

# Małopolska, Poland

## GENERAL INFORMATION

**Country:** Poland

**Region Name:** Małopolska

**Region NUTS2 code:** PL21 - Małopolska

**Region NUTS3 code:** PL21A – Oświęcimski Subregion

**Main urban centres in the region:** the voivodeship contains 62 cities and towns. The largest towns are:

Krakow – 756,757

Tarnow – 117,109

Nowy Sacz – 84,594

Oswiecim – 40,979

Chrzanow – 39,797

Olkusz – 37,552



*\*NUTS: Nomenclature of Territorial Units for Statistics*

## NOTICE ON COVID-19

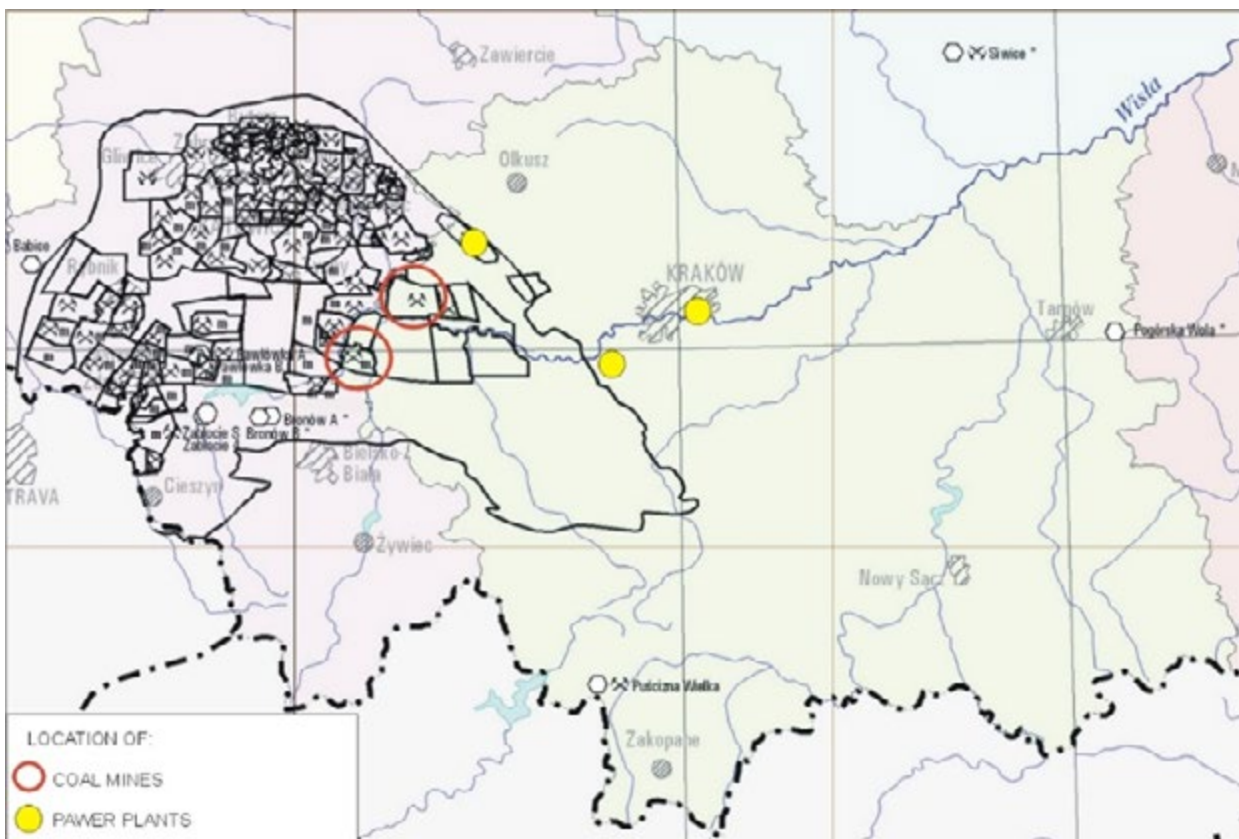
The data and information presented in the regional profile were gathered prior to the COVID-19 pandemic. Consequently, this profile does not reflect the impact of the pandemic and response measures on regional energy demand, on coal mining and power generation activities, and on other economic sectors. At the time of publication of this profile, the full consequences and implications of the pandemic for the region are emerging and evolving, although they can be expected to be significant.

## Overview

Małopolska is situated in southern Poland and has a population of 3.35 million. The region is composed of 182 municipalities, of which 6 are significantly or directly affected by coal mining activities. Małopolska is one of the regions which has been notably affected by low-carbon transformation in Poland and the European Union. The region's energy transformation began in the 1990s. The closure of 3 mines (in Trzebinia in 2001, and some mine shafts in Libiąż and Brzeszcze) still has negative social, economic and environmental effects in the region.

Małopolska's two existing coal mines are in the western part of the region, in the Oświęcimski Subregion that directly borders the mining area of Silesia (see map below) where the coal industry is significant, and in some places a key employer. Małopolska is in the top five Polish regions

in terms of the number of economic entities involved in coal mining. In the western part of the region, their share in the total number of economic entities fluctuates around 30%. Małopolska ranks 11th among all European regions in terms of the number of coal-related direct jobs and 12th in terms of the risk of socio-economic effects of energy transformation. One of the three of Małopolska's coal power plants is in the western part of the region (NUTS 3) - the Tauron Siersza Plant (located in Trzebinia, east of Katowice and close to Silesian border). The other two power plants in Małopolska are located in Skawina and Kraków. Western Małopolska and Krakow are strongly associated with energy-intensive industries such as aluminium, steel, cement and chemical industry.



