



Retirement and support packages for older workers in the EU coal sector: a briefing paper on European cases

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Table of contents

Introduction: background and objectives.....	3
Background and context.....	3
The literature: a brief synthesis	3
Report structure	4
The Polish case	5
Key lessons	5
Context.....	5
Characteristics of the schemes	6
Key results/effectiveness	8
The German case.....	11
Key lessons	11
Context.....	11
Characteristics of the schemes	12
Key results/effectiveness.....	15
The Czech case.....	16
Key lessons	16
Context.....	16
Characteristics of the scheme/intervention.....	17
Key results/effectiveness.....	20
The Spanish case.....	21
Key lessons	21
Context.....	21
Characteristics of the schemes	22
Key results/effectiveness	23
Comparative analysis and conclusions	25
Summary of early retirement schemes examined in the report.....	25
Cross cutting conclusions	28
Further reading	30
General sources	30
The Polish case.....	30
The German case	31
The Czech case	32
The Spanish case	33
Annex: Miners' Pensions in Hungary	34
An overview provided by the Trade Union of Mining, Energy and Industry Workers (BDSZ).....	34

Tables

Table 1. State subsidies planned in the 1998 restructuring programme for 1998-2002, millions of USD of 2005.....	8
Table 2. Implemented measures in Ruhr.....	14
Table 3. Implemented measures in Lusatia.....	14
Table 4. Summary of Spain's coal mining restructuring plans.....	23
Table 5. Summary of initiatives supporting mine workers' phasing out in the countries covered in the report.....	27

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Introduction: background and objectives

Background and context

This briefing paper identifies and illustrates European experiences in assisting older coal miners and other displaced workers through early retirement and other targeted support. In the context of the future cessation of lignite burning at the Matra Power Plant, the main aim is to provide information on practices and lessons learned following the closure of mining and power plant operations that could be useful for relevant stakeholders in identifying possible strategies to support older workers who cannot be easily reallocated in the labour market. The research has been developed at the request of the Hungarian Trade Union of Mining, Energy and Industry Workers (BDSZ), as part of the assistance it is receiving from the EU Coal Regions in Transition Initiative's START Programme. It will assist BDSZ in its efforts to ensure appropriate pension and welfare provision and support for its members.

Matra Power Plant (MPP) is a lignite fired power plant located in Visonta, Heves County, which has a population of almost 300 000 inhabitants. The MPP has been active since 1969 and is the second largest plant in Hungary, accounting for about 15% of the total country's electricity production. In the context of the green transition, the Hungarian government decided to close the MPP between the end of 2025 and the end of 2029. The MPP employs directly about 2 200 workers, while the companies operating in the MPP supply chain, which provide related products and services, employ more than 5 000 additional people¹. These companies are often highly dependent on the MPP for their revenues and specialised in their activities, with a low capacity to diversify. The closure of the MPP will have social and economic consequences. As far as the workers are concerned, it is worth noting that the labour force employed in the lignite mines is ageing, with about 300 workers who are expected to retire by 2025 and a similar number of people who will be over 60 by 2025. For these groups the chances to be reallocated in new jobs is very low given their age, hence an early retirement might be a valid option. Based on this consideration, in 2021, the Union of Mining, Energy and Industrial Workers (BDSZ) has already submitted to the Hungarian Government a proposal for the establishment of a social fund for the employees of the Mátra Power Plant, to finance, through

the Recovery and Resilience Facility (RRF) a benefit scheme accompanying the eligible workers until they reach their ordinary retirement age. Therefore, the cases presented in this report provide examples of possible solutions and lessons learned in other contexts which could be useful in the Northern Hungarian context.

The analysis relies mainly on a desk-based review of literature and documents concerning example of initiatives taken to support older workers after closing mines in Germany, Spain, Czechia, and Poland. In all cases, except for Spain, the literature review was integrated with the findings from interviews with relevant stakeholders, such as representatives of trade unions in Germany and Czechia², and representatives of a think tank in the case of Poland. Furthermore, these interviews were aimed at validating desk research findings.

The literature: a brief synthesis

By embracing the just transition approach, the European Union aims to avoid past experiences of people and territories left behind because of structural transformation processes, especially de-industrialisation. The desired coal phase out scenario is quite different from the transition which took place in industrial areas such as the Ruhr in the eighties or in any other place in which work disappeared (Wilson, 1996).

A green transition cannot be only driven by market forces. In fact, there is a need for developing spatial solidarity, and, more generally, reconcile climate ambition with social justice through appropriate policies (Marty, 2020). The climate crisis, in tandem with the effects of the COVID-19 pandemic and new uncertainties concerning energy supply after the conflict in Ukraine, puts pressure on fossil-dependent regions to speed up decarbonisation and energy transition. Yet these urgent transformations are riddled with social tensions and moral complexities (Gürtler & Herberg, 2021; Śniegocki et al., 2022).

In practice, policies for a green energy transition have several effects that extend far beyond reducing emissions. Importantly, they have socio-economic consequences for those marginalised populations who have already borne disproportionate burdens of an economy built around fossil fuels (Eisenberg, 2019; Doorey & Eisenberg, 2022).

More precisely, following the Emissions Gap Report (2017), a transition away from coal has historically left

1. Dias Alves et. al., (2018). EU coal regions: opportunities and challenges ahead. doi:10.2760/064809

2. In this latter case written answers to our questions were sent instead of a proper interview.

workers and communities to bear the brunt of job losses and de-industrialisation (Caldecott, Sartor, and Spencer 2017; Trebilcock 1981). While macroeconomic analyses of the employment impact of switching to more renewable energy usually highlights that there is a net job creation (Cameron and van der Zwaan 2015; Perrier and Quirion 2016; Ragwitz et al. 2009; Wei, Patadia, and Kammen 2010), there might be job losses in other locations, and hence considering only net jobs might be a poor indicator for a just transition. Indeed, case-by-case analyses are often needed to assess the kinds of jobs created, their wages and conditions, the skills required by these jobs, and whether they can be accessed by roughly the same population group affected by a coal phase-out (Miller, Richter, and O'Leary 2015).

As a matter of fact, the socio-economic consequences of transition in coal regions include worsening of working conditions and significant unemployment. Active labour market policies have only a partial counter effect. For example, in Taranto, a Southern Italy transitioning steel city, public employment centres only offer scarce, almost null, coaching and training services; the mismatch between labour demand and supply is persistent, even distant from the local education system; the labour market is hostile, lacking many decent work opportunities (Cacciapaglia, 2023).

Like for de-industrialisation processes, coal phase-out may result in economic distress rather than diversification, particularly in monolithic economies and peripheral territories. Indeed, despite several programs aimed at supporting the creation of new enterprises and entrepreneurs, regions such as Lusatia in Germany were locked in decline, and incapable of breaking a condition of "path-dependence" (Hassink, 2010).

Perfectly in line with the last century experiences of steel cities like Gary and mill towns like those surrounding Pittsburgh in the USA, transitions also lead to significant population losses, which in turn generate a loss of community sense, identity, and recognition for the working class and their families (Lubove, 1996).

Other negative impacts of a coal phase-out are those concerning poor and middle-class energy users, notably increasing energy poverty (UNEP, 2017).

Against this backdrop, mitigating policies have been developed to ensure a just transition. Among these, we find early retirement schemes, direct cash transfers as compensatory measures, and in-kind benefits, along with active labour market policies, economic diversification programs, and subsidies for new enterprises (ibidem).

In particular, early retirement schemes have been promoted to support older people against transition drawbacks. Since the transitions of the 1970s and

1980s, such schemes have been considered to have been relatively successful for older workers facing major employment obstacles, when compared against activation policies (Walker & Wiseman, 2003). Additionally, support packages have been used among other things to protect coal and steel workers, that enjoy a salary premium compared to other workers, against a worsening of their work and life conditions. However, despite avoiding a drop in individual or family well-being, this reduced the incentive to find a new job.

At the same time, early retirement schemes have been negatively impacting on social spending. This further poses a challenge to developing a sustainable and adequate pension system. In fact, pension reforms have been introduced across the European Union, at national and sector levels, to improve the pension system's (financial) sustainability, limiting early retirement schemes, among other things (Eurofund, 2016).

Moreover, early retirement schemes have also individual socio-psychological costs. With limited reskilling and working opportunities, some workers had no choice but to take up such schemes and research shows that the individuals dissatisfied with pre-retirement options have higher levels of anxiety and depression, driven by the difficulties of accepting "a role without a role". This combines with negative self-perceptions, especially in the case of men. How pre-retirement is experienced depends greatly on gender, available capital (i.e., human, social, material), as well as on institutional variables like the national security system and other macroeconomic variables (Martinez et al., 2003).

Regardless of the above-mentioned flaws, early retirement has been and will be an essential instrument for the socially responsible coal phase out or a just transition (Galgóczy, 2014).

Report structure

After this introductory section, the paper describes separately four European cases (Poland, Germany, Czechia, and Spain) and then provides a comparative analysis with a summary of the main characteristics of the cases, illustrating the similarities and the differences of the approaches. This report does not provide a detailed analysis of the transferability of the different approaches to the Hungarian context, given the specificities in terms of legislative and institutional framework, however, the aim is to provide information on lessons learned and inspiration, in order to help identify possible solutions tailored to the specific context. A brief overview of the Hungarian situation and current shortcomings in pension provision for miners, which was provided by BDSZ, is included as an annex.

The Polish case

Key lessons

- Poland is a large coal mining EU country which, over the last 30 years, has implemented several policies aimed at restructuring the sector and promoting its competitiveness, stimulating economic development outside the coal sector, reducing unemployment among former coal workers, and addressing the socio-economic consequences of mine closures.
- The implemented interventions in Poland consisted of different packages finalised to support the mining sector restructuring, normally including an early retirement scheme. Some examples of these initiatives are the Mining social package (1998-2002), the Mine restructuring company (2000-2018), the Coal allowance for mining pensioners (2012- 2018), and the latest social contracts for mining industry transformation (2021, 2022).
- The main results achieved were: reduction of employment in inefficient and unprofitable mine sites; significant income support and in-kind benefits (e.g., free coal for use in their homes); social partnership with unions and other stakeholders, or a constructive social dialogue; effective mitigation of social conflicts.
- The main shortcomings of the interventions were: significant burden on the government budget; limited positive spillovers such as a limited reuse of the skills and experiences of retired miners in supporting the development of the local economy; implementation gaps and low take-up concerning activation measures (e.g., reskilling programmes; start-up incentives).

Context

Poland, the second-largest coal mining country in Europe and the ninth-largest producer globally (Enerdata, 2018), is exposed to several contrasting factors driving change in the energy sector. These include high levels of GHG gas emission, the commitments under the European Union climate policies, the growing awareness of environmentally driven issues, but also the relevant employment and local economic dependencies to the coal sector (Greenpeace, 2019).

In Poland, the transition is not an easy challenge for certain workers, especially miners who experience significant wage premiums compared to other industries.

Nonetheless, coal mining workers are rather low-skilled, and their families depend more on their work than other workers' households (Baran et al., 2018).

Two Polish territories are particularly exposed to the challenges related to coal phasing out. First, Eastern Wielkopolska has been identified as particularly vulnerable to the clean energy transition. It is characterised by the most polluting plants in the region, while it is economically heavily dependent on coal and energy production. ZE PAK Capital Group, the biggest employer in the region, announced the end of its coal-based operations by 2030, when more than half of the workforce (55%) will have earned their retirement rights (World Bank Group, 2022).

Second, there is the Silesian Voivodeship, a prosperous, highly industrialised region located in Southern Poland, with one of the lowest unemployment rates in the country (4.3%) (Statistics Poland 2018). Since the 1990s, unlike other regions, Silesia has undergone a substantial structural transformation triggered by privatisation, efficiency requirements, and technological development. The heavy industry sector has become less important, employing only 7% of the regional workforce. Nonetheless, the region still holds the largest workforce in the country's coal mining and power sector, with more than 70 000 people. Their average age was 39 in 2021, even though surface workers are, on average, 12 years older than those working underground (48 compared to 36 years among underground miners) (WWF, 2021).

Despite such diverse challenges, the Polish transition can benefit from the country's experience in the structural transformation of its coal sector. After the collapse of the Soviet bloc and the emergence of a market economy, hard coal production has gradually decreased by 63% (from 147 million tons in 1990 to 54 million tons in 2020), followed by a 80% decline in employment (from roughly 390 000 to 80 000 jobs). Consequently, over the last 30 years, several policies have been implemented to restructure and bolster the sector's competitiveness, stimulate economic development outside the coal sector, reduce unemployment among former coal workers, and address all the socio-economic consequences of mine closures (Śniegocki et al., 2022).

