



Just Transition to climate neutrality

Doing right by the regions

Publisher	WWF Germany
Publication date	February 2020
Authors	Marta Anczewska (WWF Poland), Juliette de Grandpré (WWF Germany), Nikos Mantzaris (The Green Tank, Greece), Georgi Stefanov (WWF Bulgaria), Katie Treadwell (WWF European Policy Office)
Coordination	Juliette de Grandpré (WWF Germany)
Contact	juliette.degrandpre@wwf.de
Editor	Stephanie Ellers (WWF Germany)
Layout	Anita Drbohlav (mail@paneemadesign.com)
Production	Sven Ortmeier (WWF Germany)
Printing	***
Paper	***



Cover photo	Monument of the mining industry in Katowice, Poland (iStock/Getty Images)
--------------------	---

© 2020 WWF Germany, Berlin. May only be reprinted in full or in part with the publisher’s consent.

Supported by:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety



European
Climate Initiative
EUKI

based on a decision of the German Bundestag

TABLE OF CONTENTS

EXECUTIVE SUMMARY		4
INTRODUCTION		7
1	THE EXAMPLE OF THE RUHR IN GERMANY	13
1.1	A brief history: the rise and fall of the Ruhr region	13
1.2	Lessons learned	15
1.3	Conclusions	21
2	CASE STUDIES OF COAL REGIONS IN TRANSITION	23
2.1	The region of Western Macedonia in Greece	23
2.1.1	Introduction	24
2.1.2	History and status of the transition process in Western Macedonia	27
2.1.3	Challenges	30
2.1.4	Recommendations	33
2.1.5	Conclusions	34
2.2	The Silesia region in Poland	35
2.2.1.	Introduction	36
2.2.2.	Current status of transition in Poland	39
2.2.3	Challenges for the region	43
2.3.4	Recommendations	45
2.3.5	Conclusions	46
2.3	The South West region of Bulgaria	47
2.3.1	Introduction	49
2.3.2	History and status of the transition process in the South West region of Bulgaria	52
2.3.3	Challenges	54
2.3.4	Recommendations	55
3	CONCLUSIONS AND RECOMMENDATIONS	59
3.1	Policy recommendations	61
3.2	Implications for European policy	66
LIST OF REFERENCES		70

Executive Summary

Just transition is a buzzword in policy circles today. There is consensus that the transition towards climate neutrality should be a just one. However, when and even if such a transition should really take place, is still met with vastly diverging viewpoints. At the same time, what ‘just’ actually means and what its implications are for national and EU policy is even less certain.

This report – a review of four case study regions of the transition from coal in Europe – illustrates that even though each region is different, the challenges they face to ensure a just transition from coal are strikingly similar.

By analysing these regions and their needs to ensure a just transition, we make five clear headline policy recommendations to ensure a just transition. These should be applied at regional, national and European level in order to deliver a truly just and comprehensive transition from coal, leaving no-one behind.

Given the EU’s new and existing commitments to assist Member States, both technically and financially in the transition (notably to ensure it is just), Member States now have no excuse but to sign up to the Union’s objective to reach climate neutrality by 2050, a fundamental prerequisite of which is phasing out coal as early as possible. Doing so will also enable transition to be accelerated further, funded better through the Just Transition Mechanism and will ensure they are in the best position to make sure it is just.

The EU must furthermore ensure that the support it provides for a just transition can deliver on its promises. The new platform must go further than the existing coal platform, with much greater involvement and a clear definition of the role of all stakeholders in the processes of transition planning. It must also be a beacon of transparency to enable all to access, understand and engage with the transition.

The new Just Transition Mechanism, the pillar of President von der Leyen’s promise to leave no-one behind, will need to enhance the transition through mandating territorial transition plans which include clear timelines for the coal phase-out and which are underpinned by clear and objective analysis.

Just transition in coal mining regions constitutes one of the biggest challenges – and opportunities – of the next decade. Europe must prove its commitment to social justice by ensuring that no-one is left behind, while the EU moves beyond coal and the entire economy shifts to climate neutrality before mid-century.

Set a phase-out date for coal as early as possible, followed by an agreed and consensual, timeline-based transition strategy

Setting a clear timeline with a binding and ambitious phase-out date for coal provides certainty to investors; avoiding the creation of stranded assets and lowering the overall costs of the transition.

Ensure timelines and strategies are based on high-quality, quantitative analysis, guided by a commitment to sustainability

To be meaningful, effective and have the greatest chance of success, just transition strategies and plans should be informed by quantified, transparent and objective analysis. They should also be formulated with the aim to achieve true environmental sustainability in order to ensure that the transition is durable.

FIVE POLICY RECOMMENDATIONS TO ENSURE A JUST TRANSITION

Ensure adequate, targeted financial and policy support for the transition using EU as well as national funds

The transition requires upfront investment, which cannot always be made by investors alone. Long-term policy support and frameworks, supported by dedicated public financing are necessary to leverage the sustained investment required for a just and sustainable transition.

Aim for real economic diversification

A diverse collection of smaller businesses and industries provides resilience to economic change, with big economic changes having a lower impact on overall employment and the GDP. Diversification should be on the basis of environmental sustainability to ensure it will deliver long-term, quality jobs.

Engage all stakeholders in an ongoing process, especially at local level

The involvement of local stakeholders can determine whether the transition succeeds or whether it is delayed, resisted and derailed. Local stakeholders and communities are more likely to buy into the strategies and will support their implementation if they were the driving force behind developing them. Local communities have unrivalled insight into their needs and desires, even if on their own they do not have the resources or expertise to actualise them. Failing to involve local communities will risk missing essential information into their needs, desires and strengths and can drive resistance to change.



Szombierki Heat Power Station is a coal-fired power station in Bytom, Poland, operational from 1920 to 2011. It is regarded as industrial monument due to its architectural values.

© Konstantin Hristov

Introduction

The current economic system is changing and we need to adapt

In the face of unprecedented climate change and anthropogenic strain on the environment, policies are steadily evolving. 187 countries have ratified the Paris Agreement, which commits parties to limiting global heating to below 2°C, and to strive to limit it to no more than 1.5°C. Moreover, technology development, notably in renewable energy, is generating market forces that further drive this transformation by rendering fossil fuels less competitive.

New EU 2050 goal of climate neutrality

In December 2019, the European Council adopted a goal of **climate neutrality by 2050**. This will require huge investment (estimated by the European Commission at €260 billion more per year than current levels). The adoption of the target is a leap forward for the EU and begins to provide the crucial certainty for investors to start investing in the transition and to avoid generating future stranded assets. To cement this certainty, the EU must enshrine this target in an EU climate law, whose proposal is expected by February 2020. The new **EU climate law** must open the door to planning the transition in a just and cost-effective way by also enshrining an increase in the EU's 2030 climate and energy targets. The EU is currently considering an increase of the 2030 target of greenhouse gas emissions reduction of 50%–55% (compared to the current -40%). To be truly in line with the Paris Agreement, WWF believes the 2030 target should be -65%.

The clean energy transition is inevitable¹

Previously dominant, polluting industries are giving way to clean technologies that provide a secure and competitive energy supply, consistent with global climate and environment commitments. The International Labour Organisation (ILO) estimates that the 'green' transition will generate a net two million new jobs in Europe whilst the Commission recognises it will be positive overall for the European and global economy². However, the immediate benefits will not be felt in some regions³. Mono-industrial areas, particularly those highly dependent on energy-intensive and extractive industries, such as coal mining, will need to undergo massive regional transformation and will be negatively impacted by an unmanaged energy transition. Moreover, the structural changes required are likely to be more ubiquitous and necessarily more rapid than previously observed.

Delayed action is costly

Past transitions, such as those in the UK during the 1970s and 80s, were resisted by communities, who feared the loss of jobs, culture and quality of life. The same fear is driving resistance to the clean energy transition today; echoed in the unrest of the yellow vest movement in France, which results from a perceived unfair distribution of costs of the transition. There is a real risk of generating political forces that slow, divert or even derail the transition.

The energy transition must be a just transition

We cannot afford to ignore the lessons of the past, but neither can we afford to halt the clean energy transition. Efforts to cling on to dying industries cost consumers and can artificially force up energy prices (which is already being observed in some countries, such as Poland), plunging communities into energy poverty for the gain of a few concentrated business interests. As an example, technology-neutral capacity mechanisms led to paying out billions of euros to power utilities every year in order to keep uncompetitive lignite and hard coal plants on the grid⁴. Not only does this stifle clean innovation by starving it of funds, but it slows the transition, increasing the investment in ultimately stranded assets, decreasing the competitiveness of national economies and increasing the risk of derailing progress on the EU's climate objectives. Without a swift, clean energy transition, we risk catastrophic climate change that will destroy the very basis of our production systems, generating enormous economic losses globally, while devastating lives and livelihoods.

Regions who have contributed so much to the growth of the European economy deserve better than being left behind with costly stranded assets. The EU has a moral and Treaty-based obligation to ensure solidarity, social cohesion and that no region is left behind. At the same time, the EU strives to meet its climate and environment objectives to improve the health and prosperity for its citizens.

EU-level developments on just transition

The EU recognises the need for a just transition. At COP24 in Katowice, Poland, the Presidency presented the 'Solidarity and Just Transition Silesia Declaration'⁵, which was signed by just over a quarter of the parties to the conference, including the European Commission and 24 Member States. It calls on signatories to implement the Declaration, which recognises the need for a just transition. No concrete steps have yet come from the Declaration itself, although several EU-level measures have been established relevant to the realisation of a truly just energy transition in Europe.

Despite calls for financial support, the European Commission took a conservative approach, establishing first a 'Coal Regions in Transition' (CRiT) platform as part of the Clean Energy Package. A central and direct initiative in support of the just energy transition, CRiT seeks to support coal regions in addressing the challenges of 'transformation' they are facing by facilitating experience and good practice sharing, as well as encouraging regions to develop coherent strategies that take into account the social elements of the energy transition. The platform is evolving and is steadily being institutionalised through the creation of a secretariat, but it has been criticised for a lack of transparency and clear support for a clean energy transition. It also provides no direct financing.

In order to implement a just transition and to unlock the opportunities it presents, investment is needed. A limited amount of public finance for just transition has been secured at EU level through the creation of the 'Modernisation Fund', which derives funds from the auctioning of allowances under the EU Emissions Trading System⁶. This fund, however, can only be accessed by ten Member States (with a 2013 GDP less than 60% of the EU average), and use of the funds for just transition also competes with other investments to improve energy infrastructure.



View of National Park Rila from the Kyustendil Province, South Western Bulgaria. Bulgaria is blessed with beautiful nature which could be used for the development of ecotourism.

Several programmes under the 2021–2027 Multiannual Financial Framework also provide possible financing streams for the just transition. This includes the cohesion policy. Calls for dedicated EU financial support for the just transition continue, including from the European Parliament⁷.

As a result of these developments, a new Just Transition Mechanism was proposed by the European Commission in January 2020. It aims to mobilise €100 billion to support workers and their communities in regions whose economies are based on carbon-intensive activities, like coal mining. It consists of three pillars: a grant-giving pillar (the €7.5 billion Just Transition Fund), a pillar to leverage private funds (the InvestEU guarantee) and a third ‘public sector loan facility’ pillar. Most of the aspirational €100 billion, however, will need to be leveraged through the private sector, and co-financing from the cohesion policy also makes up a significant part.

Bottom-up initiatives

Local authorities and leaders have been mobilising themselves to ensure a just transition. In September 2018, the first Forum of Mayors on Just Transition took place in Kozani, Greece: a bottom-up initiative which initially involved representatives from six Member States aiming to enable the sharing of experience and knowledge between those on the ground affected by the transformation. This was followed by a second Forum hosted by the mayor of Weißwasser, Germany, in September 2019. It was at the second forum that a Declaration was signed, calling for EU support, underlining the mayors’ commitment to the Paris Agreement and asking for support to make just transition a reality. The Declaration is a progressive text that includes certain asks of the European Commission for ensuring that transition will take place and will be just⁸. The second Forum gathered 16 mayors from Europe as well as 40 stakeholders (trade unions, civil society, the German ministries of environment and economy, and regional institutions) and numerous journalists.

Aims and objectives of this paper

Case studies from three European regions undergoing the clean energy transition are used to highlight the current challenges regions face when implementing a just transition. An example of a completed transition (the Ruhr Region in Germany) is also included as a reference. Together, these provide valuable lessons, inform the principles of what constitutes a just transition and contribute to the development of policy recommendations for implementing the just transition. These recommendations are included in the specific sections, and EU-policy implications are summarised in the conclusions. Europe is at a crucial moment and must now seize the opportunity to ensure that the transition taking place is not only economically efficient, but also socially just.



Ex-coal mine
Zeche Zollverein
in Essen, a
UNESCO World
Heritage Site

© iStock/Getty Images

1 The example of the Ruhr in Germany

1.1 A brief history: the rise and fall of the Ruhr region

The Ruhr region is the coal region par excellence. While coal is also being mined in other regions such as Lusatia, no other region in Germany has been as strongly influenced by coal as the Ruhr region. In combination with the iron and steel industries, as well as steam engines, mining has fundamentally changed this once-rural region in the west of the republic.

Today it is the largest agglomeration in Germany. Settlements and small villages developed into large cities such as Dortmund, Essen, Gelsenkirchen or Bochum, which almost merge into each other. More than five million people live here, significantly more than in Berlin, for example. Many of the towns in the region were founded in the Middle Ages, but it was coal that propelled their economic growth.

Around 1850, the speed of industrialisation took off in the region. Refining coal into coke was the prerequisite for the production of iron and steel. The combination of steam engines, coke blast furnaces and the building of a railway in the Ruhr region made an industrial revolution possible. Between 1850 and 1925 the population increased explosively from 400,000 to 3.8 million people. The ‘coal age’ lasted about 150 years. It played a crucial role at crucial times, making the region the ‘armory of Germany’ during both world wars but also the ‘heart of steel’, making a major contribution to reconstruction and having an important role in the economic miracle of the 1950s.

