hegemonic?

No politics without the civil society, so we wanted to learn more about its internal diversity: where are the industrial associations, the trade unions, the church(es), the media (TV, newspapers, online), soccer clubs? In which structures can actors talk about a good transformation? Assuming there would be money for a just transformation: who decides where the money goes? Who sits on the committees?

The fourth topic we discussed are the Public Discourses on Coal – the 'imaginary'. Do the states have a coherent industrial policy? And how are energy independence and eradicating energy poverty defined? What is understood as a successful transformation? What are the official plans for the transformation? What are the visions for the post-coal era (e.g., in culture)?

If there are broader visions for the regions: are these dominated by the private sector with a focus on competitiveness (green capitalism), or are there regional economies oriented towards the common good (with a public share in the economy)?

The last chapters in the studies offer a very brief overview about left political actors.

Roland Kulke – May 2023

Studies on Challenges in Post-Coal Regions: East Germany – Lusatia & Upper Lusatia

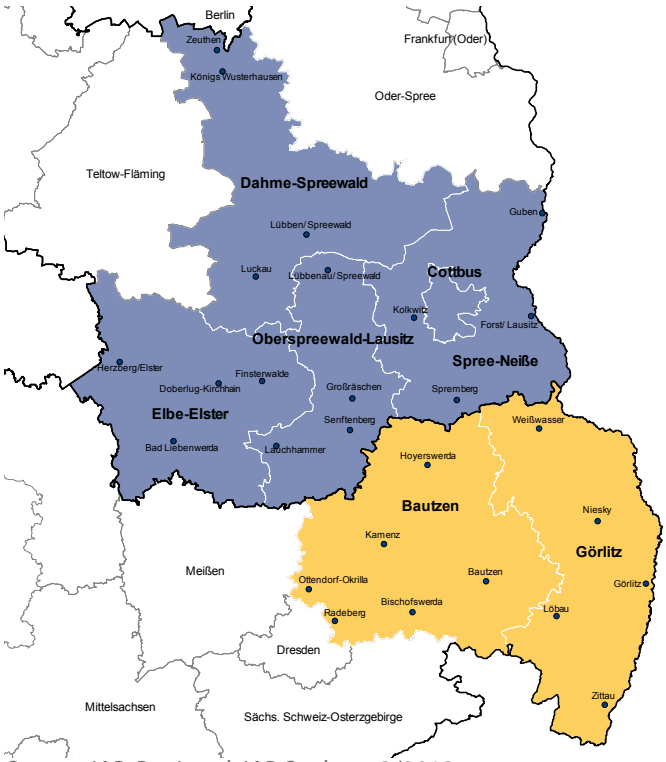
by Mathias Fröck

Historical developments of lignite mining

Owing to the large number of lignite and coal mining regions in Germany and the proximity of the Lusatian mines to Poland and Czech Republic, this study focuses on what is known as the Lusatian District ('Lausitzer Revier').

The Lusatian lignite mining region is one of three historically grown lignite mining areas in Germany and remains in operation to this day. Historically, mining in the area has included Lusatia and Lower Silesia with the city of Cottbus as their centre as well as the areas around Frankfurt, Görlitz, Zittau and Forst. Bar four opencast mines in Northern Saxonian Upper Lusatia and Southern Lusatian areas in the state of Brandenburg, most mines have been closed since the 1990s and have since been flooded and recultivated or are currently undergoing such process.

Figure 1: Map of Lusatia in Brandenburg and Upper Lusatia in Saxony



Source: IAB-Regional. IAB Sachsen 3/2018

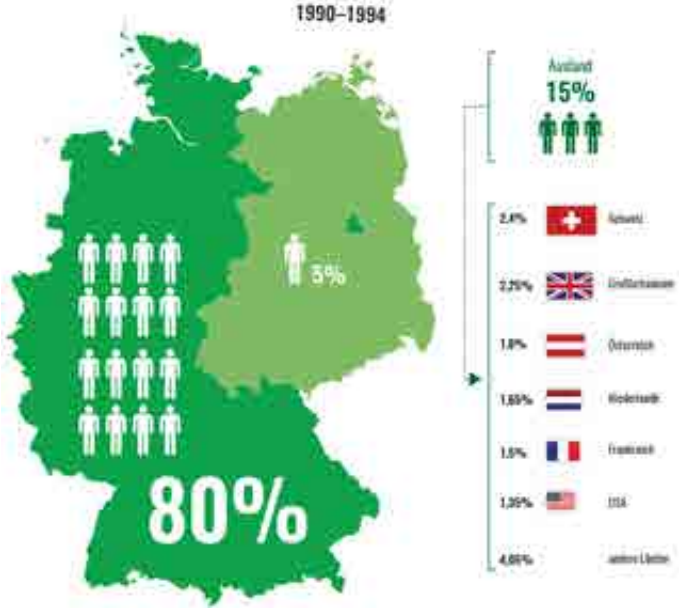
First written evidence of lignite mining in Lusatia dates back to when the first coal seam was tapped close to Bockwitz. In the mid-1890s, opencast mining became the main mode of mining in the region, which gave rise to lignite mining at an industrial scale. Reparation payments and cession of territory in the aftermath of the first World War saw Germany lose 40% of its hard coal reserves, and lignite became a significant source of energy, accounting for up to 60% of energy generation (cf. Bischoff 2000). This way, Germany became the largest producer and consumer of lignite (Balzer 1935: 55) and remains so to date at an annual production and consumption of 166.3 mega tons in 2018, outranking China's production at 147 megatons and its annual consumption at 150 megatons (cf. Gaedicke et al 2020: 159-161). The Lusatian District accounted for up to a quarter of all lignite produced in Germany until the outbreak of World War II (cf. Schmidt et al 1975: S.126).

After World War II, use of lignite intensified in East Germany. Lignite served as the primary source of energy for East Germany, which is why most of the opencast mines in the Lusatian District were established after 1945. Among others, the East German district of Cottbus was nicknamed 'energy district'. This fundamentally defined the identity of residents in Lusatia and in Northern Upper Lusatia and created an emotional connection with lignite mining. At an annual production of up to 300 million tons, East Germany became a global leader in lignite mining and tens of thousands of East German miners worked to extract the 'black gold'. The *Schwarze Pumpe* ('black pump') lignite-fired power station was deemed the 'flame of socialism'; the population of the cities of Cottbus, Hoyerswerda and Weisswasser skyrocketed. Simultaneously, the flip side of this boom became apparent in this region across three countries which became known as the 'dirty triangle': The considerable environmental impact is a direct consequence of mining activity. To date, restauration and recultivation of former East German remains a central task and cost factor to Lusatia.

The post-1990 structural shift

The peaceful revolution in the autumn of 1989 put an end to the lignite industry boom in the Lusatian District. Up until 1999, the number of opencast mines, power stations and briquette factories reduced to a mere handful, centred around the region surrounding Cottbus, Hoyerswerda and Weisswasser.

Figure 2: Background of buyers of privatised East German businesses (Haupt 2021)



Source: katapult-magazin.de

In 1990, the Senftenberg Lignite Combine was privatised and became Lausitz Braunkohle AG ('Lusatia Lignite plc'), which would merge in the 1990s with further businesses associated with Lusatian lignite mining and was sold to a consortium of West German energy companies in 1994 by the *Treuhandanstalt*, the agency that privatised East German state enterprises (BT-DRS:13/1660). This featured as part of a larger privatization and selling campaign by the *Treuhand*, which understood it to be its task to rid itself of East German businesses which on the books had incurred tremendous loss when the West German Mark was introduced post-unification in what had been East Germany. Approximately 50,000 properties, 10,000 companies and more than 25,000 small businesses were sold off, at times under dubious circumstances and frequently without appraisal of the buyer's soundness or checks on contractual compliance. The sellouts, shutdowns and optimisation efforts destroyed a total of more than three million jobs (cf. mdr.de 2020). In 2001, HEW, a Vattenfall subsidiary, bought the majority of LAUBAG shares and in 2002, the Vattenfall Europe Mining AG was created (cf. Ein neuer Energiekonzern entsteht / Die Chronologie der Fusion von Bewag, HEW, VEAG und LAUBAG [An Energy Corporation Rising: A Chronology of the Bewag-HEW-VEAG-LAUBAG Merger], 2003). In 2015, the Cottbus North opencast mine shut down as scheduled. Vattenfall's 2016 departure from the lignite industry saw the creation of the Lausitzer Energie Verwaltungs GmbH, owned by the Czech EPH group. Today, LEAG produces around 60 million tons of lignite, making it the second largest lignite district in Germany.

Structural transformation experienced today is in fact the second such transformational process for Lusatia. As early as in the 1990s, there was a fundemantal structural shift in Lusatia. Many enterprises operating in key industries were privatised and/or closed. When the East and West German economies and currencies merged, industrial labour across East Germany was either overexerted or sold off practically overnight – a mere 5% remained in East German ownership, while 80% were snapped up by West Germans.

Even though East German businesses had been valued at 600 billion marks in 1990, the *Treuhand* ultimately incurred a loss of 250 billion German marks. Many enterprises, including those that had operated at a profit, changed hands for the token price of 1 German mark, ostensibly because there would be any prospective buyers for many enterprises given that they did not promise much return. One key issue which surfaced was that production facilities were dated, and too little capital was available particularly among the East German general public to acquire them. Many investors, so claimed *Treuhand* staff, could only be convinced to buy up East German businesses because of the extremely low price and the fact that existing debt and restructuring costs would be covered by the state.

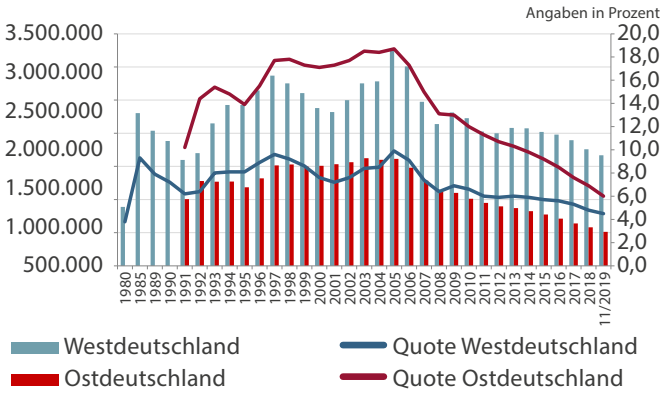
This triggered deindustrialisation on a massive scale, but this crash had not come unannounced. East German enterprises could have kept pace with their West German counterparts had they been given more time to adapt, a phase during which they would have been shielded from competition and seen their own currency protected. Forecasts suggested as early as when the German mark was introduced in the East that many enterprises would no longer be competitive as the exchange rate sent wages soaring

prohibitively at lower productivity. Nevertheless, wages were converted at the rate of 1:1, chiefly for socio-political concerns. This was compounded by the collapse of Eastern European markets caused by the shifts these countries, too, witnessed. In addition to the contracting markets, supply chains also collapsed, making it necessary to explore new markets. Many enterprises had seen no investment or acquisition of new equipment for years, and this had taken a toll on competitiveness as a result. Up to 1990, this had been absorbed by means of the declared state target of full employment though surplus labour and secure sales markets. This structural deficiency was in part grounded in East Germany's imperfect economic policy, but this fails to fully explain the industrial demise of the East (cf. Haupt 2021). Beyond home-made deficits, they key problem was also located in privatisation: "People said the bride should either be beautiful or slim. And then they trimmed the businesses down to produce solely within their core expertise, and sold them off" says Ulrich Blum (Baum 2015). In this, the *Betriebsverbunds* – which were comparable to West German corporations – were broken up, in the process also destroying networks and supply chains.

From the very beginning, any active industrial policy was dismissed to avoid distorting the market at the expense of the taxpayer. West Germany had had bad experience with this; West Germany had kept its otherwise unviable industrial sector afloat through subsidies in the billions. The free market was expected to regulate this and establish competitive businesses (cf. BT-Drs. 12/8404). As a result, most enterprises that were granted funding for restructuring were those who had investors on board, triggering tremendous competitive distortion to the detriment of East German enterprises, which in turn prevented them from making crucial adjustments. This was in the interest of West German corporations which were engulfed in a sales crisis themselves and would otherwise have seen East German businesses competing with them in addition to competitors from outside Germany. Against this backdrop, the fended off any intention to depart from the market-liberal trajectory (cf. Czada: 386).

The *Treuhand* had been meant to act as a custodian of market-liberal notions vis-à-vis *Aufbau Ost*, the "rebuilding of East Germany", and as an advocate of the East, working swiftly and accurately. It achieved none of it. Through millions of people who have lost their jobs and thus an important feature of their identities as workers within their respective businesses as well as the demise of East Germany's industrial sector have rendered the *Treuhand* a symbol of the harsh upheaval and mistakes made after Germany's reunification (cf. Haupt 2021). To date, much of the *Treuhand*'s activity requires revision, particularly in light of claims of corruption, and a fresh focus which connects these actions with the high levels of scepticism towards established parties and preparedness to engage with right-wing populists today.

Figure 3: number of unemployed and unemployment rate in East and West Germany over time (considering civilian labour force) (Röbenack 2020)



Source: Statistik der Bundesagentur für Arbeit, Arbeitslosigkeit im Zeitverlauf, data status November 2019, own figure

The number of people in work in East Germany dropped from around 9.8 million in the autumn of 1989 to a mere 6.7 million in late 1991 (German Federal Labour Office/Bundesanstalt für Arbeit 1992: 776). Figure 4 indicates clearly that the number of unemployed individuals skyrocketed in the 1990s. From 1991 to 1996, this number which had rapidly increased anyway rose again to nearly 18%. Industrial areas which had developed organically now turned into structurally weak regions. The District of Görlitz, for instance, is in the region recording the lowest average salary in Germany today (cf. dpa 2019).

Environmentalism

In West Germany, the environmentalist movement was born through the anti-nuclear movement in the late 1970s, when the first NGOs were created, too. East Germany, by contrast, did not have such NGOs. They were banned within the political system (cf. Langsdorf/Hofmann 2014). Indi-

vidual protests did however occur, for instance in response to destruction of the Erzgebirge Forest or air pollution in Wolfen/Bitterfeld, an industrial region home to chemical industry production. One key feature at any such protest was rebellion against the government failing to provide adequate information. When East Germany's environmentalist movement institutionalised, it did so in a church context. Between 1987 and 1989, there were 'ecumenical meetings' of peace, environmentalist and justice groups and representatives of the churches; among others, they created the "Grün-Ökologische Netzwerk Arche" (*The Ark Green-Ecological Network*) (cf. Käfer 2017).

Unification divided East Germany's environmentalist movement because there was no consensus as to whether there should be an ecological party. Proponents of the idea founded the 'Green Party in the German Democratic Republic', which merged with West Germany's Green Party in 1990. Detractors of the idea instead joined forces within the 'Grüne Liga' (*Green League*). Originally, the Green League had hoped to connect all East German environmentalist groups and to create a movement that would include the society as a whole. Their founding appeal stated: "Awareness of the serious and urgent nature of global and local ecological problems is what brings us together. The shared responsibility every one of us senses to solve what seem to be unsurmountable tasks of environmental protection in East Germany is what spurs us on to take action. This action must necessarily be collective. Irrespective of diverging experience and worldviews, we want to join hands in an action unit of all environmentally aware forces. This is why we call to create a 'Green League'. It shall serve as a shared umbrella to save our natural livelihood, to stimulate alternative modes of thinking and acting, and to overcome the societal lack of action on environmentalist matters…" (cf. Bundesverband GRÜNE LIGA e.V. 2018). Today, the topics covered by the Green League remain diverse: smaller, autonomous, and well-connected groups involved in education and environmental protection organise larger campaigns and eco-anarchic theory and practice. Points of view, too, diverge. In the state of Brandenburg, for instance, the League focuses on opposition to new lignite production (cf. GRÜNE LIGA Umweltgruppe Cottbus e.V. 2012), while Saxony's Green League used to work on the ramifications of renewable energies and centralisation efforts for nature and the countryside. Such a focus certainly in part was due to right-wing actors operating within the Saxony chapter in the past and presumably still today. By means of example, Jörg Urban, currently whip and state chairman of the fascist AfD party, used to be the director of the Green League's Saxony chapter up until 2014 and has been instrumental in shaping it. Only the Green League's German national chapter unequivocally repudiated Urban after he had entered Saxony's state parliament for the AfD. The website of the Saxony chapter, by contrast, does not make any mention of critical engagement with the chapter's cooperation with Urban (cf. Bundesverband Grüne Liga n.d. und GRÜNE LIGA Sachsen e.V. n.d.).

East Germany's environmentalist groups failed to connect mostly because of the expansion of West German environmentalist organisations into the East. Initially, the Green League cooperated with West Germany's Bundesverband Bürgerinitiativen Umweltschutz. Right now, they are critically reviewing the establishment of a Tesla plant in Grünheide, just outside Berlin, jointly with Naturschutzbund Deutschland. Recently, they have however lost in court demanding trial operations be discontinued in June 2021 (cf. Nauschütz 2021). Green League operations are today restricted to eastern Germany, and even there they maintain a strong presence only in Berlin and Saxony.

It is particularly noteworthy that nearly all newly founded East German parties included ecological issues in their manifestos. Among others 'Das Neue Forum' (The New Forum), the 'Initiative Frieden und Menschenrechte (Initiative for Peace and Human Rights)' and 'Demokratie Jetzt' (Democracy Now) formed the 'Bündnis 90' and in 1993 merged with West Germany's Green Party.

Since the 1990s, civil movements which have opposed further exploration of extraction sites have grown stronger. The 'Stoppt Cospuden 90' ('Stop Cospuden 90') initiative organised a march on the mine joined by over 10,000 protesters. The initiative turned out to be successful as the mine was not expanded and ultimately closed in 1992 (cf. Ökolöwe – Umweltbund Leipzig e.V. 2009).

Among others, middle-class initiatives aiming to protect villages from demolition are gathering momentum. Their central focus is fear of losing one's home. This centers on freedom of choice of domicile over paternalism. These movements intersect in their positions with climate protection groups and in part cooperate with *Ende Gelände*.

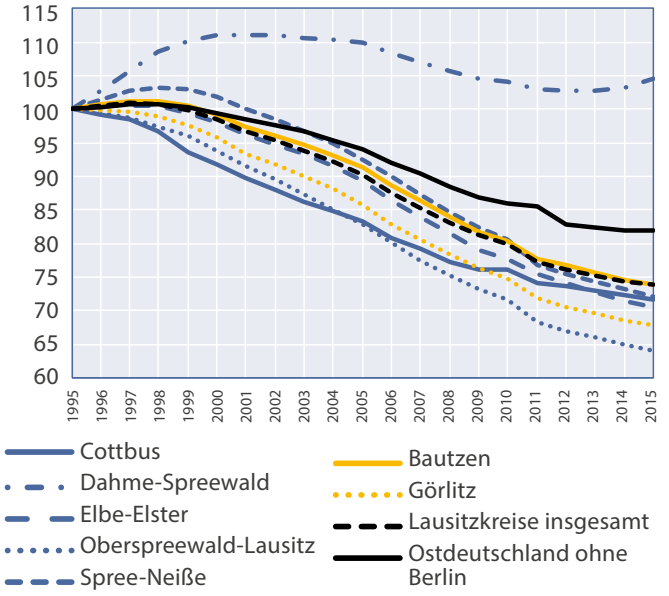
In 2016, they organised tree sittings around the Nochten mine, while in May 2016 the Lusatian District ended up in *Ende Gelände's* crosshairs. *Ende Gelände* understands itself as "a broad coalition of people from the anti-nuclear and anti-coal movements, the preparation teams of the climate camps in the Rhineland and Lusatia, of the occupation of Hambach Forest, climate-policy grassroots initiatives, and civic initiatives, but also larger environmentalist organisations, left-wing political groups and many others. We are united in our conviction that we must take climate protection into our own hands, and in our desire to send a widely visible signal for a shift towards true climate protection through acts of civil disobedience that go beyond the protest of the past years." (Ende Gelände, n.d.). Local residents are divided about *Ende Gelände*. While some appreciate the moral support and participate themselves, others feel strongly about what they perceive to be meddling of external actors and as a personal attack on their jobs. (cf. Alles-Lausitz.de 2019). What merits critical examination is that because of the modes of civil disobedience and organisational structures, true inclusion of and engagement with the movement on the part of residents only happens for the duration of the respective action. In 2021 activists were occupying a section of a forest close to the city of Dresden to prevent clearing for the extension of local gravel mining operations. (cf. Alternative Dresden News 2021). As an actionist structure, they correctly criticise the apathy on the part of politicians and businesspeople vis-à-vis global warming. While the extent to which these actions yield results is debatable, *Ende Gelände* at the very least clearly addresses the problems of capitalist interests in coal energy and environmental destruction in Germany (cf. Ende Gelände n.d.)

DEMOGRAPHICS

Figure 4: Location of Lusatia in Central Europe

Source: Wikipedia Author/Nord Nord West 2003

Figure 5: Demographic development of those aged 15 to 65 in the Lausatian Districts 1995 – 2015 (Seibert et al. 2018: 13)



Source: IAB-Regional. IAB Sachsen 3/2018

Population

approx. 1.1 million (2019). The population of the region has been dwindling significantly: since 1995, the population has decreased by 23%. This decrease affected all but one of the seven districts: Dahme-Spreewald District in the state of Brandenburg, characterised by its close proximity to Berlin. This trend of depopulation is expected to persist in the future. One peculiarity of the Lusatian District is that it extends across several federal states owing to reforms of

Germany's administrative structure in the 1990s (cf. Statistisches Bundesamt, Wiesbaden, n.d.).

Birth and Mortality Rate

Since German reunification, Lusatia has seen a birth deficit, i.e., the number of deaths exceeds that of births. Lusatia's birth rate is at 8 per 1000 inhabitants, i.e., roughly 15% below Germany's national average of 9.2 births per 1000 inhabitants. The death rate is at 14 per 1000 inhabitants. This means Lusatia has a birth deficit of -6 per 1000 inhabitants, which is twice the national average of 2.6 (cf. Statistisches Bundesamt, Wiesbaden, n.d.).

Age Structure

The region is characterised by substantial obsolescence. While the average age of people in Germany is 44.5 years, it is 46.5 years for men and even 50 years for women in Lusatia; 50% of Lusatia's population is over 50 years of age (cf. Statistisches Bundesamt, Wiesbaden, n.d.).

Migration

Population statistics of all statistical offices of both the Federal and States governments indicate net emigration for virtually all districts in Lusatia. Since 1995, the population of Lusatia has decreased from 1,430,000 people to 1,170,000 in 2015. This means that Lusatia has lost over 18% of its population since 1995 (cf. Markwardt/Zundel 2017). Only the district of Dahme-Spreewald has registered net migration to the area since 1995. Cottbus has seen positive net migration since 2009. There was a special effect solely in 2015 for all districts of Lusatia: refugees migrating to Lusatia resulted in positive net migration across all regions. The Lausitz Monitor, an annual opinion survey among residents, suggested in 2021 that young people in particular are prepared to relocate elsewhere. 45% of people aged 16 to 29 responded that they are rather or highly likely to leave Lusatia in the next two years. Overall, one in 10 Lusatians would consider moving away from the area. At this point, gender has no bearing on this readiness to leave (cf. Bischoff/Heidig 2021).

ECONOMY

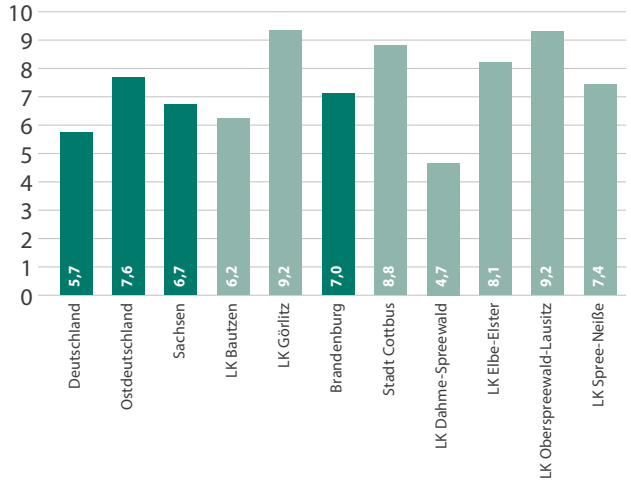
Basic Indicators

Assessing the basic indicators explained below, we find that Lusatia is not a particularly economically successful place compared to the rest of Germany. There are marked differences compared to the states in which Lusatia is located. In the broadest of terms, the part of Lusatia located in Brandenburg is of greater importance to the State of Brandenburg than the part located in Saxony is for the Free State of Saxony.

Gross Domestic Product (GDP) per capita

The gross domestic product (GDP) per capita has been considerably below national average since the 1990s across all Lusatian districts – bar the district of Spree-Neisse in 2010. The reasons for this higher GDP in 2010 in the Spree-Neisse District remain unclear. The GDP of four out of the seven districts in Lusatia has consistently been below the average of the respective State in which they are located.

Figure 6: unemployment in %



Source: Bundesagentur für Arbeit, own figure

Unemployment Rate

Lusatia's unemployment rate is noticeably above national average. In four out of seven districts, the unemployment rate is above eastern German average.

Table 1: wage levels by districts

Land/Region	Landkreis	Median des Bruttoentgelts (Platzierung)
Deutschland		3.209
Ostdeutschland (inkl. Berlin)		2.600
Brandenburg		2.493
	Elbe-Elster	2.215 (398)
	Oberspreewald-Lausitz	2.490 (352)
	Dahme-Spreewald	2.518 (348)
	Spree-Neiße	2.532 (344)
	Cottbus	2.653 (337)
Sachsen		2.479
	Bautzen	2.283 (395)
	Görlitz	2.183 (401)

Source: Bundesagentur für Arbeit, own calculations

Median gross salary of salaries subject to social insurance contributions by place of work

The median income splits all salaried workers into two groups of equal size: one half achieves a higher, the other a lower income. This makes it unsusceptible to outliers and thus better reflects the 'standard income' of the region.

Generally, the median income in eastern Germany is below that elsewhere in Germany. This in particular affects Lusatia. Furthermore, three of the districts with the lowest median income nationally – namely the districts of Görlitz, Bautzen and Elbe-Elster – are in Lusatia. Salaries in the lignite and gas industries on average outpace average salaries. The lowest pay scale group (Salary Grade 1 of 10) laid out in the collective wage agreement of the German Brown Coal Industry Association (Deutschen-Braunkohle-Industrie-Verein e.V.) and the Trade Union for Mining, Chemicals and Energy (Industriegewerkschaft Bergbau, Chemie, Energie) is at a starting salary of €2,318.09 per month a mere 7% below Lusatia's average salary. At Salary Grade 3, i.e. €2,527.02 per month, it is roughly equal to the average salary of €2,500 (LR 2019); in the top bracket, it is over 100% over the average salary, i.e. at €5,245.71 in the lignite industry.

Energy Sovereignty

Since 2002, Germany has been exporting more electricity than it has been importing. A total net 21 terawatt hours were exported in 2020. Poland, the second largest importer of electricity from Germany, is particularly affected by this, exporting 4.7 TWh from Germany. Czechia, too, is a net importer of electricity from Germany, but to a far smaller degree at 0.6 TWh (cf. Bundesverband der Energie und Wasserwirtschaft e.V. n.d.). Germany's most important export markets are Switzerland, Poland and Austria. The largest share of electricity in Germany is now being produced from renewable sources and lignite. The share of renewables is increasing year-on-year, with wind energy accounting for the largest section of it, followed by PV and biomass (cf. Bundesministerium für Wirtschaft und Industrie n.d.). However, Germany has fallen short of its own targets – since 2018, the number of newly installed wind turbines has been decreasing owing to stricter statutory requirements as to the distance in between turbines and other buildings as well as modified tendering processes. In 2021, only 460 turbines were commissioned, a quarter of the number of new turbines which had been put into operation in 2017. To achieve the 1.5-degree climate target, Germany would have to achieve zero emissions by 2030. To this end Germany would need to build 10 times as many wind power plants per year as it did in 2021, according to the non-governmental "Energy Watch Group" (cf. Schrader 2021).

In 2019 (cf. Bundesministerium für Wirtschaft und Industrie n.d.), Germany's energy production was made up of

- lignite: 114 TWh (19%)
- nuclear: 75 TWh (12%)
- hard coal: 58 TWh (10%)
- natural gas: 91 TWh (15%)
- renewables: 242 TWh (40%)
- other: 25 TWh (4%)

Notably, 56% of energy supplied to the German grid in the first half of 2021 stemmed from conventional sources. The spring had seen little wind and coal returned as the most important energy source (cf. Destatis 2021).

During the structural shift of the 1990s, there was a substantial reduction in the labour force in the lignite sector. The number dropped from around 79,000 in 1989 to fewer than 8,000 in 1999. Today, around 7,000 people work in the in-

dustry, even though exact figures are unavailable because of LEAG's information policies. An additional maximum of 8,000 staff works for suppliers and thus indirectly in the lignite sector (depending on the basis of calculations). This corresponds to about 3% of all working people in Lusatia.

Ownership structures in the lignite industry have changed constantly since privatisation in the 1990s. Until the early 2000s, main shareholders of the Lusatian lignite industry had been West German energy corporations. This changed at the very latest when Swedish Vatenfall began purchasing shares. Vatenfall did however sell its shares in 2016 to the Czech EPH Group, which founded LEAG jointly with PPF, a financial group operating internationally. Behind this conglomerate are industrial subsidiaries of the Czech-Slovak J&T Group and the PPF Group around the heir of Petr Kellner, who passed away in 2021. Now, the EPH Group is mostly owned by Patrik Tkáč, the founder of the J&T Finance Group, and Daniel Křetínský, CEO of EPH. Both have invested in a range of European media groups. EHP has been known to buy up energy businesses for cheap to make money out of them (cf. Janzing 2016). What is particularly critical for Lusatia is that EHP reduced reserve funds to offset long-term ecological damage and costs associated with this caused by the mining industry by 55% in the first year after EHP acquired MIBRAG in the Central German lignite mining area (*Mitteldeutsches Revier*) (cf. Greenpeace.de 2016). It is uncertain if reserves accumulated to date will suffice. For this reason, EPH's accounts were audited in 2018 in Saxony and Brandenburg State. A Brandenburg expert report claimed that the €1.4bn earmarked on the books would be sufficient, but a similar expert report from Saxony has been classified (cf. Kraushaar 2019), perhaps because – as Greenpeace has claimed – the €1.7bn for renaturation which Vatenfall had passed on in cash at the time of sale appears to be nowhere to be found according to the books (cf. Greenpeace 2019). This again raises suspicion of corruption and that EPH had from the word go been speculating for restoration at the taxpayer's expense and through compensation from the coal phase-out. This is evidenced by Křetínský conceding in an interview: "As a shareholder of LEAG, we cannot accept any guarantees for recultivation." (Kraushaar 2019) This is not least since even in 2022, there are no clear stipulations requiring the parent company to cover the costs of natural recultivation in the case of insolvency of the lignite subsidiaries (cf. Kraushaar 2019).

Even though lignite has been contributing to Lusatia's economic vitality, its impact should not be overestimated. 3% of the workforce being directly or indirectly employed in the lignite industry means that the remaining 97% are working in other sectors and industries. The actual salience of lignite diverges regionally. Most jobs in the lignite industry are in the northern parts of the districts of Görlitz and Bautzen as well as in the districts of Cottbus and Spree-Neisse.

Beyond lignite, Lusatia is home to a diverse range of economic sectors. Only the agricultural, forest and fisheries industries employ fewer people. The largest employer in Lusatia is the public sector and other service providers, accounting for nearly 31% of the workforce. This is followed by trade, transport and warehousing, hospitality, information and communication, accounting for around 22% of people in work in Lusatia. Coming in a close third, manufacturing industries at around 20%. Owing to the smaller size of enterprises and the structural weakness of trade unions in eastern Germany, the degree of organisation is considerably lower than in mining and energy. In general, around 20% fewer people are union members in eastern Germany than in western Germany (cf. Schroeder/Greef 2020). Although the share of workers in mining is low overall, the gross value creation in mining, energy and water provision is at 15.2% three times as high as the eastern German average and even four times as high as the western German average.

GOVERNMENT STRATEGY

State Governments

The political landscape is shaped by the long-term dominance of the Conservative CDU party spanning nearly three decades in Saxony, and that of the Social Democrat party SPD in Brandenburg, which is however conservative vis-à-vis lignite. Since 2015, the fascist, right-wing conservative AfD party has become the second strongest party across Lusatia. Beyond this, the left-wing DIE LINKE (Left Party) is the third largest party in Saxony, a role assumed by the Conservative CDU in Brandenburg. Unlike elsewhere in Germany, the Green Party fails to score in Lusatia and in some polls fails to clear the *five-percent hurdle*, the electoral threshold parties are required to exceed to enter parliament. The support for Conservative and right-wing parties is reflected at municipal

government level, while parties of the centre-left play hardly any role in the political arena, with the results of the Left Party developing from bad to worse.

For years, Saxony had been pursuing a low-wage strategy to attract investors and entrepreneurs. This is evident from the relatively low increase in average wages contrasted with Germany's national average. From 1995 to 2009, average wages increased very slowly against the national German average from 76.3% to 80% in 2009 (cf. Riepl 2017). In 2019, Saxony was still at the lower rungs of wage levels comparing Germany's different States. Saxony's wage level is at a mere 79.9% of the national German average; at €35,955, it is nearly €10,000 below Germany's national average annual salary (cf. Jagiello 2019). Additionally, 7% of jobs in Saxony paid minimum wage in 2017, compared to 4% nation-wide (cf. mdr.de 2018). In 2014, the then-government of Saxony led by the CDU and the liberal FDP party was the only state government to oppose the introduction of a general minimum wage in the German Bundesrat. To date, Saxony's business promotion agency highlights Saxony's below-average labour costs, which are around 20% lower than elsewhere in Germany (cf. Wirtschaftsförderung n.d.).

Since the 1990s, Saxony has been betting on 'lighthouse policies'. This means that economic promotion has been focused on larger centres to develop the surrounding areas in passing. Then-minister president Biedenkopf and his minister of finance, Milbradt, are credited as masterminds of this policy. Crucially, regions off the urban centres around Dresden, Leipzig and Chemnitz were substantially disadvantaged and only particular showcase businesses received financial support (cf. mdr.de 2010). DIE LINKE party has been criticizing this approach since the 1990s. Among others, the DIE LINKE group in Saxony's state parliament devised a completely alternative State Development Concept for Saxony complete with a clear vision, strategies and an action plan setting out realistic targets and a roadmap for the ten to 15 years to come (PDS-Fraktion im Sächsischen Landtag et al. 2004). The paper should have been consistently updated, but this process has petered out owing to the massively reduced size of the DIE LINKE's parliamentary group, the shift in subject focus as well as the corona pandemic and a necessary, fundamental structural debate.

Federal Government

The ruling parties in Germany have adopted a clear stance to phase out coal as a source of electricity. To this end, the Commission on Growth, Structural Change and Employment (or *Coal Commission* for short) was set up in 2018 and presented its final report in January 2019. Based on this report, Germany's Federal Parliament passed the Act to Reduce and End Coal-Fired Power Generation (*Kohleverstromungsbeendigungsgesetz*) and the Act on Investment in Coal Regions (*Investitionsgesetz Kohleregionen*) on 3rd July 2020. This encompasses €40bn for Germany's three coal mining regions to ensure restructuring of the local economy in a socially responsible manner after the lignite phase-out up to 2038. At first, the Rhineland Power Stations are to be taken off the grid, then Jänschwalde power station in Lusatia, followed by *Schwarze Pumpe* ('black pump') and finally Boxberg power plant. The phase-out roadmap mostly considers the desires of the coal lobby: they are to be paid huge sums in compensation. The basis on which compensation is calculated is not transparent and in the case of LEAG highly questionable at that. Against this backdrop, the European Commission has been reviewing these compensations grounded in a Greenpeace statement. The focus of efforts at this stage is to verify if compensation is permissible under European state aid legislation (cf. Greenpeace 2021). These €40bn earmarked for structural change consist of different programmes and specific investments. €26bn are direct investments from the Federal government, €14bn come in the shape of structural funding the use of which is upon the respective State government to decide. Around €11bn are budgeted for Lusatia. Broken down, this equals nearly €850,000 per person directly or indirectly employed in the lignite industry.

Federal investment is intended for
- transport infrastructure
- research
- Federal authorities
- the *Unternehmen Revier* and *STARK* support programmes (funding corporate investment as well as staff and material costs)

Structural funding for the regions (to be allocated by the State governments):
- infrastructure supporting economic activity excluding public roads

- transport, excluding Federal, State or Municipal government roads
- public welfare (youth, health, culture)
- urban development, city, and regional development
- digitalization, broadband and mobile communications technology
- tourism infrastructure
- science and research infrastructure
- climate and environmental protection
- conservation and landscape conservation

In many areas, this strategy aims to provide funding for investment in infrastructure which has been long overdue and is in fact independent of changes to lignite production. The city of Görlitz, for instance, requested €90m of the fund towards urban mobility upgrades, i.e., first and foremost the acquisition of new low-floor trams. This acquisition had become necessary anyway owing to the age and insufficient accessibility of the current tram network (cf. Beutler 2021).

The problem in this instance primarily is that no one local to the region is involved in the decision-making process as to the purpose towards which funding should be allocated. Local actors may request funding, but the decision is ultimately made at the State and Federal levels, within structures that do not involve any Lusatians.

Regional monitoring committees have been set up following structural change in the Lusatian District, however they have been relegated to merely offering proposals. Decisions are made by representatives of the State and Federal governments.

The new government — a coalition of the social democrats SPD, Green party, and liberal FDP — has agreed to resolve the coal phase-out earlier as per its coalition agreement. As of right now, they hardly liaise with those affected. The early phase-out has had palpable impact on employees, supplier industries and municipal administration. Municipal administrators have already come under particular pressure to develop and submit project proposals. Many municipalities lack time and staff to draft good proposals – while there still is no strategy at the State and Federal level.

THE ROLE OF THE DIE LINKE PARTY

The role of the left-wing DIE LINKE party has been different in the political spheres of Saxony and Brandenburg.

In Brandenburg, DIE LINKE was in government as part of a coalition until 2019 and supported lignite extraction as a "bridge technology" to be used until 2040. It must be noted that DIE LINKE has in part very close ties with the IGBCE union in Brandenburg, which introduced its structurally conservative notions of economic activity into the party's discourse in a powerful and at times aggressive manner and dominated debates for a very long time. Without reservation, it supported the State government's project proposals to extend local infrastructure. It is committed to the coal phase-out as well as recreating Lusatia as an 'energy region' which is to be revamped through use of solar and wind energy. It must be emphasised that the expansion of renewable energy was a politically driven target. DIE LINKE attempted to pull off a balancing act between climate change and securing jobs in the lignite industry in Brandenburg and was punished for this at the polls in the 2019 State elections, achieving the lowest result in party history at 10.7%. Since, the SPD has been in government in Brandenburg, jointly with the CDU and the Green Party.

In Saxony, DIE LINKE has always been in opposition. It was able to act more freely but has struggled to make its voice heard in the media and with the current government. Therefore, it has unequivocally pointed to existing problems and the status quo, including the fact that "long-standing relationships and extant business structures have facilitated access to funding" and that "young, creative projects lose this race" for this very reason (Kagelmann et al. 2019). The party has called for project funding to be more accessible as well as for more funding for "alternative modes of economic creation, ways of live and forms of housing" (ibid.) and novel, individual approaches.

Following the end of DIE LINKE's involvement in the Brandenburg government, efforts to collaborate on modifying economic activity with its comrades in Saxony have been reinforced. This has produced cornerstones for structural change: "Jobs in industrial workplaces in the extant industrial cores are to be protected and the creation of new well-paid jobs subject to social insurance contributions is to be promoted, without linking these to any specific in-

dustries. This includes business settlement policies and targeted recruitment of skilled workers. Functional and secured basic services are a prerequisite for creating jobs in rural spaces. All expressing commitment vis-à-vis Lusatia as an Energy Region are united in their refusal of new mines in the region. Open-cast mine rehabilitation is an important foundation for Lusatia's development after the end of mining."

DIE LINKE demands structural change processes in Lusatia be participatory, democratic and sustainable bottom-up. It demands part of the post-mining landscape be returned to agricultural and forestry use. In addition to business promotion, there should be equal promotion of civil society. A migrant-friendly culture of welcome towards migrants from within and outside Germany should be introduced that speaks to "dreamers, visionaries, doers" (cf. Kagelmann et al. 2019).

In late 2019, a circle of DIE LINKE representatives from areas affected by lignite production across Germany drafted a list of demands regarding how the earmarked €40bn Euros should be allocated in the run-up to 2038. In a nutshell, these seven demands are (Gösta Beutin 2019):

1. secure funding
2. structural change measures in tune with Sustainable Development Goals
3. funding to be allocated through transparent and democratic processes
4. regional model processes first, then specification of projects and allocation of funding
5. strengthening municipalities, regional businesses and the public sector
6. establish the *Fonds Zivilgesellschaft* ('civil society fund')
7. coal phase-out by late 2019

In its 2021 Federal Elections campaign, DIE LINKE proposed the most radical programme to tackle global warming. It called for net zero CO_2 emissions by 2035. Notwithstanding, it objected to increasing CO_2 prices as this was deemed to be of little climate policy effect while unsocial. The coal phase-out should be complete by 2030, though. These demands are to be offset primarily by high levels of government investment in renewables and the research sector.

On 3 December, Saxony's ADELE ecology working group ('Landesgemeinschaft Ökologie') organised a conference on the hype around hydrogen. Bringing in guests from the business sector, environmental protection and the political realm, the conference debated the role of hydrogen technology in structural change in Lusatia. In the process, the speakers provided comprehensive insight into the matter and triggered broad discussions (cf. Henning/Mertsching 2021).

ACTORS IN LUSATIA

Structures and cooperative efforts among different actors clearly reflect the fact that Lusatia stretches across two Federal States and seven districts. Saxony's Upper Lusatia is the poorest region within Saxony and the share of manufacturing industries is markedly higher. Located in Brandenburg, Lower Lusatia on the other hand is one of the few industrial regions in that State, and mining provides great value to the State of Brandenburg.

Brandenburg and Saxony's Lusatia Officers (Lausitzbeauftragte)

Brandenburg's and Saxony's State Governments have nominated dedicated Lusatia Officers who "are to monitor the structural development of Lusatia from within the region" (Staatskanzlei Brandenburg 2018).

Brandenburg's Lusatia Coordinator (*Lausitzkoordinator*) and his small team are based in Cottbus and report directly to the Minister President. The Lusatia Coordinator liaises closely with the Minister President and guides, coordinates, and accelerates activities by the State Ministries in the context of structural change.

In Saxony, the Mining District Officer (*Revierbeauftragter*) acts as head of a dedicated division within Saxony's State Chancellery which has been newly set up and is currently being developed.

Regional Monitoring Committee (Begleitausschuss)

Regional Monitoring Committees are involved in selecting projects within the scope of funding directives for "Grants as stipulated in the Act on Investment in Coal Regions" ("Zuwendungen nach dem Investitionsgesetz Kohleregionen –

RL InvKG") and further develop the programme of action. Saxony's Monitoring Committee includes voting members from the municipalities and the Saxony State Ministry for Regional Development as well as additional consultative members representing business and social partnerships as well as civil society. For Saxony, this however only includes two municipalities or associations of municipalities from the Districts of Bautzen and Görlitz. For this reason, over 100 cities and municipalities in both districts are not being considered and cannot vote. This way, the municipalities most affected by the coal phase-out cannot be sure to be heard.

Moreover, projects requested by the Regional Monitoring Committees remain to be implemented. 56 municipal projects have been recommended, but Saxony's Development Bank has to approve them – and after over half a year, not a single project has been authorised, with the Ministry for Regional Development not expecting the projects to become reality (Drucksache 7/8182). This as well as the fact that Monitoring Committee decisions are not binding but can be overturned at any time by the State or Federal government is reason to fear that the process as-is is bound to fail.

At this stage, there is insufficient staff to develop sustainable projects. Many municipalities in Lusatia are financially weak, which is why they cannot keep abreast with funding that is dearly needed and the deadlines to be met. Therefore often less mature projects are submitted. Furthermore, municipalities in Lusatia hardly find their planning costs covered in full, i.e., they are taking on additional risk when submitting proposals. Hence, projects approved to date have primarily been submitted by more well-off municipalities such as Görlitz and Kamenz. These administrations also have the staff who can draft detailed plans for projects.

Communal Actors

Owing to the municipal structure many districts provide administrative duties and guidance. Given the size of districts and their demographic structures, this triggers great challenges. Against this backdrop, some districts and municipalities have formed associations with specific targets.

Wirtschaftsregion Lausitz GmbH (Economic Region of Lusatia)

Wirtschaftsregion Lausitz GmbH (*Economic Region of Lusatia*, a *GmbH* being the German equivalent of a Ltd.) is a cooperative association of the districts of Lusatia in Brandenburg as well as the district-free city of Cottbus. Since 23 June 2020, it has been operating as a structural development association for the part of Lusatia located in Brandenburg and has been tasked with coordinating and monitoring structural change and cooperation across State lines.

It has been carrying out important projects and programmes, such as a *model process* (*Leitbildprozess*) to create a development strategy for Lusatia. It has also been administering Saxony's Participation Fund (*Mitmachfonds*).

Projects (Wirtschaftsregion Lausitz GmbH):

- Wirtschaftsregion Lausitz GmbH ran the *Lusatia Future Factory*, a project foregrounding the inter-State development process of municipal local authorities of Lusatia in Saxony and Brandenburg. As part of a three-year process, it created the "Lusatia Development Strategy 2050" (*Entwicklungsstrategie Lausitz 2050*), which could have served as an important foundation to address structural change. The process brought together around 2500 citizens through chats at information booths and was led and drafted by around 60 authors from all over Lusatia. Comments citizens had made were integrated in the paper as much as the results of 25 studies and expert reports as well as existing concepts. An inquiry raised by Antonia Mertsching, a DIE LINKE parliamentarian in Saxony's state parliament, did however show that this paper did not play any role for Saxony and the Federal authorities in devising a strategy on structural change (cf. Mertsching 2020).
- "Lausitz – Starke MINT-Region" (Lusatia – A Strong STEM Region) was a project aiming to help school leavers into the STEM industry in Lusatia. To this end, a portal was created, which Wirtschaftsregion Lausitz GmbH operated jointly with several partners (Federal Agency for Employment, Germany's job centre; Wirtschaftsinitiative Lausitz e.v., a Lusatian business promotion initiative; Wirtschaftsförderung Land Brandenburg GmbH, a Brandenburg State business promotion body) until January 2021.

