



# EDITORIAL: THE TRANSFORMATION OF POST-INDUSTRIAL AREAS AND TERRITORIAL ASPECTS OF JUST TRANSITION FUND IMPLEMENTATION

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**Abstract.** An introductory text discusses the Just Transition Fund's core assumptions and origin, in the process revealing stages to the evolution of the approach taken – in the direction of 'green economy' assumptions. Activities financed within the framework of the *Fund* are identified, in respect of the restructuring of Poland's mining regions. Examples of fields of intervention are then discussed by reference to the *Terytorialny Plan Sprawiedliwej Transformacji Województwa Śląskiego 2030*, i.e. the 2030 Territorial Plan for the Just Transition of Poland's Śląskie Voivodeship, in Silesia. A particularly important aspect here is the timetable for closures of mines and conventional power plants. The material also presents selected data on the significance of mining and the extractive industries in both their social and economic dimensions. Particular attention is here paid to the labour-market consequences of the Just Transition. The references are to levels of pay in the sector referred to, as well as the wealth characterising the relevant Polish gminas (areas of local-governmental administration) – as an alternative way of looking at the entire process. The article also points to a large number of research aspects linking up with transitioning in the economy and requiring further study and analysis. Overall, the work points to the challenges that regions subject to restructuring are going to be faced with.

**Keywords:** Just Transition Fund, decarbonisation, *European Green Deal*, mining regions, Śląskie Voivodeship, Poland

## Introduction

The work detailed in this article has sought to identify the challenges associated with the (climate-related) energy transition, as well as the role in this which is to be played by the Just Transition Fund (JTF) put in place by the European Union (EU). The process is a complex one, seeking to contribute to the European Green Deal's achievement of its objectives.

The starting point here is thus a presentation by way of synthesis of the core decisions and activities leading to the establishment of the JTF. The assumptions underpinning the Programme are addressed here, and mention is made of the amounts allocated to different EU Member States. Analogous analysis is here done in regard to support for Poland's coal-mining regions, and the potentially large sums available to the different authorities active at regional level. A detailed

analysis of planned activity is undertaken by reference to *Śląskie Voivodeship's Terytorialny Plan Sprawiedliwej Transformacji* (UMWS, 2022c), given that this is Poland's largest coalfield region, which in fact accounts for most of the land within the province-region of Poland located in the wider Silesia and known as Śląskie. However, the article does not confine itself to synthesising key implementation documents, as it also offers data on the context for the transition, making its complexity clear. Transformations in general are processes hard to pursue and achieve in both their social and economic aspects, and they also denote – in this case in particular – large-scale environmental interventions. And while there is no way not to mention certain key facts that may represent factors holding up change, these may on the other hand be seen to some degree as myths linking up with phenomena and with a region whose existence has depended on coal. Overall, it is research challenges that are presented here, given that these should also be fields for scientific exploration. And it is first and foremost objective information that is offered – and needs to be so in order for substantive support to be available as the Just Transition is managed.

This article is thus based around the analysis of source documents, including those deriving from the European Commission and Silesia's aforementioned Territorial Plan. Also invoked are selected items of literature, expert opinions and reports, information in the media, and statistics from Statistics Poland, Poland's Ministry of Finance and Eurostat.

## The origins of the Just Transition

The JTF was established by the European Commission in 2021, as a reflection of decisions taken prior to that and formalised in the EU strategy known as the *European Green Deal* (EGD), or in Polish *Europejski Zielony Ład* (EC, 2019a) – where the word *ład* suggests rather a new order than a deal.

Naturally, change in the world's way of doing things to take better account of environmental objectives has a far longer history, with a potential intellectual and philosophical starting point being found back in the early 1970s, with *Limits to Growth* from the *Club of Rome* (Meadows at al., 1973). This was itself a reflection of the then financial crisis, and it pointed to growth grinding to a halt in the circumstances and context of natural resources (in particular fuels) being exhausted.

Disquiet as to the resources deficit, and the way that resources which were consumed in Europe generated far too much pollution, was likewise expressed in the *Delors Package*, which did also note the needs of traditional industrial regions. These were then the subject of EU structural intervention in the name of a policy that came to be known by the name 'cohesion'.

On the global scale, a breakthrough came in 1992, at the Rio *Earth Summit* (UN Conference on the Environment and Development). That witnessed the signing of the UNFCCC (Framework Convention on Climate Change), as well as *Agenda 21*. By this stage it was already clear that a key goal was to hold back increases in the mean temperature of the Earth to levels that would be safe for the environment and human life (UN, 1992).

Only in 2010 did the Union adopt its *Europe 2020* (albeit as a follow-up to the Lisbon Strategy). The 2020 subtitle was 'for smart, sustainable and inclusive growth', and climate and energy – together – were present as one of the key aims. In fact, obligations were imposed on Member States as regards a reduction in emissions of greenhouse gases by 2020 equal to 20% of the level they generated in the base year of 1990. To be added to that were two more '20s' to be achieved by 2020, i.e. a 20% share of energy used in the EU generated from renewables, as well as a 20% cut in energy consumption in comparison with forecasts, even as social inclusion would also be favoured (EC, 2010).

The broad concept of the green economy assumes green growth thereof, with sustainable development achieved in the process. The transition perceived in this way was to make reference to three approaches: business-as-usual; active environmental management; and a striving for sustainable development, with support, and in conditions of joint good governance. The result is envisioned to be a new economy characterised by the degree to which it is economical with resources, has achieved reduced levels of emission and greater social inclusion, in this way ensuring improved wellbeing and better health in the population, and a safeguarding of the opportunities for future generations to pursue their own development.

A major aspect of all this is for economic growth to be generated by investment in the development of clean technologies and the use of renewables. Just use is also to be made of human resources and public institutions. The system of separate measures to be pursued proves to be a complex one, with as many as 15 segments. However, most store is set by issues relating to energy, and especially its generation and storage; as well as environment-friendly transport, recycling and waste management, and the management of water and wastewater. The research supplementing these approaches concerns new technological solutions as well as necessary services for business. Green construction is a further, very specific area of action (Grose, 2013).

The multiplicity of challenges linked to the pursuit of a green economy came together with the identification of a need for the environment for human life to be improved to incline the EU into its 2019 adoption of the new aforementioned Strategy going by the name of *European Green Deal* (EC, 2019b).

The core objective here is nothing less than the transformation of the EU into a just and prospering society living in a modern, energy-saving and competitive economy. By 2050, there are to be net GHG emissions at a level of zero, thereby ensuring the status of the Union as climate neutral. The health and wellbeing of citizens is also to be safeguarded against threats and negative consequences of an environmental nature.

A key mechanism with which to achieve the goals set is a transformation (transition) above all being achieved in coalfield regions. This envisages a series of investments being made in renewables, and the green economy more widely. The mechanism in question was formalised into a so-called JTF.

In the case of Poland, all actions taken in the transition context will exert a major influence on the energy mix. The adopted energy policy entitled *Polityka energetyczna Polski do 2040 roku* (MKiŚ, 2021) involves the Just Transition as one of its three pillars. Coming under it is the transformation of coal-producing regions, the curbing of energy poverty, and the development of new branches of industry associated with both renewables and nuclear power. The component element thus a distinct influence on the labour market and economic base of coal-producing regions. The second pillar is of a net-zero-emission energy system which makes reference to offshore wind energy, nuclear power, local energy and citizen-generated energy. The third component aspect is then air of good quality – to be assured through action to transform heat generation, proceed with the electrification of transport and bringing in a programme known in Polish as *Dom z Klimatem* (translating neatly as both ‘a home with climate’ and ‘a home with a good mood/atmosphere’).

Poland’s energy policy through to 2040 proceeds on the assumption that the climate and energy transition domestically (only through to 2030) will be in receipt of some 260bn PLN, within which the allocation for the Polish JTF is of around 15.6bn PLN. It is planned for means from the Cohesion Fund to be increased markedly (to around 79bn PLN), alongside the Recovery and Resilience Facility (on around 97.8bn PLN).

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## Principles underpinning JTF support

It was Regulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 that established the JTF (EC, 2021b). It indicates possible ways in which funding can be allocated, and these should of course encourage achievement of the main goal that is a just and efficient transformation of subregions in the direction of a green, digital economy capable of ensuring a high quality of life to inhabitants in the circumstances of a clean environment.

The Regulation's provisions further note how production can be funded – including in start-up enterprises – with a view to the economy being both diversified and restructured. New enterprises can be invested in, as can research- and innovation-related activity, and there will be support for the transfer of advanced technologies whose pursuit and introduction will secure clean energy at affordable prices and will bring about a reduction in greenhouse gas emissions, even as energy efficiency is improved. New developments in renewable energy, the digital transformation and communications will also be funded.