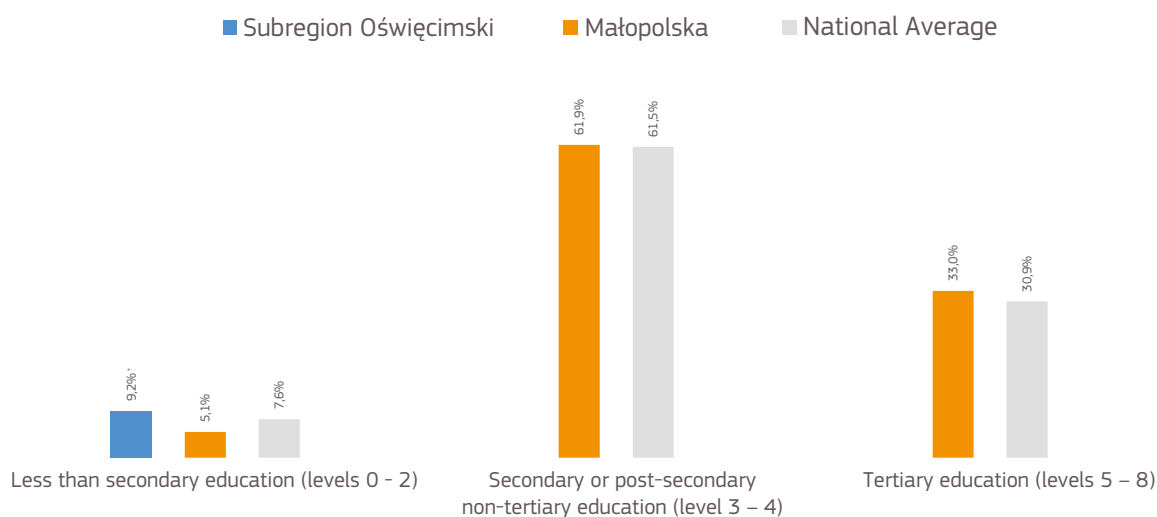
LOCATION OF COAL MINES AND POWER PLANTS IN MAŁOPOLSKA REGION

Source: PGI-NRI, modified

## Regional socio-economic profile

	Subregion Oświęcimski (NUTS 3)	Małopolska (NUTS 2)	National Average (NUTS 0)	Date / Source
<b>Population</b> [persons]	551,287	3,349,498	37,976,687	2018 Eurostat (demo_r_d2jan)
<b>Population density</b> [persons/km <sup>2</sup> ]	273	222	124	2017 Eurostat (demo_r_d3dens)
<b>Employment</b> [No. persons employed]	113,012	1,409,200	16,133,400	2018Q4 Eurostat (namq_10_a10_e)
<b>Employment rate</b> [% share of population aged 20-64]	N/A	72%	72%	2018 Eurostat (lfst_r_lfe2emprt)
<b>Unemployment rate</b> [% share of labour force aged 15-74]	6.4%	2.9%	3.9%	2018 Eurostat (lfst_r_lfu3rt)
<b>GDP per person</b> [€]	N/A	€19,100	€20,900	2017 Eurostat (nama_10r_2gdp)
<b>Small and Medium-Sized Enterprises (SME)</b> [% of total]	Subregion Oświęcimski (NUTS 3)	Małopolska (NUTS 2)	National Average (NUTS 0)	Date / Source
<b>Share of total employment</b>	N/A	73%*	68%*	2018 *Estimate based on GUS

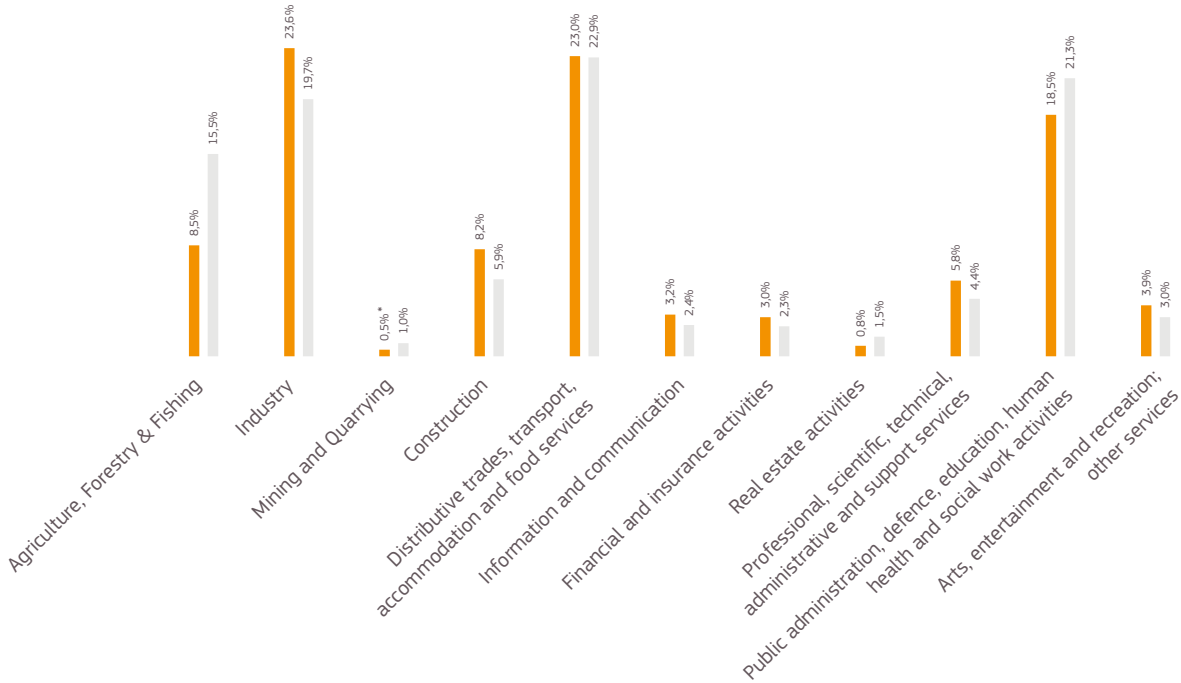
### Educational attainment



Data / Source: 2018 Eurostat (edat\_lfse\_04)  
\*Estimate based on data from the National Census