- "Sächsischer Mitmach-Fonds" (Saxony's Participation Fund), a competition of ideas launched by Saxony and aimed at identifying ideas to create something positive out of the coal phase-out through mechanisms of citizen participation. Ideas ranged from augmented reality, revitalisation of historical village centres, environmental education to the development of skilled individuals.

Lusatia Round (Lausitzrunde)

Lausitzrunde is a self-organised alliance of Lusatian mayors and administrative directors. It serves as a conduit between regional societies and citizens and as the voice of local government concerns to State and Federal governments. They want Lusatia to be granted the special status of a European Model Region for Structural Change (Lausitzrunde n.y.). They call for a structural fund to secure infrastructure, social and cultural projects as well as public services provided by local administrations.

Finally, they demanded substantial changes of the way in which coal funding is allocated so as to ensure they are most impactful in active coal districts, and organised numerous round tables and conferences. As a structurally critical actor representing many affected municipalities, the *Lausitzrunde* rather frequently touches the sore spots within the current structural debate and developments.

ECONOMIC ACTORS

Lusatia Region of Innovation GmbH (Innovationsregion Lausitz GmbH)

Innovationsregion Lausitz GmbH was founded by the University of Cottbus-Senftenberg (BTU) in response to climate policies passed by the Federal government. It is meant to develop ideas and strategies as to how businesses can respond to cultural change. Its associates are the Cottbus Chambers of Industry an Commerce, the Cottbus Chamber of Crafts, BTU Cottbus-Senftenberg University, the Union of the Business Associations of Berlin and Brandeburg (Vereinigung der Unternehmensverbände Berlin und Brandenburg e.V.) and Business Initiative Lusatia (Wirtschaftsinitiative Lausitz e.V.). It acts as a mediator between science, business actors and researchers in the field of structural change. Its aim is to identify entrepreneurial answers and to further promote the economy. *Innovationsregion Lausitz GmbH* hopes to mobilise Lusatians to tackle the tasks structural change entails and to solve these challenges constructively.

Business Initiative Lusatia e.V. (Wirtschaftsinitiative Lausitz e.V.)

Founded in 2009, this initiative unites Lusatian businesses, chambers and local administrations who aim to strengthen Lusatia as a place to do business sustainably. It understands its tasks to be pooling and marketing economic prowess and to further the promotion, securing and training of young talent and highly skilled professionals.

CIVIL SOCIETY ACTORS

Centre for Dialogue and Change (Zentrum für Dialog und Wandel)

This structure was initiated by the Protestant Church to support societal dialogue during structural change. It aims to provide a platform for exchange between actors who contribute to "good life in Lusatia" (cf. Zentrum für Dialog und Wandel n.d.)

For Lusatian Lignite e.V. (Pro Lausitzer Braunkohle e.V.)

This citizens movement advocates preservation of mining jobs. They argue that Lusatia without lignite is unthinkable, and that Lusatian lignite will be needed for a long time to come. They receive active support from LEAG. There is evidence that their board is not made up of ordinary citizens but conservative social-democrat-minded decision-makers from municipalities that have been profiting from mining, as well as a few entrepreneurs with direct roots in the mining industry (cf. Pro Lausitzer Braunkohle e.V.)

Lusatian Perspectives e.V. (Lausitzer Perspektiven e.V.)

This association defines itself as a "thinktank exploring different angles of the structural shift in Lusatia" (Lausitzer Perspektiven e.V. n.y.). Its aim is to involve civil society in the dialogue on the coal phase-out and in new structures.

It communicates this to policymakers, NGOs, associations and the general public.

Throughout the past couple of years, they have implemented a couple of projects that at their heart focused on networking (cf. Lausitzer Perspektive e.V. 2021)

Green League e.V. (Grüne Liga e.V.)

At this point, they are the most influential environmentalist actor advocating a faster coal phase-out. They advise, network and support those who oppose plans for new mines. The Green League is rooted in the church-led environmentalist and peace movements, city ecology groups and a range of different regional environmental protection initiatives of East Germany. The League argues for a gradual and timely exit from lignite use as well as stable energy provision through renewables. It opposes any further resettlements (cf. Bundesverband GRÜNE LIGA e.V. 2018).

The Green League is most involved in structural debates in Brandenburg. In Saxony, the League has shifted its emphasis in response to the take-over/growing influence of representatives of the New Right as outlined in the first chapter of this paper; in consequence, it has lost many of its members who used to be actively involved in structural change processes to other environmentalist organisations such as the German Association for Nature Conservation NABU.

Structural Change Now action group — no to Nochten II (Aktionsbündnis Strukturwandel jetzt – Kein Nochten II)

This action group was founded in March 2013 to prevent the expansion of the Nochten mine and the consequent resettlement of residents whose villages would have been demolished for the mine. The mine had been reduced in size owing to the scheduled phase-out, but efforts were ultimately unable to spare the village of Mühlrose. There, houses are currently being razed to the ground.

Having prevented Nochten II, the group has since worked to reduce the mining area covered by Nochten I and to preserve the village of Mühlrose. To this end, they have organised information events across the region as well as activities generating public attention such as vigils and Easter marches, and they launch legal appeals. The action group considers itself politically neutral and unaligned with any religious denomination. It has adopted a clear stance against nationalism, racism and violence towards other human beings (cf. Strukturwandel Jetzt / Kein Nochten II).

All villages are here to stay! (Alle Dörfer bleiben!)

The *All villages are here to stay!* initiative works to protect their hometowns. Their work against expansion of mines is grounded in their fear of losing their homes.

Labour Unions

The Federation of German Trade Unions (DGB) and its constituent member, the Trade Union for Mining, Chemicals and Energy (Industriegewerkschaft Bergbau, Chemie, Energie) have been able to join the Coal Commission. They have assessed the results produced by the Coal Commission as "a foundation to build on" (DGB 2019). The unions call for *just transition* to be incorporated as a core principle for structural change and that good work, union wages and participation be strengthened, with high-quality jobs being created and protected. IG Metal, the Industrial Union of Metalworkers and the largest union within the DGB, was only involved indirectly.

On structural development in Lusatia, the DGB organised a lecture series at BTU University and the Lusatia Conference (*Lausitzkonferenz*). The DGB's Lusatia Conference — in its 16th iteration in 2020 — is one of the oldest platforms for discussions of the structural shift, even though it had rather been a platform showcasing the intentions of the coal industry in its early years.

Sorbs / Wends

The Sorbs (in Upper Lusatia) and Wends (in Lower Lusatia) are a minority who use their own Slavic language and have their own cultural traditions. At this point, they are negotiating a treaty with the governments of Saxony and Brandenburg on cultural and educational decision-making competence.

The Serbski Sejm was established in 2018 — the first Sorbian parliament, which aims for greater autonomy. It advocates recognition of the Sorbs as an indigenous people, which would entail greater right to self-government and

legally binding decisions in the fields of environmental protection, use of resources and political participation. Primarily, it has been acting as a lobby for the Sorbs. They have stood in solidarity with municipalities threatened with demolition (cf. Kliem 2020).

Saxony's DIE LINKE has in its own organisation a Sorbian working group, the LAG Sorbian Left, which joins debates within DIE LINKE. DIE LINKE in Saxony aims to maintain contact with Sorbian representatives, to support them and to integrate them within their own structures. They are also given consideration when drafting lists of candidates for elections. This was however not as successful in the case of the last elections as it used to be, mostly for lack of young politicians.

VISIONS FOR THE POST-COAL ERA

Many different actors have tried on many occasions to develop a vision for Lusatia. Yet, to date there is no consistent vision for a Lusatia that does not depend on coal. Frequently, it was the diverging stances on lignite production which saw advocates and detractors at loggerheads. Now, however, the general decision to phase out coal presents an opportunity to develop a vision for Lusatia and get everyone on board. the Act on Investment in Coal Regions has proposed one vision statement, in addition to two alternative concepts, "Lusatia as an energy region" and "Lusatia – Green Lake District".

Lusatia 2050 Development Strategy (Entwicklungsstrategie Lausitz 2050)

In 2020, there was a participatory process including a range of events and a writing workshop for around 50 authors from across Lusatia who together drafted this strategy between May and September 2020. Notwithstanding, the process to create the Lusatia 2050 Development Strategy has provoked trenchant criticism. Among other issues, the selection and mode of work of the authors is highly unclear and was implemented without involving local parliaments.

The vision expressed through this strategy envisions Lusatia as a CO_2 neutral business space. In this, existing economic structures are to be developed further by means of a green industry approach. New technologies and sustainable value creation chains are to be anchored in the region long-term.

In the process, the Lusatian District is to transform into a European Model Region for sustainable structural enhancement, to then widen into an integrated central European area boasting efficient and sustainable value creation. Additionally, great emphasis is placed on the energy region – it is expected to develop from lignite to a modern and sustainable energy region. Furthermore, Lusatia is hoped to develop into an interconnected model region for health, research, teaching and provision especially in rural spaces. Lusatia is to develop into a region of high quality of life through diversity in culture and sports, which is given an international presence through branding.

There are three stages of priority to implement this vision:

1. Strengthening and promotion of competitiveness of businesses through investment in research, innovation, and science. At the heart of these efforts is the stabilization of existing businesses and the development of new business hubs. One focus is the establishing of infrastructure and training and promotion of securing skilled workers.
2. Development of the brand (Lusatia/Lausitz/Luzika/Luzyca)
3. Strengthening and promotion of quality of life by supporting arts and culture, social infrastructure, and tourism. One focus is environmental protection and conservation as well as sports.

Lusatia as an Energy Region

The concept of Lusatia as an Energy Region refers to the time-honoured tradition of mining and energy production in Lusatia. Often, people associate this with lignite, but the concept has been branched out to also include sustainable and future-proof energy policy.

Today, there are already many Lusatia-based businesses that deal with renewable energy. Post-mining areas provide a vast, unused, empty space which can be used to expand renewable energies. The local population, too, identifies strongly with the energy sector.

Therefore the concept argues that the aim must be to transform the Lusatia Energy Region into an innovative hub for

sustainable energy (such as renewable energies and storage) by promoting extant and creation of new research establishments, and by connecting educational institutions and enterprises with one another.

Senftenberg Solar Park, for instance, was the largest solar complex in the world at the time of commissioning and was built on the dumping site of a former lignite mine. A further two large solar parks are located elsewhere in Lusatia. None of the operating companies are based in Lusatia.

For wind parks, too, former lignite mines have been used. In this case, again, the operators are based outside Lusatia.

Lusatia also offers an advantageous environment for storage technology. There are plenty of spaces available, boasting decent connection to the grid and offering lots of room for project ideas developed locally. The *1000 Speicher* ('1000 storage units') promotional programme allows private households to acquire smaller storage unions and it was used so extensively that no further applications can be submitted. Beyond further plans, a battery cell factory is expected to set up shop in Lusatia. The largest and most contested project now is Tesla's Gigafactory in Grünheide just outside Berlin.

Moreover, decision-makers count on power-to-gas and power-to-X technologies to produce electricity from renewables, be able to transport and store it with greater ease. However, at this point in time to few businesses have invested in these sectors.

Lusatia as the Green Lake District

Lignite mining has created new usable spaces after the end of lignite extraction. In Zittau, this created Olbersdorf Lake, and Berzdorf Lake close to Görlitz. There are also some natural green structures such as the Zittau Mountains and its surrounding woods, the Königshain Hills, and the famous Spree Forest: all of them regions which are tourist destinations already and have potential for further development.

On top of this, there now is the Lusatian Lake District, which with its total of 23 larger lakes is Europe's largest connected lake district even as early as at this preliminary stage. 10 of these lakes are to be linked up through navigable canals; four of these canals have already been completed.

Lusatia features an exceptional unique cultural diversity, particularly with its Sorbs and Wends and their diverse traditions. These should be foregrounded and supported more, and the region should be developed as a whole, together.

Vision as laid out in the investment agreement

- European Model Region: science and research, establishment of administration and efficient connection across European spaces
- innovative and powerful economic region: energy sector, circular economy, mobility, bio-economics, resource efficiency, health and tourism, semiconductor, chemical, glass, metal, engineering and multisectoral textile and synthetics industry
- establishing of digital, sustainable medical provision and training through a next-generation hospital
- connecting sectors: use of renewable electricity through power-to-x technology to produce heat, transport services, e-fuels or regenerative 'green' gas (hydrogen)
- research focus: intensify development of energy and energy storage systems, alternative and climate-friendly drive technologies, recultivation and AI, knowledge, and technology transfer
- expansion of 5G networks and broadband coverage
- science sector to be invigorated through research institutions outside the university setting
- highlight cultural, natural and tourism potential and strengthen regional identity
- in Lusatia, wellbeing, health and tourism intersect with the arts and creative industries

A DIE LINKE Vision: 15 Theses for Structural Change in Lusatia

In her position paper, Karin Kagelmann, former member of Saxony's State Parliament, Mirko Schultze and Antonia Mersching, who has been a member of Saxony's State Parliament since 2019, outline an idea how the structural shift can be read as an opportunity for a new start and transition for the region (Kagelmann et al. 2019). Through this, they argue, this traditional industry and cultural region can be infused with a new attitude towards life, momentum, and progressive ideas. With this paper, they aimed to contribute to the ongoing debate in a way that creates an open space to copy, rework, refine. Four years after its initial publication, the paper remains topical and a treasure trove of

ideas vis-à-vis the status quo of structural change in Germany, Poland and Czechia, and provides another foundation for discussion.

1. Lusatia leading the way — a new working culture for a new era
   Lusatia is particularly preoccupied with the question of future jobs. Sustainable industry jobs and regional supply and service structures must be preserved. DIE LINKE should not count on international corporations to this end, but rather on small and medium-sized enterprises and support for diverse ownership structures. In addition, the authors propose Lusatia should introduce a basic income that is restricted to certain personnel, spaces and times, to be able to produce specific results towards the ongoing debate surrounding social security systems in the 21st century and unconditional basic incomes as to what such shifts might entail.
2. Reversing the brain drain – increasing wage levels – remaining an energy region
   In light of the existing lack of skilled workers in the region even today, there will be no need for job guarantees for skilled workers in the energy sector. Instead, greater focus should be on renewable energy and investments should target expertise and efficient technologies in this sector.
3. Structural change bottom-up – colourful workshop atmosphere instead of grey conferences
   The promise of an equitable structural change process that includes civil society needs to be put into actual practice. To this end, participatory and democratic formats are needed through which provides easy and straightforward access for those committed to join the effort and be taken along, so as to develop an alternative narrative of "Lusatia tomorrow" together.
4. Free spaces for free spirits — turning empty buildings into creative hubs, and strengthening ecological agriculture through local slivers
   Lusatia can understand the vacancy rate in the region as an opportunity and can offer these sealed spaces to start-ups and creative minds. Free-of-charge space for innovative projects can help create visibility beyond the region for this network of free spirits and should be financed for instance from regional budgets. The agricultural sector in particular is struggling to find young people to take over farms, which is why these agricultural spaces might be pooled, a concept to be rolled out more widely.
5. Lusatia Idea Lab – promoting start-up culture and free coaching
6. It will bear fruit! — additional funding for actors from the cultural, educational and ecological spheres
   Structural change needs new, fresh, creative ideas. Lusatia, too, has a large network of established structures at its disposal through which it can access funding more easily. Unfortunately, young, creative projects without these networks tend to be overlooked. This problem can be solved through a civil society fund for Lusatia and easier access to special promotion funds.
7. Towards a welcoming region — emphasising migration as an opportunity
   The structural transition can only be successful with a culture of welcome and migration towards Lusatia. The region is home to too few young people, but young people will be coming to Lusatia not solely from neighbouring regions but the whole world. For this, Lusatia needs new modes of social interaction, a culture of welcome and a more sensitive way of interacting with migrants. Established structures, enterprises and administrative bodies can support this effort through training on intercultural openness and have to contribute actively to reducing prejudice and xenophobia.
8. Hardly trivial — taking new attitudes towards life seriously
   A regional atmosphere of modernity, cosmopolitanism and environmental awareness can be a pull-factor to a range of actors. To achieve this, though, opportunities to partake in political and societal life, openness to alternative modes of economic creation, ways of life and forms of housing and a diverse economic and cultural landscape provide a suitable backdrop. In this regard, we need to leave behind attempts to purely fulfil demands. For instance, this would mean to build playgrounds now so that they are available when people move to the area with children who will need them, rather than wait for demand to be raised.
9. It's not all on supermarket shelves — rethinking consumption, production and trade and including regional economic cycles and international direct trading partners.
10. Copying best practices — organise a regional variation of the IBA Fürst Pückler Land building exhibition for Saxony's Lusatia and scale up to include land rehabilitation

11. More than road and rail — alternative mobility concepts start with avoiding traffic in the first place
    Mobility should not depend on cars. Removing individual fares could make public transport and mobility more attractive and reduce costs arising from individual transportation, which are not even considered in calculations today. Transport hubs with attractive local transport of regular lines, on-demand busses, carsharing and rental bikes can bear equal recreational and economic potential to tourists and locals alike. Care should be taken to build up international rail lines, at the earliest time possible, to reduce freight traffic, too, by moving freight transport onto rails tracks as well.
12. Taking over instead of catching up – rather than trying to meet today's standard, investments should be made straight into the gigabit network and 5G technology
13. Universities are something Lusatia already has — now they need to be more embedded into an international network and developed further. Lusatia's location across Germany, Poland and Czechia is an opportunity for an international educational hub which should be seized.
14. Promote good life and economic creation without exception – experimentation clauses instead of special economic zones
    Cheap labour costs are one economic factor, but chiefly in the interest of expected return in the short-term and exploitation. High profits and low environmental standards result in no investment. Social, environmental, and participatory standards are non-negotiable but should instead be understood as an opportunity to innovate, improve quality and increase efficiency – provided administrators support actors in these efforts.
15. Lusatia as a retreat – save no man's land
    "We are convinced that Lusatia's natural authenticity primes it for a particular local recreation concept: vast, noise-free spaces, black-out dark sky zones at night (like dark sky national parks) and areas purposefully kept off-grid, without mobile reception. Promoting recreational and relaxational centres allow us to leverage what's there already: islands of peace and quiet to wind down, recharge, allow your mind and soul to relax – all that in conjunction with better healthcare also for locals. Any structural restart needs to be conscious of Lusatia's unique characteristics." (Kagelmann et al. 2019: 18).

CONCLUSION

In short, the structural transition presents a tremendous opportunity for the region. The region benefits from ideas, motivated actors and visions as much as considerable investment: everything you could possibly need for structural change to be successful is available here.

Nonetheless, structural change and public approval are at risk. This is not exclusively because of the repercussions of the first structural change process which caused substantial discontent among the public. Many people have not been benefiting sufficiently from recent developments. Billions of Euros syphoned by large corporations such as EHP have been paid out in dividend to its shareholders. This might appear impactful yet fails to create sustainability in the region.

Promises are being broken – again. Participation of actors e.g., as laid out in the Lusatia 2050 development strategy is lacking, and decision-making processes pay but lip service to promises of wider participation. Rather than investing in future-proof projects, much is being spent on dearly necessary infrastructure measures with little heed being paid to the salience of these projects to the district. Wildau is a case in point: a city in Lusatia that has seen no mining throughout its history but is part of the Lusatian District merely because a tiny part of its territory is located in it. Wildau has seen investment to the tune of €300m, from the funds earmarked for the creation of sustainable jobs in lieu of climate-damaging jobs.

One central disadvantage lies in the fact that start-ups, businesses etc. are not granted direct investment. Funds are rather put in soft location factors. This increases the overall attractiveness of the space but in consequence sees comparatively well-equipped cities such as Görlitz being given new trams or trampolining parks or the extension of the Art Casting Museum in Lauchhammer in Brandenburg.

Hope lies in Brandenburg's Lusatia, since we observe specialisation in electromobility there, at least to a certain extent. In Brandenburg, BASF is planning to manufacture cathodes for battery production; in Guben, there are plans to erect Europe's first production site for the main component of power packs by building a lithium hydroxide converter. This would make Brandenburg the only German

State and only region in Europe that can cover the entire e-mobility value chain from battery production to producing e-cars.

Research by Correctiv and Spiegel magazine in June 2021 have highlighted the risk that in parallel to structural change, huge follow-up costs might arise in the aftermath of lignite production and subsequent recultivation. Experts forecast that restauration costs of the Lusatian District will be in the billions. This is because Saxony's and Brandenburg's State governments have aimed to please EPH and accepted job losses, blackmailed by Křetínský. As a result, in a worst-case but unfortunately highly likely scenario, local citizens will have to pay the price for sinking ground, water shortages and pollution as well as collapsing embankments, while Křetínský pockets the tremendous profits.

Brandenburg estimates costs to be at €3bn for Lusatia as a whole. Greenpeace and other environmentalist associations rather put this figure at €10bn. These costs are likely should LEAG go bankrupt and consequently be unable to cover follow-up costs. Today, coal and lignite production are incurring losses owing to the high CO_2 price of European emission rights. This is mindful of the fact that as of today, no clear regulations are in place that would oblige parent companies to pay for recultivation in the case of insolvency. LEAG has only reserved €138m in banking reserves – for Brandenburg. This accounts for a mere 5% of the total costs of Lusatian natural restauration as per government estimates. Making matters worse, the €1.7bn in cash Vattenfall had put aside for restoration appear to be nowhere to be found on LEAG's books.

Secret reports do suggest there are special-purpose vehicles in Saxony and Brandenburg to secure both states. It does remain unknown to the public when and how much money has been paid in by LEAG. The sole thing that is officially known is that Brandenburg's State government was triumphant in their talk of €15.5m in deposits and that compensation payment to LEAG to the tune of €1.75m is to be used towards the earlier coal phase-out. All this against the backdrop of a rather unsettling outlook Lusatia is facing in 2022. (cf. Götze/Joeres 2021).

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Prospects for Coal Exit in Poland. National and Regional Perspective

Paweł Jaworski & Czesław Kulesza

Among the EU member states, Poland's economy is the most heavily dependent on coal. The issue of alleviating possible social-economic disorder in coal regions while shifting away from coal gives a fundamental context for the debate on a just transition to a zero-emission economy. When the media, politicians and experts speak of just transition (JT), what they most often mean is the mitigation of unfavourable social phenomena, primarily unemployment, which cannot be avoided in the process of decommissioning coal mines and coal-fired power plants, as well as combined heat and power plants (CHP). At the same time, the most emotional aspect of the public debate is the prospect of mine closures in the Silesia region (Silesian Voivodeship[1]). In fact, this has been a sensitive issue for years. Today, after an agreement was signed including a schedule for the closure of 14 hard coal mines, you could conclude that Poland is indeed, for the first time in its history, facing the closure of its mining industry. There is less attention paid to ending lignite mining, which happens on a similar scale to hard coal mining, probably due to the historical and political background.

I. HISTORICAL BACKGROUND

The first information on mining raw materials dates to the 10th century. Silesia, which is the subject of our research, has a complex geological structure, seen in the occurrence of rocks and mineral deposits from various ages. In the beginning of mining history, coal was not a strategic resource because its use was unknown. Rather, precious metals and minerals were sought after. The first confirmed sources of knowledge about mining in Poland come from the beginning of the 12th century and they refer to salt mines. The existence of Silesian mining is confirmed by a document from 1136, in which Pope Innocent approves the possessions and revenues of the Archbishop of Gniezno, including, among other things, the tithe of iron from all the mines in the village, probably in the vicinity of what we now recognise as Chorzów. Information about coal mining appears in 1545, confirming it was carried out to a small extent in the early history of the mining industry.

From salt and ore mining to the rise of coal

The situation changed in the eighteenth century with the industrial revolution. Since then, the extraction and use of coal has become increasingly important; it is exploited on an industrial scale. World War I broke out when hard coal covered about 90% of the world's energy needs. It was an essential raw material for the arms industry. Increasing mining was not an easy task due to the lack of qualified workers, who had been called up to the army. There were also difficulties with the supply of machinery and problems with the transport of coal.

The period of 1914-1939

After the end of World War I, Silesia again became an object of interest for the international community for economic, political, and strategic reasons. Its natural resources and infrastructure were recognised as well as its extremely complicated international situation. The Paris Peace Conference did not settle the matter, and the information about the Versailles decisions concerning Upper Silesia caused local outrage and Silesian uprisings. The economic circles of Germany, France, and England were interested in building their economic position on the basis of the enterprises of the region. At the end of the 1920s, the Americans became interested in the mining infrastructure, and in 1926, they bought all the shares of Gieshe Works in Katowice.

The 123-year division of Poland's territory and occupation by neighbouring countries (Russia, Germany, and Aus-

1 For the purpose of this work, the term 'voivodeship' is used interchangeably with 'region', which has its basis in the vocabulary used in EU climate policy procedures for Poland. A voivodeship is the largest unit of administrative division in Poland. The term dates back to the 14th century. The current voivodeships are intended to match the historical regions of Poland.

tria-Hungary) led to an uneven development of this branch of the mining industry and to different management methods and working conditions. As a result of the division of Upper Silesia within the borders of the Polish state, the industrial potential included 53 coal mines, 22 blast furnaces, 17 metallurgical plants, 9 steelworks and rolling mills, 7 ore mines, 12 zinc smelters, and 13 zinc and lead ore mines. After the division of Upper Silesia in 1922, there were 56 active mines in the Polish part, which extracted 25.8 million tons of hard coal. The mining industry developed, but with poorer working conditions and levels of exploitation. In some countries, at that time, trade unions managed to secure favourable social solutions such as unemployment insurance, the cost of which was borne by the employers, and the regulation of working conditions and increased safety. In Poland, insurance was only introduced in 1924. Benefits in kind were also paid, eviction from company housing was limited and working conditions became more civilised. The development of a nationwide system of sickness, accident and old-age insurance reduced the influence of trade unions in the industry. The privileged status of miners from Upper Silesia should be emphasised here, as they had already acquired rights from previously functioning self-help funds. The unemployment that prevailed in the interwar period was also not conducive to finding work outside the industry.

World War II – a different face of exploitation

The outbreak of World War II forced coal mining to increase to meet the needs of the war economy. As in the case of World War I, skilled workers were called up to the army and the shortage of personnel was supplemented with prisoners of war and women. The merging of the mines of the Upper Silesian Basin within the borders of one country (a consequence of the occupation of Poland) led the Nazi authorities to make plans to develop the region. The plans, however, only existed on paper and the mines taken over by Poland in 1945 were devastated and, for the most part, deprived of their mining front.

It should also be recalled here that labour, social, and insurance legislation did not apply to Polish people. Polish labour was treated as a bilateral debt obligation. Poles only received wages for their work; they were deprived of insurance in case of illness and were not entitled to bonuses, awards, or allowances for their wives and children. A Pole could not be a German's superior at work. In the event of a worker's death, the family received no benefits. If the death was the result of a work-related accident, the miner's wife only received a benefit if she had four children, and the amount was 50% less than the German benefit. Nevertheless, insurance premiums were the same for everyone. Polish wages could not exceed 70% of German wages. Poles paid taxes on benefits they were not entitled to, e.g., 2% was deducted for the Deutsche Arbeitsfront. They paid 15% tax for the needs of the Reich. The food standards guaranteed by the rationing system were lowered and were insufficient to meet the minimum needs.

People's Republic of Poland 1945-1989

In 1945, after the mines were liberated from Nazi occupation, the underground works councils operating in them secured the plants against the retreating Germans and, with the participation of representatives of the Ministry of Industry, created temporary mine management boards. On February 24, 1945, the Central Board of Coal Industry, headquartered in Katowice, was established. All hard coal and lignite mines, along with auxiliary plants, grouped into unions, were subordinate to it. Since the mining industry was also of strategic importance in socialist democratic countries, developing it was dealt with at the international level. In 1949, the Council for Mutual Economic Assistance was established, in which the Coal Commission was set up. In 1949, the Ministry of Mining and Energy was also established, which took over the management of the mining industry. In 1949 the Council of Ministers passed the Miner's Charter, a set of special privileges for employees of the coal industry, including early retirement rights, higher social benefits, longer vacations, additional quarterly wages for regular attendance at work and additional privileges related to the miner's profession.

As of 1 January 1951, the mines were transformed into state enterprises operating on the principles of economic settlements and unions continued to coordinate and control the activities of the mines and enterprises belonging to them. In 1951, 81 mines were subordinate to the Central Board of the Coal Industry, but by 1972 there were 73 mines as smaller plants were merged or liquidated. Employment in the mining industry increased significantly from 190,000 jobs in 1946 to over 340,000 in 1972. Working conditions improved and wages were above average. In view of the

need to increase output, overtime work was carried out and there were unprecedented forms of rivalry between individual mines. To increase employment, an extensive recruitment campaign was developed, among others in villages where unemployment was high. An extremely developed social system meant that despite the many dangers, working in a mine became not only a privilege, but also a desirable step to raising social and material status.

After World War II, the system of vocational training and qualification upgrading in the mining industry was developed significantly. The miner's ethos, which in the early days of the mining industry included and gave privileges to a few – including freedom of movement, creating funds for social and cultural purposes, taking care of safety (mutual insurance funds), building class bonds, or heredity of the profession (during the industrial revolution) – was significantly expanded in the period of the People's Republic of Poland. Miners began to constitute a very important, well-integrated and well-perceived professional group with an extensive cultural, sports and leisure infrastructure. It is worth noting here that in the mid-1980s – i.e., just before the beginning of the systemic transformation – mines allocated three times more than other enterprises of the state economy for their employees' social activities.

Restoration of capitalism

The system transformation that started at the end of the 1980s was quite painful for the mining industry. The Silesian Voivodeship, dominated by heavy industry, faced a number of necessary changes imposed by the restructuring processes. Although they were directed mainly at the economic sphere, they affected all areas of social life. The restructuring processes implemented for hard coal mining disturbed the existing social equilibrium and the habits that had been formed and established. One of the priorities was to reduce employment, but this process was carried out in accordance with the general principle of no collective redundancies. Retirements were induced and new employees were not recruited.

The government did not undertake important initiatives related to creating new jobs outside of mining. The lack of cooperation with non-mining partners, mining municipalities, local development agencies, trade unions and mining associations meant that miners and mining school graduates were not interested in changing careers. The social impact of the changes also affected occupational groups in the mining environment.

Economic degradation was accompanied by the degradation of the prestige of mining as a profession. Retirement rights led to individuals voluntarily leaving the profession, and thus a large group of young retirees emerged, who most often had wives and numerous offspring to support (a characteristic feature of the profession). Their pensions did not guarantee their current quality of life and the situation on the labour market was not conducive to finding additional employment. In the years 1990-2005, five sectoral mining restructuring programs were implemented, which primarily adjusted economic entities to function efficiently in market economy conditions and maintain the competitiveness of Polish coal on the European market. One of the basic goals of these programs was to reduce the production capacity of the mining industry and to reduce employment while taking measures to mitigate the social effects of restructuring.

Unfortunately, the neoliberal philosophy of transformations and the faith placed in the determination and adaptation abilities of individuals led to a situation in which protective measures were only a short-term solution to social problems, and ill-prepared programs of professional activation ended in failure. The situation was not improved by the "Revision of the government program. Reform of the hard coal mining sector in Poland in 1998-2002" or the program of hard coal mining reform in 2003-2006 with the use of anti-crisis acts and the initiation of the privatisation of mines. In 1998-2006, employment in the mining sector was reduced by almost 120,000 people.

Even the Supreme Audit Office, which positively evaluated the process of restructuring the mining industry in the years 1990-2000, published a report underling the short-sightedness of the experts preparing the reforms and stating that the social costs of the plans could be significantly reduced. As the reforms took place at the end of the 20th century, a generation gap in the mining industry was also created. Analysis showed that the outflow of employees from the mines due to natural reasons could cause a significant shortage in underground employment.

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II. COAL ECONOMY IN POLAND

The process of moving away from the coal economy will depend on central and national factors. The reason is simple: Poland as a whole, and not just in part, is dependent on coal. 70% of energy in Poland is generated from hard coal and lignite[2]. **Giving up coal will require finding a solution for the entire population of the country.** This will be such a profound process that its successful implementation will require at least passive social acceptance. The economic and social situation in coal regions is of course part of this problem and will have to be prioritised as part of a JT.

The role of coal regions in the decarbonisation of the economy is given special consideration not only because coal is mined there, but because most of the key coal-fired power plants that fuel the whole country are also located there. This means that, in this process, while Poland as a whole primarily shares the risks of **energy security** (a point often stressed by the Polish government in its debate with more developed EU countries), the coal regions bear most of the risk in terms of job losses.

The Polish government and Polish industry are today – reluctantly, but nevertheless actively – preparing for the gradual decarbonisation of the economy, mainly due to pressure from EU climate policy. Climate issues, which have featured prominently in public debate in Poland only recently, overlap with economic issues. For years, the media and expert circles have been stressing the unprofitability of the Polish coal-based economy, emphasising above all the unprofitability of Polish hard coal mines, which have been subsidised by the state for the last 30 years. Until now, this issue has been presented in purely neoliberal terms: mines should be closed or privatised, a large part of the workforce should be laid off. This is indeed what happened on a massive scale at the turn of the 20th and 21st centuries, under Jerzy Buzek's right-wing government[3]. Previously, opponents of the Polish mining industry tended to assume that Polish coal should simply be replaced by imported coal. Today, public opinion, media commentators

2 Data source: Agencja Rynku Energii (ARE), see: "Źródła energii w Polsce w 2020: mniej węgla, więcej gazu i OZE", wysokienapiecie.pl, 12.02.2021, accessed on 26.08.2021, https://wysokienapiecie.pl/35619-zrodla-energii-w-polsce-w-2020-mniej-wegla-wiecej-gazu-oze [„Energy sources in Poland in 2020: less coal, more gas and RES"]

3 Jerzy Buzek is currently a MEP in the European Parliament, representing Civic Platform (EPP). Among Polish MEPs, he stands out for his intensive lobbying for the energy transition, speaking jointly with Polish energy companies, eagerly talking about a "just transition" and the Just Transition Fund.

and politicians are more accepting of the need to abandon the coal economy altogether and replace it with renewable energy sources and nuclear power. It is also quite widely accepted that this should be a well-planned process with government involvement, supported with public money, though preferably from the EU.

The Polish energy system is still partly a remnant of the People's Republic of Poland, albeit in a form adapted to capitalism. This is partly because energy is treated as a strategic area of the economy (energy security) and partly because of the very strong (albeit undemocratic and non-transparent) trade unions in the mining industry.

Most coal mines are owned by two companies: Jastrzębska Spółka Węglowa (JSW) and Polska Grupa Górnicza (PGG). PGG is the largest hard coal producer in the European Union. Both companies are **listed stock companies with majority state ownership** and are therefore considered to be government-controlled, although this view is not entirely correct. The same is true of the largest energy production companies: PGE, Tauron and Enea. (Tauron is a vertically integrated company, as it owns three mines that operate mainly for power plants. The other two are vertically integrated to a lesser extent). The mines of these companies are concentrated in Silesia (Silesian Voivodeship) and in the subregion of Western Małopolska (Lesser Poland Voivodeship). Currently, the only coal mine owned by a fully private entity is the "Silesia" mine, which is owned by a Czech company.

Lignite mines (opencast) are concentrated in the Bogatynia subregion (Lower Silesian Voivodeship), in the Piotrków subregion (Łódź Voivodeship) and in the Konin subregion (Greater Poland Voivodeship). They operate to meet the needs of power plants and CHPs located nearby. Most of them belong to PGE, apart from the opencast mines in the Konin subregion, which belong to the private company ZE PAK.

Mines have remained a particularly controversial topic over the years. For most years since 1990, hard coal mining has been making losses, also taking into account **subsidies from the state budget.** It is difficult to find clear data on how much public money has gone into subsidising mining since the beginning of the capitalist transformation. According to the business press it was PLN 135bn (EUR 29.35bn)[4]. The findings of the 2017 report by the Supreme Chamber of Control (NIK) indicate that between 2007 and 2015 the support amounted to PLN 65.7bn (EUR 14.28bn)[5]. As far as recent years are concerned and the sector as a whole, profits were recorded in 2017 (PLN 2.9bn) and 2018 (PLN 0.9bn), while losses were recorded in 2019 (PLN 1.1bn) and 2020 (PLN 4.3bn)[6]. The volume of hard coal extraction in Poland has been falling continuously since 1990, from over 120m tonnes a year to over 62m tonnes[7].

The cited Eurostat database also shows a decline in lignite output, from over 67m tonnes in 1990 to over 47m tonnes in 2020. The financial performance of lignite companies is much more difficult to summarise due to much poorer data availability.

Coal-fired power plants are largely unprofitable; a study by Instrat shows that electricity generated by 45% of coal-fired units is sold below cost[8]. The share of unprofitable units is expected to increase mainly due to the increase of CO_2 prices under the Emissions Trading Scheme (ETS) and the fact that in the years 2025 and 2028 the so-called "power market" (contracts of several years), which guarantees relatively favourable prices to existing power plants, will expire in Poland definitively.

4 "Od Buzka do Sasina. Miliardy na ratowanie śląskiego górnictwa, a skutek ten sam", businessinsider.com.pl, 28.07.2020, accessed on 27.08.2021, https://businessinsider.com.pl/finanse/ratowanie-gornictwa-pochlonelo-fortune-szykuje-sie-kolejna-transza/zdr6n03 [„Billions to save Silesian mining, and the effect is the same"]

5 NIK (2017) Funkcjonowanie górnictwa węgla kamiennego w latach 2007-2015 na tle założeń programu rządowego. Informacja o wynikach kontroli, 62, https://www.nik.gov.pl/plik/id,13913,vp,16351.pdf [„Functioning of the coal mining industry in 2007-2015 against the background of the assumptions of the government program. Information on the results of the audit"]

6 Source: Ministry of State Assets (MAP), in: wysokienapiecie.pl, 31.03.2021, accessed on 25.08.2021, https://wysokienapiecie.pl/36605-gornictwo-przynioslo-43-mld-zl-strat-w-2020-roku/

7 Eurostat: Supply, transformation, and consumption of solid fossil fuels, https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_sff&lang=en

8 Czyżak, P., Wrona, A. (2021), Droga do celu. Odejście od węgla w polskiej elektroenergetyce. Instrat Policy Paper 01/2021, https://instrat.pl/odejscie-od-wegla [„Road to the goal. Moving away from coal in the Polish electric power industry"]

The discussion on the economic aspects of the Polish mining industry is complex. First and foremost, it is true that the greater profitability of foreign coal on the international market is due to the fact that in countries such as Russia or Columbia, miners extract coal under worse pay and working conditions. Polish thermal coal also stands no chance in free competition with foreign coal due to its low quality.

Polish miners earn well for Polish conditions. ARP data for March 2021 show that underground workers in hard coal mines earned on average PLN 7,485.52 (EUR 1,630.44) per month (gross, from January to March). During this period, the average gross wage in the Polish economy was PLN 5,681.56 (EUR 1,237.38)[9]. The average miner's salary in annual terms is even higher, as it includes all allowances and the thirteenth and fourteenth salary months, which are the benefits particularly criticised by the media. The salaries of underground miners represent more than 64% of the total wage bill of the mines (this does not include the salaries of mining company management)

Increasing the competitiveness of Polish coal at the expense of the wages and working conditions of Polish miners does not seem to be an option due to the basic principles of social justice (even though, according to many opinion-forming media outlets and circles in Poland, they should simply earn less). Increasing productivity in the mining industry to the level known, for example, of the US, would require huge investments and, at the same time, massive layouts. Thus, it would still entail the need for a just transition – providing an alternative for those affected. The use of protectionist measures (leaving aside EU law and international agreements) would in turn cause even higher costs of producing energy from coal, and thus a greater burden on the entire economy and society.

Most of the power stations are owned by PGE, Tauron and Enea, which – as said above – are effectively controlled by the state. This means that the price of the domestic coal they buy is sometimes higher and sometimes lower than foreign coal, the price of which fluctuates greatly depending on the global economic situation. However, high mining costs and low labour productivity mean that the profitability of Poland's coal-fired power generation is decidedly sub-optimal. This means that the national economy is missing out on development opportunities. In addition, an audit by the Supreme Chamber of Control (NIK) carried out in 2017-2018 revealed that domestic power plants are dissatisfied with the low quality of Polish coal, which results in higher costs of power generation as well as higher CO_2 emissions[10].

In this context, leaving aside the issue of the external costs of CO_2 emissions and air pollution, the main economic arguments for abandoning the coal economy seem to be as follows: 1) Polish hard coal is of increasingly poor quality and is increasingly difficult to extract, making the whole economy more and more inefficient., 2) There are scientific estimates to argue that PGG has much smaller deposits than officially stated, and they may only last for the next 10 years.[11] This means that it is high time to begin a planned, socially just phasing out of the industry.

Indeed, under pressure from the media and especially the EU's climate policies, in September 2020 an agreement was provisionally reached. In February 2021, it was signed by the government, PGG, Tauron, Węglokoks and the mining trade unions. It stipulates that by 2049, all mines belonging to PGG, Tauron and Węglokoks, i.e., most hard coal mines in Poland, will be closed. It is referred to as the plan to 'liquidate mining in Poland', although this is a misleading name. It does not include the mines belonging to JSW and Tauron-Wydobycie. The plan provides a very distant deadline. Environmental organisations and the media have criticised

9 ARP Oddział Katowice (2021), Zatrudnienie, wydajność, płace i przepracowany czas pracy w górnictwie węgla kamiennego w Polsce w marcu 2021 r., https://polskirynekwegla.pl/sites/default/files/StPu/2021.03_Zatrudnienie%20wydajno%C5%9B%C4%87%20i%20przepracowany%20czas_w.pdf [„Employment, productivity, wages and hours worked in coal mining in Poland in March 2021"]

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the agreement due to what they perceive as a lack of ambition. Nevertheless, for the first time in the history of the Polish mining industry, a date for the planned closure of a great majority of Polish hard coal mines has been presented in an unambiguous manner. The plan from the government and unions to close the PGG mines will be discussed later.

The official plans for the closure of lignite opencast mines, along with the power plants for which they operate, will also be presented below.

Russian coal in Poland's economy

Coal of domestic origin is a political issue. It is viewed by the ruling party and nationalist circles through the prism of energy security and economic independence. Imported coal, especially from Russia, is therefore a political issue as well, given the generally anti-Russian stance in the foreign policies of both the current Polish government and previous ones. Successive Polish governments have always been keen to support Western trade sanctions on Russia, imposed for political reasons, including the annexation of Crimea. For many years, energy independence from Russia was one of the main themes of Poland's foreign trade policy – above all in gas supplies. Over the years, gas supplies have been partially diversified. From the outset, Warsaw has remained a consistent opponent of the Nord Stream 2 gas pipeline, which bypasses Poland and weakens its bargaining position in EU-Russia trade relations.

The level of coal imports from Russia is not enough to suggest there is a dependence of the Polish energy sector on Moscow. According to Eurostat, the volume in 2020 was 9.4m tonnes, down from 2018 (13m tonnes) and 2019 (10.7m tonnes). Only 19%[12] of the professional power industry and heating sector are consumers of imported foreign coal. Half of the imported raw material is purchased by small consumers, i.e., mainly by households outside large cities, which use coal for heating. This is because their old boilers require coal with parameters that domestic coal does not provide.

A report by the Energy Forum shows that, although imports of hard coal from Russia account for less than 10% of domestic output, they have increased by 750% since 2000. It is therefore no wonder that this has become a political issue. During this period, gas imports from Russia have doubled and oil imports have increased by 41%. In total, over the past 21 years, Poland has spent the equivalent of EUR220bn on fossil fuel imports, and most of this money has flowed to Russia[13].

The current level of imports of this raw material from Russia is obviously problematic for the government. The headlines scream that 'Poland is being flooded by coal from Russia'[14]. Before coming to power in 2015, the Law and Justice (PiS) party announced in a spirit of protectionism that the flow of Russian coal into Poland would stop if they formed a government. In subsequent years, however, imports from the East grew and reached their highest level in 2018. Currently, the amount of coal imported from Russia exceeds the stock of unused domestic coal. For the reasons described above, this has little practical significance, but is fodder for the media.

In early 2020, the Minister of State Assets, Jacek Sasin, admitted that an embargo on Russian coal was impossible due to EU regulations. At the same time, he announced that state-controlled companies would be banned from buying imported raw material. The ban has come into force, but it has only changed the situation to a small extent. Meanwhile, the demand for a total ban on Russian coal is regu-

12 Data source: Agencja Rozwoju Przemysłu (ARP), see: Dlaczego importujemy węgiel z całego świata?, wysokienapiecie.pl, 22.04.2020, accessed on 28.10.2021, https://wysokienapiecie.pl/28608-dlaczego-importujemy-wegiel-z-calego-swiata [„Why do we import coal from all over the world?"]

13 Forum Energii (2022) Ponad bilion złotych na import paliw kopalnych. https://www.forum-energii.eu/pl/blog/import-paliw-kopalnych [„More than a trillion zlotys for fossil fuel imports"]

14 "Węgiel z Rosji nas zalewa. Polska wciąż ściąga rekordowe ilości", money.pl, 14.01.2020, accessed on 09.09.2021, https://www.money.pl/gospodarka/wegiel-z-rosji-nas-zalewa-polska-wciaz-sciaga-rekordowe-ilosci-6467711598352513a.html [„Coal from Russia is flooding us. Poland still pulls record amounts"]

larly repeated by mining unions, with whom the government is trying to maintain the best possible relations[15].

Coal extraction volume and employment in mining

There are seven so-called coal-mining regions in Poland. Hard coal is mined in the following voivodeships: Silesia (55m tonnes annually), Lesser Poland (1m tonnes), Lubelskie (7m tonnes). Lignite is obtained in the following voivodeships: Greater Poland (7m tonnes), Łódzkie (41m tonnes), Lower Silesia (5m tonnes) and Lubuskie (0.3m tonnes)[16]. All of them, except for Lubuskie, were qualified by the European Commission as regions eligible for support from the Just Transition Fund. In the end, **6 out of 16 voivodeships in Poland** were recognised as being particularly vulnerable to the social fallout of the coal phase-out. Employment in mining is as follows: Silesia – 54,920 jobs, Lesser Poland – 1,887, Lubelskie – 5,769, Greater Poland – 6,752, Łódzkie – 40,788, Lower Silesia – 5,018, Lubuskie – 296. Mining in Poland is thus quite centralised: Silesia accounts for 86% of hard coal mining and 88% of employment in this sector. Similarly, the Łódzkie region accounts for 77% of lignite mining and 66% of employment in the lignite industry. These regions, however, are economically diverse; the subregions have different levels of macroeconomic indicators and mining areas are concentrated only in particular powiats (counties), so they will be affected by the loss of mining jobs to different degrees.