There will be support for investment that encourages land regeneration, decontamination, and renaturalisation, as well as projects that change designations of land, and reinforce closed-cycling in the economy, *inter alia* by preventing or limiting the generation of waste. The Fund assumes efficient resource management, reuse, repair and recycling.

A key area the JTF supports involves the labour market, not least the raising of qualifications and reskilling among employees, help with finding a job and the active inclusion of jobseekers. As is typical with EU funding, the Fund will also operate in support of Technical Assistance.

On the other hand, it should be clear that there will be no funding for, for example, the close-down or indeed building of nuclear power plants (notwithstanding the fact that Poland's energy policy now foresees their construction). There will also be no support for activity relating to fossil fuels, be it in their production, processing, distribution, storage or combustion.

As conceived of broadly, the Just Transition falls within the concept of sustainable development. It is usually associated with mining regions, but in practice involves the whole of society. This is because of the effort needed to achieve a change linking up with a definitive departure from conventional sources of energy, with innovative solutions deployed, and habits cultivated across society in line with the technologies turned to. Some measures in this connection are a source of controversy with the public, or even downright opposition. As is clear, resort to energy-saving technologies will require that recipients (both businesses and households) assume the right kind of economical attitude towards both energy and heat. That means, not only education, but also a widespread conviction that the indicated behaviour is right, even if it may not be easy or convenient.

Polish society is certainly paying attention to any further or more final departure from coal, given the role the fuel has long played in the economy, both directly and via the power it generates. The Polish state thus has a challenge here, while an even greater one is faced by the local and regional authorities in coalfield areas – given that they will have to cope with a number of negative social, economic and environmental phenomena.

Indeed, the Just Transition has to be judged in its broader context, with emphasis placed on its role and place when it comes to the system of global trends working towards the development of a green economy. For this is one of the actions offering a way to achieve a goal that has been set, even as the significance and level of acceptability with the public is going to differ from place to place, in line with the scale of the change that has to ensue.

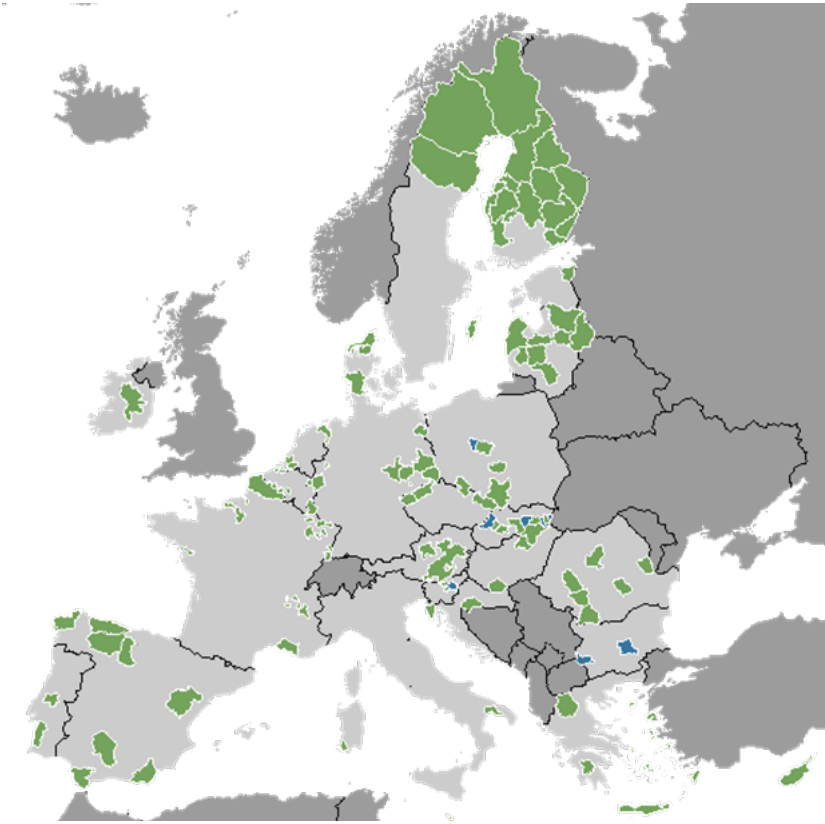
The overall budget for the JTF in the 2021–2027 period is €17.5bn. Of that the €7.5bn is to come within multiannual financial frameworks, while the €10bn will be funded within the *NextGenerationEU* framework. Beyond that, Member States are of course encouraged to augment money allocated via the JTF with funding from the ERDF and the *Plus* version of the European Social Fund (EP, 2022).

**Table 1.** Allocations to different EU Member States of means from the JTF

| State       | Meeting the objective of investing to boost employment and growth | Under the Recovery Facility | In Euros       | % share |
|-------------|---|-----------------------------|----------------|---------|
| Poland      | 1 684 651 792   | 2 162 694 681               | 3 847 346 473  | 20.0    |
| Germany     | 1 084 908 435   | 1 392 765 975               | 2 477 674 410  | 12.9    |
| Romania     | 936 925 136   | 1 202 790 396               | 2 139 715 532  | 11.1    |
| Czechia     | 718 766 159   | 922 725 849                 | 1 641 492 008  | 8.5     |
| Bulgaria    | 567 050 523   | 727 958 828                 | 1 295 009 351  | 6.7     |
| France      | 450 989 146   | 578 963 453                 | 1 029 952 599  | 5.4     |
| Italy       | 450 829 742   | 578 758 816                 | 1 029 588 558  | 5.4     |
| Spain       | 380 400 518   | 488 344 345                 | 868 744 863    | 4.5     |
| Greece      | 363 410 496   | 466 533 172                 | 829 943 668    | 4.3     |
| Netherlands | 272 840 538   | 350 262 760                 | 623 103 298    | 3.2     |
| Finland     | 203 908 053   | 261 769 737                 | 465 677 790    | 2.4     |
| Slovakia    | 200 992 341   | 258 026 660                 | 459 019 001    | 2.4     |
| Estonia     | 154 961 870   | 198 934 412                 | 353 896 282    | 1.8     |
| Lithuania   | 119 653 040   | 153 606 222                 | 273 259 262    | 1.4     |
| Hungary     | 114 308 396   | 146 744 959                 | 261 053 355    | 1.4     |
| Slovenia    | 113 288 670   | 145 435 873                 | 258 724 543    | 1.3     |
| Portugal    | 98 013 215  | 125 825 800                 | 223 839 015    | 1.2     |
| Latvia      | 83 899 584  | 107 707 235                 | 191 606 819    | 1.0     |
| Croatia     | 81 394 890  | 104 491 797                 | 185 886 687    | 1.0     |
| Belgium     | 79 958 238  | 102 647 474                 | 182 605 712    | 0.9     |
| Sweden      | 68 196 332  | 87 547 974                  | 155 744 306    | 0.8     |
| Austria     | 59 449 788  | 76 319 480                  | 135 769 268    | 0.7     |
| Cyprus      | 44 275 036  | 56 838 679                  | 101 113 715    | 0.5     |
| Denmark     | 38 957 168  | 50 011 795                  | 88 968 963     | 0.5     |
| Ireland     | 36 985 744  | 47 480 950                  | 84 466 694     | 0.4     |
| Malta       | 10 187 448  | 13 078 275                  | 23 265 723     | 0.1     |
| Luxembourg  | 4 056 672   | 5 207 811                   | 9 264 483      | 0.0     |
| Total       | 8 423 258 970   | 10 813 473 408              | 19 236 732 378 | 100.0   |

Note: values given at current prices

Source: author's own elaboration based on EU (2021a).



**Figure 1.** Regions enjoying JTF support in the years 2021-2027  
Source: EC (2022a).

The largest share of the JTF allocation goes to Poland, though this is still ‘just’ 20% of the entire sum (Table 1). While the allocation is deemed to be in proportion, it fails to match the scale of the phenomenon, given the Commission’s own realisation that Poland supports 54% of all EU jobs associated with the winning of coal from the ground, as well as 26% of all those working in coal-based conventional power generation. Together, that means that 49% of the jobs associated with the ‘coal branch’ in general are in Poland (Alves Dias et al., 2018). As of 2021, the country was mining 55M tonnes of hard coal and 52M tonnes of brown coal annually. Poland and Czechia are in fact the last two countries in the EU to still mine hard coal, but with Poland accounting for 96% of the EU total (Eurostat, 2022).

