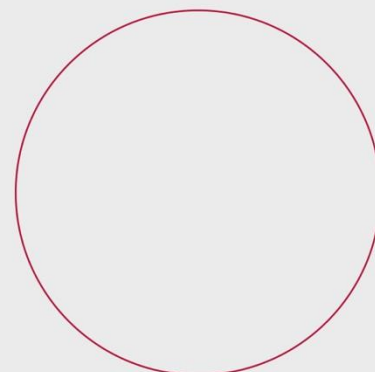


HOW TO REDUCE THE SOCIAL COSTS OF COAL MINE CLOSURES?

Jan Frankowski, Joanna Mazurkiewicz, Jakub Sokołowski



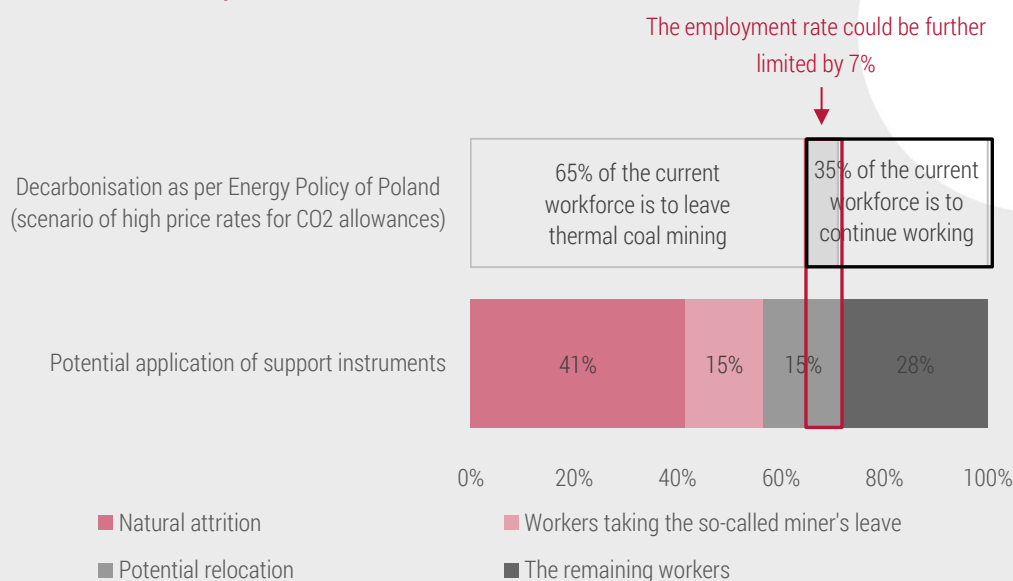
Main message

As a result of decarbonisation, the number of jobs in coal mining and mining-related industries will drop. However, the risk of increased unemployment related to this process can be minimised. To that end, in order to mitigate the consequences of the transition away from coal, it is necessary to halt the inflow of new workers, to allow older employees to work until they reach retirement eligibility, and to provide support in advance for younger workers in mining and mining-related industries so that they can take up jobs outside of the sector. To achieve that, we suggest three instruments: (1) relocating workers to coking coal mines, (2) retraining, and (3) support in starting up and running a business. With these instruments, it is possible to help accelerate decarbonisation while retaining a well-qualified workforce in the regional labour market.

Facts and figures

- **61 thousand people** work in companies producing thermal coal.
- **25 thousand people** will reach retirement age by the year 2030 (41% of those currently employed in such companies).
- **9 thousand people** will be eligible for the so-called miner's leave (15%).
- **9 thousand people** may be relocated to a company producing coking coal (assuming the admission of new workers is frozen and the level of employment is maintained; 15%).
- **22 thousand people** will continue to work in thermal coal mining as per the Energy Policy of Poland until 2040 (35%).

Employment reduction in the mining sector until 2030 could accelerate even without pursuing active labour market policies



Source: Own elaboration based on the assumptions presented in the IBS Research Paper 01/2021.

1. Introduction

Decarbonisation will reduce employment in coal mining and mining-related industries. Pursuant to the Energy Policy of Poland until 2040, hard coal production will be phased out in 28 years at the latest. Yet even such a delayed transition to a low-carbon economy raises concerns and resistance among the representatives of coal mining and related sectors. By the year 2030, the labour surplus in hard coal mining will range from 14,000 to 36,000 people, depending on the pace of decarbonisation. The job cuts will mainly impact the region of Upper Silesia. Thus, how could the social costs of mine closures be reduced?