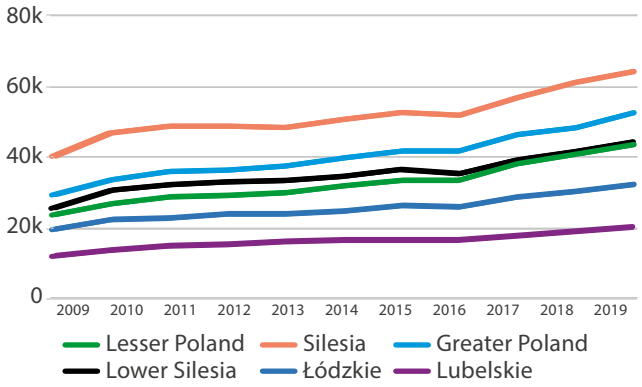
Picture 1: Polish coal regions qualified by EC for support from the Just Transition Fund

Source: Wikipedia

General comparison across voivodeships

A comparison of individual provinces in terms of GDP leads to the conclusion that Silesia is the best in terms of the production of goods and services (Chart 1).

Figure 1: Comparison of coal regions in Poland in terms of GDP in thousands of EUR



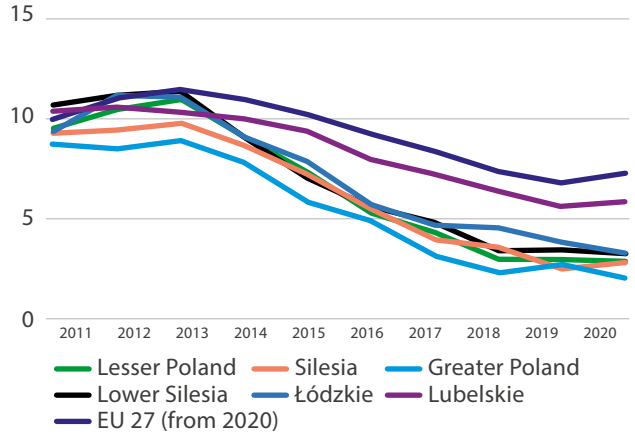
Source: Eurostat

15 "Śląsk umiera w biały dzień. Związkowcy krytykują rząd za węgiel z Rosji i zapowiadają ogromny protest", businessinsider.com.pl, 11.08.2020, accessed on 27.08.2021, https://businessinsider.com.pl/wiadomosci/zwiazek-sierpien-80-zapowiada-protest-i-pyta-premiera-o-rosyjski-wegiel/kw00csl ["Silesia dies in broad daylight. Trade unionists criticize government over coal from Russia and announce huge protest"]

16 Juszczak, A., Szpor, A. (2020), Wskaźnik Wrażliwości Regionów Górniczych na transformację energetyczną – obraz na podstawie danych z powiatów, Working Paper, nr 4, Polski Instytut Ekonomiczny, Warszawa, https://pie.net.pl/wp-content/uploads/2021/03/PIE-WP_4-2020.pdf ["Index of Sensitivity of Mining Regions to Energy Transition – a picture based on county data"]

Unemployment in all Polish coal regions is currently significantly lower than the EU average. Of the voivodeships in question, Lubelskie is performing the worst (Chart 2).

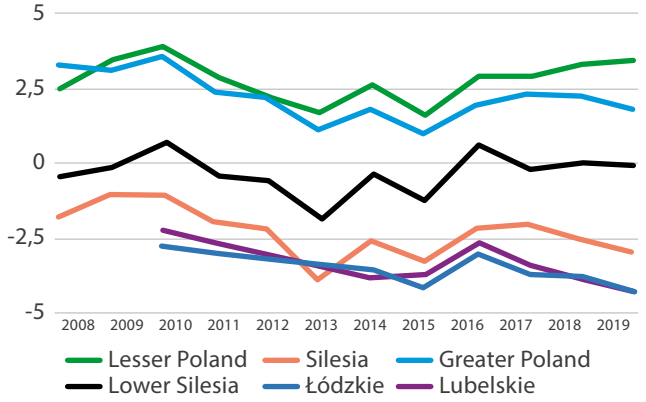
Figure 2: Comparison of unemployment rate across Polish coal regions and the EU average, Eurostat



Source: Eurostat

Taking into account population growth and migration, the Łódzkie and Lubelskie voivodeships are most affected by depopulation (Chart 3).

Figure 3: Gross population change across coal regions in Poland, Eurostat



Source: Eurostat

Detailed analysis of subregional sensitivity to possible coal exit

Economists at the Polish Economic Institute (PIE) have come up with a multi-dimensional index which determines to what extent regions, subregions and individual powiats are 'sensitive' to mine closures. It takes into account economic factors, social factors, the labour market, the proportion of people employed in mining and the impact of previous mine closures. The results of their study are complex. The authors of the study write:

"The powiats most vulnerable to the energy transition include the mining towns of Jastrzębie-Zdrój, Bytom or Zabrze (Silesia), which have been significantly affected by mine closures in the last 5 years, while the [existing] mines continue to remain one of the largest local employers.

Some of the powiats most exposed to the negative effects of the energy transition are at the same time characterised by good results of labour market indicators. This is due to good employment conditions in the mining industry. At the same time, the relatively poor economic performance indicates that the local labour market will not be able to create alternative jobs without support. (…)

Powiats of the Silesian Voivodeship are mentioned both among those least and most vulnerable to the consequences of the energy transition. This shows that when applying just transition mechanisms, one should resist the temptation to treat Silesia as a whole and consider the situation of individual counties individually."[17]

The analysis carried out by PIE does not pay attention to the sectoral structure of employment in the regions. Meanwhile, the Institute of Structural Studies (IBS) has obtained data showing that today's miners, thanks to their competences, can count on employment in specific industries: manufacturing, energy, construction, and logistics[18]. Unfortunately, **none of these industries are currently able to pay blue-collar workers the wages to which hard coal miners are accustomed.** It seems that is the factor that will

17 Juszczak A, Szpor A. (2020), op. cit., p.7.

18 Frankowski J., Mazurkiewicz J., Sokołowski J. (2021), Jak ograniczyć społeczne koszty zamykania kopalń? IBS Policy Paper 02/2021, Instytut Badań Strukturalnych, https://ibs.org.pl/publications/jak-ograniczyc-spoleczne-koszty-zamykania-kopaln/ [„How to reduce the social costs of mine closures?"]

pose the greatest problem for a just transition in Silesia, not the mere risk of losing one's job.

Table 1 shows the number of employees in the five most popular industries and the mining employment for each province designated for transformation. It only allows for a very general estimate of the chances of miners being employed in the preferred industries. A more accurate estimation requires us to consider the pace of coal exit and the situation in the subregions against regional backgrounds. These factors will be briefly discussed in the chapter entitled *Just transition in practice*.

Table 1: Employment in the five most popular industries and mining across the coal voivodeships.

	Agriculture	Manufacturing	Construction	Trade and repair of motor vehicles	Transportation and storage	Coal mining
Silesia	99.0	384.6	110.0	277.6	111.8	**54.9**
Lower Silesia	83.5	231.8	69.9	171.4	66.8	**50.2**
Lesser Poland	270.5	218.1	104.3	214.2	67.6	**1.88**
Greater Poland	207.7	363.9	103.4	262.4	101.2	**6.75**
Łódzkie	177.0	209.9	48.6	155.0	60.9	**40.8**
Lubelskie	305.4	94.7	40.2	99.8	40.0	**5.77**

Source for mining: PIE[19]; source for the other: Central Statistical Office[20]

The social consequences of the liquidation of coal-fired power plants require a separate analysis and will be presented when discussing government plans in this area.

Projected job losses in hard coal mining due to coal exit

IBS researchers also provided a projection of how many people working in mining (not just miners) will have to seek new employment as a result of the move away from coal, taking into account natural retirements[21]. The results depend on the rate of decarbonisation adopted, i.e., the complete phase-out of thermal coal in the economy and in households. In the least ambitious option (decarbonisation by 2050) 14,000-15,000 former mining employees will have to look for new jobs in 2030. Under the more ambitious plan, i.e., decarbonisation by 2040, that number will be 15,000-16,000 in 2030. The most ambitious scenario, i.e., moving away from coal by the end of this decade, will mean 36,000-37,000 people out of work in 2030.

Currently, no official plan foresees a 100% decarbonisation of Poland. The authors of the IBS study claim that the current government's timetable for phasing out PGG and Węglokoks mines by 2049 will mean **5,000 former employees out of work in 2030.**

In each variant of the forecast, the authors describe all the workers losing jobs as people "in need of support in the labour market". By "support", they refer primarily to three HR policy instruments: 1) retraining assistance, 2) mining leaves, 3) relocation of some workers to mines still in operation in 2030, including to coking coal mines.

The IBS researchers do not draw conclusions on which pathway away from coal is the "best" one, but they do present the economic case for decarbonisation by 2050 at the latest and write about coal mining as a "declining industry".

Mining related employment and coal exit (hard coal)

According to a study by the University of Economics in Katowice, the number of people employed in companies

19 Juszczak, A. Szpor A. (2020), op. cit.

20 GUS (2019), Yearbook of Labour Statistics, p.126, https://stat.gov.pl/obszary-tematyczne/roczniki-statystyczne/roczniki-statystyczne/rocznik-statystyczny-pracy-2019,7,6.html

21 Sokołowski J, Frankowski J, Mazurkiewicz J., Antosiewicz M, Lewandowski P. (2021) Dekarboznizacja i zatrudnienie w górnictwie węgla kamiennego w Polsce. IBS Research Report 01/2021, Instytut Badań Strukturalnych, https://ibs.org.pl/app/uploads/2021/01/IBS-Research-Report-01-2021.pdf [„Decarboznization and employment in hard coal mining in Poland."]

closely related to hard coal and lignite mining reaches **110,000-130,000**[22]. Both estimates are much lower than the commonly accepted assumption that for every one job in mining there are between three and four jobs in mining-related industries.

The study consisted of a survey that covered 207 companies supporting coal mining in various ways. 63% of their revenues come from trades made with mines or other mining companies. 82% of them have already seen a decline in their turnover with the mining industry. A third of the companies surveyed believe that if they lose the opportunity to do business with the mining industry they will face bankruptcy, while 56% said they would be able to find new contractors. 60% of companies stated that their employees are attached to their jobs and are afraid of change.

The researchers estimated that almost two-thirds of the people employed by these firms are not qualified to take an immediate job in another industry. However, the report points out that mining-related companies generally have higher skills than those required in mining itself, giving them good opportunities to win contracts in other industries. Financial assistance is recommended for these companies to help them develop in terms of digitalisation and automation, which should help them adapt to the new environment. The authors of the IBS report[23] are optimistic about mining-related companies' chances of acquiring new contracts in the energy, construction, automotive and engineering industries.

Economic situation in lignite regions: Łódzkie Voivodeship

The Łódzkie Voivodeship is important in that it is home to the so-called Bełchatów complex, i.e., lignite opencast mines and the Bełchatów power station, which takes its name from the nearby town. This power station is the largest single emitter of CO_2 in the EU[24]. The complex's facilities are in the Piotrków subregion and the Sieradz subregion, which together constitute the so-called transformation area included in plans for support from the Just Transition Fund.

The complex is owned by PGE GiEK, which belongs to the PGE capital group. PGE GiEK is the third largest employer in Poland and the largest in the Piotrków subregion. Within this subregion, (i.e., in the company's headquarters, the Bełchatów power plant and the lignite mine), 57% of the company's workforce are employed, amounting to 8,366 people. It is estimated that about 7,000 people may work in related companies[25].

In October 2020, **the PGE Group announced a new strategy to achieve climate neutrality by 2050**[26]. The last power plant units will cease to operate in 2036, and the open pits will finally close in 2038. A report by Instrat estimates that employment will fall by 43% in 2030. By the time the complex closes in 2038, however, some 73% of the workforce will be entitled to take their pension. The situation will be different at the related companies, where 67% will not have reached pension age. This is obviously determined by the difference in the age structure of the employees. This means that around 5,460 people will be unemployed[27].

The economic situation is further complicated by the fact that 1) the entire Łódź region is quite poor (its GDP per capita is around 75% of the EU average), 2) the region faces the challenge of high levels of depopulation (which will probably continue), and 3) the liquidation of PGE GiEK will entail a loss of revenue for local governments. In 2019, the Bełchatów mine alone paid PLN 171m (EUR 37.14m) to local government units in taxes.

22 Ingram T., Bartuś K., Baron M., Bielecki Ł. (2020) Sytuacja przedsiębiorstw okołogórniczych w Polsce, Uniwersytet Ekonomiczny w Katowicach, Katowice, http://sprawiedliwa-transformacja.pl/wp-content/uploads/2021/01/UEK-Ekspertyza-SYTUACJA-PRZEDSI%C4%98BIORSTW-OKO%C5%81OG%C3%93RNICZYCH-W-POLSCE.pdf [„Situation of mining enterprises in Poland"]

23 Frankowski J., Mazurkiewicz J., Sokołowski J. (2021) op. cit.

24 Approximately 30.1 million Mg in 2020 according to ETS register data, see: https://ec.europa.eu/clima/policies/ets/registry

25 Kiewra D. (2021) Sprawiedliwa transformacja w regionie bełchatowskim. Instrat Policy Paper 07/2021, Warszawa, https://instrat.pl/wp-content/uploads/2021/07/RAPORT_BELCHATOW_FINAL.pdf [„Equitable transformation in the Belchatow region"]

26 Strategia grupy PGE: neutralność klimatyczna w 2050 roku, gkpge.pl, 19.10.2020 accessed on 28.08.2021, https://www.gkpge.pl/biuro-prasowe/komunikaty-prasowe/korporacyjne/strategia-grupy-pge-neutralnosc-klimatyczna-w-2050-roku [„PGE Group strategy: climate neutrality in 2050"]

27 Kiewra D. (2021) op. cit.

Demographic trends are worrying. Between 2010 and 2019, the population of the Piotrków subregion decreased by 2.8% and that of the Sieradz subregion by 2.5%, both due to negative natural growth and migration. Mainly people of working age are leaving, and the population is ageing. This means that, on the one hand, people who in 2038 will have to look for a job after the closure of the Bełchatów complex will be "valuable" for employers in the region. On the other hand, it is not known what the labour market will have to offer them, as it will change heavily after the closure of PGE GiEK (a consequence of the economic monoculture). One should also remember that this group of employees enjoy higher salaries than other employees in the subregion. It is quite likely that without large investments in the restructuring of the economy (increasing the role of modern industry) they will seek employment in other parts of the voivodeship, also due to the demographic factors that will shape the labour market in the rest of the region. Current labour market trends in the transformation area are not favourable for PGE GiEK employees, because employment in industry is falling while simultaneously rising in services[28].

Economic situation in lignite regions: Greater Poland Voivodeship

The Konin subregion, which is often referred to as Eastern Wielkopolska (Eastern Greater Poland), is similar in economic terms to the area in which the Belchatow complex is located. Here too, we are dealing with a monoculture that has developed around opencast lignite mines and power stations, resulting in economic backwardness, an unpromising labour market and an outflow of population. The unemployment rate in the district of the Konin powiat (where most of the ZE PAK operating facilities are located) is approx. twice as high as in the Greater Poland Voivodeship in general. The company's employees are very area focused. 66% of them live in just five small municipalities[29]. The subregion is the reason why Greater Poland has been identified by the European Commission as a possible recipient for support from the Just Transition Fund.

ZE PAK, the company behind the power plants and mines, is a key employer in the territory. In October 2020, this company, owned by Zygmunt Solorz-Żak, one of the richest men in Poland, made a declaration to stop exploiting and burning coal in its two remaining power plants by 2030. The main difference between ZE PAK and PGE GiEK is that the former is a completely private company.

The announcement that operations will be wound down by 2030 will not change the reality for the company's employees. The decline in employment at ZE PAK has been progressing for 10 years and has already reached 60%, occurring mainly through the termination of employment contracts. Only around 33% of employees have retired during this period. According to official data, at the end of 2020 the company employed 3,693 people[30].

The Instrat think tank has made predictions about expected job cuts. The official scenario of decommissioning the mines and power plants of ZE PAK until 2030 will result in further reduction in employment at a rate like that of the previous years, i.e., an average of 520 people per year will leave the company by 2025. Employment will then remain at around 1,700 people until 2030, when it will have to fall to zero. By that time, 55% of the current staff will be eligible to take their pension.

At the same time, the authors prepared an alternative, more ambitious scenario, which they believe better reflects the economic conditions of lignite mining and burning in the region. In this case, the decommissioning of the mines and power plants will have to be accelerated and job reduction will occur at a 60% faster rate.

The Instrat researchers claim that, according to in-depth interviews with stakeholders in decarbonisation in Eastern Wielkopolska, a significant number of the employees of the ZE PAK mines and power plants that were already closed in previous years found employment with other employers in the region without much issue, in transport and logistics.

28 Kiewra D. (2021) op. cit.

29 Hetmański M., Iwanowski D., Kiewra D. (2021) Scenariusze redukcji zatrudnienia i wsparcia pracowników w sektorze węgla brunatnego – przypadek GK ZE PAK, Instrat Working Paper 01/2021, Prepared by Instrat Foundation for WWF Polska, https://instrat.pl/wp-content/uploads/2021/04/Instrat-Working-Paper-01-2021.pdf [„Downsizing and employee support scenarios in the lignite sector – the case of ZE PAK CG"]

30 Zespół Elektrowni Pątnów-Adamów-Konin SA. Wyniki 2020 roku, zepak.pl, accessed on 29.08.2021, https://ri.zepak.com.pl/upload/aggregate/ZEPAK_2020-4Q_PREZENTACJA_PL_publikacja.pdf [„Results 2020"]

However, this could have been a matter of specificity relating to one district through which a motorway runs. In any case, the authors of the report claim that by 2030 and immediately thereafter, **about 1,800 people will need active support on the labour market.**

III. POLITICS OF COAL AND COAL EXIT IN POLAND

The discussion on coal exit and a just transition is taking place in Poland primarily under the influence of the European Union's climate policy. It gained momentum after the EC announced the European Green Deal programme at the beginning of 2020, followed by Next Generation EU by the European Council, based on which the Multiannual Financial Framework 2021-2027 was adopted. The establishment of the Just Transition Fund became the most important element in this context. Poland can count on receiving the largest pool from the fund (EUR 3.5bn). For the time being, however, half of this amount (EUR 1.75bn) will remain "frozen" because the Polish government has not signed up to the EU's declaration of climate neutrality in 2050. However, Poland supported (albeit not without concerns) the new EU climate law at the European Council meeting in May 2021.

There are interpretations that this move has increased Poland's chances of receiving all the JTF allocation. The issue is still undecided. Given the Polish government's stubbornness on the issue of a date for carbon neutrality (motivated by the utilisation of nationalist sentiment for domestic politics), the risk of obtaining only half of the JTF resources must be seriously considered. In fact, however, Poland will be able to use other sources of EU funds in addition to the JTF, such as the Modernisation Fund (EUR 5.7bn) and funds from the cohesion programmes for 2021-2027 (part of the EUR 12.3bn currently under negotiation) that can be used to support the energy transition and climate policies. These funds (intended for use across the country, not just in coal regions) will be particularly needed for huge investments in the electricity grid, which must be modernised and practically rebuilt to accommodate the less centralised system of renewable energy sources (RES).

At present, at the beginning of 2022, the Polish government's international climate policy is difficult to clearly define. At COP26 in Glasgow, the Polish delegation signed a declaration to move away from coal, but at the same time Prime Minister Morawiecki has drawn criticism from domestic progressive circles accusing him of hypocrisy and pointing out that the actual process of moving away from coal in the domestic economy cannot be launched[31]. Morawiecki, against the backdrop of soaring energy prices across Europe in 2021, has also stepped up his rhetoric against the European Green Deal, in particular the Fit for 55 package. The Prime Minister blames the ETS system (or more precisely the speculation of emission permits) for the rise in energy prices in Poland[32]. He announced that he would demand a reform of the ETS or a temporary exclusion of Poland from the system. However, during a special meeting of the European Council in December 2021 he was not able to achieve anything[33]. The narrative was simultaneously hardened by Jarosław Kaczyński, chairman of the ruling party. Speaking about EU climate policy, he said that "such a thing cannot be accepted".

It can be said with certainty that none of the main political parties in Poland are ideologically committed to abandoning coal in the economy. The topic is gaining popularity due to pressure from the European Union authorities, especially since the announcement of the European Green Deal in early 2020. It was almost only at that point that the slogans of coal abandonment and climate neutrality started to be taken seriously by the Polish liberal media. For them, the strongest point of identification with the European Commission's policy is a kind of political mission, es-

31 See: "Kolejne puste słowa premiera Morawieckiego na szczycie w Glasgow", greenpeace.pl, 01.11.2021, accessed on 18.01.2022. https://www.greenpeace.org/poland/aktualnosci/30643/kolejne-puste-slowa-premiera-morawieckiego-na-szczycie-w-glasgow [„More empty words from PM Morawiecki at Glasgow Summit"]

32 "PM Morawiecki: The EU ETS system driven by speculators must be reformed", euractiv.com, 03.01.2022, accessed on 18.01.2022. https://www.euractiv.com/section/emissions-trading-scheme/opinion/pm-morawiecki-the-eu-ets-system-driven-by-speculators-must-be-reformed/

33 "Bez przełomu w sprawie ETS. Morawiecki nie przekonał unijnych przywódców", wprost.pl, 17.12.2021, accessed on 18.01.2022. https://biznes.wprost.pl/gospodarka/energetyka/10574185/bez-przelomu-w-sprawie-ets-morawiecki-nie-przekonal-unijnych-przywodcow.html [„No breakthrough on ETS. Morawiecki failed to convince EU leaders"]

pecially since 2015, when the programmatically nationalist and Eurosceptic PiS party took power.

The main centres of influence on the liberal side (i.e., the Gazeta Wyborcza and the TVN broadcaster) now accept without reservation that we must effectively move away from coal, or at least urgently implement the EC's requirements in this regard. This is treated primarily as an identity issue, a counter to the "parochialism" of PiS. One can conclude that in this view of the media, taking up climate issues and the need to move away from coal is supposed to be proof of education, modernity and openness to the world. The opposite of these qualities is represented by PiS and its voters, according to the worldview presented by the media in question. It is reasonable to argue that the climate issue has become a part of the so-called "culture war" in Poland.

The left-wing media outlets (e.g., Krytyka Polityczna), which in Poland are small, scarce, underfunded and lacking in influence, also show a similar approach to the issue. The only thing that distinguishes them from the liberal media is that they more often publish content suggesting that climate change and the climate catastrophe are the result of the neoliberal economic model or capitalism as such. They are also more likely to say that the transition to a carbon-free economy should be done in a way that "leaves no one behind" (egalitarianism, social justice).

Nationalist and conservative media linked to or sympathetic to the government mostly practice climate denialism, therefore they reject the very idea of moving away from coal on principle. They present the problem as part of an international offensive against Poland, the aim of which is to weaken the Polish economy to subjugate the Polish nation to foreign countries. According to those media sources, the main "masterminds" behind this supposed evil are most often "Brussels" (i.e., the EU), Germany, or Angela Merkel personally, whose main Polish "agent" is supposed to be Donald Tusk.

The emphasis on the risk of the domestic energy system being dominated by foreign companies in the process of switching the economy to carbon-free tracks can only be found in the nationalist media. The right-wing press – such as Gazeta Polska and Catholic magazines, as well as extreme right-wing, conservative weeklies and their websites, state-owned TVP and private TV Republika – also emphasises the importance of energy security more often than liberal media. However, demagogic "Germany scare tactics" dominate. A factual, expert discussion about energy security (which will be a real issue in the process of energy transformation) takes place on specialist websites dedicated to energy (energetyka24.pl, wysokienapiecie.pl), but the narrative often features a neoliberal approach, fetishising the "competitiveness" of the economy. Nevertheless, these websites have a smaller reach than the media mentioned above.

It is worth noting that the increase in coal consumption by Germany is a very well-known fact in Poland and is published, mainly by the right-wing media, as "proof" that coal exit is a hoax and a move against Polish society.

Representatives of the government and the ruling party themselves currently adopt a more balanced tone in their statements in comparison to the associated media. Speaking to domestic audiences, they usually imply that they will adjust the Polish economy to the EU's environmental requirements "because they have no choice" but will negotiate the best possible conditions for Poland – i.e., delay the coal exit as long as possible and preferably "make the EU pay for it".

Mateusz Morawiecki's government, on the one hand, tries to emphasise the resistance with which it accepts the EU's climate policy and the obligations associated with it, justifying this on the grounds of concern for independence and energy security. On the other hand, however, it is the first Polish government with plans for a major (albeit incomplete) decarbonisation of the economy, the closure of most coal mines and the launching of large-scale RES development projects (to be discussed below).

Poland's liberal opposition forces generally avoid the topic of moving away from coal, probably realising that this will be a process involving sacrifices and difficulties for a large part of society. The main opposition party, the Civic Platform (PO), which ruled the country between 2007 and 2015, has never shown any interest in the topic of climate change and energy challenges. Hypothetically, this situation may change since Donald Tusk, after leaving the post of President of the European Council in the spring of 2021 and once again taking over PO, has announced his return to Polish politics in order to take power away from PiS. Tusk

now declares great concern about climate issues, but time will tell how much this will affect PO's policy on transforming the economy.

Three Green MPs are very interested in climate issues and in moving away from coal in a socially just way, but they work in the Civic Coalition parliamentary club, where PO is hegemonic, so their voice has no chance of being heard. The Polish Greens are strongly opposed to the construction of a nuclear power plant in Poland, which the government plans to build.

The parliamentary club called the Left (Lewica) is made up of mostly socially liberal people, and it pays as much attention to climate issues and the transition away from coal as the PO: it is interested in the subject insofar as is necessary to respond to the implementation of EC climate policy as defined by the EGD and the principles of the Multiannual Financial Framework. Slightly more attention is paid to climate issues by the six MPs of the Razem (Together) party, sitting in the Left club – they advocate for typical social democratic economic policies. However, they carry out ad hoc and unorganised activities and do not have a comprehensive programme in this area.

Coal exit and politics at an international level: the Turów case

One of the clearest manifestations of the challenges facing the coal region linking Germany, Poland and the Czech Republic is the dispute over the Turów complex, consisting of a lignite mine and power station, located in Poland (Lower Silesian Voivodeship), near the border with the other two countries. The citizens and authorities of the Czech Republic have objected to the operation of the mine for many years because it results in the drainage of groundwater in their area. Residents in the border area on the German side complain about subsidence leading to the collapse of buildings.

The conflict escalated in May 2021, when the Czech side filed a complaint against Poland with the European Court of Justice (ECJ). The trigger point occurred in February, when the Polish government extended the mine's mining licence until 2044. In 2015, the Polish side initiated a report assessing the environmental effects of the mine. When it was produced in 2018, the Czech and German parties complained that the Polish analysis did not address the issues most relevant to them. The basis of the official complaint filed by the Czech Republic was that Poland violated the EU's Environmental Impact Assessment Directive on transboundary cooperation[34]. The ECJ reacted quickly and at the end of May ordered Poland to immediately halt mining at Turów, as an interim measure pending a final verdict.

The Polish government has not complied with the ECJ ruling and the company PGE GiEK (part of the PGE capital group) responsible for the mine has not stopped mining. As a result, Poland has been threatened with financial sanctions from the EC. As a result, a fine of EUR 500,000 per day has been imposed on Poland. The government is refusing to pay, disagreeing with the decision.

The term "just transition" was used by the Polish Prime Minister Mateusz Morawiecki, who claimed that the verdict contradicts the principle of justice. In doing so, he stressed the importance of the Turów mine and power plant to the economy of Poland. According to the government, the power plant provides about 5% of the electricity consumed in Poland. The question of the size of Turów's share in power generation is disputed, but experts agree that the plant plays an important role in the Polish system. When the failure at Bełchatów occurred in May 2021, without Turów the country would have faced an actual blackout.

It is also true that many experts and journalists that are hostile to Poland's coal-based economy have judged the ECJ's order to be overly harsh and biased. At present, there is no apparent objection to the technical argument: that a temporary halt in extraction would lead to irreversible construction consequences and to the mine being closed completely in an abrupt way, endangering workers, the local community, and possibly Poland's energy security, without leading to a direct improvement in water management on the Czech side[35]. At the same time, this argument

34 "Reasoned opinion in case brought by Czechia against Poland", EC press release, 17.12.2020, https://ec.europa.eu/commission/presscorner/detail/en/IP_20_2452

35 "Turów: Sędzia ślepa na polskie argumenty", wysokienapiecie.pl, 22.09.2021, accessed on 10.11.2021. https://wysokienapiecie.pl/40987-turow-sedzia-slepa-na-polskie-argumenty [„Turow: Judge blind to Polish arguments"]

does not prevent the claim that the Polish side is at fault in the dispute, considering the origins of the problem.

The PGE capital group has launched an intensive PR campaign to defend its mine and power plant. A website turow2044.pl has been launched, on which the company, among other things, boasts about the investments it has made to stop the water outflow from the Czech Republic. In Brussels, PGE launched an outdoor campaign under the slogan "Green Deal, not Grim Deal", suggesting that the closure of the Turów mine could lead to a social and economic disaster in the region. Polish government sources[36] alone state that at the end of April 2021, 3,536 people were directly employed in the complex. The PGE Group is the only large company in the EU to have increased its GHG emissions after 2015. The group also includes the Bełchatów power plant, the largest single emitter of CO_2 in Europe.

In June 2021, a protest by coal sector unions was organised in Warsaw under anti-EU and pro-coal slogans (in defence of "energy sovereignty"), with Turów as the main topic. In October, the unionists protested in Luxembourg, where the ECJ is based.

Negotiations are ongoing between Poland and the Czech Republic, but at the beginning of 2022 there are no signs of an imminent agreement. Under discussion are, among other things, the terms of financial compensation on which the Czech Republic would be prepared to withdraw the lawsuit.

The Lower Silesian Voivodeship has not prepared a Territorial Just Transition Plan, which would outline an alternative to the Turów complex. However, a Turów Transformation Committee has been formed and is preparing a plan to transform the area[37]. The content of the plan is so far very general. The Committee is made up of representatives of local authorities and entrepreneurs grouped in the ZKlaster (an energy cluster operating in the Zgorzelec powiat, described below). The plan assumes economic diversification, replacement of coal power with RES (wind, solar, biomass, water), development of the digital and circular economy, and the creation of 6,000 jobs by 2029[38].

Coal exit and the mining trade unions

It must be strongly emphasised that the trade unions as a whole are either not interested in the issue of moving away from coal or are opposed to it. As for the two largest centres, OPZZ and Solidarność, they have signed an agreement with the government on closing the mines of PGG, Tauron and Węglokoks by 2049. OPZZ publishes literally no positions on the consequences of decarbonisation of the economy or a just transition. In its trade union press, Solidarity regularly practices climate denialism ("Tygodnik Solidarność"[39]) and at miners' rallies or at trade union protests presents the ultra-conservative positions described earlier as characteristic of right-wing media. Solidarność even officially partnered with the American think tank the Heartland Institute in 2018 and together they issued a statement that there is no scientific consensus on climate change[40]. It must be acknowledged that the largest trade unions are most comfortable with the "cementing" of the Polish energy system in its current form – most likely for fear of redundancies – and the topic of a JT does not exist for them. It should be recognised that on a national or regional scale, the unions will not be independent partners in the social and political process of the JT. The unions at ZE PAK are an exception, which will be discussed in the context of the Territorial Just Transition Plan for Eastern Wielkopolska.

36 Position of the Ministry of State Assets in response to a parliamentary inquiry, 08.04.2021. http://orka2.sejm.gov.pl/INT9.nsf/klucz/ATTBZZFTC/%24FILE/i21546-o1.pdf

37 See: http://ozeturow.pl/transformacja-regionu

38 "Co po węglu w Turowie?", wysokienapiecie.pl, 11.07.2021, accessed on 09.09.2021, https://wysokienapiecie.pl/39129-co-po-weglu-w-turowie [„What after coal in Turów?"]

39 "Najnowszy numer "Tygodnika Solidarność": Katastrofa klimatyczna? James Taylor: Nie ma naukowych dowodów", tysol.pl, 14.07.2019, accessed on 30.08.2021, https://www.tysol.pl/a34647-Najnowszy-numer-Tygodnika-Solidarnosc-Katastrofa-klimatyczna-James-Taylor-Nie-ma-naukowych-dowodow [„The latest issue of "Solidarity Weekly": Climate catastrophe? James Taylor: There is no scientific evidence"]

40 "Press release: Solidarity, Heartland Institute sign Historic Climate Communique at COP24", heartland.org, 06.12.2018, accessed on 30.08.2021, https://www.heartland.org/news-opinion/news/press-release-solidarity-heartland-institute-sign-historic-climate-communique-at-cop24

In the realities of the Polish labour market, the mining profession must be regarded as well-paid and stable. This is due to the exceptionally high level of unionisation and collective bargaining, which is quite a unique situation against the background of overall labour relations in Poland. The mining trade unions, however, have to be seen as undemocratic, non-transparent and managed in a top-down manner. Union management is led by separate groups with vested interests. These are organisations that do not in any way refer to the traditions of the socialist labour movement.

Politics at regional level

Poland's political system is very centralised, and the regions (voivodships) have very limited (practically non-existent) power to make laws. For example, regarding tax policy and direct investments, the councils of individual communes have more say here than the voivodeship authorities. This is compounded by the fact, as described earlier, that significant changes in the Polish energy system necessarily require close coordination at the national level. Although increasing the share of RES in energy generation will mean a greater dispersion of the energy system, the changes that lead to this will mostly depend on efficient policies from the government in Warsaw and the central institutions. This means that the coal regions – and particularly subregions – will necessarily feel the changes caused by the coal exit to a greater extent than the rest of the country, but they will have a limited decision-making role. They will primarily be executors of central policy. Realistically, their biggest role will be in the preparation of Territorial Just Transition Plans, which will then have to be approved by the EC to finally allocate funds to the regions. At a national level, the bodies responsible for coordinating work on the TJTP are Marshal Offices, meant to assist the governments of individual voivodeships.

Power over a voivodeship is divided between the voivode (a single-person office) and the elected local authority body, the sejmik. The voivodes are appointed by the Prime Minister in Warsaw, so they are effectively the government's deputies in the regions. In recent years there have been disputes over the scope of competences between the regional assemblies and the authorities of large cities and the voivodes, and these have reflected the polarisation of the governing party and the opposition at a national level.

THE POLITICAL COMPOSITION OF SEJMIKS:

Lower Silesia:

The forces are fairly evenly matched. PiS: 14 seats, KO (Civic Coalition including Civic Platform, liberals): 13 seats, PSL (agricultural party): 5 seats, unaffiliated: 4 seats. No seats leftover.

- Silesia:
  PiS: 22, KO: 20, Lewica Razem (left coalition): 2, PSL: 1
- Lesser Poland:
  Significant advantage for the ruling party. PiS: 24 seats, KO: 11, PSL: 4
- Lubelskie Voivodeship:
  Significant advantage for the ruling party. PiS: 18, KO: 7, PSL: 7, Lewica Razem: 1
- Greater Poland:
  Advantage for opposition parties. PiS: 13, KO: 15, PSL: 7, Lewica Razem: 3, unaffiliated: 1
- Łódzkie Voivodeship:
  Small advantage for the ruling party. PiS: 17, KO: 12, PSL: 4

It should be emphasised that no significant political party in Poland has a coherent policy for coal exit. Politicians of local governing bodies occasionally speak to media outlets on climate and/or energy issues, or take part in public debates on the subject, but it usually amounts to repeating the narrative of the government (PiS) or some vague statements in favour of the coal exit intended to show acceptance of EU climate policy in hope of EU funds for the transition. The same must be said about politicians on the left, although a few of them stand out for their participation in climate protection events, e.g., conferences at local level and environmental protests.

The Polish political scene is now a field of great political polarisation, but this is more visible at the national level than at the local and regional level. At the level of municipalities and powiats, politicians from the ruling camp and the opposition tend to cooperate if they see an advantage in it. It is reasonable to assume that **JTF money will be essential to local politicians of all parties in coal regions** (as well as resources from the EU Transformation Fund), so no one will try – at least not officially – to jeopardise efforts to get money for communities strongly affected by the closure of coal mines and power plants. One can only expect that if

problems arise along the way (e.g., the TJTPs do not meet the requirements, or funds are withheld due to the pro-coal policy pursued by the regional authorities at the same time), politicians from the national-right camp will blame it on "Brussels", and those associated with the opposition, i.e., their political opponents.

NGOs and civil society

NGOs will probably play an important role in Poland's energy transition by putting pressure on the Polish government and local authorities through the media and by appealing to the European Commission.

Civil society in Poland is very weak. One symptom of this is that, on the issue of coal exit, the voice of local organisations which bring together the most vulnerable stakeholders in coal regions (citizens and workers) is practically inaudible. Individual municipalities cooperate with each other, for example within the Association of Mining Municipalities, but their activity is very limited. Above all, these activities are inaccessible to the wider public. Regarding the transformation (e.g., development of RES), municipalities are more willing to communicate with businesses (which will be addressed further on) than with ordinary citizens.

In this situation, it can be expected that the discussion about a JT will be dominated by large NGOs observing the situation from Warsaw. These include WWF Poland, Greenpeace, and the Polish Green Network (the Polish branch of Bankwatch). These organisations regularly comment on issues related to the just transition and their voice is well heard in the media. These NGOs attempt to represent the inhabitants of coal regions, e.g., by cooperating with municipal authorities[41]. The most active in this field is the Polish Green Network, which tries to initiate "umbrella" activities, gathering many participants and playing a leading, advocacy role among them. The examples include their involvement in just transition in Eastern Wielkopolska and a letter to the EC criticising the course of work on Territorial Just Transition Plans[42]. The organisation has cooperated with renowned European think tanks, e.g., Agora Energiewende.

It is worth noting that a public hearing was held in March 2021 on the National Recovery and Resilience Plan prepared by the government (which is under review by the EC). The part devoted to "green transformation" aroused great interest among NGOs and local governments of small towns[43]. They made critical comments on the government's draft, often stressing that a just transition must be as inclusive as possible and counteract energy poverty. Characteristically, however, representatives of coal regions did not speak at the hearing.

IV. JUST TRANSITION AND POLAND'S ECONOMIC AND INDUSTRIAL POLICY

The plan for hard coal mines

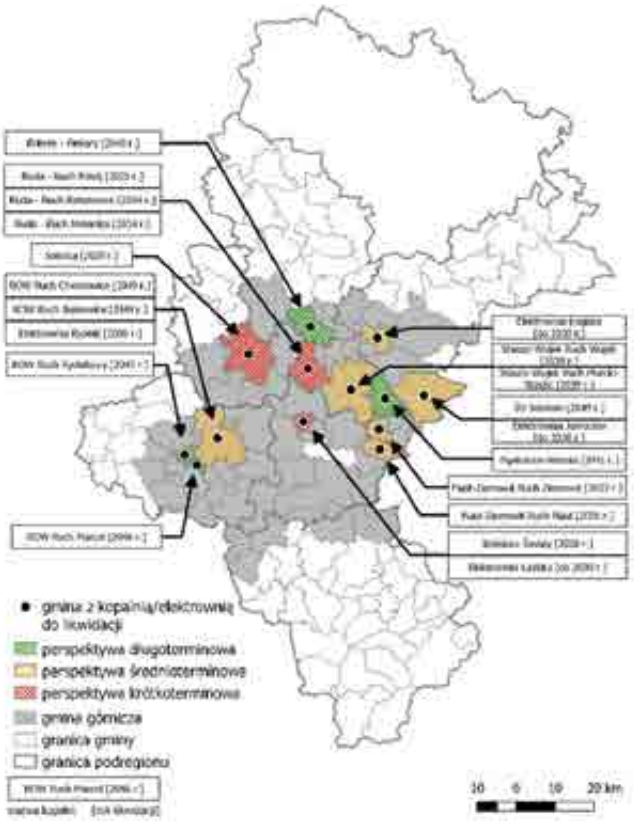
A long-awaited agreement between the government, mining companies and trade unions began to take shape from September 2020 and was signed in April 2021. It consists of a plan to decommission 14 of Poland's hard coal mines (a substantial majority), owned by three companies: PGG, Tauron and Węglokoks. Most of the facilities are located in Silesia and two of them in Western Małopolska (Lesser Poland Voivodeship). The plan sets out that the last of the mines, "Ruch Chwałowice" and "Ruch Jankowice" (Rybnik, Silesian Voivodeship) will be closed in 2049. The first, "Pokój" (Ruda Śląska, Silesian Voivodeship), is to cease operations as early as 2021. The agreement does not cover the mines belonging to Jastrzębska Spółka Węglowa. JSW's business is more coking coal mining, but we can only speculate whether this is the main reason for the company not joining the agreement.

41 "Samorządy i organizacje społeczne chcą uczestniczyć od początku w planowaniu sprawiedliwej transformacji regionów górniczych", wwf.pl, 01.06.2020, accessed on: 01.09.2021, https://www.wwf.pl/aktualnosci/samorzady-i-organizacje-spoleczne-chca-uczestniczyc-od-poczatku-w-planowaniu [„Local governments and community organizations want to participate from the beginning in planning for a just transition of mining regions"]

42 "List NGO do Komisji Europejskiej ws. sprawiedliwej transformacji", sprawiedliwa-transformacje.pl, 23.03.2021, accessed on 01.09.2021, http://sprawiedliwa-transformacja.pl/2021/03/23/1212 [„NGO Letter to the European Commission on a Just Transition"]

43 "Krajowy Plan Odbudowy – wysłuchanie publiczne. Zielona energie i zmniejszenie energochłonności", wysluchanieplanodbudowy.pl/zielona-energia, accessed on 01.09.2021, https://www.wysluchanieplanodbudowy.pl/zielona-energia [„National Reconstruction Plan – Public Hearing. Green energies and reduction of energy intensity"]

Picture 2: The hard-coal mines in Silesia planned for decommission by 2049.



Source:Terytorialny plan sprawiedliwej transformacji województwa śląskiego 2030, 2021

The agreement provides for a **guarantee of employment for current staff** until retirement (a provision for which the trade unions have been particularly active). If it is not possible to keep the jobs at the plant or transfer them to another site, the miners will be able to count on a one-off severance payment of PLN 120,000 (EUR 26,700) or take pre-retirement leave.

The overall concept of the agreement suggests that the government has decided to "solve" the main social problem associated with the transition, namely the risk of rising unemployment, in such a way that the departure from coal will be stretched as far as possible over time so that most of today's miners will have time to retire.

The plan also envisages that the mines in question will be **subsidised by a total of PLN 2bn (EUR 444m) a year.**

Moreover, the agreement contains vague declarations about the development of "clean energy sources" in the regions, including "clean coal". This term refers particularly to CCU technology, which according to most energy experts can in no way form the basis of a carbon-neutral economy.

The plan has drawn harsh criticism of the government both at home and abroad. As far as statements in the public debate are concerned, the plan is defended almost exclusively by the media supporting the government (there is no data showing what attitude miners themselves or the people of the region have to the plan). Massive criticism comes mainly from the opposition and liberal/left-leaning media and from climate NGOs (including those mentioned earlier)[44]. It was emphasised, firstly, that the mines should be phased out much earlier, i.e., all of them by 2030 (to counteract the climate catastrophe and comply with EU climate policy). Secondly, the opinion was widely expressed that the EC would not agree to the proposal to subsidise unprofitable mines with EUR 444m per year for almost 30 years due to EU competition law. The agreement is now considered completely unrealistic, and the widespread opinion is that the signatories are aware of it, thus some journalists repeat Greenpeace's claims that "both the government and the unions are deceiving miners"[45].

Furthermore, the government and the ruling party have become the target of criticism from some right-wing circles that are even more nationalistic than themselves. The extreme right, most often in the form of small political groups and media and individual journalists, have criticised the government for "selling out the Polish mining industry" and putting "the country's energy security" at risk. This position is most often associated with the dogmatic assumption that the Polish economy "stands on coal" and will always do so, and with ritualistic calls for "patriotism" and "no subservience to Brussels". Part of the trade union

44 "Zmierz ery węgla. Jak pożegnać czarne złoto z godnością i sensem?", sprawiedliwa-transformacja.pl, 23.04.2021, accessed on 02.09.2021, http://sprawiedliwa-transformacja.pl/2021/04/23/zmierzch-ery-wegla-jak-pozegnac-czarne-zloto-z-godnoscia-i-sensem [„Measure the coal era. How to say goodbye to black gold with dignity and sense?"]

45 "Greenpeace do Morawieckiego: przestańcie oszukiwać górników", rp.pl, 29.09.2020, accessed on 02.09.2021, https://www.rp.pl/polityka/art8808011-greenpeace-do-morawieckiego-przestancie-oszukiwac-gornikow [„Greenpeace to Morawiecki: stop cheating miners"]

community also reacted in this way, although these were mostly unofficial voices, expressed mainly on social media.

It is also interesting to note that at the beginning of October 2020, shortly after the adoption of the preliminary agreement on the plan, a miners' rally "in defence of jobs" took place in front of the ruling party's headquarters in Warsaw. The protest denounced the "death sentence on the Polish mining industry". The same trade unions that had previously signed the agreement took part, namely Solidarność and OPZZ.