Nevertheless, if the EU is home to mining operations supplying 57M tonnes of hard coal, the bloc is consuming almost 161M tonnes of the stuff, meaning that consumption exceeds production by 180%. That of course denotes importation of the fuel in its raw state, albeit only on a limited scale where Poland is concerned. In 2021, most of the EU’s imported coal was coming in from Russia, which supplied 55% of all the coal purchased across the Union (Eurostat, 2022).

In turn, Poland accounts for a 19% share of the production of brown coal, taking second place only to Germany, where as much as 126M tonnes is extracted, i.e. 41% of the whole-EU total (Eurostat, 2022). After Poland and Germany, the third country to which more than 10% of the Fund is going to be allocated is Romania. Lower positions down the hierarchy are then taken by Czechia and Bulgaria (though with both on far less than 10% of the total).

The EU includes 41 regions at NUTS2 level that have 128 coal mines, while 108 of these have infrastructure associated with the coal-sector value-chain. The coal sector employees around 237,000 people overall, with around 185,000 actually going down pits to work (Alves Dias et al., 2018). The Member States most connected with the extractive industries at this stage are Poland, Germany, Czechia, Romania and Bulgaria. However, the largest remaining coalfield region in the whole EU is now in Poland's Śląskie Voivodeship – at the heart of the wider Silesia region.

In 2020, analysis of a study of territorial Just Transition plans led the Commission to select 100 regions at NUTS3 level eligible to receive JTF funding over the 2021–2027 period (EC, 2020). The ultimate number of areas encompassed is somewhat larger (Fig. 1). EU regions supported under the JTF emerge as most concentrated in northern Finland and Sweden, while there are also a large number of involved coalfields in the borderland area between Poland, Germany and Czechia. In general, there is a dense network of areas in Central Europe.

## The territorial extent of JTF support in Poland

Poland has coalfields located in no fewer than 6 of the 16 Voivodeships into which the country is divided administratively at regional and provincial level. This was borne in mind as Poland sought to present the geographical scope of JTF support across the country (MFIPR, 2021). A comprehensive analysis and diagnosis of Poland's coalfields was offered by Drobniak (2022), with this report also identifying potential and making recommendations. The outcome from that was an idea that the transformation each region needed to undergo in the transition context ought to be treated and approached individually, even as there is a defined kind of intervention needing to be engaged in at national level.

Ultimately, the assessment of the territorial Just Transition plans referred to support as follows:

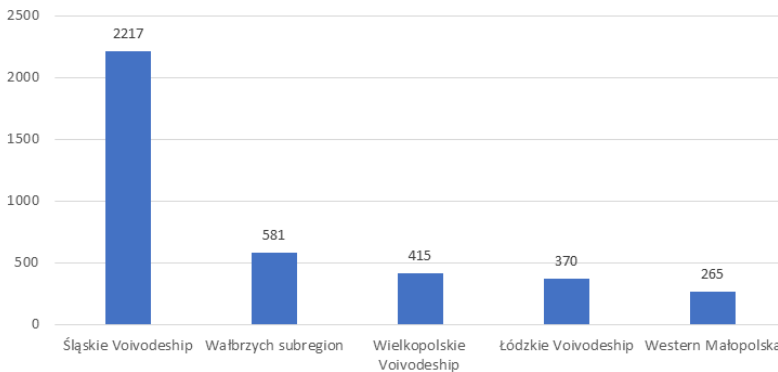
- Śląskie Voivodeship (Silesia): the Katowice, Tychy, Bielsko-Biała, Rybnik, Gliwice, Bytom and Sosnowiec subregions;
- Wielkopolskie Voivodeship (Wielkopolska) (in fact its Eastern part): Konin subregion;
- Dolnośląskie Voivodeship (Lower Silesia): Wałbrzych subregion;
- Małopolskie Voivodeship (Małopolska) (and in fact its Western part): Oświęcim subregion;
- Łódzkie (Łódź) Voivodeship: Bełchatów subregion.

The Lublin subregion ended up being deprived of funding, notwithstanding the *Bogdanka* mine operating on its territory. The same fate befell the powiat (county-level unit of administration) of Zgorzelec with its Turów Mine – with this being the effect of an ongoing dispute with the EU. The fact of these areas not being encompassed by support from the Fund implies a loss of real opportunities for the coalfield districts involved. *LW Bogdanka* in fact plans to become a concern dealing with a number of different raw materials. Its portfolio will include salts of potassium and magnesium, coking coal, amber, phosphorites (rock phosphates), rare-earth metals, gypsum, gold, ferrolites, molybdenum and tungsten with copper, zinc and lead, and uranium (Madeja, 2023). The strategy also assumes a role being played by so-called green initiatives (production of components

for the generation of energy from renewables, and their development in general), as well as work to manage former mining land (Bogdanka, 2023b). This in fact coincides with the assumptions of the Just Transition.

The greatest amount of funding within the JTF framework is the sum received by Śląskie Voivodeship (€2.22bn). That is followed by the Wałbrzych subregion of Dolnośląskie Voivodeship, i.e. Lower Silesia (on €581.5M), as well as Eastern Wielkopolskie (on €415M). These sums of money will be designated for both investment activity being pursued by units of local or regional government and activity engaged in by entrepreneurs. The degree to which things are co-financed depends on the given region's level of development, amounting to 50% where regions are better-developed, 70% where regions are actually in transition, and 85% where a region is only weakly developed so far. In the Polish case, Śląskie, Łódzkie and Western Małopolskie will all be 85% co-financed, while the level in the cases of Dolnośląskie and Wielkopolskie will be 70% (ECDF, 2023).

Śląskie Voivodeship is in fact seen to concentrate some 58% of JTF funds assigned to Poland as a whole. And since the Western Małopolskie region is adjacent and linked functionally (to the extent that the TPST (*Territorial Just Transition Plan*) applies to both, the sum here reaches €2.4bn and thus accounts for 65% of the Polish allocation. The Wałbrzych subregion along with the no-longer-operational Lower Silesian coalfield region obtains almost €590M, denoting 15% of what is assigned to Poland (Fig. 2).



**Figure 2.** Levels of JTF support for different mining regions in Poland for the years 2021-2027 (in €M)  
Source: developed by reference to: UMWŚ (2022a); UMWWM (2022) and EC (2022b).

## The Territorial Just Transition Plan (TPST) for Śląskie Voivodeship

The best-known example of transition involves Śląskie Voivodeship. The coalmining subregions encompassed here are seven in number, with that of Częstochowa excluded. The Voivodeship is now at a turning-point in the economic transformation process, with this also offering the region a chance for a change of image. Achievement of that goal requires regional government taking up a coordinating role where the transition is concerned, with economic diversification at the local-administrative (*gmina*) level needing to be determined, and use made of diversified instruments by which to generate professional activation, most especially among the younger (former) mine-workers (Frankowski & Mazurkiewicz, 2020).



Under the TPST, the largest amount of funding is to be assigned to measures that will restore areas distorted and degraded by the extraction of hard coal. This is of major significance, given that Śląskie region is the part of Poland in which the share of land that has suffered degradation is highest, to the point at which a serious spatial problem is posed. However, there are now model examples of the management of formerly industrial sites – e.g. the transformation into a culture zone of what was formerly the area surrounding the Katowice Mine in the centre of the city of the same name (Drobniak, 2010). Far earlier, activity on a grand scale was undertaken between Chorzów and Katowice as *Park Śląski* was created. Since 1950, some 600 hectares of land in that area have been transformed into green space and recreational areas, even as at the outset some 75% of that area was under spoil heaps, mining waste, areas of bootleg mining and subsidence (and hence marshes), and other kinds of landfill sites and waste dumps (PŚ, 2023).

The core Operational Objective of the JTF for Śląskie Voivodeship is to ensure that formerly-industrial land is repurposed to serve the economy, society and the environment. Indeed, no less than a 20% share of all funding has been designated for this (Table 2). The land use in question ought to serve the interests of development in the region. Measures include action to make good the negative consequences of industrial activity for the environment, e.g. through remediation, reclamation, recultivation, regeneration, renaturalisation, the decontamination of sites and the cleanup of polluted or contaminated ground and surface waters. There is also support for all kinds of activity leading to the systematic management of formerly industrial land. Co-financing is thus extended to planning activity, such as concepts for land management and physical development on land and in buildings that once served the mining industry, as well as the drawing-up of planning and technological-economic documentation, as well on-site inventorying and valuation work (*inter alia* developing scenarios for renewed management and use).

