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THE INVOLVEMENT OF STAKEHOLDERS IN THE DECARBONIZATION PROCESS IN THE COAL REGION OF NORTHERN HUNGARY

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Abstract. This article deals with the analysis of Hungary's still-existing coal region (Northern Hungary), including the future of coal mining and energy production. Within the interpretive tradition of social research, we approached the problem and explored the role and significance of the Mátra Power Plant in the country and the coal region. The results show that there has been widespread involvement in the field of coal removal, Just Transition and that it is important for decision-makers and energy policy stakeholders in the country and the region to have a say. It also helps to shape discourses and bring out alternative views.

Keywords: coal region, North Hungary, Just Transition, stakeholder involvement.

Introduction

The European Union's coal regions are currently undergoing an energy transformation aimed at decarbonization. This poses several social, economic, and environmental challenges that need to be addressed at all levels (Riley & Tkocz, 1999). One of the main elements of the challenges facing the EU and local authorities in the context of the energy transition is the Just Transition, i.e. the transition of workers from the mining and energy industries to the post-coal era. This can only be achieved through the involvement of stakeholders and joint planning with stakeholders.

Hungary is also involved in the transformation of coal mining regions, there are several former or currently operating mining areas and coal regions in the country. The largest coal region in Hungary is the Northern Hungary coal region. Since coal mining (lignite) is still active in the region, the issue of decarbonization has only become an issue in recent years.

One of the largest employers in the region is mining and the energy industry, so the removal of coal has become not only an environmental or economic issue but also a social one. Northern Hungary, is also facing the challenge of transition. We also examine the importance of the sector in direct and indirect employment, in the local and regional economy, and the related problems. Thirdly, we aim to show how the region is preparing for the decarbonization process, and how to involve the individual stakeholders in the just transition.

Literature review

The energy industry accounts for more than 40% of global greenhouse gas emissions, and burning fossil fuels (excluding transport) accounts for more than half of emissions (IEA) in the EU. Despite declining coal production, the use of this fossil fuel is still high, accounting for almost 19% of the EU's total primary energy supply, 25% of electricity and more than 26% of gross heat production (Eurostat, 2020).

Replacing coal with more environmentally sustainable energy decarbonization is an important step in mitigating global climate change (Baros, Bujdosó, Kovács, Patkós & Radics, 2012). Some European countries have already exported coal (Belgium) or are phasing out coal from electricity generation by 2025 at the latest (Austria, Hungary, France, Ireland, Italy, Sweden, UK).

Industrial transformation is not a new phenomenon, but it has received increased attention today due to its complex effects. As a result of globalization, technological developments (e.g. digitalization and automation) and their requirements, environmental and climate change policies have become increasingly important.

The literature on the future of coal has no long history and is mostly based on economics (Hafterdorn, Kemfert & Holz, 2012; Kowalska, 2015; Vaněk, Bora, Maruszewska & Kašparkova, 2017) and energy and environmental protection (Heinrichs & Markewitz, 2017; Garcia-Gusano, Iribarren & Dufour, 2018).

The studies can be divided into two groups according to the approach. The first group focuses on studies summarizing the norms of energy policy actors (Khademi-Vidra, 2014; Kuchler & Bridge, 2018; Leipoland & Fachsland, 2018; Rosenbloom & Framing, 2018) while the second group focuses on the opportunities for 'end users' of climate and energy policy (coal miners, coal mining communities) (Della Bosca & Gillespie, 2018; Evans & Phelan, 2018; Mayer, 2018; Osička et al., 2020).

Coal has historically played an important role in the European economy, which is still present today, with the coal sector present in 12 EU countries and 41 regions, with annual coal production of over 500 million tonnes (more than half of EU gross consumption). It is estimated that 237,000 people are employed in coal mining, of which 185,000 are direct workers (Cała,Szewczyk-Swiątek & Ostręga, 2021). In this context, the carbon regions occupy a significant area of the continent. The coal region is a region where coal mining is a significant economic activity. They can be grouped according to different characteristics, such as industrial monoculture (one or only a few industries that dominate the economic structure of the region), specialized coal regions, or areas with declining, capital-intensive industrial activities controlled by some large (often multinational) companies.