### Employment by sector

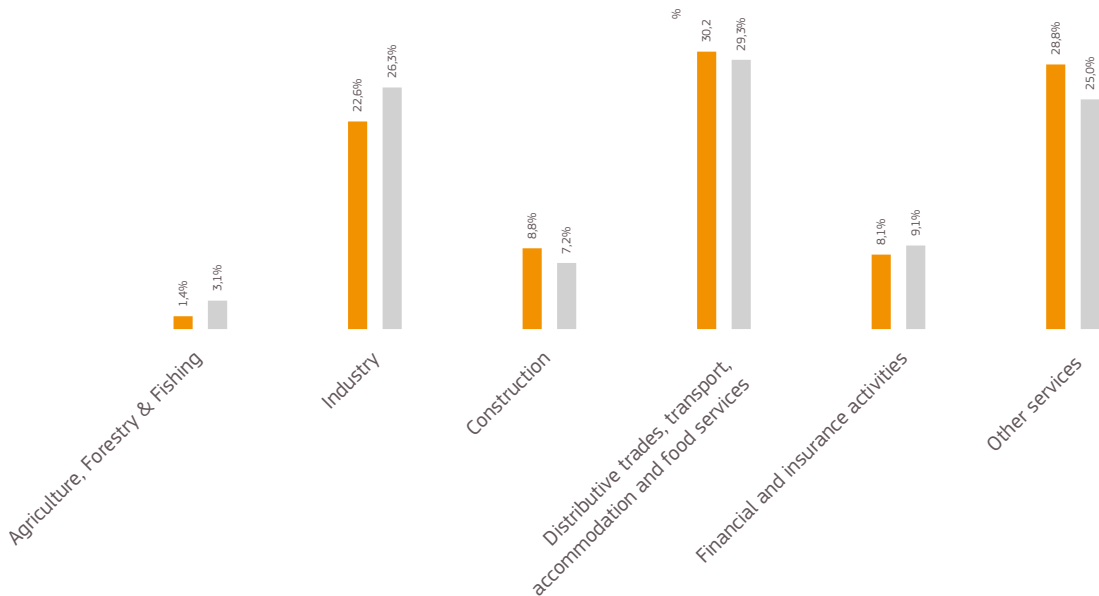
■ Małopolska    ■ National Average



Data / Source: 2017 GUS  
\*Estimate based on data on mine employees.

### GVA per sector

■ Małopolska    ■ National Average



Data / Source: 2017 GUS

## General description of the economic and demographic profile of the region including notable trends and projections

Poland faces a declining and ageing population, which is apparent through a decreased share of young people and an increase in the population aged between 44 and 64, and of post-working age. By contrast, since 2004, Małopolska observed an increase of its population (by approximately 178,000 people). This increase is forecasted to continue, with the Central Statistical Office projecting that Małopolska will see a population increase of 0.7% through to 2035 (with respect to 2014), resulting from both births and (net) inward migration.

Poland in general, and Małopolska particularly, have very low unemployment rates (3.9% and 2.9%, respectively). The employment rate in Małopolska stands at 72%. Workers enjoy a high level of education, with only 5.1% of population of Małopolska having a low educational level (levels 0 to 2), compared to a national average of 7.6%. The region has also a higher share of people with tertiary educational level (33.0% compared to a national average of 30.9%).

The region's gross domestic product (GDP) was €37.6 billion in 2017, representing about 8.1% of national GDP. GDP per capita is slightly below the national average (at €19,100 compared to €20,900 at national level in 2017). There is a growing importance of sectors such as high-tech manufacturing and automotive industries, but traditional sectors (metallurgy, heavy chemicals, mining, metal, and tobacco and food industries) continue to constitute Małopolska's regional economic base. With 55.4 micro, small or medium enterprises per 1000 inhabitants, Małopolska ranks above the Polish average of 49.7.

## Regional coal industry and power plant profile

### Overview and general characteristics of coal-related industry

Hard coal mining in Poland is centred around three coalfields: Upper Silesia Basin, Lower Silesia Basin and Lublin Coal Basin. Over 80% of coal deposits in Poland are in the Upper Silesian Coal Basin. Małopolska's coal mines are located in the Upper Silesian Coal Basin but they make up only a small part of production in the Basin, with most coal mines located in the neighbouring Silesia region.

Mining communities are concentrated in the Western part of Małopolska in the Oświęcimski Subregion (NUTS 3), which borders with Silesia. The hard coal is extracted in two coal mines (KWK Janina in Libiąż and KWK "Brzeszcze"), with a total annual production of over 2.3 million tons/yr.

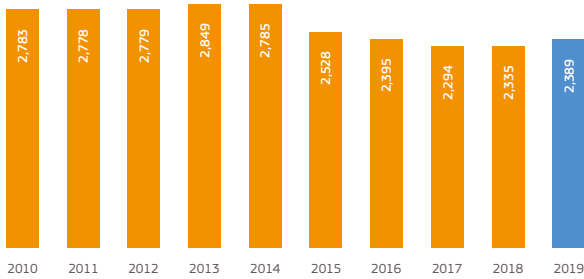
The three coal power plants in Małopolska were commissioned in 1957, 1962 and 1977. The Tauron Siersza Plant is located at Trzebinia, east of Katowice and close to Silesian border. The installed capacity is 546 MW and the thermal capacity is 36.5 MW. The Skawina Power Plant is located 20 km south-west of Krakow (the installed capacity is 490 MW) and the Krakow Power Plant is located near Krakow (the installed capacity is 460 MW and the thermal capacity is 1,547 MW).

### Socio-economic characteristics of coal-related industry

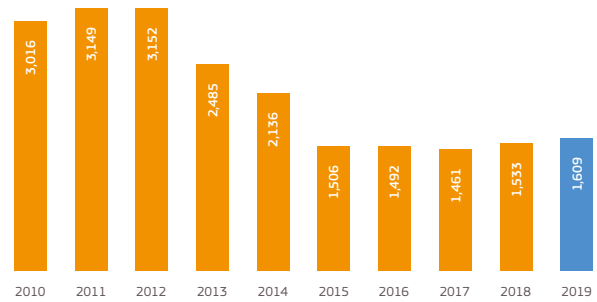
Annual hard coal consumption in Małopolska is over 5 million tons, with locally extracted coal used for coal-fired power generation in the region. In 2018, power generation (electricity plants, combined heat and power plants (CHP) and heat plants) consumed over 2.6 million tons of coal, while industry and construction consumed around 1.3 million tons, and small consumers around 1 million tons. Hard coal is one of the primary fuels used by Małopolska's households for heating purposes, especially among people affected by energy poverty. It is estimated that about 8.5 % of households in Małopolska are energy poor. Households consume over 920 thousand tons of hard coal (18% of total hard coal consumption in the region), with more than 400,000 coal boilers estimated to be operated in Małopolska, which has negative impact on air quality.