These policies include early retirement schemes for miners. Importantly, they have been implemented in every restructuring programme since the 1990s. Additionally, they fit into a regulatory context where miners are one of the few professional groups which kept the special retirement privileges obtained during Communist times. Within the current pension system, the possibility of early retirement can be opted in by those employees who have reached the age of 55 and have worked for a minimum of 20 years, in the case of

women, and 25 years in the case of men, including at least 10 years of mining work. In the case of 15 years mining work, it is possible to retire at 50. However, a person with 25 years of full-time underground mining work, can retire at any age (Baran et al., 2018; Szpor, Ziółkowska, 2018; Śniegocki et al., 2022).

In the following paragraphs, five Polish schemes are summarised: the mining social package (1998-2002); the mine restructuring company (2000-2018); the coal allowance for mining pensioners (2012-2018); the social contract for mining industry transformation (2021); the social agreement on the transformation of the electricity sector and the lignite mining industry, including the spin-off of manufacturing and mining coal assets from state-owned companies (2022). For each of them, first we present the main features of the scheme and then a summary of the key results achieved, as well as possible shortcomings. It is worth noting that the scope and depth of information available varies significantly from case to case. More details about the functioning and result of the schemes can be found for the older experience, the Mining Social Package.

Characteristics of the schemes

Mining Social Package (1998-2002)

In 1998, the Polish government adopted a plan called “Reform of Hard Coal Mining”, in agreement with the largest and most influential unions active in the sector. Their representatives were involved in formulating the plan, following their proven strength in the organisation of massive strikes and their high unionisation rate (85%) (Szpor and Ziółkowska, 2018).

The shared plan was aimed at addressing the causes of the coal sector’s rapidly deteriorating economic performance and accumulating liabilities – overproduction and oversized workforce. As part of it, the Mining Social Package (MSP) was finalised to encourage mineworkers to accept voluntary layoffs through different instruments, including early retirement schemes.

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

The package contained four types of instruments, distinguished as “protective” and “activating” ones (Karbownik & Bijańska, 2000; Szpor, Ziółkowska, 2018):

- Miners’ leave, corresponding to early retirement schemes: eligible miners were those with less than five years to being eligible for retirement due to age or job seniority. It accounted for 75% of the monthly salary. Upon achieving retirement rights, the beneficiaries began to receive full retirement benefits.
- Redundancy payment: a single, unconditional redundancy payment – a “golden handshake” – which amounted to 24 months of the average salary in the mining sector. The redundancy payment was limited to workers not eligible for miners’ leave and could not be combined with the welfare allowance.
- Welfare allowance: a form of voluntary redundancy. It amounted to 65 % of the average monthly salary and was paid monthly during retraining and job-seeking for no longer than two years. If a worker gained new employment within two years after leaving a colliery, a payment of 14.4 months average salary was granted.
- Retraining course: all the former mineworkers, both underground and non-underground, were eligible for a single retraining course to improve their employability outside the mining sector.

The overall public expenditure for the restructuring programme reached USD 2.404 million (1998-2002), which the Polish government sustained with the help of the World Bank (see Table 1). An additional USD 445 million was provided by the mining companies (Turek & Karbownik, 2005).

As specified by Suwala (2010), the differences in the structure of expenditures between the 1998 and previous programmes were striking, with more public resources made available to the Mining Social Package.

Table 1. State subsidies planned in the 1998 restructuring programme for 1998-2002, millions of USD of 2005

Purpose	1998	1999	2000	2001	2002	Total	%
Total subsidy, out of which:	250	600	607	459	488	2404	100.0
Mines closing costs	71	138	155	75	59	498	20.7
Costs of repairing damage to closed mines	9	12	12	12	12	57	2.3
Social programs for redundant miners	169	349	340	272	317	1447	60.2
Special provisions for pension funds	0	84	84	84	84	335	13.9
Job creation	0	17	17	17	17	68	2.8

Note: the numbers provided in this table have been rounded to the nearest million.

Source: Suwala, 2010 based on Szlązak, 2004

The Mining Social Package also addressed other priorities, such as stimulating economic activity and support local job creation in municipalities with a functioning mine, which could start new enterprises with the mining company, take over real estate from closed or scaled-down mines, and receive preferential loans from the government (Szpor & Ziółkowska, 2018).

Mine Restructuring Company (2000-2018)

In 2000, the Polish government established the Mine Restructuring Company – mainly known as SRK – to close unprofitable mines, safeguard their infrastructure, repair mining damage, and reclaim sites.

Its agenda even included early retirement schemes for miners with less than four years left to reach the applicable retirement age (or three years for coal treatment plant employees), as well as programmes to assist workers in finding employment in other sectors (including self-employment opportunities) and to promote new job openings in other still operating mines. These schemes worked similarly to the Mining Social Package and other earlier policies.

SRK acted as a buffer in restructuring processes. Since 2010, SRK operated under the rules of the EU Council Decision 2010/787/EU on State Aid to Facilitate the Closure of Uncompetitive Coal Mines. This decision established that subsidies to existing coal mines would have to be phased out by December 31, 2018, making it impossible for EU member states to provide indefinite support to unprofitable mines. It was still possible to subsidise mine closures, for instance, by covering the costs of mine site remediation and supports for laid-off workers, but SRK could not extend coal mining activities by transferring ownership to third parties. It needed to limit its activities to ensure unprofitable mines economically, environmentally, and socially responsible closure.

The activities of the Mine Restructuring Company were financed by the state budget in line with EU state aid rules but with no involvement of European funds. State aid allocated to SRK in 2010–2020 exceeded USD 2.8 billion (Śniegocki et al., 2022).

Coal allowance and monetary benefits for mining pensioners, 2012- 2018

According to Śniegocki et al. (2022), another public response to the decline of the hard coal industry in Poland was related to the coal allowance for former employees. It was an in-kind remuneration whereby miners could receive free coal for use in their homes. Pensioners were entitled to a lifetime supply of 2.5 or 3 tons of free coal annually. Alternatively, this right was given in the form of a cash equivalent conferred on employees of coal companies in addition to the salary, as well as on pensioners from active and liquidated mines. The amount of this equivalent depended on the value of coal, based on market prices, and was determined each year by the ministry responsible for the mining sector.

Collective bargaining agreements in the mining industry included clauses concerning the coal allowance since before Second World War. However, in 2012–2015, mining companies terminated the collective bargaining agreements, including the coal allowances for pensioners. These obligations were then taken over by the State Treasury, which started paying out the cash equivalents to all entitled beneficiaries via Zakład Ubezpieczeń Społecznych (ZUS, the Polish social security institution). The financing of the coal allowance from the state budget constituted state aid to the companies, but it was considered consistent with the Council of the EU Decision of 10 December 2010 on State Aid to Facilitate the Closure of Uncompetitive Coal Mines (2010/787/EU) because it did not serve to extend the life of currently operating mines.

In 2017, the regulatory framework changed again. Every pensioner receiving the coal allowance was paid a one-time benefit as compensation for losing the right to free coal of USD 3 000 (net). The state budget financed these payments for an implementing cost of more than USD 700 million.

Social Contract for mining industry transformation, 2021

Polish restructuring programmes could not avoid the deterioration of the mining sector. Mining productivity remained low while labour costs rose, further diminishing companies' profitability and triggering industry crises. The COVID pandemic accelerated such a process and forced the Polish government to consider a new wave of restructuring and mine closures.

Facing strong opposition from the mining trade unions, in September 2020, the government abandoned its previous de-industrialisation plans. It rather started lengthy negotiations on the so-called "Social Contract", aimed at developing a mechanism to avoid sudden market-driven closure of coal mines and to prolong the coal phaseout.

The contract was signed in May 2021 by the Polish government, representatives of trade unions, Stowarzyszenie Gmin Górniczych w Polsce (Association of Mining Communities in Poland), and Stowarzyszenia Gmin Górniczych i Powiatów (Association of Mining Communities and Districts Authorities), as well as by representatives of the coal companies.

The contract specifies a schedule of closures for mines, mainly after 2030. All their workers have the right to keep their jobs until they retire or, should that not be possible, to find employment in another operating mining unit. Alternatively, they can benefit from a special pre-retirement mining leave, during which they will receive 80 percent of their salary (for those who will retire within the next couple of years) or from a one-time severance payment of USD 31 000 combined with a one-time retraining opportunity.

The Social Contract also envisages an investment of more than USD 4.1 billion in clean coal technologies, such as coal gasification, carbon capture and sequestration, or smokeless fuel production installations. Nonetheless, the contract does not specify who would make this investment and whether it is economically feasible, equally sustainable from an economic point of view (Śniegocki et al., 2022).

Social agreement on the transformation of the electricity sector and the lignite mining industry, including the spin-off of manufacturing and mining coal assets from state-owned companies, 2022

Further chasing the integrated sustainability (economic, environmental, and social aspects) in transforming electricity and mining industries, and in regions strongly associated with conventional energy, a new social agreement in Poland was officially signed on December 22, 2022.

The signed version of the agreement is the result of negotiations and cooperation among the Social Party of Tripartite Teams for the Lignite Industry and the Energy Industry, Representatives of Energy Groups (Enea, Energa, PGE Polska Grupa Energetyczna and Tauron Polska Energia) and the Ministry of State Assets (MAP). As for earlier agreements in Poland, the engagement of trade unions was important in this case. Their social dialogue pointed out that it was necessary to develop provisions to minimise the adverse socio-economic effects of the power sector and lignite industry transformations, laying the foundation for a just transition while ensuring the energy security of Poland.

The social agreement in question established the National Energy Security Agency (NABE). Through the participation of the State Treasury, NABE will separate the coal, conventional assets for the electricity production from the capital groups of the energy companies, becoming the owner of these assets. Subsequently, and gradually, energy companies will focus on the implementation of low- and zero-emission investments. Coal will be replaced by gas units adapted to supply zero-emission fuels such as biomethane or hydrogen in the future, and other renewable heat sources.

Besides the establishment of this agency, the social agreement defines the obligations towards employees of the power sector and the lignite mining sector. It includes a statutory package of social benefits for these employees and, more generally, a system of social protections and mechanisms for minimising the effects of transformation. Employee guarantees include the maintenance of their rights (working conditions, remuneration agreements, etc.) and the stabilisation of employment in the process of assets separation.

The social agreement on the transformation of the electricity sector and the lignite mining industry defines its own monitoring and implementation rules.

Key results/effectiveness

Mining Social Package (1998-2002)

From 1998 to 2002, thanks to the MSP the coal sector employment decreased by 67 000 workers, while labour productivity (tonnes of coal/person) rose by 40%. The number of miners who benefited from it was slightly higher than expected, and almost 37 000 workers chose the miners' leave option (Szpor, Ziółkowska, 2018).

Therefore, the MSP succeeded in reducing the size of the workforce and improving the mining sector's economic performance. It proved that significant employment reduction could be achieved solely via voluntary redundancy assisted by various social instruments. It

also demonstrated that trade unions' involvement could be a success factor, making it possible to implement a fast and large-scale programme of employment reduction without significant social turmoil.

Nevertheless, considering its “activating” measures, the MSP did not provide the support necessary to generate satisfactory outcomes for the workers who left the sector. Specifically, it could have been more effective in keeping ex-miners in the labour market. Contrary to expectations, in fact, only 419 miners opted for the welfare allowance. They considered it too risky, given their limited experience in job searching, lack of professional competences, low levels of education, and the uncertainties in the local labour market.

Furthermore, 30 000 miners opted for the redundancy payment, but only a few of them started their own businesses. Indeed, those who did start businesses had to shut down because they needed more entrepreneurial experience and effective support mechanisms. As a result, redundancy payments led to a large-scale retreat from the labour market. A survey of former mineworkers showed that, in 2004, 35% of the redundancy payment recipients were not employed. The average economic situation of the beneficiaries' households actually worsened after leaving the job: in 2001, 17.6% stated that they could meet only their most basic needs; in 2004, this percentage increased to almost 30%. Unsurprisingly, many ex-workers had to spend the benefit on current consumption, rather than saving or investing the money (Karbownik, 2005; Szpor & Ziółkowska, 2018; Śniegocki et al., 2022).

Equally unsurprisingly, the retraining opportunities offered by public employment services to ex-miners were insufficient, and in some cases, the new skills offered did not match the needs of the labour market. Apart from the one optional retraining course, there was no comprehensive support for beneficiaries in the difficult process of job-seeking (Szpor & Ziółkowska, 2018; Śniegocki et al., 2022).

