

Smart strategies for the transition in coal intensive regions

Project No: 836819



***Report on social challenges and re-skilling
needs of the workforce solutions in the
TRACER target regions***

WP 3 – Task 3.5 / D 3.4

July 2020



Authors: Lulin Radulov, BSERC, Bulgaria
Angel Nikolaev, BSERC, Bulgaria
Vera Genadieva, BSERC, Bulgaria
Jan Frouz, CU, Czech Republic
Markéta Hendrychová, CULS, Czech Republic
Dirk Knoche, FIB, Germany
Anne Rademacher, FIB, Germany
Rainer Schlepfforst, FIB, Germany
Kilias Vassilis, CRES, Greece
Charalampos Malamatenios, CRES, Greece
Bartłomiej Woś, UAK, Poland
Justyna Likus-Cieślak, UAK, Poland
Marcin Chodak, UAK, Poland
Marek Pająk, UAK, Poland
Marcin Pietrzykowski, UAK, Poland
Sabina Irimie, AISVJ, Romania
Maria Lazar, AISVJ, Romania
Emilia Dunca, AISVJ, Romania
Irinel Stegar, AISVJ, Romania
Ibrian Caramidaru, AISVJ, Romania
Ioana Cristina Dima, ISPE - PC, Romania
Maja Stipić, ENERGOPROJEKT ENTEL, Serbia
Brankica Popović Zdravković, ENERGOPROJEKT ENTEL, Serbia
Jasmina Mandić Lukić, ENERGOPROJEKT ENTEL, Serbia
Sanja Petrović Bećirović, ENERGOPROJEKT ENTEL, Serbia
Miodrag Mesarović, ENERGOPROJEKT ENTEL, Serbia
Danylo Cherevatsky, CETI-NASU, Ukraine
Vladyslav Rashchepkin, CETI-NASU, Ukraine
Dmytro Bondzyk, CETI-NASU, Ukraine
Igor Volchyn, CETI-NASU, Ukraine
Sara Davies, STRATH, UK
Rona Michie, STRATH, UK
Wilbert den Hoed, STRATH, UK

Editors: Sabina Irimie, AISVJ, Romania
Maria Elena Boatca Barabas, AISVJ, Romania
Marian Dobrin, ISPE – PC, Romania
Gloria Popescu, ISPE - PC, Romania

Reviewers: Rita Mergner, WIP Renewable Energy, Germany
Rainer Janssen, WIP Renewable Energy, Germany

Contact: Asociația Institutului Social Valea Jiului (AISVJ)
Sabina Irimie
Email: sabina.irimie@gmail.com
Tel: +40 (0) 723 718 829
20 Universității str
332006 Petrosani, Romania
www.institutulsocialvj.ro



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 836819. The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the INEA nor the European Commission are responsible for any use that may be made of the information contained therein.

TRACER website: www.tracer-h2020.eu

Contents

1	<i>Executive summary</i>	9
2	<i>Introduction</i>	13
3	<i>Bulgaria, Yugoiztochen Region</i>	21
3.1	State of play of the social environment	21
3.1.1	Current status of the main social indicators	21
3.1.2	Comparative analysis	28
3.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	28
3.2.1	National public policies	28
3.2.2	Regional and local policies	31
3.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	32
3.3.1	Recent development of coal transition	32
3.3.2	Transition objectives. Key issues analysis	33
3.3.3	Non-market mechanism for recovery of the generating system	35
3.3.4	The sketch / scheme of the future workforce structure, in a holistic approach	36
3.4	Conclusions	37
3.5	References and further links	38
4	<i>Czech Republic, North-West Bohemia</i>	39
4.1	State of play of the social environment	39
4.1.1	Current status of the main social indicators	39
4.1.2	Comparative analysis	42
4.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	43
4.2.1	National public policies	43
4.2.2	Regional and local policies	45
4.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	46
4.3.1	Transition objectives. Key issues analysis	46
4.3.2	The future workforce structure, in a holistic approach	49
4.4	Conclusions	51
4.5	References and further links	51
5	<i>Germany, Lusatian Lignite District/Economic Region Lusatia</i>	53
5.1	State of play of the social environment	53
5.1.1	Current status of the main social indicators	53
5.1.2	Comparative analysis	56
5.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	57
5.2.1	National public policies	57
5.2.2	Regional and local policies	59
5.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	60
5.3.1	Transition objectives. Key issues analysis	60
5.3.2	Projection of the workforce structure	62

5.4	Conclusions	63
5.5	References and further links	63
6	<i>Greece, Western Macedonia Region</i>	65
6.1	State of play of the social environment	65
6.1.1	Current status of the main social indicators	65
6.1.2	Comparative analysis	71
6.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	73
6.2.1	National public policies	73
6.2.2	Regional and local policies	75
6.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors	76
6.3.1	Transition objectives. Key issues analysis	76
6.3.2	The future workforce structure, in a holistic approach	80
6.4	Conclusions	81
6.5	References and further links	81
7	<i>Poland, Upper Silesia Region</i>	83
7.1	State of play of the social environment	83
7.1.1	Current status of the main social indicators	83
7.1.2	Comparative analysis	85
7.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	86
7.2.1	National public policies	86
7.2.2	Regional and local policies	87
7.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors	87
7.3.1	Transition objectives. Key issues analysis	87
7.3.2	The future workforce structure, in a holistic approach	89
7.4	Conclusions	90
7.5	References and further links	90
8	<i>Romania, West Region / Jiu Valley</i>	92
8.1	State of play of the social environment	92
8.1.1	Current status of the main social indicators	92
8.1.2	Comparative analysis	97
8.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	98
8.2.1	National public policies	98
8.2.2	Regional and local policies	102
8.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	103
8.3.1	Transition objectives. Key issues analysis	103
8.3.2	The future workforce structure, in a holistic approach	109
8.4	Conclusions	109
8.5	References and further links	110
9	<i>Serbia, Kolubara Region</i>	112
9.1	State of play of the social environment	112
9.1.1	Current status of the main social indicators	112