The coal industry in Germany employed more than 600,000 people at that time. A further 100,000 worked in the steel industry, the rise and decline of which was closely linked to hard coal. But for many, the beginning of the end came sooner than expected. As early as the 1960s, Ruhr coal was no longer competitive on the international market and oil gained in importance. In contrast to the hard coal mining areas in the USA, South Africa and Colombia, hard coal in the Ruhr lies in much deeper layers. Production was correspondingly costly and time-consuming. As a result, more than 30 large mines were closed by 1963, followed by numerous further closures in the following decades.

The effects were not only felt by the miners, which were reduced to 200,000 workers in the 1970s, but the entire region was plunged into an economic crisis. In Duisburg alone, between 1980 and 1992, more than 40 percent of employees in the mining and steel industries lost their jobs. The situation in the other economic centres of the region was no better, especially as mine closures had indirect effects. Suppliers, crafts enterprises and service providers were also pushed out of business.

In 2007, the German government decided to phase out subsidies and close the last hard coal mine by 2018. This officially sealed the end of hard coal mining in Germany. There were tears, solemn speeches and sentimental retrospections, but the wistful closing of the last mine was really the end of a transformation that had already begun in the 1960s. It was a painful process because it was the end of an industrial and social ‘monostructure’ that had developed in the region over 150 years. For a long time, success was defined solely by the production figures of the steel and iron industry and the output of coal. For generations, devastating environmental damage, health risks and massive public subsidies had been widely accepted as part of a national consensus on the importance of coal in the economy and cultural identity of Germany, as in many mining regions across Europe.



The work in the coal mine was dirty, exhausting and dangerous, with a high feeling of solidarity and comradery between the miners. The work was well-paid and the miners were held in high esteem in society.

1.2 Lessons learned

Lesson 1: Setting a phase-out date early is crucial

The Ruhr example is often seen as a role model for fair transition, mainly because no dismissals took place. Nevertheless, it is important to remember the timeframe (60 years between the acknowledgement that Ruhr coal is not economical and the last mine closure) and the exorbitant cost of the hard coal mining phase-out in Germany. Depending on how narrowly or broadly one interprets what is meant by the term ‘subsidy’, different sums result. They are all impressive. If one takes into account the direct financial aid provided from the public budgets, approximately **€150–200 billion flowed into hard coal mining over those 60 years**. Alternatively, one can base the calculations on a broader concept of subsidies which also includes tax concessions and other regulations independent of the state budget – this results in a sum of €337 billion⁹.

The extent of the contraction process in the industry was not fully foreseeable in the 1950s, but the signs of the times were hard to overlook: oil and gas, and later nuclear energy, increasingly outstripped German coal; the price of Ruhr coal was at least twice as high as the world market price. For purely economic reasons, it would have been more conclusive to say goodbye to Ruhr coal earlier. Although the 1960s did witness the closing of mines, closed sites were still owned by the mining companies and were not released for other purposes. This blocked the establishment of companies from other sectors, which in turn inhibited alternative economic activities¹⁰. Furthermore, yet more new mines were opened in the Ruhr area and the Saarland.

For a long time, politicians tried to maintain the competitiveness of the established energy companies and the steel industry. One measure was the founding of Ruhrkohle AG (RAG): a merger of the remaining mines. In the new group, 80 percent of hard coal production from 52 mines was bundled. Around 200,000 people were employed here. Another measure was the introduction of the ‘coal penny’: through the so-called ‘contract of the century’ signed in 1974, energy supply companies were obliged to prioritise German coal over imported coal and the additional costs were added to the electricity price as a ‘coal penny’. From 1974 to 1995, this surcharge on electricity bills averaged around eight percent, which brought in around €2.7 billion per year. It was not until 1995 that the Federal Constitutional Court put a stop to this and declared

this an unconstitutional special levy. However, the ruling did not put an end to the financial support, as the funds were simply replaced by direct subsidies from the public budget. In addition, the steelworks contract guaranteed the mines a purchase of German coking coal for the domestic steel industry until the year 2000.

On the whole, economical and political actors as well as trade unions showed an astonishing inertia. Instead of investing in change early, they tried to save what could no longer be saved and German tax payers were asked to dig deep into their pockets to pay for this. Decades were lost for the preparation of ‘what comes after’. It is an illusion to believe that a just transition can begin without an unambiguous and definite decision to end coal – as long as important actors like companies, policy makers and trade unions spend time and money on defending the status quo, no change can be expected and regions will not have a mandate to plan a new, sustainable and prosperous future.

Lesson 2: Negotiating with employees and trade unions is central to reach a national consensus

In the mid-1950s, the number of employees in the German mining industry reached its highest level. Almost 500,000 people worked in the mines of the Ruhr area. Not only did their income depend directly on coal, but so too did that of their relatives. Indeed, almost every family had one or more people who owed their jobs directly or indirectly to mining.

The close connection between the region, the people, their culture and the raw material led to a kind of ‘coal scuttle’ romanticism that long concealed the dark sides of the back-breaking job. For many, mining was much more than just a job. Even today, the miners’ anthem (‘Steigerlied’) is played before every game in the football stadium in Gelsenkirchen. The miners and their trade unions acted accordingly self-confidently.

This was expressed, among other things, in 1951 in the **co-determination** act of the mining and the iron and steel industries, which guaranteed employees a high degree of influence on both supervisory and management boards. Parity co-determination not only resulted from the increased self-confidence of the miners but was also a lesson learned from the Second World War. The ‘steel barons’ and mine owners had earned a great deal from the increased armament of those years; co-determination in these sectors was intended to prevent a war driven by economic reasons. While co-determination may seem reasonable in this context, it also guaranteed the preservation of vested interests.

In view of the almost symbiotic relationship between mining and the culture of the region, massive social disruptions were feared. To prevent this from happening, a bundle of labour market and energy policy measures was supposed to ensure that ‘no one fell into the mining pit’, as the jargon of the miners put it. With the help of purchase guarantees and subsidies, the phase-out of German hard coal mining was cushioned and the early retirement of numerous miners aged 50 and over was made possible. Thanks to a state-financed adjustment allowance, early retirements did not have any serious financial consequences for the miners. Employees from suppliers or from smaller businesses around the mines, however, were often hit harder by the coal phase-out.

Lesson 3: Waiting for a large-scale industry is in vain

In the Ruhr area it was possible to preserve social peace with a lot of money. On the other hand, the hope of replacing the coal and steel industry with other major branches of industry proved to be deceptive.

A full-bodied industrial policy that relied on lavish subsidies to create new jobs out of thin air was put in place. As subsidies ran out, new jobs often disappeared just as quickly as they had been created. In the beginning, many former miners were accommodated in steel or automobile companies. But with the economic downturn in the 1980s, promising attempts to establish companies such as Nokia or Opel in the Ruhr area proved unsuccessful¹¹. **In retrospect, the focus on large-scale industry and thus the inadequate development and promotion of smaller companies may have hindered early structural change.**

Lesson 4: Building institutions and infrastructure and preserving cultural identity is an important part of the solution

The balance sheet of structural policy measures in the Ruhr area has seen both positives and negatives. Success stories are the expansion of the university institutions and a very well-functioning public transport infrastructure.

Until the mid-1960s, there was not a single university in the Ruhr area. The founding of the Ruhr-Universität Bochum marked the transition of the region from a production region to a research and development region. Its urban location made the Ruhr area interesting, both with regard to a large market access and the establishment of one of the

densest research and university landscapes in Europe. In contrast to the settling of industrial companies and the short-term jobs that followed with it, investments in education only paid off in the medium term, but they proved to be considerably more sustainable: former coal miners rarely become university lecturers, but research institutions can act as magnets and breeding grounds for new initiatives and start-ups in the longer term.

The Ruhr Development Programme (EPR) heralded Germany's active structural policy in 1968. Further regional funding programmes worth billions, financed with federal, state and EU funds, were to follow. This was the first time an integrated approach had been implemented to transform an industrial region in Germany¹². The focus of the measures was on the socially responsible reduction in employment in the coal industry and the expansion of the infrastructure in the Ruhr area with the aim of aligning it with nationwide standards, in particular: expanding the road network and public transport system, expanding regional recreational facilities (e.g. coal mining district parks) and establishing and expanding the education and research infrastructure.

The efforts to promote a cultural identity went hand in hand with the promotion of the scientific landscape. The conversion of former industrial facilities into accommodation and cultural centres, such as the Zollverein in Essen (today a World Cultural Heritage Site) or the Duisburg Park around a former steelworks, are now landmarks and attractions known far beyond the region. The International Building Exhibition Emscher Park is regarded as particularly innovative in its form and orientation. Here, for the first time, the socio-ecological claim was translated into a regional political programme and the industrial heritage transformed into something of physical value. The industrial monuments designated in this context formed the basis for the region being able to present itself as the European Capital of Culture in 2010. Essen even became Europe's environmental capital in 2017. The EU Commission awards this title to metropolises that have succeeded in combining environmental protection and economic growth with an outstanding quality of life for their inhabitants. A performance that hardly anyone would have thought possible in the days of blast furnaces and coal mines, when drying laundry outdoors was not advisable due to the rampant air pollution.



Duisburg Inland Harbour is a former industrial area which was fundamentally transformed as part of the International Building Exhibition Emscher Park (IBA) which ran from 1989 to 1999

© WWF Greece

Lesson 5: Civil society should be involved

Today's German coal problem focuses largely on Lusatia, even though larger volumes of lignite are still being extracted in the western part of the country, in Northrhine-Westphalia. Lusatia is a prime example of a region that is dominated by mining and energy generation, while having little connection to the surrounding metropolitan areas. Though its industrial base has diversified, the electricity generated in Lusatia's lignite-fired plants remains its most important export, even after the collapse of the former East German lignite chemical industry¹³.

The German Coal Commission, which worked between June 2018 and January 2019, recommended the following:

- » Germany to phase out coal by 2038 at the latest and shut down significant capacity of hard coal and lignite plants by 2022;
- » Germany to invest 40 billion Euros in transition measures in lignite mining regions over a 20 year period, detailed in a transition law.

The Commission consisted of 28 members, of which five were NGO representatives (two representatives of the regions and three representatives of federal level environmental NGOs) who played a major role in upholding the climate integrity of the process. They also credibly conveyed the perspective of people and communities affected by mining – an aspect that is often overlooked by the 'official' transition narratives from regional governments and unions that focus mostly on employment in the context of just transition. The recognition of the legitimacy of these actors to sit at the table is fairly recent and thus did not play a real role in the transition of the Ruhr area. However, the strong involvement of the civil society can make a difference and should be institutionalised, especially in remote or rural regions which have difficulties attracting new investors as it strengthens the resilience of the region.

In Lusatia, for instance, there is a strong movement which initiated 'Citizen Region Lusatia' (Bürgerregion Lausitz) in order to articulate and actively represent the civil society perspective of the region.

1.3 Conclusions

In view of the complexity of this structural change, it is a misbelief that one could create blooming landscapes overnight. In the case of the Ruhr, the need for change was obvious but still resisted for so many years – that is why setting a phase-out date is crucial to send the right signal to all actors involved in the process. In order to stabilise the socio-economic development of a region in the medium and long term, generous financial support alone is not enough. The example of the Ruhr area shows that social hardships could be partially cushioned, at least regarding direct jobs. At the same time, the subsidies (implemented without foresight or in conjunction with a transition plan) cemented the existing structures and working conditions. Economic development on the drawing board is often not particularly successful. Two things help to support it: infrastructure, i.e. roads, bridges, fiber optic cables; and educational institutions. 'Young people are drawn to universities – and new structures are created around them', says Jens Südekum, an economics professor at the Heinrich-Heine-University Düsseldorf. A process like this takes time, as shown in the Ruhr area, where at least two generations were affected.



In Greece, the PPC mine collapse had negative effects on biodiversity and agricultural production.

2 Case studies of coal regions in transition

2.1 The region of Western Macedonia in Greece

Summary	
Coal phase-out date	2028, all currently existing lignite plants will be retired by 2023
Just Transition in official documents	NECP
Available funding	National Just Transition Fund (6% of public revenue from auctioning of CO ₂ allowances)
Potential funding sources	EU Just Transition Fund, European Social Fund +, European Regional Development Fund, European Cohesion Fund.
Biggest challenges	1. Lack of time (imminent plant retirement) 2. Lack of a just transition plan 3. Non-participatory process
Key recommendations	1. The Public Power Corporation (biggest landowner) should participate in the process. 2. A widely represented Just Transition Committee should agree on an official transition plan by mid-2020 3. Establish a dedicated funding stream for just transition

Indicator	Value	Year	Source
GDP per capita (Greece)	€17,220	2018	Eurostat, provisional estimate
GDP per capita (W. Macedonia)	€14,800	2017	Eurostat, provisional estimate
Lignite share in electricity production	33%	2018	ADMIE (IPTO) and ENTSO-E 2019
Workers in lignite industry (Greece)	7,175	2020	General Secretary of Energy
Workers in lignite industry (W. Macedonia)	5,522	2014	Public Power Corporation (PPC) (does not include private companies)

Table 1: Important indicators for Greece and Western Macedonia

2.1.1 Introduction

The region of Western Macedonia is located in northwest Greece, bordering Albania to the west and North Macedonia to the north. Western Macedonia is the only region in Greece not bordering the sea and is one of the least populated regions in the country. It consists of the regional units of Kozani, Grevena, Kastoria and Florina.

It covers an area of 9,451 km², 7.16% of the country's total area, and comprises mostly of mountainous and semi-mountainous terrain (82%). Western Macedonia is well-known for its rich natural resources, such as fossil fuels (lignite), ores (asbestos, chromite, marble etc.), forests (50% of its total land) that form ecosystems with rich biodiversity, as well as pastures. It also has the greatest surface water potential in Greece (approximately 65% of the country's entire potential).