This question has been addressed in the present report. The authors believe that to achieve this goal, one must:

- freeze hiring new workers in the entire hard coal mining sector;
- allow older workers to continue to work until they are eligible for retirement;
- support younger workers in mining and related industries in advance so that they can take up jobs outside of the sector.

Furthermore, the report recommends three instruments to help accelerate decarbonisation and retain well-qualified workers in the regional labour market, i.e.:

- relocations to coking coal mines;
- retraining aimed at enabling miners to find jobs outside of the mining industry;
- support in starting up and running their own businesses.

Although these instruments were applied during previous stages of mining restructuring, the socio-economic and institutional situation of the region has since significantly changed.

The implementation of the instruments should run in parallel with changes in four areas of the public policy.

Firstly, technical secondary schools and vocational schools should cut down on the number of students enrolled to become miners as there will not be enough jobs in coal mining. Secondly, the government and mining companies should establish the principle of compulsory retirement for workers once they have become eligible for retirement. Thirdly, the government and hard coal mining enterprises should draft and supervise an intra-sectoral workforce allocation agreement between thermal and coking coal companies. Fourthly, the government and municipalities should support and foster conditions for job creation in industries such as construction, manufacturing, energy, logistics and land reclamation.

This study is based on the conclusions from interviews carried out with 16 Silesian Labour Offices operating in mining areas.

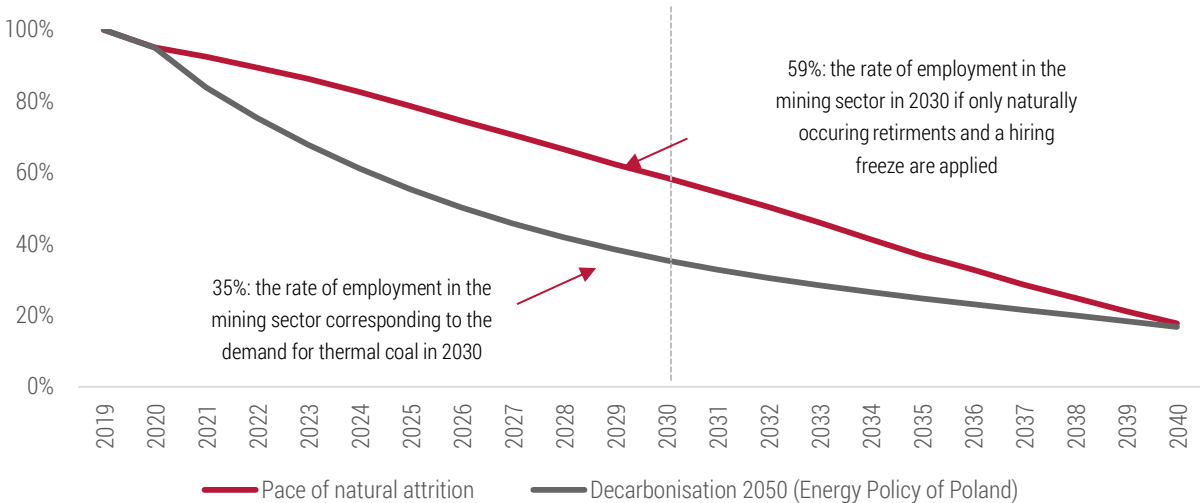
As part of earlier studies, the Institute for Structural Research interviewed miners to identify their opinions on job opportunities in the labour market (2019), conducted a diagnosis of the Silesian voivodeship, performed an analysis of employment in the mining industry (2020a, 2020b), and estimated the magnitude of necessary job cuts depending on the pace of decarbonisation (2021). In this paper, we have evaluated the efficiency of protective and professional activation instruments directed at the employees of the mining and related sectors. Furthermore, we have presented two best practices of reducing the social costs of mine closures based on the example of the Piekary hard coal mine and the Olkusz-Pomorzany zinc mine in Lesser Poland. These practices suggest that downsizing in the mining industry can be performed smoothly, while maintaining the professional activity of workers.

The report encompasses two parts. The first one discusses employment reduction instruments in the mining sector broken down by (a) sectors and (b) types of activation, whereas the second part presents conclusions and recommendations for public policy.

2. Available labour market instruments

Natural attrition is a prerequisite to mitigate the social costs of mine closures. According to our estimations, in the period from 2021 to 2030, 25,000 people working in thermal coal mining companies will reach retirement age. This represents over 40% of the total workforce according to the employment data as at the end of 2019. Admittedly, such natural attrition may not be treated as an active instrument to reduce employment in mining. Still, it is required in order to model the magnitude and proportion of sectoral protective instruments (i.e. instruments addressed exclusively at hard coal mining workers and implemented by mining companies), as well as activation instruments (similarly targeted at the workers of mining-related industries and implemented by Labour Offices).