Poland's Energy Policy until 2040

In March 2021, the government finally published the long-awaited document entitled "Energy Policy of Poland until 2040" (PEP2040)[46]. Predictably, it turned out to be extremely unambitious compared to the EU's energy and climate policy. By 2030, the EC plans to reduce GHG emissions by 55% (compared to 1990), which means that at the end of this decade, 55TWh could be generated from coal at the EU level. Meanwhile, based on PEP2040, it can be concluded that Poland is considering generating as much as 75TWh from its own coal units[47]. Moreover, the government wants an additional 45TWh to be produced from fossil gas by 2030, which requires **the largest gas investments among the EU member states**. Declaratively, gas is treated by the government as a transitional fuel, but such a large extension of the installations prompts the conclusion that this solution could take on a more permanent character. In addition, this will make it more difficult to reduce GHG emissions. The plan envisions a gradual **transition to a "zero-emission" energy sector, while at the same time it does not announce the complete abandonment of fossil fuels.**

The PEP2040 announces the development of renewable energy sources, and this is confirmed by the government's preparations for large offshore investments in the Baltic Sea. At the same time, according to the document only 23-32% of Poland's electricity is to be generated from renewables in 2030. 32% is consistent with the EU target established in 2018, but the target has been increased to 40% recently with the announcement of the Fit for 55 legislative package. The government's plan is unambitious in this respect. There is an estimate that up to 76% of electricity in Poland in 2030 could come from renewable sources and only 13% from coal[48] (this means reversing today's proportions), for which it will be necessary to remove some administrative barriers obstructing onshore wind farms development[49] (in fact, there is already a draft law planning their partial relaxation). In this hypothetical case, only 22TWh could be generated from coal in Poland. This forecast is based on very optimistic and risky assumptions. A more cautious estimate by an influential think tank Forum Energii gives the possibility of **43% of energy from RES in 2030.**

As an aside, it should be emphasised that an effective substitution of coal by RES is not what the Energy Regulatory Office (URE) believes in. In its report of June 2021 URE showed that by 2034 Poland will be threatened with **an "energy gap" of 4.6GW**, such will be the shortage of power generating units[50]. This is a forecast based on an analysis of planned and actual investment processes. The gap will be related to the fact that the pace of the roll out of low-dispatch units (RES) will not sufficiently match the pace at which high-dispatch (coal fired) units are decommissioned. Unfortunately, this means **a real threat to Poland's 'energy security.**

In the PEP2040 document, the government ensures that no more than 56% of energy will come from coal in 2030.

46 Ministry of Climate and Environment (2021) Energy Policy of Poland Until 2040. Extract, https://www.gov.pl/attachment/7ba82820-4a14-4bb8-a84a-a0bb51c6d432

47 Calculations by Ember think tank based on PEP2040, see: "Disappointing lack of ambition in Poland's Energy Policy until 2040", ember-climate.org, 15.03.2040, accessed on 03.09.2021, https://ember-climate.org/commentary/2021/03/15/pep2040/

48 Czyżak, P., Wrona, A. (2021). Droga do celu. Odejście od węgla w polskiej elektroenergetyce. Instrat Policy Paper 01/2021, https://instrat.pl/odejscie-od-wegla [„The road to the goal. Moving away from coal in the Polish electric power industry"]

49 Bronk L., Czarnecki B., Magulski R., Pakulski T., Ścigan M., Maćkowiak-Pander J., Jędra M. (2021) Jak wypełnić lukę węglową. 43% OZE w 2030 roku, raport Forum Energii, https://www.forum-energii.eu/pl/analizy/jak-wypelnic-luke-weglowa [„How to close the coal gap. 43% RES in 2030"]

50 URE (2021) Informacja na temat planów inwestycyjnych w nowe moce wytwórcze w latach 2020-2034, https://www.ure.gov.pl/pl/urzad/informacje-ogolne/edukacja-i-komunikacja/publikacje/raport-plany-inwestycyj/8068,Raport-Plany-inwestycyjne-w-nowe-moce-wytworcze.html [„Information on investment plans in new generation capacity in 2020-2034"]

The rate of coal energy reduction in PEP2040 is related to the costs of its generation. In this respect, however, the government's forecasts are widely considered to be completely detached from reality. The document includes two scenarios of CO_2 emission prices under ETS. The baseline scenario assumes a price of EUR 30 per tonne of CO_2. This is a ridiculous assumption, as at the time of publishing for PEP2040, prices reached EUR 40. Such an assumption is a consequence of the fact that PEP2040 started to be written in 2018. The "ambitious" scenario, however, is also unrealistic. It assumes a price of EUR 35 per tonne of CO_2 in 2025 and EUR 50 in 2030. Anyway, **the objective of 56% of energy from coal and 32% of energy from RES in 2030 should be now considered binding for the Polish government.**

The plan of the current government also includes launching **a nuclear power plant in 2033**. Nuclear power is rightly recognised as an almost zero-emission technology but based on the experience of other countries (most recently Finland), the timeframe of 12 years is too short to base decarbonisation efforts until 2040 on this technology, built in Poland from scratch.

Regarding renewables, PEP2040 places great hopes on the offshore wind farm project, which will be discussed further on. The document also acknowledges the significant development of photovoltaics, which resonates with the already existing trend in Poland. There has been a great increase in the number of small, individual PV installations in households, so-called prosumers. 2020 turned out to be the best year in the history of photovoltaics in Poland. The installed PV capacity at the end of 2020 amounted to 3,935.74MW[51]. This means an increase of more than 2MW on an annual basis, and a 200% jump in year-to-year terms. At the end of the first quarter of 2021, the installed PV capacity was 4,466MW. The fastest growth is observed in micro-installations, which increased by almost 500MW of power. In this regard, Poland ranks among the EU leaders, alongside Germany, the Netherlands and Spain. The demand for individual photovoltaics is growing mainly due to a decrease in PV cell prices in recent years and an increase in competition between installation companies, as well as due to the government programme My Electricity ("Mój Prąd"), which offers subsidies for individual PV installations connected to the national electricity grid. However, for this very reason, **the programme should be considered socially unjust.** In fact, it can only cover a small proportion of citizens: relatively wealthy owners of single-family houses who can afford to make an investment of PLN 18,400-23,000 (EUR 4,060-5,700)[52], and then receive a refund from the government. There are also additional provisions: The prosumer feeds the surplus energy produced into the grid, and when the sun is not shining, one can instead draw electricity from the grid for a very symbolic rate. In practice, therefore, the grid functions as an almost free electricity store for (relatively wealthy) prosumers. However, from April 2022, these conditions are set to change to the disadvantage of new PV owners.

Social justice occupies little space in PEP2040. It mentions just transition of mining regions first and foremost, which is perfectly understandable. The document mentions measures to create new jobs for miners and economic development of their regions, for which PLN 60bn (EUR 13.23bn) of public funds are to be allocated, both from national and EU sources. The entire transformation by 2040 is expected to cost PLN 1.6bn (EUR 0.35bn). In addition, the government's plan includes general declarations to implement solutions to strengthen the position of individual electricity consumers vis-à-vis energy companies. There are also declarations on reducing energy poverty by supporting the thermo-modernisation of buildings or support for the replacement of coal-fired boilers in individual houses, but these declarations do not go beyond the existing support programmes, which in fact are progressing very slowly.

The PEP2040 also states that the development of RES will work to reduce electricity prices for end consumers and that this is supposed to be part of the just transition. This is debatable. Polish wholesale energy prices were the highest in Europe (until late summer 2021) and the development of RES may indeed lead to a decrease in this difference over

51 Data source: Polskie Sieci Energetyczne, see: "Poland's solar PV capacity tops 3.9 GW", renewablesnow.com, 05.05.2021, accessed on 03.09.2021, https://renewablesnow.com/news/polands-solar-pv-capacity-tops-39-gw-733428/

52 "Ile kosztuje fotowoltaika w 2021 roku?", gazetaprawna.pl, 26.01.2021, accessed on 04.09.2021, https://serwisy.gazetaprawna.pl/energetyka/artykuly/8077313,ile-kosztuje-fotowoltaika-fotowoltaika-koszt-instalacji-fotowoltaika-cena-instalacji-montazu.html [„How much does photovoltaics cost in 2021?"]

time, but for the time being the government plans to allow offshore corporate producers to charge very high prices of up to PLN 319.6/MWh. Besides, the German Energiewende shows that low wholesale prices can translate into very high retail prices, some of the highest in Europe[53]. For now, the Morawiecki government is unable to stop the relentless rise in household electricity prices. For 2020, only the poorest could be compensated from public funds. The compensation legislation for 2021 is still not ready.

While referring critically to PEP2020, it should also be noted that in this document **the term "just transition" is used in a broader sense than in EU climate and energy policy.** The European Green Deal speaks of JT only in the sense of helping coal regions. PEP2040 generally also uses the term to refer to tackling energy poverty and fair access to energy for all inhabitants of the country. This is rather appropriate from a social justice point of view.

Finally, the total expenditure on transformation assumed by PEP2040 (PLN 60bn) is definitely not excessive. It is enough to compare this amount with Poland's planned expenditure on armaments in 2021: PLN 51.8bn (EUR 11.35bn), which represents 2.2% of Polish GDP[54].

Decommissioning of coal-fired power plants

The government has also presented a separate restructuring plan for the power generation sector, geared towards a gradual shutdown. According to the plan, the three largest energy producers in Poland would be merged. Enea and Tauron would become part of the PGE capital group. The group's joint coal assets would then be gradually transferred to the newly established, state-owned company NABE (Narodowa Agencja Bezpieczeństwa Energetycznego – National Energy Security Agency). The coal-fired units accumulated in NABE would be decommissioned over time in a planned manner under the Early Decommission Mechanism (EDM), i.e., they would be subsidised with public money, on the assumption that their operation would not be economically viable and would only go on to preserve the country's energy security. The last units in power plants – Jaworzno 3, Kozienice and Opole – are to be shut down in 2037. The power system would simultaneously switch to RES, supported in the longer term by the future nuclear plant. The assets of the merged PGE, Enea and Tauron that are not transferred to NABE (i.e., non-carbon assets) are to be dedicated to RES development in Poland.

First of all, this plan is inconsistent with PEP2040. In 2030, coal would generate as much as 92.2TWh of energy, which would bury EU decarbonisation plans. In this situation, it is difficult to expect the European Commission to accept such a plan. The EU may challenge such a solution primarily on the grounds of competition law. In this way, a gigantic industrial Moloch will be created, with the total capacity of its coal installations much exceeding the potential of the largest European producer in this respect, the RWE company. According to the Deputy Minister, investments in NABE will be limited to necessary upgrades to allow for day-to-day operations.[55] It would, by definition, be unprofitable and subsidised for many years[56]. Such a solution would violate EU competition law. There are therefore grounds to doubt whether the NABE plan will come to fruition. If it does, the general feeling among commentators is that NABE will become the biggest ever monopoly, operating

53 As mentioned above, this was the case until the end of 2020. Since then, there has been a rapid increase in wholesale prices in Germany and in Western Europe in general. From the beginning of 2021 to mid-August, they rose by more than 60%., see: "Europa stoi w obliczu energetycznego szoku. Powód? Wzrost cen gazu i energii", forsal.pl, 10.08.2021, accessed on 04.09.2021, https://forsal.pl/biznes/energetyka/artykuly/8223125,europa-stoi-w-obliczu-energetycznego-szoku-powod-wzrost-cen-gazu-i-energii.html [„Europe is facing an energy shock. The reason? Rising gas and energy prices"]

54 "2,2 proc. PKB na armię w 2021 roku. Prezydent podpisał ustawę budżetową", defence24.pl, 28.01.2021, accessed on 10.09.2021, https://www.defence24.pl/22-proc-pkb-na-armie-w-2021-roku-prezydent-podpisal-ustawe-budzetowa [„2.2 percent of GDP for the army in 2021. The President signed the budget bill"]

55 "Soboń: NABE ograniczy się inwestycyjnie do niezbędnych modernizacji", bankier.pl, 18.05.2021 accessed on 04.09.2021, https://www.bankier.pl/wiadomosc/Sobon-NABE-ograniczy-sie-inwestycyjnie-do-niezbednych-modernizacji-8115506.html [„Soboń: NABE will be limited in investment to necessary upgrades"]

56 However, at the same time, being a complete monopolist, there is a risk NABE would actually cause electricity prices increases, see: Czyżak, W. Kukuła (red.) (2020) Monopol węglowy z problemami. Analiza restrukturyzacji polskiego sektora energetycznego, ClientEarth & Instrat, https://instrat.pl/restrukturyzacja [„Coal monopoly with problems. Analysis of restructuring of the Polish energy sector"]

in a very untransparent way, that will effectively inhibit the move away from coal, wasting public money at the same time. It is quite telling that the minister for energy and climate Michał Kurtyka was dismissed from the government by the PM after criticising the NABE project using arguments along these lines[57].

At the same time, it may in turn cause enormous legal problems for the Polish state within the EU. A foretaste of this is the Turów dispute (described above). Situations like this can pose significant risks for company employees. The Turów conflict has caused great concern and even anger among mine workers, who fear that they will suddenly and unexpectedly lose their jobs. The plan, which is unrealistic, creates the risk that in the event of its collapse, people will lose their jobs abruptly and without any security measures. In the end, therefore, **irresponsible prolongation of the coal economy may paradoxically lead to its abrupt end, which will be painful and problematic for the people.** The same could happen to coal-fired power stations if they have to be closed outside the timetable irresponsibly adopted by the government. A report by the independent think tank Instrat[58] suggests this could happen out of purely technical issues, because coal-fired plants in Poland are in very bad shape in general. In the summer of 2021, the failure of several units at the Belchatow power plant occurred, putting the national electricity system on the brink of a black-out[59].

There is another aspect to the issue. The concentration of obsolete assets in a separate single company will prevent banks from giving credit and mean the process must rely solely on subsidies, which will come from taxpayers' money. This way, the new, consolidated PGE group would get rid of "stranded assets" and effectively improve its competitiveness and balance sheet. This is a mechanism for **socialising costs and privatising profits.**

The entities that are to make up NABE currently employ **29,000 workers**. The loss such a number of jobs will have an unavoidable impact on the regional social situation. Most of the coal-fired power plants threatened with closure are located in the coal regions. The government's restructuring plan includes proposals for the current workforce but doesn't provide for everyone. 11,800 may retire; 4,600 may take advantage of voluntary redundancy programmes or continue to work on decommissioning; 1,300 may move to gas projects; 1,700 may find work on nuclear power plant construction; 1,500 may find work on RES projects and the reclamation of post-coal areas. All this is under the condition that a very risky timetable can be maintained. Meanwhile, **more than 8,000 workers have been left out of this analysis, for whom there are no proposals**[60]. The plan does not include any support for those who will reach retirement age after 2040, and this is over 25% of the workforce. It is somewhat surprising that 1,700 people are to find work in the nuclear power plant, while only 1,500 are to be employed in RES, given that the potential for jobs in RES in Poland is estimated at 300,000 in PEP2040. It is reasonable to expect governmental transition projects to make greater use of the potential of renewables than the government itself is talking about.

The official plans for the transformation – Territorial Just Transition Plans

Polish TJTPs were created locally but under the supervision of the Ministry of Funds and Regional Policy. Together, they are to make up the National Just Transition Plan (NJTP). Their main disadvantage is the lack of transparency in the process of writing them and the top-down nature. On 1 June, together with representatives of eight local governments, NGOs addressed an open letter to the ministry, calling for greater transparency in the development of the plans and preservation of the principle of participation

57 "Ostatnia szarża na Narodową Agencję Bezpieczeństwa Energetycznego. Czy dlatego minister musiał odejść?", biznesalert.pl, 02.11.2021, accessed on: 10.11.2021. https://biznesalert.pl/ostatnia-szarza-na-narodowa-agencje-bezpieczenstwa-energetycznego-czy-dlatego-minister-musial-odejsc [„The latest charge against the National Energy Security Agency. Is this why the minister had to leave?"]

58 Czyżak, W. Kukuła (red.) op.cit.

59 "Poland's main Belchatow power plant crippled by outage", independent.co.uk, 18.05.2021, accessed on 18.10.2021. https://www.independent.co.uk/news/polands-main-belchatow-power-plant-crippled-by-outage-poland-warsaw-germany-sweden-b1849348.html

60 Czyżak, W. Kukuła (red.) op.cit.

mandated by the EC. In total, more than twenty local authorities have signed the letter[61].

In addition, Silesia – despite preparing its own plan – is on a fast track to losing its chance of JTF funding altogether, as the process of setting up two more mines is still underway. The Lower Silesian Voivodship will only receive money for the Wałbrzych subregion – the Bogatynia subregion lost its chance for JTF funds due to the decision to extend Turów power plant operation indefinitely (this is not directly related to the Turów dispute with the Czech Republic, because the latter concerns the opencast mine operating for the power plant). The voivodeship authorities prepared their own TJTP for Bogatynia, but as it does not include a timetable for decommission of the Turów power plant, it was rejected even by the relevant ministry and was not sent to Brussels.

Some experts involved in overseeing the NJTP call for the creation of a Just Transition Agency to coordinate the TJTPs independently from the government. This concept was supported by environmental NGOs, while pointing out that the new agency must be inclusive, involving civil society organisations and local governments as much as possible[62].

Łódzkie Voivodeship's TJTP[63] (Bełchatów)

The TJTP for the region of Łódź is important as it concerns the Piotrków subregion that includes the Bełchatów power plant. The plan assumes consistency with two official documents: PEP2040 and the regional Strategy for Responsible Development until 2020 (with a perspective until 2030). **The TJTP does not so much declare as allow the possibility of complete closure of the heating and power plant, making it conditional on support from the JTF.** It is difficult to say how this way of putting the problem will be treated by the decision-makers of the JTF. The authors of the document use projections from the Ministry of State Assets (MAP). These forecasts envisage a reduction of emissions to 6.9m Mg, i.e., an 80% reduction, by 2030, and the complete decommissioning of power units will take place between 2030 and 2036. The decommissioning of two lignite deposits closely linked to the operation of the power plant will take place in 2026 and 2038. Although the Polish state has still not declared its support for the EU's 2050 climate neutrality target, the Łódź TJTP stresses that the province's plan is supportive of this goal, even though the region itself has not declared a climate neutrality target. It also emphasised that climate neutrality in 2050 has been announced by PGE GiEK. The company plans to achieve it by investing in renewable energy.

Picture 3: The transformation area in Łódzkie Voivodeship

Source: Terytorialny Plan Sprawiedliwej Transformacji Województwa Łódzkiego, strategia.lodzkie.pl,

The analysis of employment reduction in the region in question focuses mainly on the expected changes in the Bełchatów complex. The number of jobs in the complex in 2030 is expected to be 4,263, which is a 43.3% decrease from the current number, estimated to be 7,515 (which differs from the official PGE GiEK data cited in the chapter "Economic situation in lignite regions"). There is no precise

61 "Samorządy i organizacje społeczne chcą uczestniczyć od początku w planowaniu sprawiedliwej transformacji regionów górniczych", wwf.pl, 01.06.2021, https://www.wwf.pl/aktualnosci/samorzady-i-organizacje-spoleczne-chca-uczestniczyc-od-poczatku-w-planowaniu [„Local governments and community organizations want to participate from the beginning in planning a just transition for mining regions"]

62 Letter from Polish Green Network on Just Transition Agency: http://sprawiedliwa-transformacja.pl/wp-content/uploads/2021/11/List-Polskiej-Zielonej-Sieci-w-sprawie-Agencji-Sprawiedliwej-Transformacji-1.pdf

63 Terytorialny Plan Sprawiedliwej Transformacji Województwa Łódzkiego, strategia.lodzkie.pl, http://strategia.lodzkie.pl/wp-content/uploads/2021/06/projekt-Terytorialnego-Planu-Sprawiedliwej-Transformacji-WL.pdf [„Territorial Plan for Equitable Transformation of Lodz Province."]

forecast for the decrease in employment in related companies, there is only an estimate that for every one job in the mine there will be four additional jobs in the region, and for every one job in the power plant, two jobs in the region.

The document notes that 74.5% of the mine and power plant workforce are aged 45+ and will be eligible for retirement by 2030. The age structure is different in PGE's subsidiaries. 66.9% of their employees are below the age of 45. It is mainly with them in mind that the authors of the plan want to launch retraining and professional competence development programmes. They estimate that this process will have to cover about **4,700 people.** They add that "the final number of people losing their jobs will depend, among other things, on business decisions, including the pace of the closures of the opencast mines and the ultimate destination of post-industrial areas for new jobs". This means that the Łódzkie Voivodeship authorities (reasonably) assume that they will have a limited impact on unemployment resulting from decarbonisation. At the same time, the rest of the plan puts the issue of organised job creation in place of liquidated jobs in extremely general terms – in fact, it is difficult to regard the authors' declarations as a properly understood plan.

The authors of the Łódzkie TJTP estimate that the "transition to a climate-neutral economy" will result in **13,500 job losses** in all the municipalities that they consider to be in the transition area.

In addition to the rise in unemployment, the plan also foresees other negative effects of (partial) decarbonisation: a decrease in the GDP of the subregion in question (the Piotrków subregion is estimated to have produced 23.8% of the GDP of the entire Łódzkie Voivodeship in 2018) and the impoverishment of local government units, as well as possible depopulation. Moreover, the plan takes as a given the far-reaching ecological effects of lignite monoculture: terrible air quality posing a threat to public health and "large-scale degradation of land surface, soils, water resources (depression funnel) and landscape".

The plan divides the challenges of the region's transformation process into economic, social, and spatial challenges. The economic ones are defined as follows: 1) "Development of an innovative and diversified economy, using ICT technologies"; 2) "Raising the level of entrepreneurship", 3) "Mobilising the industrial sector for a clean closed-cycle economy." The provincial government aims to create "a competitive, innovative and climate-neutral economy based on smart growth, diversified industry, modern technologies and attractive jobs." However, no date is suggested for achieving climate neutrality. The plan stresses that the area in question is completely economically dominated by the lignite industry and that this translates into its backwardness; it speaks of the need to develop the R&D sector and to increase the innovation of the economy, combined with the development of RES and the recultivation of former mining sites. **Economic development is treated in a very neoliberal way**, with a strong emphasis on "competitiveness", and there is even an announcement of an increase in the number of so-called special economic zones, where investors are given tax privileges.

Greater Poland's TJTP (Eastern Wielkopolska)[64]

Eastern Wielkopolska (the Konin subregion) is by far the most ambitious coal region in Poland, both in terms of declared goals and the implementation of the transformation[65]. In October 2020, it became the first and, so far, only region in Poland to announce its intention to achieve **climate neutrality by 2040.** In this way, the region has not only overtaken the government in its climate "ambitions" but has adopted a neutrality date 10 years prior to that of the European Union. The declaration is undoubtedly a breakthrough for the region, which has been mining lignite for 80 years. The exploitation and combustion of the raw material will be brought to an end by 2030.

When planning the transformation, the region's authorities involved the lignite industry's trade unions, local businesses, people from the sphere of education and science and non-governmental organisations (such as the Green Fu-

64 Samorząd Województwa Wielkopolskiego (2021) Terytorialny Plan Sprawiedliwej Transformacji – projekt, Konin, https://bip.umww.pl/artykuly/2827050/pliki/20210426123105_projekttpstww04.2021002.pdf [„Local Government of the Wielkopolska Region (2021) Territorial Fair Transformation Plan – draft, Konin"]

65 "A just transition is already happening in Eastern Wielkopolska", regionsbeyondcoal.eu, 24.03.2021, accessed on 05.09.2021, https://regionsbeyondcoal.eu/a-just-transition-is-already-happening-in-eastern-wielkopolska/

ture Institute Foundation and the Polish Green Network). Eastern Wielkopolska has long stood out in terms of social participation in the just transition already in progress. The process gives the impression of being bottom-up and has been going on since 2019. It accelerated when ZE PAK, the company responsible for the open pits and the power plant, announced that it would abandon the exploitation and burning of lignite.

Initially, it was local activists who had to make their voices heard in order to come up with an economic alternative for the region, and then the Regional Development Agency (Agencja Rozwoju Regionalnego – ARR) in Konin became involved in planning the transformation. The ARR was largely responsible for the smooth process of public participation in the creation of the TJTP. Regional authorities and NGOs are optimistic about the chances of obtaining funds from the JTF.

The TJTP was created and went to public consultation in June, the course of which is not known now. The plan is based on the region's declaration of climate neutrality by 2040 and the assertion that creating a carbon-free economy will have negative social and economic impacts in terms of the risk of increased unemployment, a weakened economy, and public finances – hence the need for a just transition. The authors of the TJTP describe the difficult economic situation of the subregion against the background of the whole voivodeship, highlighting the deteriorating economic dynamics, which will be made even worse by the closure of mines and the power plants. The plan highlights the danger of depopulation and the great destruction of ecosystems caused by the open pits.

According to the TJTP, the main goal of the transformation is to "build a zero-carbon, dynamic circular economy", and so to create the basis for neutralising negative social and economic phenomena.

The authors write that: "The actions taken will counteract the increase in unemployment, as well as serve to maintain the professional activity of these people and reduce the depopulation caused by an outflow of people of a working age. The development of a zero-carbon and resource-efficient economy, as well as a digital economy, pose significant challenges in terms of raising and changing the skills of employees and employers." Their estimation is that 2,200 employees currently employed at ZE PAK will need this support.

Detailed operational measures are listed, among them mechanisms to support the development of qualifications for ZE PAK employees and the other inhabitants of the region. Importantly, the plan also provides support for the employees of companies linked to ZE PAK. There is a declaration of investment in the R&D sector, including "building a start-up ecosystem, including the construction and development of technology hubs". Also mentioned are "productive investments in large enterprises that contribute to job creation and the achievement of climate neutrality". This includes ZE PAK's support for the design and production of a Polish zero-emission bus. The company also declares its intention to redirect its activities towards RES development. The plan identifies renewable energy development as one of the engines of the region's new economy and equitable transformation. The existing technical and energy infrastructure is expected to support the project. Unfortunately, the plan does not detail any specific operational measures to support RES development.

The TJTP also includes a second objective: "Ensuring high quality integrated space". It will be implemented, among others, through "investment in the development of public transport, including the purchase of zero emission bus fleets for urban and inter-municipal connections with the necessary infrastructure". This involves understanding the role of public services as something that contributes to overall quality of life.

In addition to the TJTP, there are also two separate projects to support workers. One of them was submitted to the ARR jointly by ZE PAK and the trade unions. It outlines support similar to the proposal in the TJTP and is also intended to cover 2,200 people. It is still not clear how it formally relates to the TJTP. In addition, the social and labour committee of ZE PAK has also submitted its own project. Representatives of the KADRA trade union believe that the closure of the power plant will take place earlier than scheduled for economic reasons and that more workers must be assisted. The committee's project envisages the establishment of an Employee Support Centre, which would carry out job placement and career counselling activities and would grant vouchers for courses and training. Both projects have

been written with the intention of receiving funding from JTF and are at an early stage of development.

In April, trade unionists from ZE PAK addressed an open letter – carrying a rather dramatic message – to the EU Climate Commissioner Frans Timmermans, responsible for the JTF[66]. They claim that, according to current procedures, JTF money for the initiated projects will not arrive until two years from now at the earliest but will be needed much earlier, as the two lignite opencasts will be closed in 2021 and 2022. They ask for measures to be taken to protect them from sudden job losses.

Silesia's TJTP[67]

The Silesian voivodeship is the most coal-dependent region in the European Union. Since the early 1990s, production of coal in Poland has decreased by half (from 150m tonnes to about 73m tonnes) but employment in the mining sector decreased fourfold (a drop of about 388,000 from 1990 to 2015). However, the voivodeship still has the largest number of employees in the mining sector in the EU.

The official plan for Silesia envisages that the transformation area will cover seven subregions. The document contains a detailed diagnosis of the social, economic and ecological situation of individual communalities in cooperation with the University of Economics in Katowice. Four criteria were distinguished based on which the territorial units were qualified for support in the transformation process: 1) negative effects of the mine closure itself, 2) the loss of socio-economic functions, 3) poor air quality, 4) impact on the economic development of the region.

Picture 4: The transformation area in Silesian Voivodeship

Source: Terytorialny Plan Sprawiedliwej Transformacji Województwa Śląskiego

The plan states that **5 mines and 4 coal-fired power plants will be closed in the transition area by 2030**, in line with government strategies. **Job losses in mining were estimated at 5,100 by 2030 and 14,400 in mining-related companies**. About 850 people are expected to lose their jobs in the power plants to be closed over that period.

When writing about the negative social impact of mine closures, the authors of the plan also mean **current consequences of the previous closures, especially in the second half of the 1990s**. This is particularly the case of the Sosnowiec, Bytom, and Katowice subregions (although not necessarily the city of Katowice itself). The term "social consequences" refers primarily to long-term unemployment, low professional activity of the inhabitants, low quality of education, low level of participation in social and political life, and depopulation of cities and towns. The forecast of the Central Statistical Office (GUS) was quoted, according to which, by 2050, the population of the entire voivodeship

66 Full text of the letter: https://zepak.com.pl/upload/ZZ_KADRA_-_List_do_Timmermansa_2021_04_20___ENG.pdf

67 Terytorialny Plan Sprawiedliwej Transformacji, https://transformacja.slaskie.pl/content/terytorialny-plan-sprawiedliwej-transformacji1

will have shrunk by 18.8%. This accounts for 850,000 people, the highest number on the national scale. The level of unemployment is currently very differentiated territorially, the highest being in Bytom at 10.4%.

In addition to the above, the TJTP accentuates the following structural problems in the region that should be addressed in a just transition:

1. Insignificant share of renewable energy production (4.4% – one of the lowest percentages in the country).
2. Coal as the primary source of heat (75.4% of total production)
3. The highest level of coal consumption in households (for home heating) in the country
4. The largest amount of industrial waste generated (almost one quarter of the national total) in the country
5. Surface water pollution adversely affecting the natural environment, causing disturbance of water management
6. The highest percentage of degraded and devastated areas in the country
7. Decommissioned enterprises having a negative impact on lifestyle and economic attractiveness of many post-mining areas.
8. Very high road traffic intensity, with low intensity of public transport.

The Silesian TJTP divides the voivodeship's JT goals and planned activities into three areas: economy, environment, and society.

Economy

Objective 1: Innovative and low-carbon economy of mining subregions

The plan is to develop centres that support the transfer of knowledge and technology to enterprises (technology parks, demonstrators of new technologies, technology centres, research and design centres) for a green, digital economy. This is supposed to help strengthen the level of innovation and generate new engines of growth in mining subregions to replace traditional industries.

Objective 2: A diversified and resource- and energy-efficient economy of the mining subregions

Support is envisaged for the investments needed to change the profile of activity, including the introduction of new climate-neutral products, services, processes, or the conquest of new markets in companies previously operating in the mining and traditional sectors. Support will also be given to undertakings that contribute to increasing the level of digital development of enterprises, through the implementation of projects related to digitisation, automation, services, robotisation and informatisation. Aid will also go to companies that want to develop recycling and reduce waste production. The development of a circular economy is announced. According to the authors of the plan, the above initiatives are to lead to a "competitive advantage" for Silesia and to the creation of "stable jobs," but they do not say how.

Objective 3: Strong entrepreneurship in mining subregions

The development potential and competitiveness of micro and small enterprises, including services, will be supported. Support will include both infrastructural initiatives and complementary training component. This point is followed by the traditional neoliberal enumeration of methods for supporting entrepreneurship and business activity in all forms, which on the one hand are supposed to lead to the creation of "stable jobs" and on the other hand also envisage support for self-employment. A policy of "attracting investment" is also announced.

Environment

Objective 1: Balanced energy of mining subregions based on alternative energy sources

The intention is to support primarily the development of RES (wind, solar and biomass), including prosumer activities and the creation of energy clusters. The plan's authors write that it will "increase energy security and engage the local community in promoting clean energy sources and striving for climate neutrality". Replacement of coal-fired heat sources with low- and zero-emission sources and thermal upgrading of buildings will also be supported.

Objective 2: Effective use of post-industrial areas of mining subregions for economic, environmental, and social purposes

Co-financing will be provided for comprehensive activities relating to both land reclamation and targeted land development, including comprehensive preparation of post-industrial areas designated for economic activity, along with the necessary infrastructure, including, to a limited extent, transportation in these areas. It was emphasised that "investments related to eliminating the effects of industrial activity – including mining – on the environment must consider the 'polluter pays' principle".

Objective 3: Effective system to enhance mobility in mining subregions
Support will be provided for the purchase of zero-emission rolling stock along with the necessary infrastructure for its power supply. In addition, support will be provided for public transport infrastructure. Preference will be given to investments using renewable energy sources to the greatest extent possible. In addition, support will be provided for activities aimed at developing infrastructure for non-motorised traffic, including the development of bicycle infrastructure.

Society

Objective 1: Attractive and effective education system and skill enhancement in mining subregions.
The plan looks to support the professional development of subregion residents by supporting education at all levels. These are to be, above all, courses, training opportunities and job consultation initiatives conducted in cooperation with local businesses. It assumes adaptation to the labour market changing in accordance with the anticipated direction of the region's economic development, i.e., preferring "green industries".

Objective 2: Attractive and effective labour market support system for mining subregions
The envisaged activities are practically similar to those of Objective 1, except that they are addressed specifically to mine workers and also cover job placement and "professional activation" through setting up one's own business, including advisory and financial support in this area.

Objective 3: Comprehensive social and health support system activating residents of subregions and mining subregions
The scope of support will include activities relating to medical rehabilitation facilitating return to work and maintenance employment, increasing accessibility to diagnostics and preventive health care with respect to, among others, occupational diseases, cancer, civilisation diseases, and mental illnesses which are a significant health problem in mining subregions. The implementation of comprehensive projects aimed at supporting infrastructure to improve quality and accessibility to health services is also planned, in particular to facilitate the return to work and maintain employment. Measures will also be undertaken to improve the quality and accessibility of broadly understood social services.

Objective 4: An effective, socially responsible transformation management system in mining subregions
It is reasonable to assume that this objective effectively means achieving all the above objectives. According to the TJTP authors, the most important will be "the implementation of the partnership principle, cooperation with and inclusion of social and economic partners in the decision-making process and providing coherent system information". Support will be given to running dedicated bodies, meant to cooperate with a wide range of partners from various sectors in the implementation of grant and pilot projects, to build awareness and acceptance of the mining subregions' inhabitants for the transformation process using the participatory model.
This part shows commitment to the participation principle in the transformation process. Unfortunately, the Silesian TJTP itself, as far as we know, was formed in a completely non-partisan manner. The plan also does not contain any list of social partners with whom the voivodeship authorities would like to cooperate in this area, nor examples of them, nor are general types of organisations mentioned. The authors do not propose any method for involving the social partners.
This is where the biggest drawback of the Silesian TJTP comes in. The authors detail the costs to be borne for the implementation of objectives (in millions of zloty). Yet, they do not present literally any measurable indicators of the results, such as the number of new jobs, trained people or companies supported in each area. The places in the table for these indicators were left blank, with a comment, "to be completed at a later stage of work". This is the state of the official version of the plan, which is publicly available. If this is the version

that was sent to the EC, it would be quite surprising if the TJTP was accepted.

Lower Silesia's TJTP (Wałbrzych subregion)

In the case of the Lower Silesian Voivodship, any transformation plans so far concern only the Wałbrzych subregion. The European Commission has openly communicated that the Bogatynia subregion cannot count on support from the JTF because it chose to maintain the current situation with the Turów opencast mine and power plant[68]. However, the latter remains able to use funds from other EU sources, e.g., the Modernisation Fund and the Cohesion Fund, for activities in the field of energy transition.

The existing plan for the Wałbrzych subregion focuses on describing the difficult social and economic situation. The authors of the document consider this to be a direct result of the wave of mine closures in the 1990s, which they describe as "chaotic" and "disorganised", neglecting social needs. The estimate presented in the plan is that about 65,000 jobs were lost in that period. This was the opposite of a just transition. Coal-exit ventures are to be largely directed at repairing the socio-economic damage that began then and has continued over the past 20+ years.

Picture 5: The transformation area in Lower Silesian Voivodeship

Source: geoportal.dolnyslask.pl

The plan's climate goal is the "decarbonisation of the (sub) region by 2030", which in practice mean moving away from coal in power generation and heating by then. As part of the socio-economic diagnosis, the authors draw attention to the following facts. The subregion is poor, GDP per capita is only 51% of the EU average, and the rate of growth of this indicator for the subregion is slower than that of both the voivodship and the whole country.

There is low economic activity, measured by the number of companies per 10,000 inhabitants, compared to the voivodship. In the decade 2010-2019, depopulation reached 8.4%, which means an outflow of 60,000 people, and the GUS forecast predicts that by 2030 another 50,000 inhabitants will leave the subregion.

The Wałbrzych subregion is also the "oldest" in Lower Silesia in demographic terms: the median age is 44 years. There is a very low LFS employment rate (18.2%) in comparison with the whole voivodeship (27.6%). The unemployment rate, which in the late 1990s reached almost 30%, was 7.5% in 2019 but is still the highest in the region. The percentage of long-term welfare recipients (among those receiving support) is 17.4% and is also the highest in the region.

80% of dwellings in the subregion date back to before 1945 and require comprehensive modernisation, also in terms of heating sources and energy saving. The authors of the plan estimate that there are 100,000 coal-fired furnaces to be replaced and 35,000 buildings to be thermo-modernised. It is worth noting that households heated with coal are the main source of CO_2 emissions in the subregion (45%) and the second (and growing) source is transport (30%), followed by industry (25%). Maintaining housing which formerly belonged to the mines (which were closed and taken over by the municipalities) represents a very heavy financial burden for the municipalities (especially as the mines were significant financial contributors).

The authors of the plan structure the transformation activities on three levels: economic, social, and spatial-environmental.

68 European Parliament. Committee on Petitions' notice, 23.03.2021, https://www.europarl.europa.eu/doceo/document/PETI-CM-691118_EN.pdf

1. The economic objective is "to activate the economy and strengthen competitiveness by exploiting the endogenous potential of the subregion in a way that ensures the objectives of low emission reduction and decarbonisation are achieved". The measures include support for services related to the installation and construction industry (thermal modernisation) and RES development, mainly in the form of micro-installations. This is to provide benefits in terms of job creation and adaptation of workers' qualifications to the needs of the new, more technologically advanced economy of the subregion. It is also supposed to allow the companies themselves to develop in this direction.

There are also plans to support investments in electromobility and bioeconomy, which the authors see as an opportunity for the development of the R&D sector. The potential in the form of existing industrial zones in the subregion will be helpful in this. There is also talk of investment by industrial companies in energy savings and adaptation to a closed loop economy.

It was also considered important to implement solutions leading to the highest possible share of renewables in heating. This process is also seen as a source of innovation.

2. The spatial objective is to "provide a coherent, transport-integrated, attractive, high quality space for residents while respecting environmental resources". The idea is to carry out the following actions: land reclamation, renaturalisation, remediation, decontamination and redevelopment of post-mining and post-industrial buildings by restoring biodiversity and giving land and facilities new economic, social, and recreational functions, e.g., creating tourist and educational areas (ecological education, education on historical heritage of the region).

In addition, there are also plans for projects to revitalise degraded urban and rural areas, including post-mining settlements and historic urban layouts, considering energy modernisation and including investments in intelligent energy management systems, energy for electricity and heat, and renewable energy sources. In addition, groundwater and rainwater management systems and improving waste management within a circular economy are considered.

Investments in low and non-carbon public transport and intelligent transport management systems are foreseen, including the purchase of low- and/or zero-emission rolling stock for public transport, charging points for public transport vehicles, cycling routes, transfer points, and the restoration of closed railway lines.

3. The social objective is, in short, to have competent inhabitants that are aware of the development challenges and actively involved in the development of the subregion, in the achievement of the climate neutrality goals.

The plan envisages protective support on the labour market accompanying the transformation and support for professionally excluded people affected by the negative consequences of the transformation. This will include labour activation programmes, professional retraining courses towards energy modernisation and circular economy, increasing the potential of the social economy (probably meaning cooperatives), expanding the range of nurseries and care services, financial support for the poorest in relation to heating costs, and improving education on climate neutrality and decarbonisation.

Comprehensive educational development programmes in the subregion include improved access to higher education, development of teachers' competences (also in terms of green transformation), and new vocational and continuing education programmes adapted to a more diversified green economy.

There is also a desire to combat energy poverty by using new technologies, RES, and energy storage for public and residential buildings. This is to include: support for investments in alternative energy sources (including PV installations and heat pumps), also in the scope of prosumers together with energy storage facilities; thermo-modernisation of buildings and support for replacing heat sources with environmentally friendly ones; support for energy-efficient building construction; and advice and individual support in the field of RES and energy efficiency.

There is also a pledge to develop energy cooperatives, inter-municipal renewable energy clusters and RES energy communities.

The publicly available version of the plan does not include outcome indicators.

It is also worth noting that, according to the Polish Green Network, the Wałbrzych subregion's TJTP promises to achieve climate neutrality by 2040. However, the official document does not contain such a declaration. Instead, the authors of the plan commit to consistency with the voivodship's development strategy, which is still being drafted and which includes the goal of climate neutrality by 2050.

Lesser Poland's TJTP (Western Małopolska)

The Oświęcim subregion is the coal area in Małopolska that will undergo transformation. The plan's authors draw attention to its close economic links with the Upper Silesian Coal District (GOP), i.e., the transformation area of the neighbouring Silesian Voivodeship. Historically, it is de facto the same industrial district divided by an administrative border. The plan's diagnosis is that more than 10,000 people from the subregion commute daily to work in Silesia. The authors are confident that the subregion will bear part of the burden of the neighbouring region's move away from coal, although the plan does not quantify this precisely.

As in the case of the other coal regions discussed, the transformation area in Western Małopolska is in a worse social and economic situation than the rest of the voivodeship. Between 2010 and 2019, the population of the transformation area decreased by 1.25%, while in Western Małopolska as a whole it increased by 2.2%. There is both a negative birth rate and migration balance. The subregion has a lower number of economic entities per 1,000 inhabitants than the voivodeship. The unemployment rate in the subregion (5.8%) is higher than for the voivodeship (4.1%), although it is not high compared to the situation in the EU. There is also high air pollution, which the plan's authors suggest may be one of the causes of emigration. Another problem for the transformation area is that the Silesian Voivodeship and the Krakow agglomeration are drawing away potential investment in the subregion.

As for the transformation area in the Małopolskie Voivodship itself, the burden of moving away from coal will be shifted to the period after 2030, which is of course criticised by environmental organisations as not being in line with IPCC guidelines. The point is that two hard coal mines there, owned by Tauron, are to be closed only in 2040 and 2049. In this respect, the plan's authors adhere closely to the official agreement between the government and the unions on the future of mining.

Picture 6: The transformation area in Lesser Poland Voivodeship

Source: Terytorialny Plan Sprawiedliwej Transformacji dla Województwa Małopolskiego

By 2030, hard coal production is expected to fall by only 21%: from 2.8m tonnes to 2.2m tonnes. This will entail the loss of approximately 800 jobs in mines. By 2050, i.e., by the time the last mine closes, 3,500 jobs in mines and 7,500 in the region's entire mining industry will have disappeared. In companies related to mining, 1,800-2,100 jobs are expected to disappear by 2030 and 8,700-10,100 by 2050. The Siersza coal-fired power plant is also expected to be closed down by 2025, which means a direct loss of 220 jobs.

In addition to the risk of increased unemployment, the plan highlights other negative phenomena that will be caused by the subregion's move away from coal: a loss in municipal incomes, a further deepening of GDP dynamics against the province and a continuation of negative demographic trends. This will be compounded by degraded land and a depleted infrastructure, with a shortage of new land for economic activities and public services (mainly housing).

The activities planned as part of the transformation are divided into **three objectives:** 1) professionally and socially active population, 2) stable and diversified low-carbon economy, 3) high-quality and attractive environment.

1. Professionally and socially active population. The first objective aims at keeping people currently working in at-risk industries active in the labour market and providing employees with opportunities for development in forward-looking industries to counteract social exclusion and depopulation.

Main actions:

- career counselling, re-qualification, support in seeking jobs and movement of employees between employers, internships for people leaving the mining sector, and mining-related and emission companies
- support for employers in employing people over 50 years of age who will be leaving mining (also the so-called flexible forms of employment)
- education of inhabitants of all age groups in the scope of climate neutrality and sustainable economy, also raising qualifications of administration employees in this field
- animating activity of inhabitants and local communities for local development and climate transformation
- activities to preserve social links and local cultural identity
- supporting infrastructure and care services for dependent persons
- comprehensive regeneration of former mining and factory estates, including development of public spaces

2. Stable and diversified low-carbon economy with minimised environmental pressures. Sustainable development, based on energy efficiency, falling emissions and the circular economy paradigm, is to be a priority.

Main actions:

- Support the creation of new, technologically advanced companies that create jobs, such as start-ups, business incubators, technology parks etc.
- facilitation of energy cluster formation
- research and development advice to companies previously linked to the mining sector to help them operate in carbon-free industries, including assistance in establishing relationships with new clients
- support for investment by large companies that will translate into jobs (without specifying that this should be a climate-friendly economy)
- supporting investment in energy saving and the development of a circular economy
- support also for social and communal enterprises

3. High-quality and attractive environment. This will include upgrading infrastructure to meet the challenges of a climate-friendly economy and improve the quality of life for residents in an inclusive manner.

Main actions:

- increase the use of RES in district heating and energy-efficient district heating systems based on cogeneration sources, RES and the development and modernisation of district heating systems
- implementation of infrastructural solutions for RES energy production, generation, and energy storage, and also the development of sustainable energy areas (energy cooperatives, virtual power plants, "energy communities")
- improving energy efficiency [of buildings] and tackling energy poverty
- building an integrated zero-emission public transport system with the necessary infrastructure (including the development of hydrogen technologies)
- giving new social, economic, and environmental functions to post-industrial and post-mining areas and sites, while maintaining high environmental standards.

Additional remarks:

- The project declares a 40% reduction of GHG emissions in the subregion by 2030, a target only consistent with the now obsolete EU policy, which has been replaced by a 55% target.
- The project does not contain a description of the measurable results of the planned activities (number of com-

panies supported, number of people assisted, number of new jobs).
- The plan contains a vague assurance that it was developed in consultation with stakeholders and community organisations and that these groups will participate in its proper implementation. The details are not known.

Lubelskie Voivodeship's TJTP

The Lubelskie Regional Plan is the shortest and most general of all. In its socio-economic diagnoses it sometimes uses data from over a decade ago.

The description of the challenges that the region faces in moving away from coal focuses on highlighting the poor social and economic performance of the transformation area (7 powiats, 3 subregions) and the degree of its economic dependence on the Bogdanka mine, the only one in the region.

Picture 7: The transformation area in Lubelskie Voivodeship

Source: Terytorialny Plan Sprawiedliwej Transformacji dla Województwa Lubelskiego

The most important thing to remember about the Lubelskie plan is that **it does not include a declaration to stop mining altogether at this sole mine.** This is a fundamental reason that calls into question the possibility of the EC accepting the plan. There is to be a drop in extraction from a level of 9.7m Mg (average per year in 2021-2025) to 6.5m Mg in 2030. (a 33.2% decrease). This is to contribute to the region's objective of reducing GHG emissions by 35% by 2030.