Coal mining				Date
Type of coal	Hard coal			
Type of coal extraction	Underground mining			
Number of coal mines	2			2018
Annual production of coal	2.3 million tons			2018
Coal mining enterprises				Date
Company Name	Mine Name	Ownership	Number of employees	Date
Tauron	Janina Mining Plant	Mixed (30% ownership by Treasury)	2,389	2019
	Brzeszcze Mining Plant		1,609	
Coal power plants				Date
Number of coal power plants		3		2019
Installed capacity		1,576 MW		2019
Share of coal in regional power generation mix		80%		2019
Main (largest) coal power plant operators				Date
Company Name	Plant name	Ownership (e.g. public or private)	Number of employees	Date
Tauron	Siersza Power Plant	Mixed (30% ownership by Treasury)	300	2019
CEZ Group	Skawina CHP Coal Power Plant	Mixed (70% ownership by Treasury of the Czech Republic)	200	2019
PGE	Krakow CHP Coal Power Plant	Mixed (57% ownership of Treasury)	700	2019
Regional employment in coal mining and coal power plants				Date
Employment	Number	Share of total regional employment [%]		Date
Coal mining (direct employment)	3,998	0.3%		2019
Coal power plants (direct employment)	1,200	0.08%		2019
Other coal-related activities [e.g. supply chain and services to coal operations]	3,703	0.2%		2018

HCM Janina (Libiąż) - 2,389



HCM Brzeszcze - 1,609



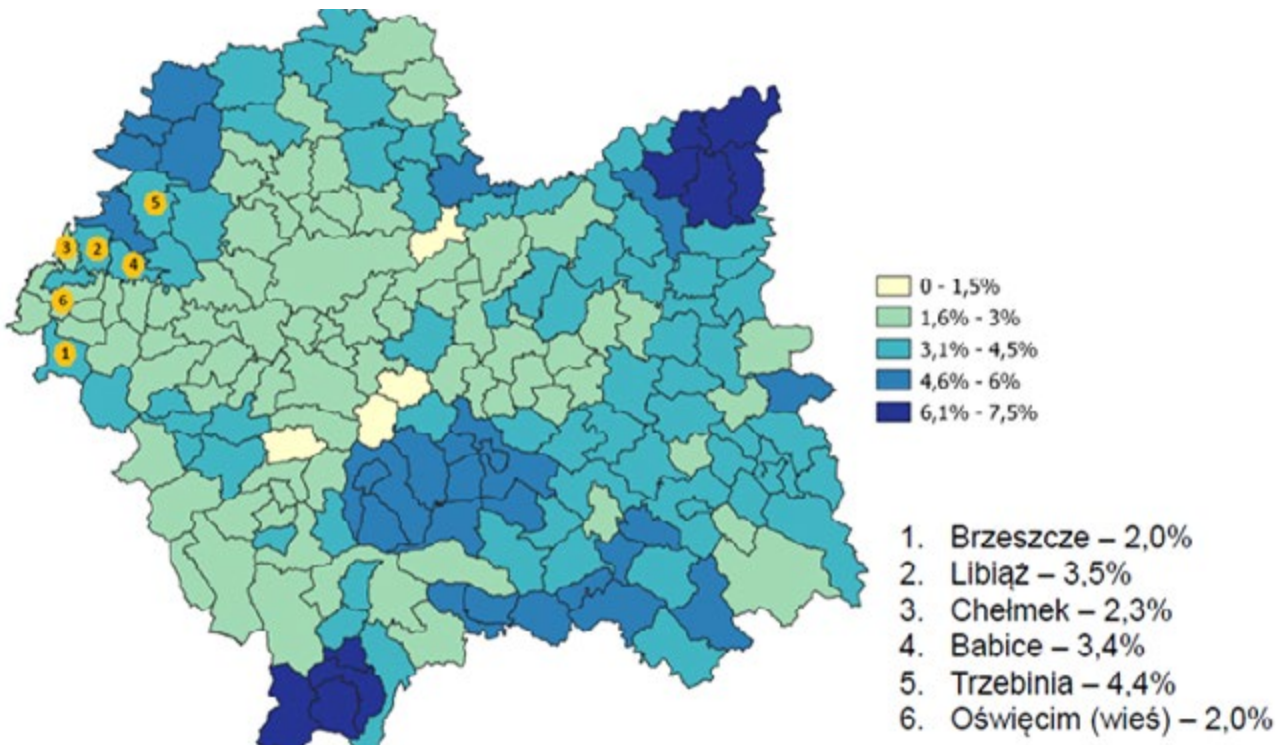
**EMPLOYMENT IN MINING PLANT JANINA (LIBIĄŻ) AND BRZESZCZE**

Source: TAURON Polish Energy, 2019

According to the data of the Regional Labour Office in Krakow, over 7,000 people are employed in mining sector in Małopolska. Compared to neighbouring Silesia, Małopolska does not have a heavy economic dependence on the coal industry and employment in mining has been falling in recent years. In 2019, just under 4,000 people worked in the Region's two coal mines, which represented around 0.3% of total regional employment. In addition, the three coal power plants employ around 1,200 people in the region.

In 2018, the unemployment rate in municipalities home to mining communities was estimated between 2.0 and 4.4%, which is close to an average for the region. The highest unemployment rate was in the municipality of Trzebinia (4.4%) and the lowest in the municipalities of Brzeszcze and Oświęcim (village).