Figure 1. It is necessary to accelerate the downsizing process in the mining sector to meet the assumptions of the Energy Policy of Poland until 2040



Source: Elaboration based on the data from thermal coal producing companies and IBS Research Report 01/2021. The “2050 decarbonisation” scenario represents an extrapolation of the “high prices” scenario in PEP 2040.

Relocations to coking coal mining plants, retraining and support in starting up and running a business are considered the most effective instruments from the labour market perspective. The evaluation of their effectiveness reflects the total impact on the level of economic activity and the unit cost of implementing a given instrument.

2.1. Sectoral instruments

The so-called miner’s leave is a solution accelerating the retirement of workers by the payment of 75% of remuneration to underground coal miners and coal processing workers for 4 or 3 years, respectively, until they reach retirement age. By 2030, about 9 thousand underground workers and surface workers employed mainly in thermal coal mining companies will have reached the age entitling them to take miner’s leave. By applying this

measure, the employment level in the sector can be permanently reduced. At the same time, this instrument translates into long-term state financial liabilities and may hamper the occupational activity of the workforce.

Relocations involve the transfer of workers from decommissioned mines to active facilities or engaging them to work on mine closures. The above instrument should target those workers who are not eligible for miner's leave but have acquired substantial length of service. Intra-sectoral relocations facilitate the succession of personnel without the need to take on new employees and reduce vacancies related to those jobs necessary for the stable operation of mining facilities. Intra-company relocations, even when a change in workers' skills is required, do not reduce the rate of labour surplus.

The most efficient sectoral instrument will consist in relocating workers to coking coal mines. In fact, the European Commission has classified coking coal as a strategic raw material, making it possible to plan and continue mining in this area even during the decarbonisation process. In order to maintain the current level of production, retiring workers will need to be replaced. Over this decade, 9,000 jobs in coking coal mines will be vacated for this reason. They could be taken by the workers from decommissioned thermal coal plants. Importantly enough, these mines are favourably located, in the western part of the Silesian Voivodeship. To implement this protective measure, however, it is crucial to freeze new hires, negotiate an intra-sectoral agreement on allocation of employees and create conditions for their mobility: e.g. the possibility to choose a mine close to home and ensure convenient transportation links between municipalities.

Box 1. Reduction of employment related to the closure of Olkusz-Pomorzany zinc mine

In 2020, ZGH Bolesław – a producer of zinc and related products – shut down the last mine in Poland, Olkusz-Pomorzany, following the depletion of its deposit. The process, which involved the reduction of almost 1,000 workers, was planned several years ahead as the employer took measures aimed at limiting the risk of group layoffs.

Hiring employees for a fixed period was the first rule introduced. A longer employment period was offered to persons with pension rights. About 200 people (approximately 20% of the workforce) could retire at the point of extraction stoppage. To carry out the work necessary for the decommissioning of the mine, 300 workers maintained their employment (Zaborski, 2021). Some of the workforce was given the opportunity to be re-employed in other mining entities as part of earlier declarations of employee allocation (KGHM, Jastrzębska Spółka Węglowa, Tauron Wydobycie; after: Ponikowska, 2019). More than 40 workers were offered to move to the metallurgical part of the plant, taking advantage of retraining opportunities. The CEO of ZGH Bolesław stated that “over 80% of the mining staff were offered the opportunity to maintain employment” (after: Zaborski, 2021).

One-off severance payments involve the unconditional granting of funds to a worker in exchange for termination of employment. On the one hand, such payments can quickly reduce employment in the mining sector, but on the other hand they entail a high unit cost and unpredictable, hardly quantifiable effects on the labour market. Without linking them to activation instruments (e.g. participation in the process of vocational counselling, specialised courses supplementing and improving professional competences or training in running a business), severance payments will not increase the chances of employees to take up jobs outside of the mining sector and may undermine their motivation to undertake other activities. Also, the rate of severance payments should be proportional to individual workers' age and length of service in mining, and should be coupled with activation measures. Protective subsidies, paid to dismissed workers for a limited period of time, can be an alternative to a

one-off severance payment. The proposed instrument is intended to mitigate the social impact of the transition. Moreover, when part of the severance payment is paid out in the form of monthly subsidies, it may serve as a protective measure in the period when workers seek employment outside of the sector. At the same time, such subsidies can temporarily compensate for the difference in wage levels both inside and outside of the mining sector. The period in which subsidies are paid out should correlate with the worker's age and length of service.