The Operational Objective to which the second-largest sum is allocated – of nearly €414M (or 19% of the total) – involves support for strong entrepreneurship in the mining subregions. There will thus be support for new start-ups and for people to assume self-employed status in a wide range of fields, as well as for the services that back initiatives of these kinds. Then there will be backing for the enterprises of branches listed in Śląskie Voivodeship's Programme for the Development of Technologies (*Programu Rozwoju Technologii*). This entails the bringing of new products and services on to the market.

A further group of activities seek to ensure attractive and efficient training and upskilling in the mining subregions. Professional qualifications may be raised on this basis, along with teaching competences; while educational institutions will obtain infrastructural support, with new subjects of study and profiles of professional training put in place. Measures will also take in higher education, with targeted development of training that heads in the direction of the green economy.

A sum of €300M (14% of the overall allocation) is to act in support of the development of dispersed energy generation, as clusters and cooperatives are set up, and prosumer activity strengthened. Installations using renewables will be constructed using the funding, in former mining- and other industrial areas, while infrastructure that generates, distributes and stores energy from renewables will be developed or redeveloped.

Nearly €295M (13% of the total) is assigned to the development of an economy that is diversified and engaged in the maximal saving of resources and energy. That goal will be pursued through investment in the production, logistics and R&D necessary for new products, services and processes to be introduced, and new markets gained – for both large enterprises and SMEs. Also to be funded at this level are measures seeking to reduce the consumption of primary resources and usher in clean technologies.

Remaining activity, though of no lesser importance, can only command much more limited streams of funding. The innovative economy in mining subregions is joined by active labour-market support as goals each assigned about 5% of total funding. And just under €90M goes on the system of support for transition management, raising competence levels among staff engaged in management of the TFST. Also foreseen is support for inhabitants' activation and the raising of their quality of life, *inter alia* thanks to cultural activity and efforts to ensure that regional identity is preserved.

A frame of reference for the sums assigned to TPST support in Śląskie Voivodeship can be gained if reference is made to the level of income in the budgets of *gminas* and urban localities enjoying *powiat* rights across the region (though with the Częstochowa subregion excluded). In 2021, the sum involved was 28.5bn PLN (Statistics Poland, 2022). The size of the TPST for Śląskie converted into Polish currency is around 10bn PLN, or around 1/3 of the income gained from 2021, albeit with assigned funding relating to a 7-year period. This means that that the TPST raises the budget of all *gminas* by around 5% each year on average. The level of TPST support for mining subregions of Śląskie Voivodeship can also be expressed as around 2500 PLN per inhabitant. These are not tiny sums, but they still look less impressive expressed in this way, as opposed to in absolute terms.

**Table 2.** Intervention structure and means assigned to the different Operational Objectives under the 2030 TPST for Śląskie Voivodeship

| Operational Objective   | Framework JTF sum in €M | Share of the sum for the given objective |
|---|-------------------------|--|
| Effective utilisation of the formerly-industrial mining Sub-Regions for economic, environmental and social purposes | 433.0                   | 20%                                      |
| Strong entrepreneurship in the mining Sub-Regions   | 414.5                   | 19%                                      |
| Attractive and effective training and upskilling in the mining Sub-Regions  | 375.0                   | 17%                                      |
| Balanced dispersed energy across the mining Sub-Regions   | 300.0                   | 14%                                      |
| A diversified resource- and energy-saving economy   | 295.5                   | 13%                                      |
| An innovative economy for the mining Sub-Regions  | 130.0                   | 6%                                       |
| An attractive and efficient system of support for the labour market in mining Sub-Regions                           | 99.0                    | 4%                                       |
| A socially-effective and responsible system for management of the transition in the mining Sub-Regions              | 89.0                    | 4%                                       |
| A comprehensive system of social support activating inhabitants of mining Sub-Regions                               | 46.0                    | 2%                                       |
| An efficient system to enhance mobility in mining Sub-Regions   | 30.0                    | 1%                                       |
| Total   | 2217                    | 100%                                     |

Source: author's own elaboration based on UMWS (2022d).

## The Transition context

At the fundament of the Just Transition are technological changes linking up with the move away from fossil fuels, with a view to this resulting in a curbing of CO<sub>2</sub> emissions. However, there is here a mobilisation of a series of actions that do translate indirectly into what may be termed

broadly human living conditions, as well as a reorientation of economic structure. Depending on the scale of linkage, this may – in traditional mining regions at least – take the form of a revolution in socio-economic life. However, to a greater or lesser extent the transition involved here takes in the whole of society. This leaves this subject matter as both one of interest from a scientific point of view, and one of importance to the pragmatics of managing development on different spatial scales. A number of controversies are raised, given the way people are forced to make tough decisions, above all as the order existing thus far has to be disrupted, with a series of major changes enforced. It is typical for society to react negatively to change, given the uncertainty involved, and an impaired sense of economic security – even if the idea and goal of the challenges taken up is a right one, broadly acceptable to the public.

Growing environmental problems as ultimately manifested in climatic warming give rise to a number of dangerous phenomena that pose a real threat to humankind and human activities. That demands that action be taken globally to try and reverse some of the trends. Fundamentally, that requires the generation and emission of smaller amounts of carbon dioxide, as linked to the partial or even total substitution of fossil fuels in a country's power-generation structure. Spatially, the problem with emissions of greenhouse gases (GHGs) links mainly with industrial or post-industrial regions, given the way in which these were founded, and have always based themselves, around technologies that do lead to emissions. Replacement of this kind of economic activity is a task both difficult and long-term in nature, which also denotes a kind of evolutionary process of transformation/transition.

In a historical context, the transition in question also brings an end to an era of technology that lay at the basis of European cooperation, given that the coal and steel embraced by Treaty and given shape as the ECSC (European Coal and Steel Community) was actually the first forerunner of today's EU, harking back to the 1950 Schuman Declaration. The need to ensure technological change and other sources of energy ensures that the transformation process being referred to is best known in (Western) Europe's (coal) mining regions.

However, stereotypes notwithstanding, the more-easterly Poland has also been experiencing ongoing decarbonisation, as can be seen from the way that 'peak coal' was reached in the country as long ago as in 1979. Almost 201M tonnes were mined in the country that year. The level of extraction remained roughly stable in the 1980s, at around 190M tonnes a year, and peak employment in the industry was reached in 1987 (at a level of an impressive 435,000 people or thereabouts; Frużyński, 2009). According to *Statistics Poland*, in 2021, the amount of hard coal extracted in the country was 55M tonnes, while employment in the state-owned mines of Śląskie Voivodeship stood at just over 61,000. To be added to that are the 2200+ workers in Silesia's private mining sector (*TPST WSL – Territorial Just Transition Plan for Śląskie Voivodeship*), as well as the almost 4000 employed at 2 pits in Western Małopolskie (*TPST MZ – Territorial Just Transition Plan for Western Małopolskie assumptions*) (UMWM, 2021). That makes some 67,000 employees altogether. Then there is the *Lubelski Węgiel* Group – another private entity in which the dominant (65%) shareholder is *ENE A S.A.* This owns the *Bogdanka* mine with its 4900 or so workers (Bogdanka, 2023a). Poland's national Just Transition Programme of 2021 (IETU, 2021) stated that – as of 2020 – Śląskie Voivodeship had 18 active mines and mining enterprises, at which 76,200 people were employed. This leaves current employment in Polish coal at less than 20% of the peak historical levels.

Through to 2049, planned output of hard coal from the Upper Silesian coalfield is to fall to less than 5M tonnes (TPST WSL). That is associated with a reduction in levels of employment to 12,700 by 2030. As would be typical, a level of job losses twice as high (of 24,200) is expected when it comes to firms serving the mining industry more generally. The further fall in levels of employment

expected for the 2030-2049 period is of 48,700 employed directly, plus almost 96,000 in the linked sectors. Also needing to be recalled is the reduction in numbers of jobs expected in conventional energy generation, the assumed decline here by 2030 is a halving – from 1700 jobs to 848 (TPST WSL).

The scale of the reductions in employment indicated is major, with the timetable for closures of pits and power plants including ‘milestones’ along the way to the goal. Yet the 2021-2027 programming period saw just one mine closed. A key date in the future might now be 2030, in which year the conventional blocks in three power stations ought to cease operating. The *Łągisza* plant is likely to go on generating for longest – through to 2035. Yet, the mine-closure process will only really gather pace from 2040, with 2 extraction operations scheduled to end at that point. And only at the last moment in 2049 will four further mines cease operations, with one of these being outside Silesia – the *Janina* mine in Western Małopolskie (Table 3)).