Concerning the mining municipalities, between 1998 and 2001, they took over the real estate of decommissioned mines in many cases. Still, the local authorities mostly used the related buildings and lands for various public utility functions rather than for the development of new enterprises and economic activities (Szpor & Ziółkowska, 2018).

For all these reasons, the assistance provided under the Mining Social Package focused extensively on financial measures and greatly burdened the government budget (0.75% of GDP) (Baran et al., 2018). Like other early retirement schemes in Poland, MSP effectively reduced employment in unprofitable mines while mitigating

social conflicts. However, within programs of this kind, the skills and experiences of retired miners were not relevantly used to develop the local economy, neither in traditional nor in new sectors, further negatively impacting public finances.

Such limits may serve as a valuable guide for decision-makers facing similar challenges today, not least because preferential treatments for miners have already resulted in public controversies over the years, despite the strong influence of trade unions. Members of coal communities themselves increasingly favour a future beyond coal for their children (ISF Research, 2018; Śniegocki et al., 2022).

Mine Restructuring Company (2000-2018)

During the last major restructuring wave in the industry (2015–2018), the Mine Restructuring Company took over 16 mines and more than 13,000 employees. More than 6,600 workers took voluntary miners' leave, and more than 3,000 opted for severance pay. The rest continue to work on safeguarding the mines (Śniegocki et al., 2022).

More generally, in decades of industry restructuring in Poland, only a portion of restructuring goals have been achieved. Importantly, these aims include reductions in employment and increased productivity, but many collieries still need to improve efficiency sustainably (Kowalska, 2015).

In conclusion, based on the available evidence, the Mine Restructuring Company experience was effective in supporting employees who were willing to leave the coal sector, but it did not sufficiently promote the “transformation” of the territories and their coal phasing out.

Coal allowance for mining pensioners, 2012- 2018

In 2013-2014, 17 000 people left the hard coal mining sector, 80% of whom due to retirement (Baran et al., 2018), 13 600 people were then eligible for the coal allowance. Other available data show that, in 2017, 235,000 people were the eligible beneficiaries of the coal allowance for mining pensioners (Śniegocki et al., 2022).

As anticipated before, with the termination of the collective bargaining agreements in 2012, the Polish government accepted to provide coal allowance for mining pensioners in the place of companies. In this sense, subsidies to pensions and social security benefits for miners could be considered as an indirect form of aid to the mining industry. More generally, government expenditures on such subsidies have amounted to around USD 0.9 billion to USD 1.4 billion per year for the past 10 years (ibidem).

Social Contract for mining industry transformation, 2021

The Social Contract for mining industry transformation will be financed by public resources, but it will become effective only after the European Commission checks it for compliance with EU state aid rules. It is then worth noticing that some activities, such as retirement bonuses, are not eligible under the Just Transition Fund.

The schemes envisaged in the social contract can be very costly for public finances and, if they are not well targeted, may even discourage employment of people who, would find work anyway without the scheme.

The social contract raised significant criticism. According to Client Earth (2021), “The favourable treatment of the increasingly unprofitable, and in the longer term permanently unviable, coal mining sector constitutes an obstacle to the country’s energy transition. There are no grounds to continue to treat this industry in a preferential manner. Coming to terms with the reality facing this sector will benefit everyone (...) The funds from the state budget to provide further support for the mining industry, which is permanently unprofitable and does not comply with the new climate policy, cannot be applied for other purposes.”

For the same organisation, more generally, it is an unenforceable social contract for many reasons. Negotiating and signing a social contract between the government and representatives of the hard coal mining industry does not generate direct legal effects and requires new universally binding regulations and decisions to be adopted at national and EU levels. The contract also requires the adoption of changes to EU environmental, energy, and State aid law, which would be favourable to the coal industry but are unlikely considering the European Green Deal.

Social agreement on the transformation of the electricity sector and the lignite mining industry, including the spin-off of manufacturing and mining coal assets from state-owned companies, 2022

This recent social agreement, which is focused on the transformation of the electricity sector and the lignite mining industry, has received a considerable media attention. However, its entry into force still requires notification of its compliance with the rules of state aid set by the European Commission. Therefore, at the moment, there is still no information on results and effectiveness.

The German case

Key lessons

- Germany is today's eighth-largest producer of coal in the world. Since the 1960s, its production has gone through periods of reduction and transition for economic and environmental reasons, in a more socially compatible way compared to other industrial regions in Europe and North America.
- The implemented interventions consist of public policies the field of de-industrialisation, economic restructuring and local development, but also "baseline" social policies, including early retirement schemes which were first introduced by state legislation in 1972. More recent and specific programs of this kind can be found in the Act on Financing the Termination of Subsidized Coal Mining (2007) and in the Coal Power Generation Termination Act (2020).
- The main results achieved were: economic diversification, social dialogue and involvement of workers representatives in the company management, preventive (e.g. anticipating economic and environmental crises) and holistic (e.g. work and welfare and education and industrial development) policies, structural interventions by the government, inclusion of territorial peculiarities in the policy making, effective mitigation of social risks and conflicts.
- The main shortcomings of the interventions were: increasingly challenging financial sustainability, premature retirement of skilled and experienced workers, limited impact of public policies in coal regions (e.g., activation policies in Ruhr, formation of new industries in Lusatia), partial mitigation of social risks and conflicts (e.g., relevant unemployment rates), insufficiently forward-looking initiatives to accelerate the transition away from fossil fuels while investing in the future prosperity of workers and communities.

Context

Germany is today's leading producer of brown coal and, more generally, the eighth-largest coal producer in the world. Despite the country's last hard coal mines being shut down in 2018 and its reputation as an ecological role model, coal remains an important pillar of Germany's power supply, with a share of 35.3% (Clean Energy Wire 2023). Coal has even made a comeback in 2022 following the war in Ukraine and the European energy crisis (Reuters, 2022). Nevertheless, environmental concerns

and objectives – the major drivers of structural change according to the German Environment Agency (2021) – eventually led to Germany's coal phase-out. The "Act to Reduce and End Coal-Fired Power Generation" (2021) requires, in fact, that coal-fired electricity production must be reduced gradually and then stopped completely at the latest at the end of 2038.

Since Germany agreed on coal phase-out, the situation in mining regions has gained a new importance in policy debates, particularly in Ruhr and Lusatia. Regarding the former area, it was considered as the industrial heart of Germany, where almost all of its hard coal was mined and steel was produced. The regional economy was indeed developed according to a monolithic structure around steel and coal heavy manufacturing (Dahlbeck et al., 2021). Such a dependency turned out to be significantly unfavourable during the "coal crisis" of 1958 and the consequent rapid decline in hard coal production. Similar shocks were experienced throughout the 20th and early 21st century, bringing governments and other stakeholders together to manage the economic restructuring of the Ruhr region, especially by developing new industries in the knowledge sector. The transition lasted around 60 years, with an average annual decrease in coal production of 2 Mt/year only. Influential coalition of interests, from companies to trade unions and local institutions, sought to revive the coal industry and allowed for continuous government subsidies, at least until 2007 when the European Union put pressure on Germany to end such an unsustainable strategy. Today, the Ruhr region moved from an industry-based economy towards a mainly service-based one. The results are ambiguous. On the one hand, the high employment losses in the coal and steel sectors have not yet been fully compensated, given for example the lower value-added and income effects of the alternative jobs. On the other hand, compulsory redundancies and structural breaks have been prevented. In fact, the gradual phase-out of hard coal mining ensured that most workers had reached retirement age by the time of the final mine closure in 2018. Furthermore, the regeneration of old industrial sites towards venues of innovation or tourism, as well as the investment in culture or mobility, have improved the quality of life in the region (WWF Germany, 2019, Furnaro et al., 2021, New Climate Institute, 2022).

Lusatia is Germany's second-largest lignite mining region. Energy-related activities date back to 1815, even though, after the German reunification, the uncompetitive costs of lignite became a factor of massive structural disruptions in the region. This caused significant layoffs and population outflows, which led to structural policies of economic diversification, leveraging on innovation, yet with modest success. Lusatia tried to enhance the remaining lignite industry, by first developing carbon capture and storage technologies,

then building up renewable energies, but to fully substitute past and future losses in jobs or GDP due to the coal mining reduction turned out to be challenging (IÖW 2017). More precisely, Lusatia did not sufficiently develop innovations and new businesses. Employment opportunities decreased and worsened since older and less well-trained employees found it difficult to find new occupations, while others could only find jobs with lower salaries in renewable energy or other sectors. In addition, workers could not perceive themselves as entrepreneurs, further limiting the creation of new economic and employment opportunities. Unsurprisingly, many young people left the region searching for new jobs, and the average regional age rose above the national average (Franke et al., 2017; Furnaro et al. 2021, New Climate Institute, 2022).

Germany, hence, can rely on a long tradition in coal mining, which includes significant experiences of decline and transition. Long before the fall of the Berlin Wall, regions developed a wide range of approaches to support and govern the related processes. An overview of the implemented measures over the years is shown in the following two tables.

Among all these experiences, we find anticipatory and preventive public policies, even tailored to local realities, needs, and voices. Another central characteristic of the German approach is the active participation of different stakeholders in the policy processes, starting from the implications of co-determination and collective bargaining. Importantly, Germany opted for the use of integrative policies based on a combination of policy goals (i.e., economic diversification, workforce support, well-being, environmental remediation and protection) and mechanisms (i.e., financial support for public organisations, businesses, and workers; service and assistance for public organisations, businesses, and workers; direct investments). Moreover, Germany combined the specific programs for coal businesses, workers, and communities with its general, structural, or “baseline” policies. As a matter of fact, its internationally renowned national social security system provided the major support for coal workers and communities, independent of policies explicitly designed for this purpose (Furnaro et al., 2021).

Within the national security system in Germany, retirement plays a central role along with healthcare and unemployment. The German pension system is based largely on mandatory contributions by employers and employees, accompanied by voluntary occupational schemes in almost half of the cases. The level of pension depends on the number of years contributed (with a pension reduction of 3.6% for every year of retirement before the statutory pension age) and the average salary during the contribution period, while the statutory

pension age is being increased stepwise from 65 to 67 by 1 month per year until 2023 and 2 months per year until 2029 (Eurofund 2016). Early retirement options are certainly provided by the German pension system, representing an essential instrument for the socially responsible downsizing process and coal phase-out. The related legal framework is based on the transition payments system (APG) for coal industry employees, introduced by state legislation in 1972 and still valid nowadays with certain amendments. More recent and further specific programs of this kind can be found in the Act on Financing the Termination of Subsidized Coal Mining (2007) and in the Coal Power Generation Termination Act (2018). All their characteristics and effects are detailed in the following sections.

It is worth noting that Germany also relies on partial retirement schemes, according to which, from the age of 63, people can receive a partial early pension and work part time simultaneously up to the statutory pension age. Part-time work can be at 33%, 50% or 66% of the full-time working hours (ibidem).

Characteristics of the schemes

Transition payments system (1972 – nowadays)

The legal framework for early retirement schemes in Germany is based on the transition payments system (APG) for coal industry employees introduced by state legislation in 1972. These payments take the form of financial bridging support, paid monthly until the workers are qualified for a regular pension. They can be granted for a maximum period of five years, during which recipients can keep working for other companies.

The volume provided depends on the individual's pension, without any reductions made. Rather, opportunities for additional earnings and benefits, such as tax exemptions, are offered to compensate for the wage reductions. Further, additional mandatory grants are provided by the employer, if the adjustment money is below 60% of the employee previous salary (Galgóczy, 2014, New Climate Institute, 2022).

Initially, this adjustment money was available to workers over 50 (underground coal miners) and 57 (surface coal miners). Over time, however, the benefits associated with early retirement schemes have been restricted. Following the “Retirement with 63” pension reform in 2014, early retirement is available at 63 for persons with an insurance record of at least 35 years. Furthermore, in case of retirement before the statutory retirement age, benefits are permanently reduced by 3.6% for each year pensioners fall short of the statutory retirement age. Individuals can still retire at 63 without pension penalties if they complete 45 years of insured time.