Coal mining regions are also often associated with the social, cultural, and environmental impacts of coal mining (Alves Dias et al., 2018). To address these effects, the EU has decided to have the first wave of decommissioning by 2025, including the least efficient power plants, which will result in the loss of around 15,000 jobs (EC, 2022). Under the second wave, an additional 18,000 people will be laid off by 2035 (Alves Dias et al., 2018). This derivation, the transition period, must be done only in a fair way, taking into account the aspects of workers, the environment, and the economy, this is called a fair transition.

The history of the concept of a fair transition dates back to the 1950s when a fund was set up within the Coal and Steel Community for the retraining and resettlement of workers (Kassai & Farkas, 2012). This fund is designed to support the retraining of workers who have lost their jobs as a result of derecognition and subsequent new technological developments (Cameron, Claeys, Midões & Tagliapietra, 2020). The Treaty of Rome establishing the European Economic Community (1957) transformed the European Social Fund into a support for the development of modernized industries or the promotion of the lives of coal miners.

'Just transition' as a term came into the public consciousness in North America in the 1990s, used primarily by unions supporting workers who lost their jobs due to environmental austerity (Cameron et al., 2020).

To ensure the removal of socially just coal, in December 2017 the European Commission set up the Transition Coal Platform.

Today, the Just Transition Fund (JTF) has become a key element in the implementation mechanism of the Green Deal, aiming to mitigate its social consequences, but is also characterized by climate and environmental objectives or participatory planning processes (EC, 2020). This provides an opportunity for local and regional authorities, and affected communities, to play an active role and take the lead in developing a strategy for the development of transition.

Methods and Materials

To achieve the research goals, we used several methodologies. Both secondary and primary methods were used in our study. During the processing of the literature, we collected and analyzed the available Hungarian, but mainly international literature, their experiences and results.

We examined the role of coal mining and the energy industry primarily on the basis of the available databases (Hungarian Central Statistical Office, local governments, tax authorities), we also presented our own experiences.

The study of the involvement of stakeholders was carried out by primary data collection. The method of the primary research was the interviews with decision-makers, and stakeholders. A total of 40 stakeholders from different target groups were interviewed in depth at least once.

The studied area is the North Hungary region. The area of the North Hungary region is 13,433 km^2 and the population is 1,143,902 (2018). The region includes 3 counties: Borsod-Abaúj-Zemplén, Heves, Nógrád (Fig. 1). The regional center is Miskolc. 53% of the region's population lives in cities. The average population density is 95 people per km^2. The population of the region decreased by 12.2% between 2001 and 2018, in 2018 it accounted for 11.7% of the total population of Hungary. The region is an aging region (with an aging index of 129.5 in 2018, up from 89.3 in 2001) (HCSO, 2019), and emigration is also contributing to population decline (Bujdosó et al., 2014; Pénzes, Bujdosó, Dávid, Radics & Kozma, 2014).