**Table 3.** Timetable for the closure and restructuring of mines and power plants within the area of the Upper Silesian Coalfield

| Mines and power plants designated for closure or restructuring            | Number | Year |
|---|--------|------|
| The <i>RUDA Ruch Pokój</i> Mine   | 1      | 2021 |
| The <i>Bolesław Śmiały</i> Mine   | 1      | 2028 |
| The <i>Sośnica</i> Mine   | 1      | 2029 |
| The <i>Łaziska, Rybnik and Jaworzno</i> Power Plants                      | 3      | 2030 |
| The <i>Piast-Ziemowit Ruch Piast</i> Mine and <i>Łągisza</i> Power Plant  | 2      | 2035 |
| The <i>Piast-Ziemowit Ruch Ziemowit</i> Mine                              | 1      | 2037 |
| The <i>Staszic-Wujek</i> Mine   | 1      | 2039 |
| The <i>Bobrek – Piekary and Brzeszcze</i> Mines                           | 2      | 2040 |
| The <i>Mysłowice-Wesoła</i> Mine  | 1      | 2041 |
| The <i>ROW Ruch Rydułtowy</i> Mine  | 1      | 2043 |
| The <i>ROW Ruch Marcel</i> Mine   | 1      | 2046 |
| The <i>ROW Ruch Chwałowice, Ruch Jankowice, Sobieski and Janina</i> Mines | 4      | 2049 |

Source: authors' own elaboration based on UMWŚ (2022c).

Given a context of the abandonment of coal extraction, there is a justifiable question regarding the energy mix, as well as the state of the transmission network whose capacity might seriously hamper energy generation from diffuse sources. Some conventional blocks (like at *Jaworzno III*) are new, so any move towards restructuring them would not denote a cessation of operations. A question also arises regarding energy security, and indeed Russia's war against Ukraine only shows the scale of the geopolitical threat that poses many problems for the EU.

Spatially, the degree to which a departure from coal denotes negative consequences is also seen to be differentiated. Most exposed to negative consequences of the energy transition are *Jas-trzębie-Zdrój, Bytom, Zabrze, Wodzisław Śląski* and *Ruda Śląska*. In turn, the risks seem most limited for *Gliwice, Katowice, Jaworzno*, the *poviat* (county) of *Bełchatów*, and *Piekary Śląskie* (Juszczak & Szpor, 2020).

In the coalfields, matters of the Just Transition first evoke anxiety and fear as much as anything else. For what is sketched out is a wave of change that throws a spanner in the works that have existed up to now, and requires that whole regions react to what is being done. The process links up with a number of unfavourable examples, as may be noted in an article devoted to the Lower Silesian Industrial District. That region's experience only add to the well-known ones from Western European history to ensure that emotions like fear, anger and sadness are raised in society. Illegal mining of coal in the *Wałbrzych* subregion remains a current (unresolved) problem, with the tangi-

ble scale on which the phenomenon has manifested itself presenting the town with a major branding and image-related issue. More than that, it casts a darkish shadow across the whole transition process (Lorenz, 2016).

On the other hand, account needs to be taken of the way that, as of 2022, the mining and extractive industries were in fact the sector of the Polish NACE classification of the economy offering the second-highest level of remuneration. The average for that branch is just under 11,200 PLN per month, with this being only slightly less than what is available in the ICT sector! Things are even more pronounced when the focus is on the sub-sector involving the mining of hard or brown coal (only), the mean remuneration in this case being of 12,100 PLN. The story does not end there as, not only was this the most-lucrative branch in terms of pay, it was also as of 2021-22 the part of the economy in which pay rises were the highest noted – at 29.4%. This may be set against average increased remuneration in the economy as a whole equal to just 12.7% (according to Statistics Poland).

Thus, while the mining branch is certainly on the road to oblivion, it continues to provide very well-paid work. Given the nature of that work, this may of course be entirely right, though only somewhat lower (and still above the national average) is the remuneration possible in the section of the economy including power supply.

The very fact that remuneration in the mining branch is so handsome, even as the retirement age is lower<sup>1</sup>, is enough to ensure that many people will not regard departure from mining as a very favourable thing to do. While the vision of mass unemployment looks an unlikely one given today's situation on the labour market, pretty much any alternative that can be imagined would denote a less-favourable financial situation for people involved. This is true of those linked with mining itself, or fields closely linked to it, even as people not linked to sectors like this will surely be more accepting of the proposed changes. Harm done by and in mining, the negative impact on the environment, and the generally noxious nature of the whole enterprise all ensure that many inhabitants (even in mining areas, or perhaps even especially) will view the changes the transition is to bring about as positive ones. Indeed, other aspects feed into this, as – given social conditions, status and entitlements all conferred upon miners in the circumstances of the Polish People's Republic – this is a group whose real privileges may regularly generate sneers or even resentment. In no way is it clear that the general public approves of what miners won for themselves under the old regime.

The level of unionisation of the extractive industries is a feature characteristic of this branch. As of 2104, there were 45 trade unions active within the mining company known as *Jastrzębska Spółka Węglowa* (JSW). The 45 together have 26,400 members. The firm known simply as *Kompagnia Węglowa* has 160 organisations of this kind in operation. Indeed, in the aforementioned JSW, the level of union membership is officially at 120%, given that part of the workforce is in two or more unions at the same time (Energetyka24, 2023). The group in question is doubtless fully aware that the ongoing and upcoming transformation is ultimately going to mean job losses. The optimal solution would thus denote, not only the convincing of the stakeholders to the need for the process, but also an indicating of solutions that do not degrade the economic basis underpinning many people's lives.

Local government also draws benefit from activity in the coal branch, with taxes making a key contribution to incomes at the local-authority level of the Polish *gmina*. As of 2019, it was esti-

<sup>1</sup> Criteria for a person wishing to be in receipt of a miner's pension: age of 55 reached, with a period of work in mining (taken together with equivalent work) reaching at least 20 years in the case of women and 25 for men, with this is to include at least 10 years of actual mining work. Alternatively, where a person has reached the age of 50, and the period of mining work (taken together with equivalent work) is of at least 20 years for women and 25 for men, including at least 15 years of mining work *per se*. Or alternatively, if a person has completed at least 25 years of mining work done below ground all the time and full-time (see ZUS, 2022)

mated that the tax revenue originating in mining in Śląskie Voivodeship included 10.9% of the total accruing from property taxes and exploitation fees, 9.4% in Personal Income Tax and 5.4% in Corporate Income Tax (UMWŚ, 2021).

Furthermore, Poland's wealthiest local authorities actually include those which have (brown-coal) mining activity on their territory. The clear Polish leader is Kleszczów, in which the 2022 G index (i.e. the basic tax take per inhabitant of the *gmina*) was at 29,700 PLN. Third place was in turn taken by Rzęśnia (7400), and fifth by Szczerców (6900). In contrast, the national average is at 2100 PLN (MF, 2022).

All of that said, it would seem that there is a measure of exaggeration to some of the risks being linked with the departure from coal. Mining is not a branch that young people coming on to the labour market regard as attractive. People are less and less aware of it; and regard for the sector is lowered by conditions less favourable than those known from the past. Where there is some sentiment for mining, this is very largely among people who actually work there or have done so. Most have retired already, or soon will.

A core characteristic of society today is its pragmatism, including an interest in satisfactory income being obtained. Some continuation of a great mining tradition is not obviously a part of that. Equally, a reduction in the role played by mining as a source of income for people will serve to reduce numbers of people dissatisfied with the actual harm the sector does. The proportionality between that group and the group of people drawing financial benefit from the mining sector operating will change. And if job losses are spread across the longer time-scale anticipated for that, this will never be enough at any given moment to disrupt the labour market. Rates of losses of jobs that have occurred up to now have been readily made good – even at the level of regional economies (Sitek et al., 2013). The idea that the labour market remains stable is supported by both low unemployment and the demographic change that is ongoing (with a decline in numbers and shares of the population that are of productive age). People's awareness is also growing, not least a widespread feeling that life needs to be led in a clean environment; as well as an awareness that excess deaths result from the low quality of air experienced.

Many urban areas in Silesia (in the sense of Śląskie Voivodeship) no longer count the mining sector as part of their economic portfolio. Equally, a number of new branches have made their appearance, with the motor industry in first place. Many actions seeking to change the economic structure have been taken, though this still does not preclude the region being perceived stereotypically. The Voivodeship authorities are seeking to combat that, inter alia through the new vision for development set out in *Strategia Rozwoju Województwa Śląskiego "Śląskie 2030" – Zielone Śląskie* (UMWŚ, 2020). The latter sub-title actually refers to 'Green Silesia' in connection with a 2030 date.