Since the mid 1950s, lignite mining has been the main economic activity in the area. Despite this, the population of the region has significantly reduced over the past 50 years; according to the official census, it dropped by 9.7% between 1961 and 2011. According to the latest Eurostat figures, the population of the area was estimated at 269,222 in 2018, i.e. there was an additional 5.8% drop between 2011 and 2018.

The Gross Domestic Product (GDP) of the region of Western Macedonia was €4 billion in 2017¹⁴, contributing 2.23% to the national GDP of €180.22 billion the same year¹⁵. The industry and power production sectors together had the largest contribution to the regional economy of Western Macedonia (one third)¹⁶. The energy production sector produces electricity through lignite combustion and hydroelectric energy. It constitutes the main economic activity of the regional economy, rendering Western Macedonia Greece's 'energy center'.

The heavy dependence of the regional economy on the lignite industry is largely responsible for the high unemployment rates, as it prevents the development of other economic activities. With a 27% overall unemployment rate in 2018 (22.5% for men and 32.9% for women)¹⁷, the region of Western Macedonia ranks 3rd amongst NUTS 2 regions¹⁸ in the EU. Long-term unemployment (≥12 months) made up 19.3% amongst the region's active population in 2018¹⁹ (2nd amongst regions in the EU), while unemployment amongst young people (up to 24 years old) was 62% in 2018, placing Western Macedonia 3rd amongst all EU regions²⁰.

Unemployment is expected to skyrocket due to the anticipated decommissioning of existing lignite plants. Specifically, the Greek Prime Minister recently announced the retirement of all lignite plants by 2028 at the latest. The newly drafted National Energy and Climate Plan (NECP) reflects this decision and indicates that the steepest reduction in the lignite-based electricity production is imminent as it is planned to occur by 2023. For the region of Western Macedonia, this development will lead to the retirement of 3.775 MW of gross nominal capacity. The only lignite plant that is expected to operate in the area beyond 2023 and only until 2028 is the 660 MW Ptolemaida V lignite plant, currently under construction, and expected to come online by 2022.

The lignite phase-out decision constitutes a U-turn in Greece's energy policy compared to the stance of the previous government which was planning on keeping lignite in the electricity mix until well beyond 2040, fought for lifetime extensions of lignite plants, sought derogations which would subsidise the operation of lignite plants, planned on building two new lignite plants (Ptolemaida V and Meliti II) in the region of Western Macedonia and attempted to sell 40% of the Public Power Corporation's (PPC) lignite assets, thus prolonging the lignite-based electricity model in Greece.



© © Marianna Plomarti

The Meliti I lignite power plant was constructed in 2001 and will cease to operate in 2023.

Although the phasing out of lignite in Greece will undoubtedly be beneficial for the protection of public health, the environment and the climate (lignite was responsible for 34% of the national greenhouse gas emissions in the period 1990–2017), it will pose a significant challenge for the local societies and regional economy due to their deep dependence on lignite-related activities.

Hence, it is imperative to urgently design the transition of the region of Western Macedonia towards alternative and sustainable economic activities.

2.1.2 History and status of the transition process in Western Macedonia

Despite the region's heavy dependence on lignite mining and combustion activities, significant progress has been made regarding Just Transition in recent years at the political level.

National context

The just transition concept was first introduced by WWF Greece prior to COP21 in November 2015 in Paris. WWF Greece proposed to the Greek government a lignite phase-out by 2030, while also ensuring social justice by channeling public revenue from the auctioning of CO₂ allowances to support the development of sustainable economic activities in Greece's three lignite regions: Kozani, Florina (both in Western Macedonia) and Arkadia (in the Peloponnese).

Furthermore, WWF Greece in collaboration with experts from Panteion University of Athens developed a 'Roadmap for Transition of the Western Macedonia Region to the Postlignite Era' based on an input-output model. The report was first presented to the local stakeholders in July 2016. It was the first report which showed quantitatively that the construction of the two -then planned- new lignite plants simply cannot compensate for the jobs and regional GDP that will be lost due to the retirement of the existing lignite plants. Instead, injecting an amount smaller than the construction costs of these two new plants into 12 sustainable economic activities would revive the region's economy by creating almost double the number of jobs and more than doubling the regional GDP, compared to the corresponding losses from the retirement of existing lignite plants. The study also presented potential funding sources for the implementation of the plan including public funds from the auctioning of CO₂ allowances.

The idea of establishing a National Just Transition Fund (NJTF) from CO₂ allowances was embraced and further developed by the then-mayor of Kozani, who proposed it as an amendment in an upcoming bill which defined how public revenue from CO₂ auctioning would be spent. He also engaged mayors from the other four lignite municipalities in Greece, the prefect of Western Macedonia, as well as Members of the Greek Parliament from almost all political parties. However, in the end, the then-Minister of Environment and Energy rejected the idea.

The efforts of the lignite mayors and WWF Greece for establishing the NJTF were reignited in mid-2018 during the discussion of the bill to sell PPC's lignite assets. This time, the Alternate Minister of Environment and Energy was persuaded. He announced the establishment of a NJTF and launched a public consultation process for its uses. The consultation resulted in priority axes which excluded any lignite-related project and focused on renewables, energy savings, circular economy, the primary sector and the promotion of the rich industrial heritage of Greece's lignite regions, as well as training activities so that workers could join the above-mentioned sustainable economic sectors.

The NJTF was further included in Greece's draft National Energy and Climate Plan that was submitted in January 2019 to the European Commission²¹ as well as in the updated one by the recently elected government, submitted in December 2019. This in turn indicates agreement between the two biggest political parties in Greece when it comes to using public funds for supporting the country's three regional lignite units.

In April 2019, a ministerial decision was published, directing 6% of the public revenue from CO₂ auctioning in 2018 (approximately €30 million) towards lignite regions. The NJTF was established with clear priority axes 3,5 years after the original idea was first publicly presented.



© Lea Vranicar

Mavropigi village. In 2015 residents started to abandon it, as the open mine that feeds utilities to the PPC's coal plants began to eat away at its edges. Today the village is abandoned, and being slowly demolished.

The new government's decision to phase out lignite by 2028 at the latest vastly influenced the just transition process after September 2019. Most of the newly elected regional and municipal authorities in lignite regions were put under tremendous pressure to oppose the phase-out decision to avoid 'economic disaster' as many local stakeholders and opinion makers in Western Macedonia fear. The local debate on just transition is temporarily on hold due to the shock of the phase-out decision but is expected to regain momentum in early 2020 after the NECP is finalised and the new government unfolds its policy to support the lignite regions.

The EU context

Due to the remarkable efforts of the former mayor of Kozani and the coalition he formed with key local stakeholders and other mayors in Western Macedonia, NGOs and the main lignite trade union, the challenges the region was facing became more well-known at EU level as well. Accordingly, Western Macedonia became one of the first three pilot regions to be included in the CRiT initiative by the European Commission which was launched in December 2017. In addition, since the autumn of 2018, a World Bank team, funded by the European Commission through the Structural Reform Support Service (SRSS) has been working towards developing a detailed plan for the repurposing of mining lands and assets as well as an economic transition strategy for the region of Western Macedonia. The World Bank team was and continues to be in contact with all stakeholders including NGOs, workers and PPC itself and will present its final report in June 2020.

The context of the WWF 'Regions Beyond Coal' project

The dialogue among NGOs, local stakeholders and local authorities in Western Macedonia was further reinforced through the WWF project focusing on Just Transition in Eastern and Southern Europe, funded through EUKI, the European Climate Initiative of the German Ministry of Environment²².

As part of this project, a well-attended capacity building seminar was organised in Kozani by WWF Greece in February 2018. Moreover, local stakeholders from Greece had the opportunity to liaise with stakeholders from three other countries (Germany, Poland and Bulgaria) in four study trips to coal mining regions in Germany, Greece, Bulgaria and Poland. During these trips, the participants became acquainted with the particular characteristics of each region and the status regarding transition of the local economies away from coal.

The excellent collaboration between NGOs and the mayors participating in study trips of the EUKI project also helped identify the mayors as the key stakeholder category, with the greatest potential to achieve positive impact. As a result, the formation of a network of mayors became a major focus of the EUKI project.

The first Forum of Just Transition Mayors from coal regions across the EU took place in Kozani in September 2018. The forum brought together mayors and regional representatives, while also allowing the participation of representative NGOs and trade unions. Participants from six different countries, namely Romania, Slovakia, Germany, Poland, Bulgaria and Greece, helped establish a network of mayors from regions in transition. The success of the first forum encouraged the organisation of a second forum which took place in Weißwasser, Germany, in September 2019. The second forum amplified the results of the first. Fifteen mayors from eight countries participated, along with MEPs, NGOs, trade union representatives, and journalists. At the conclusion of the forum, the mayors signed a Declaration, which ended up being signed by 42 mayors from eight countries, and presented in the plenary session of the CRiT working group meeting in Brussels in October 2019.

2.1.3 Challenges

In addition to NGOs and the World Bank team, **multiple teams** currently exist, each **having a different approach** to the region's future. Their efforts are neither streamlined, nor coordinated and their proposals are often contradictory and conflicting. For example, there are ongoing efforts to incorporate 'clean coal' Carbon Capture Storage or Utilisation (CCSU) projects in the transition plan for Western Macedonia, while at the same time the Greek government has decided to phase out lignite by 2028.

Weak Just Transition governance. A clear administrative structure for decision-making and implementation of a just transition plan is missing. Currently, the Ministry of Environment and Energy issues a ministerial decision each year which determines the share of public revenue from the auctioning of CO₂ allowances that will be dedicated to just transition and also decides on the projects that will be funded by the National Just Transition Fund. Meanwhile, the process of developing a detailed transition plan for the region with the help of the World Bank is funded by the European Commission (SRSS) and run by the prefecture of Western Macedonia. However, the Greek NECP is not in line with the

proposal of the World Bank team for creating an Energy Hub in Western Macedonia. In addition, the members of the regional team have presented varied ideas to the CRiT working group meetings in Brussels so far, thus creating an unclear picture regarding the priorities and overall vision for the region's future.

An additional threat for the future of just transition in Greece stems from the **fractured and short-term approach** enshrined in the law establishing the National Just Transition Fund, which selects projects on an annual basis. The same philosophy is indirectly promoted by the CRiT initiative when it facilitates discussion of projects and project selection in regions without a recognition of the need for such projects to be underpinned by an overarching strategy. Although the development and selection of concrete projects for each coal region in the EU is of great importance, the rush to implement them immediately can lead to negative results.

While CRiT is a much-needed and very valuable forum of exchange of information and ideas among coal regions, its decision-making processes are also unclear. In particular, **a lack of stakeholder representation in the regional team and lack of transparency in the project selection process** which ends up being run solely by



Anargiroi village in Western Macedonia was evacuated after a mine collapse. However some residents refused PPC's offer of an accommodation in a nearby city and leave their homes and land behind.

the team representing the region in the initiative is noted. This amplifies the national coordination problems. Although ad hoc contacts by members of the regional team with other stakeholders are sought, a clear role and a well-defined process for the participation of NGOs, trade unions, representatives of local communities in the decision-making process is still missing.

Although representatives from different stakeholder groups have managed to set aside major differences regarding energy and climate policy and to focus on their agreement regarding the necessity of just transition in the region of Western Macedonia in recent years, **the Public Power Corporation (PPC) is still not engaged in the ongoing public debate regarding just transition** – despite frequent invitations by other stakeholders. This is a major obstacle, if one considers the fact that PPC is the most important landowner in the region and its property is absolutely essential for the implementation of any transition plan.

An additional challenge for the continuation of the just transition process is **political change** in Greece. The progress achieved so far was to a large extent the result of the political efforts by the then-mayor of Kozani who managed to engage local stakeholders, the president of the largest trade union of workers in the lignite industry, the mayors of the four other lignite municipalities in Greece, the prefect of Western Macedonia, the Alternate Minister of Environment & Energy and the Alternate Minister of Economy & Development in a variety of just transition efforts and activities. However, neither the mayors of lignite municipalities nor the prefect of Western Macedonia were re-elected during the municipal elections in May-June 2019, while the leadership in the Ministry of Environment & Energy also changed after the national elections in July 2019.

Perhaps the most significant challenge, however, is time. The **timetable of the lignite phase-out** in Greece set forth by the new government drastically reduces lignite-based electricity production by 2023, before completely phasing it out by 2028, threatening to lead to a violent instead of a just transition in the region of Western Macedonia.

2.1.4 Recommendations

In order to consolidate the progress made so far and to address the above-mentioned challenges the following recommendations are made:

PPC needs to get involved in the just transition process since it owns the land that will be used for the development of economic activities. The Greek State should work closely with the regional and municipal authorities in Western Macedonia to create the necessary conditions and financial incentives, which will bring healthy industries to the region to propose activities that will benefit the PPC as well as a shift of the regional economy towards sustainability.

It is of paramount importance for all stakeholders involved in the just transition process, both at national and regional level, to agree on one **transition plan** prioritising a set of sustainable economic activities for the next 10–15 years. Having this plan, a set of criteria for selecting appropriate projects under these activities must be identified and agreed upon.

The development and successful implementation of a concrete transition plan will require a more **transparent and participatory process** than the ad hoc approach followed so far. All groups of stakeholders should participate and have a clear role in the decision-making and project selection processes. A **Just Transition Committee** should be formed by the central government with the participation of representatives from several relevant ministries, regional and municipal authorities, representatives of lignite villages, local stakeholders, trade unions, NGOs and the PPC. The committee should agree on a specific master-plan by mid-2020 with technical assistance from the World Bank team.