Bogdanka is one of the four largest employers in the region. According to the data submitted by the mine itself, 5,900 people are directly employed and an additional 2,800 people are employed by contractors providing services for the mine (more than 100 businesses in total). As many as 42.3% of them commute to work from outside the powiat where the mine is located, also from the city of Lublin itself.

The unemployment rate in TA powiats varies, ranging from 5.1% to 15.7% (voivodeship average: 7.5%). It is the powiat of Łęczna, where the mine is located and where unemployment is currently the lowest, that is threatened the most by an increase in unemployment.

Among the important problems, the plan also refers to low "entrepreneurship rate" (number of companies per 10,000 inhabitants) and poor economic and transport infrastructure, which translates into "low investment attractiveness" of the TA. It is a sparsely industrialised territory. Despite the operation of the mine, 50% of the workforce is employed in agriculture.

The decline in output is expected to mean **the loss of 1,700 jobs at the mine alone by 2030** (3,600 by 2040, direct employment and outsourcing). Moreover, in companies for which Bogdanka is a key contractor, **the number of job losses may reach 2,100-2,500 by 2030 and 4,400-5,200 by 2040**. There is also an estimate that, without planned mitigating measures, the total number of people that may outflow from the TA could reach 32,500 after 2040 (however, this is based on GUS estimates from 2019 and thus is not related to the planned restriction of coal mining, as the authors try to imply).

Apart from the rise in unemployment, the authors fear that local budgets will lose a large part of their funding, but they do not specify what percentage of current tax revenue this might be.

The TJTP points to very low household incomes (the average gross wage in TA is 85% of the national average, despite high salaries in the mine) and "a strong dependence on coal" [probably for heating]. This can lead to an increase in fuel poverty.

There is also talk of ecological damage, destruction of the landscape and groundwater run-off.

The transformation objectives and corresponding planned activities are divided into four areas: 1) economy, 2) society, 3) energy and heating, 4) space.

Objective 1: A diversified, green and zero-emission economy. The priority is to create alternative economic specialisations to mining and to provide the transitioning subregions with stable development based on climate-friendly technologies and a circular economy. It assumes diversification, decarbonisation, increasing energy efficiency, RES development and the modernisation of existing enterprises, as well as a focus on "economic activation" and the incubation of new enterprises with new specialisations. Sustainable agriculture is one of the potentials to be exploited.

Main actions:

- investments in small and medium-sized enterprises (SMEs) aimed at diversification or rebranding, adaptation to the market, implementation of new technologies (particularly RES-based energy systems)
- investments aimed at reducing GHG emissions, improving energy efficiency, implementing circular economy
- R&D investment, particularly in zero-emission and sustainable technologies, including support for cooperation in this field between SMEs and universities
- development of agro-energy cooperatives
- development of post-mining waste lands to make them suitable for sustainable investment

Objective 2: Active and qualified society. The aim is to build skills for a diversified and zero-carbon economy, as well as give advice and support for those who are unemployed and job seekers. Theis is to enable the "provision of employment" to those affected by the transition and "activate inactive persons". In addition, there are plans to carry out energy and climate education and comprehensive programmes against energy poverty. The aim is to combine social protection with activation of the unemployed and preparation for work in a new type of economy.

Main actions:

- counselling and support in the area of professional activation for those who are unemployed and seeking employment, including development of their qualifications for a sustainable economy
- adapting the profile of mining schools and the different sorts of education they offer to meet the demand for new qualifications, particularly related to the development of RES and circular economy
- improving the quality and accessibility of services and infrastructure for childcare and care for the elderly, as well as care for dependent individuals
- comprehensive programmes against energy poverty, including investments in thermo-modernisation (doubling some activities from Objective 1)

Objective 3: Clean power/heat generation and energy security. The aim is to ensure energy security through systemic development of RES installations and the creation of self-balancing energy areas based on cooperatives or energy clusters, using RES and energy storage. This will also mean switching entire systems and individual heat supply sources from coal to advanced low- and zero-emission technologies.

Main actions:

- support for the creation of self-balancing energy systems based on cooperatives or energy clusters, using RES and energy storage. Also increasing the connectivity of newly emerging capacities that might be part of such systems
- development of efficient, low-carbon communal heating
- development of energy production/heating networks using biogas of agricultural origin,
- investments in improving the energy efficiency of public and residential buildings; replacing coal-based heat sources with low- and zero-emission technologies, in particular RES, also consultancy in this regard.

Objective 4: High-quality integrated space. The priority here will be the expansion of the sustainable transport system, responding to the needs of both the new, diversified economy and the inhabitants. Measures aimed at reclaim-

ing and renaturalising areas valuable for the economy and for the environment will also be of great importance.

Main actions:

- development, reclamation and environmental recovery of post-mining areas and areas affected by the consequences of mining activity, including restoration of proper water relations in post-mining areas
- investments in reducing waste production and improving waste management, including adapting it to the circular economy
- investments in zero-emission public transport and intelligent transport management systems, cycling routes, restoration, and extension of railway connections

An additional, separate objective: support for the development of GK LWB's capital group, i.e., the Bogdanka mine itself. It is to encompass the following measures:

- creation of a regional centre for the development of energy technologies in the field of RES and circular economy
- launching a photovoltaic farm, energy biomass utilisation and the production of components for RES installations
- recovery of waste and post-mining infrastructure, recycling of waste from RES
- reclaiming brownfield sites and adapting to other uses, generating new jobs

Additional remarks:

- This TJTP is another that **lacks a description of the measurable results** of the planned activities (number of companies supported, number of people assisted, number of new jobs).
- The **process of developing and consulting** on the plan is described in extremely vague terms. Nothing is known about the actors independent of the authorities who participated in this process. The authors of the plan only claim that they exist. Their role in the implementation and evaluation phase is not specified either.
- The Minister for Climate and Environment himself **expressed doubts** as to whether Lubelskie Voivodeship would receive money from the JTF based on this plan. In any case, the voivodeship sees opportunities to finance the above-mentioned actions from the other pillars of the Just Transition Mechanism.

A general comment on the Polish TJTPs: "hard" transformative activities (i.e., investments) in the public sector, which are intended to be financed by the JTF, in the vast majority are to be performed by private companies. It is likely to be the same for training and retraining courses. It is not written explicitly, but this is the common practice of Polish local governments.

Nation-wide RES (wind and solar) development plans and participation of Polish companies

Currently the future of renewable energy sources in Poland is one of the most widely discussed elements of the vision of a coal-free Polish economy. The participation of Polish companies in the development of RES and their share in the supply chain is an issue eagerly addressed by the government, the media and industry representatives.

Currently, the most advanced are **offshore wind farm projects in the Baltic Sea,** which is one of the government's flagship energy projects. According to PEP2040, the total installed capacity of offshore wind farms is expected to be around 5.9GW in 2030 and 11GW in 2040. Estimates made by industry lobbying groups indicate that, assuming 4GW-8GW of installed capacity by 2030, the share of Polish suppliers in expenditures over the entire life cycle of offshore wind farms from the first round of projects planned by the government (until 2030) would be 20-25%. In the next decade it would increase to 45-50%[69]. In September 2021, the "Sectoral Agreement for the Development of Offshore Wind Energy in Poland" was signed, which aims to maximise local content in the value chain of emerging and

69 PSEW (2021) Optymalizacja rozwoju krajowego łańcucha dostaw morskiej energetyki wiatrowej w Polsce. Skrócona wersja raportu, http://psew.pl/wp-content/uploads/2021/08/Optymalizacja-rozwoju-krajowego-%C5%82a%C5%84cucha-dostaw-morskiej-energetyki-wiatrowej-w-Polsce.pdf [„PWEA (2021) Optimizing the development of the domestic offshore wind energy supply chain in Poland. Abbreviated version of the report"]

planned farms. The signatories included several ministries, representatives of local governments and the industry[70] .

In 2021, the projects of five entities were approved, which in total will build eight offshore farms. Three of them are joint ventures, where one partner is a Polish partner, and the other is a foreign one.

1. Polenergia (Poland)/Equinor will build the Baltic II (720MW) and Baltic III (720MW) OWFs.
2. PGE (Poland)/Ørsted will construct Baltica 2 (1,498MW) and Baltica 3 (1,045MW).
3. Orlen (Poland)/Northland Power to construct Baltic Power (1,197MW).

Investors in two smaller offshore farms are RWE and EDPR/Engie. In addition, there are also joint plans between Ørsted and ZE PAK, the owner of the lignite mines and power stations in Eastern Wielkopolska described above[71].

The above projects are to receive financial support from the Polish state. At the same time, the investors managed to negotiate with the Ministry of Climate a higher contracted reference price for electricity: 319.6 PLN/MWh (EUR 69.65) instead of the initial 301.5 PLN/MWh (EUR 65.71). The second phase of support, after 2024, assumes auctioned prices.

As for today, **onshore wind energy is not supported by the government at this scale.** Offshore wind farms have a clearly defined place in PEP2040, while onshore wind farms do not. However, regular contacts and substantive cooperation between representatives of this sector and the government take place. At the beginning of 2021, the installed onshore capacity in Poland was 6,614MW in approximately 1,300 installations of this type. A further 3GW of capacity is being built because of auctions in 2017 and 2018. This year's government report proposing amendments to the Wind Energy Act seriously considers the scenario that 6GW -12.5GW of onshore capacity will be installed in Poland by 2040[72]. This is expected to cost PLN 30bn-62bn (EUR 6.53bn-13.64bn).

The main industry lobbying organisation is the Polish Wind Energy Association (PSEW). In 2019 PSEW published an analysis predicting that 42,000 jobs could be created in onshore wind energy by 2040 in an optimistic scenario. PSEW's members and sponsors include all the companies mentioned earlier as investors in offshore and many other energy companies. PSEW participated in the creation of the government report mentioned above. In 2019, PSEW published an analysis predicting that **42,000 jobs** (both directly and indirectly) could be created in onshore wind energy by 2040 in an optimistic scenario[73]. The association also predicts that offshore wind farms will create a total of **77,000 jobs in 78 Polish companies across the value-chain** by 2030[74]**.** This is even higher than the government's estimate of 70,000 jobs. According to the CEO of PGE, the total value of investments in wind farms in the Polish Baltic Sea will amount to PLN 160bn (EUR 35.34bn)[75]. PSEW's estimates that these investments will generate PLN 60bn (EUR 13.25 bn) of added value.

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70 "Podpisano Porozumienie sektorowe na rzecz rozwoju morskiej energetyki wiatrowej w Polsce", http://psew.pl/podpisano-porozumienie-sektorowe-na-rzecz-rozwoju-morskiej-energetyki-wiatrowej-w-polsce [„Signed Sectoral Agreement for Offshore Wind Energy Development in Poland"]

71 "Zmiana układu sił w energetyce. Solorz z międzynarodowym gigantem wchodzi w morskie farmy wiartowe", green-news.pl, 15.10.2021, accessed on 19.10.2021, https://www.green-news.pl/2150-zmiana-ukladu-sil-energetyka [„Changing balance of power in the energy industry. Solorz with international giant enters offshore wind farms"]

72 Energetyka wiatrowa na lądzie. Założenia reformy i propozycja ustawy (2021). (Report by UN Global Impact Network Poland, the Ministry of Development, Labour and Technology, the Ministry of Climate and Environment and the Ministry of State Assets), http://psew.pl/wp-content/uploads/2021/07/Raport_Energetyka_wiatrowa_na_l%C4%85dzie.pdf [„Onshore wind energy. Reform assumptions and proposed law (2021)."]

73 PSEW (2019), Wkład krajowych dostawców w rozwój energetyki wiatrowej na lądzie i jej wpływ na polski rynek pracy do 2040 r., https://wise-europa.eu/wp-content/uploads/2019/07/PSEW_WiseEuropa_web-0031.pdf [„Contribution of domestic suppliers to onshore wind energy development and its impact on the Polish labor market until 2040"]

74 PSEW (2019), Przyszłość morskiej energetyki wiatrowej w Polsce. http://psew.pl/wp-content/uploads/2019/06/Przysz%C5%82o%C5%9B%C4%87-morskiej-energetyki-wiatrowej-w-Polsce-raport.pdf

75 Communiqué from PGE's press office, 10.02.2021. https://www.gkpge.pl/biuro-prasowe/komunikaty-prasowe/korporacyjne/pge-i-oersted-wspolnie-zbuduja-morskie-farmy-wiatrowe-na-baltyku

The large wind farms (at least 30MW) that currently exist are dominated by large energy companies: Tauron, PGE, Enea (Poland), RWE, EDP Renewables (foreign).

All the country's main coal-fired power generators – Tauron, PGE and Enea – have already established subsidiaries to invest in wind and solar RES. It seems reasonable to assume that if large-scale onshore wind development occurs, these companies will have a significant stake in it.

It is also worth noting that Polish construction companies such as Erbud are beginning to enter the renewable energy market as developers. The company intends to build both wind and solar farms.[76]

In the area of solar energy, it is worth noting that in July 2021, Polish capital group Unimot launched production of its own photovoltaic cells. The company is expected to produce 40,000 cells with a total capacity of 15MW[77].

The Polish solar energy sector is dominated by micro-installations, with large farms only just starting to be built. However, the potential of this sector may be evidenced by the fact that there are companies offering new models of financing solar farms by selling tradable investment instruments. This is the so-called "tokenisation", which in practice amounts to speculation on energy investments.

Companies focused on the development of RES also operate in the so-called energy clusters, within which they develop circular economies in an organised manner and in agreement with local governments, also promoting the slogan of just transformation. The most rapidly developing one is the Zgorzelec Energy Cluster (ZKlaster), operating in Zgorzelec powiat, in the Lower Silesian Voivodeship[78]. It is linked to the National Chamber of Energy Clusters lobbying group.

General discourse on coal exit and just transition

As said before, the serious discussion about moving away from coal only began in Poland in early 2020, when the European Commission announced the EGD. This has created a situation where liberal circles, which are pro-EU, are in favour of moving away from coal, while conservative and nationalist circles are either sceptical or opposed. Conservatives associated with the ruling party only tolerate a vision of coal exit that is very stretched in time and conditioned by large financial support from richer EU countries. They claim that Poland should be given special treatment terms in this process.

The concept of JT – as it exists in the media and political debate – is treated superficially and pragmatically, as "something to be financed from the Just Transition Fund". It is generally understood as a possibility to replace mining jobs. The prevailing view is that these new jobs for former miners are to be created in the RES sector and in the thermal modernisation of buildings. In this regard, **the media attaches little importance to decent wages in new "green jobs", related social security or the role of trade unions.** It is likely that this is related to the generally negative image of miners created by the media to date. The previous attitude of liberal circles preferring free-market solutions also plays a role. Nowadays, this approach has weakened as the EU emphasises that the energy transition should take place in a planned and structured manner.

As already mentioned, the government's PEP2040 uses a broader understanding of JT: also including the elimination of energy poverty during the transition and equitable access to energy.

NGOs are practically the only agents of influence that consistently (and unsuccessfully) point out that change should take place in a participatory manner; they present this as a condition of ensuring that "no one is left behind" in prac-

76 "Erbud. Zielona wolta inżynierów", forbes.pl, 06.06.2021, accessed on 26.08.2021, https://www.forbes.pl/biznes/trendy-zielonej-gospodarki-w-budownictwie-erbud-idzie-w-strone-odnawialnej-energii/l094e8c [„Erbud. Green volta of engineers"]

77 "Grupa Unimot uruchomiła linię produkcyjną polskich modułów fotowoltaicznych", unimot.pl, 05.08.2021, accessed on 26.08.2021, https://www.unimot.pl/aktualnosci/grupa-unimot-uruchomila-linie-produkcyjna-polskich-modulow-fotow [„Unimot Group launched production line of Polish photovoltaic modules"]

78 "Zgorzelecki Klaster Energii liderem transformacji na Dolnym Śląsku", kapitaldolnoslaski.pl, 28.10.2020, accessed on 26.08.2021, http://www.kapitaldolnoslaski.pl/zgorzelecki-klaster-energii-liderem-transformacji-na-dolnym-slasku [„Zgorzelec Energy Cluster a Transformation Leader in Lower Silesia"]

tice. In Poland there is also practically **no discussion of energy cooperatives** as a social and egalitarian alternative to corporate energy. It was not until spring 2021 that the first energy cooperative (within the legal meaning) was established in Poland (the cooperative's website: www.eisall.eu). Again, NGOs (especially small ones) are the only entities promoting this solution (in articles on their websites mostly and when talking to the media), most often relying on examples from Germany and Denmark.

People's attitudes towards coal exit and climate issues

The prevailing belief is that, in Poland, only the middle classes from large cities are interested in the problem of climate change. This is partly supported by the growing popularity of the Youth Climate Strike organisation, which organises protests mainly in Warsaw, Poznań, Gdańsk, Wrocław, Kraków, Katowice and Białystok. In its activism, the movement resembles Extinction Rebellion. Its members adopt the slogan of a just transition, but they do not undertake any cooperation with communities in coal regions, economically threatened by a possible coal exit.

However, a study has emerged, eagerly discussed by the liberal media, showing that as much as 80% of the Polish public recognises climate change as a serious threat. The survey results also showed other interesting statistical facts:

1. Older generations tend to take climate change more seriously than the young.
2. Attitudes towards climate policies or climate-oriented behaviour are class-based. The upper classes generally consider the elimination of behaviour characteristics of the lower classes as the most appropriate solution, and vice versa. The rich say that driving old diesel cars or heating homes with coal should be banned to protect the climate. The poorer classes, for example, think it is best to limit air travel. Przemysław Sadura, the author of the study, calls this "climate egoism".

Sadura is also co-author of another publication that has received some media coverage: "The Slept-Over Revolution"[79]. It is a study of the beliefs and attitudes of the population of the Piotrków subregion, in which the Bełchatów complex is located. It reveals that the local population is completely unaware of both climate issues and the fact that the coal industry is a declining sector, doomed to disappear. This publication is important because it contains a clear comment from the authors that the transition – if it is to succeed – must be fair, otherwise it will not happen at all for political reasons. There is also a clear suggestion that a just transition is needed to prevent the rise of nationalist attitudes and the growth of the far right. The authors write about this citing examples from ex-mining regions in England. Thanks to "The Slept-Over Revolution", this message has found its way into some liberal media.

Hard coal miners' attitudes to aspects of the coal exit and just transition

In 2019, sociologists from IBS conducted a survey among underground miners from four Polish hard coal mines in Silesia, designed to show their general attitudes towards job opportunities in other industries and towards the idea of a JT[80]. It turned out that **the majority of respondents were positive about their chances of finding a job outside mining.**

The study also examined, among other things, the assessment of selected factors that were considered important for choosing a new workplace. For today's miners, the most important factors were of course salary and job stability. Work safety was the third important. Unfortunately, this means that when the miners face the labour market realities in other industries, they will probably be seriously disappointed. **44% would not consider working for a lower salary** than they have at the mine.

Respondents also indicated how attractive they find other industries besides mining. Importantly, the most favoured

79 Dańkowska A., Sadura P. (2021) Przespana rewolucja. Sytuacja społeczna w regionie Bełchatowskim u progu transformacji energetycznej, Fundacja Pole Dialogu, Instytut Studiów Zaawansowanych, Warszawa, https://poledialogu.org.pl/przespana-rewolucja-sytuacja-spoleczna-regionie-belchatowskim-u-progu-transformacji-energetycznej [„The overslept revolution. The social situation in the Belchatow region at the threshold of the energy transition"]

80 Kiewra D., Szpor A., Witajewski-Baltvilks J. (2019) Sprawiedliwa transformacja węglowa w regionie śląskim. Implikacje dla rynku pracy. IBS Research Report 02/2019, https://ibs.org.pl/app/uploads/2019/05/IBS_Research_Report_02_2019.pdf [„Fair coal transition in the Silesian region. Implications for the labor market"]

sectors were those that are well developed in Silesia: the automotive industry, transport, and construction. Renewable energy came out relatively well, and at the same time proved to be much more attractive than jobs in conventional energy.

The miners were also asked about the best instruments, in their opinion, to support workers losing their jobs in mines. The best rated were early retirement and wage subsidies for employees moving to lower-paid professions. Among the least appreciated instruments were training and career counselling as well as assistance in starting up one's own business.

Respondents also evaluated the most important objectives that should be pursued as part of a JT. The highest ratings were given to supporting the economic development of mining regions, reducing unemployment and social problems. **Climate protection was indicated by only about 8% of respondents and moving away from fossil fuels just by 1%.** This means that convincing miners to change the energy system with the use of purely ecological arguments should be considered an idea of very limited effectiveness.

When asked how they evaluate the actions of different agents involved in the JT, miners rated the European Union worst (70% negative responses). Interestingly, all groups of agents were more often rated bad than good. Trade unions, the government, local authorities, and NGOs scored similarly poorly, and, interestingly, employers scored the best.

The survey results lead to two important conclusions: 1) arguing for the liquidation of the mining industry on the basis of EU authority must be regarded as doomed to fail, 2) in the current economic situation, workers leaving the jobs in mines will not necessarily have significant difficulties in finding a new job, but **as unskilled workers they will be exposed to unsuitable wage conditions** (and, besides, to much less protection from trade unions).

This raises an important issue that characterises thinking about the JT in Poland. Most solutions regarding new jobs for the miners in coal regions, whether proposed by local authorities or NGOs, boil down to providing former coal industry workers with *any* job. **Little attention is paid to mechanisms that would allow these jobs to be of at least the same quality they previously enjoyed.** There is not a single proposal that these jobs should be unionised by default, for example.

V. THE LEFT IN THE GAME

When discussing the place and role of the left in the coal exit, it must be acknowledged that, on the one hand, this may be an ideal political topic, but on the other, it is unlikely to play any significant role in this at present. The reasons for this are as follows:

1. The weakness of the parliamentary left. The left in the Sejm (the lower chamber of the parliament) currently consists of two parties that form a single parliamentary club: the party literally named the Left (Lewica, 41 MPs) and the Razem party (6 MPs). The former was recently formed from the merger of the SLD and Wiosna. SLD was originally a party gathering former notables of the Polish United Workers' Party (1948-1990), and after 1989 it formed several governments that continued neoliberal reforms. Wiosna was a party formed in 2018 that was economically liberal, focused primarily on "cultural liberalism", particularly LGBT rights. The current Left party has no particular agenda and is torn by internal disputes. It runs no think tank or media centre and publishes no expert opinions on economic or climate issues. It pursues a policy of merely reacting to the actions of the government or other opposition parties. Polls give it support of 7-10%. The former SLD cooperated quite closely with the OPZZ trade union federation, but this cooperation no longer exists, or is only incidental.

Razem, formed in 2015, is a typically social-democratic party in all areas of activity. They consistently picture themselves as the "ideological left" and are surely the most left-wing party in the Sejm. It is difficult to precisely determine their ability to act on a just transition. Given the statements of the party's MPs, they subscribe to the idea of JT, but in practice they do not carry out visible activity in this area. Instead, it is the only party in parliament that shows interest in workers' rights, and they try to support strikes and protests over social rights. Razem is a small party with very few resources. The polls give it no chance of entering parliament if it were to run separately.

2. Lack of communication with the coal communities and the working class. As shown in the chapter "Politics at the regional level", the position of the left in the voivodeships is equally weak, or even weaker. There is no known regular action by local left-wing politicians for communities threatened by a possible coal exit or for JT.

The situation is not much better on the extra-parliamentary left. It includes left-wing online media and left-wing journalists in the mainstream media, small left-wing trade unions such as Inicjatywa Pracownicza, local activists of the Razem party, and the Social Justice Movement (RSS). Regarding the members of the coal communities or mining trade unions who are somehow connected to those circles, they do exist, but those are individuals on a national scale.

The basic problem of the Polish left is that it is a cultural rather than a class phenomenon and is confined to the circles of educated people from large cities. There are currently only two left-wing activists who are recognisable to the wide public: Piotr Ikonowicz, leader of the Social Justice Movement (RSS), and Jan Śpiewak, both outside parliament.

At the moment it must be said that the Polish left does not have any serious support in the trade unions, apart from the fact that some people from the aforementioned circles are personally acquainted with the leaders of the OPZZ.

What is to be done?

In a situation of general weakness of the left and because the official plans for a just transition lack strong elements of social justice, it would be sensible for a new or renewed left formation to tie its strategy to coal exit. It should include four elements.

1. Long-term social movement building. In view of the strong polarisation of the Polish political scene between liberals and conservatives/nationalists, it seems necessary to start from the basics: the organisation of a social base and then the creation of a parliamentary force. This is an enormous challenge, which no one has tried so far. Firstly, the attempts made so far by left-wing parties to find their place in the existing political discourse have failed since 2005 (since the collapse of the SLD). Secondly, and paradoxically, the success story of Law and Justice contains elements of reliance on grassroots movements. This may be more difficult for the left for several reasons, but it must be considered that it can be an effective political method.

2. A focus on social and livelihood issues, which can include a just (participatory, inclusive) shift away from coal. This should necessarily involve engaging with coal communities on a regular basis. However, there is a concern about the credibility of left-wing organisations/parties in the eyes of these communities – it would simply be lacking in the beginning. This would probably have to be part of a process of developing a broader movement within Poland, linking also small independent trade unions, tenants' organisations, protest movements on social issues, and a resurgent farmers' movement (though here with caution, as the farmers with a typically business mindset are currently strong within it).

One part of such a movement should include actions to eliminate energy poverty and create energy cooperatives (although initially it will be very difficult). Such a movement should actively seek to ensure that "green jobs", i.e., jobs in RES, are unionised by default, or contain elements of workers' control. This would probably have to be part of a process of developing a broader movement within Poland, linking also small independent trade unions (IP, ZA), existing tenants' organisations (KOPL, WSL), protest movements on social issues (RSS), and a resurgent farmers' movement (Agrounia) (caution here though, as the wealthy farmers with a typically business mindset are currently strong within it).

It would also be worthwhile to come out with a bold campaign for a solution called the job guarantee[81]. In 2020, a community of intellectuals from Poland launched the "Europe, a Patient" initiative. As part of this initiative, the "green recovery" of economies after the Covid-19 pandemic is being promoted and the idea of job guarantees is included.

3. Build initially on the existing small organisations listed above. They have repeatedly shown great determination

81 "A European job guarantee to foster wellbeing", socialeurope.eu, 07.01.2021, accessed on 08.09.2021, https://socialeurope.eu/a-european-job-guarantee-to-foster-wellbeing

and organisational efficiency, although they often rely on strong leadership by individuals. The added value from the left here would be expert, legal, infrastructural and media support and networking. These are elements that those organisations lack most often. Additionally, we should seek the participation of academic circles and experts ready to support such a movement with their competencies. In Poland, one can observe a slowly growing number of researchers and experts with left-wing and left-leaning views and cooperation with them could be established quite easily for this purpose. Such experts can be found, for example, in the NGOs that were described earlier.

4. Taking the above actions to a higher political level, but preferably bypassing the institutions of the Polish political system (for the time being). A campaign to give a voice to Polish miners and give the Polish communities in coal regions an audible voice on the European forum, e.g., in the European Parliament, could be considered. This would be aimed at demonstrating the exceptional situation in which they find themselves and at capturing the just transition through the prism of the fate of ordinary people. At the same time, it would encourage the European public to perceive Poland's problems with decarbonisation in a way related to social justice, and not necessarily associated with the nationalism and xenophobia of the Polish government. It could even serve to change the EU's energy and climate policy to a more pro-social and egalitarian one.

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Coal Regions, Coal Exit in the Czech Republic

Ivan Strachoň, Dagmar Švendová

FOREWORD

This study is part of the 'transform! europe EUPF' survey, which aims to develop basic knowledge of the challenges of the diversion of coal in neighbouring border coal zones in the Czech Republic (northern Bohemia, northern Moravia), Poland (southwestern Poland) and Germany (eastern Germany).

In the first step, we focus on mapping relevant actors and policy issues. Our aim is to stimulate a transnational debate between critical and left-wing actors. The aim is to strengthen the pro-popular forces in the socio-ecological transition of these regions towards a post-fossil society. The consequences of changes made in other mining-related industrial plants and in the related sector of services are also important in our considerations.

The study does not aim to find a solution, but rather to approach the issue of leaving coal in the Czech Republic in a broader context and in a way that is understandable and useful not only for foreign readers. We want to point out some aspects of the transition, to bring closer the regions' experiences of the ongoing decline in coal mining, and to draw attention to the challenges that accompany the decline.

We want to show that all three countries and their coal regions face similar challenges of regional structural change and that we can learn from each other. Establishing closer cooperation between the actors involved, sharing experiences, making efforts to coordinate joint actions in reaching the goals of achieving carbon neutrality, even outside the traditional national framework, could help us in frontier areas, but also outside this area, in our efforts to develop our regions. It is also an imaginary bridging of the border between 'Western' and 'Central-Eastern' Europe.

Ivan Strachoň, Dagmar Švendová

INTRODUCTION

In the territory of our state, the first historical mention of mining activities dates to the 15th century, but organised coal mining does not occur until the second half of the 18th century.[82] The industry flourished in the 1980s, when almost 100 million tonnes of coal were mined annually. In the 1990s, more than 110,000 people worked in coal mining alone.

At present, however, coal mining in the Czech Republic is slowly coming to an end (Figure 1), also considering that it is no longer economic and does not meet the long-term energy goals to which the European Union (EU) and thus the Czech Republic have committed themselves.

In 2018, approximately 44 million tonnes (almost 5 million tonnes of black coal and 39 million tonnes of brown coal) were mined in the Czech Republic. This coal is used mainly to produce electricity and heat. Black coal is also used in coke production and metallurgy. The Czech Republic is thus in 15th place in the world ranking of the largest coal producers. Virtually all coal-fired electricity generation in the Czech Republic is concentrated in the regions we map, and coal-fired electricity generation[83] still accounts for more than 50% of all electricity generation in the Czech Republic.[84] Thus, coal accounts for about 36% of gross do-

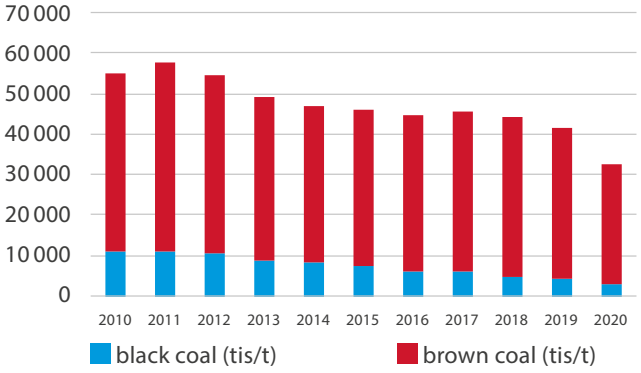
82 Vladimír Bouška, Zdeněk Dvořák, Nerosty severočeské hnědouhelné pánve (Minerals of the North Bohemian Brown Coal Basin), 1st edition, Prague: published by Dick, 1997.

83 There are only two large power plants outside the region – Mělník and Chvaletice

84 The Territorial Just Transition Plan, version Meeting PM 0.3 ma_PSUT_srpen 2021, https://dotaceeu.cz.

mestic energy consumption and a total of 28,000 people are employed in this sector.[85]

Figure 1: Development of coal mining in the Czech Republic, 2008-2018



Source: Own elaboration according to MIT (State Raw Materials Policy) and Czech Geological Survey (Publications Raw Materials Resources of the Czech Republic – Mineral Resources, http://www.geology.cz.)

According to the World Health Organization, in 2020 the Czech Republic was the seventh worst country in the EU in terms of carbon dioxide emissions per capita. Only Luxembourg and Estonia are worse; Sweden is the best.[86] According to the IQAir Report on World Air Quality for 2020[87], the Czech Republic is in 18th place in Europe in terms of air quality and 9th in the EU28. Despite this fact, according to the evaluation of the European Environment Agency[88] from 2021, the Czech Republic manages to meet the set national targets for climate change mitigation (in the categories of greenhouse gas emissions, renewable energy sources (RES), final energy consumption, primary energy consumption).

The current State Energy Concept (SEC) from 2015[89] relies on the continuation of coal mining until 2038.[90] In its resolution of 4 December 2020, the Coal Commission states that 2038 is a realistic year for the decline in the use of coal for the purposes of electricity and heat production in the Czech Republic. At the same time, however, it emphasised the conditions for the downturn, which are in particular:

- timely replacement of attenuated coal resources by other production sources;
- ensuring energy security in the Czech Republic;
- completion of new nuclear resources, which must be implemented to the extent planned and within the current timetable;
- successful transition of the heating industry enabling a controlled departure from the use of coal in heat production.

Nevertheless, part of the former government spoke in favour of moving away from coal as early as 2033.

However, this did not satisfy environmental organisations, which in their common *Coal Commission's Joint Opinion*[91] criticised and suggested not accepting the recommended deadline of 2038 for abatement of the use of coal, but instead proposed the development of an 'emergency scenario' that would set the deadline for the end of coal in 2030 or earlier.

The Czech-Moravian Confederation of Trade Unions (ČMKOS) together with the Trade Union of Mining, Geology and Petroleum Industries (OS PHGN) expressed the opposite opinion, drawing attention to the possible risks associated with the transition process and expressing fundamental concerns about the Czech Government's action; and

85 Alves Dias, P., Kanellopoulos, K., Medarac, H., Kapetaki, Z., Miranda Barbosa, E., Shortall, R., Czako, V., Telsnig, T., Vazquez Hernandez, C., Lacal Arantegui, R., Nijs, W., Gonzalez Aparicio, I., Trombetti, M., Mandras, G., Peteves, E. and Tzimas, E., EU coal regions: opportunities and challenges ahead, EUR 29292 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-89884-6 (online). Accessible at: https://publications.jrc.ec.europa.eu.

86 Accessible at: https://zpravy.aktualne.cz/zahranici/jak-cesko-znecistuje-ovzdusi-srovnani-se-zememi-eu.

87 Accessible at: EEA Report No 13/2021, https://www.iqair.com/world-air-quality-report.

88 Accessible at: https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2021.

89 Ministry of Industry and Trade, https://www.mpo.cz/dokument158059.html.

90 The Coal Commission was established by Government Resolution No. 565 of 30 July 2019 as an advisory body to the government. The Chairmen of the Commission are the Minister of Industry and Trade and the Minister of the Environment. The Commission has a total of 19 members, https://www.mpo.cz.

91 Accessible at https://www.hnutiduha.cz.

regarding the Coal Commission conclusions, ČMKOS and OS PHGN consider 2038 to be a compromise.[92]

Despite commitments to the EU and international agreements or pressure from environmental activists, the Czech Republic needs to consider what the decline of coal mining in the short and long term means for employees in the Czech mining, energy, heating, engineering and steel industries, both for these industries in general and in the related branches and services. We must be very sensitive to this issue in terms of the impact on the affected regions, but also the citizens of the Czech Republic. It is necessary to prepare a strategy for coal reduction in the Czech Republic so that any negative impacts, especially socio-economic ones, are reduced as much as possible.

CHARACTERISTICS OF MAPPED COAL REGIONS

There are, historically, three regions in the Czech Republic – the area west of Prague, the area of northern Bohemia, and the area in the north of Moravia – where coal has been or is still being mined. The area west of Prague – Karlovy Vary Region (KVR) – is no longer used for mining. For this reason, in this study we will focus on the two areas where coal is still mined:

1. area of northern Bohemia (Ústí nad Labem region), where it is mainly surface mining of brown coal. Brown coal is primarily responsible for the domestic supply of energy to households and households. In this consumption sector, the gradual restructuring of large and commercial power supplies as well as the gradual change in household heating (e.g., the transition to natural gas) is particularly evident.[93]
2. the area of northern Moravia (Moravian-Silesian region), where there is deep mining of hard coal. Mining from our hard coal deposits traditionally supplies the input raw material not only for energy, but especially to the metallurgical industry, both the Czech steelworks and some metallurgical plants in the Central European region.[94]

Picture 1: Map of the Czech Republic showing the areas of brown coal (lignite) and black coal (hard coal) mining

Source: EURACOAL.EU

NORTHERN BOHEMIA[95]

ÚLR is in the north-west of the Czech Republic. The north-western border of the region is also the state border with the Federal Republic of Germany and the federal state of Saxony.

ÚLR is divided into seven districts (Děčín, Chomutov, Litoměřice, Louny, Most, Teplice and Ústí nad Labem), it is divided into 16 administrative districts of municipalities with extended powers, which include a total of 354 municipalities, of which 59 are towns.

The population density (154 inhabitants/km^2) is higher than the national average (136 inhabitants/km^2) and it is the fourth most populous area. The area of the region is 5,339 km^2, which represents 6.8% of the area of the Czech Republic. Agricultural land occupies more than 51% of the region's territory, forests cover almost 31%, and water areas 2% of the territory.

92 Accessible at: https://www.cmkos.cz.

93 MPO. Těžba nerostných surovin v ČR 2014 – 2018. [MIT, Mining and quarrying in the Czech Republic 2014 – 2018] Issued in August 2019

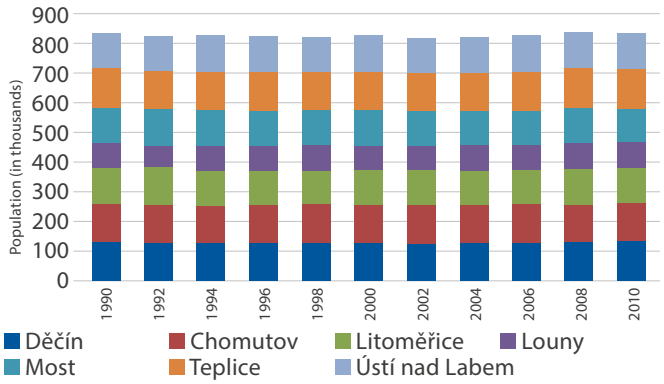
94 Ibid.

95 Statistical Yearbook of ÚLR, https://www.czso.cz/csu/xt/kraj.

Four areas can be defined in the region, these differ significantly from each other. It is an area with highly developed industrial production, which is concentrated mainly in the Podkrušnohoří region (districts of Chomutov, Most, Teplice and partly Ústí nad Labem). The energy, coal mining, engineering, chemical and glass industries have a significant position in the sector. Another area is Litoměřice and Louny, which are important for their production of hops and vegetables. The Polabí and Poohří regions in particular are famous fruit-growing areas, called the Garden of Bohemia. There is a wine-growing area in the Most region, where vines are grown mainly on land reclaimed after lignite mining.

Population: At the end of 2020, ÚLR had 819,713 inhabitants, which ranks it fifth in the Czech Republic. The number of inhabitants in ÚLR is decreasing.

Figure 2: Development of the population in ÚLR in the years from 1990 to 2010, selected cities of the ÚLR in respective years



Source: Problem Analysis of the Ústí nad Labem region

Age structure: ÚLR has a very specific age demographic of the population in the Czech Republic. This is a region with the youngest age demographic. This fact can certainly be perceived positively, however, despite the significantly younger population and the increase in the number of births, there is a significant trend of population ageing in all districts in the region without exception, conditioned by an increasing group of people aged 65 and over.

Ethnic composition: The region has a relatively diverse ethnic composition compared to the homogeneous structure of the Czech Republic. According to the Census of People, Houses and Dwellings 2011 (SLDB 2011)[96], ÚLR is specific in terms of the formation of the ethnic composition of the population, which was affected by historical events associated with the Second World War and especially with the movement of the population after it. A significant change in the composition of the population by nationality was caused by the expulsion of the German population (although a large part of them still remained at the border, and thus the share of German nationality in the region was still high compared to other parts of the republic), and at the same time there was an influx of people from all over the then republic, including a large number of young Slovaks. The development of mining activities in the region also brought with it the need for additional labour, addressed at the time by mass recruitment of people from other parts of the state, supported by various contributions, including obtaining an apartment.

According to the 2011 Census, foreigners represented a total of 3.3% (26.9 thousand persons) in the population of the ÚLR (regardless of the type of stay), which is 0.7 percentage points less than in the entire Czech Republic. The Ústí nad Labem region thus accounted for more than six per cent of the nationwide number of foreigners. In an inter-regional comparison, this share was the sixth highest. The most represented group of foreigners comes from Vietnam, followed by Ukraine and Germany. The Roma minority is also significantly represented here.

Employment: The ÚLR region is an area that has long struggled with high unemployment. After 1990, due to the transition and privatization of the Czech industry, when brown coal mining was decreasing, there were massive redundancies. The monotonous structure of industry was also represented by only a few employing giants. ÚLR is a region with, significantly, the lowest level of education in the entire Czech Republic.

Environment: Industrial activity from the past – the development of heavy industry, energy, and coal mining – has had and still has an adverse impact on the quality of the environment. Heavily developed surface mining has damaged the natural face of the landscape, which is gradually being restored only by very costly reclamation. If we want

96 Accessible at the CZSO web-site https://www.czso.cz/documents/10180/20567443/42413513a3.pdf/ce563231-385e-47b7-81a0-2313a036275f?version=1.0.

to document the situation and the impact on the landscape from the period before mining, during mining and shortly after mining, we can use photographs of the local landmark of the Jezeří Chateau.

Picture 2: Jezeří Chateau, Ústí nad Labem region – before mining, the first half of the 20th century

Source: https://www.idnes.cz/cestovani.

Picture 3: Jezeří Chateau, Ústí nad Labem region – while mining was being carried out, the present time (2016)

Source: https://www.zeropixel.cz/foto/2261.htm.

Picture 4: Jezeří Chateau, Ústí nad Labem region – current view (2020)

Source: Wikimedia Commons, Jiří Dlouhý.

Despite the desulphurization of power plants in the 1990s, a number of environmental problems persist, which also has a negative effect on the health of the population. The problems with the emissions situation in the region are also well-known. There has been a significant improvement in the last decade, which can be documented by the declining amount of emissions, but even so, the region is perceived as the area with the most damaged environment. The region is infamous for its specific emissions (t/km^2) of sulphur dioxide and nitrogen oxides.

Summary in comparison with the Czech Republic: To this day, ÚLR is struggling with the consequences of post-war changes and the decline in industrial production after 1990, and among the regions of countries undergoing a transition from a socialist to a market economy, it is typically representative of a structurally disadvantaged area. However, unlike some other regions, the structural problems in ÚLR are still exacerbated. The negative specifics of ÚLR include:

- great internal social differentiation of the region
- high infant mortality
- low life expectancy
- low level of education
- existence of socially excluded localities
- a large share of low-income households
- overall lower quality of life.

NORTH MORAVIA REGION[97]

MSR is in the northeast of the Czech Republic. In the north and east it borders with the Polish voivodships – Silesian and Opole; in the southeast with the Žilina region in Slovakia.

MSR is defined by districts – Bruntál, Frýdek-Místek, Karviná, Nový Jičín, Opava and Ostrava-město – and is divided into 22 administrative districts of municipalities with extended powers, which include a total of 300 municipalities, of which 42 are towns. With its area of 5,431 km^2, it occupies 6.9% of the territory of the entire Czech Republic and thus ranks 6th among all regions.

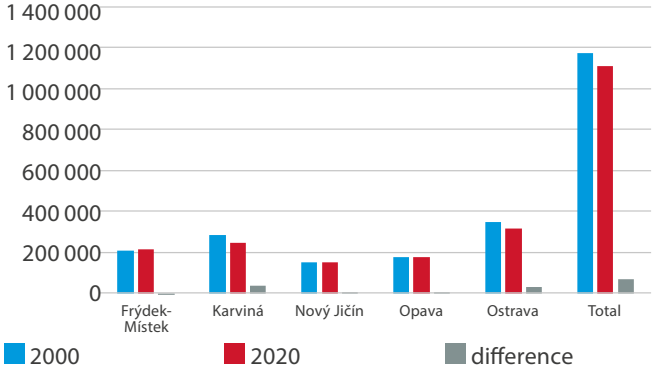
More than half of the region's territory is occupied by agricultural land, and more than 35% is covered by forest land (especially in the Jeseníky and Beskydy mountains). In addition to natural resources, the region has rich reserves of minerals – especially crucial domestic reserves of hard coal, deposits of natural gas and other raw materials such as limestone, granite, marble, shale, gypsum, gravel, sand, and brick clays.

Since the 19th century, the region has been, and still is, one of the most important industrial regions in Central Europe. The region is a nationwide centre of metallurgical production, at the same time the mining of almost the entire production of hard coal in the Czech Republic is concentrated here, even though the amount of the mined minerals is being decreased. In addition to these traditional industries, the production and distribution of electricity, gas and water, the production of means of transport and the chemical and pharmaceutical industries are also gaining ground in the region. However, its focus on economic activity – the sectoral structure – today brings considerable problems related to the restructuring of this region, with the solution of social problems, especially related to the level of unemployment.

Population: At the end of 2020, MSR had 1,198,534 inhabitants, which ranks it third in the Czech Republic. The most densely populated part of the agglomeration is between the cities of Ostrava, Frýdek-Místek, Karviná and Bohumín. More than half of the MSR population lives here. For the purposes of this material, we have therefore used the number of inhabitants living in the districts of Ostrava, Karviná, Frýdek-Místek, Nový Jičín and Opava, which cover or directly connect to hard coal mining sites. We have not included the district of Bruntál, which is in the north-western part of the region and its inhabitants do not participate in coal mining. The numbers of inhabitants in individual districts in 2000 and 2020 are shown in graph 2.

The population of MSR is declining. Compared to other regions in the Czech Republic, this is a long-term and systematic outflow. Residents are leaving for other regions within the Czech Republic. They most often choose Prague and the Central Bohemian region. In recent years, the number of those going abroad has also increased. It was assumed that people from industrialised parts would move to the countryside, where housing is more affordable, but so far this has not happened due to the lack of transport accessibility, insufficient Internet connection to work from home, and other factors. This problem will affect the economic sustainability of cities and smaller settlements in the future. It is already difficult for some to maintain a functioning infrastructure from reduced tax revenues.

Figure 3: Population of MSK by district, own processing



Source: Czech Statistical Office (CZSO) and own calculation based on CZSO data

Age demographic: Over the last 20 years, the average age of the MSR population has increased by 8 years. The average age in 2020 was 43. In 1991, it was 35. This is the average in the Czech Republic. The group with the largest population in the region of 15-64 years (almost 800,000 inhabitants) is the most represented in the region. Ageing is

97 Statistical Yearbook of ÚLR, https://www.czso.cz.

comparable for both men and women. We can state that the population of MSR is gradually ageing.