Since 2015, the supply of job offers in mining has been growing and the number of registered unemployed in the mining sector has been falling. Between 2015 and 2018, the number of job offers increased almost 8 fold, with 308 vacancies recorded in 2018 and 112 in the first half of 2019, with a large part (almost 50%) for underground



**UNEMPLOYMENT IN MUNICIPALITIES IN THE MAŁOPOLSKA REGION**

Source: Regional Labour Office in Krakow

mining. In 2018, 458 people in mining professions were registered as unemployed in local labour offices throughout Małopolska; 64.8% of those unemployed in the mining sector are people above 50 years old and 60.7% of them are long term unemployed. Some of the unemployed are not interested in taking up work in the mining profession because of health issues and unattractive remuneration.

### Characteristics, trends and challenges of coal-related locations and communities

The subregion of Western Małopolska is heavily industrialised, particularly around the mining municipalities (Babice, Brzeszcze, Chelmek, Libiąż, Trzebinia). The economy of these municipalities is largely based on the mining industry (mines, gravel pits), with few new industrial or service investments. For over 100 years, the coal industry has “always” provided jobs, often for entire families. In these traditional coal mining areas, a certain social status is attached to these jobs, which has contributed to the creation of a cultural identity with a strong ethos of work.

Development of the subregion of Western Małopolska is hampered by environmental pollution associated with heavy industrialisation and by the degradation of areas where industrial activity (including mining) has terminated or is in decline. The mining municipalities share common problems relating to loss of urban functions (Brzeszcze, Trzebinia and Libiąż), unfavourable demographic indicators and outflow of young educated inhabitants, aging of the society, feminisation of unemployment, professional monoculture (on average every fourth employed person works in the mining industry), pollution and degradation of the natural environment as a result of mining exploitation (the natural environment of the municipalities of Trzebinia is among the most degraded and depleted in Małopolska), and underdevelopment of post-mining and post-industrial areas, especially where municipalities do not own the sites and thus encounter difficulties in (re-)activation and finding alternative economic use.

## Coal transition strategies and plans

### Current status and timeline of coal transition

The Polish government remains committed to coal and, accordingly, plans for an energy transition are only slowly being developed, with limited national level discussion on coal phase-out. Nonetheless, although no timeline yet exists for the coal phase-out, strategies and plans regarding energy, climate and air quality have been developed at the national and regional level (see section on current strategies).

### Current strategies and plans for economic diversification / development and decarbonisation

#### At national level:

In 2019, Poland submitted its **National Energy and Climate Plan for years 2021-2030** (NECP) which stipulated its objectives relating to increased energy efficiency and decarbonisation (see next section on KPIs of strategies and plans). A comprehensive analysis of the impact of energy transformation on mining areas (including on society, employment, and skills) was not possible within the time required for submission of the NECP. Such analysis will be carried out as part of the restructuring plan for hard coal and lignite mining regions envisaged in 2020. However, in the context of equitable energy transformation the intention to include Małopolska in the transformation aid for coal regions is clearly indicated in the NECP.

In 2018, Poland adopted its **Strategy for the coal sector in Poland until 2030**. The stated objective of the Strategy is to create conditions conducive to building a profitable, efficient, and modernised hard coal mining sector, based on greater cooperation, knowledge sharing and innovation.

In 2019, the Ministry of Energy prepared a draft of **Energy Policy of Poland until 2040** in which it commits to a reduction of coal in electricity generation by 2030, an increase in renewable energy in final gross energy consumption, the implementation of nuclear energy by 2033, improvement in energy efficiency, and a reduction in CO<sub>2</sub> emissions.

In 2017, the **Strategy for Responsible Development until 2020 (with a perspective until 2030)** was adopted. Concerning coal mining, the Strategy provides for: increased efficiency of mines, adjusting extraction to meet market needs and, where possible, an increase in the share of higher value-added products in the extraction structure, and ensuring adequate levels of investment.



### At regional level:

Coal mining makes a relatively small contribution to Małopolska's GDP and employment. From a policy perspective, the regional focus is on mitigating air pollution and improving air quality, and from 2019 also on mitigating and adapting to climate change, as well as on low-carbon transformation of the region. Regional low-carbon transformation activities have been included in the Regional Action Plan for Climate and Energy (RAPCE). Małopolska struggles with very poor air quality, particularly during the winter season. Along with Silesia and nearby regions in Slovakia and the Czech Republic, it is one of the most polluted regions in the EU. Concentrations of particulate matter (PM10 and PM2.5) and benzo(a)pyrene are exceedingly high throughout the whole region.

Małopolska is the first Polish region with a dedicated plan for climate change mitigation and adaptation. **The Regional Action Plan for Climate and Energy (RAPCE)** was adopted by the Management Board of Małopolska on 18 February 2020. The Plan supports a low-carbon transition of the region through mobilisation of public and private funds. The overarching objective of the Plan is to strive for climate neutrality and contribute to the EU climate goals for 2030 (i.e. a cut of at least 40% in greenhouse gas emissions compare to 1990 levels, a share of renewables of at least 32%, and at least 32.5% improvement in energy efficiency). The Plan covers not only energy but also transport, agriculture, and water and waste management, as well as forestry and land use. RAPCE constitutes the basis and starting point for further strategic actions and programmes aimed towards a low-carbon transformation of the region.

Małopolska is the first Polish region to limit the use of coal for household heating. The Regional Assembly adopted a solid fuel ban in Krakow effective from 01/09/2019, with an obligation to replace old solid fuel boilers in the region by 31/12/2022. At the level of the entire region, emission standards for boilers and fireplaces have been introduced to eliminate the use of poor-quality fuels. The Anti-Smog Resolution requires the replacement of almost 500,000 old solid fuel boilers in the coming years. **The Małopolska Air Quality Plan (MAQP)** defines the tasks for local governments to eliminate obsolete solid fuel boilers and modernise household heating systems for use of environmentally friendly energy sources (including renewable energy sources) or installation of modern solid fuel boilers meeting eco-design emission standards. The level of implementation of these actions is insufficient, however. In 2017–2018 the achieved reduction of particulate matter and benzo(a)pyrene emissions was only 6.3% of the target set for 2017–2023. At a local level, the fundamental barriers hindering effective implementation of the MAQP are a lack of human resources, organisational capacities, and necessary know-how within municipal authorities.