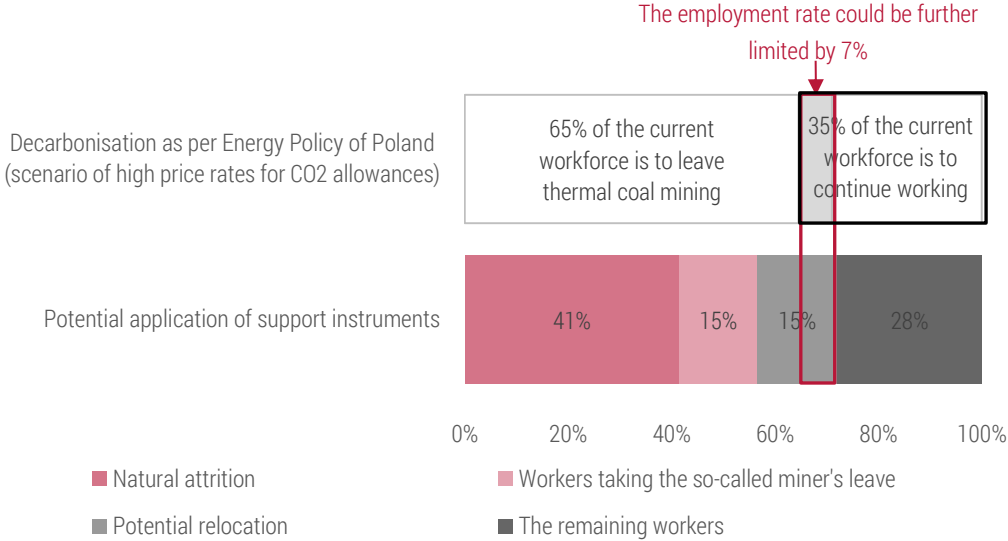
Table 1. Relocation of workers to coking coal mines is the most effective sectoral instrument

Instrument	Unit cost	Impact on occupational activity of workers	Total labour market efficiency
Relocation to mines producing commodities other than thermal coal	low	<ul style="list-style-type: none"> Occupational activity maintained at the same level; No change in qualifications required; Employment in thermal coal mines reduced. 	high
Relocation to thermal coal mines	low	<ul style="list-style-type: none"> Occupational activity maintained at the same level; No change in qualifications required; Employment in thermal coal mines maintained. 	medium
Retraining within the same facility	medium	<ul style="list-style-type: none"> Occupational activity maintained at the same level; No change in qualifications required; Employment in thermal coal mines maintained. 	medium
Relocation to work on mine closure	medium	<ul style="list-style-type: none"> Occupational activity maintained at the same level; A change in qualifications may be required; Employment in thermal coal mines reduced. 	medium
Miner's leave	high	<ul style="list-style-type: none"> Occupational activity reduced; Fails to create opportunities for taking up jobs outside of the mining sector; Employment in the mining industry reduced. 	low
One-off severance payments	high	<ul style="list-style-type: none"> May temporarily reduce occupational activity; Fails to create opportunities for taking up jobs outside of the mining sector; Employment in the mining industry reduced. 	low

Source: own elaboration.

The slow pace of decarbonisation means that the employment reduction in hard coal mining sector may be achieved only through sectoral protective instruments. This scenario will involve a significant cost for the state budget and may undermine the level of occupational activity of the workforce. Additionally, sectoral instruments may prove insufficient to balance short-term mismatches related to the transfer of employees or closure of individual plants. Accelerating the downsizing process through severance payments will not improve the chances of taking up employment outside of mining and may temporarily lower the level of workers' occupational activity. Moreover, when measures are limited to sectoral instruments only, the employees of mining-related companies, who may also bear the social costs of mine closures, will be left without any support.

Figure 2. Employment reduction in the mining sector until 2030 could accelerate even without pursuing active labour market policies



Source: Own elaboration based on the assumptions presented in the IBS Research Paper 01/2021.

2.2. Activation instruments¹

Retraining, i.e. changing or upgrading qualifications of workers, is, in the opinion of Poviats Labour Offices, the most effective instrument in terms of activating mining employees. Workers subject to retraining will gain additional qualifications, confirmed by a certificate, in a profession similar to the one they currently perform. Furthermore, such schemes allow them to use their experience and existing professional skills. Retraining initiatives should consider the preferences and aptitudes of individual workers, as well as the demand for specific professions. Consequently, individual training programmes should be prepared once workers' competences and skills have been identified. According to the opinions articulated by the representatives of Poviats Labour Offices, the duration of retraining programmes should range from 3 to 9 months, depending on their subject matter and scope. Also, they should be adapted to specific labour markets and involve well-paid shortage occupations that are similar in nature to mining. Individual training programmes will be more efficient if:

- they are implemented prior to the downsizing decision. Actually, the process of career path change is most effective when it starts while the employee is still working in their current position. In the case of mining employees, training could be arranged during working hours or special leave for this purpose could be provided. An additional measure could be the establishment of career counselling points in the mines subject to closure so as to help identify the competences of employees and devise a training offer tailored both to the needs of individual employees, and to the market;

¹ The starting point for the assessment of activation instruments was the summary of proposed activities of the pilot outplacement project entitled "Energia" ("Energy"), coordinated by the Voivodeship Labour Office in Katowice. The project was addressed to persons who were laid off, were to be laid off or are at risk of being laid off due to workplace-related reasons, with particular consideration given to employees or former employees of coal mining companies and cooperating companies from the Silesian Voivodeship.

- individual employers are involved in the training process in order to establish employers' expectations regarding the qualifications needed for certain jobs. Simultaneously, workers have the opportunity to become familiar with the prospective remuneration and career development options;
- persons enjoying social trust should be involved in the process, such as other miners who have moved to another profession or trade union members more familiar with the relevant social and economic environment.

Box 2. Training for workers of the Piekary coal mine

The Piekary coal mine was closed at the end of January 2020. The mine closure was prepared well in advance. Initially, 440 workers benefited from mining severance packages while retiring early (Podsiadło, 2016). As the next step, the process of relocating staff to the associated 'Bobrek' coal mine was initiated, while some subcontractor services were discontinued (Berezowski, 2020). Training upon exit was provided to a part of the workers in 2016. 'Węglokoks', the owner of the company, established cooperation with the Poviát Labour Office in Piekary Śląskie for this purpose. The Poviát Labour Office, partially funded by the National Training Fund and partially by the company itself, offered a list of certified courses allowing for additional qualifications to be obtained by the miners. Several hundred mine employees, mainly the underground workforce, chose to take part in the offered courses. The training participants were granted electric and energy certificates (such as SEP qualification certificates), machine operators' certificates, welding certificates and C-category driving licences in accordance with the corresponding courses they completed. Training was also organised for surface workers and included, among other things, operational management of payroll and HR software. In conclusion, actions undertaken in the Piekary coal mine may be considered good practice since:

- the workforce reduction was planned gradually in order to prevent a sudden surge in registrations and applications for new positions;
- training was provided in advance, during the miners' regular working hours and in their regular work location, thus enabling maximum participation;
- the nature of the training made it possible to take up higher-paid jobs or to set up their own business;
- the company's financial contribution supported both the underground miners as well as the surface workers.

According to information obtained from the Poviát Labour Office in Piekary Śląskie, only 2 out of 1,295 people

Additional policy instruments will be needed for the employees of mining-related companies. Such companies will in turn require support in changing their main area of activity, developing and diversifying their product portfolio, making material investments and entering new markets. Assistance measures should apply to workers who declare the need to upgrade or change their qualifications. Therefore, designing support for such undertakings requires a precise definition of the term "mining-related company" as well as a diagnosis of their employment structure and an in-depth assessment of their links to mining.

However, retraining coal mine workers alone will not guarantee their employment. The government and local authorities should therefore stimulate new vacancies by fostering conditions for their creation. Construction, manufacturing and the energy sector exhibit the greatest potential in replacing mining positions. They are also indicated to be the most attractive in the eyes of the miners themselves. Furthermore, the aforementioned industries are large enough to accommodate new workers while having a similar employment structure to the mining sector in terms of education, age and sex.² Labour Office representatives listed the above-mentioned sectors as the most plausible destination for miners to find jobs (Table 2). The same industries were also named as such in a study carried out among former miners who left the mining sector between 1998 and 2002 (Tyrybon, Szczepański 2004; Turek, Karbownik 2005). Additionally, several of the industries fit well with the energy transition process and adoption of less carbon-intensive technologies³. Construction and land reclamation are areas where public investment and the need to adapt brownfield areas to new functions will result in the creation of new jobs. The energy and automotive industries in the Silesian Voivodeship are established, provide well-paid, stable work and constitute an area of strategic state intervention.⁴ Other manufacturing industries and the logistics sector will further develop naturally in the region. This is also thanks to land development for new activities in the area as evidenced by numerous private investments supported by the Katowice Special Economic Zone.

Table 2. The construction, manufacturing and energy sectors could absorb current mining jobs

Industry	Occupations with the greatest potential for replacing mining
Manufacturing	Machine operator; mechatronics technician; automation technician; welder; locksmith; turner.
Energy	Electrician; electrical fitter; PV installer; HVAC specialist; heating specialist; plumber; gasfitter.
Construction	Insulation specialist; construction worker; bricklayer; plasterer; roofer.
Logistics	Machine operator; truck driver; mechanic.