The government should work to **secure a dedicated funding stream** for the implementation of the transition plan, particularly from the new EU funding period (2021–2027) and the EU Just Transition Fund, as well as seek additional national funding sources. This funding will supplement that of the National Just Transition Fund currently receiving only 6% from the auctioning of CO₂ allowances, which is far from being sufficient in addressing the huge challenge of transforming the lignite-dependent economy of Western Macedonia.

2.1.5 Conclusions

It is evident that just transition has gained significant political momentum in Greece in recent years. The objective of achieving a just transition, as well as a description of the funds that will be used to meet this challenge are now included in Greece’s NECP. Greece is the first EU Member State to establish a National Just Transition Fund, financed by 6% of the public revenue from the auctioning of CO₂ allowances. Moreover, consensus exists among major political parties on all of the above. In addition, the dialogue between NGOs, local stakeholders, trade unions, PPC representatives and mayors in lignite municipalities has significantly advanced. The main lessons learned from the progress achieved thus far are as follows:

Mayors are key stakeholders in the just transition process. They are the implementers of the transformation; at policy level they are the ones most affected by the gradual phase-out of coal and at the same time they have the power to pioneer the transformation if financial and institutional conditions are favourable.

Quantitative approaches really help in strengthening the just transition concept. The presentation of a well-documented roadmap for the region of Western Macedonia reinforced and solidified the value of the dialogue between local authorities, NGOs and other stakeholders. Although varied and often conflicting perspectives were expressed, sometimes in a heated fashion, the previously tense relationship between environmental NGOs and local stakeholders was eased and trust was gradually established.

Continuous engagement of all categories of local stakeholders at all stages and efforts towards just transition is of paramount importance in achieving progress.

2.2 The Silesia²³ region in Poland

Summary	
Coal phase-out date	Not defined
Just Transition in official documents	Project of NECP sent to EC on 30 December 2019 by the Polish government
Available funding	No direct funding sources defined
Potential funding sources	Modernisation Fund, Cohesion Fund, Just Transition Fund, national resources, European Social Fund +, European Regional Development Fund
Biggest challenges	1. Lack of proper long-term planning for the region 2. Lack of social dialogue in transition 3. Lack of commitment to phase-out coal in the country
Key recommendations	1. Set a coal phase-out date for Poland 2. Diversify Upper Silesia’s economy 3. Inform and engage stakeholders in a transparent process in order to build trust and enable peaceful change 4. Prepare a dedicated territorial just transition strategy

Indicator	Value	Year	Source
GDP per capita (Poland)	€12,920	2018	Eurostat, provisional estimate
GDP per capita (Upper Silesia)	€12,600	2017	Eurostat, provisional estimate
Lignite/Hard coal share in electricity production – Poland	76,4%	2018	ENTSO-E 2019

Indicator	Value	Year	Source
Workers in the coal industry (lignite and hard coal) (Poland)	91,578	2017	Industry Development Agency, Katowice; AGH University of Science and Technology in Krakow
Workers in the hard coal industry (Upper Silesia)	72,000	2018	WiseEuropa

Table 2: Important indicators for Poland and Silesia

2.2.1. Introduction

Upper Silesia is the biggest hard coal region in Europe, with over 20 active mines (as per 2019) where bituminous and coke coal is extracted. Its history and legacy are directly linked to mining. The development of industry in this area began at the turn of the 18th and 19th centuries and was associated with rich deposits of mineral resources: zinc and lead ores, silver and hard coal. Rapid industrialisation took place in the second half of the 19th century and in the years 1945–1989.

Today, the Silesian voivodeship (Polish administrative area²⁴) is the most industrialised region in Poland and the second largest region in terms of the share of GDP generated. 4.5 million people live in this strongly urbanised area which has shaped into a conurbation. Nowadays its economy is diversifying, new industries take the place of old ones: mining is directly responsible for only 5.6% of the gross added value compared to almost 10% in the early 2000s²⁵. The sector currently employs approx. 72,000 people in the region (direct jobs, both steam and coke coal – see Figure 1) and creates an undefined number of indirect jobs (assumptions vary between 200,000 and 280,000 but the topic has not been thoroughly analysed). Even though employment in mining here is highest among all European coal regions²⁶, the situation is about to change rapidly. Estimates project a drastic decline in hard coal extraction in the coming years solely due to economic reasons – even without a phase-out date that Poland, at this point, opposes to set. The geological situation and necessity of extracting coal from layers even as shallow as one kilometer are the drivers for an end to Upper Silesian coal. This strongly impacts the prices and extraction costs making Polish coal non-competitive compared to imported coal. In 2018, according to

the Industry Development Agency, Poland imported around 20 million tonnes of coal. At the beginning of 2020, unions and miners were warning of protest as heaps of extracted Polish coal almost filled the limits of coal dumps and energy companies were still importing. In addition, the rising labour costs combined with the high labour intensity of the process adversely affect the extraction. Based on these developments, the decrease in profitability of Silesian mining is expected to deteriorate and is bound to result in the closure of most mines within two decades and an even more rapid decrease in the number of jobs.

The lack of mining profitability is not a new topic. Silesia has been subject to coal industry restructuring programmes since 1989, when the centrally planned economy was replaced with a market-driven one. Since that time, employment in the hard coal sector decreased from 400,000 jobs to the current 83,000 in Poland of which 72,000 are located in the region. These developments were part of a planned restructuring scheme, expressed in more than eight state strategies and programmes

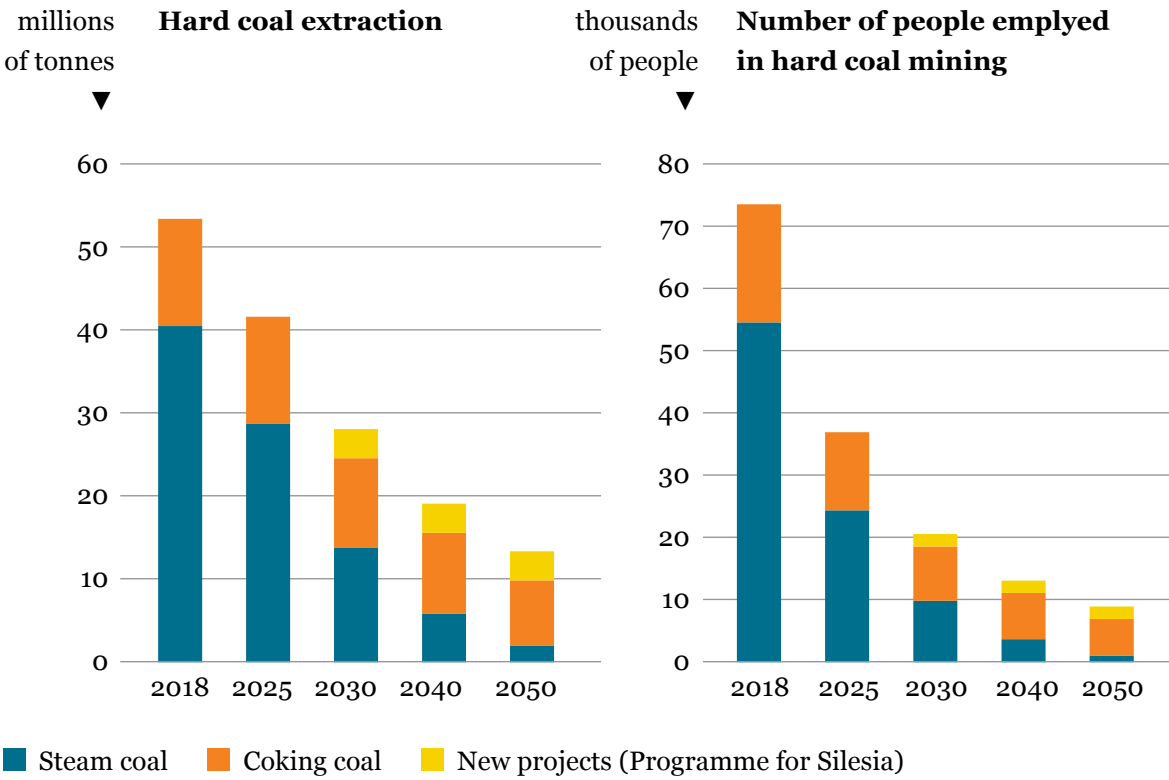


Figure 1: Forecasts derived from WWF report 'From restructuring to sustainable development. The case of Upper Silesia' Maciej Bukowski, Aleksander Śniegocki, Zofia Wetmańska, 2018. Number of people employed presents permanent jobs only, corresponding profitable extraction levels and meeting account rising wage expectations of miners.

aimed at turning the sector profitable. Unfortunately, in most cases both state and coal companies' actions were based on unrealistic assumptions and forecasts – detached from market trend reality and economic cycles. This mainly concerned overly optimistic assumptions regarding the revenue side of the coal producers' activity, while marginalising the cost side. This was also due to the fact that layoffs and restructuring of employment in mining became a political burden for every government. The unions fiercely opposed it and cultural attachment to coal reinforced this pressure.

Current state strategies focus on improving the efficiency of coal mining in order to meet domestic coal demand as well as adjusting infrastructure and skills to change market conditions²⁷. This comes at a high financial cost. According to the Polish Supreme Audit Office (NIK), the total aid provided by the State to the mining sector between 2007 and 2015 amounted to over €15.3 billion²⁸. Within this sum, almost €13.6 billion was dedicated to finance special mining pensions. At the same time, over €500 million was spent on directly capitalising the state mining companies.



© R. Kaźmierczak

Mining orchestras are an important element of Silesian identity – pictured here in Nikiszowiec district, a miners' settlement of the Giesche mine, dating back to the beginning of the XX century. Most mines had their own band that performed during festivities such as the mining festival of St Barbara's Day ('Barbórka') as well as at public and religious events.

Silesia's labour market and economy are undergoing major changes. Despite the strong position of the voivodeship in Poland's GDP creation (second largest in 2017²⁹), the share of its economic contribution is decreasing. Furthermore, the value of GDP per capita has not grown since 2013, which means that economic growth in the region is weakening. The plans and strategies³⁰ of the regional authorities to address this issue focus on the introduction of new SMEs to the market, investing in 4.0 industry, transport, innovative solutions in the energy sector and on re-industrialisation. An increase of innovative solutions on the local market, not only in the energy sector, is one of the key goals. Despite the slowly decreasing share of industry in the labour market (56.8%³¹ in 2018 compared to 58.6% in 2013), industry and construction still constitute over 40% in terms of the regional Gross Value Added.

Cultural attachment to coal legacy is very strong in the region and largely responsible for its political importance. Politicians promise to 'save' Silesian coal mining to win votes in this constituency. There is a saying 'whoever wins Silesia, wins the country' which so far effectively prevented a national debate on a coal phase-out or on the costs of managing old and inefficient energy and mining infrastructure.

2.2.2. Current status of transition in Poland

National context

Poland's energy sector is heavily reliant on coal with a 78% share in 2018. The main barrier to the just transition agenda in Poland is the lack of an agreed and consensual coal phase-out date. Respective governments reject the fact that it is inevitable. Instead, they argue that ending coal mining poses a threat to the country's energy security (relying on domestic fuel and cutting unfavourable gas deals with Russia are a priority). Yet, the high costs and low efficiency of domestic mining are resulting in growing imports – mainly from Russia. According to the Energy Strategy and Polish NECP, the high consumption of coal is planned to be sustained for the next decade. Namely, it is supposed to have a 56% share of total electricity generation in 2030, which in turn corresponds to the extraction of 46 million tonnes of coal per year³². Also the capacity market mechanism introduced in 2018 is strongly supporting coal and lignite power plants, as high contracts for ensuring potential energy supply are signed with them until the end of 2035³³.



© Oskar Kulik

Jaworzno power plant is one of the biggest coal-fired thermal power plants in Poland with installed capacity of 1 535 MW. Poland's energy sector is heavily reliant on coal with a 78% share in 2018.

However, in 2019, for the first time ever in parliamentary elections, the biggest opposition party included the coal phase-out as part of their political agenda and energy transition issues were visible in all programmes. Also in 2019, for the first time, Poland created a Ministry of Climate, with Michał Kurtyka, former COP24 President, in charge. Despite the lack of a phase-out discussion, three Polish regions are members (as pilot regions) in the European Commission's CRiT initiative. Upper Silesia is one of them.

Another factor which might shift the public views towards the phase-out is the impact of EU ETS allowances on domestic energy prices. In order to keep prices from growing for households and SMEs, the government implemented a statutory freeze in 2019, which was widely criticised by experts and didn't include the large industry who had to accept the higher costs. The prices in 2020 are already 10–12% higher compared to 2019. The government is working on a proposal to provide less affluent households with compensation.

The top three predominantly state-owned coal companies based in Upper Silesia (PGG (Polska Grupa Górnicza), JSW (Jastrzębska Spółka Węglowa) and Tauron (predominantly an energy company owning three mines)) are fighting for financial survival in changing times. In view of

the current market situation and climate restrictions, Tauron and JSW are trying to develop projects to make coal less polluting, diversify their production to renewables and to find R&D solutions to make use of existing infrastructure (for instance, producing hydrogen from coke oven gas). JSW's situation is still quite profitable as the company extracts coke coal, for which demand will continue within the EU. Coal companies were also asking for support from CRiT to prolong the use of coal or make use of existing infrastructure and gas waste (coke gas) to produce hydrogen. Unfortunately, some proposals involved the development of so-called 'clean coal technologies', which are not an answer to the necessary energy transformation. What is not taking place, or at least not communicated to stakeholders, is the quest for a new value chain and dialogue with workers and communities on the necessity to change. The proposals put forward to CRiT are still lacking the much needed requalification and reskilling aspect.