At the city level, Krakow has adopted the **City Adaptation Plan to Climate Change by 2030**. The Plan indicates a vision and specific objectives for the City's adaptation to climate change, which should be achieved through selected adaptation activities in the field of public health, water management, transport, and conditions of functioning of high intensity development areas. The plan's objective is to achieve net zero CO2 emissions in 2030.

### Principal KPIs of strategies and plans

**National Energy and Climate Plan for years 2021–2030 (NECP)** stipulates the following goals related to increased energy efficiency and decarbonisation:

- 21%–23% of RES is gross final energy consumption by 2030. The 23% target is conditional on the granting of additional EU funds, including those addressed to a just transition. In 2018, RES represented 13% in gross final energy consumption in Poland.
- A national target for improved energy efficiency by 2030 corresponding to a 23% reduction of primary energy consumption comparing to the PRIMES 2007 forecast.
- A 7% reduction target for greenhouse gas emissions in sectors not covered by the ETS system compared to the level in 2005.

The draft **Energy Policy of Poland until 2040** adopts the following indicators as global measures of the achievement of the Polish Energy Policy goals:

- 60% share of coal in electricity generation in 2030 (currently the share stands at 78%).
- 21% renewable energy in final gross energy consumption in 2030.
- Implementation of nuclear energy in 2033.
- 23% improvement in energy efficiency by 2030 compared to 2007 forecasts.
- 30% reduction in CO2 emissions by 2030 (compared to 1990).

**Regional Action Plan for Climate and Energy** adopt the following key performance indicators, which are in line with EU 2030 targets:

- Reduction in regional greenhouse gas emissions of 7 427 thousand tonnes equivalent of CO2 (33.6% decrease).
- Energy production from RES in the region should increase by 53 623 TJ to reach 62 432 TJ of final energy production from RES in 2030 (600% increase).

- Primary energy consumption in the region should decrease by 2 518 ktoe (105 445 TJ), such that total energy consumption should not exceed 5 230 ktoe in 2030 (equivalent to 5.2 Mtoe of primary energy or 219 001 TJ) (24% reduction).

### Principal actors in development and implementation of transition strategies and plans

- Ministry of Economic Development
- Ministry of Climate
- Ministry of National Assets
- Małopolska region

### Role of civil society

The NGO sector is steadily developing in Małopolska. NGOs played a key role in adopting anti-smog resolutions in Poland (as well as in Małopolska). There are currently 15 local smog alerts in Małopolska. Thanks to their joint efforts, public awareness of the smog problem has increased, and this has motivated politicians to work on changes in the law, with the government announcing air improvement as one of its main priorities. The issue of air pollution receives wide coverage in local and national media.

Małopolska's NGOs have an impact on the voivodeship's activities in the field of environmental protection by participating in the EkoMałopolska Council. The main goal of the Council is to exchange professional knowledge and information in the most important areas of environmental protection.

Coal mining trade unions are one of the strongest labour organisations in Poland. Nowadays, trade unions, apart from the traditional functions (protection the rights of employees, especially to work in healthy and safe conditions), extend the range of their operations by participating in social movements to support local communities and protect the environment. The trade unions are particularly influential in the mining sector in Małopolska.

### Principal legislative drivers of transition

The mining industry is affected by:

- **The Environmental Protection Law** of April 27, 2001 (Revised October 16, 2019) which sets out the principals governing environmental protection and the use of environmental resources with regard to sustainable development requirements.
- **The Act on the function of hard coal mining** of September 7, 2007 which sets out the principles for financial restructuring of mining enterprises, rules for liquidation of mines, rules for employment restructuring in liquidated mines, conditions for obtaining initial investment subsidies, and principles of corporate governance. By 2020, a new, comprehensive **Act on the functioning of hard coal mining** will be adopted, which will determine the financing in this sector and it will include legal provisions enabling, among others, development of the model of functioning of the hard coal mining sector, limitation of hard coal imports, securing strategic deposits and revitalisation of post-mining areas.
- **National Energy and Climate Plan for years 2021-2030**, which presents the objectives, targets, policies, and measures in five dimensions of the Energy Union: decarbonisation, energy efficiency, energy security, internal energy market, and research, innovation, and competitiveness.

## Transition challenges

### Nature and scale of transition challenges

Heat and electricity production in Małopolska is primarily based on coal (around 80% of the energy generation comes from coal, with the remaining 20% from high-methane gas and biomass), with consequential contribution to pollutant emissions, which appear to be particularly important in Western Małopolska. Reduction of pollution can be achieved by replacing coal with alternative energy sources in the power sector, while coal consumption in the residential sector can be significantly reduced through the adoption of energy-saving technologies and measures. In the coming years, low-carbon transformation will require the replacement of almost 500,000 old solid fuel boilers.

**Regulatory reforms to support low-carbon transformation** are required both at national level (e.g. amendments to the Renewable Energy Sources Act for the use of renewable energy for heat production and cooling) and at the regional level. Failure to enact important regulatory reforms and absence of dedicated financial support to the RES installations, low-emission transport, thermo-modernisation, low carbon construction etc., may significantly delay low-carbon transformation in Małopolska.

**Regulatory reforms to support low-carbon transformation** where industrial activity (including mining) has terminated or been reduced are a challenge for regional and urban development. Brownfield sites affected by mining damage often cover significant areas and are unattractive for both inhabitants and investors. In addition,

many former mining sites are unfit for building because of voids in the ground that require expensive backfilling which makes their development uneconomic.

**Workforce reduction** is strongly related to the closing of unprofitable collieries. Currently, over 7,000 people are employed in mining sector (including 4,000 work directly in the two coal mines) in Małopolska. If the transition to a low-carbon economy is undertaken without other actions to create new jobs and stimulate the local economy, it risks an outflow of workers seeking jobs in other regions or abroad, and encouraging the development of the shadow economy. Workforce reduction in the mining industry affects not only former miners and their families, but the whole regional economy. These effects also extend to the younger generation entering the local labour market. Therefore, coal sector restructuring requires finding new pathways of development for the whole region, which has previously been dominated by heavy industry. Educational pathways in secondary and post-secondary schools, technical schools and university programs must be synchronised to the competences and future skills required by industry, and to adequately prepare the workforce for technology-intensive high productivity jobs.