Source: Interviews with Labour Offices' employees

According to the experiences of Labour Offices, **assistance in setting up and running a business** can form an incentive to start a job outside of the mining sector. Under this instrument, an employee receives non-refundable financial support from the Labour Office, which can be used to retrofit the workplace, purchase necessary materials or provide legal assistance. The amount of support varies depending on the Labour Office and usually ranges between PLN 15,000 to 25,000. In order to fulfil the condition necessary to be granted such financial

² For more: IBS Research Report 02/2019; WWF Poland 2021.

³ Construction: investments in building insulation and energy transmission and distribution improvement; industrial processing; automotive and electromobility; electrical machinery industry and circular economy development etc., installation of photovoltaic panels; air conditioning systems and heat pumps.

⁴ Examples of announced investments in the field of energy and automotive industry are the declarations concerning the location of an electric car factory in Jaworzno and a photovoltaic cell factory. Regardless of these investments, numerous sub-suppliers of both industries, with Polish and foreign capital, currently operate in the Silesian Voivodeship.

support, one must run the newly established business for at least one year after receiving the grant⁵. To increase the effectiveness of this type of support, free legal, accounting and advisory assistance should be granted at both the opening and early business development stages. This should prevent a repeat of the negative experiences acquired during previous restructuring processes.

Box 3. Potential Effectiveness of other active labour market policies

According to the interviewed labour offices:

- **Retrofitting a workplace** can be treated as an additional incentive for an employer to take on employees in a given enterprise;
- **Postgraduate studies** may be an attractive form of activation, but due to the structure of education in the mining industry, it may be limited to surface workers and technical supervisors only;
- **Financing commuting costs** may be a potentially effective solution, but is difficult to implement, however. Firstly, there is no data on how many workers would be interested in such a solution and over what distance the workers need to travel to work. Secondly, the Silesian Voivodeship has numerous urban centres which are close by, so changing jobs does not necessarily involve a longer journey. Thirdly, funding the commute would result in inequality among workers who continue to work at the same location;
- **Relocation allowance** can be a potentially attractive solution. There are cases of people taking up jobs outside of the region, such as in copper mines in the Lower Silesia voivodeship. Such a solution could provide additional motivation for relocation, but is however unbeneficial for local development as it forces qualified staff to transfer to other work centres;
- **Traineeships** may prove useful for a part of the surface workers but should be treated as a transitional form of employment only, as they provide lower remuneration and are thus less attractive.

Activation instruments can mitigate the course of decarbonisation and retain workers in the labour market.

Retraining and assistance in setting up and running businesses can complement aid packages and support natural alterations in the employment structure. At the same time, they will: (1) mitigate mismatches associated with the closure of a specific plant, (2) keep well-qualified people on the labour market (3), accelerate the decarbonisation process. The proposed instruments should be launched immediately and address employees of both mining and mining-related industries. Such a solution is cheaper for the state budget than using only sectoral instruments while being beneficial from a labour market and long-term regional development perspective.

⁵ According to representatives of Labour Offices, miners rarely registered as unemployed, but usually chose the possibility of subsidised economic activity from the available offer. They later worked in their own business as electricians, construction workers or craftsmen in most cases. During the restructuring, some miners used their severance pay to set up their own business, without taking advantage of support offered by the Labour Offices.

Table 3. Retraining and assistance in setting up and running a business are the most effective activation instruments for miners

Instrument	Unit cost	Impact on occupational activity of workers	Total labour market efficiency
Retraining (upgrade or change of qualifications)	medium	<ul style="list-style-type: none"> • Supports retention in the labour market and enables continuation of work outside of mining; • Requires changes or upgrading of skills; • Reduces employment in mining. 	high
Assistance in setting up and running a business	medium	<ul style="list-style-type: none"> • Supports retention in the labour market and enables continuation of work outside of mining; • Requires changing or upgrading of skills; • Reduces employment in mining. 	high
Retrofitting a workplace	medium/high	<ul style="list-style-type: none"> • Supports retention in employment and continuation of work outside of mining; • May require skill changes or upgrades; • Reduces employment in mining. 	medium
Wage subsidies	high	<ul style="list-style-type: none"> • Supports retention in employment and continuation of work outside of mining; • Reduces employment in mining. 	medium/high
Funding commuting costs and relocation allowances	medium	<ul style="list-style-type: none"> • Supports retention in employment and continuation of work outside of mining; • May have an impact on the reduction in mining employment. 	medium/low
Traineeships	medium	<ul style="list-style-type: none"> • May support retention in employment and continuation of work outside of mining; • May require changing or upgrading of skills; • Reduces employment in mining. 	medium/low

Source: own elaboration.