9.1.2	Comparative analysis	117
9.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	118
9.2.1	National public policies	118
9.2.2	Regional and local policies	118
9.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors	119
9.3.1	Transition objectives. Key issues analysis	119
9.3.2	Projection of the workforce structure	121
9.4	Conclusions	122
9.5	References and further links	122
10	<i>Ukraine, Donetsk region</i>	124
10.1	State of play of the social environment	124
10.1.1	Current status of the main social indicators	124
10.1.2	Comparative analysis	128
10.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	128
10.2.1	National public policies	128
10.2.2	Regional and local policies	129
10.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	130
10.3.1	Transition objectives. Key issues analysis	130
10.3.2	The future workforce structure, in a holistic approach	131
10.4	Conclusions	131
10.5	References and further links	131
11	<i>United Kingdom, Wales</i>	133
11.1	State of play of the social environment	133
11.1.1	Current status of the main social indicators	133
11.1.2	Comparative analysis	135
11.2	Public policies and legislation in the labour, social protection and education (re-skilling) fields	136
11.2.1	National public policies	136
11.2.2	Regional and local policies	138
11.3	Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor	140
11.3.1	Transition objectives. Key issues analysis	140
11.3.2	The sketch / scheme of the future workforce structure, in a holistic approach	144
11.4	Conclusions	145
11.5	References and further links	145
12	<i>Conclusions</i>	147
	<i>Bibliographical sources</i>	148
	<i>List of Tables</i>	150
	<i>List of Figures</i>	152
	<i>List of Annexes</i>	153

Abbreviations

ADR Vest	Agency for Regional Development West Region
AI	Artificial intelligence
BG34	Southeast Region, Bulgaria
CEH	Complexul Energetic Hunedoara / Hunedoara Energy Holding
CZ04	North West Bohemia, Czech Republic
CZSO	Czech statistical office
DE40	Brandenburg, Germany
DED2	Dresden, Germany
DSM	Demand Side Management
DSR	Demand Side Response
DWP	Department for Work and Pensions
EaSI	Employment and Social Innovation Program
EC	European Commission
EE	Energy Efficiency
EGF	European Globalization Adjustment Fund,
EIB	European Investment Bank
EL53	Western Macedonia, Greece (WMR)
ELSTAT	Hellenic Statistical Authority
EOPPEP	National Organisation for the Certification of Qualifications and Vocational Guidance
EPS	Electric Power Industry of Serbia
ESF	European Social Fund
EU	European Union
f	females
FSWS	Family and Social Welfare Sector
FUA	Functional Urban Area
GDHI	Gross Domestic Household Income
GDP	Gross Domestic Product
GDR	German Democratic Republic
GHG emissions	Greenhouse Gas Emissions
GQAL	Good quality agricultural land
GR	Greece
GSLI	General Secretariat for Lifelong Learning
GVA	Gross value added
HE	Higher Education
HEFCW	Higher Education Funding Council Wales
HPP	Hydro Power Plant
ICT	Information and Communication Technologies
ILO	International Labour Office
INS	National Institute of Statistics
INSEMEX	National Institute for Research and Development in Mine Safety and Protection to Explosion

JTM	Just Transition Mechanism
LES	Labour and Employment Sector
LLCs	Lifelong Learning Centres
m	males
MB	Mining Basin
ME	Ministry of Energy
MEE	Ministry of Economy
MF	Ministry of Finance
MFF	Multiannual Financial Framework
MLEVSA	Ministry of Labour, Employment, Veteran and Social Affairs
MLSP	Ministry of Labour and Social Policy
MoEW	Ministry of environment and waters
MTTT	Ministry of trade, tourism and telecommunications
MW	Megawatt
NA	Not available
NEAP	National Employment Action Plan
NECP	National Energy and Climate Plan
NEET	Not in Employment, Education and Training
NERP	National Emissions Reduction Plan
NES	National Employment Services
NGO	Non-governmental organization
NSI	National Statistical Institute
NUTS	Nomenclature of Territorial Units for Statistics
OAED	Greek Manpower Employment Organization
OECD	Organisation for Economic Co-operation and Development
OP Employment	Operational Programme Employment focuses on the human capital of the population and public administration
PAEM	Programme of Active Measures for Fighting Against the Unemployment
PESTEL	Political, Economic, Social, Technological, Environmental and Legal
PL22	Upper Silesia, Poland
PNR	National Reform Program 2011 - 2013
PPC	Public Power Corporation
R&D	Research and Development
RDTI	Research, Development & Technological Innovation
RES	Renewable Energy Sources
R&I	Research and Innovation
RIS	Regional Innovation Strategy
RO	Romania
RO42	West Region, Romania
RS	Republic of Serbia
RS11	Belgrade statistical region, Republic of Serbia
RS21	Sumadija and West Serbia statistical region, Republic of Serbia
RSPs	Regional Skills Partnerships