Given the experience that has now accumulated, as well as the means made available in the Just Transition context, there is a real possibility of the situation being turned around ... from one of change representing a threat to change representing an opportunity for the region. Beyond that, there is also the way in which Śląskie Voivodeship in general, and the Upper Silesian Industrial District in particular, have begun to witness change in a metropolitan direction (Zuzańska-Żyśko, 2016). Indeed, this area has long ceased to be dominated by mining, or indeed by 'industry' in the broader sense of the term. Services are now at the core and centre of the economy here, as in many other places. The position of the District when it comes to digital transformation and the 'Fourth Industrial Revolution' (*Industry 4.0*) is a relatively favourable one – as is also made clear by changes in the region's economic status and standing (Gwosdz et al., 2022).

Śląskie has been home to many activities seeking to usher in new forms of use and management in formerly industrial areas, even as the share of degraded land here is of course very considerable (Pytel et al., 2021). The Voivodeship has indeed adopted *Regionalna Polityka Rewitalizacji Województwa Śląskiego* (UMWŚ, 2022b) – a regional revitalisation policy that sets great store by efforts to reclaim, manage and bring back into some form of use the many ex-mining and ex-industrial sites.

An example of what awaits Silesia (as Śląskie Voivodeship) may be offered by the transformation occurring much earlier in Germany's Ruhr region (albeit with the key steps also being a 21st-century achievement). That industrial region has in fact been seen to transition on many different levels simultaneously, and in a comprehensive manner. The actions were the subject of so-called *Masterplans* put into effect along rivers (Krajewski et al., 2006; Dickmann & Diekmann-Boubaker, 2008). This meant environment-friendly activity, a restoration of rivers (cleaned up, and flowing along renaturalised channels and valleys), and space (especially formerly industrial land) being managed in a modern and sustainable way. A fine example is provided by the Emscher-Zukunft Masterplan drawn up in 2006, and put into effect in the nearly two decades since along the valley of the Emscher – a river flowing through the very heart of the industrialised Ruhr. Numerous individual transition projects have been pursued in that area (Chmielewska & Otto, 2013; Otto & Chmielewska, 2014) – and the solution overall can be considered a model one worth following as other mining regions make their own efforts to move forward.

## The research challenge linking up with the process of transformation

The aim of the volume that has been made ready is to point to different aspects of transformation, and in particular the potential opportunities and threats associated with the Just Transition Programme. The economic problems are on a scale that proves to be differentiated spatially, and can be subject to differing interpretations. There are places in which the extraction of coal is unprofitable, with the deposits almost worked out. Such areas would unavoidably have to be restructured in whatever circumstances. Equally, there are areas in which the mining activity engaged in still brings a healthy profit, to the point where resigning from that looks far from obvious. Another equally important economic consequence takes the form of negative multiplier effects making themselves known in cooperating branches. This may go as far as to demand the total 'reprogramming' of regions involved, though that may of course be seen to offer new opportunities for technological modernisation to take place.

Equally, economic challenges can have their knock-on effects into the social sphere. Transformation of this kind demands new ways of thinking, the gaining of new competences and strengthening of human capital, and above all a willingness/readiness to accept change. The problems of regions subject to transformation often serve to worsen demographic change that may already be in progress, with a negative migration balance being made worse. The inclination to move out of an area is mainly experienced among young people, who see no future (for them) in traditional regions. Modernising activity also has its spatio-environmental dimension, which is made manifest in formerly industrial areas, and typically requires major financial outlays, as well as ideas on how those are to be best used. The adaptation of areas involved to serve new functions is a condition if there is to be further sustainable development of urban centres, with this in turn influencing the living conditions that inhabitants experience.



But the issue(s) involved here is/are not clear-cut and obvious to all parties; and they anyway come up against the disparate interests of both large firms and nation states. The usual effect is for considerable public resistance to be generated, especially among those for whom the branches in question have previously represented a sources of upkeep and wellbeing. The process is not just of interest to politicians and local authorities, since it is also taken up for scientific debate. This all makes it better for issues of transformation in post-industrial areas, and of the introduction of Just Transition mechanisms, to become the subject of scientific study both inter-disciplinary and international. This should then be a way in which objective knowledge feeds into the process – as regards the course it is following, the consequences, and the actions either taken or neglected.

Core considerations here ensure that future research needs to take in certain selected aspects of the transformation process. Analysis is particularly indicated in regard to such issues as:

- the generation of new endogenous resources facilitating transformation;
- the identification of potential paths for economic development in coal-mining regions;
- opportunities for technological leaps to be made in regions undergoing transformation;
- the proper assessment of environmental benefits accruing;
- the management and utilisation of formerly industrial areas, and ways in which new functions can be assigned to them ;
- the identification of social and demographic challenges associated with transformation / transition;
- risks and costs inherent in the process, be these economic, social or environmental;
- potential consequences if or where transformation / transition is neglected;
- region-to-region differentiation in the advancement of the transition process;
- methods by which to assess regions' adaptability in the face of new challenges;
- transition / transformation in post-industrial areas that are also borderlands;
- examples of good practice when it comes to effective transformation or transition.

Energy transitions are evolutionary processes necessarily linking up with civilisational development. One transition (requiring resort to more efficient sources of energy) represented a core factor and basic condition for the earlier progress to take place. Energy from trees that had been cut down and burnt gave way, step by step, to power from coal, oil and gas. These are conventional sources and hydrocarbons, and their combustion has meant a reversal of the chemical processes long taking place naturally to lock up carbon in organic compounds. A further revolution came along with nuclear fission and atomic energy. This source has been efficient, but has its obvious and well-known drawbacks and risks – as the energy is being generated, but also as something has to be done with radioactive waste that accumulates.

Today the dimension of the energy transition we now face demands that a larger number of criteria be met. Somehow, society and the economy have to be supplied with enough energy, yet the demand increases geometrically, and hence proceeds far faster than the global increase in the human population (rapid as that also is). Acting in opposition is the development of technology and equipment that is energy-saving to an ever-greater degree. But public awareness also needs building here, in relation to the saving of energy in particular and natural resources in general, irrespective of the actual level of availability.

And then there is the process of climate change, accounted for by reference to an enhancing of a greenhouse effect long active on Earth, with this being due to greater emissions (and higher atmospheric concentrations) of CO<sub>2</sub> thanks *inter alia* to more combustion of fossil fuels. A second condition is thus that – even as energy goes on being generated – emissions of CO<sub>2</sub> must decline, with that meaning a departure from conventional sources. Equally, action here falls within the wider concept of reducing our human impact on the environment, even as the dangers of climate change



are reined in. Hope is invested in the renewable energy (re)sources – the sun, water, the wind and sources of geothermal energy. Of course, it needs always to be borne in mind that these environment-friendly sources are *not* in fact entirely neutral for the said environment, even at the operational stage; but also certainly as components (like batteries) are manufactured and utilised. Further questions revolve around issues like efficiency, durability, reliability, stability and so on, even as it is realised that large areas of land are needed if the necessary installations are to be put in place – with all the impact on the landscape that that denotes.

A third dimension to the energy transition is the layer of a socio-economic nature. Thus far, ways of generating energy have been shaped by an adequate economic structure that derives from the energy branch. This often became the economic basis underpinning whole regions, and the societies living in them. Modernisation of the supply side to the energy sector ensures that the energy transition means a breakdown of the system that has long been in place in many regions. This is why the energy transition has to take account of inhabitants' needs, allowing for a change of economic base to take place in localities associated with the energy-generating technologies of the past.

## Conclusions

The JTF can be viewed as an important support mechanism in and for the regions affected most negatively by a transformation that is regarded as essential. The years to 2027 will see the EU assign some €17.5bn to the associated action, which is to ensure that the Union's objectives regarding energy and climate are achieved by 2030, even as a climate-neutral status for the whole bloc is approached by 2050.

Poland's mining regions are to have 20% of that entire resource at their disposal, meaning €3.85bn. Measures pursued within this framework are to address social, economic and environmental aspects, with interventions all seeking to limit the negative consequences of decarbonisation. Equally, the process involved here must envisage support, not merely through to 2027, but through to the time of final liquidation of the coal sector. Of course, the time frame in relation to environmental measures will of necessity be a longer-term one. Either way, the reality to be faced here is a timetable for pit closures and restructuring in the power-supply sector within which many entities are only actually going to go out of operation in the years 2040-2049.