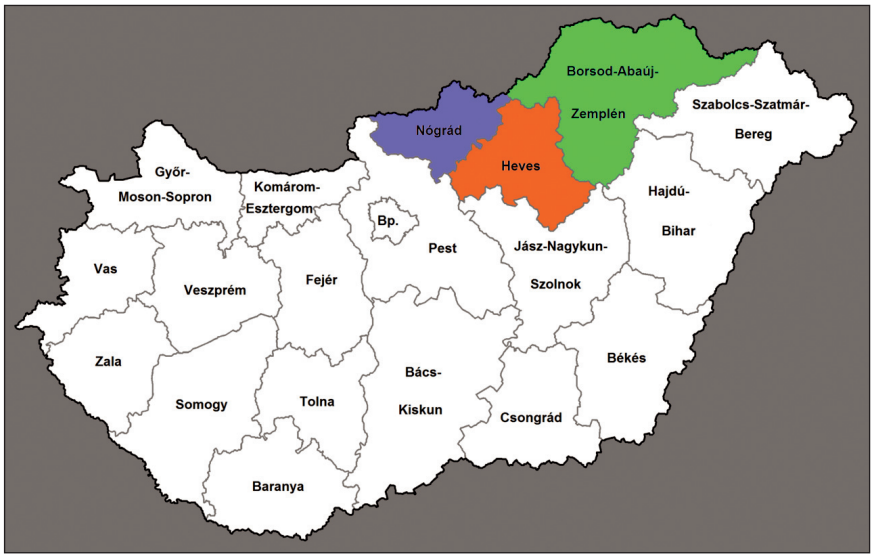

Figure 1. The location of the Northern Hungary region
Source: own editing.

From the economic point of view, this region has suffered the greatest economic damage caused by the 1990 regime change. Due to its natural endowments and historical traditions, the region's economy has been largely determined by heavy industry and mining. After the economic restructuring, these industries declined and industrial production declined. Through a few large companies modernized with the help of foreign capital, the region has retained its industrial (machinery and chemical) character. The region is characterized by a combination of declining, increasingly marginalized areas and rapidly developing, enriching areas. The growth zone is represented by the larger cities, Miskolc and Eger, in addition, the cities of Kazincbarcika and Tiszaújváros, which have survived the economic restructuring with the stabilization of the dominant chemical companies. The development of the more backward small and medium-sized towns further away from the growth zones (e.g. Encs, Edelény, Pétervára, Heves, Mezőcsát, Ózd, Szécsény) is hindered by their poor accessibility, unskilled labor supply, low entrepreneurial activity.

Results

The role of the coal mining and energy industry the in Northern Hungary Region

The traditional specialization structure of the region (metallurgy and chemical industry) has been changed due to the expansion of foreign investors. The composition of manufacturing has diversified (automotive and electronics) and traditional industries have modernized significantly. Nevertheless, the regional stock of foreign direct investment is far below the national average: 5.8% of the total in 2017 (HCSO, 2019). The activity rate of the population was 59.7% in 2018, which is the second lowest in Hungary (after Southern Transdanubia). In contrast, the national average is 62.5% (HCSO, 2019). This is due the large number of underdeveloped, inaccessible settlements,

without opportunities to catch up, where unemployment is close to 100%.

The unemployment rate in the region was 4.7% in 2018, the lowest level since 2008 at 13.3% (Eurostat, 2019). This value is also higher than the national average (3.7%) (Table 1). In addition to growing labor demand, factors such as public intervention (such as the public employment system) and significant emigration (to other region and/or other countries) have also contributed to achieve favorable unemployment data.

Table 1. Main economic indicators of Heves and Borsod-Abaúj-Zemplén counties (2019)

Indicator	Heves county	BAZ county	Northern Hungary	Hungary
Population	293 421	637 064	1 118 577	9 769 529
Number of employees (persons)	130 000	270 900	481 700	4 512 100
Employment rate	68.5%	65.1%	66.1%	70.1 %
Unemployment rate	2.7%	4.6%	4.5%	3.5 %
GDP / capita in purchasing power parity	16 342	16 122	15 105	21 898

Source: www.ksh.hu.

In terms of R&D, the activity of the region is moderate. Most of its innovation performance indicators are below 50% of the EU average, with the lowest performance among the Hungarian regions in the case of practically all innovation indicators. The proportion of people employed in the R&D sector as a percentage of the active population is very low at 0.57%, which is less than half of the Hungarian national average. According to the Rank Correlation Index, the region ranked 218th out of 262 regions in 2013. The proportion of the population with tertiary education is the lowest in the region of Northern Hungary, at 16.4% (Eurostat, 2013), partly due to the significant emigration of the highly educated.