RTI	Research, Technology and Innovation
SACET	Sistemul de Alimentare Centralizată cu Energie Termică / Centralized Thermal Energy Supply System
SDSMC	Social Development Scheme for Mining Communities
SE	State Enterprise
SER	South East Region
SMEs	Small and medium-sized enterprises
SNIMVJ	Jiu Valley National Mine Closure Society
SPDS	Social Protection Development Strategy
SRSS	EC Structural Reform Support Service
STEM	Science, Technology, Engineering and Mathematics
SWOT	Strengths, Weaknesses, Opportunities, Threats
TPP	Thermal Power Plant
TUC	Trades Union Congress
UKL1	West Wales and The Valleys, Wales, UK
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs, Population Division
VET	Vocational Education & Training
WAM	(scenario) with additional measures
WB	World Bank
WEF	World Economic Forum
WEM	(scenario) with existing measures
WMR	Western Macedonia Region

1 Executive summary

This report investigates in 9 European coal-intensive regions the current demographic and workforce structures, together with relevant social challenges and re-skilling needs, all these on the background of an ongoing or future transition process from coal to smart, sustainable and green energy systems, while safeguarding the social cohesion for communities involved.

Economic growth, social inclusion, well-being, sustainable labour market are attributes that all TRACER target regions are aiming for, and this report analyses the impact of energy transition, in terms of social change, communities shrinking, migration, demographic aging, poverty, high youth unemployment rates and participation to education and training. Each of the 9 coal intensive region also drawn out an overview of the existing public policies summarised in Annex 1, and drafted its transition objectives in order to overcome social challenges and cope with re-skilling and workforce needs.

This analysis will serve as a basis for the development of solutions for the transition from coal, included in the strategies and action plans which will be further developed in TRACER project.

TRACER target regions are: Southeast Region (BG34 - Bulgaria); North West Bohemia (CZ04 - Czech Republic); Lusatia (Brandenburg DE40 and Dresden DED2 - Germany); Western Macedonia (EL53 - Greece); Upper Silesia (PL22 - Poland); Jiu Valley, West Region (RO42 - Romania); West Wales and The Valleys (UKL1 – Wales, United Kingdom); Kolubara (Region Beograda RS11 and Region Sumadije i Zapadne Srbije RS21 - Serbia); and Donetsk (Ukraine).

Demographic change is one of the key challenges in our days. Regarding the phenomenon of shrinking cities, due to population migration gradually moving to the negative indices, ageing and mortality growth we can say that the trend in recent years (2015-2018) is constant but not as pronounced as the aggressive reduction compared mainly to the '90s. During 2015–2018, population decreased in majority of the analysed regions (**Figure 1.a**). However, in 2018, Brandenburg, DE and West Wales and The Valleys, UK regions recorded marginal growth y-o-y (0.4% and 0.1%, respectively). Positive influences could come from the relative improvement of the quality of life, standard of living and medical services, resulting from increase in median age in all TRACER target regions (**Figure 1.b**), even if there still exists no equal access and social disparities deepen for vulnerable and socially excluded groups.

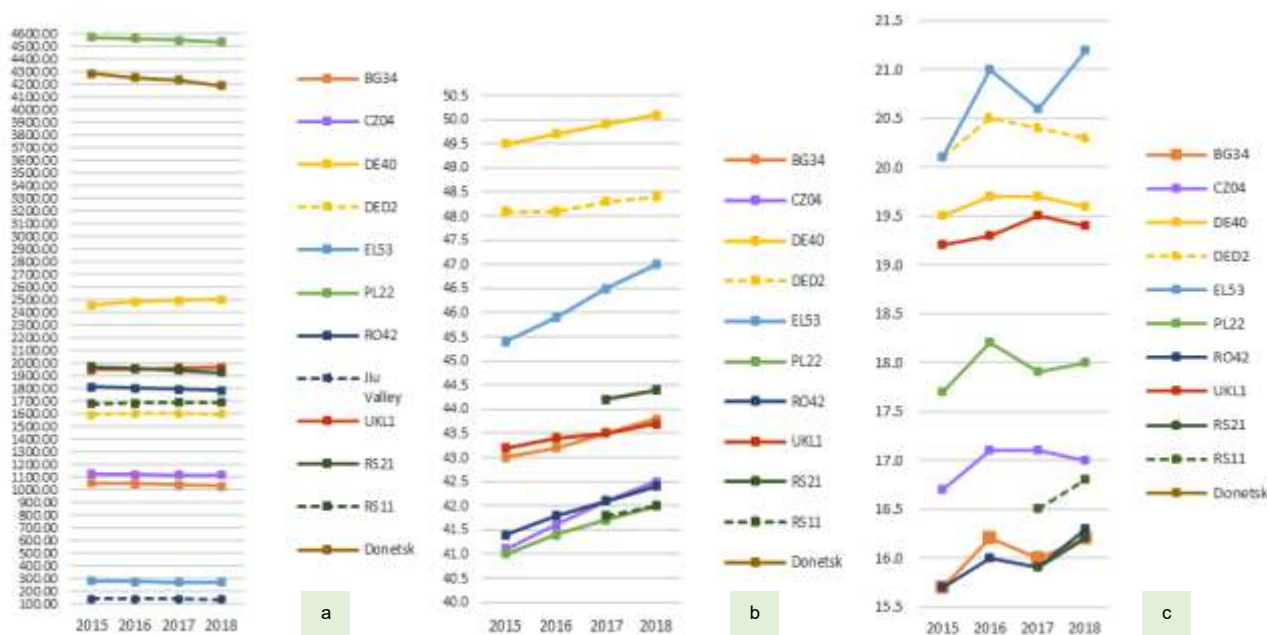


Figure 1.a Total population on 1 January at TRACER target regions level (th.inh.);