Indeed, given that the process of transition in Poland's coalfields links up with energy policy in general, far-reaching synchronisation of the two is an obvious requirement. Equally, the introduction and pursuit of green-economy assumptions is a matter for society as a whole, so the message here will need to be generalised as targeted, as there can be no stark identification with mining regions only.

Bearing in mind the significance of the mining branch of the economy when it comes to both shaping people's incomes and the local-authority tax take, it would seem clear that any first stage is going to impair both quality of life locally, and the financial standing of authorities locally. Branch-shifting and restructuring will also take in a wide range of business entities needing to re-orientate (and 'rediscover themselves') in a new economic reality. This all makes it particularly important that social consensus be developed, minimising community tensions when it comes to the scope and rate of activity to be undertaken.

Naturally, any transformation/transition can also be looked at in terms of opportunity. However, this has to go beyond the mere fact that there are designated funds for this kind of thing. Rather, new competences, and a market of new-style services, will be needed. The new green economy ought to be sparked and driven by new technologies and innovative solutions. Positive effects should then see the state of the environment improved, even as climate-neutral status is approached, and quality of life is raised in consequence.

The process of transformation involved here should (along with its consequences and internal dynamics) be the subject of inter-disciplinary analysis by research teams and independent experts – in relation to both the areas doing most of the core transitioning, and areas beyond. For the knowledge made available in this way will be the starting point for strategic planning. A transparent bank of data will be crucial, helping identify potentials and threats inherent in the process, whether the dimensions be social, economic or spatial, or all three at the same time. The room here for inter-disciplinary study is clear and major, especially during the preliminary phase. Funds actually being planned for at present relate to the 2021-2027 period.

As work is done on the transition, it will be worth drawing on the experience gained with restructuring such regions as the Ruhr in Germany; even as conclusions are also drawn from such failed transformations as the one involving the Polish Coalfield of Wałbrzych. In some areas, there should be new opportunities to make good the years of neglect following earlier episodes of closure.

The effects and impacts of transition will make themselves felt over both the shorter and longer terms. Like every process ongoing in the market economy, and linking up with the allocation of funding, and restructuring, there will be winners and losers here. This explains the very word 'Just' and generates an assumption that action will help with both safeguarding and adaptation, protecting groups and enterprises from marginalisation and exclusion. However, the overall balance of benefits (and social acceptance) here needs to be skewed towards environmental progress, given that all can be seen as beneficiaries of that. And that inevitably denotes tough decisions from start to finish – decisions unfavourable to some. That leaves it so very crucial that there be both high-quality management of the process, and appropriate intervening steps where necessary.

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This volume comprises seven texts that embrace different dimensions and aspects of the transformation of post-industrial areas and the implementation of JTF mechanisms in the EU context. Such is the diversity inherent in the topic that the articles prepared concern a range of different facets of the phenomenon, but do not come close to exhausting it.

Three of the texts relate to the situations faced by Poland's coal-mining regions, in both Śląskie and Dolnośląskie Voivodeships (Silesia and Lower Silesia). Articles of foreign origin in turn allow for an orientation regarding a similar coal district in Hungary; while Latvian solutions involving windfarms in maritime areas represent a further topic of interest. A last article then brings us back to the potential inherent in wind energy in the EU's coastal states. This is in the nature of a review, offering insights into the actions and outlays required if energy from this renewable source is to be obtained.

An introductory text here discusses the core assumptions to the JTF, as well as its genesis. Stages in the evolution of the approach leading to the shaping of a green economy are presented, with actions financed from the Fund being identified, along with the ways in which support is extended to the restructuring process in mining regions. An example of a field of intervention is offered in the form of *Terytorialny Plan Sprawiedliwej Transformacji Województwa Śląskiego 2030* (which addresses the Just Transition in the aforementioned Śląskie Voivodeship). A particularly key thread to that story is the timetable for the closure of both mines and power plants. The material also

presents selected data showing the significance of the mining and extractive industries in both their social and economic dimensions.

Particular attention is of course paid to the labour-market implications of the Just Transition, with reference being made to wage levels in mining and the extractive industries, as well as to the wealth possessed by different gminas (local-authority areas) – given the way this represents an alternative point of view when it comes to the entire process. The article also indicates a number of research threads linking up with economic transformation, and requiring further research and analysis. There is then a summary indication of the challenges facing regions most affected by restructuring processes.

The next article – on *The place of Śląskie Voivodeship (Poland) in the greening space of flows* (Wójcik et al., 2022) – shows the transformation's influence on the structuring of linkages between Silesia and other EU regions. Along with Western Małopolska (also located in Poland), Śląskie Voivodeship is the EU's largest coalmining area – meaning that success of the process Europe-wide will depend significantly on how effective its transformation proves to be. While mine closures have been ongoing in this region for many years now, along with closures of enterprises, and reductions in amounts of coal mined, a significant coal component remains in place to this day.

The analysis here takes in the scale of flows of goods, people, capital and knowledge. A comparison of two variants is then made, with the present situation regarding these flows set against what would be achieved were all mining-related activity to be eliminated. The results here make it abundantly clear how much of a challenge for the region and its inhabitants this is going to be. For functions that might represent an economic alternative for the region remain relatively weak, and the linkages and overall significance remain below what they should be, given the demographic potential. Knowledge flows display particularly severe shortfalls, and it is unfortunately quite likely that things will be made worse by the decarbonisation of the economy. The authors are keen to stress the consequences of the transition for regional identity, which is linked so powerfully with the mining tradition.

A further text on *Disproportions in socio-economic development of the Lower Silesian Voivodeship with particular emphasis on post-mining areas* (Rynio & Zakrzewska-Póttorak, 2022) is devoted to change within Dolnośląskie Voivodeship, which unfortunately stands out in terms of its socio-economic disparities. These reflect a wide range of factors, including specialisation, many years of focus on just a single branch, and linkage with traditional sectors that are very capital-intensive. Negative impacts on the environment have of course made themselves felt very tangibly. The authors seek to determine the sizes of the disparities in socio-economic development across Lower Silesia, also assessing how much support will be necessary to activate the former mining regions, by way of integrated planning of the Just Transition.

Disparities can obviously have negative impacts for a whole region where there are cumulative challenges to development, and hence drastic economic imbalances (disequilibria) between centres of growth and of stagnation. Equally, the identification of disparities and inequalities can serve as a motivating factor in the development of areas that are lagging behind – at least where an appropriate level of support is made available via EU Cohesion Policy.

The results suggest that, from among all the categories studied, it is ex-mining areas that have been suffering most. Notwithstanding actually-dynamic development on the scale of the region as a whole, these places have not been manifesting either socio-economic transformation or even restructuring. The region under study retains its core-periphery configuration, with the core being Wrocław, even as the former mining areas emerge as peripheral units in great need of support. A strengthening of sub-regional centres would be a means of taking pressure off the core, and

would ensure greater spatial diversification of regional development. New activity based around endogenous resources ought to favour their development, as dependence on the core is reduced. A manifestation of the founding of a new economic base in local centres lies in the share of all enterprises that are in information and communications or professional, scientific and research activity; as well as increased investment outlays.

Just Transition offers support instruments ensuring an appropriate degree of animation of a subregion on the basis of developed entrepreneurship, above all in the business-services sector. A major role is also assigned to the sizes of investment outlays achieved by local authorities and enterprises. Activities of this profile represent the core of the pro-development approach taken, conferring on a subregion a potential to catch up with other areas as disparities are reduced. The primary goal is thus to reduce disparities within a region when it comes to the socio-economic development of Lower Silesia (Dolnośląskie Voivodeship).

The article *Transformation of the Lower Silesian Coal Basin – a failed experiment* (Hajduga et al., 2022) supplies an analysis of the case represented by the so-called Dolnośląskie Zagłębie Węglowe – i.e. the mining district of Lower Silesia long operating in the vicinity of Wałbrzych and Nowa Ruda. The article seeks to assess changes ongoing in the Wałbrzych subregion under the influence of the official abolition of *Dolnośląskie Zagłębie Węglowe* district. This is therefore close to being a case study in the matter – covered by the previous article – of development-related disparities within Dolnośląskie Voivodeship. The area experienced very drastic changes – expressed in practice, in the context of the systemic transformation – through the district basically being closed down.

This was the first example of such a large area of economic activity being consigned to history. And the action taken here was unfortunately characterised by limited efficiency, fragmentation, a great deal of variability in what was actually done, and a lack of coordination. Notwithstanding a range of pressing problems in all socio-economic dimensions, the area has failed to receive support.