In 2019, the number of registered jobseekers in Hungary was 234,903 (of which 19,231 are new entrants). The number of people registered in the region of North Hungary is 54,343 (of which 5,086 are new entrants), of which 10,265 (of which 833 are new entrants) are from Heves County and 33,845 are (including 3,398 new entrants) from BAZ County. 19-23% of the nationally registered jobseekers appear in the Northern Hungary region. In BAZ county this proportion has ranged from 12 to 14%, while in Heves county it has ranged from 3.4 to 4.4% in the last 16 years.

Based on the examination of business forms, national data and processes prevail in the region. The popularity of Ltd. as a corporate form has declined, but this has not stopped the decline in the number of limited partnerships, it has only slowed the pace of decline. The number of joint stock companies and unlimited companies is also insignificant compared to the other two mentioned forms of company, also reflecting national trends. Comparing the two counties, the changes in the number and composition of joint ventures are characterized by practically the same trends. In addition to joint ventures individual proprietorships also play an important role in the region. At the end of the investigated period, their number already exceeded 46,000, an increase of around 11% compared to the beginning of the investigated period (2008). The financial and economic crisis, which peaked in 2008-2009, dampened the entrepreneurial spirit, and after a state of stagnation for a few years, the number of registered individual proprietorships will increase significantly from 2017 onwards. The main component of the growth is the increase in the number of self-employed individual proprietors. The number of operating enterprises is increasing in both counties, and the increase in the number of real new enterprises is also an important factor in this growth. Based on the data on terminated businesses between 2014 and 2018, we are witnessing a steady increase. However, it can be assessed as a positive process that the number of enterprises surviving one year shows a dynamic growth in both counties for the period under review.

The examination of the management of the enterprises was carried out on 7539 enterprises. Of these, 4,855 enterprises were from Borsod-Abaúj-Zemplén County and 2,684 from Heves County. Our analysis was performed using data from the year 2019. There is still no significant scatter in terms of liquidity, but there is a significant difference between companies in terms of leverage. In the case of the companies included in the study, a conservative financing strategy, which can be considered dominant, is characterized by a relatively high cost of capital but low risk. Low profitability can hurt on research and development, which is of key importance for corporate growth and is a requirement for long-term survival.

The relationship between Mátra Power Plant and local governments

Mátra Power Plant (MPP) has a significant impact on the functioning of settlements and local governments. On the one hand, this comes from the local business tax (Table 2), which went to the municipalities until 2020 (however, from 2021 the government took away this revenue from the municipalities for an indefinite period). On the other hand, MPP has sites or mining sites several of settlement and several settlements are affected by MPP's environmental inspections.

Table 2. The proportion of the local business tax within the tax revenues in the settlements affected by the MPP (%, 2019)

Settlement	Local business tax
Abasár	**75.5%**
Aldebrő	97.2%
Bükkábrány	95.1%
Csincse	93.6%
Detk	98.6%
Halmajugra	99.7%
Karácsond	82.2%
Ludas	96.0%
Markaz	81.8%
Mezőnyárád	85.7%
Pálosvörösmart	46.5%
Vatta	97.1%
Vécs	80.2%
Visonta	96.3%

Source: own editing based on KSH-TSTAR data

In the study of the settlement involvement of the MPP, the following groups were formed by grouping the settlements (Table 3):

- In the case of 9 settlements, all complex involvement factors appear simultaneously. These municipalities have had significant local business tax revenues from MPP in recent years (Municipalities with direct, complex involvement; blue colour in the Table);
- 8 settlements form a group from the point of view of environmental assessment, as well as the key settlements of the regional economic analysis (Settlements with territorial impact);

green colour in the Table;
- 4 settlements belong to one group from the point of view of economic income and the operational area (Settlements with economic and cultural involvement; yellow colour in the Table);
- 4 settlements that are indirectly related to the activities of the MPP appeared in the impact assessment documents (Settlements with indirect involvement; brown colour in the Table).

In addition to the economic aspects, the grouping was carried based on of the operating permits of the sites and mining plots, the territorial aspects and the environmental parameters in terms of the impact of the MPP on the settlements.