Table 2. Implemented measures in Ruhr

Measure	Years	Funds	Description
Social policies	1968-2020	€18bn National	<ul style="list-style-type: none"> Retraining, financial aid to support new employment, liberation of unemployment insurance, early retirement
Subsidies for domestic coal sales	1968-2018	€165bn National	<ul style="list-style-type: none"> Subsidies to close gap between domestic and international coal prices Phase-out initiated in 2007
Technology programmes for steel, coal, and energy	1974-1984	€1.3bn State/ National	<ul style="list-style-type: none"> Creation of jobs via aids for existing companies. Modernization of companies.
Development program Ruhr and NRW	1968-1975	€16bn National	<ul style="list-style-type: none"> Settlement of new companies without any sectoral specification (economic reorientation) Education (est. universities) Transport infrastructure
Action program Ruhr	1980-1984	€83.5bn State/ National	<ul style="list-style-type: none"> Technology transfer and innovation Culture and environment Refurbishment of old industrial sites
Technology programs	1985-1988	€200m State/ National	<ul style="list-style-type: none"> Support for development of new products in 8 fields (e.g., environment and technology)
Future initiative coal and steel regions	1987-1989	€1bn State/ National/EU	<ul style="list-style-type: none"> Innovation and technology funding Education of workers Support for soft location factors
IBA Emscher Park	1989-1999	€2.5bn Public/ private	<ul style="list-style-type: none"> Financial support for individual projects for economic reorientation and better living conditions Coordination Consulting
EFRD & public funding for individual projects	1989-2006	€3.7bn National/EU	<ul style="list-style-type: none"> Investment and research support Development of education and research facilities Environmental measures Creation of business centers
EFRD & public funding for individual projects	2007-2013	€2.5bn National/EU	<ul style="list-style-type: none"> Entrepreneurship Higher living conditions Improvement of innovation activities
EFRD & public funding for individual projects	2014-2020	€2.5bn National/EU	<ul style="list-style-type: none"> Subsidies for innovation and technology Support for SMEs Support for renewables and energy efficiency

Table 3. Implemented measures in Lusatia

Measure	Years	Funds	Description
Social policies	2020-2048	€4.8bn National	<ul style="list-style-type: none"> Early retirement, pension contributions, retraining, additional earning opportunities, and other benefits
German Federal Government support for coal regions (incl. Lusatia)	2020-2038	€40bn National/ EU	<ul style="list-style-type: none"> Investment package for regional governments (€14bn) Federal measures incl. R&D funding, infrastructure investment, and establishment of federal facilities within coal regions (€26bn)
German Federal Government support for Lusatia (with support of EU JTM)	2020-2038	€17bn National/ EU	<ul style="list-style-type: none"> Immediate investment in new infrastructure projects such as transport and broadband Establishment of new clusters for research, university, and agencies Establishment of federal agencies
Coal-fired Power Cessation Act	2020-2038	€5-5.4bn National	<ul style="list-style-type: none"> Decommissioning premiums of €165,000/MW, decreasing from 2020 Support for conversion to CHP and from coal CHP to gas CHP €390 000/MW
Mine reclamation	2018	€2.2bn National	<ul style="list-style-type: none"> Conversion of 140 km² former open-surface lignite mines into 24 artificial lakes, connected by 70 km of canals

Source: New Climate Institute (2022)

Thus, working years count for early retirement, besides care activities, education, military service, or sickness. Unemployment is also relevant in the last two years before early retirement. In this way, governments aimed to avoid “voluntary unemployment” bridging the years to retirement (OECD, 2019).

Act on Financing the Termination of Subsidized Coal Mining (2007)

In 2007, the German government passed the “Act on Financing the Termination of Subsidized Coal Mining” (AFTSC), to gradually end the significant subsidies for sales of domestic hard coal by 2018. Starting from 1950, the national government provided EUR 331 billion of direct and indirect subsidies to the hard coal industry.

Although the hard coal production declined from 150 million metric tons in the past to 21 million in 2007, and the number of employees from more than 600 000 to 33 000, many employment opportunities in the Ruhr area were found in the mining sector (5-10%). Because of this, the act did not pass in a particularly favourable environment.

The National Ministry for Economic Affairs and Energy established guidelines to provide further specifications on implementing this policy. The ministry’s subordinate office, the National Office for Economic Affairs and Export Control, was then in charge of disbursing the subsidies for domestic hard coal, set to phase out by 2018, and funds allocated for decommissioning coal infrastructure and adjustment allowances.

The AFTSC had three main objectives:

- ending hard coal production by 2018 and financing the decommissioning process;
- financing post-mining environmental obligations;
- enabling a socially equitable adjustment process for workers.

In particular, the AFTSC updated regulations on the adjustment allowances for laid-off workers and was accompanied by measures from the national government for the re-employment of workers who did not meet the age criterion.

The AFTSC also established the RAG Foundation to finance mining-related environmental remediation and contribute to a socially equitable transition (Furnaro et al., 2021).

Coal Power Generation Termination Act (2020)

The Coal Power Generation Termination Act is one of the two German “coal exit laws”, which found their origins in the recommendations of the Commission on

Growth, Structural Change and Employment. It was a multi-stakeholder and independent initiative promoted by the national government in 2018, with representatives from the government, workers, coal regions, trade associations, environmental groups, and research institutions. The commission mandate was multiple:

- to close the gap to reaching the domestic 2020 emissions reduction target (-40 % emissions compared to 1990) to the greatest extent possible;
- to reach the domestic 2030 emission reduction targets for the energy sector, including a robust impact assessment;
- to gradually reduce and end power production from coal, including the identification of a phase-out date and recommendations for accompanying legal, structural, economic and social measures;
- to ensure financial support for the transition in the affected regions and make funds available for the necessary structural change.

On January 22, 2019, with 27 votes in favour and one against, the Commission approved the following main recommendations:

- a coal phase-out by 2038 at the latest, including a review in 2032 to decide whether the phase-out date can be brought forward to 2035;
- an additional closure of 7 GW of coal capacity until 2022 and a continued reduction of coal capacity to 17 GW in 2030;
- redirection of investments of EUR 2 billion per year into transition funding for affected regions for the next 20 years;
- early retirement schemes for coal workers above 58 years and additional retraining and job guarantees for younger employees;
- compensations for utilities for early closures and potential compensations for households and industry in the case of rising energy prices due to the coal phase-out,
- regular review mechanisms to monitor progress to adapt ambition.

Regarding early retirement schemes, the Commission specifically pointed out that older employees in lignite mining and power stations will require special job guarantees, and sufficient funds from the national government must be earmarked to finance this. Where necessary, the legal options to claim early retirement must be used. Any early retirement and pension deductions must be compensated (National Ministry for Economic Affairs and Energy, 2019).

After a delayed process and some deviations, these recommendations were translated into legislation

on coal phaseout and structural change in 2020. In particular, the resulting Coal Power Generation Termination Act (CPGTA) regulates the phaseout of hard coal and lignite consumption in the energy sector in Germany, respectively, by 2038 and 2035.

CPGTA even defines the mechanisms aimed at supporting the employees of the coal industry, including early retirement schemes. Namely, workers who will lose their jobs will receive adjustment money for a maximum of five years until they reach the qualifying age for pension benefits. In addition to the adjustment money, workers receive contributions to their health insurance.

To be eligible for the adjustment money, the employee must have worked continuously for one of the affected companies on September 30, 2019, and for the last two years before the employment termination.

The adjustment money is calculated based on the pension entitlements of the applicant in the statutory or miners' pension insurance at the time of employment termination. Like statutory pensions, the adjustment money is reformulated annually. It is possible to earn additional income while receiving the adjustment money, but 30% of this income is offset against the adjustment money (BAFA 2021, Furnaro et al., 2021).

Pension reductions resulting from the early claiming of a pension after the adjustment allowance are compensated by the National Office for Economic Affairs and Export Control, directly through the statutory pension insurance. The employer is responsible for applying for the adjustment money for its employees during the process.

Key results/effectiveness

Transition payments system (1972 – nowadays)

According to the German Pension Fund, at the end of July 2022 there were already 1.99 million people in Germany who were claiming their pensions at 63. This is 400 000 more people than was expected when the amended early retirement policy began in 2014.

Early retirement schemes are part of national and structural social policies, for which Germany is internationally renowned in terms of expenditure levels and effectiveness. Only in the Ruhr region, between 1968-2022, social spending including early retirement schemes, retraining, and financial aid to support new employment, amounted to EUR 18 billion.

Several scholars and policy experts affirm that early retirement schemes have been the largest support programs for miners in the transition, other than important instruments for a socially responsible downsizing process (Storchmann, 2005, Galgóczi, 2014, Furnaro et al., 2021, New Climate Institute, 2022).

Act on Financing the Termination of Subsidized Coal Mining (2007)

Limited specific data shows that the total adjustment money amounted to EUR 100.1 million in 2017, 90.5 in 2018, 95.9 in 2019, and 87.6 in 2020 (BMF 2019, Furnaro et al., 2021).

More generally, the hard coal phase-out had ambiguous results, especially in the Ruhr area – much achieved, little gained (Bogumil et al. 2012). De-industrialisation and economic restructuring did not lead to compulsory redundancies and structural breaks in local development, even though high and uncompensated employment losses occurred (WWF Germany, 2019, Furnaro et al., 2021, New Climate Institute, 2022).

Various environmental organisations would have preferred to set the coal phase-out in 2012. This would have saved €4 billion to €10 billion in fewer environmental damages and subsidies, which could have been invested to retrain workers and create decommissioning jobs. On the contrary, unions, workers, hard coal producers, and politicians – mainly social democrats – believed it was a successful decision since workers had time to retire, thus reducing the costs of compensation for early retirement (Frigelj 2009, Furnaro et al., 2021).

Coal Power Generation Termination Act (2020)

The Coal Power Generation Termination Act, which laid out the end of coal production in Germany and was lauded as a success, soon became an exemplary case for environmental sustainability and just transition aspirations. Nonetheless, the climate ambition, economic rationale, and social-justice effects of the law have been contested.

Scientists and climate experts argued that, to prevent the climate from reaching the irreversible tipping point, the phase out must have happened by 2030 already. Indeed, according to the most radical organisations, the German phase-out plan looks more like a forced prolongation of coal use (Raitbaur, 2021).

Flaws in the participation process and deviation from expert recommendations have also been raised as criticisms, contributing to the significant degree of dissatisfaction on the Commission's work from stakeholders across the political spectrum, science, industry, and NGOs (Raitbaur, 2021).

The Czech case

Key lessons

- The Czech Republic is one of the most important countries in the production of coal, though the downsizing of the sector in the last 30 years in terms of tonnes mined and in terms of workers in the sector. Before 2016 the country had specific rules for the early retirement of older workers, while from 2016 a new reform introduced a stable early retirement scheme in the official Act ruling the pension system.
- Several measures, among which early retirement support, were implemented over the years to support the restructuring of the coal sector. During the '90 measures were aimed at facilitating the transition of the coal sector from the communist regime to the new market economy, as illustrated below in relation to the Ostrava region. In 2016, also as a consequence of several crises in the sector, a new reform introduced permanent specific rules for the early retirement of old miners. Furthermore, other initiatives, though not strategically integrated, were introduced (reskilling interventions, initiative for the development of territories - RE:START, etc.).
- Among the positive results, the measures examined in the text assisted the reduction of the number of workers in mine sites while avoiding significant social tensions (though in the 90's the unemployment in the region of Ostrava increased substantially in the first years). Cooperation among stakeholders was reinforced, not only with unions, but also with other stakeholders and with territories, as demonstrated by the RE:START programme.
- A limit emerging in both the experiences and underlined in literature is the lack of an integrated strategy of passive and active measures, at least till the launch of the RE:START programme in 2018. There is also debate about the financial sustainability of the 2016 reform, affecting a pensionary budget already in deficit.

Context

The Czech Republic is one of the largest coal producers in the world (ranking 15th), though the coal sector reduced its size in the last 40 years, going from 100 million tonnes of coal which were mined annually in the 80's to 44 million tonnes of 2018 and going from about 110 000 people employed in FTE in the sector in the 90's

to about 22 000 in 2018 (Strachoň, Švendová, 2023; Dias et al., 2018)³. Despite the reduction of the employment in coal and lignite mining, the Czech Republic remains, together with Poland and Romania, one of the European countries with the highest employment share in these sectors (0.8% of total employment in 2008 and about 0.4% in 2021; see Vandeplas et. al., 2022). Coal is one of the main fuels for electricity generation and for residential housing heating in Czechia (coal-fired electricity generation accounts for more than 50% of all electricity generation) and it accounts for almost 40% of total emissions from the energy sector (Sila, Frohm, 2023). Overall, the Czech Republic has one of the highest GHG-emission intensities in the EU.