Ethnic composition: The MSR's population is ethnically diverse. In addition to people of Czech, Moravian or Silesian nationality, there are also Polish, Greek, Slovak, Ukrainian, Vietnamese, but also German, Romani, Russian, Bulgarian and Hungarian nationals living in its territory (the largest Hungarian minority within the Czech Republic also lives here).[98]

Employment: The decline of hard coal mining also has a strong social impact on employment in MSR and especially on the Ostrava-Karviná agglomeration, including employment in companies in the supply and demand chain of the Ostrava-Karviná mines (OKD).

Environment: Since the beginning of the 1990s, the state of the environment has significantly improved due to the decline in industrial production, the use of more environmentally friendly technologies and significant investments in environmental measures. Despite these improvements, the region remains one of the most congested areas in the Czech Republic, as all components of the environment have been polluted in the past. The agglomeration of Ostrava, Karviná and Frýdek-Místek in northern Moravia, which is part of this study, has been struggling with air pollution for a long time. The recently published international study 'Premature mortality due to air pollution in European cities.'[99] ranked Karviná, Havířov and Ostrava among the ten European cities where the largest number of people die due to polluted air. Pollution also comes from neighbouring Poland. The Ostrava Basin is usually closed on both sides of the border by an inverse 'lid'.[100] Today, soil and groundwater contamination due to industrial activity, mine subsidence and surface water and air pollution appear to be the most serious factors.

SOCIO-ECONOMIC HISTORY OF THE SELECTED REGIONS.

Northern Bohemia

The first known mention of mining activities in northern Bohemia is from 1403 in Duchcov. The region of Most hold records of the first mining activities dating from 1613. Starting from 1740[101], other records of coal mining in the Ústí nad Labem region began to appear.

In the period from the second half of the 19th century until the end of the 19th century, with the development of the railway network in the North Bohemian brown coal basin, brown coal mining increased and the gradual merging of mining companies into large mining companies began, connecting smaller coal mines to larger ones. Two important companies were founded in 1871: *Most Coal Mining Society* and *Duchcov-Podmokel Railway*.

For the period between 1900 and 1945, the pivotal year was 1910, when the Czech Trading Company was founded and at the same time there were already many other small mining companies. Before the Second World War, all mining assets in the North Bohemian brown coal basin were divided into 35 individual mining companies. During the German occupation, the twelve most efficient mining companies were merged into one mining company *Sudetenländische Bergbau A.G.* (SUBAG), based in Most. Subsequently, further mergers and acquisitions of other companies took place, which resulted in 1941 in SUBAG owning as many as 36 mines in the North Bohemian brown coal basin and three mines in the Sokolov basin. SUBAG thus accounted for approximately 80% of the coal production in the two basins, which amounted to approximately 16.5 million tonnes of coal per year.

In the period after World War II, the President of the Republic, Dr. E. Beneš, nationalised the mines by Decree No. 100/45 of 24/10/1945. In 1946, an independent mining national company *Severočeské Hnědouhelné doly, n. p.* was

98 National minorities in the Moravian-Silesian Region and their organizations, Ostrava 2020, https://www.msk.cz.

99 Accessible at https://www.thelancet.com.

100 Accessible at https://www.hnutiduha.cz.

101 The period of the Silesian Wars, three conflicts that took place between 1740 and 1763 between the Kingdom of Prussia and the Habsburg Monarchy for the domination of the originally Austrian region of Silesia.

based in Most. This company managed 58 mines operated at the time and was the largest national mining company of the then Czechoslovak Republic.

Even in the mid-1950s, there were almost 60 lignite quarries in operation in north-western Bohemia, mostly small-scale and deep mines, with a total production of 37.6 mil. tonnes.

North Moravia region[102]

We consider the end of the 18th century to be the beginnings of hard coal mining in the Ostrava region. It was then part of Austria. At the beginning of the 19th century, with the upcoming industrial revolution, the importance of hard coal resources began to grow. The discovery that coal can be used to produce coke provided huge momentum for the development of metallurgy in the region.

Iron production dates to the 1830s, when the first puddling (melting) furnace was launched in what was then Austria-Hungary. Establishment of the Vítkovice Ironworks in 1828. In 1860, by estimation, 1 million tonnes of coal were mined. The need for new metallurgical plants also required more mining capacity. This required a larger number of miners. Mining colonies are being built. With the need for faster transport of mined coal, the need for horse-drawn carriages and subsequently the railways increased, which enabled the transport of coal outside the region and, conversely, allowed the import of iron ore.

In the Ostrava region, already at that time there was a unique enclosed technological chain connecting raw materials into the final product. Thus, hard coal – coke – iron – steel. Water availability is also important. Water was in sufficient quantity in the local rivers (*Ostravice*). This is the direction the whole region was heading in for the next almost two centuries up to the present day. Coal mining and metallurgy are becoming an integral part of the economy. The rising working class is also becoming an important element of society.

In[103] the second half of the 19th century, 18% of workers from Moravia, 57% from Austrian Silesia, 8% from Prussian Silesia, 15% from Galicia and 2% from Germany came to the mines. At the beginning of 1901, about 35,000 people worked in the Ostrava-Karviná district in the Ostrava region. Of this number, 53.5% of all workers worked in the western part of Ostrava, 41% of miners worked in the mines in the Karviná region, and coke makers accounted for 5.5%.

In the interwar period, the benefits of coal mining in the Ostrava region were an unquestionable resource for the functioning of the state. In the first years after World War I, mining did not return to the level of 1913 until 1923. It was also caused by social instability and social ties of the newly emerging state. Social instability reflected the problems of the transition from the original Austria-Hungary to the new state. The main issues were currencies, asset transfers (land reform), healthcare (war veterans, lack of medicines, Spanish flu), problems with the supply of agricultural products and, finally, the de-Germanization of public institutions and society at the time. The overall international situation regarding building the position of Czechoslovakia in the post-war European order also played an important factor in the transition in this period. The economic crisis in the 1930s also hit mining in this area negatively. Stabilisation did not occur until around 1936.

At the time of the occupation by Nazi Germany before the beginning of World War II, the situation was complicated by the fact that the management of the Ostrava-Karviná mines had to submit to and join the economic system of the Third Reich. Resources were looted regardless of future economic developments, with the main emphasis on profits for the German military industry. During the five years of war, mining increased by about one third compared to 1937.

In October 1945, mines and key heavy industries were nationalised by decree of the President of the Republic. The mining plants of the *Ostrava-Karviná* district were integrated into a single national enterprise together with coke ovens, power plants, construction plants, farms, and

102 SISKA, František. Život a práce horníků v ostravsko-karvinském revíru po druhé světové válce. [The life and work of miners in the Ostrava-Karviná district after the Second World War.] Brno, 2014. Diploma thesis. Masaryk University in Brno. Faculty of Education. Thesis supervisor Jaroslav VACULÍK, accessible at https://is.muni.cz/th/ass89/diplomka_oprava_6._4_franta_ODEVZD..pdf.

103 Accessible at https://www.zdarbuh.cz/reviry/okd.

forests. The future line of the national economy was set out in the first five-year plan. There was both construction on the surface and expansion of existing mining facilities and construction of new ones. The first five-year plan, which began on 1 January 1949, marked an important period in the post-war development, as it defined the basic lines of development of the national economy for a very long time. In 1953, the socialist sector accounted for 99.6% of industrial production, 99.8% of construction, 100% of transport, 99.5% of internal trade and 44% of agriculture. After a certain deviation between 1953 and 1955, economic policy gradually returned to its original post-war nature. Again, preferential growth for heavy industry was preferred.

The unilateral development of the district, focused on the renewal and development of mining capacity, was replaced by a period characterised by a wide variety of diverse social, technical, and economic changes within the district and the state. The state sought to reduce the physical demands of this profession by modernising technical equipment (mechanised conveyors, locomotives, internal transport) and increasing the safety of workers (monitoring the concentration of mine gases, explosion protection measures, providing protective equipment, etc.) and paid attention to the healthcare available to miners. These changes were received positively by the miners, so there were no major protests.

As a result of sales difficulties, caused mainly by the smelting plants, mining in the years 1966-1967 decreased compared to the level in 1965 by 789,000 tonnes. Since October 1969, a 40-hour work week with free Saturdays for underground workers has been in place in the district. New mines, built mainly in the Karviná region, with their volume of 1,561 million tonnes, contributed almost in full (99.4%) to the total growth of the annual production for the above-mentioned period, which amounted to 1,571 million tonnes. In the final year of 1970, their share in the annual mining of the district reached the level of 13.1%. Changes in the technical and economic environment have led to changes in the orientation and content of the company's work initiative development programmes.

These changes have contributed to the massive supply of modern technological equipment from both imports and domestic production. The possibility of using modern technological procedures was essential for deep mining of hard coal. In addition to the mining itself, this also concerned the transport of coal and tailings, as well as the transport of miners to the workplace. The mechanisms had to be subject to limited conditions in the mines (space requirements to allow the mechanism to be assembled at the point of use). The machines and equipment were designed to work in the most difficult operating conditions and had modern safety features that protected both the operator and the machines and equipment themselves. The main mechanisms included particularly sliding and pulling plows, scraper, and belt conveyors, suspended locomotives, equipment for handling heavy loads, hydraulic reinforcements and, last but not least, equipment used to conduct energy to the places of use of machines and equipment. The traditional quality of these products has made them popular with customers around the world. The products of the companies in the period of the original Czechoslovakia were exported to countries in South America, Africa, Asia and of course Europe.

Economic data for the period of 1966-1970 demonstrate the overall favourable economic development. The growth rate was significantly higher than in the first half of the 1960s and approached the dynamics achieved in the first five-year period.

RELATION TO HISTORICAL HERITAGE

In both regions, a relationship to the history of mining is maintained. Especially in the region of Moravia, the family tradition of inheriting a craft and working in the field is no exception. Miners' Day has been significantly celebrated in the past[104].

Mining has always been a tough profession. Even at the beginning of the 20th century, difficult working conditions escalated with several strikes, when miners demanded higher wages, safer working conditions, social security in

104 Celebrated for the first time on September 9, 1949, when the miners commemorated the origin of the oldest mining right, issued by Wenceslas I in 1249 for the town of Jihlava.

the event of accidents, and political rights. The strikes have been bloodily suppressed many times.

Let us recall, for example, the events of May 1894 at the *Trojice mine* in Ostrava (the current territory of MSR), when the management of the Prokop trade union decided to declare a strike, which involved all the mines in the Ostrava-Karviná district. The striking miners wanted an eight-hour workday, a 25% wage increase and universal suffrage. Some associations also demanded a ban on working on Sundays. The situation was tense and the army from Opava, Krakow, Těšín and Přerov was called in to intervene against the twenty thousand strikers. The miners advanced to the *Trojice mine* to speak with a few strike-breakers and the mine management. A cordon of gendarmes stopped them here, saying that they were not allowed to continue. However, the commander of the gendarmes mistakenly considered the deputation to be attackers and gave the order to fire. The bullets hit 34 miners, eight of whom were shot dead on the spot. The other four died of their injuries later. Injured miners were interrogated in hospitals, and some received prison sentences lasting 6-8 weeks. The bloody incident caused outrage throughout the monarchy, and protest rallies were held in many cities. The events in Polish Ostrava were discussed in the Chamber of Deputies in Vienna, where an investigating commission was set up, but it was not impartial. On the positive side, the requirements for eight-hour workdays began to be discussed in public.

After World War II, the newly elected state leadership sought to ensure above-standard conditions for mine workers, and the tragic events of the past were not forgotten. From 1965-1966, a memorial was erected to the victims of the strike at the *Trojice mine*, and in 2018 it was reconstructed. The memorial includes benches with the names of those shot.

Picture 5: The Memorial to the Victims of the Mining Strike at the Trojice Mine (1894), Slezská Opava

Source: tourism.cz, author: dedeon

Even today, the heritage of the mining tradition is remembered. The European Regional Development Fund – Program for the Support of Cross-Border Cooperation 2014-2020 between the Czech Republic and the Free State of Saxony funds the project named *"Our Cultural Heritage – Mining Cultural Landscape of the Ore Mountains / Krušnohoří / Erzgebirge"*. The aim of the project is to strengthen the emotional attachment of the local population to the common Czech-German mining heritage and to deepen the understanding of its enormous global significance. The aim is to make the common cultural heritage visible, which would ensure its long-term preservation.

Traditionally, the Ústí nad Labem region hosts meetings of mining towns and municipalities from Czechia, Slovakia, and the Saxon partner town – Marienberg. In September 2021, the 25th meeting took place in Most, which offered representatives of mining associations and mining towns and municipalities and the public a rich programme in which there was enough space not only for mining traditions and rituals, but also for a new Mining and Mining Accidents Memorial and was granted the *Czech Permon* Award by the Association of Mining and Metallurgical Societies of the Czech Republic in the following categories: mining folklore, preservation of technical monuments, the greatest achievement of the year, a lifetime achievement,

Picture 6: Unveiling of the Mining and Mining Accidents Memorial, September 2021, Most (ÚLR)

Source: www.mesto-most.cz

Picture 7: Photos of the processions of the Club of Costumed Miners

Source: https://khfrantisek.webnode.cz.

and an extraordinary award this time for maintaining and developing mining traditions.[105] For example, the Club of Costumed Miners of the František Mine in Horní Suchá operates in the Moravian-Silesian region.

SOCIAL BENEFITS IN MINING

Before 1989, miners were highly valued and had access to the following benefits:

- higher salaries compared to other professions;
- possibility of living in flats owned by the mine, the offer of flats was part of the recruitment bonuses. In summary, it is stated that, for example, 44,000 such flats were built within the Ostrava-Karviná mines over the years;
- quality healthcare and regular health examinations;
- the right to a 3-week spa reconditioning stay;
- high-quality catering in the form of snacks and canteens (mines worked in three shifts, non-stop mode);
- a coal quotient (*deputát*) of 4.2 tonnes of coal per employee per year, which roughly covered the annual consumption of heating a family house, miners had the right to take home their quotient of coal even after retiring – alternatively, they could choose to receive the equivalent monetary value of the coal;
- recreation stays were provided in company or trade union centres throughout the country (before the division of the state in 1993, including Slovakia), as well as abroad for themselves and family members, and summer camps were also organised for the children of miners.

The so-called exposure time, which was given by the number of 5,600 shifts worked in the mine, was specified. After this, the miners were entitled to the annuities paid to them if they left the mining industry. The rent was paid even if the miner had to leave the mine for health reasons. It was paid until entitlement to a retirement pension arises.

With the transition of society to a new social system in 1989, the privatization of mining companies has reduced many of these benefits. Thanks to privatization in particular, the possibility of recreation has been reduced. Annuities paid to miners also became problematic. This is not an

105 More info at: https://www.mesto-most.cz/hornicke-setkani/,https://youtu.be/ooeSWiKi0kI.

annuity[106], which is paid, for example, to police or firefighters after certain years of service.

ECONOMY IN COAL REGIONS

The beginning of the decline of mining from the 1990s to the present day

Ústí nad Labem region

At the beginning of the 1990s, only 20 mines were operated in the North Bohemian and Sokolov basins, but with a total extraction of 78.5 mil. tons.[107]

Between 1990 and 2005, two waves of coupon privatization were transformed. In the first wave between 1991 and 1993, joint-stock companies emerged from nine non-mining state-owned enterprises. Territorial mining limits have been in force in northern Bohemia since 1991. In 1992, the Czech government announced a reduction programme for the coal industry[108] and less efficient mines were gradually closed. In 1993, *Mostecká uhelná společnost, a.s.* (MUS) was founded through the merger of three state-owned companies[109]. These included the following companies: *Mines and treatment plants Komořany, Hlubina Litvínov Mine* and *Ležáky Most Mine*. Furthermore, on 1 January 1994, Severočeské doly, a.s., Chomutov was founded, which originated from two state-owned mining companies. These were the *Nástup Tušimice Mine* and *Bílina Mine* companies. The only company in liquidation that remained state-owned was the *Ústí nad Labem Fuel Factory*. In 1997, after mining in the Ústí nad Labem region, the company focused on rehabilitating areas that were affected by mining.

In 2007, *Severočeské doly, a.s.*, Chomutov, accounted for almost 24 million tonnes per year, which accounted for 61.25% of total mining in the Severočeská brown coal basin, and *MUS* with 15 million tonnes per year for almost 39% of mining. At present, *SD, a.s. Chomutov*[110] is owned 100% by *České energetické závody a.s.* (ČEZ[111]) and is the largest lignite mining company in the Czech Republic. Annual sales volumes exceed 20 million tonnes, which corresponds to a 55% share of brown coal production in the Czech Republic. Today, *MUS, a.s.* as such no longer exists. Its transition since 1994 has been accompanied by several ambiguities. Today, it has essentially been replaced by the *Czech Coal Group*[112], which mainly includes the *Vršanská uhelná a.s.* and *Severní energetická a.s.* mining companies.

The main supporters of not breaking the mining limits include the affected municipalities and their councils, especially the town of Horní Jiřetín, where a referendum was held on 25 February 2005 with 75 % of all the city's inhabitants. The referendum in Litvínov was similar, with 95.5 % of the population voting in favour of maintaining the limits on 1 December 2006. The participation here was 38% of the population. The town of Hora svaté Kateřiny also spoke in favour of their preservation. Several political parties have also spoken out in favour of maintaining mining limits. Proponents of the limits include several associations and non-profit non-governmental organisations, such as the *DUHA Movement, Greenpeace ČR*, *Zelený kruh* (Green Circle), *Limity jsme my* (We are the Limits) and the *Společnost pro trvale udržitelný život* (Society for

106 Mining rent is caused by damage to health due to work in the mine. Therefore, if a miner receives an annuity because of dusty lungs and, for example, heart attack or diabetes affects him, the doctor notifies the insurance company, and the insurance company subsequently stops paying the annuity. With reference to the fact that due to the new disease, the person would no longer be able to continue to practice the mining profession. So, it is not certain how long the miner will receive the annuity. This is an obstacle e.g., when taking larger loans or mortgages. Unlike miners, police officers and firefighters in the Czech Republic receive a retirement annuity, which is paid to them regardless of their state of health.

107 Accessible at https://www.podkrusnohorskemuzeum.cz/cz/z-historie-uhli-na-mostecku.

108 Government Resolution on the Coal Restructuring Program No. 691/1992

109 Web site http://www.mosteckauhelna.cz.

110 Web site https://www.sdas.cz.

111 CEZ Group is one of the most important economic entities in the Czech Republic and continues to operate in the countries of Western, Central and Southeastern Europe. The main business is production, distribution, trade and sales in the field of electricity and heat; natural gas trade and sales; provision of comprehensive energy services from the new energy sector and coal mining. CEZ Group is one of the ten largest energy companies in Europe, with more than 7 million customers and approximately 32,000 employees. More info at https://www.cez.cz.

112 Web site https://www.7energy.com.

Sustainable Living), and other organisations represented in the *Climate Coalition* (see chapter Participating parties in the transition process). On the contrary, mining companies such as Severní energetická, Czech Coal and Severočeské doly are clear supporters of breaking mining limits.

Mining in the last deep lignite mine in the Czech Republic at the *Centrum mine in the Most region* ended on 1 April 2016. Today, brown coal is mined only in quarries in the Czech Republic, mainly in the foothills of the Ore Mountains, i.e., in the Sokolov and Most basins. At present, a total of four companies works in the region: *Sokolovská uhelná*[113] (*Jiří quarry and Družba quarry*), then *Severní energetická* (*ČSA quarry*) and *Vršanská uhelná* (*Vršany quarry*) falling under Sev.en Energy AG[114] and *Severočeské doly*[115] (*Bílina quarry, Nástup – Tušimice quarry*) falling under ČEZ.

There are four large, coal-fired power plants operated by ČEZ – *Ledvice, Počerady, Prunéřov and Tušimice*. In addition to CEZ's coal-fired power plants, local heating plants are also important sources of energy burning brown coal. Due to their production of electricity, the *Teplárna Komořany* near Most (the company *United Energy a.s.*) and *Teplárna Trmice* near Ústí nad Labem are especially important. (*Teplárna Trmice a. s.*).[116]

Moravian-Silesian region[117]

As a result of national management, when the district met long-term high mining requirements beyond its capacity, and insufficient investment in development, the *Ostravsko-karvinské doly (OKD)* found themselves in a difficult economic situation in the early 1990s. The need to transform the company was exacerbated by the transition to a market economy in 1989. The new state leadership, which emerged from the social changes of 1989 (Velvet Revolution), decided to dampen heavy industry, including mining. This transition was perceived positively by most society in these post-revolutionary years. However, the changes were decided by people who did not have the necessary knowledge and did not perceive the negative impact of their decisions on these regions and the entire state economy.

Back in 1990, *OKD* had 100,000 miners. As of 31 December 1990, the state-owned company *OKD* was liquidated without liquidation procedure, and on 1 January 1991, the joint-stock company *OKD* was established as the legal successor with the exclusive ownership of the state. In 1991, the state-owned company OKD was the joint-stock company *Ostravsko-Karvinské doly*. The state put part of these shares into coupon privatization and transferred part of it free of charge to cities and municipalities that were affected by hard coal mining. The rest of the shares were transferred to the Restitution Investment Fund.

In 1992, the government[118] approved a coal restructuring programme. There was a rapid decline in Ostrava's mines, a subsequent reduction in the number of employees and the gradual privatization of the company. In the period from 1990-2001, mining ended in 14 mining areas in the Ostrava and Petřvald parts of the district on an area of 180.0 km^2. The costs of mitigation programmes accounted for the tens of billions of Czech crowns. Unfortunately, it was the loss of tens of thousands of jobs. This was also reflected in the departure of people to other regions, although the state counted on compensation for the laid-off and retraining courses.

During the restructuring of the coal industry, a wave of protests arose from the miners. The 'deep' form of protest, for example, was chosen by the miners in 1993, when fewer than a hundred miners refused to harvest at the *Darkov Mine* in the Karviná region. The miners demanded a 20 per cent wage increase. Due to the restructuring of *OKD*, when more than 20,000 jobs were lost, the miners protested in 1994 – in mid-June, the unions declared a strike on all *OKD* mines. The miners ended the emergency after 16 days, when the unions signed an amendment to the collective agreement with the

113 More info at https://www.suas.cz.

114 More info at https://www.7energy.com.

115 More info at https://www.sdas.cz.

116 Development Program of the Ústí nad Labem Region 2014-2020 (hereunder refferred as DP ÚLR), available at https://www.kr-ustecky.cz.

117 More info at https://www.okd.cz.

118 The Government of the Czech Republic since (02/07/1992 – 04/07/1996): Prime Minister of the Czech Republic – Václav Klaus (ODS), Deputy Prime Minister – Jan Kalvoda (ODA), Deputy Prime Minister and Minister of Finance – Ivan Kočárník (ODS)

company's management. This agreement specified slightly higher salaries, a Christmas allowance and addressed the claims of employees who had been laid off. A year later, an hour-long warning strike broke out at the *Paskov Mine* – trade unions temporarily ceased mining to express disagreement with the expected decline in mining.[119] The last mine in the Ostrava region was the *Odra Mine*, closed in 1994.

In 1996, at the time of the governing right-wing coalition, consisting of the *Civic Democratic Party*.[120] (*ODS*), the *Civic Democratic Alliance*[121] (*ODA*) and the *Christian Democratic Union – Czechoslovak People's Party*[122] (*KDU-ČSL*), the economic situation was very difficult. Some cities and municipalities have addressed this situation by selling *OKD* shares. The state transferred its shares in the Restitution Investment Fund[123], making itself a minority shareholder with a 45.9% stake.

In 1998[124], there was a change in the ownership structure of *OKD*. The state (MIT – Ministry of Industry and Trade) lost[125] its majority stake and *KARBON INVEST, a.s.* became the majority owner. A major step was taken when state representatives were 'adversely' laid off from the company's governing bodies. This happened during the cooperation of the ruling *Czech Social Democratic Party*[126] *(ČSSD)* with the *ODS*. At that time, the state sold its entire share, i.e., 45.9% to KARBON INVEST, a.s. for 4.1 billion CZK (at the exchange rate of EUR 1 / CZK 26 this is the equivalent of EUR 158 million). The price also included 44,000 OKD flats, built before 1989 as state flats, at a price of only CZK 40,000 per unit. Out of a total of 32 OKD subsidiaries, only three were awarded. KARBON INVEST, a.s is the main shareholder *OKD* (95.89% of shares). In the same year, it acquired a majority stake in the group of companies of *KARBON INVEST, a.s.*, *RPG Industries Ltd.*[127] based in Cyprus, represented by entrepreneur Zdeněk Bakala. At the end of 2005, the *mining company ČMD* merged into *OKD*. Entrepreneur Zdeněk Bakala thus gradually took over OKD through companies established abroad [128]. Some of his companies subsequently went bankrupt. A lawsuit was filed against the entrepreneur Bakala, according to which he had to export CZK 100 billion from the company (at the exchange rate of EUR 1 / CZK 26 this is the equivalent of EUR 3.8 billion). The trial is still ongoing. An investigating commission of the Chamber of Deputies of the Parliament of the Czech Republic was also created for this matter.

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119 Accessible at https://ct24.ceskatelevize.cz/domaci/1074965-heslo-ja-jsem-hornik-kdo-je-vic-je-minulosti.

120 The ODS is a liberal-conservative political party in the Czech Republic. In the parliamentary elections to the Chamber of Deputies in 2017, it won 25 of the 200 seats, more info at: https://www.ods.cz. In the European Parliament, the ČSSD is represented in the political club of European Conservatives and Reformists, more info at: https://ecrgroup.eu.

121 More info at: https://cs.wikipedia.org/wiki/Ob%C4%8Dansk%C3%A1_demokratick%C3%A1_aliance.

122 KDU-ČSL is a Christian Democratic party. In the parliamentary elections to the Chamber of Deputies in 2017, it won 10 of the 200 seats, more info at: https://www.kdu.cz. In the European Parliament, KDU-ČSL is represented together with TOP 09 and the STAN in the political club of the European People's Party (EPP), more info at https://www.eppgroup.eu.

123 It was managed by the National Property Fund set up by the Ministry of Finance and was intended to compensate the owners whose property was confiscated in the post-war period.

124 The Government of the Czech Republic from 22/07/1998 – 12/07/2002: Prime Minister of the Czech Republic – Miroslav Zeman (CSSD), 1st Deputy Prime Minister and Minister of Labor and Social Affairs – Vladimir Spidla (CSSD), Deputy Prime Minister (since 30/ 5/ 2001) and Minister of Industry and of trade – Miroslav Grégr (ČSSD).

125 The owners of the shares were also municipalities and cities, which decided to respond to the offer to buy shares from a private entity. They probably did not realize that with this step they could reduce the number of state representatives in the statutory bodies of the then OKD.

126 The ČSSD is a social democratic political party in the Czech Republic. In the parliamentary elections to the Chamber of Deputies in 2017, it won 10 of the 200 seats, more info at: https://www.cssd.cz. In the European Parliament, the CSSD is represented in the political club of the Progressive Alliance of Socialists and Democrats, more info at: https://www.socialistsanddemocrats.eu. Government of the Czech Republic from 04/08/2004 – 25/04/2005: Prime Minister of the Czech Republic – Stanislav Gross (ČSSD), 1st Deputy Prime Minister and Minister of Labor and Social Affairs – Zdenek Skromach (ČSSD), Deputy Prime Minister (since 30/ 5/ 2001) and Minister of Industry and shop – Martin Jahn (no party affiliation).

127 More info at https://rejstrik-firem.kurzy.cz/rpg-industries-limited-cr.

128 *New World Resources B.V.* founded in 2005 in the Netherlands, *New World Resources Plc,* founded in 2011 in the United Kingdom, has listed on the London, Prague and Warsaw Stock Exchanges. It can be assumed that in this case it is both domestic and foreign capital. Until 2013, the company *OKK, koksovna*, was a subsidiary of *OKD*. It was then sold to a private owner.

In 2017, *OKD* signed an agreement with the state-owned company *PRISKO*[129] on the transfer of shares in the *OKD* subsidiary. The sale was approved by the government of the Czech Republic, and the state then became the owner of the mine for CZK 80 mil. (approx. EUR 3.08 million – at the exchange rate of CZK 26 / EUR 1). Unfortunately, *OKD* no longer included apartments, which gradually changed owners several times over the years.

In 2020, the Czech Government[130] approved the transfer of *OKD*'s assets to the state-owned company *Diamo*[131], established by the Ministry of Industry and Trade. As of 1 January 2021, *Diamo* takes over all damped mines within *OKD*. According to the government materials, the costs of this decline for the period from 2021-2035 will be in the order of CZK 15 billion (at the exchange rate of EUR 1 / CZK 26 this amounts to EUR 0.57 billion).

ECONOMIC PERFORMANCE OF BOTH REGIONS[132]

The economic efficiency[133] of the regions, together with the industrial structure, is key to making the transition from coal mining. The amount of GDP (gross domestic product) is most often used for its evaluation.

GDP per capita illustrates the growing economic performance of both monitored regions. However, in terms of economic development, these regions lag behind the Czech average, even without counting Prague. From a long-term perspective, only the MSR converges to the average level of economic development of the Czech Republic; ÚLR performs consistently slightly worse in this respect.

In the period since 2000, MSR has grown faster economically – the region has come close to the economic level of the entire Czech Republic. Especially thanks to the period when its growth was faster than the growth rate of the entire Czech economy (most years between 2004-2011). On the contrary, the growth rate of ÚLR is slower, with a few exceptions, and these regions are moving away from the economic performance of the Czech Republic.

MSR maintains a growth rate like the Czech average (excluding Prague). The ÚLR slightly lags behind the growth dynamics.

The reason for lower productivity in the affected regions (measured as GDP per employee) is mainly higher unemployment in ÚLR and MSR, and therefore lower population participation in the region's economic product, which is also increased compared to other regions in the Czech Republic by reason that investment-demanding and extraordinarily productive (due to their character) branches have much higher representation in the structure of the economy[134].

An important aspect not only of economic development and economic maturity is the level of household income, which can be measured by household disposable income. This indicator represents the amount of funds that households have at their disposal and can spend on the market, as stated in the Update of the Input Analysis of the Strategic Framework for Economic Restructuring of ÚLR, MSR and KVR.

129 The company was established pursuant to Section 172 of the Commercial Code. The date of entry in the Commercial Register is October 1, 1992. The only founder is the National Property Fund of the Czech Republic, to which the property of the state enterprise Škoda Mladá Boleslav s.p. in the sense of § 11 par. 3 of Act. No. 92/1991 Coll., On the conditions of transfer of state property to other persons. With effect from January 1, 2008, pursuant to the provisions of Section 20 of Act No. 293/2001 Coll., the state represented by the Ministry of Finance of the Czech Republic became the sole shareholder of the company, to which the ownership interests owned by the Czech Consolidation Agency were transferred. The people in the management of PRISKO are appointed by the Ministry of Finance of the Czech Republic in accordance with the Civil Service Act. More info at http://www.prisko.cz.

130 The Government of the Czech Republic since (June, 27 2018 – after the elections on November 11, 2021 according to the Constitution, resigned, and the President accepted this resignation that day): Prime Minister Andrej Babiš (ANO 2011), Deputy Prime Minister Jan Hamáček (ČSSD), Deputy Prime Minister and Minister of Finance – Alena Schillerová (ANO 2011).

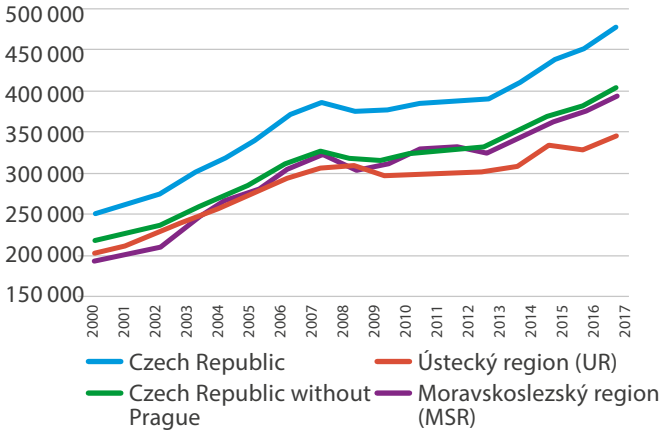
131 More info at https://www.diamo.cz.

132 Update of the input analysis of the Strategic Framework for Economic Restructuring of ÚLR, MSR and KVR, 2020, https://restartregionu.cz. Further, there is only RESTART

133 The economic share of the region (creation of GDP) in the overall performance of the state is assessed.

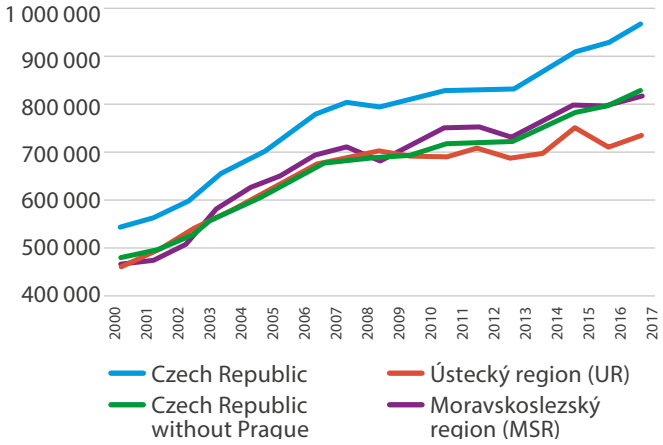
134 Lower performance is due to higher unemployment in the regions, which means that state revenue is not generated, but social benefits are consumed to a large extent.

Figure 4: GDP per capita (in CZK), 2001-2017 acording regions



Source: CZSO – Annual national accounts, public database, https://apl.czso.cz/pll/eutab/html.h?ptabkod=tgs00006

Figure 5: GDP per employee (in CZK), 2001-2017

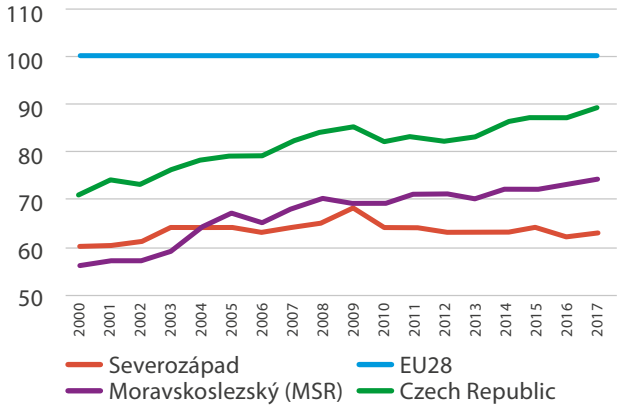


Source: CZSO – Annual national accounts, public database

THE POSITION OF THE REGIONAL ECONOMY IN THE EU 28[135]

Selected indicators of economic maturity in relation to the EU 28 offer a comparison of the development of the monitored regions and the Czech Republic against macro-economic trends. As the graphs below illustrate, in the first decade of the new millennium, the Czech Republic and the monitored regions achieved higher growth dynamics and approached the EU 28 average, but the growth rate of MSR was significantly higher than the north-west region. Around 2010, the trend of convergence to the economic performance of the EU 28 stopped. The main reason is, considered to be, the impact of the economic crisis at the beginning of 2008 on the Czech economy. Since 2013, only the MSR has approached the EU 28 economically, albeit at a slower pace than the entire Czech Republic. On the contrary, the north-west region has lagged slightly behind since 2009, from 68% to 63% of the EU 28's GDP average.

Figure 6: Development of GDP per capita of regions of the cohesion of the North-west and Moravia-Silesia to the EU 28, PPS in percentage terms to the EU 28 average (EU 28 = 100%), 2000–2017.



Source: Eurostat, <https://apl.czso.cz>.

INDUSTRY

General structure of regional industry and the economy.

MSR and ÚLR, despite the decline in coal mining after 1989 (in ÚLR brown coal – surface mining and in MSR hard coal – deep mining), retained a significant position in the econ-

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omy. Nevertheless, they are perceived as regions with a low standard of living and belong to the group of structurally disadvantaged regions. This is evidenced by the unemployment rate, which is still one of the highest in the Czech Republic. While, at the end of 2020, unemployment reached the level of 4.02% nationwide, in the mapped coal regions it reached levels of up to 6%, and in districts with coal mines the values were even higher than the regional average (Table 1).

Table 1: Unemployment: by regions and districts, 31/12/2020

	share of unemployed persons in %
Czech Republic	**4.02**
Ústí nad Labem Region (ÚLR)	5.46
Chomutov	6.30
Most	6.63
Moravian-Silesian Region (MSR)	5.55
Karviná	8.12
Karlovy Vary Region (KVR)	3.11
Sokolov	5.97

Source: CZSO 2020

The non-manufacturing sector and agriculture are below the national average. The process of transition to new conditions is still ongoing. There is a noticeable higher demand for social services here.

With the advent of new political changes in the 1980s and 1990s, when society's environmental sentiment was rising, the mining industry was not supported by the public; quite the contrary. It strengthened the activities of newly emerging environmental organisations, which promoted the decline of mining and the closure of mines in northern Bohemia.

Historically and up to now, the main employers in these regions – large companies in the metallurgy, engineering, and energy industries and, more recently, in the mining industry – play the role of key employers. This also entails certain risks. So far, however, these companies have ensured stability.

Lower business intensity is also associated with lower incomes (the question of the ability to buy services). The start of business activities was slowed down by the economic crisis in 2008-2010. The current business environment is also significantly affected by the COVID-19 pandemic, the impact of which will be felt later. There is space for service development, potential for research, development, and innovation in relation to emerging industries.

Unfortunately, employment in the coal sector, downstream industry and supply chain is not centrally monitored. For our purposes, we are going to use the overview prepared for the AMO Climate Policy Paper[136] (Table 2).

Table 2: Employment in the coal sector in 2018

Raw material	Number of employees*			
	in power plants and heating plants	in mining	indirect	in total
Black coal	423	6,747	2,118	9,288
Brown coal	3,132	7,869	7,936	18,937
In total	3,555	14,616	10,054	28,225

** Processing by Zindulková according to Vazquez-Hernandez (2018), OKD, a.s. (2019), MIT (2020)*

Source: AMO.cz, Climate Policy paper No.5

136 AMO. Klimatický Policy paper č.5: Uhlí, zaměstnanost a spravedlivá transformace v podmínkách České republiky. [AMO. Climate Policy Paper No.5: Coal, employment and fair transition in the conditions of the Czech Republic.] Kristina Zindulková. May 2020 Accessible at: https://www.amo.cz.

Table 3: Employment in the mining sector by regional company headquarters

Region	2018	
	total employees	of which subcontractors
Moravian-Silesian	7,947	2,448
Ústí nad Labem	5,041	939
Karlovy Vary	2,177	71
Liberec	2,138	207
Prague	687	137
Central Bohemia	654	90
South Bohemia	302	155
Plzeň	905	152
Hrádec Králové	307	108
Pardubice	274	61
Vysočina	135	7
Olomouc	487	135
Zlín	201	60
South Moravian	834	160
In total in the Czech Republic:	**22,089**	**4,730**

Source: www.mpo.cz. raw materials policy, 2018

Ústí nad Labem region

The manufacturing industry in ÚLR is less specialised than in the MSR – there is no one dominant industry, but six major ones in ÚLR, which together make up two thirds of the total employment in the manufacturing industry. In addition, specialization is declining slightly over time and industries important to the regional economy are changing. The importance of the chemical and textile industry in terms of employment decreased significantly (although it is still an important sector, the share decreased by 4.5 and 8.3 pp, respectively), and the share of the metalworking industry also decreased slightly. On the contrary, in the past 20 years, new industries such as the production of automotive parts and components, or the electronics industry have developed strongly in the region, which was largely the result of new foreign investors. Manufacturers in other traditional industries (chemical production, building materials) are typically focused on the production of raw materials or basic products entering production in other industries. These companies, such as Nexen Tire Europe s.r.o.[137], are often very important players in the regional economy in terms of sales, but most of them focus primarily on production with lower added value with strong pressure on price competitiveness and production efficiency (these are most often the main goals of innovation in these companies).[138]

In terms of employment, economic importance, and the overall impact of production activities on the region, the most important industrial branch in ÚLR is still mining and processing of brown coal, to which the production of electricity is closely linked. Both production activities have extraordinary significance in the context of the Czech Republic as a whole.

MORAVIAN-SILESIAN REGION[139]

The internal structure of the manufacturing sector shows a high degree of industrial specialization. This mainly concerns metal production, metallurgy, and foundry.

The region struggled with high unemployment at the level of 10% in 2009, when the region suffered an economic recession. Current unemployment in MSR as of 31/7/2021 is at 5.42%.

In the Ostrava region, 450 mil. tonnes of coal were mined during the whole mining period. It is estimated that there are still coal reserves of 200 million tonnes underground. These seams are high-quality coal, approaching the parameters of anthracite. When comparing two localities in this region – Ostrava and Karviná – it is essential to know that

137 Tire manufacturer, industrial zone Triangle, Žatec, see https://www.nexentire.com/cz.

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the thickness of the seams (i.e., the height of the coal layer) in the Ostrava region are in the range of 0.5-2m and more workers are needed, and the use of technology is limited. In the Karviná region, the coal layers range from 2-4m, and it is possible to use machine technology in larger quantities. Therefore, the efficiency of mining and costs per tonne of coal differ. At present, only one *ČSM* deep mine for hard coal mining for energy purposes operates in the described area. The mining capacity is 1,100 tonnes/hour. The annual production is about 2.5 mil. tonnes. Its closure is planned for 2022.

Current mining technology is loss-making in some localities. If mining ceases, downstream conservation of the mines must be performed in a way that allows re-mining in the event the new possibilities for using coal occur, such as the development of new, more environmentally friendly coal mining technologies. These reserves have not yet been written off by the state, and, as mentioned in the introduction to the present document, the State Energy Concept (SEC) of 2015 envisages coal mining until 2038. However, this may change at any time.

The existing mines are the property of the state-run *DIAMO* company. The responsibility therefore lies with the state through the Ministry of Industry and Trade. If we calculate that another 3 jobs[140] are created for one job in *OKD*, then the negative impact on employment could amount to over 20,000 jobs. The Government of the Czech Republic has taken some social measures in relation to the departure of *OKD* employees, according to the length of employment and the division into surface and mining employees. Employees dismissed from employment by agreement are entitled to an indemnity for 11 times their average monthly earnings and to a state allowance, which depends on the time worked, their age, and the nature of the work. Deep miners are entitled to up to CZK 8,000 per month (if we presume EUR 1 / CZK 26, this amounts to EUR 308), while other workers are entitled to CZK 5,300 (if we presume EUR 1 / CZK 26, this amounts to EUR 204). And, in some cases, for up to 5 years. For this reason, the decline in mining has not yet provoked much resistance from employees and, in many respects, has the support of trade unions.

Nevertheless, it should be noted that in the event of the collapse of this sector (and the subsequent steel industry), 100,000 jobs in this region would be in direct danger.

The Trade Union of Workers in Mining, Geology, and the Oil Industry (Czech abbr.: OS PHGN) has long been involved in finding a new job for miners in the labour market. OKD, in cooperation with the Trade Union and the Labor Office, implemented the 'New Shift' (in Czech: *'Nová šichta'*) programme with the aim of helping employees who were looking for a new job to find a suitable job on the labour market. The 'New Shift' is a programme that has already been used to dampen other mines. It is an individual approach for each employee according to his/her needs. HR staff and officials of the Labour Office assisted in the preparation for a job interview or helped by providing instructions on how to write a resume. The contact points for employees operated in all locations that were closed. The advantage was that OKD's core HR personnel also took part in this activity, so they often knew the clients. OKD has established cooperation with employers in the Moravian-Silesian region who are looking for workers. Communication takes place through consultants of the 'New Shifts' programme. Every OKD employee with whom an employment relationship was terminated or even one who no longer worked in OKD could sign up for the 'New Shift' programme for up to 6 months after his contract was terminated.

A subsidy title is prepared for employees of mines and related suppliers who had to be laid off due to a coal decline, in cooperation with the Moravian-Silesian Regional Authority and the Moravian-Silesian Employment Pact[141], which enables the drawing of funds for the gradual departure of employees. One of the projects of the Moravian-Silesian Employment Pact is TASK FOR OKD. Its goal is to help companies supplying OKD's services and products

140 This number results from presentations and meetings with representatives of the Regional Chamber of Commerce of MSR and presentations of the Regional Authority of MSR. To confirm it, we present a source that also works with that value, see https://ct24.ceskatelevize.cz/regiony.

141 It has been operating since 2011 based on a partnership agreement. The founding entities are the Moravian-Silesian Region, the MSR Development Association, the MSR Regional Chamber of Commerce and the Council of the Region of Cohesion of the Moravian-Silesian Region. In their activities, they seek solutions and strive for systematic change. They act as strategic partners of forty business entities, schools, and other institutions in MSR. https://mspakt.cz.

and thus mitigate the impact of the decline in mining. The project was created in response to the decision of the Government of the Czech Republic No. 1169 of 16 November 2020 on the cessation of coal mining in the Ostrava-Karviná district. This decision has an impact on both OKD employees and employees in supply companies. This poses a significant problem for the whole region and its commercial and economical function. The basic activity of the project is to contact the suppliers of OKD, a.s. and identify their needs. Furthermore, consulting services will be provided to these companies and their employees. A more extensive restructuring plan will be prepared for the key companies from among the interested parties. The project is financed from the budget of the Moravian-Silesian Regional Authority for approx. CZK 2 mil. (at the exchange rate of EUR1 / CZK 26, this equates to EUR 76,923).

The change in the structure of the regional economy has two key aspects – the first of which is the continuing decline of heavy industry and mining, which entails a significant decline in employment in these sectors to which we have already referred. The second factor is the growth of economic activities in new fields, especially related to the automotive and electrical engineering industry and IT. This growth in the region was mainly caused by the arrival of new foreign investors focusing on the automotive market. In MSR, *Hyundai* has chosen the headquarters of its only production plant in Europe. Its suppliers then set up plants to produce automotive components in MSR. These include *Plakor Czech, MAHLE Behr, Cromodora Wheels, Hyundai MOBIS*, located in the Mošnov industrial zone. Other suppliers, such as *Varroc Lighting Systems, Brose* and many others, which supply other car manufacturers in the Czech Republic, also operate in other parts of the region. This segment of the industry has a long-term demand for a new workforce. Laid-off employees are expected to find employment in existing companies and the next generation to find employment in areas such as IT, logistics, energy transition (e.g., upcoming Hydrogen Valley projects), the use of SMART technologies, etc.