EU context

Poland is politically isolated in the EU in its view on prolonging the coal-based electricity production model. It was the sole Member State not to commit to implement the 2050 climate neutrality objective at the European Council meeting in December 2019. A decision is now delayed until June 2020, although the EU's 'climate neutrality by mid-century' goal was not vetoed by the Polish Prime Minister. The pressure from the EU's long-term climate policy, and the rules for absorbing funds from the new Just Transition Mechanism are likely to influence the public debate at national level in the near future.

The context of the WWF 'Regions Beyond Coal' project

Local authorities turned out to be an open and engaged partner for WWF Poland to cooperate with on promoting the just transition concept. The representatives of the Marshal Office participated in all study trips of the WWF 'Regions Beyond Coal' project and the institution co-branded the WWF report commissioned within the project³⁴. Key stakeholders are mayors, with the greatest potential to achieve positive impact. Seven Polish cities signed the 'Declaration of Mayors on Just Transition', presented and discussed during the second Forum of Mayors on Just Transition which took place in September 2019 in Weißwasser, Germany. The signatories, namely Gliwice, Bytom, Konin, Kleczew, Jastrzębie - Zdrój, Wałbrzych, and Nowa Ruda, represent three coal regions in Poland: Upper Silesia, Lower Silesia and Eastern Greater Poland. Thanks to the analytical work and capacity building workshops conducted within the project, authorities start to recognise NGOs as a credible partner in the transition process.

Recent developments

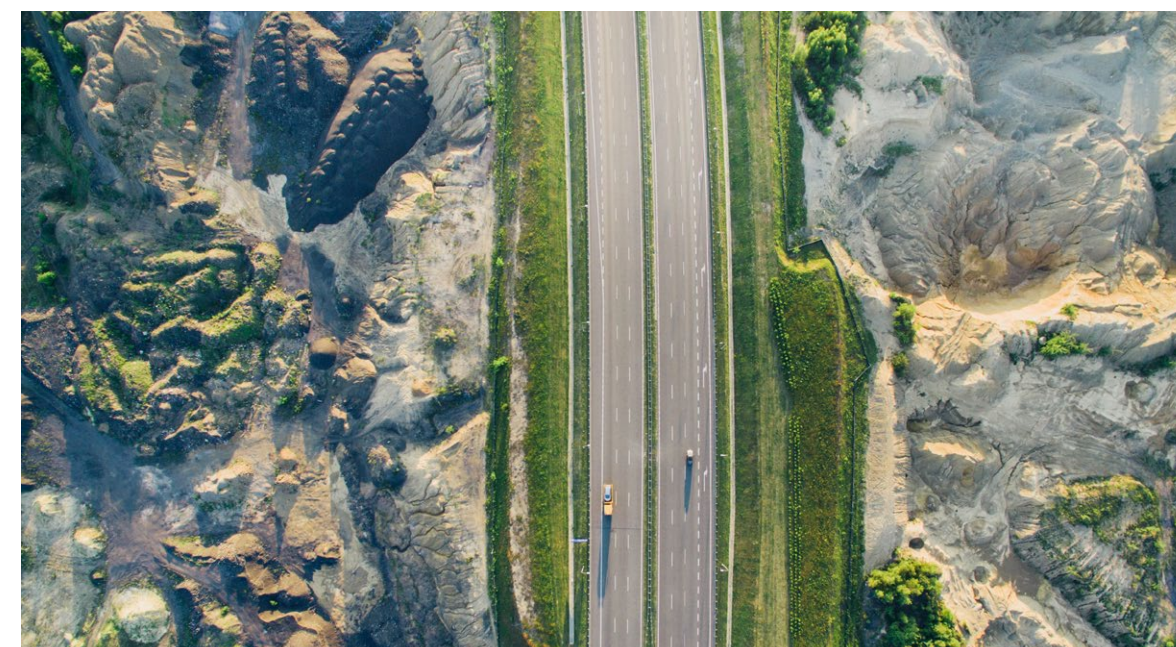
Despite the above mentioned challenges, significant progress has been made in 2019, both in terms of data available to the public as well as in regard to the dialogue with local stakeholders coordinated by the Upper Silesia Marshal Office. For instance:

- » Analytical work. WWF Poland's report (2018) 'From restructuring to sustainable development. The case of Upper Silesia' shows how the Silesian voivodeship can strive for a level of development close to that of the prosperous countries of Western Europe in the coming decades. In addition, IBS's (Instytut Badań Strukturalnych) study (2019) 'Just coal transformation in the Silesia region. Implications for the labor market' in which miners of one of the companies were interviewed about their willingness and motivation to potentially change employment sector, key take outs show that, if mining is no longer an option, miners see transport, the automotive sector, or the construction business as the top three areas for new employment. The most important elements in the search would be salary level and the stability of the employment.
- » Participation of Upper Silesia in the CRiT platform which enabled good exchanges and made the topic of just transition visible in Polish media;
- » Submission of the draft version of the National Energy and Climate Plan (NECP) by the Polish government which sheds some light on the government's plans on energy transition. There are currently no documents describing the state energy strategy that would correspond to reality. The last official document dates from 2009.
- » A capacity-building workshop in Silesia with stakeholders organised by academia and NGOs which provoked action from local authorities and the opening of the local team working on regional transition to new stakeholders;
- » Willingness of some coal municipalities and 'Association of mining municipalities in Poland' to participate in European policy and international endeavours for just transition. Municipalities and their mayors are starting to play a more active part in the just transition planning process.

2.2.3 Challenges for the region

The main challenges faced by the Upper Silesia region are:

- » The relative decrease in economic growth in Silesia, as illustrated by the declining relative contribution to overall Polish GDP.
- » Big discrepancies in the development levels of different subregions (NUTS 3 level) and cities in Upper Silesia. For example, the unemployment rate in cities can vary between 2.7% and 6.9%. Mining and former industrial municipalities are strongly disadvantaged in terms of unemployment, depopulation and social problems³⁵.
- » Decline in the number of the region's inhabitants and the increase in the average age of the local population – young people are leaving the region for other regions or to live abroad. The process is very visible in mining municipalities. As a consequence, some cities are struggling to keep existing housing and public utility infrastructure.
- » Low quality of life and poor air quality: according to statistics by the World Health Organisation, 36 out of 50 of the European cities being most polluted with PM10 and PM2.5 particles are in Poland. Among them, 13 are located in the Silesian voivodeship.



A1 Highway, Bytom area, next to post-industrial brownfield.

- » Low level of professional activity and employment of the inhabitants of some cities, particularly in post-mining municipalities.
- » Lack of a managed, transparent process of transition to a non-carbon-intensive economy.
- » Lack of focus on competitive advantages in the development of strategies (for example, as compared to the case of the Ruhr area which chose to focus on research and development).
- » Failure of state and regional actors to accept the inevitable reduction of the importance of hard coal mining.
- » Problematic mining legacy. In particular, the impact of the mining industry in the region is very visible – not only through the high air pollution but also through degraded land and collapsing buildings and roads. This creates a big obstacle for all actors hoping to bring in new investments. Large parts of the area are simply unfit for construction purposes, especially in municipalities where mines were located inside the city. Every year, affected municipalities spend significant parts of their budgets to cover both industrial and residential building revitalisation. Some districts in former mining municipalities also need increased budgets for social support because part of the mining legacy is a concentration of social problems and exclusion in former mining settlements.
- » Transparency. The public debate and dialogue lacks transparency. Even though some strategic documents try to establish permanent policy-making mechanisms based on a participatory model³⁶, communities are still not being sufficiently consulted on the future of mining investments and there is little exchange between unions, governments, local government and utilities. Local authorities only invited civil society organisations and other non-governmental partners to the table one and a half years after the CRiT platform launch. Society is divided into those who look forward to change and those who fear it.
- » Lack of fact-based public discussion. Uncertainty continues, as the number of jobs to be replaced or lost is not communicated openly by mining companies and their strategies are short-term, focused only on maintaining profit. While some analyses are made by think-tanks and economists, the information often fails to reach lay populations, meaning there is a lack of awareness about the real picture. Some politicians furthermore use the numbers in political fora to promote

the narrative that transformation can happen only at enormous cost. One such example comes from a study commissioned by the mining industry³⁷. It highlights the costs of replacing a total of 200,000 jobs, consisting of all workers of Polish Mining Group (40,000) plus people employed in the ‘mining-related sector’ (160,000 indirect jobs). The process of creating alternative jobs for this group (in the automotive, construction and logistics sectors) is estimated to cost approximately €45 billion (PLN 190 bn). The sectors of the methodology of the analysis is lacking some important aspects, such as the added value generated by new jobs, presenting only the level of investment needed, or cost spread over time, as jobs will be disappearing gradually. Since no alternative official (approved by the government or local authorities) analyses of this topic exists, the challenge seems insurmountable and ill-defined.

2.3.4 Recommendations

Set a coal phase-out date for Poland

A coal phase-out date is a political decision that should be taken as fast as possible in order to enable the most effective transition towards a net-zero economy in 2050, as proposed by the European Commission and adopted by all EU Member States. It would enable fact-based debate on job reductions (including indirect), new jobs, enable proper planning and preparation of a local transition plan for Silesia and other coal regions.

Diversify Upper Silesia's economy

According to WWF Poland's report³⁸, the greatest need of the region in terms of development and assuring economic growth is a further diversification of the local industrial base with high-efficiency, low-emission manufacturing subsectors, such as machinery, electrotechnical, chemical and pharmaceutical. The automotive industry, which is already well-established in the region, must also transform to climate neutrality, with the challenge of redesigning the supply chain towards electric vehicles within the next decade. The industrial policy and the measures for the transition of sensitive sectors should be complemented by the creation of conditions for service sector growth, especially in its more technically advanced segments: engineering, IT, medical, and consulting services. This requires not only actively seeking investments in these areas, but also measures to help shape high-quality human capital, including further, more focused development of higher education and a scientific and research & development base in the region in the direction consistent with the needs of the industry and modern services.

Inform and engage stakeholders in a transparent process in order to build trust and enable peaceful change

Public authorities should organise a set of public hearings where the changes will be presented and open the possibility of submitting projects for CRiT to all stakeholders. More transparency should be introduced to the Regional Team for CRiT held by the Marshal Office. The terms of participation and full list of projects as well as public access to meeting minutes is a good, recommended practice.

Prepare a dedicated territorial Just Transition strategy

In order to secure a just transition of the mining and all local economies in Upper Silesia, WWF Poland recommends the preparation of a just transition strategy 2020–2030 by the local government in cooperation with industry, unions and civil society. The document should describe how direct and indirect mining jobs could be replaced, what new investments in creating low-emission work will be made and how fast the region can decrease its carbon footprint. As announced in January 2020 by the European Commission in the context of the new Just Transition Mechanism, such territorial strategy for region decarbonisation will be a prerequisite to using money from the Just Transition Fund. The money is dedicated to be invested in low-carbon sectors, research and innovation, upskilling and reskilling of the workforce, jobseekers’ assistance, and repurposing of industrial sites³⁹.

2.3.5 Conclusions

The transformation challenge in Upper Silesia, when compared to other coal regions in Europe, is not the lack of opportunities or infrastructure, since it is a relatively wealthy, well-situated and connected area, but the lack of proper long-term planning, social dialogue and a commitment to phase out coal. A precondition for a just transition for all citizens is revival of the economic growth by rising GDP per capita levels, through the development of low-emission types of activities and coherent vision for the region’s future. Miners and people employed in the coal sector require special focus in this transition as approximately 50,000 permanent workplaces will be gone within a decade in Silesia (of which 20,000 will still be professionally active). Historical respect and the strong position of trade unions reinforce this need, in order to plan a peaceful change. Failure to address this will have an impact on Poland’s energy transformation and the Upper Silesian economy as a whole. It will also have severe consequences for coal-mining municipalities and livelihoods of miners and their families.

2.3 The South West region of Bulgaria

Summary	
Coal phase-out date	No official procedure to set up a concrete timeline and a clear process
Just Transition in official documents	It is expected to be added to the NECP 2030 for South West Bulgaria region (also in Long-Term Strategy 2050 for Stara Zagora region), but this has not yet been done or been confirmed by the government
Available funding	No direct funding sources defined
Potential funding sources	European Globalisation Adjustment Fund, Modernisation Fund, Cohesion Fund, Just Transition Fund, national resources, European Social Fund, European Regional Development Fund and some percentages of public revenue from auctioning of CO ₂ allowances
Biggest challenges	1. Lack of constructive dialogue involving all aspects and stakeholders; 2. Lack of a long-term perspective to change Bulgarian society and go sustainable as an economy and nation; 3. Low media transparency and shrinking of civil space.
Key recommendations	1. The Bulgarian government should seize the European Green Deal as a driving force and the best possibility to advance the whole economy; 2. Bulgaria should start a process to establish an official working group, following the successful good examples to agree on a concrete long-term target of decarbonising with step-by-step approach; 3. A process should be started to clarify the financial issue of the transition and link it to a concrete coal phase-out date.

Indicator	Value	Year	Source
GDP per capita (Bulgaria)	€7,980	2018	Eurostat, provisional estimate
GDP per capita Southwest region named also ‘Yugozapaden region’ where the capital, but also Pernik and Bobov dol are located	€11,770	2017	Eurostat, provisional estimate
GDP per capita only for Kyustendil district (where Bobov dol municipality is located)	€4,096	2017	Bulgarian National Statistic Institute
GDP per capita only for Pernik district (where Pernik municipality is located)	€3,996	2017	Bulgarian National Statistic Institute
Lignite/hard coal share in electricity production	40,4%	2018	ENTSO-E 2019
Workers in lignite/coal industry (Bulgaria)	14,300	2016	Industrial regions and climate change policies report (ETUC 2016, p.25)
Workers in lignite/coal industry in the whole South West region	8,279	2016	WWF Bulgaria (multiplier, p.152 – based on NSI data)
Workers in lignite/coal only in Kyustendil and Pernik districts (where Pernik, Bobov dol municipalities are located)	4,489	2016	WWF Bulgaria (multiplier, p.152 – based on NSI data)

Table 3: Important indicators for Bulgaria and the West region

2.3.1 Introduction

The **South West region of Bulgaria** is covered by the Southwest planning region. This case study focuses on the district of Pernik, where the main town is Pernik, and the district of Kyustendil, where the Bobov dol municipality is located.