Table 3. List of settlements belonging to the MPP

No.	Settlements Concern with for Local Industrial Tax	Industrial Sites and Operation Permits for Mining Areas and Uniform Environment Permits (2020-2025)	Environmental Review Procedures (Heves and Borsod-Abaúj-Zemplén County Government Office)
1	Visonta	Visonta	Visonta
2	Halmajugra	Halmajugra	Halmajugra
3	Markaz	Markaz	Markaz
4	Karácsond	Karácsond	Karácsond
5	Detk	Detk	Detk
6	Ludas	Ludas	Ludas
7	Abasár	Abasár	Abasár
8	Vécs	Vécs	Vécs
9	Aldebrő	Aldebrő	Aldebrő
10	Csincse	Domoszló	Domoszló
11	Bükkábrány	Kápolna	Kápolna
12	Vatta	Kompolt	Kompolt
13	Mezőnyárád	Nagyút	Nagyút
14		Nagyfüged	Nagyfüged
15		Adács	Adács
16		Gyöngyös	Gyöngyös
17		Gyöngyöshalász	Gyöngyöshalász
18		Pálosvörösmart	
19		Tarnazsadány	
20		Visznek	
21		Zaránk	

Source: own editing.

MPP has an extensive partner network.[1] The number of suppliers has exceeded 900 in recent years. In 2007, an industrial park was established in the vicinity of the Power Plant, which houses businesses that are heavily dependent on the power plant's products. For the future operation of these companies, it is important to know the extent of their dependence on the power plant. According to business and power plant experts, the list of more than 900 companies has been

[1] MPP's internal database was available to learn about the supplier network. Data on the size of the business between the Power Plant and the partner companies for 2020 were available. Based on the volume of business turnover, we focused on the main partners. We collected additional data on the partner companies from the company information database of the Ministry of Justice, which contains the annual reports of the joint. By merging the two databases, we had several options for categorizing companies (e.g., based on size, main activity, geographic location, added value, degree of dependency).

reduced to 307.

In 2019, the surveyed companies provided employment to a total of 72,828 people, an increase of 15.12% compared to 2017. In 2019, based on the number of employees, the majority of companies (39.22%) are micro-enterprises, 37.91% are small enterprises and 14.05% are medium-sized enterprises. 8.82% of them no longer represent the SME sector (Table 4). In their case, the number of employees exceeds 250. The number of large enterprises is 27, the main activities of which are: special construction, supply of electricity, gas, steam and air conditioning, manufacture of rubber and plastic products, financial intermediation (except insurance and pension funding), manufacture of non-metallic mineral products, land and pipeline transport, manufacture of chemicals and chemical products, legal, accounting, tax consultancy.

Table 4. Categorization of enterprises by number of employees

Category	Number of employees (capita)	Number of enterprises (piece)
Large enterprises	>250	27
Medium-sized enterprises	51-250	43
Small enterprises	11-50	116
Micro-enterprises	<10	120

Source: own editing.

The two largest employers, MOL PLC. employed 26,330 people in 2019, while MVM Zrt employed 12,168 people in the same year. The other large companies employ an average of 2006 people. In the case of medium-sized enterprises, the average number of employees in the business year 2019 was 114, in the case of small enterprises 25, while in micro-enterprises the average number of employees was 4.

The surveyed companies carry out a total of 45 main activities. Most of them (80 companies) work in the field of wholesale (except motor vehicles, and motorcycles), which means 26% of them. In addition, there is a significant number of enterprises engaged in the following main activities: special construction (22 companies), retail trade (except motor vehicles, and motorcycles) (21 companies), architectural activities; technical testing, analysis (20 companies) and manufacture of machinery and equipment (19 companies).