The structure of the manufacturing industry is strongly focused on the production of motor vehicles and their parts. The role of the automotive sector in the regional economy is therefore growing and it is currently the most important industry in terms of employment. However, this also brings certain risks if there are fluctuations in this industrial segment. Perhaps, except for Škoda Auto a.s., other car manufacturers in the Czech Republic have no research and development centres, which is the limit for further development and sustainability of production in this sector in the Czech Republic. The solution would be to focus on other fields with higher added value – in our region this would be the engineering industry, e.g., processing of new materials, new technological processes, products for the field of nuclear energy and energy in general. Although the importance of new industries is increasing, the share of the 6 most important industries in total employment has fallen by 14 pp in the last 15 years.

GENERAL SUMMARY AND IDENTIFICATION OF THE MAIN PROBLEMS IN BOTH REGIONS.

The risks that may arise in both regions can be summarised in several points:

- There is still a threat of exacerbating economic problems due to the regions' orientation towards mining;
- low representation of services;
- the resulting lack of suitable job opportunities;
- and, on the other hand, a high proportion of the long-term unemployed.

Part of the population leaves the regions for work elsewhere. The environment also plays a role – MSR is considered one of the worst regions in the EU in terms of air quality, dust, etc. Another important factor here is pollution from Poland, which is in accordance with the accession conditions to the EU negotiated by Poland. Poland was not forced to solve this situation at the point of joining the EU, and the situation began to change not earlier than after 2016, when these exemptions ended.

There is improvement in MSR now. Reclamation is being performed here and old environmental burdens from the times of heavy industry are gradually being removed. Public transport infrastructure is still not complete.

The change can be expected to take several years, together with establishing branches of business with higher added value, which will be linked to the existing sectors, but won't be 100% dependent on them. An example could be companies in the IT sector, incoming electromobility and the consequential need for energy transition. Please refer

to the allocated financial resources from the Just Transition Fund for strategic projects in regions affected by the cessation of mining.

Regarding the ageing population, the need for workers in social services, incl. implementation of social services in the home environment, is set to grow. The low standard of living of seniors and the consequent need for support from the state will have a risky effect here.

Table 4: Employment in selected regions and the Czech Republic according to NACE, 1998–1999, 2017–2018

NACE section	Ústí nad Labem Region			Moravian-Silesian Region			Czech Republic	
	1998-1999	2017-2018	Change in %	1998-1999	2017-2018	Change in %	1998-1999	2017-2018
A – Agriculture, forestry, fishing	4.40%	2.43%	-1.97	3.10%	1.93%	-1.17	5.40%	2.80%
B – Mining and quarrying	4.30%	2.52%	-1.78	7.10%	2.00%	-5.10	1.80%	0.63%
C – Processing industry	23.60%	27.10%	3.50	28.40%	31.21%	2.81	26.70%	27.71%
D – Production and distribution of electricity, gas, heat	2.80%	1.88%	-0.92	1.20%	1.19%	-0.01	1.50%	0.99%
E – Water supply, waste management activities	1.30%	1.64%	0.34	0.70%	1.15%	0.45	1.00%	1.07%
G – Wholesale and retail trade, repair of motor vehicles	13.10%	12.59%	-0.51	11.80%	11.41%	-0.39	13.00%	11.58%
H – Transport and storage	8.90%	7.52%	-1.38	6.80%	6.33%	-0.47	6.70%	6.24%
I – Accommodation, catering, hospitality	3.30%	3.51%	0.21	3.10%	2.62%	-0.48	3.40%	3.42%
J – Information and communication activities	1.60%	1.63%	0.03	1.60%	2.89%	1.29	2.00%	3.03%
K – Finance and insurance	1.60%	1.61%	0.01	1.70%	1.88%	0.18	2.00%	2.22%
L – Real estate activities	0.40%	0.65%	0.25	0.40%	0.65%	0.25	0.50%	0.84%
M- Professional, scientific, and technical activities	2.00%	3.32%	1.32	1.90%	3.92%	2.02	2.80%	5.07%
N – Administrative and supportive activities	1.70%	2.57%	0.87	1.50%	2.78%	1.28	1.90%	2.48%
O – Public administration and defence	6.60%	7.57%	0.97	6.20%	5.18%	-1.02	6.40%	6.51%
P – Education	4.80%	5.67%	0.57	6.70%	6.79%	0.09	6.10%	6.61%
Q – Health and social care	5.30%	6.53%	1.23	5.50%	8.00%	2.50	5.40%	7.07%
R – Cultural, entertainment and recreational activities	120.00%	1.77%	0.57	0.90%	1.70%	0.81	1.30%	1.81%
S – Other activities	2.10%	1.98%	-0.12	2.40%	1.93%	-0.47	1.80%	1.75%

Source: RESTART

ENERGY TRANSITION

State Energy Concept of the Czech Republic – outlook to 2040.

According to the energetika.cz portal, based on the optimised scenario of the State Energy Concept[142], in the coming years, electricity consumption in the Czech Republic is expected to grow to 85 TWh by 2040. An increase is expected for both large and small customers, except for households, where, on the contrary, savings are expected in the future.

The total gross electricity production should also increase and, in 2040, production should amount to almost 90 TWh. Significant fluctuations are expected by 2025, when obsolete coal-fired power plants should be shut down. On the contrary, the concept assumes a positive fluctuation in the years 2033 to 2037, when the involvement of new nuclear resources is expected.

The share of nuclear power in total electricity production should rise to 49% by 2040, while the share of coal-fired power plants should fall to 17.5%. Renewable energy sources should account for about 23%. The concept further states that the potential of hydraulic power plants in the Czech Republic is already practically exhausted, and therefore there will be an increase mainly in biomass, biogas, and photovoltaic power plants. It is the energy from the sun that should provide the largest part of electricity produced from renewable sources, by 2040 approximately 30% of green energy.

However, some experts criticise the government's overly optimistic outlook for nuclear energy. The energy concept envisages the construction of new reactors with a production of 20 TWh by 2040. At the same time, the most advanced negotiations so far concern the completion of just one unit of the *Dukovany* nuclear power plant. According to the original strategy, the life of *Dukovany* is estimated until 2035, but *ČEZ* is negotiating an extension for another ten years. Plans for the possible construction of a new unit were hampered for many years by negotiations on the method of financing, where an agreement has already been reached this year. If all goes well, construction could begin in 2030.

The completion of the *Temelín* nuclear power plant is still unclear. According to former Prime Minister Andrej Babiš and Minister of Industry and Trade Karel Havlíček in July 2021, during their visit to the *Temelín* nuclear power plant, one or two new units in *Temelín* could be completed when the new *Dukovany* nuclear power plant unit is completed. It is assumed that it could be in the mid-2040s.

If we add the possible complications that usually accompany similar projects, there can be long delays and an associated cost increase. With these prospects, it is unlikely that the energy concept, which at the time accounts for almost a half share of the nuclear energy, could be met. The plan for the Czech Republic to produce surplus electricity in the coming decades also cannot be considered very realistic.[143] It therefore follows that the Czech Republic, from the position of an energy exporter, will become an importer and thus dependent on energy prices, which it will not be able to influence.

ECONOMIC FACTORS

The Annual Report on the Operation of the Czech Electricity System for 2020 prepared by the Energy Regulatory Office states that total gross electricity production in 2020 reached 81.4 TWh, which represents a year-on-year decrease of 5.5 TWh (-6.4%) compared to 2019 and the lowest gross electricity production in the last 18 years. The COVID-19 pandemic has also had an impact on the decline in electricity production since spring 2020.

The largest year-on-year change in gross electricity production was recorded by steam power plants, which produced 6.2 TWh less year on year (-15%) and their installed capacity fell to 10.1 GW, which is a decrease of 0.7 GW (-6.3%). On the other hand, gross electricity production increased, especially in steam-gas power plants by 0.5 TWh (+9.5%), and relatively in pumped storage hydropower plants by 0.1 TWh (+10.8%). Gas and combustion power plants also produced more, by 0.1 TWh (+3.1%). Gross electricity produc-

142 Available at https://www.mpo.cz/assets/dokumenty/52841/60959/636207/priloha006.pdf.

143 energetika.cz, article "Electricity generation in the Czech Republic", author Jana Březinová https://www.elektrina.cz/vyroba-elektriny-v-cr.

tion from brown coal decreased by 6.1 TWh (-17.3%), production from hard coal decreased by 0.2 TWh (-10.9%) year on year. Electricity production from natural gas increased by 1.1 TWh (+19.4%) compared to 2019. Electricity production in hydropower plants increased by 0.1 TWh (+6.7%) year on year.

As in previous years, the balance of electricity imports and exports was permanently negative in 2020, amounting to 10.2 TWh for the whole year, which means that we exported more electricity than we imported (Table 3). This represents a year-on-year decrease of 2.9 TWh (-22.5%). Exports fell by 0.6 TWh (-2.5%) year on year, while imports rose by 2.3 TWh (+21.2%) year on year.

For each import of hard coal, it is necessary to consider the volume and for how long it will be necessary. Hard coal imported for the needs of MSR is being used in:

1. heating plants – a source of energy for 250,000 households in MSR, an estimated 700,000 residents;
2. local combustion chambers – this heat source is mainly used by older types of solid fuel boilers, which are gradually being replaced. Even so, there are about 30,000 of them in the region.

In 2021, the last mines for the extraction of thermal hard coal were closed. Its need for the winter season is 400,000 tonnes. Already this season of 2021/22, it is no longer possible to rely on just-in-time deliveries directly from the mines, as it was in previous decades. Additional reserves of 400,000 tonnes are needed for coking coal. This is now being mined in the last mine operated in the Karviná region (*ČSM Mine*). It is therefore necessary to ensure the dumping of coal amounting to 800,000 tonnes for the heating season. MSR does not have such storage capacity now. Due to the approved environmental conditions (high dust), it is not possible to ensure open landfilling. When the mine shafts were in operation there was a continuous supply, and it was not necessary to have the capacity of landfills at such a volume.

Table 5: Share of fuels and technologies in gross electricity generation in MSR, ÚLR and KVR in 2020

	MSR	ÚLR	KVR	In total in the Czech Republic:
Gross electricity production in 2020, [GWh]	3,583.8	22,997.4	3,979.7	81,443.4
brown coal	83.6	17,820.3	1,543.2	29,073.6
nuclear fuel	0	0	0	29,073.6
natural gas	104.7	3,723.7	1,091.0	30,043.3
hard coal	1,780.7	0	0	6,586.9
other gases	775.9	47	1,139.1	1,914.2
biogas	154.5	82.4	36.3	2,035.0
photovoltaic	62.9	160.5	13.1	2,594.7
biomass	444.7	682.9	5.8	2,235.1
water	64.5	297.0	20.2	2,498.9
pumping	0	0	0	2,143.9
windmill	80.3	180.9	131.0	1,293.1
BMW (biodegradable municipal waste)	0	0	0	699.1
other solid fuel (excepting BMW)	2.6	0.1	0	119.4
waste heat	28.1	0	0	89.7
fuel oils	1.4	2.3	0	70.3
other liquid fuels	0	0	0	23.5
others	0	0	0	21.8
coke	0	0	0	1

Source: ERO-E1 report, OTE, a.s.

Table 6: Data on gross production and gross electricity consumption in the Czech Republic (GWh)

YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Year-on-year change – 2019-2020
Electricity production	87,560.6	87,573.7	87,064.9	86,003.4	83,893.6	83,305.5	87,041.0	87,041.0	86,990.5	81,443.4	
Electricity consumption	70,516.5	70,453.3	70,177.4	69,622.1	71,016.2	72,419.6	73,819.3	73,819.3	73,931.6	71,353.9	-3.5%
Electricity export	-31,068.3	-27,447.5	-27,708.7	-28,141.8	-28,661.4	-24,791.0	-28,108.9	-25,480.5	-24,122.8	-23,520.9	
Electricity imports	14,024.3	10,327.4	10,821.6	11,841.8	16,145.8	13,816.6	15,072.0	11,573.4	11,026.2	13,368.1	-22.5%
Net exports	-17,044.0	-17,120.1	-16,887.1	-16,300.0	-12,515.6	-10,974.4	-13,036.9	-13,907.1	-13,096.6	-10,152.8	

Source: own processing according to the ERO – Annual Report on the Operation of the Electricity System

These requirements arise due to the need to import thermal coal from abroad. The metallurgical company *Liberty Ostrava* stores 100,000 tonnes and *ironworks Třinec* about 60,000 tonnes of coking coal. Coal for coke production must meet the exactly given quality and chemical composition parameters. Therefore, not every imported coal will meet these parameters. The difference is whether the coal is imported from max. 30km distance or whether it is dependent on imports from Australia, Russia, China, Canada. This aspect then also applies to the import of coal for heating plants. Transport costs may increase the price of coal, which is now being determined on stock exchanges. In this case, we must expect an increase in the value of the carbon footprint due to transporting it over thousands of kilometres. However, we must also consider the throughput rating of logistics networks – in this case railways. The capacity of rail freight transport within the Czech Republic is now at its limit. The existing international corridors are used jointly with passenger transport. Due to the congestion of the railway network, the possibilities of using combined transport (water transport, railways), for example, from the seaport of Rotterdam to Děčín are being tested. In this case, it will be a huge increase, and this will last for several years. As estimated, until 2030, i.e., until it is possible to use the planned capacity for gas heating.

According to information published by the deník.cz portal, *ČEZ* has ceased operations of several coal sources in the last two years. It closed the *Prunéřov I power plant* (440 MW), closed two units at the *Ledvice power plant* (220 MW), the first unit in *Dětmarovice power plant* (200 MW) and converted the coal-fired power plant in *Ostrava-Vítkovice* (80 MW) to gas. Since January 2021, the company has not operated the *Počerady power plant* either, and in 2021 it plans to close the *Mělník III lignite power plant* (500 MW). At the end of 2022 or at the latest after the heating season 2022-2023, *ČEZ* is going to shut down three coal-fired units with a total output of 600 MW at the *Dětmarovice power plant*. Instead, it will build powerful cogeneration units that will provide combined heat and power from gas[144]. At the same time, *ČEZ* announced that the *Dětmarovice power plant*[145] would lay off about ten per cent of its employees in 2021 in

144 The Czech Republic does not have essential gas sources to cover the total required capacity, therefore gas supplies from abroad are used. With regard to the current transition of the economy due to transition from the coal use, ways how to replace it are being sought. One of the ways is the possible use of hydrogen.

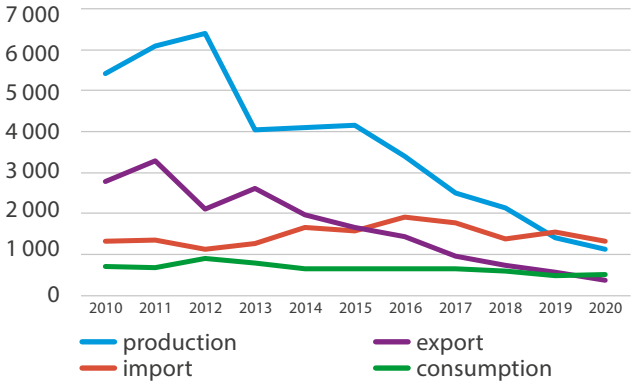
145 The Dětmarovice power plant will end up with coal and is going to lay off. The gas era is coming. https://moravskoslezsky.denik.cz.

connection with the changes, and that further staff reduction could be expected in the coming years.

Thus, the replacement of coal as a source of heat remains a big topic. An estimated 700,000 inhabitants of the region depend on supplies from central sources. Given that both district heating plants and the district heating (DH) distribution network are in the hands of private owners, the assumption is that heat prices will increase[146]. According to information published by the Energy Regulatory Office (ERO), the structure of heat production on a local scale is governed primarily by the local availability of fuel. Although the production of heat from brown coal has fallen by more than a tenth in the last four years, coal continues to play an important role in the country (40%). Natural gas (20%) and biomass (14%) are behind it.

The Chairman of the ERO Council, Stanislav Trávníček, also says: *"The domestic heating industry is gradually moving away from coal. Over the last four years, heat production from brown coal has fallen by more than a tenth, and from hard coal even by more than a quarter. Biomass production, on the other hand, has grown by almost a quarter over the same period. However, we observe significant differences across localities. For example, in the Moravian-Silesian region, most of the heat is still produced from hard coal, while the Ústí nad Labem region leads in the use of biomass with a 37% share of production."*[147]

Figure 7: Production, consumption and balance of imports and exports of hard coal in the Czech Republic



Source: Impact study on the departure from energy coal combustion, https://www.mskec.cz.

Unfortunately, the regions do not own either energy resources or distribution networks. Therefore, their role is considerably limited compared to the state (the state is the owner of ČEPS, a.s. through the semi-state company ČEZ[148], a.s.). It can help with subsidies for this area, as is the case with 'boiler subsidies[149]'.

For example, MSR provides individuals with a subsidy to replace an old high-emission solid fuel boiler with a more modern variant with automatic dosing, a gas condensing boiler or a heat pump. The aim is to reduce air emissions. In total, out of approximately 55,000 original boilers in the region, approximately 20,000 boilers have been replaced. The final number of the replaced boilers, for which there have been financial subsidies until now, will approximate to 23,000 local combustion chambers (boilers). The subsidy amounts to up to 80% of the costs and can reach the amount of 127,700 CZK (at the exchange rate of EUR 1 / CZK 26 this equates to EUR 4,912).

146 The development of consumer prices for heating and hot water preparation increased by almost 80% between 2003 and 2014. More publications of the Energy Efficiency Center: Measures against energy poverty in the Czech Republic, https://www.svn.cz.

147 Press release, 11/7/2021, available at https://www.eru.cz.

148 The joint-stock company ČEPS operates in the Czech Republic as the exclusive transmission system operator (400 kV and 220 kV power lines). Within the electricity system of the Czech Republic, ČEPS, a.s. provides transmission services and services related to ensuring the balance between the production and consumption of electricity in real time (system services). ČEPS also provides cross-border transmissions for the export, import and transit of electricity. The company has also been actively involved in shaping the liberalized electricity market in the Czech Republic and in Europe for a long time. The company ensures the balance of electricity production and consumption in real time. It provides electricity transmission between producers and distributors. More info at https://www.ceps.cz.

149 Since 2015, the Czech Republic has managed to replace about 80,000 non-compliant boilers and plans to continue with these subsidies.

ENERGY CRISIS

When leaving coal, it will be important to follow EU legislation. The Emissions Trading Scheme (ETS), which was launched in 2005, is the EU's main instrument for reducing greenhouse gas emissions. The system sets limits on the total amount of greenhouse gases that can be emitted by sectors within its scope, while allowing companies to obtain or purchase emission allowances that can be traded as needed. As their price increases, so does the motivation of companies to try to reduce emissions. In May 2021, the European Commission stated that the number of allowances in circulation increased in 2020. At the end of 2020, about 1.579 billion allowances were in circulation, according to the Commission. The European Commission has therefore decided to withdraw 378.9 million allowances from future auctions and to place them in the market stabilization reserve.[150]

Thus, the value of emission allowances, whose value in the EU at the beginning of September 2021 for the first time exceeded the value of EUR 60 per tonne of CO_2 (at the exchange rate of EUR 1 / CZK 26, this equates to CZK 1,560), plays an important role.[151] At the end of 2021, the price of emission allowances climbed to EUR 90 per tonne of CO_2 (at the exchange rate of EUR 1 / CZK 26, this is the equivalent of CZK 2,340); although it temporarily fell to EUR 80 per tonne of CO_2, it is already rising again. Further growth can be expected. The *DUHA movement* states that the European Commission assumed that the price of emission allowances would reach EUR 85 per tonne of CO_2 in 2030, while Bloomberg analysts estimated that the price of emission allowances would reach EUR 108 per tonne of CO_2 in the same year. With that allowance price, coal-fired power generation would probably become completely uncompetitive, even in the event of higher electricity prices.

According to the *elektrina.cz* portal, emission allowances also pose a problem to produce electricity from gas, which accounts for approximately 25% of the total electricity price. Rising gas prices, but also allowances, are the main factors why the stock market is experiencing a sharp price shock and electricity is becoming more expensive. Speculation by large financial companies is also a significant reason for rising allowance prices. For example, the company *CO_2IN*, whose currency is linked to the price of allowances, appeared in the Czech Republic. It is the greater interest in allowances that will push their price up.

There are 250 entities in the Czech Republic that are obliged to participate in the European emissions trading system. Unfortunately, the high price will be reflected in the total costs. For example, at heating plants or smelters, these costs will reach hundreds of millions of crowns a year. In its *Energetická revoluce* (Energy Revolution) study[152], the *Duha movement* stated that the price of allowances oscillating between EUR 18-33 per tonne of CO_2 in 2020 had already caused massive losses to all key players producing electricity from coal in the Czech Republic: *Severní energetická and Vršanská uhelná* have lost cumulatively CZK 0.6 billion (at the EUR 1 / CZK 26 exchange rate, this equates to EUR 23 million), *OKD* generated a loss of CZK 2.4 billion (at the EUR 1 / CZK 26 exchange rate, this is the equivalent of EUR 92.3 million) and *ČEZ* in the first half of 2021 due to the revaluation of *Severočeské doly*'s assets, had to write off CZK 8.7 billion (EUR 334.6 million at the exchange rate of EUR 1 / CZK 26). Metallurgical and steel products then become uncompetitive compared to products from countries where they are not obliged to pay for CO_2 emissions. If the price of allowances were not regulated and continued to rise (financial experts do not exclude a price of up to EUR 100 / tonne of CO_2), the price of heat supplied to citizens through central supply could also be jeopardised.

The relevance of the impact of emissions trading in the regions we map can be demonstrated by the situation of *Liberty Ostrava*[153], based in MSR, which sold emission al-

150 https://www.irozhlas.cz.

151 More info at https://oenergetice.cz/elektrina.

152 Accessible at https://www.hnutiduha.cz.

153 Metallurgical and steel company owned by Indian owners. https://libertysteelgroup.com.

lowances for the purpose of economic rehabilitation of its company in Romania. Employees of the plant currently operating in Ostrava (6,000 persons), led by trade unions, are concerned that these funds will be missing for the necessary investments here. Therefore, in April 2021, they launched a strike emergency and called a protest meeting. They wanted to know the following steps, which will be implemented by the current owner and the Czech government. The negotiations took place with the participation of the former Minister of Industry and Trade of the Czech Republic (ANO 2011, Karel Havlíček).

According to the *oenergetice.cz* server, the current wholesale electricity prices are the highest so far. Electricity to be supplied in 2022 was traded on the *Prague Energy Exchange* for EUR 94 (approximately CZK 2,444) per megawatt-hour (MWh). The price thus exceeded the previous record of 1 July 2008, when it reached EUR 90 per MWh and is still rising. With reference to data from the *Power Exchange Central Europe* (PXE)[154], the semi-state energy company *ČEZ* stated this on Twitter.

The *elektrina.cz* portal lists 5 reasons that highlight the current growth of energy: 1. economic recovery after the lockdown, 2. growth in the price of natural gas related to the increase in demand in connection with the closure of nuclear and coal-fired power plants in Germany, 3. growth in the prices of emission allowances, 4. speculation in the energy market, 5. rising natural gas prices: the wholesale price of natural gas also reached its peak at the beginning of October, when one MWh of gas was traded on the Prague Stock Exchange for EUR 80. The price of natural gas and electricity are closely linked. When selling electricity on the stock exchange, its price is determined by the most expensive source from which it is currently produced. And that's natural gas right now. The high price of natural gas is therefore the main reason why electricity becomes more expensive.

However, the rapid rise in prices on wholesale exchanges has meant that smaller energy suppliers have had to significantly increase prices in household price lists because they are currently buying electricity that is very expensive. As a result of this sharp fluctuation and the inability of suppliers to cover their contractual obligations, several energy suppliers have ceased operations since October 2021, leaving almost 950,000 clients without a supplier before the start of the heating season (Table 7).

Table 7: Energy suppliers that have ceased operations since 13/10/2021-31/12/2021

Energy supplier	number of clients	number of supply points
Bohemia Energy	900,000	
Kolibřík energie	28,000	
A-PLUS Energie		150
Ray Energy	3,000	
Microenergy	760	
Energie pro Tebe	300	
Český Energetický Dodavatel	7,000	
Františkovy energie	2,350	
Svinos		21
In total	941,410	171

Source: our own processing

The situation was stabilised within a few weeks with the help of the legally authorised 'Suppliers of Last Resort' (SoLR), who are required by law to supply energy (i.e., electricity and natural gas). This service is guaranteed for 6 months for small customers, only 10 days for large customers, and the decisive factor here is the amount of energy taken. This started the race to find a new supplier in a very confusing situation on the energy market and the congestion of energy suppliers, who were not able to immediately solve the enormous interest of clients. On the one hand, the supply of energy to the clients of the SoLR who were newly included in the system was secured without any outages, but on the other hand, it brought uncertainty regarding the price at which SoLR supplies them with energy. After receiving new specifications of monthly advances from SoLR, clients were very surprised to find that, in some cases, SoLR suppliers calculated three to four times higher monthly energy advances than their original advances. For many clients, these were unbearable instalments. In their difficult situation, many turned to the Energy Regulatory

154 https://www.pxe.cz/Produkty/Detail.aspx?isin=FCZBLY221231#KL.

Office (ERO), which at the time was not allowed by legislation to address the situation with energy suppliers. This has raised questions about the ERO's position and powers.

According to the *elektrina.cz* portal, experts expect household accounts to rise by 50% on average in 2022. Customers whose contractual price fixation has expired will receive an unpleasant surprise – for products with a fixation period of 1, 2 or 3 years, there has been the most significant price increase. For example, ČEZ changed the price lists of fixed products for new customers from October 2021. In the most common tariff D02d, one kWh costs CZK 4.30 when fixed for 2 years. In the previous period, the price was CZK 2.64/kWh, which means an increase of 63%. For the three-year fixation, the price climbed by 50% to CZK 3.91/kWh from the original CZK 2.60. For gas, we can expect even higher price growth in 2022 – for example, the supplier PRIMAGAS increased the price of 1 MWh of natural gas in the *Jistota* product by 222%.[155]

RELATED ASPECTS – SPECIFICS OF THE APPROACH OF MAPPED REGIONS

According to our information, the ÚLR does not have an impact study on leaving coal. The management of the Ústí nad Labem region has decided to actively negotiate the development of a hydrogen economy in its territory for a long time and thus evaluate the strong position of the region in the chemical and energy areas.

The so-called *Hydrogen Platform of the Ústí nad Labem Region* was established in the region in 2018, and currently consists of 23 entities from companies, research organisations and cities. Its goal is the preparation and implementation of activities supporting the comprehensive use of hydrogen.

In October 2019, the *Hydrogen Platform of the Ústí nad Labem Region* was established as a working group at the ÚLR Council. The platform has 16 members, including representatives of mining companies, independent experts, and representatives of the Regional Chamber of Commerce and the Economic and Social Council of the region. It deals with activities aimed at mitigating possible negative impacts on the economic, social, and environmental situation of ÚLR. Its task is to propose solutions and specific project plans that will contribute to the smooth transition of the region, and then discuss everything at the central level with the *Coal Commission of the Czech Republic*.[156]

The Ústí nad Labem region was the first Czech region to join the European industrial association 'Hydrogen Europe'. This is another effort to support the use of technology for the processing and utilisation of hydrogen. These new sectors will be important in the period of finding alternative energy sources at the time of the abandonment of coal use. Different forms of hydrogen production then bring different shares in solving the amount of emissions in the air. Thanks to its membership of this platform, the region will be able to participate in the dissemination of information and expert knowledge in the field of hydrogen technologies, develop ecological hydrogen production or enable pilot verification of new solutions on test infrastructures or in real operation. However, applied research on hydrogen mobility in the areas of road, rail, water and, in the future, air transport will not remain on the margins of interest.

As stated by the portal of the Economic and Social Council of the Ústí nad Labem Region[157], this intention is unique from the point of view of the Czech Republic in that within one region it offers a total closed circuit from the use of existing hydrogen production capacities, as well as its processing, distribution, construction of gas-filling stations, up to development within emission-free transport, and in other sectors. An integral part is the capital of research and educational capacities of local universities and research centres.

The *J. E. Purkyně University (UJEP)*[158] in Ústí nad Labem is also responding to the changes in relation to coal mining in the ÚLR. On its website, it declares that it has submitted

155 More info at https://www.elektrina.cz.

156 More info at https://www.kr-ustecky.cz.

157 More info at http://www.hsr-uk.cz.

158 Accessible at https://www.ujep.cz.

three plans totalling CZK 3.15 billion. All these intentions – the *Region to University, University to Region (RUR)*, *Materials and Advanced Technologies for Recycling, Emission Reduction, Health and Chemical Safety (MATECH)* and the *Green Energy Technologies Center of UJEP (GET Center UJEP)* – aim to comprehensively address the needs of ÚLR and contribute to a successful transition process related to the decarbonisation of the region, and UJEP is thus actively claiming the role of a key Actor in the process of the region's social and economic transition.

As a topic for the future, the Moravian-Silesian region also wants to develop hydrogen at the time of the region's transition once coal mining has ended. A memorandum is currently being signed between the Moravian-Silesian region and the *University of Mining – Technical University of Ostrava* on cooperation in the implementation of the *'Energy and Environmental Technologies Center'* project. This is an applied research project, its output is the creation of a unique location for research, development, testing and implementation of methods and technologies in the field of modern energy with a focus on hydrogen technologies. The Regional Standing Conference of the Moravian-Silesian region approved the MSR Transition Plan and made recommendations on financing strategic projects, thematic challenges, and overarching projects, which include the so-called *MSR Hydrogen Valley* with a recommended allocation of CZK 1 billion (at the rate of EUR 1 / CZK 26, this equates to EUR 38.5 million), which is focused on the support and development of hydrogen solutions in the region. It will guarantee the transfer of information between those who work with hydrogen. Thanks to the National Hydrogen Strategy of the Czech Republic, it was determined for the following period in which deadlines specific goals are to be achieved in the fields, i.e., the use of hydrogen as a fuel for passenger and freight transport, for railways, shipping, as well as for the creation of adequate hydrogen production capacities, the construction of a sufficiently massive infrastructure for its storage and transport to the necessary places of consumption. Finally, hydrogen is considered as an alternative fuel that will be used to produce heat and electrical energy. For this purpose, the construction of a 'hydrogen pipeline' network is envisaged. Until this infrastructure is ready, the use of existing gas pipelines is envisaged. Hydrogen can currently be added to them at a concentration of 2%.

The impact study of Moravian-Silesian region (MSR) describes two stages that will replace coal-fired energy in the region. Particularly, this applies to the supply of heat and electricity to the population. These are gas and nuclear variants:

1. The gas variant describes the existing District Heating (DH) distribution network. It respects the population density in the central agglomeration of MSR. In the basic variant, the coal-fired heat power plant or heat plant will be replaced by a gas-fired heat plant with hot water boilers and a small gas cogeneration unit, the purpose of which is to cover part of its own electricity consumption. The SWOT analysis confirmed that the most important factors to which the utmost attention must be given when preparing a change are the acceptability of heat prices for the final consumer and the competitiveness of the price of electricity from CHP (combined heat and power). Increased fuel costs for new natural gas sources can be balanced to some extent by sophisticated gas purchase management, higher energy efficiency, reduced in-house consumption and heat loss, lower consumption of greenhouse gas emission allowances and savings in investment and operating costs for flue gas cleaning technologies from coal resources.
2. The nuclear variant states that the feasibility of the replacement of heat from coal combustion, accompanied by emissions, with primary heat from steam generators subsidised by heat from uranium fission in the nuclear reactor, respectively from the primary heat from the steam generator (emission-free process), is technically conditioned by the availability of suitable technology. For this purpose, a number of projects from several variants currently represented by renowned nuclear technology manufacturers was assessed. The International Atomic Energy Agency's (IAEA) survey paper states that at the time of publication (i.e., in 2018), in total there were 55 types of SMRs (small modular reactors) in various stages of development worldwide; in 2020, there were more than 70 types[159], which can be divided into 4 basic groups:
   a) Light Water Reactors, either pressurised or boiling (LWR-PWR or BWR),
   b) High Temperature Gas Reactors (HTGR),
   c) Molten Salt Reactors (MSR), with the possibility of using liquid salt dissolved fuel,

159 IAEA, Advance in SMR Technology developments, https://aris.iaea.org/Publications/SMR_Book_2020.pdf.

d) Fast Reactors (FR), usually cooled by liquid metals, less often by gas.

The University of Mining[160] (VŠB TU) from Moravian-Silesian region, which has been preparing experts for the mining industry for decades, is also responding to changes in relation to coal mining. It now focuses on other areas of rock mining, especially for the construction and industry sectors. It takes advantages of the opportunities offered by EU funding. Here, their *SMARAGD* project can be mentioned, which is focused on new opportunities. It wants to be the engine of transition and revitalisation of the MSR post-coal landscape. It is preparing to solve technological and societal challenges in priority areas. These are renewable sources of energy, environmental applications, digitization of industry, transport, IT and finally it is engaged in materials research. According to this project, a research base is necessary for the efficient use of the current state of energy and the transition to carbon-free technology. It addresses technologies related to the circular economy and the development of the hydrogen economy. At the time of creating this paper, evaluations of other VŠB TU's projects, which are applying for money from EU funds, are in progress. We do not yet know the result of these.

TRANSITION TOOLS.

Possibilities of financing from EU funds

For the renewal of regions affected by the decline in coal mining, the Czech Republic can use subsidies through the Structural Funds, i.e., European Regional Development Fund (**ERDF**[161]) and the European Social Fund (ESF[162]). It is also possible to draw financial resources from the European Cohesion Fund (CF) for energy transition[163].

For the new programming period in the years 2021-2028, the European Union has agreed to create two new funds to draw funds for ceasing to burn coal, namely the Modernization Fund (MF[164]) and the Just Transition Mechanism (JTM[165]). The Social Climate Fund is also being prepared. This fund, which should be available from 2026, is going to focus on helping households by compensating them for financial losses related to the 'green' transition.

Modernisation fund

CZK 150 billion is allocated to the Czech Republic in the Modernization Fund (at the exchange rate of EUR 1 / CZK 26, this is approximately EUR 5.8 billion). The resources of this fund are made up of funds from the sale of emission allowances. It is assumed that this amount will be further increased to a value of around CZK 200 billion (at the exchange rate of EUR 1 / CZK 26, approximately EUR 7.7 billion). According to the conditions, this fund will provide a bonus to the coal regions. There are a total of three coal regions in the Czech Republic: MSR (CZK 19 billion), ÚLR (CZK 16 billion) and KVR (CZK 6.6 billion). These funds are directed primarily to the transition of energetics, heating, and manufacturing industry. Its guarantor in the Czech Republic is the State Environmental Fund. Projects to be selected for funding must relate to:

- the heating industry;
- new ways of using renewable energy sources;
- energy savings;
- clean mobility;
- or to community energy.

The first pre-registration call has already been closed. In the area of *'Modernization and Supply of Thermal Energy (HEAT)'*, MSR submitted 47 projects totalling 10% of the allocated amount for this area. These are projects for the reconstruction or replacement of heat sources, reconstruction or construction of new heat distribution, expansion of

160 Available at https://www.vsb.cz.

161 More info on Social fund, Cohesion Fund at https://ec.europa.eu.

162 Ibid.

163 Ibid.

164 More info at https://modernisationfund.eu.

165 More info at https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal/just-transition-mechanism_cs.

cogeneration, i.e., combined heat and electric energy. Energy storage projects are also supported here.

Renewable energy projects are being prepared for the area of *'New Energy Sources (RES +)'*. In our case, it will be photovoltaic and geothermal power plants. Unfortunately, at present the Czech Republic is dependent on the import of photovoltaic technology. Private entities can also submit projects here.

In the area of *'Reducing Greenhouse Gas Emissions and Increasing Energy Efficiency (ENERG ETS)'*, those projects that deal with the modernisation of production and distribution facilities for their own use and those that will implement the use of waste heat or introduce innovative elements of efficient fuel management have a chance to succeed. Finally, hydrogen applications are mentioned here.

Just Transition Fund[166]

The Just Transition Mechanism is part of the Sustainable Europe Investment Plan. The mechanism consists of three 'pillars':

1. Fair Transition Fund, (Grant scheme – 'subsidies' for regions with coal, lignite, oil shale and peat…)
2. InvestEU (mobilisation of public and private investment through the EU budget guarantee)
3. activities of the European Investment Bank (Public Sector Lending Facility).

The main purpose and objective of the Fair Transition Fund is to support territories which, due to the process of transition into a climate-neutral economy of the European Union by 2050, are facing serious socio-economic problems. These areas are mainly regions where coal mining is declining. The fund aims to focus on job creation, helping workers to move to other sectors and rebuilding the area after coal mining or related industries.

The programme is planned for the European programming period of 2021-2027. Eligibility of expenditure starts in 2021 and ends in 2029, when the programme will finally be closed. The operational programme will be based on the Territorial Just Transition Plan (TJTP), which is being prepared by the Ministry of Regional Development in cooperation with the members of the Transition Platform.

The total allocation for the Czech Republic is EUR 1.64 billion. The Just Transition Fund thus has CZK 42.7 billion at its disposal *(at a rate of CZK 26 / EUR 1)*. After deducting technical assistance funds, the regions will distribute a total of EUR 1.58 billion, i.e. CZK 41 billion. The coal regions will divide the funds according to five indicators: population, gross domestic product, unemployment, mining area and number of R&D employees. Based on the above-mentioned indicators, the funds are distributed among the regions as follows:

- Karlovy Vary region – 15.3% (CZK 6.3 billion)
- Moravian-Silesian region – 46.1% (CZK 18.9 billion)
- Ústí nad Labem region – 38.6% (CZK 15.8 billion)

The aim of the programme is to direct resources from the Just Transition Fund to areas not covered by other operational programmes. This is therefore targeted support, and these are extra resources for the regions concerned compared to other regions.

It is debatable whether the programme should also support large companies, including companies included in the emissions trading system. However, it should only be possible to support productive investments in large enterprises if they are explicitly mentioned in the Territorial Just Transition Plan, which is preceded by the elaboration of a business analysis focused on the creation of jobs in the region.

In its *RE:START 07/2021 Newsletter*[167], the Ministry of the Environment informed that within the prepared *Just Transition Operational Program*, on the basis of a public call published in March 2021, it received a total of 46 projects from KVR, 49 projects from ÚLR and 65 projects from MSR. The proposals of strategic projects underwent several evaluation phases and at the end they were discussed by regional permanent conferences of individual regions, which issued final recommendations for the inclusion in the TJTP. The projects listed in the TJTP must subsequently be approved

166 Ministry of Environment https://www.mzp.cz/cz/opst_2021_2027.

167 The new Bulletin of the Ministry of the Environment focused on the Just Transition Operational Program, https://www.mzp.cz/cz/zpravodaj_opst.

by the government of the Czech Republic and then by the European Commission. The introduction of the project in TJTP is a necessary condition in terms of possible financing. However, projects in this pre-selection do not automatically qualify for funding; they must successfully undergo further evaluation in the following steps.

In KVR, 11 projects were selected for the shortlist of strategic projects, in ÚLR also 11 projects and MSR sends 13 projects for further evaluation. Lists[168] of recommended strategic projects are available on the regions' websites. The scope and variety of the projects is very wide in all three regions. Several brownfields, projects focusing on research, development and new technologies, projects dealing with the transition to green energy or projects dealing with training, retraining and facilitating the transfer of employees outside the existing sector will apply for funds from the Just Transition Fund.

PARTICIPATING PARTIES IN THE TRANSITION PROCESS.

Regional Standing Conference.

The Regional Standing Conference (RSC) established by the Ministry of Regional Development[169] is an important platform, or let's say a tool of the transition process of the decline of coal mining. Through this platform, regions can actively develop a dialogue on territorial needs. The Regional Standing Conference is composed of experts representing key institutions and important representatives of regional policy in the field of competitiveness and regional development. The key document is the *Regional Action Plan*[170], which links the identified needs and development activities of individual actors in the region with activities that can be financed from operational programmes and other sources.

RSC operates as follows:

- monitors and supports the region's absorption capacity, and thus gives recommendations to the managing authorities on how to focus and coordinate challenges;
- provides suggestions and proposals based on the partnership approach in the region to the setting and implementation of the territorial dimension within the individual operational programmes;
- sets up working groups for the key thematic areas of the region.

Members of working groups are important actors from self-governing units, business entities, regional or non-profit organisations focused on activities in the given thematic area. Unfortunately, the proportional representation of political parties represented in regional councils is not observed here.

Entities affected by the decline in coal mining.

The impact study[171], which was commissioned by the Moravian-Silesian region, mentions the relations between the individual entities affected by the issue of mining decline. For overview, the following groups are listed here:

1, Central State Administration Bodies

Their task is to ensure the management of processes related to the selected replacement scenario (gas, nuclear energy) and to ensure them in accordance with applicable regulations. An example is the solution of energy security, public health, regional development, proof of compliance with legislative requirements, proof of compliance with international obligations.

2, Group of Strategic Partners

- Office of the Government of the Czech Republic
- European Union
- Neighbouring countries

3, Business and Industrial Groups

- Industry, manufacturers, and suppliers of technical equipment

168 In ÚLR https://rskuk.cz, in MSR https://hrajemskrajem.msk.cz, and in KVR https://www.kr-karlovarsky.cz/krajske_listy.

169 More info Ministry of Regional Development at https://mmr.cz.

170 Ibid.

171 Accessible at https://www.mskec.cz/data/storage/files/dopadova-studie-moravskoslezske-energeticke-centrum-web.pdf.

- Thermal energy producers
- Owners and operators of the DH system
- Electrical energy producers
- Electricity producers

4, Infrastructure Managers Group

- Energy Transmission System Operator
- Relevant electricity & gas & water distribution systems
- Odra river basin

5, The public

- Consumers of heat and electricity. Energy
- Natural persons interested in environmental protection, public health and energy and region development
- Landowners
- Associations of municipalities, local representative bodies, consumer associations

The whole situation mainly affects economic entities. The partners in solving the economic situation of subcontracting companies are the Chamber of Commerce of the Moravian-Silesian Region (CC MSR[172]) and the Regional Authority of the MSR (RA MSR[173]), whose involvement in the transition we discuss in the chapter entitled *General Structure of Regional Industry and Economy*. You can also find a reference to other actors in the transition in the mapped regions in the chapter entitled *Other Aspects of Transition*.

Civil society

Below, we provide more detailed information on the selected pro-environmental organisations operating in the Czech Republic:

- **Greenpeace Czech Republic**[174] has long been working to end coal mining and raises public awareness of climate issues. It is trying to enter a dialogue with the trade unions. We can see their active role, for example, in defending the rights of workers in OKD mines during the coronavirus crisis.
- **Extinction Rebellion**[175] is an international movement that uses nonviolent means of civil disobedience to stop the ongoing mass extinctions and minimise the risk of social collapse. Nonviolent civil disobedience is at the heart of the Extinction Rebellion philosophy. They support civil disobedience and rebellion because they believe it is necessary – they ask people to muster the courage and do everything necessary to bring about change. They do not focus on traditional practices, such as petitions or peaceful marches, and are more willing to accept risks (i.e., arrests/imprisonment). They currently have 20 groups throughout the Czech Republic.
- **Fridays for future**[176] is a movement of students, mostly from high schools, which is part of a global student movement calling for a global solution to the climate crisis. At the same time, it calls on political representation, citizens, companies, and society, not only in the Czech Republic, to take an adequate part in solving this problem.
- **Duha Movement**[177] has long been dedicated to renewable energy and climate change. It works, for example, in support of community energy, has a representative in the Coal Commission, but also, for example, initiated a public opinion poll on the end of coal in the Czech Republic.
- **Klimatická koalice** (**Climate Coalition**)[178] is a platform of Czech non-governmental, non-profit organisations that deals mainly with climate and environmental protection, climate change mitigation and adaptation, the social aspects of the climate crisis, development cooperation and humanitarian aid. It was established in 2007.

172 Accessible at https://www.khkmsk.cz.

173 See https://www.msk.cz.

174 More info at https://www.greenpeace.org/czech.

175 More info at https://www.extinctionrebellion.cz/, https://www.youtube.com/watch?v=lwBYT5pPjow https://www.youtube.com/watch?v=JOSmViKXSGo.

176 More info at https://fridaysforfuture.cz.

177 More info at https://www.hnutiduha.cz. Member of Friends of the Earth

178 More info at https://klimatickakoalice.cz.

- **Zelený kruh (Green Circle)**[179] is an association of 90 environmental NGOs operating in the Czech Republic. The association provides comprehensive monitoring of laws and policies, coordinates legislative campaigns, and provides active support in advocacy activities aimed at maintaining quality environmental protection and a high level of civil rights in decision-making processes. It has long been dealing with the issue of public participation in decision-making on plans and projects with an impact on the environment. It also coordinates the selection of non-governmental experts in interdisciplinary working groups and advisory bodies and government commissions and coordinates the creation of joint comments, positions, and public statements of environmental organisations on important issues in environmental protection.
- **Re-set**[180], a platform for socio-ecological transition, is a Czech organization that supports research, education, and public relations efforts to achieve a more sustainable and fairer society. It considers and popularises concepts for the social, ecological, and democratic economy, examines the causes of social and ecological problems and seeks solutions. They support bottom-up initiatives and work with social movements, helping people to organise and promote their interests together. They are part of the Europe Beyond Coal[181] campaign and in the *Climate Justice through Research and Organization* programme support the rapid end of coal and gas mining and combustion and the transition to a new energy based on decentralized, democratically controlled renewables.
- **Limity jsme my (We are the limits)**[182], bottom-up civic movement against coal mining and burning. It brings together individuals from various activist and non-activist groups throughout the Czech Republic. They were established in 2015 in connection with the government's proposal to extend the limits of lignite mining at the Bílina and ČSA mines in northern Bohemia.

According to a public opinion poll published by MEDIAN, the knowledge of civic initiatives active in the field of ecology and active in matters of diversion from coal is not yet very high on the part of Czech society. Of the civic initiatives examined, respondents most often know *High school climate strikes – Fridays for future*. 37% of respondents have heard of them. *Limity jsme my (Limits are we)* (13%) and *Rebelie proti vyhynutí* (*Rebels Against Extinction*) (10%) initiatives are significantly less well known to them. In general, initiatives are more commonly known to the younger generation of 18-34-year-olds and students.

POLICY

The structure of political power in the regions.