Both municipalities are characterised by lignite and brown coal⁴⁰ mining, which began to develop at the end of the 19th century in Pernik. For many decades the area became the driver of the industrialisation and coal expansion in Bulgaria. Before the Second World War and during the communist period in Bulgaria, Pernik became the most industrialised city in Bulgaria, specialising in steel, glass and machine-building production. Bobov dol provided most of the electricity needed for the industry in Pernik and its industrial growth started after World War II.

Coal production in the South West region of Bulgaria began to decline in the 1980s because of the depletion of resources. By the 1990s, it went into serious decline. As early as the 1970s, Bulgaria started to develop strongly its other lignite region, Stara Zagora in the South Eastern part of the country, which has much bigger reserves. This further



The enrichment factory is still operating albeit at low capacity. It was built around 1944 next to the underground mine Babino which closed at the end of 2016.

complicated the situation in the Pernik and Kyustendil districts. Gradually from the end of the 1990s, with the restructuring from centralised planning to a market economy, most of the industrial enterprises in Pernik and Bobov dol were privatised and practically shut down their activities.

Currently, the thermal power plant in Bobov dol is operating with a low-capacity factor – around 20% of the installed potential. The underground brown coal mines were closed down at the end of 2018, and the number of employees in the sector is steadily decreasing as the three open pit lignite mines still operating do so at a very low capacity.

There are no alternative investments to diversify the local economy and the industry sector has not been modernised for decades. **The region is becoming an example of a violent transition,** showcasing the dire consequences of the lack of planning and ignoring the importance of new energy and climate policy developments.

From an energy perspective, coal reserves in the territory of Southwest Bulgaria make up around 85% of the brown coal and 15% of the lignite deposits in the country, including the reserves of two other districts area (Sofia region and Blagoevgrad districts), in which coal mining stopped at the end of the 1990s. In the broader region of Southwest Bulgaria, there are two thermal power plants (TPPs) – Bobov dol in the Bobov dol municipality and Republika in the Pernik municipality which provides more heat than electricity. Both TPPs produce around 900 GWh annually, equal to 2,5% of the annual total electricity production of the country. The coal used for this energy output constitutes only 5% of the total amount of coal extracted in Bulgaria.

From an economic perspective, the South West planning region has the highest GDP in Bulgaria compared to the other five in the country, due to the fact that the capital Sofia is located here. According to Eurostat⁴¹, the GDP of the South West planning region of Bulgaria was €24.741 billion in 2017, contributing around 49% of the national GDP of €51,663 billion. However, the figure is much lower for the regional GDP of the Pernik and Kyustendil Districts. The National Statistical Institute⁴² numbers for the same year show that Kyustendil generates a GDP of €500 million, from which €136 million are directly related to the coal mining and industrial sectors. For Pernik, the corresponding amounts are €482 million and €140 million.

The mining, industry and power production sectors do not play a dominant role in the regional economy of both districts. Pernik's industry accounts for 1/3 of the local economy, whereas the service sector is twice as big. 1/4 of the economy in Kyustendil is based on the mining and industrial sector, yet again the service sector is double. The official statistics further show that the primary sector is decreasing and the secondary and tertiary sector in both districts are increasing. Summarising the numbers reveals that the coal industry constitutes only a bit more than 1% of the economy in the South West planning region.

At municipality level, the situation is different. **73% of the Bobov dol municipality economy is based on coal mining, electricity production and its related industry subsectors. In the Pernik municipality, 28% of the local economy is based on coal, electricity and the industry subsectors; but all together accumulates around 48% of local labour in the Pernik municipality.**

The region has the potential to develop alternative economic activities – notably through its preserved cultural and historical heritage and its natural environment, which is the third richest in biodiversity in the EU and has a high share of protected areas and NATURA 2000 sites. There is a high share of forest land and a subsequent availability of significant forestry resources, whilst rich water resources, including hydrothermal, are available for use in agriculture and balneology. But the maintenance of these resources is lacking as well as the development of the local economy in this direction and the tertiary sector in general.

The demographic situation in the South West planning region of Bulgaria is slightly better than in the other five regions of the country, but again this does not apply to the major coal areas. For example, in Kyustendil district, where the Bobov dol coalfield is located, the population has decreased by nearly 30% in less than two decades. For the population of Pernik district, the decline is equal to 8% during the same period.

Secondary vocational education is the most common level of education achieved in the districts of Pernik and Kyustendil, where most employment is also in the industrial sector. There has also been an increase in the number of employed persons with higher education compared to 2013 – a signal for the direction of the educational structure needed to underpin future development.

2.3.2 History and status of the transition process in the South West region of Bulgaria

National context

In order to counter the changes that are already happening, Bulgaria stated in its first draft of the National Energy and Climate Plan (NECP) that the country's coal reserves will be enough for the next 60 years of electricity production. **In a damaging attempt to maintain the status quo, Bulgaria wants to extract all of this coal as a local energy source, arguing it is extremely important for Bulgarian energy security and independence.** At the same time, it seems evident that Bulgaria has to change its coal-dependent energy system, especially in the South West planning region where coal is almost phased out, and has to ensure that the local economy shifts in a sustainable direction. Despite the fact that the term 'just transition' is becoming more recognisable and the discussion ministerial level has already started, the lack of long-term vision and political will is evident. Explaining the problem to all relevant stakeholders and affected communities is still a challenging task for public officials in Bulgaria, who would rather not discuss this publicly.

Another major problem is that decision-makers are now focused on preserving the coal and energy structure of the Stara Zagora region, shifting them away from the negative scenarios happening in the South West planning region. Therefore, it is crucial to activate and engage with relevant stakeholders to establish a constructive dialogue and build trust around the just transition concept. Such a partnership will enable the commitment of major decision-makers to the just transition concept in Bulgaria, such as the ministries of environment, energy, labour and social policy, economy, regional development and finance, but also to the Council of Ministers and the Parliament.

At this stage, it is clear that the topic of just transition will be included in the development of the strategic planning documents at municipal and regional level in the South West planning region. These are the Bobov dol and Pernik 2020–2027 municipal development plans as well as the development strategy plans for 2030 for the Pernik and Kyustendil regions, if they continue to be prepared.

Local elections held in October 2019 showed that most of the decision-makers and the candidates avoided the discussion on coal phase-out and just transition. However, by doing so, Bulgaria could miss opportunities to exploit the potentials of the new Just Transition Fund.

It is no longer a question of if, but of when Bulgaria will phase out coal. However, the key issue remains: Will this transition be smooth and socially just for the Stara Zagora region? Will steps be taken to do justice to Bobov dol and Pernik where the transition has so far been violent? Both regions have been relying on coal for decades, fuelling the country's economic growth at the expense of public health, the quality of life of their communities and the environment.

EU Level

In April 2019, Bulgaria pulled out from joining the CRiT platform at the last minute, officially because of the European and local elections. The real reason was that it posed a major risk for political parties to lose voters from the two coal regions in the country, because of the sensitivity of restructuring the coal-power production, shifting the local economies towards other economic activities and switching to other energy sources such as renewables. The fact that the just transition concept is still very unknown in the biggest lignite region of Stara Zagora also contributed to the decision not to participate in the platform.

In EU Council meetings, Bulgaria usually opposes new ambitious climate, energy or environmental regulations related to decarbonisation or phasing out coal or renewable expansion. Bulgarian decision-makers still resist progress and the idea that Bulgaria could have a sustainable development future, while joining political coalitions against progression climate policies.

The context of the WWF 'Regions Beyond Coal' project

Thanks to a systematic process initiated by WWF Bulgaria within the 'Regions Beyond Coal' project, the just transition concept has been introduced in the public debate and all the stakeholders involved agree on the need for a common approach to work with the government. This was confirmed during the first national round table on just transition organised in 2018 with all relevant stakeholders such as ministries, trade unions, environmental NGOs and businesses. Further public debates will be held in the future to influence decision makers and relevant stakeholders.

2.3.3 Challenges

- » Population decline and deterioration of the level of education: For both the Pernik and Kyustendil districts, the population in the period 2001–2017 has significantly declined and the average age of the population has increased at a faster pace than the rest of the country. In addition, the educational structure is deteriorating. If the present age and educational structures are maintained, future investors will have to rely mainly on people with primary and secondary education, which will be a serious challenge for them. Another challenge which depopulates the region is the poor air quality. A major source of particulate emissions in Kyustendil District is the TPP ‘Bobov dol’ ash pond, but also the TPP itself emits particulate emissions. Another mass source of registered excessive pollution is the burning of solid fuels in households.
- » Lack of recognition of the need for a just transition: Administrative involvement and decision-making on just transition is missing. Currently, the Mayor of Bobov dol is the only one committed to find a solution. The main state actors at the Ministry of Environment and Water, Ministry of Labour and Social Affairs, and the Ministry of Energy are not dealing with the topic at national level.
- » Energy prices in Bulgaria: An electricity price increase is bound to happen as the price has been almost frozen since 2010, while electricity production costs have increased. An additional factor contributing to the increase in electricity prices is that emerging businesses in the energy sector will aim at a higher rate of return of capital and higher incomes for employees. If this artificial freeze is lifted and the electricity prices become aligned with real electricity production costs, the public debate on just transition is bound to become central.
- » Poor qualifications of the labour force: In the absence of effective measures to increase the qualification level of the labour force, the South West planning region will not be able to rely on specialisation in high-tech industries and the introduction of innovations. This will limit its development potential and the negative demographic trends would remain or even become more pronounced in the future. This type of workforce is highly specialised and the need to adapt to the market is needed.
- » Increased rate of layoffs from the mining sector: The number of employees dismissed from the mining sector in recent years ranges from 100 to 500 people per year.

2.3.4 Recommendations

Recommendations at national level

- » Set a legally binding phase-out date for coal and lignite.
- » Phasing out coal and lignite in Bulgaria can only succeed if it is combined with attracting strategic investors, which will give priority to developing sustainable business activities on rehabilitated and re-cultivated land.
- » A package of tax relief and other investor-attracting measures (e.g. for attracting a highly skilled workforce, further qualification of staff, etc.) with a focus on municipalities where coal-mining and related industries were previously developed;
- » Sign up to European processes shaping the targets, policies and funding relating to the just energy transition as soon as possible, such as the EU Coal Regions in Transition platform;
- » Bulgaria should request an immediate reallocation within the European Structural and Investment Funds during the current period to prioritise and drive the just transition and energy transformation. They should seek to identify clear, new and sustainable solutions for the coal sector, putting in place immediate actions to resolve the issues facing the sector, without waiting for the start of the new MFF programming period from 2021;
- » Set up a National Fund on Just Transition to a low-carbon economy within the national budget structure with funding from various sources feeding into it (such as coal-mining companies, TPPs, and part of ETS revenues), similar to the one established for Greece;
- » Set up a fund for statutory re-cultivation of land degraded because of coal mining, including a commitment to find investors for the future use of such land;
- » A specialised administration to promote the effective transfer of renewable energy generation technologies and energy-efficiency measures in households and industries;
- » Introduce measures aimed at retraining and social adaptation to new economic sectors for employees who will become redundant in the coal-mining industry.



© WWF Bulgaria

One of the last operating surface mines in Bobov dol along with its supporting infrastructure.

Recommendations at district level

- » Empowerment of district administrations with regard to the process of locating key investors and providing support during the investment process within the sustainable development focus;
- » A coordination council for a just transition under the auspices of the district administration, assessing the current state of all types of territories affected by coal mining.

Recommendations at municipal level

- » Location-based investment analyses with detailed spatial development plans enclosed, to clearly identify sustainable investment possibilities in the secondary and tertiary economic sectors;
- » Detailed cost/benefit analyses for all investment proposals to be implemented on municipal land or to utilise grants for projects involving renewable energy and technological upgrades of the current types of alternative economic activities;
- » Public advocacy campaigns to raise awareness of the new economic opportunities and the shift in the situation. All national and local target groups should be actively involved in order to support the transition.