Coal is mined in three territories: two northwestern regions, Ústecký and Karlovarský, and the eastern region of Moravskoslezský. The first two regions are specialised in the mining of Brown coal (lignite) and four main mines are active⁴ (producing 39 million tonnes per year). Black coal is found in the Moravskoslezský region (5 million tonnes per year), where there is a single company operating⁵, though it is expected that it will be closed by the end of 2025. In terms of economic development, both these areas, the northern and eastern regions, are lagging behind and are affected by a high unemployment rate, lack of qualified people in the labour market and labour market mismatch, a lower economic performance and a lower average income. Another issue is the increasing ageing of population and more generally the de-population of the three regions, though less intensively in the Ústecký region. Given that employment in the mining sector is concentrated in these regions, it is worth noting that the share of mining sector on total employment is higher than the national average (around 3-4%). Furthermore, it is also worth mentioning that in the Moravskoslezský region, given the nature of mining – underground and without the use of heavy machines – the workers have no specific education or skills usable in other sectors. On the contrary, in the other two regions, workers have generally a qualification (they are mechanics, engineers, etc.) and are more employable in other industries (Heuer, 2018).

From the '90, after the end of the Communist system, the coal sector experienced a continuous contraction both in terms of production and employment⁶. To facilitate the

3. In terms of employees, Euracoal indicates for 2018 a number of about 14,000 employees in hard coal and lignite mining. See: <https://euracoal.eu/info/country-profiles/czech-republic/>

4. Bílina, ČSA, Nástup-Tušimice and Vršany. The ČSA mine is supposed to close in 2025.

5. Mining Plant 2 (ČSM) owned by OKD. Karviná and Darkov are other two mines, owned by OKD as well.

6. A formal date for the coal phase out has not been formally decided. The Czech Coal Commission set in 2019 recommended 2038 as phase out date though in 2022 the government announced its aim to phase out coal by 2033. The State Energy Strategy (SES) adopted in 2015, however, has among it aims the replacement of coal by nuclear and renewables in the electricity sector and by biomass, gas and

necessary adjustments in coal-related industries, since the 90s, Czech governments have implemented several measures to support workers and communities (Rečková et al., 2017). In 1991, the government imposed so-called ecological territorial limits in six mining locations in the North Bohemian Brown Coal Basin (Ústecký and Karlovarský regions), though over the years these limits were eased in some cases. In Czechia several measures were targeted at the households, workers, companies, and communities: financial support for environmental remediation, supporting costs of closing mines and benefits for miners that became unemployed in the 1990s, but also adaptation measures (for example investment on coal technologies and renewable energy sources). As stated by Rečková et al. (2017), until recently there was more a “collection of individual measures” than an official national strategy. More specifically, with regards to workers, the most relevant actions were the following: reallocation of miners to mines that were still working or to other companies in the same sector, early retirement for the older workers, social allowances or compensation for lost earnings and retraining interventions.

As regards the retirement rules for miners, in the 1995 Act reforming the Czech pension system (still in force), specific rules for miners were not envisaged and early retirements of miners were possible thanks to special provisions and privileges, coming from the communist regime, set in ad hoc regulations. However, in 2016 the 1995 Act have been amended, with the introduction of a specific section dealing with the early retirement of miners.

Below we describe two main Czech experiences: the measures introduced at the beginning of 90's, aimed at restructuring the coal sector, with specific references to the Ostrava area; and the measures introduced in 2015-2016, to respond to the crisis of the main company operating in the sector, OKD, and more generally aimed at supporting coal production phasing out in the three regions mentioned earlier. For both, we present the main features of the experiences and, where possible, the key results achieved, as well as possible shortcomings.

Characteristics of the scheme/intervention

The restructuring process in the Moravskoslezský region at the beginning of 90's

At the end of the 80's, the Ostrava and Karina areas in the Moravskoslezský region were highly industrialised, with about 55% of total employed people concentrated

in the industry sector. Coal mining, the steel industry and other few sectors absorbed more than 80% of total employment in industry. The Ostrava Karvina Coal Mines (OKD) was one of the most important companies of the territory, managing 16 coal mines⁷. The end of the communist regime required a restructuring and exacerbated the pre-existing problems of low profitability in the coal mining. Subsidies for coal mines were reduced and OKD, as other enterprises⁸, had to cope with the economic recession and consequently the reduction of demand. To address these problems two separate lines of interventions were developed, not as part of a single strategy (Nesporova, 1998)⁹: remedial measures aimed at facilitating the restructuring of large enterprises; adjustment measures aimed at supporting structural adjustments in the regional economy.

Remedial measures

Out of the 16 coal mines of OKD, one was privatised, five were gradually closed down, while the remaining and profitable mines benefited from modernising actions¹⁰. The central government covered the technical and social costs related to closing the sites, while the investments for the modernisation of the profitable pits was paid by the company itself¹¹. As far as the workforce was concerned, several interventions supporting workers were implemented:

- privatisation of subsidiary establishments (reducing the number of OKD workers by some 20,000);
- fixed-term contracts with foreign workers were not renewed;
- an early retirement schemes was introduced. A specific Regulation (557/1990)¹² was introduced in 1990, with extraordinary provisions for the old-age pensions of miners. The regulations allowed miners to retire at 50 years of age if: (a) they had 25 years of work experience, 15 of which in the mining industry; (b) reached the highest permissible exposure according to the law (5,600 shifts worked in the mine); and (c) their job in the mines ended before the end of 1991 or end of 1992;
- health and social benefits were introduced for workers who left OKD for health reasons before 1993;

7. Including the business units active in other sectors, OKD reached about 110 000 employed at the end of 80's.

8. For example, VITKOVICE and NOVA HUT, operating in steel sector and with respectively almost 40 and 23 thousand workers in 1989. These companies and OKD used to offer a wide range of service to their workers, such as enterprise flats, loans for housing, childcare facilities, subsidised holidays, health care services, etc.

9. Suchacek, (2005) emphasises that “numerous poorly co-ordinated projects were typical” in the case of Ostrava, and that a real national regional policy was not developed in the first years of 90's. Therefore, according to the Author, the initiatives implemented “moreover only mitigated the effects of restructuring but never forewent the causes of the problems.”

10. See also: <https://www.okd.cz/en/about-us/brief-history-of-okd/okd-after-1990>

11. OKD launched in 1990 the restructuring programme in the line with the policy of state government.

12. See: <https://www.zakonyprolidi.cz/cs/1990-557/zneni-19980101#p1>

imported hard coal in the heating sector in the next years. SES hypothesizes a reduction of 10 000 workers in mining and of 3000 workers in coal power plants by 2035. Environmental organisations were critical about the date of 2038, considering a most appropriate date 2030, while the trade union associations considered 2038 a satisfactory compromise. (Strachon, Švendová, 2023, 2023).

- an option to be transferred to other active mines or to receive severance pay was introduced to the benefit of other workers. The severance pay consisted of a lump-sum equal to ten months' wages, plus an additional four months for miners working in dangerous or difficult conditions, plus a bonus payment of CZK 1 900 per month for up to 36 months to facilitate re-employment¹³;
- An Agency for Business and Employment Support was established by OKD in 1992 to facilitate business start-ups and redeployment of redundant workers, operating through a job shop and two business centres. The job shop had the aim to redeploy redundant workers, also supporting them with retraining and cooperating with other enterprises in the region. The business centres assisted people willing to start their own business, through loans, training and other services.

Adjustment measures

Regional actors mobilised themselves to create a civic association, the Economic and Social Council of the Ostrava-Karvina Agglomeration (OKA). The association, through studies, events and other activities, contributed to the proposals of ideas for future development of the region, which were submitted to the government and partly included in the government Act "Measures for the Restoration and Development of the Ostrava-Karvina Agglomeration for 1991–1992 with an Outlook until 1995". These measures were aimed at creating new jobs in the region, for example by providing for a two-year tax exemption on profits for newly created enterprises or by reducing taxes for firms which were creating jobs for more than 20 new employees. The government provided CSK 200 million between 1991 and 1992. In 1993, a Regional Development Agency was established, and ILO was invited by OKA to cooperate on issues of labour market restructuring. Among other things, this cooperation led in 1995 to the transformation of OKA into the Union for the Development of Northern Moravia and Silesia (UDNMS). The mission of UDNMS was the promotion of projects aimed at stimulating regional development, improving the level of cooperation among key regional institutions as well as with international actors, and the support to enterprises (in recruiting and training of specialists, services for internationalisation). UDNMS was member of the Regional Development Agency, which was responsible for the management of the projects organised by the UDMNS¹⁴.

Other measures focused more on the employment field: the period for the unemployment benefits was changed,

from 12 to 6 months, and the amount of the benefits was reduced from 65% to 60% of the last monthly wage for the first three months, and from 60% to 50% for the rest of the unemployment period. The main purpose of these changes was to stimulate unemployed persons to either take up a job, participate in active employment programmes, or withdraw from the labour market. A package of labour market policies was introduced by the government as part of its effort to facilitate the re-employment of released workers and the employment of new labour market entrants. The package included: a job creation scheme for the so-called socially purposeful jobs, which covered the costs of job creation initially by grants and later by subsidised loans – this scheme was applicable for both existing and new firms, also including self-employment; wage subsidies for school-leavers to facilitate their first employment; a public works scheme; labour market training; and employment promotion measures for disabled workers.

In 1992, the government approved a coal restructuring programme, in order to support the gradual privatisation of the company and the reduction of the number of employees. According to Strachoň and Švendová (2023), the overall cost of these initiatives was quite high in the period 1990-2001 ("the costs of mitigation programmes accounted for the tens of billions of Czech crowns") and around half of the total expenditures were allocated to the measures coping with the social consequences for the workers (Šobrová, 2013). In 1991, a total of CZK 700 million was allocated to address the social health problem of mining workers, according to the Government resolution 267/1991 (Smolová, 2008).

The 2016 pension system reform and other measures

After the regulation concerning the early retirements introduced during the 90's, as a response to social debates and requests from social partners, in 2009, the government introduced a regulation containing specific early retirement rules (a retirement age lowered by five years) for deep-mine workers who fulfilled certain criteria: the worker had to have been employed before 1993 and had to have worked at least 3,300 shifts before the end of 2008 (Jahoda, Malý, Sirovátka, 2016).

Later on, in 2016, due to several factors such as the risk of bankruptcy and insolvency of ODK announced in 2015 and due to the increased volatility of prices in the international markets and to several unsuccessful internal restructuring initiatives, the debate on the adverse working conditions of miners and the risks of potential social conflicts, and the requests of the Trade Union for Mining, Geology and Oil Industry, the Government decided to revise the 2009 and ease the eligibility criteria. Therefore, special provisions

13. Regional transport allowances were also paid.

14. In 1994 the Regional Entrepreneurial Fund was created, a venture capital fund supporting SMEs with an initial capital of ECU 7,5 million, received from PHARE (the European Programme "Poland and Hungary Aid for the Restructuring of Economies").

concerning the retirement of mining workers were introduced in the regulatory base of the pension system¹⁵ in 2016. In detail, a new Part IV and two specific sections (37b and 37c) on mining workers were introduced in the 1995 Act regulating the pension system¹⁶. Compared to the previous special provisions for miners, one of the main novelties of the 2016 reform is that it introduced permanent changes at the legislative level and not temporary rules for the miners.

According to these new norms, miners who worked or are working in deep mines, and started their job before the 1st of October 2016, and with at least 3 300¹⁷ underground shifts (approximately 15 year of work) can retire 7 years earlier than the legal retirement age, which is set at 63 years and 10 months for men and at 60 or 63 years of age for women (depending on children). There are several advantages compared to ordinary early retirement provisions. Indeed, for other workers this is possible 3 years prior to the legal retirement age, if the person who wants to retire is less than 63 years old (or 5 years prior to legal retirement age if the person is more than 63 years old); at the same time, the person must have an insurance record of at least 35 years. The amount of the pension for miners is calculated more favourably than for ordinary workers¹⁸, without any of the penalties applying in the case of legal early retirement for the other workers¹⁹.

The cost of the reform, financed by the State (through the public pay-as-you-go pension scheme as ordinary pensions) was expected to be around 11.6 billion crowns between 2016 and 2055, a relatively low amount, representing just 0.11% of GDP in 2015, though still impacting on the budgetary situation of the national pension system. In fact, as underlined in Štefko (2018), the pension system's balance was already in deficit in 2016 and the new reform would have worsened the financial situation of the pension system²⁰. It is also

worth noting that the estimation of costs was done considering the initial Government's proposals, which envisaged the possibility, for the workers, to retire 5 years earlier than the legal retirement age, and not 7 years earlier as decided eventually. In any case, after 2050 the costs are expected to be close to zero since most of the current miners will be above retirement age.