Figure 1.b Median age of population at TRACER target regions level (years);

Figure 1.c Life expectancy at 65y in TRACER target regions (years)

Source: EUROSTAT [demo_r_d2jan], [demo_r_pjanind2], [demo_r_mlifexp] and TRACER target regions reports

Another indicator measuring the living standard is “population at risk of poverty” in which case we emphasize, from the few available data, that coal intensive regions in Greece (EL53) and Bulgaria (BG34) have the highest rates in 2018: 24.8% and 22.5%, respectively. On the other hand, Lusatia, DE registered a poverty rate of 17%, RO42 14.9% and PL22 only 3%, UK, RS and UA being without data available.

Life expectancy over 65y (Figure 1.c) had different variations with marginal decline y-o-y in North West Bohemia, CZ, Brandenburg, DE and West Wales and The Valleys, UK.

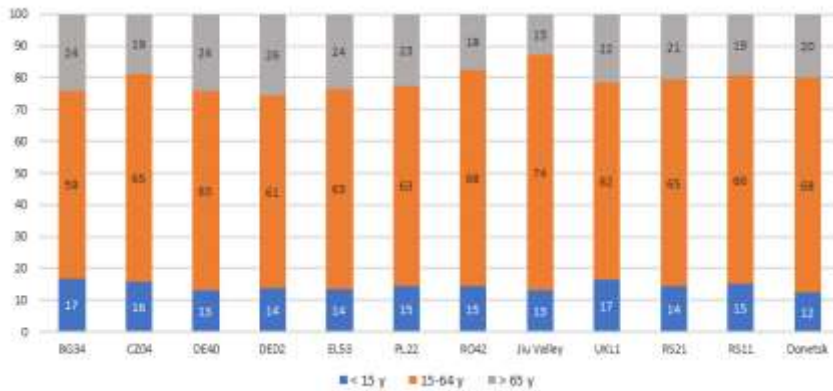


Figure 1.d Population age distribution at TRACER target regions level in 2018 (%)

Source: EUROSTAT [demo_r_pjanind2] and TRACER target regions reports

During 2015–2018 population age distribution (Figure 1.d) was relatively constant and similar in all TRACER regions with higher percentages for elderly (> 65y) group compared to youngest ones (< 15y) with a maximum share in 2018 in Lusatia, DE (26% vs. 14%); working age population (15y-64y) in 2018 was between 59-74% with a pick figure for Jiu Valley, RO (74%) and a lowest value for Southeast Region, BG.

The report also analyses the **workforce environment** and

highlights that in all TRACER coal-intensive regions, the total activity rate has a slight and constant increase, but after investigating the employment rate the conclusion is that we have an economically active population with no jobs availability or in unique situations where unemployment benefits are preferred vs. going to work.

According to Figure 1.e Western Macedonia, EL has the highest gender gap in employment (with a 22% gap in 2018), followed by West Region, RO (21% gap in 2018) and North West Bohemia, CZ, and Serbia regions (each recording a 15% gap in 2018). Efforts are made for reducing the gender gap in employment but not enough. In terms of employment rates with the exception of Germany, all the other TRACER regions record a lower regional rate as compared to the national levels of their corresponding countries (Figure 1.f).

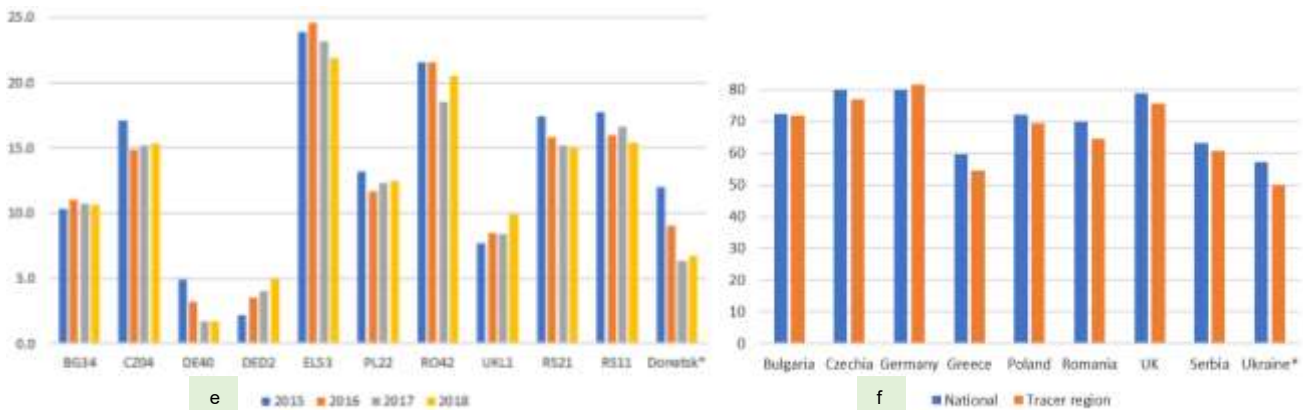


Figure 1.e Gender gap in employment (20y-64y) in TRACER target regions (%)

Figure 1.f Employment rates (20y-64y) at national level vs. TRACER region (%) in 2018; UA* (15y-70y)

Source: EUROSTAT [lfst_r_lfe2emprt], [demo_r_pjanind2] and TRACER target regions reports

Regional employment in total economy had a slight positive trend inside all TRACER coal intensive regions (NUTS2) but with disparities for NUTS 3 or smaller areas as Jiu Valley micro-region.