**The predominance of traditional industry** over companies investing in new technologies is still visible in the region. Dependence on coal in Western Małopolska has led to a mono-industrial economy, with most industry activities and business initiatives based around resource extraction. Economic transition will result in the loss of many jobs in the region, leading to social decline in many places as well as exacerbating negative demographic change (e.g. aging of the population and migration to cities).

### Skills weaknesses

- Some local authorities lack know-how about how to cope with the social challenges related to mining transformation. Local authorities (especially in smaller municipalities) are often not prepared to take on new responsibilities and propose effective policies to support economic activity in their municipality.
- There is a need to align skills-development services provided by vocational and technical education and training courses with labour market demand (e.g. for retraining miners) and ensuring workplace learning (e.g. IT courses dedicated to miners).

### Infrastructure weaknesses

- The dominance of traditional industry relative to companies investing in new technologies is still visible in the region.
- The absence of investment areas in municipalities; in particular, there is a lack of developed, functionally integrated and well-connected investment areas. This makes it difficult to attract investors and inhibits the development of entrepreneurship.
- Lack of an efficient public transport network that would contribute to the integration of local labour markets.

### Weakness in other industries and economic activities

- There are few incentives to encourage diversification of business activities or for businesses to locate in Western Małopolska.
- State aid policy is not perceived as conducive to the promotion of renewable energy or alternative energy

Current or expected transition challenges facing the region	High (priority) importance	Moderate importance	Minimal importance	Not important
Air quality	X			
Environmental degradation of land	X			
Demographic change (e.g. population ageing, outward migration)		X		
Narrow / concentrated industrial structure	X			
Modernisation of industry / re-industrialisation		X		
Employment creation	X			
Reskilling	X			
Transport infrastructure and mobility	X			
Social cohesion		X		
Limited partnerships and consensus		X		

investments, for example on brownfield sites, or the revitalisation of post-mining sites and areas.

- The presence of undeveloped post-mining and post-industrial areas, which are not owned by municipalities and where they encounter difficulties in conversion to alternative economic use and (re-) activation.

## Transition opportunities

### Research capabilities and facilities

Due to the presence of many scientific institutions, Małopolska has considerable potential in terms of human resources for R&D activities. With its capital city of Kraków, Małopolska has a very well-developed base of scientific and research and development facilities, placing it among the Polish leaders in terms of the number and quality of its R&D organisations. There are 28 higher

education institutions and universities and more than 100 research and development centres in Małopolska, including units of the Polish Academy of Sciences. In April 2015, Kraków - based universities AGH, Technical University and Agricultural University created a common research consortium called InnoTechKraK. Furthermore, the region benefits from relatively good science and industry cooperation, mainly through several business and technology parks (e.g. Kraków Technology Park, Life Science Technology Park, Crystal Industrial Park in Tarnow, and Technology Park MMC Brainville in Nowy Sącz). Moreover, there are also several industry-oriented research units, such as 'BIER Molecular Biotechnology - Integration of Education and Research' and 'STEC - Stem Cell Therapeutics-Excellence Centre' of the Jagiellonian University.

There is significant potential for energy technology research and good infrastructure in place for creative industries, with Kraków being one of the most important centres for industrial design education in Poland. Małopolska also offers infrastructure to supports regional enterprises in

Transition opportunities where the region is already active or where there is interest to develop activities	High (priority) interest	Moderate interest	Minimal interest	No interest
Reconversion of coal-related sites / locations for renewable / alternate energy	X			
<ul style="list-style-type: none"> <li>• Biomass</li> </ul>			X	
<ul style="list-style-type: none"> <li>• Energy storage</li> </ul>	X			
<ul style="list-style-type: none"> <li>• Gas (biogas plants, including agricultural biogas plants)</li> </ul>	X			
<ul style="list-style-type: none"> <li>• Geothermal, as well as heat pumps</li> </ul>	X			
<ul style="list-style-type: none"> <li>• Hydro power and pumped hydro-storage</li> </ul>		X		
<ul style="list-style-type: none"> <li>• Hydrogen</li> </ul>	X			
<ul style="list-style-type: none"> <li>• Solar</li> </ul>	X			
<ul style="list-style-type: none"> <li>• Wind</li> </ul>	X			
Other energy				
Reconversion of coal-related sites for new economic and social activities	X			
Repurposing of coal-related industrial infrastructure	X			
Heritage, culture and tourism		X		
Low carbon mobility and transport	X			
Diversification of coal-related supply chain and service activities		X		
Other opportunities				
Circular economy (waste management)	X			
Low-energy building techniques	X			

terms of advanced manufacturing; good examples of this type of infrastructure are:

1. The “Green” Construction Laboratory in Małopolska. The Laboratory delivers research and development services for companies active in the field of “green” (“zero energy”) construction/installation materials production, construction services, as well as the scientists from high schools and R&D units. The Laboratory is an example of successful co-operation between the science sector and local authorities (Krakow University of Technology and Tarnów City).
2. The South Poland Cleantech Cluster aiming at regional development based on green technology.
3. “SPIN – Małopolska Knowledge Transfer Centre”. Academic experts at the Jagiellonian University, AGH and Technical University in Kraków offer free counselling to micro, small and medium enterprises in the fields of energy-saving construction, renewable energies, information networks, and biotechnologies. The goal is to increase knowledge transfer from academia to business, guided by the regional smart specialisation.

### Labour force skills and knowledge

People from the mining profession have qualifications (e.g. engineering, metalworking, welding) and skills (e.g. for construction works) that could provide them with access to employment opportunities outside the mining sector.

### Infrastructure

Public support to encourage investors to locate their businesses in Małopolska is provided, among others, through a special economic zone (Krakow Special Economic Zone) and several business support institutions, including industrial and technology parks (e.g. Kraków Technology Park, Tarnów Science and Technology Park, Life Science Park in Krakow).