The most important suppliers of the Power Plant are companies engaged in activities that play a key role in the provision of a service or the procurement of a product, and often provide the Power Plant with a nationwide connection. The most important suppliers are MPP's subsidiaries, which deal with mining services and the repair of industrial machinery and equipment. These companies are of great importance to MPP, but conversely, this is less true as they have an extensive network of energy trading relationships. The situation is different for companies manufacturing and supplying special components (e.g. bearings, rubber belts, gears, carbon brushes, repair materials, etc.), chemicals, tools, and measuring instruments for mining and power plant activities. Supplying MPP with specialty products accounts for a significant portion of the company's turnover as they would not be able to sell them elsewhere. The situation is similar among companies performing special maintenance, repair, and construction activities. The widest group of partner companies are service providers that do not provide a specific service directly related to the coal-fired power plant, but the Power Plant is an important customer for them due to its volume. The range of these activities is very wide, from cleaning to interpreting and occupational health to hospitality.

We also examined and grouped the companies based on gross cash flow to see their dependence on the MPP (Table 5). We can see that 26 of all the companies involved have a significant cash

flow (more than HUF 300 Mn), but most of the companies partnering with MPP belong to the medium cash flow category.

Table 5. Categorization of enterprises by number of employees

Cash flow (Ft) 2020		Gross turnover (code)	Number of partners
0	99 999	1	0
100 000	999 999	2	26
1 000 000	4 999 999	3	74
5 000 000	9 999 999	4	46
10 000 000	19 999 999	5	33
20 000 000	49 999 999	6	53
50 000 000	99 999 999	7	29
100 000 000	199 999 999	8	20
200 000 000	299 999 999	9	10
300 000 000	499 999 999	10	4
500 000 000	999 999 999	11	5
1 000 000 000	-	12	7

Source: own editing.

In the case of dependence on the Power Plant, not only the cash flow category plays an important role, but also the share of the cash flow with the Power Plant in the annual turnover of the partner company. Four categories were developed:

- 0-25% low proportion, low dependence,
- 26-50% moderate proportion, moderate dependence.
- 51-75% high proportion, high dependence,
- 76-100% significant proportion, significant dependence.

We also determined the degree of dependence of the partner companies on the MPP based on the payment categories and the net sales revenue and stated the number of highly dependent companies is 32 and the number of dependent companies is 15, concentrated in 25 settlements.

The involvement of stakeholders in the decarbonization process

In the Just Transition, process stakeholder engagement has several benefits, such as building trust and legitimacy increase impact and pace of progress, save resources or broaden the knowledge base of decision-makers.

The platform for Coal Regions in Transition defines the concept of stakeholder engagement as the 'Process by which an organization leading the transition in a coal region engages with and involves those who are affected by the decisions that are made. Stakeholder engagement goes hand-in-hand with partnership building, both of which allow stakeholders to pool their resources to solve common problems' (EC, 2020, p.10).

In Northern Hungary, stakeholder engagement started in 2020, in the framework of the LIFE-North-HU-Trans project. The first step was to identify the stakeholders to be involved. At national level, the Ministry for Innovation and Technology (responsible for climate and energy policy) and the energy authority (responsible for regulation) were detected. From the lignite sector, the power company concerned was identified with the tasks of implementing of decarbonization, taking care of the workers, reclaiming the mine sites, and carrying out the decommissioning of lignite-fired units.

Workers and their representatives will have to deal with possible career changes, pay cuts, possible relocation, or participate in training or retraining programs while suppliers and subcontractors might be affected by the loss of income and orders in the meanwhile they might enter into new product chains and portfolio changes and suffer from employee outflow. Local governments could have also drawbacks during the transition process. On the one hand, they might be affected by a significant reduction in local business tax revenues and on the other hand by environmental pressures.

We identified buyers of the power plant also, as stakeholders with the effect of the substitution of electricity, gas, and steam from the plant at lower prices and the replacement of by-products (e.g. gypsum) from the plant's operation.

Residents are the heavily affected stakeholder groups in the transition as households using lignite for home heating will need to find a new fuel, however, the health impacts on residents will be reduced.

Authorities and county government and regional economic development institutions are responsible for economic development, planning economic restructuring based on the region's assets however their duties are supporting the businesses concerned, promoting a shift towards a green economy.

Research and training institutions will create professional-technical knowledge for retraining, and economic development and carry out impact studies. NGOs' duties are better involvement of the public and the independent monitoring of the transition.