Furthermore, in 2016 a state aid²¹ was proposed by the Czech Government (and then approved by the European Commission) with the aim to cover costs arising from the closure of the Paskov unit (owned by OKD) expected by the end of 2017. The state aid was aimed at paying costs for: one-off severance payments according to the number of years worked for OKD as defined by the Labour Code; loyalty bonus for miners, which usually is received at the end of the career; health benefits to be paid to 84 miners with occupational diseases; special bonus for workers who have been exposed to the maximum occupational health risk in mines. About EUR 22 million (or CZK 648 million) were allocated to the State Aid, of which 93% paid by the State, through the state company PRISCO²², and the remaining by OKD (European Commission, 2015)²³

Besides the "passive" measure introduced with the reform, active measures were implemented to support retraining and upskilling of people, though these were not part of a general strategy but were more specific initiatives and projects. After the closure of mine Paskov in 2017, some of the about 1 000 miners released from the company were trained and requalified in the field of IT and some of them were older workers (Heuer, 2018)²⁴. The Ministry, in cooperation with OKD, the Employment Department and The Confederation of Industry and Traffic, also launched the supportive service "Nová šichta" (New Shift)²⁵, aimed at offering business advice and consultation centres in the mines (Rečková et al., 2017). 'New Shift' is a programme applying an individualised approach: each employee laid off or no

15. Ruled by the Act No 155/1995 Coll. on Basic Pension Insurance (Zákon o důchodovém pojištění).

16. Introduced specifically by the Act No. 213/2016 Coll. Art. II.

17. Or 2,220 shifts in case of uranium mines.

18. The pension for underground miners, as the ordinary pensions, consists of a basic flat-rate amount and a percentage amount. The basic flat-rate amount is fixed for all pensioners at the same amount, while specific rules are envisaged for the calculation of the percentage amount of old-age pension for underground miners, in order to reach the so-called "maximum for miners", which is calculated by increasing the nominal amount of CZK 5,100 (€211) per month by all the indexation increases that occurred between 1996 and the year in which the retired person is granted a retirement pension (currently CZK 20,385 (€843) per month). If the percentage amount of miner's old-age pension calculated according to general rules is higher than the "mining maximum", the old-age pension will be granted at the (higher) amount calculated according to general rules. Source: Mutual Information System on Social Protection; <https://www.missoc.org/>.

19. The amount of pensions in case of ordinary early retirement is reduced by 0,9%-1,2%-1,5% for every period of 90 days that the pension is received respectively within a 360-day reference period before normal retirement age - within a 361-720-day reference period before normal retirement age - within more than 720-day reference period. These reductions are permanent and so continue after the recipient reaches normal retirement age.

20. The same author argues that the reform of 2016 is problematic in terms of

intergenerational and intragenerational solidarity, since it favours miners started mining before 30/09/2016 and therefore, still the mining will continue to downsize, it is expectable that another reform in the future will be needed. It is also stated that to compensate for health damage caused by the mining activity it would be preferable an increase in the salaries of miners, for example by increasing the minimum wage or introducing preferential tax policy.

21. Following the Council Decision 2010/787/EU in place since 2010, State Aid is only allowed to facilitate the closure of a mine.

22. Which in 2017 bought the shares of OKD, till 2020, when the government approved the transfer of OKD's assets to the state-owned company Diamo.

23. See: https://ec.europa.eu/competition/state_aid/cases/254578/254578_1680719_130_2.pdf // See also: <https://www.enerdata.net/publications/daily-energy-news/eu-approves-financial-aid-closing-paskov-coal-mine-czech-rep.html>; <https://english.radio.cz/ec-approves-czech-governments-aid-paskov-mine-fade-out-8269159>; <https://www.worldcoal.com/mining/16022015/eu-approves-state-aid-for-czech-coal-mine-1896/>; <https://www.mpo.cz/cz/rozcestnik/pro-media/tiskove-zpravy/vlada-schvalila-pujcku-pro-okd-az-do-vyse-700-milionu-korun--178387/>.

24. See for example the Projektu Razíme cestu, <https://zpravy.aktualne.cz/ekonomika/z-horniku-jsou-ajtac-prvni-propusteni-z-paskova-absolvovali/r-43a52802840711e7bce3002590604f2e/?redirected=1540389006>

25. <http://www.novasichta.cz/cs>

longer working for OKD, according to his/her needs, is assisted by HR staff and the Labour Offices in the preparation for a job interview or in writing a resume or other activities, for a period of 6 months after his contract was terminated.

A further parallel initiative to be mentioned is the RE:START programme²⁶, although it does not focus specifically on the support of workers in mines, rather on supporting the three mining regions in their economic, social and environmental restructuring and development. It was launched in 2015 in response to the requests of regional authorities and in 2017 a Strategic Framework for Economic Restructuring (SFER) of the three regions was defined. SFER is the basis for the Action Plans which contain concrete measures to be implemented in the territories. Action Plans are under the responsibility of the government with the involvement of regional stakeholders, such as the Regional Supervisory Board (responsible for preparing the draft versions of the Action Plans). RE:START covers seven areas of intervention: Entrepreneurship and innovation; Foreign direct investments; Research and development; Human resources²⁷; Environment; Social exclusion and instability; Infrastructure and the quality of public services. In the five Action Plans prepared as at the end of 2022, 105 measures were envisaged, for a total amount of CZK 104 billion; of these, 38 were completed as at the end of 2022 with an expenditure of CZK 10.3 billion.

Key results/effectiveness

The restructuring process in the Moravskoslezský region at the beginning of the 90's

As a consequence of remedial measures, many coal miners and other workers opted to leave the mines and receive the severance pay and other compensations. This contributes to explain the downsize of OKD workforce (from more than 100 000 in 1989 to less than 50 000 in 1995) and the fact that it occurred without intense social tensions in the region (Nešporová, 1998; Bruha et al. 2007²⁸), though miners protested in several occasions as underlined by Strachoň and Švendová (2023).

Restructuring of OKD and other big companies²⁹ led to a decline in the labour demand. Indeed, regional employment decreased by 14% between 1990 and 1993 in the region, vs. a loss of employment for the whole country of only 10%. Overall, the measures implemented contributed to stabilise the regional employment from 1993 and facilitate the labour reallocation³⁰.

Furthermore, after an initial increase of the unemployment rate, this started declining again from 1992³¹, also thanks to the active labour policies mentioned above. For example, in 1991 and 1992, the District Labour Offices in both Ostrava and Karvina were able to place nearly 40% of the average number of job-seekers in one of the active employment programmes.

The 2016 pension system reform and other measures

The Paskov's mine was closed in March 2017. The miners' pension reform, introduced in 2016, could theoretically facilitate the early retirement of 3 161 OKD workers who accumulated the requested number of shifts. Furthermore, there were 529 former OKD employees and approx. 250 employees of other entities who could take advantage of the new rules on early retirement. However, according to the representative of the trade union, "a smaller number of them took and will take advantage of new arrangements introduced in 2016; given the expected decline in mining, only a smaller number of workers will be able to work the required number of shifts permitting them to retire early". It has been also underlined that "the new rules are fully exploited by miners and some of them are combining them with the ordinary rules on early retirement, which means retiring a total of 10 years earlier". Finally, it is underlined that the "Nová Šichta" (New Shift) programme could be considered as a good practice, since the programme "has worked well and has been an inspiration for other companies".

29. As seen above as part of this restructuring older workers, workers who completed the legal maximum number of years of underground mining work, and disabled workers were encouraged to accept early retirement, disability pensions or dismissal with generous financial compensation.

30. For example, the share of employment in public sector decreased substantially in Ostrava, from 94% of 1990 to 25% of 1993 (in Karvina still in 1995 the share was high, 63%, since OKD, of which the state was the major owner).

31. Registered unemployment in Ostrava was in 1992 as 2.9%, close to the national rate of 2.6%, while a rate of 4.2% was reached in Karvina.

26. See the official site: <https://www.mmr.cz/cs/microsites/restart-regionu/uvod>. See also Radulov et al., (2019)

27. Supporting the re-employment of long-term unemployed and the creation of job opportunities in other economic sectors.

28. Buha et. al, in assessing the restructuring process of the 90's in the Ostrava region, state that "the miners' union cooperated with the government – and the government consulted with the union – which led to a peaceful process of restructuring despite the significant decline in employment".

The Spanish case

Key lessons

- Production and employment in Spain's coal industry have been declining over the past 30 years, driven by multiple factors. More recently, in 2018, the country has experienced the closure of coal mines, in addition to a process of closure of all coal-fired thermal power plants. What emerges is a Spanish long-standing commitment to a just transition, which currently aims at achieving climate neutrality by 2050, at the latest.
- Early retirement schemes have been characterizing all Spain's coal mining restructuring plans, such as the 1997-2005 Coal Plan, the 2006-2012 Coal Plan, the 2013-2018 Activity Framework, the 2019-2027 Plan for Coal. In tandem with early retirement schemes, other measures were used to promote diversification and foster employment in the mining regions, including grants to set up new businesses, professional training, and incentives for R&D or environmental projects.
- The main results achieved included: improvement of environment and public health; promotion of structured and transparently documented participatory processes; social dialogue and engagement across diverse governmental and non-governmental stakeholders; valorisation of renewable potential and other local opportunities; removal of pressure to find work or face large drops in income; maintenance of a standard living well above the poverty line for former coal industry workers and their families.
- The main shortcomings of the interventions were: limited spillovers for younger generations; inadequate funding for programme, starting from the limitations of the Just Transition Fund; serious socio-economic impacts at the local level in the areas affected by the closures; relatively high payouts in comparison to average wages; premature retirement of certain workers; sociological health of early-retired workers (i.e., without work, levels of alcoholism, depression and divorce have risen); depopulation; reduced incentives to find new employment.

Context

Spain has a long coal mining tradition, dating back to the 18th century. More recently, a long-standing commitment to phase out and just transition has emerged, culminating with Spain's objective of climate neutrality by 2050.

Production and employment in the coal industry have been declining over the past 30 years. Such a phenomenon was driven by multiple factors, including European legislation, growing support for climate action, overcapacity in the electrical grid, and the improving economics of renewable energy. Many coal mines have also been uncompetitive for a long time, dependent on taxpayer-funded subsidies that cost EUR 22 billion between 1992 and 2014.

Unsurprisingly, in Spain, the share of coal in power generation fell from 40% in 1990 to 5% in 2019, while employment went from more than 45 000 in 1990 to 1 700 in 2017. These drawbacks were particularly impactful in mining territories, leading to further economic distresses. These were added to high depopulation and unemployment rates – above the EU average level – characterising mining territories together with the lack of a diversely skilled workforce and the struggle to attract new enterprises (World Research Institute, 2021).

Coal mining has marked the last two centuries in Asturias. It is a region situated on the north coast of Spain. In 2016 its population was slightly above 1 million people, while the unemployment rate was 14.6 percent in the same year (Datosmacro, 2017). Its economy, traditionally dominated by coal, is now dominated by services (around 70 percent of gross value added), followed by industry (around 16 percent). A key driver for the transformation of the regional economy was the entry of Spain into the EU, which required member states to phase out government support to companies. At that time, Asturias' economy was centred on mining, steel, armaments, and shipyards—industries that struggled to compete in international markets. It eventually led to industrial decline and considerable social implications for the 45,000 employed miners and their families (Instituto de Desarrollo Económico del Principado de Asturias, 2017; IISD, 2017).

Alongside coal industry resizing and phase out, a series of reform packages have been promoted in Asturias and Spain as a whole, with the aim of promoting alternative economies, creating new employment opportunities, and thus mitigating the social costs of transition. The Spanish coal mining restructuring plans are summarized in the following table.

Subsequently, in February 2019, the Spanish government launched a Just Transition Strategy with an Urgent Action Plan to address the impacts experienced in coal-producing regions and by the shutdown of power plants. The starting point was the Framework Agreement for a Just Transition for Coal Mining and the Sustainable Development of Mining Regions for the period 2019-2027, which the government signed together with trade unions and mining companies (Instituto para la transición giusta, 2022).