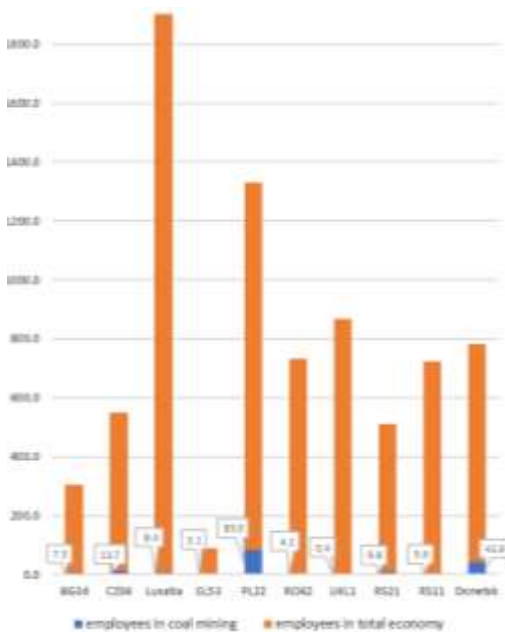


Figure 1.g TRACER target regions average number of employees (15-64y) in coal mining vs. total economy, 2018 (thousand)

Source: EUROSTAT [fst_r_lfe2en2] and TRACER

An opposite trend was instead for the industry where all regions, except RS11-RS21 and RO42, had a decrease in the average number of employees. When comparing for 2018 the average number of employees (15y-64y) in coal mining vs. those in the total economy (Figure 1.h) we tend to say that the proportion is insignificant, but the social impact is not negligible at all when you have to reskill and retrain a total of approx. 200,000 former employees in the mining industry (highest amount in PL, UA, RS and CZ) and to offer appropriate and sustainable jobs. Also, we must not forget the coal associated economies i.e. energy, other industries, related services, etc.

The mono-industrial character of the intensive coal regions and the lack of investments strongly impacted some regions, such as EL53, RS11-RS21 and Donetsk, UA, the real unemployment rates for the working age category 20y-64y being higher than those presented in the Figure 1.h. The major concern is that during 2015–2018, all regions faced higher rates of youth unemployment (15y-24y) as compared to total unemployment (20y-64y), except from Western Macedonia, GR where we have an opposite trend. However, a good perspective is that youth unemployment started decreasing during the analysed period, mainly in BG34, DE40, UKL1, RS11 and Donetsk, UA.

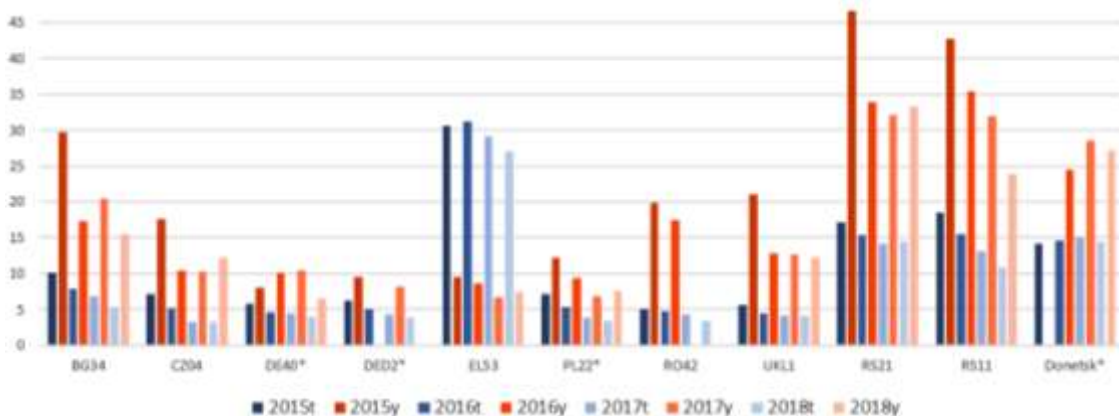


Figure 1.h TRACER target regions total (20-64y) and youth (15-24y) unemployment rates (%); DE* youth 18-24y; PL* youth 15-29y; UA* working age 15-59y

Source: EUROSTAT [fst_r_lfu3rt] and TRACER target regions reports

Education is an excellent lever for social revitalisation and regeneration, and reskilling programs development and implementation can harness capabilities in the shrinking TRACER regions under economic transformation processes, in Figure 1.i being presented the participation rate in education and training for 25y-64y during 2015-2018.

All TRACER regions have at least one university centre and a well-structured education system, and yet participation rates in education and training differ significantly from a peak reached by UKL1, Wales of over 16% highlighting strong investments in education, to BG34 and RO42 with rates up to 2%, South-East region, BG having also the highest rate (of over 20%) early leavers from education and training (18y-24y). Efforts are made by the other coal intensive regions, PL22 having a strong positive evolution in 2018.