The Regional Council decides on the budget at the regional level. The Regional Council is reserved to ensure and control the management according to the budget approved by the council. The documents for the council meeting are submitted by the regional council. For its advisory activities, it establishes commissions in which the given issue is discussed, and its members decide by a vote on the adoption of resolutions on the given points. Committees, which are advisory bodies for the regional council, operate in a similar way. Members of committees and commissions are both regional representatives and citizens nominated by individual political entities that are represented in the regional council.

Ústí nad Labem region

The current composition of the leading coalition in the ÚLR is the result of the regional elections in October 2020. Regarding the number of inhabitants of the region (817,000), 55 representatives are elected to the Regional Council.

179 More info at http://zelenykruh.cz.

180 More info at https://re-set.cz/, https://re-set.cz/downloads/re-set_budoucnost_po_konci_uhli.pdf.

181 More info at https://beyond-coal.eu.

182 More info at https://limityjsmemy.cz. They also cooperate with the Rosa Luxemburg Foundation.

The council includes the following political parties and groupings:

Political entity	Number of representatives
ANO 2011[183]	17
ODS	8
Starostové a nezávislý (STAN)[184]	7
Česká pirátská strana (Czech Pirate Party, Pirates)[185]	6
Svoboda a přímá demokracie (Freedom and Direct Democracy, SPD)[186]	5
KSČM	4
Spojenci (Allies)[187] (TOP 09, Greens, SNK-ED, JsmePRO!)	4
Lepší sever (Better North)[188] (Ústecké fórum občanů, ProMOST)	4

The leading coalition is made up of the following entities: *ANO 2011*, *ODS*, *Spojenci*. The coalition has 29 seats out of 55. Representatives of *STAN*, *Pirates*, *SPD*, *KSČM* and *Lepší sever*, who have a total of 26 seats, are in opposition to them. The head of the ÚLR is the governor from the *ANO 2011* group. The Regional Council consists of 11 members of the council and only representatives of the coalition leader are represented in it.

Both the coalition and the Regional Council have enough votes to enforce their ideas about the direction of the region. The opposition is proposing a solution to the current situation.

Moravian-Silesian region

The current composition of the leading coalition in the MSR is the result of the regional elections in October 2020. Regarding the number of inhabitants of the region (approx. 1.2 million), 65 representatives are elected to the regional council.

183 ANO 2011 is a populist political movement that has been in the government for a second term. The movement was founded by Andrej Babiš, the second richest man in the Czech Republic. In the parliamentary elections of 2017, the movement won 78 out of 200 seats, more info at https://www.anobudelip.cz. Until April 2011, the government led by ANO 2011 had the support of KSČM. At the ANO 2011 congress in 2019, A. Babiš defined the movement as a "catch all party" (idnes.cz). In the European Parliament, ANO 2011 is represented in the political club Renew Europe https://www.reneweuropegroup.eu affiliated to the European political party The Alliance of Liberals and Democrats for Europe Party (ALDE Party) https://www.aldeparty.eu.

184 STAN is a liberal center to center-right political movement, more info at: https://www.starostove-nezavisli.cz. In the European Parliament, TOP 09 is represented together with the STAN and KDU-ČSL in the political club of the European People's Party (EPP), more info at https://www.eppgroup.eu.

185 The Czech Pirate Party is liberal progressive political party founded in 2009. In the parliamentary elections of 2017, the party entered the Chamber of Deputies for the first time, where it won 22 out of 200 seats. More info at: https://www.pirati.cz. In the European Parliament, The Czech Pirate Party is a member of The Greens and the European Free Alliance (EFA) political group https://www.greens-efa.eu.

186 The SPD is a political movement, often characterized as populist, nationalist, authoritarian and far-right. Their policies are dominated by nationalism, the demand for direct democracy, and resistance to illegal migration and resistance to Islam. In the parliamentary elections to the Chamber of Deputies in 2017, it won 22 of the 200 seats, more info at: https://www.spd.cz. In the European Parliament, the SPD is a member of the Identity and Democracy parliamentary group https://www.idgroup.eu.

187 Spojenci is a regional movement in ÚLR, more info at https://spojenciprokraj.cz. The movement is composed of several entities from parliamentary, regional or local representation. TOP 09 is a conservative political party. In the parliamentary elections to the Chamber of Deputies in 2017, it won 7 out of 200 seats, more info at https://www.top09.cz. In the European Parliament, TOP 09 is represented together with the STAN and KDU-ČSL in the political club of the European People's Party (EPP), more info at https://www.eppgroup.eu. The Greens (in Czech: Zelení) in the Czech Republic have an ecological and social agenda. They are currently not represented at the parliamentary level, more info at: https://www.zeleni.cz. The Greens are a full member of the European Green Party and the Global Greens. SNK-ED was established in 2020 as a formal electoral entity of independent mayors for elections to regional councils, more info at: http://www.snked.cz. JSME PRO! is a regional environmental movement in the ÚLR, more info at:: http://www.jsmeprokraj.cz.

188 Lepší sever is a regional movement in ÚLR, more info at: https://www.lepsisever.cz. The movement was formed by the merger of politicians from the city's political movement ProMost https://promost.cz and Ústecké fórum občanů (UFO) https://www.ufo-usti.cz.

The Assembly includes the following political parties and groupings:

Political entity	Number of representatives
ANO 2011	24
ODS with the support of TOP 09	10
Czech Pirate Party	9
KDU-ČSL	7
SPD	6
ČSSD	5
KSČM	4

The leading coalition is made up of the following entities: *ANO 2011*, *ODS* with the support of *TOP 09*, *KDU-ČSL*, and *ČSSD*. The coalition has 46 seats. In opposition to them are representatives of the Czech *Pirate Party*, *Freedom and Direct Democracy* (SPD) and the *Communist Party of Bohemia and Moravia* (KSČM), which together have 19 seats. MSR is headed by the Governor of the *ANO 2011* group. The Regional Council consists of 11 members of the council and only representatives of the coalition leader are represented in it.

Both the MSR council and the Regional Council have enough votes to enforce their ideas about the direction of the region. The opposition is proposing a solution to the current situation.

In previous years, when the left-wing coalition of the *ČSSD* and the *KSČM* oversaw the MSR, representation in commissions and committees was proportional to the election results. At present, under the leadership of the coalition ANO 2011, ODS, KDU-ČSL, opposition political parties are provided with 1 or max. 2 seats in each committee or commission. The votes majority for the coalition is thus almost certain when negotiating.

THE ATTITUDE OF CZECH SOCIETY TO CLIMATE PROTECTION.

The attitude of the Czech public to climate change was the subject of a detailed representative public opinion survey, which was answered by 2,762 respondents, carried out by the team of the Department of Environmental Studies of Masaryk University (MUNI) in Brno and Green Dock incorporated club, presented in the second half of 2021.

Sociologist Tomáš Chabada from MUNI presents the results of the research: *"For most of the Czech public, it is no longer disputed whether climate change is a serious problem. Today, 76% of the public knows that climate change is happening and 71% are aware that human activity is the main cause. As many as 28% say they have been supporting climate protection for more than two years. Only 4% believe that climate change does not exist, and only 2% reject climate protection more than two years ago."*

He is followed by social psychologist Ondřej Kácha from Green Dock: *"Likewise the majority of the population agrees that we should solve this problem – according to 68%, it is important for the Czech Republic to take measures against climate change. It deserves special attention that, according to 66%, the Czech Republic should reduce its greenhouse gas emissions regardless of the emissions of other countries. At the same time, 70% of Czechs are in favour of a forward-looking, strategic policy and are convinced that the Czech state should solve the problems that threaten our country by 2050."*

Social psychologist Jan Krajhanzl from MUNI, head of the research team comments: *"There is already uncertainty among the Czech public as to whether climate change is happening or not. But residents are also unclear about several other issues. For example, only 7% correctly identified that the Czech Republic produces more greenhouse gas emissions per capita than China, India, or the United Kingdom. And only 24% correctly answered that the Czech Republic is one of the largest exporters of electricity in the European Union. The uncertainty is also illustrated by the fact that as much as 45% do not dare to answer whether or not the Czech Republic should withdraw from coal, or in what year."* [189]

189 Jan Krajhanzl, Tomas Chabada, Renata Svobodova. *The Czech public's relationship to nature and the environment.* Representative study of public opinion. Masaryk University. 2018/ ISBN-13 978-80-210-8967-9. Accessible at: https://enviro.fss.muni.cz/ceskeklima2021.

Despite the positive attitude of most of the Czech public towards climate protection, the Czech public's concerns about the impact of climate measures on the Czech economy cannot be ignored. According to a survey by STEM, majority of the population (74%) is afraid of rising prices and slight negative effects. The public is strongly concerned about the high cost of reducing emissions. And this also applies to those who agree to reduce emissions (87%). Only one in four surveyed thinks that the Czech Republic can make money reducing emissions. It is therefore highly probable that the public does not believe that the transition of the economy into a low-emission economy can be profitable for the Czech Republic. The research also showed that although carbon neutrality is intensively discussed in the professional community, where it has received considerable attention, it is currently a completely unknown term for the general public. 53% of adults in the Czech Republic have never even come across the term. Less than a third of those who are otherwise very interested in climate change have heard of this term. In general, the Czech public supports achieving carbon neutrality as soon as possible (79%). However, it is clear from previous findings that most people are unable to place the topic in the context of the social changes that will accompany this process. [190]

ATTITUDES TOWARDS ECOLOGY AND ENERGY ACROSS THE POLITICAL SPECTRUM.

In the Czech Republic, only two political parties in the left-wing spectrum were represented at the parliamentary level in the October 2021 parliamentary elections: *KSČM* and ČSSD. This study arose in the run-up to the October 2021 House of Representatives elections. Unfortunately, in the parliamentary elections, for the first time in their history these political parties did not exceed the set 5% limit on the number of votes obtained and are no longer represented in the Chamber of Deputies of the Parliament of the Czech Republic.

KSČM policy

From the point of view of energy security, it is essential for the *KSČM* to support the energy independence of the Czech Republic using a balanced energy mix. It should be built on nuclear energy and using regional energy resources. In connection with nuclear energy, they support the expansion of the *Dukovany*[191] nuclear power plant with another reactor to draw energy from it in 2040.

Here, facilities for the joint production of heat and electricity (cogeneration) as well as renewable energy sources have their irreplaceable place. *KSČM* is in favour of a responsible approach to energy consumption at all levels of consumption. It supports the use of energy efficient technologies in all areas of life, i.e., both in the economic sphere and in domestic life, as well as in the non-profit sector – hospitals, social institutions, social organisations, authorities.

Without stable, secure, economically efficient access to energy and its prudent consumption, economic, social, and political stability cannot be fully ensured. Energy security is therefore an important political and security issue. A continuous supply of energy is essential for the running and functioning of any state.

The *KSČM*'s position is against the privatisation of *ČEZ* and they would like to strengthen the role of the state in distribution companies. From the *KSČM*'s point of view, it is very sensitive to approach coal as a strategic raw material. Coal is particularly important in the metallurgical and steel industries. It is also important as a heat source for a district heating system. The planned decline of coal mining does not provide for its replacement in real terms and threatens many companies, jobs, living standards and heat supply for citizens.

KSČM is aware that leaving fossil fuels, including a decline of coal mining, is inevitable. However, it draws attention to the danger that will arise from the rapid and unprepared decline of hard coal mining in the Karviná region. This includes the im-

190 STEM. 2020/ "Czechs fear climate change and support carbon neutrality. But they are afraid of the effects on the Czech economy." Available at: https://www.stem.cz.

191 According to ČEZ, the power plant covers over 20% of the Czech Republic's total consumption for a long time. During its entire operation, it produced over 433 billion kWh of electricity, which would be enough for more than 28 years of current consumption of all households. It is the largest employer in the region. Three thousand CEZ Group employees and suppliers work directly at the power plant. A further study by Charles University showed that up to thirty thousand jobs are related to the operation of the power plant.

pact on the socio-economic situation in MSR. Impacts on energy and district heating security for the inhabitants of the region and impacts on significant fields concentrated in the territory of MSR and beyond. Primarily in the areas of metallurgy, foundry, engineering, energy, and coking. KSČM drew attention to this issue in the elections to the European Parliament in 2019 and as the only one in the regional elections in 2020 (Fig. 9). *KSČM* considers the current situation in the dismissal of *OKD* employees to be irresponsible. There may be a situation where the Czech government changes the schedule of abatement, but there will no longer be human resources for its own mining and the readiness of mining will be severely neglected.

In the electoral programme of *KSČM*[192] for the elections to the Chamber of Deputies of the Parliament of the Czech Republic in October 2021, it declared that it wanted the energy and district heating security for the Czech Republic and further elaborated the topic as follows:

- calls for the development of a clear energy policy for the Czech Republic;
- wants to invest primarily in adapting the electricity grid to fluctuations in the supply of irregularly operating power plants;
- expresses its support for the accelerated modernisation and completion of nuclear power plants;
- and calls for the end of coal mining to be postponed until the issues with district heating and the supply of coking coal for the production of iron and steel in domestic industrial plants are resolved.

Picture 8: KSČM election graphics on coal issues

a) Elections to the European Parliament 2019, text: (We're working ourselves into the ground and he's laughing? Let's stop tunnelling our businesses for billionaire profits! On 24.05 and 25.05 vote KSČM. The picture shows businessman Bakala, see OKD in the text)

b) Regional elections 2020, text: (#wewilldomore. Safety. Health. Self-sufficiency. Solidarity. The Czech Republic cannot do without coal, coke, iron, and steel!)

Source: kscm.cz

192 Accessible at https://www.kscm.cz.

From the point of view of the *KSČM*, the state's explicit task is to ensure sufficient supply capacity for both electricity and heat in the required quality, quantity and especially the price. Access to housing and energy resources is one of the basic human needs that must not be denied people. The situation known as energy poverty[193] must not worsen.

ČSSD policy

The topic of coal decline appeared more significantly in the regional elections in 2017, when, together with the *KSČM*, the *ČSSD* also mentioned this topic more significantly. Given that the coupon privatisation carried out after 1989 did not turn out as planned, the *ČSSD* is accused in this failure for the fact that the *ČSSD* was in charge of the government at the time (Prime Minister, Minister of Industry and Finance), although the courts did not find any errors in the privatisation process.

In the *ČSSD's*[194] election programme for the elections to the Chamber of Deputies of the Parliament of the Czech Republic in October 2021, the party declared that it is going to:

- set the energy mix so that the Czech Republic remains self-sufficient in energy production, but is not dependent on burning solid and liquid fossil fuels, reducing air, water and soil pollution;
- build renewable sources, modernise and build heating plants and reduce the energy intensity of all sectors;
- prepare a coal reduction strategy by the end of 2021, including addressing its social and environmental impacts, for example by introducing a retirement rent for the employees of mines and coal-fired power plants, and by supporting projects in the field of decarbonization and economic diversification of the affected regions;
- continue the so-called boiler subsidies and the New Green Savings Programme to support local renewables and support the construction of small local power sources (including alternative types – pyrolysis technologies, etc.) and 'smart' energy saving systems;
- support international agreements on global climate change and the introduction of global carbon borders, and that they would agree with the Green Agreement for Europe unless it leads to EU debt in financial markets, devastation of European industry or jobs, and unless support for nature protection only serves to mask natural gas subsidies
- adjust the State Energy Concept to respond to the rapid changes in the energy sector (e.g., decentralization), support small energy sources, modernise distribution networks, increase electricity production from renewable sources and build energy storage capacities, especially pumped storage plants, where the area after lignite mining can be used for their construction

Before the elections to the Chamber of Deputies in October 2021, the aktuálně.cz server brought an election special *'What bothers the Czechia – challenges for a new government,'*[195] in which it focused on the burning issues in the Czech Republic. As part of this study, the aktuálně.cz server also conducted a survey by selecting candidate entities. One of the topics was a survey on ecology. Below are the answers of the political parties that were successful in the parliamentary elections:

- current governing coalition: *Spolu Coalition (ODS, KDU-ČSL and TOP09)* and with the *Coalition of the Czech Pirate Party and STAN*
- opposition parties: *ANO 2011, SPD*.

What specific steps do you think the next government and the Chamber of Deputies must take to improve air quality in the Czech Republic, to bring emissions in crisis areas to acceptable limits or to mitigate the air quality impacts caused by local heating?

193 International parameters have not yet been clearly defined. Energy poverty – is a situation in which it is difficult or impossible for a household to ensure sufficient heating of the apartment at an affordable price. A temperature of 21°C in the living room and 18°C in other living rooms is considered sufficient. A situation where more than 10% of a given household is spent on securing these conditions is considered alarming. Lonely living seniors, single-parent families, single-income families are most at risk from this condition. In the Czech Republic, this affects 10% of the population. Another 10% already have a problem paying the increased costs on time.

194 Accessible at https://www.cssd.cz/data/files/cssd-program-vize-2030.pdf.

195

Spolu Coalition (ODS, KDU-ČSL and TOP 09)

- We take the forthcoming energy transition to renewables seriously, but we refuse to resign ourselves to energy security, self-sufficiency and independence. We see our future in a combination of nuclear energy and decentralized renewables, especially rooftop photovoltaics, whose energy we will store in batteries.
- The limits of coal mining are final and unbreakable for us. The decommissioning of coal-fired power plants will take place on an ongoing basis, together with the transition to low-emission sources (gas, waste, biomass). We support the construction of a new nuclear unit in *Dukovany* on the condition that it will not be built by Russian or Chinese companies. We see the future of nuclear use in smaller modular reactors.
- New photovoltaic systems on one hundred thousand rooves by 2025. It will be easier for owners to install equipment on their homes, and they will be able to share or sell the energy gained. We will support the construction of battery repositories, or the use of geothermal energy or the conversion of excess energy into usable hydrogen, which will enable the transition of the Czech energy sector in the future.

Coalition of the Czech Pirate Party and STAN

- *Czech Pirate Party*: In particular, it is necessary to create truly effective plans to improve air quality, reduce the number of exemptions for overflows and provide financial incentives to replace old heating equipment. Every year, thousands of people die prematurely from respiratory diseases, and the European Commission has initiated infringement proceedings against the Czech Republic for exceeding air quality limits, so we face heavy fines. Unfortunately, the current government is playing into the hands of industrial polluters, including companies in the Andrej Babiš holding.
- *STAN:* From our point of view, the next government and the Chamber of Deputies should, above all, begin to think systematically and, on that basis, to make systemic changes as well. Listing indefinite subsidies for various projects does not make sense unless they fit into a comprehensive concept that is key to the desired efficiency. The new government should start focusing on the circular economy, promoting electromobility and finally starting to invest in innovation. Innovation should be another way, together with 'boiler subsidies'.

ANO 2011

- In the coming years, we are going to invest a record amount of more than CZK 350 billion in improving the environment, which our government has negotiated in the EU. We will meet our obligations arising from the Paris Agreement and European legislation, and by 2025 we will reduce greenhouse gas emissions in the Czech Republic by at least another 15 million tonnes of CO_2.
- We will prepare the conditions for the end of coal combustion in the Czech Republic by 2038 at the latest, with the aim of striving for an earlier end date, providing that the state is energy self-sufficient and that social impacts are minimised. The optimistic scenario is the end of coal around 2033. Coal mining limits will remain unbreakable.
- We will continue the 'boiler revolution' we have begun – we will support the replacement of another 150,000 old domestic boilers with new, modern ecological and economical resources, and thus significantly further improve air quality in hundreds of cities and municipalities.

SPD

- The *SPD* party promotes a gradual reduction in emissions. It aims to achieve this by gradually and judiciously closing down power plants, heating plants and coal-fired companies. The party sees further emission reductions in reducing the unnecessary transport of food and other goods across Europe from place to place.

The environmental organisations *DUHA Movement*, together with the *Zelený Kruh* association, published their own evaluation[196] of the candidates' election programmes before the elections and asked the candidate parties to answer 30 supplementary questions. The aim was to assess how political parties want to address the 14 key issues and challenges associated with climate change

196 Duha movement. 2021/ '"Elections 2021. Environmental organizations evaluate election programs and election plans of political parties.' Available at: https://volby.hnutiduha.cz.

and the environment (air, waste, healthy forests, protected areas and species, water in the landscape, land and agriculture, an end to coal, the just transition, energy efficiency and savings, RES, renewable energy sources, nuclear energy, transport, raw material extraction, climate policy (national, EU, international) and citizen participation in the assessment of plans). However, only 7 candidates responded to the questionnaire, several of them only partially. It was a targeted election campaign and an effort by environmental activists to influence pro-environmental voters and help them make informed decisions.

PROGRAM STATEMENT OF THE GOVERNMENT OF THE CZECH REPUBLIC

On 6 January 2022, the government of Petr Fiala approved the final version of the Program Statement of the Government of the Czech Republic[197]. The priority is to support the development of nuclear energy and renewable sources with an emphasis on energy security, self-sufficiency, climate goals and affordable energy supplies. From the whole statement, we quote points concerning energy:

ENERGY INDUSTRY

- By the end of 2023, we will prepare an update of the State Energy Concept of the Czech Republic regarding the EU's climate and energy goals.
- We see the future of Czech energy in the combination of nuclear energy and decentralized renewable sources with an emphasis on technological neutrality and scientific knowledge. These principles must also be respected in the EU regulatory framework for sustainable financing (taxonomy) and in state aid rules. We will not back down from efforts to recognise nuclear energy as a sustainable activity and natural gas as a key fuel of the transition in the decarbonization process.
- We will contribute to the rehabilitation of photovoltaics because we consider it to be a key renewable resource in our geographical conditions. We will contribute to the establishment of new photovoltaic installations on at least one hundred thousand rooves by 2025.
- By the end of 2022 we will prepare a new energy law, which will contain the principles and requirements for community energy. The installation of equipment on houses will be simplified for the owners, and they will be able to share or sell the energy obtained. We will support municipalities and communities in their efforts to simplify administration in the construction industry. Customer protection and state tools for energy market supervision will be strengthened.
- Coal-fired power plants will be shut down on the condition of ensuring sufficient backup capacities. We will not allow the disintegration of the central heat supply; we will use combined heat and power generation and we will equalise market conditions. We will prepare the transition of the heating industry to low-emission sources so that prices do not rise sharply. We will urgently prepare a strategy for the decarbonization of the heating industry, which we will discuss with relevant partners. We will create the conditions for energy transition and development of coal regions so that a shift away from coal is possible by 2033.
- We will negotiate an increase of the resources in the Modernisation Fund and their real use for the transition and modernisation of the country. We will use the resources of the Modernisation Fund and the proceeds from emission allowances effectively to modernise the energetics and heating sectors and industry, as well as austerity measures, which will benefit citizens and small and medium-sized enterprises. The funds will also be used to offset the impact of the energy crisis.
- The importance of natural gas as a transitional source for the compensation of fluctuations will increase. However, the increase in its share must not threaten us geopolitically. We will try to acquire a share in an LNG terminal in a neighbouring country so that we have access to more resources.
- We will legislatively improve the functioning of state supervision in the sale and distribution of electricity. We will create legislative conditions for small energy producers to supply energy to the grid at a fair price.
- Czechia will stop lagging in saving energy. In public procurement, we will consider the entire life cycle and support more efficient energy management in state buildings.

197 https://www.vlada.cz/cz/programove-prohlaseni-vlady-193547.

- We will continue the Green Savings programme (insulation, boiler replacement, installation of PV in conjunction with batteries, heat pumps with PV).
- We will continue to publicly support energy research and development with a focus on low-carbon technologies.
- We will continue to develop smart grids. The aim will be to ensure high reliability, quality and security of electricity supply and to strengthen the digitization and automation of the distribution and transmission system.
- We will place greater emphasis on increasing the energy efficiency of the economy and renovating buildings, including public ones, as one of the key pillars of EU and Czech energy and climate policy.

NUCLEAR ENERGY

- We will support the development of nuclear energy. In this way, we will achieve the fulfilment of climate commitments and ensure long-term compensation for emission sources.
- In the EU, we will promote a level playing field for nuclear energy with other low-carbon sources.
- We will support the long-term operation of the existing nuclear units and the construction of a new source in *Dukovany*, if it is not built by Russian or Chinese companies. We will prepare the basis for decisions on other units in the existing nuclear sites in *Temelín* and *Dukovany*.
- We will strengthen research and development and international cooperation in nuclear energy and prepare a concept for the use of small modular reactors in the Czech Republic.
- We will continue to prepare a deep repository for radioactive waste. We will strengthen the rights of the affected municipalities when deciding on the location of the deep repository. We will also evaluate other solutions than the final location of the deep repository in the Czech Republic.

IN CONCLUSION

In the final summary of this study, it is possible to identify several facts that seem to be essential.

To meet its international commitments under the Paris Agreement on climate change, the European Union has committed itself to achieving climate neutrality by 2050 and has set a new ambitious and binding target of achieving a net reduction in domestic greenhouse gas emissions by 2030 of at least 55% compared with 1990. This is a substantial increase from the original target of reducing emissions by 'only' 40% by 2030. To meet this ambitious goal, the EU has enacted new legislation in several EU policy areas.

In 2019, an energy package called 'Clean Energy for All Europeans' was approved. **EU Member States have been required to draw up plans to address the risks posed by the change in the energy mix, new trading mechanisms (especially cross-border trade), the increase in renewable energy sources and their distribution in transmission networks. It was a supplement to the existing energy legislation, which aims to supply 32% of energy from renewable sources by 2030 and improve energy efficiency by 32.5%.** Individual EU member states, however, do not start from the same basic point, but from different positions. Each state has specific climatic conditions, population, size, and existing industrial infrastructure. All these and other parameters subsequently affect the way in which the EU's goals can be achieved in the given countries and overall.

If we look at it critically from the point of view of the Czech Republic, we can note the following:

- The current SEC (state energy concept) and territorial energy concepts in the affected regions in the field of energy do not follow each other. Regions with a higher coal reduction impact have prepared their own strategies. From the authors' point of view, it is essential that the SEC meets the energy needs of industry, the municipal sphere and the population at a given time and in the long term. The current unsatisfactory situation may consequently mean that, in the next two years, due to insufficient capacity of energy sources, supplies may be reduced and thus demand may not be met. The

approved legislation also obliges Member States to submit national energy and climate plans[198]. For the following period, it is therefore necessary to urgently and fundamentally update all strategic documents related to energy (e.g., the energy concept of the Czech Republic, the hydrogen strategy, and the plan for renewable energy sources). From this point of view, it is necessary to prepare a good analysis of this territory regarding the population growth, the development of the residential structure, as well as to process data from the Czech Statistical Office from the Census of People, Houses and Dwellings carried out in 2021. These data need to be linked to the energy needs necessary for the industrial development of specific regions. The aspect of energy consumption in public facilities must not be left out either. It should be a matter of course to include future expected benefits, for example, from the insulation of buildings or from the use of energy-saving equipment. Climate data management is also an important parameter for estimating energy consumption.

- During the transition to a new energy mix, the condition, capacity, and security of the distribution network will be important factors. The current distribution networks in the Czech Republic can transmit the necessary energy even with certain reserves. However, it will be necessary to ensure that the disconnection of coal energy sources and the connection of new ones does not cause long-term congestion. This transition process will take some time, during which a significant modernisation of the transmission systems must take place. In the context of the Czech Republic, the period of transition will also depend on the quality of legislation in the field of spatial planning and the Building Act. Specifically, the Building Act underwent major changes in 2021, and the current five-coalition government is going to work to amend it. If this happens, the process of authorising the construction of new infrastructure lines (e.g., very high voltage lines, construction of new medium-pressure natural gas pipelines) could be extended or, conversely, the possibility of disconnection from the existing district heating system may be reduced.
- For a successful transition to RES (renewable energy sources), it is necessary to ensure enough natural gas as a transition medium for the needs of the Czech Republic by concluding long-term contracts with suppliers. For a smooth transition from coal to gas, it is necessary to start negotiations on extending the supply of this medium with existing suppliers or signing new commitments with suppliers who will be able to keep the price and quantity of supplies to meet the needs of industry and the population. It is necessary to start building enough gas-fired power plants to replace the failure of the coal-fired ones. Under no circumstances should a coal-fired power unit be closed (disconnected) until the new equipment is ready for use. However, the construction of gas sources and the planned use (after 2040) of nuclear resources in the Czech Republic will take a long time. In the case of natural gas, we consider it restrictive that the transition period for gas-fired power plants is set for a short period (2030), also regarding the fact that the combustion of gas releases CO_2 into the atmosphere (about half the volume compared to coal combustion). In addition, there is a precondition for further growth in the price of this medium. In the Czech Republic, the use of nuclear energy as the main component of the national energy mix is also emphasised more for these reasons. The use of electricity from new nuclear units in the Czech Republic is planned, for example in the production of hydrogen. This was announced by the Deputy Minister of Industry and Trade for Energy in an interview with the *E15* daily newspaper. The 'rose hydrogen' is designed to help in the fulfilment of the 2050 climate neutrality targets. The proposal for an EU taxonomy (ecological investment support system) currently provides for the use of nuclear energy.[199]
- Although it seems that the Czech Republic might be satisfied with the European Commission's decision to classify energy produced from nuclear and natural gas as climate-friendly within the taxonomy, it is not clear whether the adopted rules are realistic in the context of the Czech Republic and in favour of a successful energy transition. For example, the Czech Chamber of Commerce, the Heating Association of the Czech Republic,

198 National plan of the Czech Republic in the field of energy and climate, available from the Ministry of Industry and Trade's website, https://www.mpo.cz.

199 Accessible at E15, 22/2/2022, article 'New nuclear power units could also produce hydrogen, the Ministry of Industry expects,' https://www.e15.cz

or the CEO of *ČEZ*[200] were sceptical or critical of the proposal, warning of the possible negative impact and fearing that, while using these resources, they will very often confront insurmountable obstacles.

- Meeting the EU's low-carbon transition targets also poses several challenges and the need to reduce potential negative impacts, especially socio-economic ones. Leaving coal in terms of industrial use may jeopardise jobs in sectors such as energy, metallurgy, the steel industry, followed by engineering and the chemical industry, as well as downstream industries. These are all areas of industry on which the Moravian-Silesian, Ústí nad Labem and Karlovy Vary regions are, particularly, highly dependent. Ultimately, this could lead to a major threat to the social stability of already structurally disadvantaged regions. After all, we can currently observe the instability and negative impacts for broad sections of the population, companies, and energy suppliers themselves, such as instability and sharp price fluctuations in the energy market (see chapter on Energy Transition, Table 7), which are affected by political decisions of individual states, by the geopolitical situation in the world, as well as by the goals set in the field of environmental protection at the EU or international level.
- These high energy prices obviously affect a wide section of the population. In addition, in the Czech Republic, at the end of 2021, one private company that indirectly supplied energy to more than 900,000 consumption points decided to terminate its energy supply business. As a result, customers were forced to look for a new supplier. The market responded by raising prices for new customers. This caused an increase in advance payments for individuals and corporate clients. The result has been the inability of many citizens to pay such large amounts of advances at once. The negative impact was felt especially by single people, the elderly, single parents and people with lower incomes in particular. In the DPI mode, however, in February 2022 it was still approximately 35,000 people. Unfortunately, approximately 30% of the population of the Czech Republic is now unable to pay for unexpected financial expenses of CZK 10,000 or more (approximately €400). However, this is a consequence of the overall situation in the national economy, which has only been emphasised by the energy supply situation. The rise in energy prices is also reflected in the prices of all products and services.
- The current already poor state of the energy market is in evidence at a time of long struggle with the COVID-19 pandemic. In many cases, this pandemic situation has already negatively affected the living standards of the population. The current energy crisis, rising prices for basic products and services, as well as an unexpectedly high inflation rate (approximately 10% in January 2022) have made matters even worse. At the same time, it is already clear that the current right-wing government will reduce spending on social affairs and services compared to the previous centre-right coalition. We are led to do so by the declaration that the new right-wing group will seek to abolish the solidarity tax, which was a kind of progressive taxation of higher income groups.

From the authors' point of view, it is necessary to proceed as follows:

- Deal seriously and conceptually with the issue in question, which has so far been greatly influenced by various political pressures and the lax and even irresponsible approach of previous governments. It is necessary to urgently start taking steps leading to the necessary analyses and to begin an update of the strategic documents of the Czech Republic in the field of energy and RES (energy mix), and – depending on the results – to set a fixed, and especially realistic, date for leaving coal. Although the program statement of the government of the Czech Republic speaks of a departure from coal until 2033, without the above-mentioned analyses and updates, it is more a matter of pious wishes and uncertainty for all participants involved.
- Take full advantage of EU subsidies under the various EU policies and available strategies for climate protection and low-carbon transition and help the affected regions. Avoid the risk of under-subsidization, as has often been the case in the past.
- It should be in the interests of the state and political representation to prevent the gap between different sectors of society from opening-up too much and to avoid increasing the risk of the endangering of the living standards and personal perspectives of citizens in coal-affected regions, and thus prevent from worsening the often already-bad situation in these regions, and

200 Available from Haló noviny, 6/1/2022, article 'European Commission as a "cunning fox"'.

prevent their gradual depopulation. The authors believe that the Czech government has so far insufficiently addressed the social aspects of diverting from coal, which we can illustrate, for example, by the situation of coal-fired power plant employees who are trying in vain to obtain compensation from the state for job losses, as noted by the Czech Labour Union of Power Engineers (ČOSE) and by non-profit environmental organizations. Greater emphasis should also be placed on individual support and the offer of suitable retraining for workers in the affected regions and affected industries, especially the risk group in the productive age between 35-45 years, i.e., a group of people who are still far from the regular or early retirement. Regarding the affected coal regions, we must not neglect the general problem of youth unemployment, which is not negligible in these regions.

- The government should, through the responsible ministries, intensify the dialog between the relevant public administration entities and subsequently at all levels of self-government, and thus create an environment for proactive sharing of experience, exchange of information, coordination of activities to multiply the positive impact of the adopted measures and newly created strategies and procedures across the Czech Republic, but mainly in the affected regions.
- Finally, the state should play an active role in creating conditions for increasing attractiveness not only for foreign investors and should support other and emerging high-tech sectors with regard to RES technologies that can bring added value to the economies of affected regions and beyond. For example, whether it is the potential use of hydrogen (see chapter Related Aspects – Specifics of the Mapped Regions Approach), or the possible establishment of a battery plant in the affected regions, as suggested by the Analysis of Delloite and the Association of Modern Energy "Development of battery production in the Czech Republic"[201], which proposes the possible use of brownfields in regions affected by coal mining (specifically in the Ústí nad Labem and Karlovy Vary regions), or support of the development and production of components and technological units within the space industry and aeronautics. The Czech Republic should build on a rich industrial tradition and know-how, support science and research and the associated need to create the necessary educational programs in breakthrough fields aimed at addressing climate change, environmental protection, or technologically advanced fields. The Czech Republic should thus be able to move away from the "assembly plant" model and instead become the main supplier (expert) to produce important components and technological units with added value.
- Reducing the volume of CO_2 through the departure from both types of coal (hard, brown) brings considerable complications for the EU countries that are currently affected by this problem (Germany, Poland, the Czech Republic). The reason is, to a large extent, the rapid termination of mining. We state that the departure from coal seems to be unprepared in the Czech Republic.
- In general, we consider it essential that all citizens have access to energy, which we consider to be a necessity and a right. Such as the right to housing or access to education and health care.

LIST OF FIGURES

LIST OF TABLES

201 Accessible at https://www2.deloitte.com/cz.

PICTURE LIST

USED SHORTCUTS:

ANO 2011* ..... Action of Dissatisfied Citizens 2011 (political movement)
CO_2 ..... Carbon dioxide
DH ..... District heating (Czech abbr.: CZT)
ČEPS ..... Czech Transmission System Operator
ČEZ ..... České energetické závody, a.s
ČMD ..... Českomoravské doly, a.s.
ČMKOS ..... Czech-Moravian Confederation of Trade Unions
ČOSE ..... Czech Labour Union of Power Engineers
ČR ..... Czech Republic
ČSSD* ..... Czech Social Democratic Party
CZSO ..... Czech Statistical Office (Czech abbr.: ČSÚ)
ČVUT ..... Czech Technical University
SoLR ..... Supplier of Last Resort
ERDF ..... European Regional Development Fund
ECF ..... European Cohesion Fund
ERO ..... Energy Regulatory Office (Czech abbr.: ERÚ)
ESF ..... European Social Fund
ETS ..... Emissions trading scheme
EU ..... European Union
EU28 ..... Member States of the European Union
EUR ..... Euro, currency
GET CENTRE UJEP ... Green Energy Technologies Center of UJEP
GW ..... Gigawatt
GDP ..... Gross domestic product
CC MSR ..... Chamber of Commerce of the Moravian-Silesian Region
KDU-ČSL* ..... Christian and Democratic Union – Czechoslovak People's Party
CZK ..... Czech crown, currency
KVR ..... Karlovy Vary Region
KSČM* ..... Communist Party of Bohemia and Moravia
RA MSR ..... Regional Authority of the Moravian-Silesian Region (Czech abbr.: RA MSR)
KVET ..... Combined heat and power generation
IAEA ..... International Atomic Energy Agency
MATECH ..... Materials and advanced technologies for recycling, emissions reduction, health and chemical safety
MF ..... Modernisation fund
MSR ..... Moravian-Silesian Region
JTM ..... Just Transition Mechanism
MWh ..... Megawatt hour
mil. ..... Million
bln. ..... Billion
MIT ..... Ministry of Industry and Trade (Czech abbr.: MPO)
MUNI ..... Masaryk University
MUS ..... Mostecká uhelná společnost, a.s.
ODA* ..... Civic Democratic Alliance
ODS* ..... Civic Democratic Party
OKD ..... Ostrava-Karviná Mines
OS PHNG ..... Trade Union of Mining, Geology and Petroleum Industries
pp ..... Percentage point

PXE	Power Exchange Central Europe
TJTP	Territorial Just Transition Plan (TJTP)
RSC	Regional Standing Conference
RUR	Region to University, University to Region
SLDB	Census of people, houses and flats
SMR	Small Modular Reactor
SPD*	Freedom and direct democracy (Czech: Svoboda a přímá demokracie)
STAN*	Mayors and Independents (Czech: Starostové a nezávislí)
SUBAG	Sudetenlandische Bergbau A.G.
TWh	Terawatt hour
UJEP	J. E. Purkyně University
ÚLR	Ústí nad Labem Region
VŠB TU	University of Mining – Technical University of Ostrava

* political parties and entities

Post-Script

STUDIES ON CHALLENGES IN POST-COAL REGIONS IN SOUTH WEST POLAND, NORTH CZECH REPUBLIC AND EAST GERMANY

WHAT'S NEXT, AN ATTEMPT TO SUMMARISE THE RESEARCH

A difficult starting point

It is not difficult to see that the studies from the Czech Republic, Germany and Poland differ. This should not come as a surprise, however, as each of the countries went through the historical changes taking place in the industry in different ways. They were heavily influenced by the political transformation taking place in the region after 1990. The environmental challenges were compounded by years of experience with changes in ownership and structural reforms, as well as mistakes and omissions in macroeconomic policy. European and international commitments related to the restructuring of the mining sector and the reduction of carbon dioxide emissions became not only a matter of tripartite negotiations between interest groups, but also a susceptible field for political games.

Why is the research undertaken so important?

The starting point for the research was that the left should be active during the energy transition and that it should show that a friendly transition is possible. We wanted to start a process of international civic dialogue on the transition. Only by being aware of the possibility of reducing the risks of the transition and creating alternatives for the region, industry and local communities can the success of the transition and the participatory nature of its implementation be guaranteed. By launching the research, we wanted it to contribute to a partnership between transform! europe, local authorities, academia, trade unions and NGOs for climate change, transformation of the extractive industries, combating energy exclusion and creating new jobs while respecting local culture, customs and the desire to be an integral part of Europe. Russia's invasion of Ukraine in February 2022 forces us to turn our attention to the issue of energy independence and calls into question what has been agreed so far. However, this does not mean that the work we have undertaken becomes obsolete; it merely takes on a different dynamic and creates conditions for working under less time pressure.

The Netherlands has decided to build new offshore farms in the North Sea. The Belgian authorities have decided to further develop wind technologies and to accelerate the construction of solar installations. Italy plans to build wind farms both onshore and offshore. Germany, in turn, has announced that by 2030 RES will cover 80% of its energy demand, and by 2035 it will cover 100% of demand. In the Czech Republic and Poland, the development of RES is at a slightly lower level, and the costs of its implementation and the pace of energy transition are fostered by support for the development of nuclear energy and favouring hydrogen as an alternative to gas imported from Russia.

The war and the inflation that is taking its toll are forcing all the actors of change to revise their positions on energy transition. Rising energy prices can be an ally in speeding up changes that will give countries energy independence. This is a great opportunity for investments in renewable energy sources, but also for discussions about a return to nuclear power or more environmentally friendly forms of coal mining. The discussion on this topic should not bypass those directly involved in the areas facing transformation.

What did we learn from the research?

Almost everywhere, the restructuring process was associated with uncertainty and unemployment. For years, restructuring was most often associated with deindustrialisation and economic neo-liberalism. In the activities of those in power, the ecological factor and the desire to make the changes more friendly appeared rather late. The capitalist market led to a redefinition of the concept of the miners and their social roles in the mining regions. This was usually accompanied by high social costs and the failure of mechanisms to create alternatives in employment and regional development.

Over the last thirty years, the status of the industry and its employees has changed significantly. Miners are still an occupational group with which those in power must reckon, but no longer as in the past because of the importance and

position of their industry, but because of the strength and manner of the trade unions.

The bipartite and tripartite dialogue carried out over the years has led to an increase in the knowledge and competence of trade unionists and to a greater understanding of environmental challenges. Quite often – in the process of social dialogue – employee representatives are more flexible than employers. This does not mean, however, that they do not share doubts about the need for mine closures.

All the reports show that despite some differences, the transition countries, regions and industry face similar challenges. A particularly important part of these is the search for an economic and social, pro-development alternative that will increase the friendliness and attractiveness of the areas in transition. The research highlights the important role of the state and European funds in achieving a friendly transformation of regions. They attach great importance to the role of social and civil dialogue, building alliances for transformation. The role of economic, social and cultural innovation in the changes is emphasised. The issue of using existing resources is not overlooked either. It is also important that the changes are not planned from above but result from the needs and opportunities that exist in the regions. It is also important that the changes are not planned from the top down but are based on the needs and opportunities that exist in the regions. It is desirable for the philosophy of change to take into account such issues as sustainable development, respect for the environment, transparency and the understanding of local communities of the actions undertaken. It is also important that aid funds should go to local communities and not to the business that is making the changes.

Prospects for continuing work in this area

The dynamics of change should make us realise how important it is to continue to work on the topic of a just transition away from coal, which began with the research presented here, which we treat as a pilot project.

We are convinced that further steps involving selected local governments, research institutions, trade unions, local civil society organisations in the project make profound sense. Because through such cooperation it will be possible to develop guidelines for change and to activate all relevant actors, both institutional and individual, to participate in shaping them.

The project is very important, but also requires outlays far beyond the financial capacity of transform! europe and the potential partners invited to it. It should, however, be a material justifying the application for various European funds. Particularly important here is the aspect of opportunities to meet and exchange experience. Learning from each other's failures and trying to replicate successes.

Post-Script

transform! europe

European network for alternative thinking and political dialogue

www.transform-network.net

transform! europe is a network of 33 European organisations from 22 countries, active in the field of political education and critical scientific analysis, and is the recognised political foundation corresponding to the Party of the European Left (EL).

On the transform! europe **website**, you can find reports on current events relevant to Europe, as well as analyses of economic, political and social topics. In order to enable direct exchange between politicians, academics and activists involved in social movements, our calendar provides an overview of relevant international conferences and events. Moreover, transform! europe enables free access to publications released or supported by the transform! network which cover a wide range of topics on a high level. They can be downloaded from the website for free.

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www.inep.org.cy

Czech Republic
Society for European Dialogue – SPED
email: malek_j@cbox.cz
Institute of the Czech Left (ICL)*
www.institutcl.cz

Denmark
transform! danmark
www.transformdanmark.dk

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Left Forum
www.vasemmistofoorumi.fi
Democratic Civic Association – DSL
www.desili.fi

France
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Foundation Copernic*
www.fondation-copernic.org
Foundation Gabriel Péri*
www.gabrielperi.fr
Institut La Boétie*
https://institutlaboetie.fr

Germany
Journal Sozialismus
www.sozialismus.de
Rosa Luxemburg Foundation – RLS
www.rosalux.de
Institute for Social, Ecological and Economic Studies – ISW
www.isw-muenchen.de

Greece
Nicos Poulantzas Institute – NPI
www.poulantzas.gr

Hungary
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www.balmix.hu

Italy
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www.transform-italia.net
Claudio Sabattini Foundation*
www.fondazionesabattini.it
Cultural Association Punto Rosso
www.puntorosso.it

Lithuania
DEMOS. Institute of Critical Thought*
www.demos.lt

Luxembourg
Transform! Luxembourg
www.transform.lu

Moldova
Transform! Moldova*
email: transformoldova@gmail.com

Norway
Manifesto Foundation*
www.manifesttankesmie.no

Poland
Foundation Forward / Naprzód
www.fundacja-naprzod.pl

Portugal
Cultures of Labour and Socialism – CUL:TRA
email: info@cultra.pt

Romania
Association for the Development of the Romanian Social Forum*
www.forumulsocialroman.ro

Serbia
Centre for the Politics of Emancipation (CPE)*
www.cpe.org.rs

Slovenia
Institute for Labour Studies – IDS*
www.delavske-studije.si

Spain
Alternative Foundation (Catalonia)
www.fundacioalternativa.cat
Europe of Citizens Foundation – FEC
www.lafec.org
Foundation for Marxist Studies – FIM
www.fim.org.es
Instituto 25M*
www.instituto25m.info
Iratzar Foundation (Basque country)*
www.iratzar.eus

Sweden
Center for Marxist Social Studies
www.cmsmarx.org

Turkey
Social Investigations and Cultural Development Foundation – TAKSAV*
www.taksav.org
R-komplex*
www.r-komplex.org

UK
Transform (UK) – A Journal of the Radical Left
email: transform@prruk.org
The World Transformed – TWT*
www.theworldtransformed.org

* Observers

Contact us

transform! europe
www.transform-network.net
office@transform-network.net
+43 1 504 66 86
Gusshausstraße 14/3, 1040 Vienna, Austria

facebook.com/transformeurope @transform_ntwrk

transform!
europe

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www.transform-network.net