Table 4. Summary of Spain's coal mining restructuring plans

Plan	Leading political party	Change on number of employees	Change on production (tonnes)	Cost (M Eur)	Financed by	Areas of support
Coal Reorganisation Plan 1990-1993	PSOE	-6'169	-900'116	4'689	Spanish budget	<ul style="list-style-type: none"> • Early retirement and voluntary redundancy schemes budget • Compensations for reduction of coal supplies
Coal Industry Modernisation, Rationalisation, Restructuration and Activity Reduction Plan 1994-1997	PSOE	769	427'000	4'275	Spanish budget	<ul style="list-style-type: none"> • Direct and indirect support to coal mining companies to improve productivity and to compensate supply losses • Early retirement and voluntary redundancy schemes
Coal Mining Plan 1998-2005	PP	-16'190	-5'675'271	9'246	Spanish budget	<ul style="list-style-type: none"> • Early retirement and voluntary redundancy schemes budget • Compensations for reduction of coal supplies
Coal Strategic Reserves National Plan 2006-2012 and New Model of Sustainable and Holistic Development of Mining Regions	PSOE	-4'910	-5'750'000	4'987	Spanish budget	<ul style="list-style-type: none"> • Direct and indirect support to coal mining companies to increase productivity • Early retirement and voluntary redundancy schemes • Support to environmental and technological investment projects
Action Framework for Carbon Mining and Mining Regions 2013-2018	PP	-2'222 (planned)	-672'593 (planned)	n/a	Spanish budget	<ul style="list-style-type: none"> • Direct support to compensate for production losses Spanish • Exceptional support including early retirement and voluntary redundancy schemes and mitigation of environmental impact

Source: IISD (2017)

Over the years, early retirement schemes have been a recurrent instrument of the Spanish government to manage the transition in a socially compatible way. These schemes, formalised via government “ordenes” and “decretos”, can be found in the following comprehensive programs: the 1997-2005 Coal Plan, the 2006-2012 Coal Plan, the 2013-2018 Activity Framework, the 2019-2027 Plan for Coal. Their main characteristics and results are analysed in the next sections.

Characteristics of the schemes

1997-2005 Coal Plan

In July 1997, labour unions and the government signed a plan for investments to revitalise the coal sector, modernise its infrastructures and encourage its competitiveness. In this way, Spain tried to remain compatible with European directives on the internal electricity market.

The plan provided three types of supports:

- Support for the development of business projects leading to direct employment creation, such as subsidies and soft loans (15% of total funds available);
- Support for training including specific courses and grants for all types of education (about 7.5% of total funds available);
- Provision of infrastructures (almost 80%).

Support for early retirement and voluntary redundancy was also regulated in a Ministerial Order on February 18, 1998. According to the Order, workers at least 52 years old and employed in the firm for at least three years could apply for the early retirement scheme. Differently, workers who were employed for only one year and contributed to the Special Social Security Regime for Coal Mining for at least three years could apply to the voluntary redundancy scheme (del Rio, 2017).

2006-2012 Coal Plan

The National Plan for the Strategic Reserve of Coal 2006-2012 and New Model of Integral and Sustainable Development of Mining Zones (Plan Nacional de Reserva Estratégica del Carbón 2006-212 y Nuevo Modelo de Desarrollo Integral y Sostenible de las Comarcas Mineras) represented a continuation with respect to the previous plan (del Rio, 2017).

Specifically, the Plan continued to provide sectoral support (i.e., production support, social support, early retirement support and support for the closure of mines), but it was reduced by 1.25% per year for underground coal and by 3.25% per year for surface mining. It also kept on supporting the reactivation of the affected mining zones, through new business projects, infrastructures and services like training.

Concerning early retirement schemes, beneficiaries continued to receive a salary from the mining company until their legal retirement age. Participation to these schemes was not just limited to miners, but extended across the industry, for example to engineers and administrative staff. Early retirement wages were calculated as a percentage of their salary in previous years and amounted to EUR 1 700-2 500 per month, preserving the economic advantages of mining jobs (IISD, 2017).

2013-2018 Activity Framework

The Activity Framework 2013-2018 (Marco de Actuación para la minería del carbón y las cuencas mineras en el periodo 2013-2018, or “MA”) was signed by the government, the labour unions and the industry association (CARBUNIÓN) on October 1, 2013.

MA envisaged a decreasing path of aid granted to national coal production. It stated that all the mining production units that were not competitive without receiving support had to be closed by December 31, 2018.

Its main goals were:

- To favour the maintenance of a national, competitive coal production, which would allow a level of electricity production supporting security of supply and contributing to the development of renewable energy sources;
- To ensure a sufficient participation of national coal in the electricity generation mix, within the limits set up by EU regulation;
- To channel the ordered termination of the non-competitive coal mines and to mitigate the impact on employment and regional economy;
- To encourage the development of business projects for new employment opportunities, while simultaneously triggering the recruitment of workers that become unemployed after the termination of the mining activity.

Support for early retirement was granted to meet the related objectives of MA. The support was available for workers at least 54 years old, with 10 years or more of labour seniority. Beneficiaries could receive 70% of their gross wage during the last six months of work. Annually, the government updated these wages, as in regular pensions (del Rio, 2017).

2019-2027 Plan for Coal

The Plan for Coal foresees the closure of all Spanish coal mines which are no longer economically viable. The Socialist government agreed on it together with the unions Federación de Industria de Comisiones Obreras (FI-CCOO), Federación de Industria, Construcción y Agro de la Unión General de Trabajadores (FICA-UGT) and Federación de Industria de la Unión Sindical Obrera (FI-USO), all IndustriALL Global Union affiliates.

More precisely, their agreement establishes the basis for the necessary measures for a fair transition of mining communities as of December 31, 2018. Likewise, it intends to promote actions that contribute to the rebirth and well-being of these communities.

Early retirement schemes are promoted once again, with no significant changes with respect to past measures, except for the fact that, in the Plan for Coal, they were further combined with activation programs aimed at employability and labour insertion.

Key results/effectiveness

Overall, the Spanish policies successfully promoted structured participatory processes, which are transparently documented. This can be considered an additional result, besides a good social dialogue in which diverse governmental and non-governmental stakeholders were engaged. Renewable energy sources and other opportunities at the local level were also taken. Among other things, these aspects well supported the miners and their families in safeguarding their living standards.

Nevertheless, these positive results were counterbalanced by: limited spillovers to Spanish youth policies; concerns over the sustainability of public finances; outward migration from mining towns; increasing health costs for early-retired workers, related to alcoholism and depression, with important social implications.

1997-2005 Coal Plan

Available data show that this coal plan cost EUR 9 246 million in total. It contributed to lowering the number of coal workers by 16 190. In turn, coal production decreased by more than 5 million tonnes (IISD, 2017).

2006-2012 Coal Plan

Available data show that this coal plan generally costs almost EUR 5 million. The reduction of the employees amounted to nearly 5 000. Coal production also decreased by more than 5 million tonnes (IISD, 2017).

2013-2018 Activity Framework

According to the framework agreement for a fair transition of coal mining and sustainable development of the mining communities (2018), 349 workers applied for MA's early retirement scheme. Considering a system continuity of fourteen years, the estimated cost amounts to EUR 124 million.

2019-2027 Plan for Coal

As explained by IndustriAll (2018), the Plan for Coal has been praised by unions and governments for providing an extensive package of benefits to miners and their communities. The benefits of early retirements are expected to be taken up consistently, given the high percentage (60%) of miners eligible for them.

Comparative analysis and conclusions

Summary of early retirement schemes examined in the report

In the present report, **four European country cases were examined** in order to identify initiatives taken to support older workers of closing (or soon to be closed) mines, in particular through early retirement schemes, and facilitate the socio-economic transition of the local communities. Most of the initiatives identified have been taken at national level and required adjustments in the pension system's arrangements, besides providing grants and carrying out investments at the local level aimed at easing the transition. Nonetheless, the focus of the cases is on specific coal regions, with examples concerning Eastern Wielkopolska, or Great Poland, and the Silesian Voivodship (in Poland), Ruhr and Lusatia (in Germany), Asturias (in Spain), the northwestern Ústecký and Karlovy Vary regions, and the eastern Moravian-Silesian region (in Czechia). **All these regions have different mining specialisations but have faced or face similar challenges in terms of transition and early retirement experiences.**

Each case study shows that early retirement schemes were **not standalone measures but were part of a broader system of strategies or policies.** An important condition for a satisfactory functioning of early retirement initiatives is their integration with welfare provisions, as emblematically seen within the German social security system. Another critical factor is the combination of early retirement measures with investments for economic diversification (e.g., startup support). This combination has a double purpose: it supports the local economic transformation and specialization in new technologies and new sectors (e.g., tourism, clean tech), and it may help offset the financial impact on public finances. Consequently, **combining passive policies, such as early retirement schemes, with active labour market policies, such as reskilling programs, is crucial.** In some contexts, active labour market policies face significant implementation challenges, such as the need for targeting aging beneficiaries and local economies locked in heavy industry paths. Nonetheless, they are important for enhancing local skills rather wasting them.

In the examined cases, early retirement schemes are also similar to each other because they give older workers (those with a significant number of years of service) the **possibility to opt for early retirement, earlier than pension age, at a convenient rate and/or with**

additional benefits which can accompany them until they reach the legal pension age threshold (e.g., most commonly known as redundancy payments). Differently, the measures for younger workers focus more on active support, including reskilling and initiatives to facilitate their entry and retention in the labour market.

A further common aspect is that coal workers' support schemes **are not new but date back several decades.** However, the underlying driver has changed significantly over time. Earlier, most notably over the 20th century, the measures adopted to restructure the mining sector and support mine workers responded to economic crises, particularly the coal sector's lack of competitiveness (e.g., uncompetitive costs of lignite in Lusatia). Instead, **more recently, these measures have also been driven by environmental objectives,** especially the ambition of climate-neutral Europe as underlined by the European Green Deal and the achievement of global UN sustainability goals.

In Poland, there is a relatively long history of measures supporting mine workers transition and not all related to environmental issues but, instead, to economic performance, over-production of mines and oversized workforce. The earlier measures analysed in this report date back from the late 90's.

In Czechia, there is also a relatively long tradition of initiatives, starting in the early 90's, mostly aimed at facilitating the transition towards a market economy, culminating in a more recent reform of the pension system.

In Germany, the history of initiatives is even longer, dating back to the 1958 coal crisis. In this country, the long experience with the Ruhr region is certainly an illustrative example of a socio-economic transformation whose lessons can be crucial for just transitions, besides being a source of information with respect to initiatives for early retirement.

In Spain, a significant pattern of supporting measures can be also observed, from the first coal plan of the late 90's to the latest Plan covering the period 2019-2027.

The following table provides an overview of the country and regional aspects covered in the analysis, such as examples of measures introduced over time and examined in the report, the key features of those interventions, the main challenges which they were aimed at addressing, the key results which were achieved and, if applicable, the encountered shortcomings. The table is not to be considered exhaustive while, for detailed information on each case, please see the country-specific sections of the report.

Table 5. Summary of initiatives supporting mine workers' phasing out in the countries covered in the report

Country	Examples of initiatives considered in the analysis	Key features of interventions	Main challenges which the interventions faced or are likely to face	Key results achieved and (where applicable) experienced shortcomings
Poland	<ul style="list-style-type: none"> • Mining Social Package (1998-2002) • Mine Restructuring Company (2000-2018) • Coal allowance and monetary benefits for mining pensioners, 2012- 2018 • Social Contract for mining industry transformation, 2021 • Social agreement on the transformation of the electricity sector and the lignite mining industry, including the spin-off of manufacturing and mining coal assets from state-owned companies, 2022 	<ul style="list-style-type: none"> • Early retirement schemes (e.g. 80% of the salary perceived at the condition of retiring within the indicated time frame) • Severance/redundancy payments (“golden handshake”) • Welfare allowances • Coal allowance • Parallel public investment in clean tech 	<ul style="list-style-type: none"> • Dependency on coal, also for electricity generation and heating, difficult to overcome • High wage premium of coal mine workers • Pre-existing special retirement privileges dating back to communism times • Low skills of workers • High costs for public finances • Public opinion criticism due to supporting unprofitable and polluting sectors • Incompatibility with the EU Green Deal and with State Aid laws. 	<ul style="list-style-type: none"> • Significant reduction of employment in coal mining sector • Increase in labour productivity • Retreat from the labour market due to difficult job placement of former coal miners • Income problems for households in the medium-long run (when subsidies stop) • Difficulties in transforming positively the territories
Czechia	<ul style="list-style-type: none"> • Restructuring process in the Moravskoslezský region (early 90's) • Pension system reform (2016) 	<ul style="list-style-type: none"> • Early retirement provisions and introduction of permanent changes in the pension system (e.g. mine workers can retire 7 years earlier than the legal age) • Financial compensations, including health and social benefits • Severance payments • Reallocation of workers to other mining sites • Privatisation of unprofitable mines • Active measures for retraining and upskilling of workers • RE:START programme aimed at supporting the territories with action plans 	<ul style="list-style-type: none"> • Dependency on coal for electricity generation and residential heating and harsh social consequences of dismissing coal • Low skills and qualifications of mine workers • Existing privileges from communist era • Negative impact on pension system's budget • Need for state aids to cover costs 	<ul style="list-style-type: none"> • Significant reduction of coal mining workforce • Loss of employment (temporary) due to difficult reallocation of workers