Małopolska has modern infrastructure for personnel training and operation of companies in the ICT industry. Małopolska is the topped ranked region in Poland in terms of the number of students in ICT disciplines (12% of all ICT-related graduates in Poland). Furthermore, Małopolska has the second highest regional rate of employment in the ICT sector.

Vital transport routes of Central Europe intersect in Małopolska. The most important of them is the Pan-European Transport Corridor TINA III (Berlin – Kiev) and Poland’s second largest international airport Kraków-Balice. There is a good network of road connections with Małopolska’s neighbours, (e.g. Slovakia to the south (approx. 80 km), the Podkarpackie Region and Ukraine (approx. 250 km) to the east, Silesia (70 km) and Germany

(approx. 400 km) to the west, and the Świętokrzyskie Region (60 km) and Warsaw (270 km) to the north. These connections make the region a good place for logistics, warehousing and other services investments.

### Non-coal economic activities, industries and inward investments

Małopolska’s main economic sectors include wholesale and retail trade and repair, automotive and metallurgical industries, construction, agriculture, and food industrial processing. The new technology sector and tourism are also important.

In recent years, a steady improvement has been observed in the regional environment for innovation, especially R&D spending and cooperation between enterprises and academia, which has enabled Małopolska to score highly in rankings of regional innovativeness compared to other Polish regions. The “Updated in-depth diagnosis of the innovativeness of the Małopolska economy”, published in 2018, found that general activity in research and investments in innovation was rising and personnel was becoming more conscious of the use of innovation, albeit that this trend was concentrated in a limited circle of enterprises.

## Transition actions

### Current partnerships for economic development and decarbonisation

Małopolska supports the ‘Home Without Energy Bills’ initiative of Polish Organization of Heat Pump Technology Development. This initiative aims to encourage investments in nearly zero energy buildings (NZEB) for new housing (e.g. high energy performance using RES technologies for heat and electricity generation, and the introduction of the concepts of NZEB and zero-emission buildings as a common standard for new buildings).

Małopolska participates in the work of the Just Transformation Fund (JTF) Working Group at the Ministry of Development Funds and Regional Policy. The tasks of the Working Group will include the preparation of a territorial just transition plan and national strategic frameworks for the JTF.

### Recent and ongoing regional and local transition actions

Catching Up Regions Initiative, which is part of the broader action launched by the European Commission in cooperation with World Bank experts, and local and national authorities in four countries: Poland, Romania,

Croatia, and Slovakia. Its aim is to examine the factors that hold back growth and investments in lagging regions despite them having benefited heavily from Cohesion Policy funds. In the case of the Małopolska and Silesia regions, the aim of the project has been to increase the energy efficiency of single-family buildings and improve air quality.

From October 2015 to 31 December 2023, Małopolska (the Environmental Department of the Marshall Office of the Małopolska Voivodeship) is implementing the LIFE Integrated Project “**Implementation of Air Quality Plan for Małopolska Region – Małopolska in a healthy atmosphere**” (LIFE14 IPE/PL/000021). The main project objective of LIFE-IP MAŁOPOLSKA is full implementation of the Małopolska Air Quality Plan (MAQP), which will result in emission reduction of particulate matter and benzo[a]pyrene. Most LIFE IP activities focus on the territory of Małopolska. However, the project approach and results are directly relevant to all authorities responsible for air quality in the entire poor air quality hotspot region (southern Poland, northern Czech Republic, and Slovakia). The LIFE-IP MAŁOPOLSKA project coordinated by the Małopolska Region engages a total of 67 partners (62 municipalities including Krakow, the Silesian Region, the Association Krakow Smog Alert (NGO), the Polish National Energy Conservation Agency, the VITO NV Institute from Belgium, the Slovak Hydrometeorological Institute and the Ministry of the Environment of the Czech Republic). The value of the project is about €17 million, of which EU funding is €10 million. LIFE Małopolska is co-funded by the European Union under the LIFE Programme.

Małopolska cooperates with the Ministry of Economic Development on the following projects:

- **ZONE Project** (coordinated by the MET): to develop the national database of buildings including data on heat sources, energy performance etc., which will serve as a planning and management tool used in air quality, energy and climate-related policies (e.g. annual precise information and reporting on GHG pollutants from Poland).
- **Stop Smog Programme** that allocated €300 million until 2024 for investments alleviating energy poverty in the most heavily polluted locations in Poland.
- **The National Programme for Low-emission Transformation of Heat Appliances Manufacturers (SMEs)**, supporting their transition to the low-carbon, RES technologies through R&D and financial instruments, for which public and private funds will be mobilized. The expected allocation of funds from the National Centre for Research and Development for low-emission transformation of heating appliance manufacturers is €46.5 million.

## Planned regional and local transition actions

### LIFE-IP EKOMAŁOPOLSKA - Energy transition, clean air, mobility, sustainable spatial development:

“Implementation of the Regional Action Plan for Climate and Energy for the Małopolska Region LIFE EKOMAŁOPOLSKA” (LIFE19 IPC/PL/000005).

The activities planned during the implementation of the LIFE-IP EKOMAŁOPOLSKA will contribute to reducing emissions of greenhouse gases (including carbon dioxide), which are an important factor in climate change. Implementation of the LIFE-IP will contribute to promoting clean renewable energy sources, thermal modernisation of buildings, green technology, low carbon mobility, and waste prevention. This will allow for aligning climate and air quality policies. Implementation of the LIFE IP in Małopolska will contribute to achieving the objectives set out in the EU targets by 2030.

The LIFE-IP EKOMAŁOPOLSKA project coordinated by Małopolska will engage a total of 26 partners (Ministry of Economic Development, Silesia, Brandenburg University of Technology Cottbus–Senftenberg, Wuppertal Institute for Climate, Environment and Energy, Foundation European Clean Air Centre, AGH University of Science and Technology in Krakow, three main cities (Krakow, Tarnow, Nowy Sacz) and 17 Małopolska’s poviats). The main goal of the project is to support the low-carbon transformation of the region. The implementation of the project is planned from 2021 to 2030. The value of the project is about €16.6 million, of which EU funding is €9.8 million.

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## Platform for coal regions in transition

The Platform for coal regions in transition is an initiative by the European Commission.

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