3. Summary and public policy conclusions

Decarbonisation will result in a reduction of workplaces in the mining and mining-related industries. However, this process can proceed smoothly while keeping workers active. How, then, can the social costs of coal mine closures be reduced? It is crucial to:

- freeze hiring new workers in the entire hard coal mining sector;
- allow older workers to continue working until they are eligible for retirement;
- support younger workers in mining and mining-related industries in advance so that they can take up jobs outside of the sector.

We recommend the following instruments:

- Relocations to coking coal mines;
- Retraining aimed at enabling miners to find jobs outside of the mining industry;
- Support in starting up and running their own businesses.

These instruments must be put in place immediately as they will support the natural evolution of the employment structure. Their introduction will allow:

- qualified people to be retained inside the labour market;
- mismatches associated with the relocation of workers and job losses in related industries to be mitigated;
- the acceleration of the decarbonisation process while limiting social costs.

Activation instruments should be implemented in cooperation with mining companies and labour market institutions. Resources for retraining employees and supporting economic activity can be mobilised within the framework of a systemic project supported by the regional policy funds. It is necessary to exchange information and employment plans between the mining sector, related industries and the labour market institutions. Once the cooperation has been established and the project is being implemented:

- the Voivodeship Labour Office should coordinate the regional system project, offering support instruments in mining self-governments (i.e. training and support in setting up a business), as well as monitoring job creation;
- mining and mining-related companies should inform the Voivodeship Labour Office and Poviats Labour Offices in advance about job cuts and the number of people who will require support when changing jobs. This will enable individual offers to be prepared for employees in advance;
- Poviats Labour Offices should participate in the retraining programme development, organise direct contact between local employers and workers threatened with redundancy and set up consultation points in plants scheduled for decommissioning in order to inform workers about available support as early as possible;
- trade unions should take an active part in the transition of the mining industry after the signing of the social contract. Strong unionisation of the mining industry, as well as cooperation with local actors, should facilitate the preparation of workers for the transition process. Trade union participation in this process may be

important to seize the opportunities presented by the energy transition. It does, however, require these actors to accept the process and subsequently prepare their members for it.

References

- Berezowski K. (2020). Jak będzie wyglądała likwidacja ruchu Piekary? Co dalej z jego załogą? [What will the end of Piekary Coal Mine look like? What's next for the crew?] Trybuna Górnicza <https://nettg.pl/> (24-01-2020).
- Frankowski J., Mazurkiewicz J., Sokołowski J., Lewandowski P. (2020a). Zatrudnienie w górnictwie węgla kamiennego w Zagłębiu Górnos Śląskim [Hard coal mining employment in the Upper Silesia Basin]. *IBS Research Report 01/2020*, Warszawa.
- Frankowski J., Mazurkiewicz J., (2020b). Województwo śląskie w punkcie zwrotnym transformacji [Upper Silesia in a tipping point of transformation]. *IBS Research Report 02/2020*, Warszawa.
- Kiewra D., Szpor A., Witajewski-Baltvilks J. (2019). Sprawiedliwa transformacja węglowa w regionie śląskim. Implikacje dla rynku pracy [Just coal transition in the Silesia Region. Implications for the labour market]. *IBS Research Report 02/2019*, Warszawa.
- Podsiadło J. (2016). *Restrukturyzacja KWK Piekary i KWK Bobrek. Mit czy rzeczywistość?* [Restructuring of Bobrek and Piekary Coal Mines. A Myth or a Fact?] Conference Materials: „Zagadnienia surowców energetycznych i energii w gospodarce krajowej”, Zakopane.
- Ponikowska K. (2019). Kopalnia Olkusz-Pomorzany za dwa lata przestanie istnieć. Górnicy będą musieli szukać pracy w sąsiednich kopalniach [The Olkusz-Pomorzany mine will cease to exist in two years. Miners will have to look for jobs in neighboring plants]. *Gazeta Krakowska* <https://gazetakrakowska.pl/> (12-01-2019).
- Sokołowski J., Frankowski J., Mazurkiewicz J., Lewandowski P., Antosiewicz M. (2021). Dekarbonizacja i zatrudnienie w górnictwie węgla kamiennego w Polsce [Decarbonisation and employment in Polish hard coal mining sector]. *IBS Research Report 01/2021*, Warszawa.
- Spółka Restrukturyzacji Kopalń (2021). Restrukturyzacja zatrudnienia [Restructuring of employment]. <https://srk.com.pl/onas/restrukturyzacja-zatrudnienia> (25-03-2021).
- Turek M., Karbownik A. (2015). Ocena skuteczności Górniczego Pakietu Socjalnego w restrukturyzacji zatrudnienia w górnictwie [The Estimation of Effectiveness of Social Mining Packet in the Employment Restructuring in the Mining Industry], *Zeszyty Naukowe Politechniki Śląskiej Seria: Organizacja i Zarządzanie* 27, 7–14.
- Tyrybon M., Szczepański M. (2014). Odprawnieni górnicy i ich świat społeczny [Redundant miners and their social world]. *Wiadomości Górnicze* 55(6), 254-261.
- WWF Poland (2021). Kierunki Terytorialnego Planu Sprawiedliwej Transformacji i Rozwoju dla Województwa Śląskiego [Guidelines for the Upper Silesian Territorial Just Transition Plan], Warszawa.
- Zaborski J. (2021). ZGH Bolesław S.A., po zamknięciu kopalni Pomorzany w Olkuzzu, zmienia się wyłącznie w zakład hutniczy. To koniec pewnej epoki [ZGH Bolesław after the closure of the Pomorzany mine in Olkusz turns into a metallurgic plant only. This is the end of an era]. Portal Olkusz Naszemiasto. <https://olkusz.naszemiasto.pl/> (02-03-2021).