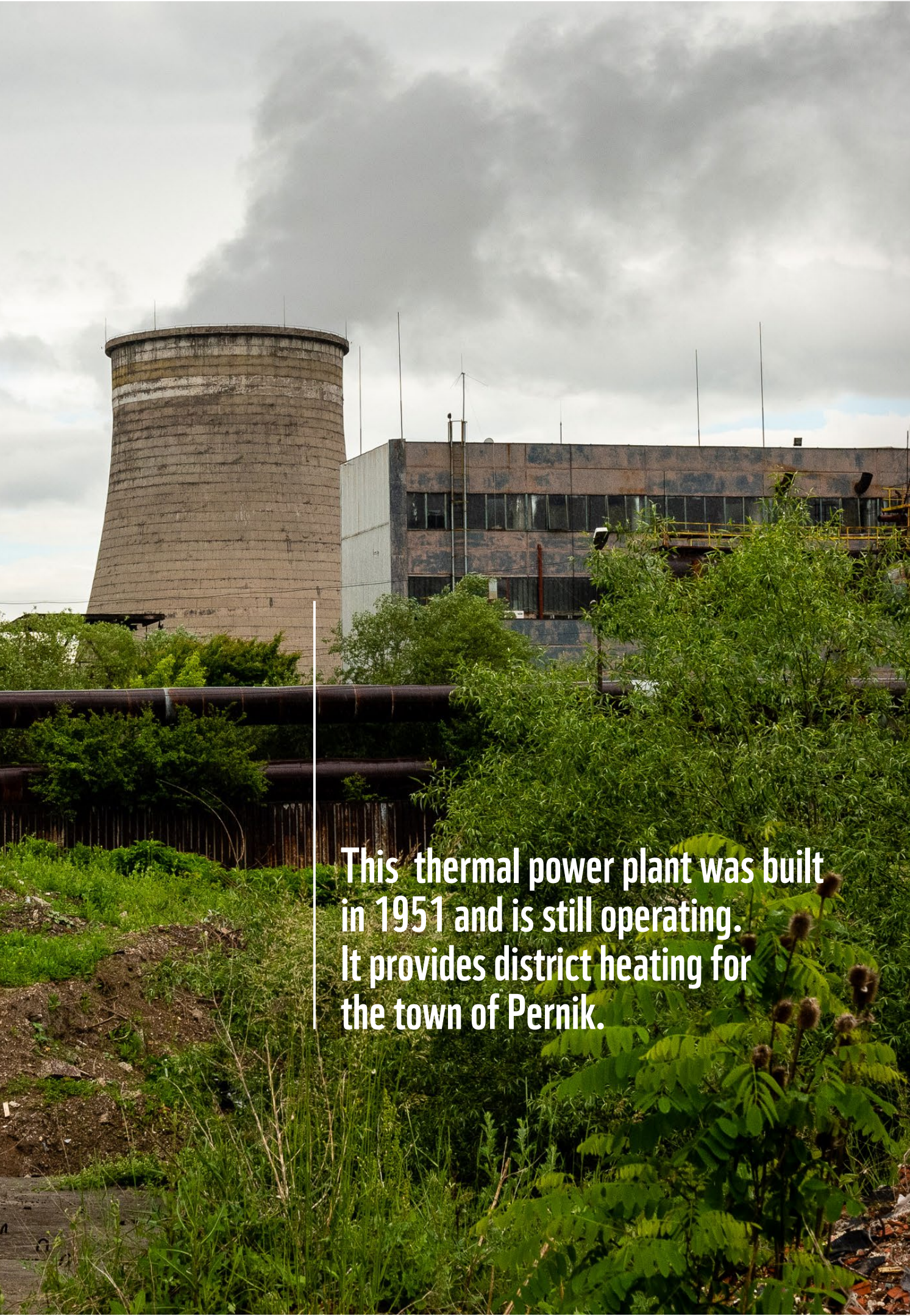
2.3.5 Conclusions

The monostructural industrial economy of the region prevented investments to diversify the local economy for years. A shift to a sustainable economic growth model is the best option for the region, as it would reverse depopulation trends in the region. Joining CRiT can be a first step in helping and supporting the country in its transition away from coal.

Qualification and reskilling of the workforce is a major tool for enhancing and retaining labour force and fighting low income and unemployment in the region. The negative experience of the Bobov dol area should not be replicated in other coal regions, neither in Bulgaria nor elsewhere in Europe.

A successful energy transition in Southwest Bulgaria requires more than the active mobilisation of affected municipalities acting to convince state institutions to become responsible and active. There is also a need for members of the local community to get involved in different sustainable economic activities.

The region overall has a full range of alternative and sustainable economic activities that can be successfully developed, but a systematic deployment of potentials in the local and regional economy is lacking.



This thermal power plant was built in 1951 and is still operating. It provides district heating for the town of Pernik.

3 Conclusions and Recommendations

This report reviewed four case studies of the transition from coal across Europe. It focuses on three regions in transition; one each in Bulgaria (South West), Greece (Western Macedonia) and Poland (Upper Silesia), while building on the experience of the Ruhr region in Germany, which completed its coal phase-out at the end of 2018.

Each region has characteristics that influence the specific situation and the possible solutions for a just transition. While GDP in Germany is much higher than in the other regions presented and inequality varies between them, a just transition from coal by 2030 is possible to achieve in all three regions. The challenges the regions face often share strong similarities. As such, general rules applicable to both the specific national processes and European policy development can also be derived from the study and are presented here in the conclusions.

The causes of coal sector decline in these regions (except Greece) have not so far been principally policy-driven. In Germany and Poland the decline has largely been a result of economic factors. Ruhr region coal became uncompetitive on global markets as early as the 1960s, whilst labour costs, restructuring towards a market economy and the necessary extraction depths have led to the decline in Poland. Meanwhile, Bulgaria's South West region has suffered resource depletion since the 1980s. Greece is an exception since the rapid decline of lignite in Greece's electricity mix in recent years can be attributed to EU policy changes such as the EU ETS Directive and the implementation of stricter emission limit values through the Industrial Emissions Directive (IED) and the Large Combustion Plant Best Reference Document (LCP BREF).

The scale of the impact on employment structures has generally been sizable, but the shift has happened over relatively prolonged periods of time. In the Ruhr region, more than 600,000 were employed in mining in the early 1960s, and by the 1970s this had declined to 200,000 and in 2018, reached zero. None of the three transitioning coal regions face such a massive shift, although many have already seen considerable declines (in 1989, Polish employment in mining was around 400,000, compared to just 80,000 today) and the timeline for phase-out is accelerated.

In all four countries, the coal industry's relative impact on national GDP is small. Even at regional level, the impact can be low. In Bulgaria's South West region, the coal industry accounts for around 1% of regional GDP, whilst in Silesia as a whole it is less than 6%. However, at local level, the impact on employment and relative GDP contribution can be quite high (73.5% of local GDP in Bobov dol municipality). In contrast, in Western Macedonia the lignite industry constitutes one third of the regional economy.

In two of the three regions in transition, unemployment is poised to skyrocket unless proactive just transition policies are implemented. Significant dismissals are already underway in Bulgaria's South West Region whilst in Western Macedonia unemployment rates have reached colossal levels: 27% overall and up to 62% among young people. In the absence of policies to address the educational structures and implement appropriate support, just transition will be no more than a dream here.

Silesia is the most industrialised region in Poland and makes the second highest contribution of a region to Poland's GDP. However, whilst overall unemployment is low and the transition is unlikely to generate much overall change in this statistic, the risks to local communities of unmanaged and unsupported layoffs from the coal sector are high, particularly because politicians refuse to admit the imminent change.

Failure to accept and embrace change in favour of reinforcing and attempting to preserve the status quo is a problem in all of the transition regions. In the Ruhr, such a policy delayed the inevitable transition, raising costs considerably. Only in 2007 did Ruhr decide to end coal subsidies. German taxpayers were obliged to support a drawn-out, 60-year transition at an estimated cost of estimated between €150–340 billion.

The three other transition regions in this study do not have 60 years to make the change or the funds that the Ruhr area had at its disposal. The urgent need to address the climate crisis, as well as the economics in each region, mean regions need to undertake a definitive and quantum leap to a sustainable economy by 2030, quitting coal within the next ten years.

3.1 Policy recommendations

Transitioning from coal is not an impossible task, but it requires dedicated, transparent and decisive policies to implement a proactive just transition. The regions are each different and face different realities, but their challenges are similar. Five general rules can be derived from this study to inform the implementation of a successful just transition. These rules and their implications are subsequently discussed in the context of European-level policy, although they apply to all regions and should also be exercised at national and local levels.

1. Set a phase out date for coal as early as possible followed by an agreed and consensual, timeline-based transition strategy

As long as resource-holding stakeholders such as companies, policy-makers and trade unions spend time and money on defending the status quo, no change can be expected and regions will not have a mandate to plan a new, sustainable and prosperous future. Instead, the transition will be drawn out and costly, while outright denial of change can lead to unmanaged job loss and social devastation.

The Ruhr case highlights the negative consequences of failing to admit the imminent end of coal and of attempting to maintain a doomed status quo. Keeping up the coal industry and opening new, uneconomic mines required the use of subsidies, eventually costing taxpayers billions. Had such a policy not been pursued, coal could have been phased out much earlier and economic diversification accelerated.

Will other regions in the EU make the same mistake?

In Pernik and Bobov dol in Bulgaria, job losses will continue and result in catastrophic social impacts unless proactive transition policy is implemented. Unfortunately, the current draft National Energy and Climate Plan⁴³ argues that coal reserves can fuel a further 60 years of electricity generation, echoing the German approach but without the same financial resources to cushion the inevitable consequences.

In Poland, the focus on incremental mining efficiency improvements is driving up the costs of the eventual transition through delaying it. Between 2007 to 2015 alone, financial support for the mining sector totaled over €15.6 billion while less than €6 billion was spent on investments in renewable energies.

In contrast, the Greek decision to phase out lignite by 2028 at the latest, announced in September 2019, is a positive step in the right direction. It is too early to draw conclusions on the impact this will have, but it will undoubtedly exert pressure on the national government, regional and municipal authorities, trade unions, the utility company, as well as NGOs and other key stakeholders to engage with just transition, while providing investor certainty.

Moreover, calls are mounting at political level to limit funding to countries which do not outwardly and clearly accept the transition. French President Emmanuel Macron called for transition funding to be restricted to only those countries who have committed to the climate neutrality objective. Reflecting this, the new Just Transition Mechanism begins to relate the deployment of funds with the commitment to transition, explicitly stating, 'the conversion or closure of facilities involving fossil fuel production or other greenhouse gas intensive activities'. It could still go further.

2. Ensure timelines and strategies are based on high-quality, quantitative analysis, guided by a commitment to sustainability

Timelines and strategies, including at regional and local level, are key to delivering the transition, providing certainty to investors and guiding the change in an optimal way. To be effective, they should be developed involving all relevant stakeholders from local, regional and national levels and they should be informed by quantitative, transparent and objective analysis. They should be formulated with the aim to achieve true environmental sustainability in order to ensure that the transition is durable and consistent with EU climate goals.

The concept of just transition is widely discussed at European level, but is still largely unknown, except to those most affected, for example in the Southwest region of Bulgaria. The lack of long-term vision and political will is evident and there are many challenges to explaining the challenge to relevant stakeholders and affected communities. However, this may be changing as the 'Just Transition' concept will be included in the strategic planning documents at municipal and regional level (Bobov dol and Pernik municipal development plans) as well as the development strategy plans for 2030 for the Pernik and Kustendil regions. None yet are conceived for Stara Zagora, the biggest coal region in Bulgaria.

The picture in Greece is more promising still. A 'Roadmap for Transition of the Western Macedonia Region to the Post-lignite Era' showed quantitatively that the construction of two planned new lignite plants simply could not compensate for the jobs and regional GDP that would be lost due to the retirement of the existing lignite plants. On the other hand, injecting an amount smaller than the construction costs of these two new plants into 12 sustainable economic activities would revive the region's economy by creating almost double the number of jobs and more than double the regional GDP. Following this analysis and perhaps now bolstered by the 2028 phase-out announcement, the World Bank is conducting a study into the transition needs for Western Macedonia.

On the other hand, in the absence of a clear sustainability principle at the heart of just transition policy, efforts are still ongoing to incorporate 'clean coal' Carbon Capture Storage or Utilisation (CCSU) projects in the transition plan for Western Macedonia, while at the same time the Greek government has decided to phase out lignite by 2028. This risks wasting time and resource on ill-disguised attempts to preserve the status quo.

3. Ensure adequate, targeted financial and policy support for the transition

In the Ruhr, the regional 'Development Programme' provided an integrated approach to regional transformation based on socially-responsible transition and employment change. It contributed to population stabilisation, economic growth and the eventual establishment of a vast university centre, illustrating the importance of targeted infrastructure and education as key elements in a successful transition.

Adequate financial support and an enabling policy environment, robust to long-term political change, are essential to ensure the development of infrastructure and the necessary 'soft' social programmes to facilitate the transition. Both EU and national financial support must be secured, but public funding alone will not be sufficient to deliver on the scale of investment needed to implement the transition. Investors need policy certainty and such certainty of direction is a precondition for regions to attract the necessary private investments.

In Greece, in spite of the phase-out announcement, a clear governance structure and a concrete just transition plan are still lacking. A disconnect between the Greek NECP and the just transition plans being developed by the World Bank team will create confusion rather than

the certainty investors need. A long-term master plan developed with the involvement of relevant ministries, regional and municipal authorities, representatives of lignite villages, local stakeholders, trade unions, NGOs and the Public Power Corporation would counter this problem.

Furthermore, although a Greek Just Transition Fund exists, it is sourced only from 6% of the public revenue from the European Emission Trading System (EU ETS) revenue. To meet the investment needs and provide financial certainty for the implementation of ambitious regional transition plans, more dedicated public funding streams should be identified alongside the existing EU funding programme and the new just transition fund.

In contrast, Poland illustrates the need for clear policies also to support the transition. In spite of relatively high investments into the Silesian voivodship (thanks to the national priority for structural investments in the region and the establishment of Special Economic Zone), the lack of a clear policy decision to phase out coal serves to cement the stagnant and costly status quo.

4. Aim for real economic diversification

The case of the Ruhr region illustrated the pitfalls of waiting for single, large industries to plug employment gaps generated by the transition. A diverse collection of smaller businesses and industries provides resilience to economic change, with big economic changes having lower impact on the overall employment and GDP. Meanwhile, universities and other pillar establishments can provide an anchor for regions, assisting diversification. Until the mid-1960s not a single university was present in the Ruhr area; it is now a university centre.

Educational establishments are particularly helpful and the investment is often the most sustainable, but it only pays off in the medium-term. Long-term strategies allow for this to be factored in and capitalised upon. For instance, the ‘Roadmap for transition in Western Macedonia’ illustrated how a planned shift to a more diverse economy, based particularly on the primary and secondary sectors, would replace jobs and wealth lost more effectively than constructing new coal plants.

5. Engage all stakeholders in an ongoing process, especially at local level

Thanks to social dialogue in Germany, ensuring guarantees and subsidies, the phase-out of German hard coal mining was cushioned and the early retirement of numerous miners was made possible. However, failing to engage wider communities meant employees from suppliers or from smaller businesses around the mines were often hit harder by the coal phase-out.