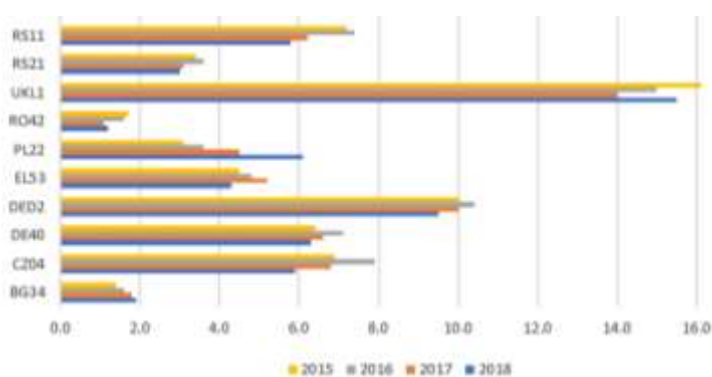


Figure 1.i Participation rate in education and training (25-64y) in TRACER target regions (%)

Source: EUROSTAT [trng_lfse_04] and TRACER target regions reports

Based on a first draft transition objectives or on the existing assumed objectives, all 9 TRACER coal intensive regions underlined their key issues in terms of social and workforce/re-skilling needs. A summary of the regions internal-external factors, key issues and SWOT analysis is presented in Annex 2.

The prediction of the labour force structure for 2030-2050 is difficult to assess for various reasons, such as: the lack of responsible assumption, at governmental level, of a deadline for the cessation of coal use; non-existence of transition from coal strategies or national programs - these

being either in the process of elaboration or not even sketched. At most, several regions mentioned the future economic sectors with development potential, which might take over reskilled labour force.

2014 EU's ambitious agenda for jobs, growth and investment for sustainable development (Junker J-C., 2014) has had a more or less impact on TRACER target regions depending on:

- how public policies have been transposed from European to national and regional level and how they have been implemented,
- the strength and financial capacity of each country to attract business investment and support entrepreneurship, reskilling workers, and social measures,
- socio-cultural specificities, and
- the economic development status of each regions – where the energy transition started or not.

Each TRACER region, a mix of urban, peri-urban and rural communities, responds in a personalized way to current socio-economic challenges as for example the de-industrialised and new recreational Lusatia, DE – the mirror of a positive economic development.

So, in order to succeed in addressing the socio-economic challenges of the transition from coal, effective policies intervention focused on human capital, financial support and a community responsible dialogue and engagement are mostly needed.

2 Introduction

Over time, mankind has understood that change is always present in all areas of its life - from the internal environment of each person, to the external environment, and up to the macrocosmic level. What shocks, lately, are the dynamics / speed, complexity and magnitude of change; „Change that involves people is a transition according to Bridges, and people are the essence of any process of change.” (Mergner, Janssen, Mandic Lukic, 2020, p.10).

The year 2020, marked by the COVID-19 pandemic, which has taken humanity "by surprise and unprepared" and which will cause a major transition on all levels of human life, will symbolize the "year of restart" or the beginning of a global reengineering process.

Thus, in the complex issue of the transition from carbon-intensive areas in the context of the TRACER project appeared this new component - not negligible, which influences all forecasts, models and scenarios on social challenges and future skills needs of the TRACER target regions.

The latest COVID-19 crisis has shaken many “certainties” we have had about labour market needs, job requirements and work environment. Many employers have faced decisions on human resources practices, such as: the opportunity to use remote teams; the replacement of formal meetings with various review substitutes; the empowerment of employees to exercise self-reflection in order to align their assignments to the new work constraints etc. One of the effects of this new context is that it has challenged organisational common places and routines, some of which have proven no longer useful, if in the nature of the case the organisation cannot any longer comply with one-on-one and face-to-face interaction. While deprived of physical presence of teams and immediate managerial control, contemporary societies have shown the radical constructivist characteristics of some of their settings.

In mining regions facing structural transitions one of the challenges to re-skilling is given by the relentless lingering of local actors to old ways of “doing things” (from managing communities to identifying labour market opportunities and needs). Maybe for such a time as this the various stakeholders of mining regions should show more versatility to innovative proposals that might have been out of sight a decade ago.

We find that socio-cultural heritage influences today's regional disparities. To understand economic development, we must be aware of the cultural factors that are contributing to it.

A cursory look at the history of the work meanings suggests that the drive of work is culturally and ideologically conditioned, being central to the inception and development of both capitalist and socialist forms of production (Grint, 2005, cited in Kelemen, Bunzel, Willis, 2009).

Considering only features of socio-economic systems, for example contemporary forms of capitalism, be they neoliberal, corporate or post-socialist, it is noticeable that traditional meanings of labour have been thrown into confusion. Thus, the cessation of manual labour has led to the decline of the working-class culture, the tendency to reduce or stagnate the wages of semi-skilled workers and competition from migrant workers has strongly eroded the "hero of labour".

If we follow the history of the target regions from the TRACER project, we contrast two economic / political types: the neoliberal model and the socialist model (Epsing-Andersen, 1990). In some countries such as: Bulgaria, Czech Republic, Poland, Serbia and Romania, socialism due to social change has become or is trying to become capitalist, the new capitalism (Grey, 2016).

There is, however, an unexplored territory between neo-liberal and socialist. „As the traditional forms of mechanical solidarity associated with hundreds of years of industrialization and urbanization decline, there may be new meanings of work taking their place, some being orchestrated from the top, others arising sporadically from below. Such meanings are by no means controllable and manageable in a traditional way: they are rather fragmented, slippery, on their way to be constituted but not quite there yet.” As the traditional forms of mechanical solidarity associated with hundreds of years of industrialization and urbanization decline, there may be new meanings of work, some being orchestrated from above, others sporadically appearing from below. These meanings are by no means controllable and easy to manage in a traditional way: they are quite fragmented, slippery, on their way to being constituted, but they are not yet there.