As a first step of the stakeholder engagement, interviews were conducted in the first quarter of 2021 with key local and national stakeholders whose insights, comments, and possible concrete development proposals could be useful in the development of a green vision for a sustainable Just Transition for the MPP and its region. A total of 40 stakeholders from the before-mentioned groups were interviewed in depth at least once.

The stakeholder interviews were used to assess how and to what extent each actor is affected by the transition. Whether negative socio-economic and environmental impacts are expected during the transition. The questions also covered the process and predictability of the transition, economic consequences, impacts on workers, the vision for reclamation, and environmental changes.

The influence of the companies linked to the MPP through their activities and the local municipalities is low, but the phasing out of coal firing could have a significant impact on them. Public authorities and agencies may have a greater influence on the process and may even be more deeply involved.

We defined that in the transition process all the municipalities concerned have heard about the decarbonization process, but no municipal strategy has been developed on how to protect jobs or make up for lost tax revenues and prepare for the future use of mining sites. Most importantly, local authorities have not started to think together about restructuring the whole region. This has changed during the stakeholder engagement process, and in preparation for the Just Transition Fund intervention operations, local authorities are now thinking in terms of projects with a regional impact. We also stated that the majority of the enterprises concerned will be affected by the changeover, as their activities are closely linked to the MPP. Among the companies surveyed, however, some will not be significantly affected by the change. Trade unions can help to liaise with employees to make them understand the need for transition and can also provide support in the steps of the career change.

As a result of the stakeholder analysis, we can say that in the employment and economic transition municipalities are heavily dependent on the MPP, there might be significant financial difficul-

ties due to loss of revenues (layoffs are expected in several places) and there are many employees in the municipalities who work for the MPP. In this phase, Trade Unions are involved in the Just Transition process through retraining and public involvement. Attention should be paid to the group of workers who will not yet be retired in 2025 but are close to it. According to the green NGOs, the region has a low proportion of small and medium-sized enterprises, and the workforce is vulnerable to large companies.

As for the impact of environmental pressures, we stated that local municipalities feel that the air quality in the area has improved over the last twenty years, as confirmed by data from the authorities. They expect further improvements in both light and noise pollution due to decarbonization processes. Unfortunately, residential lignite combustion is still present in many municipalities, with serious negative effects on health. Businesses agree that the transition is necessary and will lead to an improvement in air quality, while green NGOs are opposed to residential lignite firing, which they would like to see banned.

As far as reclamation is concerned, some of the settlements are no longer opencast mining, so they are beyond reclamation. Almost all of them would like to develop renewable energy production, but it is also common to develop areas for tourism and recreational purposes (Hojcska &Szabó, 2020; Szabó, 2021). The idea of an educational center has also been mentioned. Conservation organizations are definitely in favor of the full decarbonization of the MPP and the emergence of decentralized (and renewable) power generation solutions in the area, and of ensuring a just transition. Local and regional authorities believe that tourism in the area should be developed in parallel with the shutdown (The Mátra Mountain as the lungs of the country). In the course of reclamation, it is proposed to continuously increase the share of native species, to restore at least a state close to nature, but the idea of agricultural use has also been raised.

Conclusion

Our article was about the analysis of Hungary's still existing coal region (Northern Hungary), including the future of coal mining and energy production. Within the interpretive tradition of social research, we approached the problem and explored the role and significance of the Mátra Power Plant in the country and the coal region. The results show that there has been widespread involvement in the field of coal removal, Just Transition and that it is important for decision-makers and energy policy stakeholders in the country and the region to have a say.

The first key tangible result of the stakeholder engagement was the identification of intervention operations that could be expected to lead to calls for proposals under the Just Transition Fund.

We also can conclude that stakeholder involvement in the process is also an investment in (re) training of the workforce but has an impact on green economic diversification, technological change, promotion of research and development, and innovation.

A result of our research is that stakeholder engagement encourages not only the development of renewable energy infrastructure and environmentally sound domestic energy production and energy use but also green public transport development and the sustainable use of land.

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