List of interviewed institutions

- Powiat Labour Office in Bielsko-Biała, branch office in Czechowice Dziedzice
- Powiat Labour Office in Bytom
- Powiat Labour Office in Gliwice (which also provides services to the Gliwicki powiat)
- Powiat Labour Office in Jastrzębie-Zdrój
- Powiat Labour Office in Jaworzno
- Powiat Labour Office in Katowice
- Powiat Labour Office in Mikołów with its seat in Łaziska Górne
- Powiat Labour Office in Mysłowice
- Powiat Labour Office in Piekary Śląskie

- Powiat Labour Office in Pszczyna
- Powiat Labour Office in Ruda Śląska
- Powiat Labour Office in Rybnik (which also provides services to the Rybnicki powiat)
- Powiat Labour Office in Tychy (which also provides services to the Bieruńsko-Lędziński powiat)
- Powiat Labour Office in Wodzisław Śląski
- Powiat Labour Office in Zabrze
- Powiat Labour Office in Żory

Jan Frankowski

Institute for Structural Research
Institute of Philosophy and Sociology
Polish Academy of Science

e-mail: jan.frankowski@ibs.org.pl

Joanna Mazurkiewicz

Institute for Structural Research
The Poznań University of Economics and Business

e-mail: joanna.mazurkiewicz@ibs.org.pl

Jakub Sokołowski

Institute for Structural Research
University of Warsaw

e-mail: jakub.sokolowski@ibs.org.pl

IBS Policy Paper Series

The IBS Policy Paper series makes economic research findings accessible in order to enhance public debate.

Series editor – Jan Rutkowski

IBS Policy Paper 02/2021

ISSN: 2451-4365

Language editing – Dorota Ciborowska

Additional information

We would like to thank Jan Rutkowski for his valuable comments and assistance in preparing the text. We would also like to thank Mateusz Smoter and representatives of labour market institutions in the Silesian Voivodeship for their valuable comments and sharing their opinions and experiences with the authors.

The study was financed by the European Climate Foundation. In the publication we used data from the Ministry of State Assets and data provided by Polska Grupa Górnicza, Jastrzębska Spółka Węglowa and Tauron Wyciąg. The aforementioned institutions are not liable for the presented results and conclusions.

The content of this publication reflects the opinions of the author, which may diverge from the position of the Institute for Structural Research. The usual disclaimers apply.

About IBS

The Institute for Structural Research (IBS) is an independent and politically neutral research foundation. Our research studies focus on economic analysis and evaluating the consequences of public policies in the following areas: labour market, demography, education, family policy, public finance as well as energy and climate. We rely on state-of-the-art modelling, statistical, econometric and IT tools. We take great care to ensure the sound methodology and objectivity of our research.

Since our foundation in 2006, we have conducted almost 200 research projects for such entities as the World Bank, OECD, various ministries, Chancelleries of the Prime Minister and President of the Republic of Poland, the National Bank of Poland, employers' organisations as well as other associations and foundations. The Institute's research findings are generally available, with two series of publications being specifically responsible for their dissemination: IBS Working Paper and IBS Policy Paper. All articles, reports and information about our projects and conferences may be found at ibs.org.pl.

e-mail: ibs@ibs.org.pl

twitter: @ibs_thinktank