Grey (2016) asks the fundamental question of social philosophy: “what is the good life and how is it achieved?”, considering that we must not answer this question in the binary terms of capitalism or communism. “It is quite possible to provide for systems that preserve private property and market exchange - and are fundamentally capitalist in this respect, but based on local economies and labour practices (e.g. the German Mittelstand) that support more rather than harming human potential and the environment. He also said that capitalism was most successful when it was regulated to take into account broader concerns about social welfare and eco-human equality. If the new capitalism has really been detrimental to this welfare - both in terms of production and consumption, or the new capitalism means the end of management, then it is beginning to highlight the need for alternatives. Maybe the “old economy” is now operating within the “new economy” as Sweet and Meiksins claim.

So, what will be the future of work? What alternatives are possible for the mining regions in transition, what are the jobs and skills required? These are the questions we try to answer in this report.

The definition of skills varies a lot in the literature due to the diversity of fields in which they meet. From a broad perspective, human capital can be defined as „knowledge, skills, competences and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being” (EC, 2016).

„The Recommendation of the European Parliament and of the Council on the establishment of the European Qualifications Framework for Lifelong Learning defines the concepts of knowledge, skills and competence. Knowledge is described as theoretical and/or factual; skills are defined as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments); and competence is characterised in terms of responsibility and autonomy. In this context, ‘skills’ refers to the ability to apply knowledge to complete tasks and solve problems.

The main difference is that the first Recommendation uses ‘skills’ as a component of ‘competence’, while the second one puts the two concepts on the same level, together with ‘knowledge’. Looking at this difference through the perspective of the labour market, the first approach implies a broader view of ‘competences’ as all those attributes which enable the individual to be active in the labour market, namely knowledge, skills and attitudes appropriate to the context (EC, 2016). „Adaptation skills” are defined as „specific and generic skills related to adaptation activities and adaptation jobs, which can be new or topped-up existing skills.” (EC, 2014)

The formal framework is provided by a series of public policies and tools for their application. Considering “a public policy - a network of interlinked decisions on the choice of objectives, means and resources allocated to achieve objectives in specific situations”, we find its size, diversity and implications depending on the typology (European, regional, national, local, sector).

European Strategic Agenda 2019 – 2024 provides an overall framework and direction for shape the future world, promote the interests of our citizens, businesses and societies, and safeguard our way of life. It is intended to guide the work of the Institutions in the next five years. It focuses on four main priorities:

- protecting citizens and freedoms;
- developing a strong and vibrant economic base;
- building a climate-neutral, green, fair and social Europe;
- promoting European interests and values on the global stage.” (European Council, 2019, p.2)

These priorities, in narrower wording, are found among the 17 global goals of the millennium and in addition is the European identity.

In the concept of The Economic Times „labour market is the place where workers and employees interact with each other. In the labour market, employers compete to hire the best, and the workers compete for the best satisfying job.” But over time, the profile of the best employee or the best employer has changed a lot.

For example, following the European Digital Strategy, the new Industrial and Small and Medium Enterprise Strategy and the Recovery Plan for Europe, on 1 July 2020 the Commission adopted¹:

- a Communication on a "European Skills Agenda for sustainable competitiveness, social fairness and resilience";
- a Proposal for a Council Recommendation on vocational education and training (VET);
- a Communication and proposal for a Council Recommendation to support youth employment.

These documents will create the framework for the future skills required on the labour market and support young people to get hired.

The European Digital Strategy, 2020 specifies the following three actions:

- Technology that works for people;
- A fair and competitive digital economy;
- An open, democratic and sustainable society.

„The recovery plan turns the immense challenge we face into an opportunity, not only by supporting the recovery but also by investing in our future: the European Green Deal and digitalisation,” explained Commission President Ursula von der Leyen.

In implementing the Green Deal, the proposals seek, in particular, to turbocharge the implementation of the European Green Deal which the Commission sees not only as an environmental and climate initiative, but as a fundamental economic strategy and a 'job-creating engine'. In the revised MFF, a least 25% of the 1.1trillion EUR available will be spent on implementing the Green Deal, with up to 1.7million new jobs created by 2030.

In particular, the Commission’s proposed 'Renovation Wave' – outlined in the Green Deal – is seen as a driver for employment, aiming to double the annual renovation rate of buildings, with significant investment in energy efficient materials, technologies and the accompanying renovation workforce.” (Policy Learning Platform, 2020)

In the European Skills Agenda for sustainable competitiveness, social fairness and resilience, four quantitative objectives for 2025 (EC, 2020) are set out, with the aim to up- and reskill the workforce, with a particular focus on low qualified and unemployed workers and basic digital skills (**Table 2.a**)

Table 2.a The EC four skills objectives for 2025

Indicator	Objective for 2025	Current level (latest year available)	Increase (in %)
Participation of adults aged 25-64 in learning during the last 12 months	50%	38% (2016)	+32%
Participation of low-qualified adults 25-64 in learning during the last 12 months	30%	18% (2016)	+67%
Share of unemployed adults aged 25-64 with a recent learning experience	20 %	11% (2019)	+82%
Share of adults aged 16-74 having at least basic digital skills	70%	56% (2019)	+25%

Source: European Commission, (2020) Skills Agenda for sustainable competitiveness, social fairness and resilience, four quantitative objectives for 2025, Brussels, Belgium, p.19

The EC Skills Agenda also defined twelve actions - for example, Action 4: Proposal for a Council Recommendation on Vocational Education and Training for sustainable competitiveness, social fairness and resilience proposes a modernised EU policy vision for VET, with the view to equipping young people and adults with the skills to thrive in the labour market and supporting the green and

¹ <https://ec.europa.eu/social/main.jsp?catId=1223>

digital transitions, including transversal skills, ensuring inclusiveness and equal opportunities, and establishing European VET as a global reference point for skills development.