The authors are thus unanimous in their negative assessment of the consequences of actions taken, given the way they ushered in societal regression, along with a much-worsened unemployment situation, and impoverishment. In environmental terms there was actually an increase in levels of secondary emissions, *inter alia* through the self-ignition of a spoil heap; as well as a developing programme of the raising of water levels. Meanwhile, where the economic dimension was concerned, the district came to be distinguished by its limited levels of entrepreneurship, outflows of population to other cities, and low level of productivity across the whole subregion. There was never any more in-depth vision for the management of the ex-mining areas, and their reclamation and revitalisation. Ultimately, the article takes account of the processes observed and decided to dub them 'experimental' more than restructuring-related. Indeed, the whole article serves as its own particular kind of case study – on an improper approach taken to restructuring in mining regions. It serves as a spur, even as it is a training ground from which conclusions need to be drawn as today's Just Transition measures are put into effect.

It can be concluded that the failure lies not only in passivity on the part of the state when it came to restructuring – as manifested in lack of commitment, insufficiency of social-insurance funding and a lack of institutional support. For, sadly, a second component has been the local community's passive attitude, in which a willingness to participate in restructuring processes is lacking, even as there is no marked opposition or dissatisfaction made plain.

The authors are left in no doubt that in Wałbrzych and its vicinity the legacy of mining will long influence this area, across all dimensions. However, recent years have brought several phenomena indicating a slow curbing of negative effects due to the closedown of this industrial region. These are endogenous in nature, and any acceleration of them requires external assistance as a relation

of an equivalent, not positioning subregion in the role of applicant seeking assistance. The development of peripheral areas like the former *Dolnośląskie Zagłębie Węglowe* requires an overcoming of long-term backwardness as regards the quality of human capital (which remains at a low level here). That will depend on the development of modern education, but also on the curbing or reversal of migration trends that continually reduce the supply of well-educated and entrepreneurial young people.

The article entitled *The involvement of stakeholders in the decarbonization process in the coal region of Northern Hungary* (Bujdosó et al., 2022) concerns Hungary's remaining mining region, and hence also the future of coal extraction and power generation in that area. Social research is deployed to address the role and significance of the Mátra Power Plant for its region, and for the country as a whole. The results point to widespread involvement in coal's 'erasure', but key factors prove to be the possibilities for both decision-makers and stakeholders to play an active part in shaping energy policy. Where these exist, social acceptance for the process in question is also achievable, and public debate on alternative solutions can then take place.

The first key result of the involvement of interested parties was the determining of intervention operations capable of incentivising the lodging of JTF applications. Once stakeholders commit to JTF procedures they obtain a number of benefits, including as regards confidence-building and social acceptance, greater influence and faster progress, a saving of resources and an extended knowledge base available among decision-makers.

However, this is a complex process, as many employees will have to change their professions and places of work, also being vulnerable to loss of earnings in this way. A further challenge will reflect the need for retraining and upskilling. Suppliers and sub-contractors in the restructured sectors may also be hit by losses of income and orders, as well as being vulnerable to staff losses; and they will have to commit to new and different product chains. Households will be forced to restructure their sources of income and to change fuels, given that lignite is still used for heating in many cases. In turn, local authorities will have to anticipate reduced revenue from the local-level taxation of enterprises.

All that said, the authors seek to convince readers that the engagement of stakeholders will encourage development, not only of renewable-energy infrastructure and environmental-friendly domestic energy production and utilisation, but also of environment-friendly public transport and sustainable land use. The local government is further of the view that decarbonisation can be accompanied by a development of tourist functions and agricultural activity.

It is further possible to note that the need to build a broad coalition of activity in the name of transformation – as perceived by the authors – is an element lacking from the unsuccessful restructuring of the Lower Silesian Coal Basin – that they describe by way of exemplification.

A further article on *The role of Latvia's maritime spatial planning in promoting the European Green Deal* (Neimane & Puzulis, 2022) is devoted to spatial-planning dilemmas as these concern sea areas of Latvia included under the said *European Green Deal* (EGD). There is identification of the points of contact between that process and the Latvian system of planning where maritime areas are concerned. This is therefore an attempt to determine the extent to which maritime spatial planning is capable of acting in support of – and implementing – the EGD objectives. A problem here is the time lag between the development of Latvia's *Maritime Spatial Plan 2030* (MSPlan 2030) and the formulation of EGD goals – a circumstance that explains the lack of direct reference to the EGD and its priorities in the document at national level. Indeed, there is no precluding a situation in which EGD assumptions lack direct reference or application in the MSPlan. This leaves the Plan in a position to facilitate, but not guarantee, the achievement of goals.

From the point of view of the Latvian planning system, MSPlan 2030 is the core document by which spatial development is pursued at national level. It is strategic in nature, and has the status of a general instrument of administrative law binding upon all state agencies engaged in drawing up maritime policy and in pursuing regional planning. Nevertheless, this can be seen as supplying answers to ‘where and what?’ questions regarding what can or cannot be done, even as other regulations and instruments are needed when it comes to ‘how and in what way?’.

Analysis of MSPlan2030 content allows for the identification of three main areas of subject matter congruent with the EGD, i.e. biodiversity, energy and the sustainable blue economy. Support for that economy (and at the same time EGD objectives) is first and foremost dependent on an ability to put in place all necessary linkage between planning documentation and sectoral strategies.

The article makes it clear that solutions have to arise on two levels, i.e. the regional and the national. The regional level requires support through a larger number of indicators linking the EGD to the Plan, with certain minimal requirements for what is to be taken account of needing to be laid down. It is also of key importance that there be close supervision as the EGD objectives are operationalised, with indications as to where and when EGD provisions might be superseding the law in force.

There is in turn a national-level need for the many different policies the EGD relates to, to be synchronised. That means consolidation where there is doubling of documentation effort, as well as the elimination of areas still going unregulated, or not taken account of by relevant strategies on how to proceed. There is a need to devise policy-planning documents, such as guidelines and conceptual reports, as well as the strategies present in other sectors. In practice, this will denote the putting in place of an overarching national vision for an integrated maritime policy.

In summary, the article can be seen to signal a series of governance problems, and a need for the EGD objectives to be synchronised with planning mechanisms. Effective implementation (and thus the achievement of EGD goals) is predicated on that. At the same time, it can be presumed that other EU Member States are faced with similar systemic issues.

Wind energy is also the subject of a last article entitled *Offshore wind energy potential in Europe: a forecast of installed capacities and costs* (Laskowicz, 2022), in which the author reviews different EU Member States’ targets when it comes to the installation of maritime wind-energy capacity. The data look optimistic, making it clear how great the potential is, and thus how targets can be surpassed, provided that appropriate resources (of both sea areas and capital) are committed, in the process mobilising new supply chains.

The article cites key data (including on the demand for turbines), as well as indicating the demand for capital to cover the investment outlays. The conclusion arising from the analysis relates to development of electricity generation from other sources, with the result that GHG emissions decline even as Europe’s level of energy independence is raised.

The major development of interest in maritime wind energy as a means of achieving the objectives of the EGD and the *REPowerEU* Strategy is reported on, in the context of this being the aftermath of Europe’s energy crisis. However, this in-essence positive development needs to go hand in hand with the planning process for maritime areas. Above all, it is stressed that development of spatial-planning indicators will be essential.

The United Kingdom is among Europe’s leaders in maritime wind energy, with a support system in place that has ensured the development of efficient supply-chains in the sector. As of 2022, the amount of energy generated from this source by the UK was equivalent to 80% of the energy generated from wind across the entire EU. However, Poland is now planning to designate as much as

12% of its entire Exclusive Economic Zone to wind farms, with this representing the highest value in Europe anywhere other than Belgium.

Progress with wind energy in maritime areas may bring about positive economic effects, creating new jobs and diversifying local labour markets currently orientated towards fisheries and tourism. The economic dimension encompasses the demand for wind turbines within its value chain. However, bottlenecks are to be noted with the adequate supply of installation vessels, as well as core specialists with the necessary expertise. The invigoration of the wind-energy installation market in Europe, the USA and Asia is currently denoting longer waiting times for full implementation, making clear the need for long-term planning when it comes to energy and climate policy.

It is our firm conviction that the articles contained in this edition will be of interest to many readers, and will better acquaint them with the different dimensions to the Just Transition. The aforesaid diversity of subject-matter only emphasises the need for further analysis and research. If done at the national, regional, but also even local, levels, this will offer valuable support as the operational decisions associated with the EGD come to be taken.

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