The involvement of local stakeholders can determine whether the transition succeeds or whether it is delayed, resisted and derailed. If local stakeholders and communities are involved and engaged in the process of transition, they are more likely to buy into the strategies and will support their implementation. Local communities have unrivalled insight into their needs and desires, even if on their own they do not have the resources or expertise to deliver on them. Failing to involve them will risk missing this essential information and can drive resistance to change, potentially leading to governmental change and the failure of swift and just transition.

The roles of all stakeholders should be clearly defined. Civil society can provide advice, expertise and a clear representation of dispersed but important society interests. Incumbent industries have a vested interest in maintaining the status quo, but often also hold the resources essential to delivering the transition (notably in Greece, where PPC owns most land resources needed for the transition).

The power of local stakeholders should not be underestimated. Mayors are key stakeholders in the just transition process. They are the implementers of the transformation; at policy level they are the ones most affected by the phase-out of coal while at the same time they have the power to pioneer the transformation if financial and institutional conditions are favourable.

Finally, to engage all stakeholders, governments must give a clear direction. In this context, the transition discussion and implementation must be underpinned by a commitment to phase out and a transition to a sustainable, climate-neutral economy.

3.2 Implications for European policy

More specific recommendations to ensure a just transition at national and regional level are provided in each of the relevant regional chapters. The implications for EU policy are discussed in more detail below. While the focus is placed on specific policies and initiatives, the five recommendations above can and should apply to all relevant EU policy.

The **Coal Regions in Transition platform** (CRiT) was established in December 2017. It seeks to bring together all relevant stakeholders to promote knowledge sharing and exchanges of experience of transition in EU coal regions, aiming to provide a bottom-up approach and technical support to coal regions developing transition projects.

The CRiT platform has been a step forward for the EU supporting coal regions in transition. However, it has suffered from a number of problems:

- » Lack of transparency in the run-up to CRiT's launch and a lack of clarity in its mandate.
- » Lack of inclusivity and the absence of consultation with stakeholders in the pilot regions.
- » In some regions there was no transparent call for projects, and projects were selected without reference to any overarching objectives.
- » CRiT was at risk of being side-tracked by polluting and uneconomic 'advanced coal' technologies such as CCS that have already failed market uptake.
- » A target date for the EU to move beyond coal was not discussed at any of the meetings.

Following intensive engagement by NGOs, several improvements can be recognised with regards to CRiT. This has been particularly visible since the establishment of a dedicated secretariat, which has provided support to regions and added formality to the platform processes. While country teams have remained relatively opaque – characterised by poor communication, lack of formal structures and in some cases, stakeholder exclusion, the Platform is publicly much more transparent and accessible and it has been stated more clearly that the transition should lead to reductions in emissions in line with EU objectives. WWF, together with the Europe Beyond Coal Campaign, gave input with the Seven Golden Rules for Just Transition Planning⁴⁴, providing a good guidance.

The new **Just Transition Mechanism** represents a real opportunity for Europe to provide a part of the financial support and the necessary framework for vulnerable regions to deliver a just transition to a climate neutral economy. However, to truly deliver a just transition, it must include policy recommendations listed above, especially:

1. Mandate the inclusion of fossil fuel phase-out dates, including for coal before 2030, in all territorial transition plans

In order to truly drive the transition and to ensure the limited EU-level support available is used in an optimal way, transition support should only be provided where it is clear there is commitment to a transition. President Macron's warning should be heeded that countries not committing to EU targets should not receive support to achieve them. It is good that the European Commission's proposal for a Just Transition Fund connects the utilisation of the corresponding funds by the Member States with an 'outline of the expected transition process towards a climate-neutral economy, in line with the objectives of the National Energy and Climate Plans and other existing transition plans with a timeline for ceasing or scaling down activities such as coal and lignite mining or coal fired electricity production'. However, it doesn't yet explicitly mandate a coal phase-out date, which, as the German case illustrates, functions as a catalyst for the just transition process.

It is also good that the new proposal requires the development of territorial just transition plans at NUTS 3 level. This is a real step forward, but such plans should be consistent with achieving climate neutrality by mid-century at the latest. Thus, they should exclude fossil fuel investments and they must include a timeline for fossil fuel phase-out. Only in this way will they provide the policy certainty necessary for delivering the transition.

The current proposal would allow natural gas investments to be financed under the InvestEU Guarantee Pillar. Fossil fuel investments must be excluded across all three pillars to enable the transition to be accelerated, allowing regions to leapfrog the transition to a sustainable and more prosperous future.

2. The Just Transition Mechanism alone will not be enough to deliver a just transition

Only €7.5 billion in new EU budget has been allocated to the fund. The aspiration to leverage €100 billion is based on mobilising national public and private investment in support of the territorial just transition plans.

The Mechanism must therefore be complemented by further support from national funds and Member States must create enabling policy environments for investors to support the transition. Member States should not contradict the transition and should therefore end subsidies of fossil fuels and align national policies with the transition.

3. The distribution of funds among Member States should be made more fair and aligned with urgent needs

The current proposal of the European Commission offers significant funds to Member States which have not committed to phasing out coal (Poland, Romania, Czechia, Bulgaria); have set distant phase-out dates (e.g. Germany) or have small dependence on fossil fuels (e.g. France), while it provides a much smaller amount to Greece which has recently made the bold commitment to phase out all of its existing lignite plants by 2023 and its last one by 2028. The method for calculating the distribution of funds among Member States should reward early action, thus providing the necessary incentives for other Member States to act likewise, while also allocating the funds where they are most urgently needed.

4. Support to existing installations and to large companies should be carefully scrutinised

Careful scrutiny must be given to any inclusion of projects involving the financing of large companies. While it is positive that justification must be given for the inclusion of such investments in the territorial just transition plans, such justification must be weighed against an assessment of the relative benefits of investing in multiple smaller businesses. In all cases the investment should support sustainable diversification.

The mechanism also allows, in justified cases, the investment in existing industrial facilities. The condition that investments must contribute to the transition to a climate-neutral economy by 2050 and lead to emission improvements going substantially below the relevant benchmarks established for free allocation is positive, but ‘substantially below’ remains to be qualified. Only investments which lead to a step change in emissions reduction should be permitted – incremental improvements will be insufficient and are overall more costly than investing in breakthrough change.

5. Finally, the process of developing and implementing the territorial just transition plans should involve all stakeholders

Local community representatives and civil society must be involved alongside all other stakeholders, taking into account the risks posed by conflicts of interest. Building on the experience of country teams under CRiT, it is important to clearly define the roles and decision-making power of each partner and clear terms of reference should be adopted and made publicly available for transparency, along with all other documents in the process.

List of references

- 1 The World Energy Council define energy transition as a 'long-term structural change' in the energy system (see Hauff J.; Bode, A.; Neumann, D.; Haslauer, F. (2014) Global Energy Transitions, published by Weltenergieat).
- 2 EC (2018). A Clean Planet For All, A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy.
- 3 Ibid. Three European regions have employment shares of more than 1% in sectors expected to decline (extraction and mining in NE Scotland, Silesia and Sud Vest Oltenia), but many other regions have industries that will undergo significant low carbon transformation.
- 4 'Big fat Greek lignite sale burns EU climate policies', WWF Greece, February 2019. See <https://www.wwf.gr/en/news/2210-big-fat-greek-lignite-sale-burns-eu-climate-policies>
- 5 Solidarity and Just Transition Silesia Declaration, UNFCCC Katowice COP24 Presidency, December 2018. Accessible here: https://cop24.gov.pl/fileadmin/user_upload/Solidarity_and_Just_Transition_Silesia_Declaration_2_.pdf
- 6 EU (2018). Directive 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision 2015/1814
- 7 European Parliament (EP) (2018) Interim Report on the Multiannual Financial Framework 2021-2027 – Parliament's position with a view to an agreement (COM(2018)0322 – C8-0000/2018 – 2018/0166R(APP)) http://www.europarl.europa.eu/doceo/document/A-8-2018-0358_EN.html)
- 8 See <https://regionsbeyondcoal.eu/2nd-forum/>
- 9 Rosenkranz, G. (2018). Coal: a dead end. Why there is no future in coal. Report prepared for WWF Germany / Lichtblick. <https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/WWF-Lichtblick-Kohlereport-eng.pdf>
- 10 Dahlbeck, E.; Gärtner, S. (2019). Just transition for regions and generations, experiences from structural change in the Ruhr area. Report prepared for WWF Germany. https://regionsbeyondcoal.eu/wp-content/uploads/2019/02/2019_01_15_Just-Transition-for-regions-and-generations.pdf
- 11 Fischer, K.; Haerder, M.; Knaup, H. (2019). Das gefährliche Versprechen. Published in Wirtschaftswoche
- 12 Dahlbeck, E.; Gärtner, S. (2019) Just Transition for regions and generations, experiences from structural change in the Ruhr area. Report prepared for WWF Germany https://regionsbeyondcoal.eu/wp-content/uploads/2019/02/2019_01_15_Just-Transition-for-regions-and-generations.pdf
- 13 Rosenkranz, G. (2018). A Future for Lusatia. A Structural Change Plan for the Lusatia Coal-Mining Region. Report prepared for Agora Energiewende. https://www.agora-energiewende.de/fileadmin2/Projekte/2017/Strukturwandel_Lausitz/Agora_Impulse_Structural_Change_Plan_Lusatia_EN_WEB.pdf
- 14 Eurostat, data for 2017. <https://bit.ly/2RNKE20>
- 15 Eurostat, data for 2017 <https://bit.ly/2Id954J>
- 16 ELSTAT, data for 2016 <https://bit.ly/2Nu7duj>
- 17 Eurostat, data for 2018 <https://bit.ly/2LyV9p1>
- 18 Nomenclature of Territorial Units for Statistics referring to regions
- 19 Ravolis, A (2016). Roadmap for the transition of the Western Macedonia Region to a post-lignite era, Report prepared for WWF Greece.
- 20 Eurostat, data for 2018 <https://bit.ly/2LI3WVR>
- 21 Greece's draft National Energy and Climate Plan, 2019 (EC translation) <https://bit.ly/2FdDiiy>
- 22 For more information, see www.regionsbeyondcoal.eu
- 23 Silesia is the name of the voivodeship (province), but also the historical region of Silesia, nowadays also stretching to Czechia. Upper Silesia is the name of a historical region, forming a part of Silesia and traditionally used in describing the industrial area in the Silesian voivodeship (e.g. the Upper Silesian Industrial Region (Polish: GOP: Górnośląski Okręg Przemysłowy).
- 24 Area administered by a voivode (Governor) in several countries of central and eastern Europe
- 25 Bukowski, M; Śniegocki, A.; Wetmańska, Z. (2018). From restructuring to sustainable development. The case of Upper Silesia. Report prepared for WWF Poland. https://regionsbeyondcoal.eu/wp-content/uploads/2019/02/2018_11_From_restructuring_to_sustainable_development_The_case_of_Upper_Silesia-1.pdf
- 26 JRC Science for policy report.(2018). 'EU coal regions: opportunities and challenges ahead' <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/eu-coal-regions-opportunities-and-challenges-ahead>
- 27 Programme for the coal mining sector in Poland, Ministry of Energy. (2018). <https://www.gov.pl/web/aktywa-panstwowe/program-dla-sektora-gornictwa-wegla-kamiennego-w-polsce>
- 28 <https://www.nik.gov.pl/aktualnosci/nik-o-gornictwie-wegla-kamiennego-w-latach-2007-2015.html>
- 29 Central Statistical Office
- 30 Program for Silesia and Direction Silesia 3.0 (Kierunek Śląskie 3.0) – strategies for the region
- 31 Śląskie Voivodeship in Figures (2019)
- 32 according to the draft NECP, sent to EC December 2019, attachment 2, p. 69: <https://www.gov.pl/attachment/5731648b-d683-4f1f-9676-e7102660dc6e>
- 33 <http://www.caneurope.org/publications/press-releases/1686-first-auction-of-polish-capacity-mechanisms-sinks-billions-of-euros-into-subsidising-the-country-s-addiction-to-coal>
- 34 Bukowski, M; Śniegocki, A.; Wetmańska, Z. (2018). From restructuring to sustainable development. The case of Upper Silesia. Report prepared for WWF Poland.
- 35 ibidem
- 36 'Kierunek Śląskie 3.0. Programu rozwoju wewnętrznego województwa śląskiego do 2030', 2017 r., as described in Polish Green Network study (2019) 'Just Transition of Silesia. Challenges from a social perspective – analysis and recommendations'.
- 37 Wójcik-Jurkiewicz M., Ingram T., Emerling I. (2018). Valuation of the cost of replacing a job in mining with an equivalent job in another sector in the process of transformation of mining regions in Poland. Report prepared for Polish Mining Group
- 38 Bukowski, M; Śniegocki, A.; Wetmańska, Z. (2018). From restructuring to sustainable development. The case of Upper Silesia. Report prepared for WWF Poland.
- 39 https://ec.europa.eu/commission/presscorner/detail/en/fs_20_50
- 40 According to the Bulgarian classification, brown coal has higher energy value (2500 – 5000 kcal) than lignite has (1200 – 2000 kcal).
- 41 Eurostat, data for 2017 <https://bit.ly/2Id954J>
- 42 NSI 2017 <http://www.nsi.bg/en/content/5493/gdp-regions>
- 43 In its form on 20th January 2020.
- 44 <https://beyond-coal.eu/2019/07/15/seven-golden-rules-for-open-and-inclusive-just-transition-planning-at-the-regional-level/>

**Why we are here**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

Support WWF

IBAN: DE06 5502 0500 0222 2222 22

Bank für Sozialwirtschaft Mainz

BIC: BFSWDE33MNZ

WWF Germany

Reinhardtstr. 18

10117 Berlin | Germany

Tel. +49 (0)30 311 777 700

Fax: +49 (0)30 311 777 888