Country	Examples of initiatives considered in the analysis	Key features of interventions	Main challenges which the interventions faced or are likely to face	Key results achieved and (where applicable) experienced shortcomings
Germany	<ul style="list-style-type: none"> • Transition payments system (1972 – nowadays) • Act on Financing the Termination of Subsidized Coal Mining (2007) • Coal Power Generation Termination Act (2020) 	<ul style="list-style-type: none"> • Early retirement schemes (e.g. early retirement for coal workers above 58 years) and additional retraining and job guarantees for younger employees, • APG – transition payments since 1972 • Partial retirement schemes (partial pension combined with part-time work) • Retraining and job guarantee for younger employees • Compensations for households and industry for higher energy prices 	<ul style="list-style-type: none"> • Employment losses not compensated • Low salaries in other jobs • Outwards migration from the regions where mines are dismissed and aging (increase of average population age) 	<ul style="list-style-type: none"> • Regeneration of sites with innovation, new purposes, reinforced tourism • Economic development uncoupled from coal and accelerated green transition
Spain	<ul style="list-style-type: none"> • Coal Plan (1997-2005) • Coal Plan (2006-2012) • Activity Framework (2013-2018) • Plan for Coal (2019-2027) 	<ul style="list-style-type: none"> • Early retirement schemes (54 years old workers, with 10 years or more of seniority, receive 70% of their gross wage). • Grants for setting up own business • Training • Public R&D investments • Public environmental investments 	<ul style="list-style-type: none"> • Inadequate public funding • Negative socio-economic impacts of dismissing coal, affecting especially young people • General social problems linked to unemployment, low income and poverty • Support schemes considered too generous compared to average salaries 	<ul style="list-style-type: none"> • Social dialogue and participatory processes were encouraged Overall, standard of living of workers and their families was safeguarded • Environmental conditions were improved and renewable energy sources promoted

Cross cutting conclusions

Coal phase out is challenging for regions where coal mines have an important economic role. It is also hard to overcome the dependency on coal as an energy source, especially in the examined central and eastern European regions (e.g., in Poland, Czechia, as well as in the former Eastern Germany) as the availability of coal (or the lack of it) considerably affects disposable income. Indeed, in the past, in some cases a coal allowance was given as part of the benefits to redundant workers (e.g., see the Polish case).

The recent economic crisis caused by the Covid-19 pandemic affected European coal regions heavily. For example, a new study (Bourdin et al. 2022³²) shows severe consequences of the pandemic on unemployment and the number of people at risk of poverty, as well as high death rates, were felt in Spain and, even if more moderately, in Germany, Poland, Czechia, Slovakia and Hungary.

Coal is still important for electricity generation and heating and, the recent energy crisis brought about by the Russian war in Ukraine has highlighted such dependency, pushing some EU countries to reappraise their coal phase out calendars. Indeed, when the EU started seeing the light after the pandemic, at the end of February 2022, the Russian invasion of Ukraine had immediate repercussions on Europe and, in particular as regards the humanitarian crisis, in Poland, Hungary, Slovakia and Romania, as well as on European neighbouring countries. Beside the humanitarian crisis, one of the main repercussions was a sudden increase in energy prices and severe energy insecurity which especially affected countries and regions more dependent on Russian gas and oil exports. In order to deal with the insecurity and, at the same time, become independent from Russian energy, many EU countries such as Germany, Italy, Poland, Czechia, Slovakia, Romania and Greece started considering the possibility to keep coal mines open for longer than planned in the phase-out plans and/or to re-open closed mines. Such decisions have been controversial and divided public opinion, not only because of negative environmental consequences (e.g., the protests that took place on 23 April 2022 against coal mining activities in Lützerath, Cologne coal region, Germany) but also because coal extraction activities can be unsafe for workers (as shown by the tragic accident that took place on 20 April 2022 in Pniówek coal mine in Pawlowice, Silesia coal region, Poland). As the situation evolves and its resolution remains uncertain, it is difficult to anticipate the exact

impact of this conflict on European countries and EU coal regions. At the same time, this reinforces the need to analyse the capacity of coal regions to react and adapt to external forces, without compromising their goals of just and green transition.

Dependencies on coal-related activities at national and regional levels especially, imply that workers support measures such as early retirement schemes need to be integrated with other kinds of supports to households, industry, and commercial activities – hence other kinds of policies, especially active labour market ones – to avoid outflows of people or businesses and other social problems, even if such additional supports involve higher burdens for the public finances. Unemployment, harsh times and poverty may be typical medium-long term consequences of phasing out when the subsidies stop (e.g., these challenges affected interventions in Poland and Czechia), while outward migrations especially of young people and aging can be dangerous side effects (e.g., observed in Germany and Spain).

In several cases among the ones examined in this report, a displacement effect in the labour market was observed when early retirement schemes were introduced. For example, in Poland, mine workers benefited from high wage premiums. In Germany, the coal workers' salaries are considered mostly higher than other sectors and, furthermore, in Spain mine workers support schemes are believed to be too generous compared to the average salaries. In former communist countries such as Poland and Czechia, there were existing privileges for mine workers dating back to that era, both in terms of pay as well as in relation to retirement arrangements. All these arrangements functioned as a disincentive to work for redundant miners.

These aspects should be carefully considered because they may produce several distortions. First, too generous, or uncompetitive benefits are a powerful incentive for redundant mine workers who are potentially able to work to not re-enter the labour market, at least until the support lasts. Second, this puts even more pressure on the public budget and makes such measures far from sustainable. In conclusion, the trade-offs between compensations and incentives to enter the labour market and work must be considered, while it is of crucial importance to find a balance between the attractiveness/generosity of incentives and the possible distortions they can produce. For example, early retirement schemes can be limited only to people already nearing legal retirement age while the others should be targeted by active policies keeping the use of severance payments to a minimum.

Another key challenge when dealing with (older) mine

32. Bourdin, S., Hachaichi, M., Moodie, J., Sánchez Gassen, N., Igari, A., Lócsei, H., Amdaoud, M., and Arcuri, G. (2022) Geography of COVID-19, Territorial impacts of COVID-19 and policy answers in European regions and cities, Interim Report, ESPON.

workers is that they tend to have low skills which makes their reallocation to other jobs and sectors particularly difficult. This is a common challenge which was encountered in all the cases examined in the present report and which, therefore, deserves to be addressed adequately when these kind of policy interventions are adopted. In particular, when measures for supporting phasing out from the coal sector target working-age people, a well-balanced set of active measures for retraining and reskilling is essential to facilitate the transition. In any case, the integration of active and passive measures is also relevant for older workers, considering that European rules generally do not permit the exclusive support of passive measures (for example, in the context of the European Social Fund). Regardless of this restriction, integrated interventions involving both active and passive measures can help avoid potential displacement effects and low uptake of active measures. This is true especially when active measures are offered separately from passive ones. In several cases, such as those mentioned earlier, it has been observed that older workers tend to prefer passive measures given the difficulties and the losses they may experience in the labour market (i.e., limits of retraining and upskilling at a certain age, significant risk of earning lower salaries, a generally higher demand for younger workers).

A further common challenge relates to the fact that, in general, early retirement schemes and their combinations with active policies, are quite expensive for the public finances. This raises public opinion attention and possible criticism when the public funds are simply used to keep afloat a polluting sector rather than being targeted towards innovation, sustainability, and green transition, besides being incompatible with the Green Deal. The fact that safeguarding coal mine workers is expensive, moreover, may require public aids to cover the costs while this may be incompatible with State aid rules. A takeaway lesson is, therefore, to carefully combine support schemes for older workers with compensating green investments capable of creating future growth and employment prospects in affected territories, instead of artificially feeding sectors and specialisations without real and sustainable opportunities.

The analysed cases have highlighted that the combination of early retirement schemes and other types of measures, in general, made it possible to achieve significant results in the regions where coal phasing out is a pressing challenge. Overall, in addition to improved environmental conditions, there was a widespread reduction of employment in the coal mining sector and a related productivity increase, while the standards of living of workers and their families was more or less safeguarded (at least temporarily). The overall employment loss was sometimes temporary (e.g.,

in Czech regions) and sometimes considered permanent (e.g., in Polish regions) due to the difficult job placement of former coal miners, but such effects are inevitable and dealing with them requires investing in alternative specialisations, in addition to training and reskilling.

Facilitating the transformation of the affected territories in the sense of promoting the emergence of new, cleaner, specialisations is difficult and is a long term process (e.g., Ruhr). However, it is crucial to pursue it, otherwise early retirement measures taken alone turn out to be just a temporary mitigation of social unease, without bearing positive consequences on development and growth prospects. For this reason, again, a mix of interventions that help to uncouple economic development from coal is necessary to enable a green transition.

A further positive experience which came out from the analysed cases is related to the fact that when early retirement schemes and other measures were introduced, this encouraged a social dialogue; and participatory processes which can be extended to other social disputes may help, in the future, the taking of shared decisions with significant socio-economic implications.

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Annex: Miners' Pensions in Hungary

An overview provided by the Trade Union of Mining, Energy and Industry Workers (BDSZ)

The miners' pension scheme has evolved over centuries. Hungarian social security practice still teaches that the first community risk funds were the miners' common treasury. This is because mining work had a strong impact on health. In order to ensure that families could cope with such health risks, the miners tried to collectively build the financial basis of such support from the very beginning.

In the 1980s, the physiological consequences of the harmful effects of mining were studied. It was then established that in lignite mining, after five thousand shifts, even in the average healthy group, permanent damage to health can occur. This number of shifts was four thousand in black coal mining and three thousand in uranium mining. On the basis of these measurements, a reform of the pension system was initiated. It was also previous practice that anyone who had worked in an underground mine for about twenty-five to thirty years and whose health justified it was brought to the surface and could work there until his retirement, with the possibility of an early retirement allowance of one year after five years.

In 1991, Government Decree 150/1991 created the special miners' pension in Hungary. Based on physiological measurements, this decree also provided a special miners' pension for miners working in open-cast coal mining areas. So that after thirty years of service, that was calculated by taking into account the length of service under the Social Security Pensions Act, it was possible to take a full retirement pension.

The Government Decree 150/1991 (XII. 4.) on the miners' pension was abolished with effect from 1 January 2012. The Trade Union of Mining, Energy and Industry Workers (BDSZ) has achieved that the entitlement to the temporary miners' allowance replacing the miners' pension, from the above date, has been regulated in Mining Act XLVIII of 1993 in accordance with the previous conditions for underground workers.

At the same time, the regulations on open cast mining were no longer included in the Mining Act under Decree 150/1991. This created an unexpected situation for the open cast mining workers in Visonta and Bükkábrány. On average, they have to work ten years longer in the open pit mines.

This raised two problems. One is that the mining workers are likely to suffer permanent damage to their health - as they already have - and the second is that the workers concerned can no longer do the same job. Physically, lifting heavy weights, walking up and down machines with five to seven storeys, and carrying out the associated work, etc., is seriously difficult even in a three-shift working schedule. A large number of miners over sixty years of age are not able to meet the physical requirements. At MVM Mátra Energia Zrt.'s predecessor, Mátra Power Plant Ltd., a company pension scheme was in operation after the early retirement pension and the special coal mining pension were abolished in Hungary, replacing the early retirement pension before the old-age pension entitlement. This was called the POOL scheme. Under its rules, workers with health problems or workers who had worked for at least 20 years in the company's multishift system were entitled to benefit from the service on the basis of an agreement with the trade union. This POOL scheme had an elaborate set of rules. On the basis of this, the BDSZ proposed to reintroduce the scheme into company practice for the use of the Recovery and Resilience Instrument in Hungary, unless the Hungarian Government reinstates the early retirement system. (This proposal was shared with the START programme.)

Act LXXXI of 1997 on social security pension schemes, which regulated the complete early retirement pension scheme in Hungary, was repealed as of 1 January 2012, without any social consultation. After that, from 1 January 2015, entitlement to early retirement is no longer possible!

Workers approaching retirement age after retraining / training (i.e. acquiring new skills) are unlikely to find a job that provides an income similar to their existing one. It is also likely that employers do not want to employ disabled workers for a year or two. Therefore, a just and equitable transition for these workers is not guaranteed under current Hungarian employment and pension legislation.

Retirement and support packages for older workers in the EU coal sector: a briefing paper on European cases