Presents principles to implement this vision, including a stronger focus on permeability with other education sectors, increased learning mobility and working in close partnership with employers. It also promotes VET as an attractive choice for women and men alike, and promotes inclusion of vulnerable groups.

Sets objectives for VET systems to enhance the availability of work-based learning and mobility opportunities and the employability of vocational graduates.

Puts forward a number of actions to be implemented at EU level to support VET reform in particular on enhancing the digital readiness of VET institutions, including for VET teachers, apprenticeships and Centres of Vocational Excellence linked to smart specialisation strategies and/or regional innovation and growth strategies (EC, 2020).

From the statistical data presented, there is a significant gap for Adult Education in some countries of the target group of the TRACER project (Romania, Bulgaria, Greece, Poland, Czech Republic) compared to the European average (EU-27).

The green transition needs to be just and has to pay special attention to those workers and regions particularly affected. „A just transition creates decent work opportunities for all and ensures that social protection exists where needed. It also includes mechanisms for social dialogue from the private sector and workers’ unions throughout policymaking processes at all levels.” (ILO, 2015, p.2)

In **Figure 2.a** it is shown the connection between Green Jobs Potential and the 17 Sustainable Development Goals (SDGs) illustrating the opportunity „to address pre-existing employment challenges and create decent work opportunities for all - including women, youth and people who live in rural areas. Governments can support enterprises by combining policy instruments such as market-based instruments, regulations, public investment, procurement policies and awareness raising. At the same time, they can create an enabling environment that promotes the adoption of green workplace practices, investments in new green products and services, as well as job creation.”²

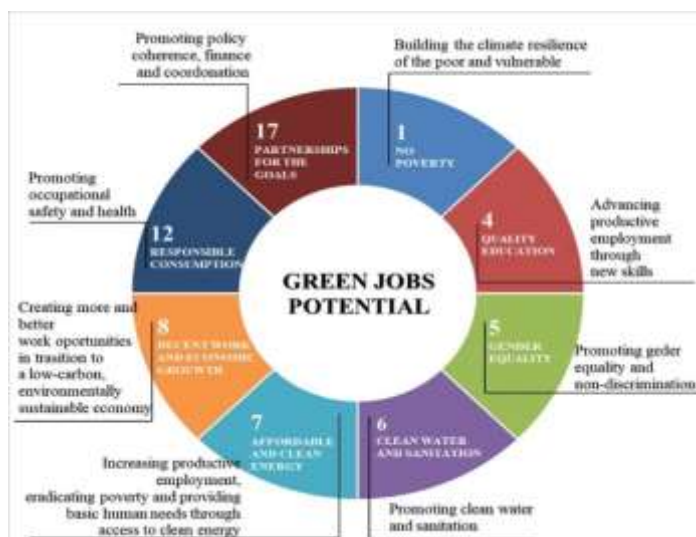


Figure 2.a ILO Green Jobs Potential

Source: ILO, (2015) Sustainable Development Goals, SDGNOTE Green Jobs, Geneva, Switzerland, p.2

According to Børge Brende - President, World Economic Forum, since April 2019, „we need a reskilling revolution”, which involves investment in human capital.” These efforts and others to invest in developing the talent and potential of all people can be the bridge we need to move to inclusive, sustainable growth that leverages technology to create opportunity for all. Investing in people can

² <https://ec.europa.eu/social/main.jsp?catId=1223>

transform them from passive observers of disruption to active leaders of positive change in their local, regional and global communities.” (Brende, 2019)

But the weak, weak point is education - which involves education reform, lifelong learning and retraining initiatives to ensure employability, not just graduation. This aspect has been highlighted in other reports prepared within the TRACER project. Investing in human capital serves both each person through training, developing skills, competencies, attitudes and behaviours to adapt to transition, systemic change, and more “empowers them to take part in creating a more equal, inclusive and sustainable world.” Thus, it is desired to increase welfare throughout the world.

Members of the Global Commission on the Future of Work presented the new agenda "Delivering the social contract: A human-centred agenda" and proposed three or three pillars of action, which in combination would drive growth, equity and sustainability for present and future generations (ILO, 2019, p.11):

1. Increasing investment in people’s capabilities;
2. Increasing investment in the institutions of work;
3. Increasing investment in decent and sustainable work.

These types of investments are expected to create this well-being, prosperity.

But the future of the labour market is quite difficult to estimate. Also, Members of the Global Commission on the Future of Work (ILO) made an analysis and presented an estimate of it (**Table 2.b**).

Table 2.b Estimations of future labour market transformations

	Source	Estimates
Technology	Frey and Osborne, 2015	47 per cent of workers in the United States are at risk of having jobs replaced by automation.
	Chang and Phu, 2016	ASEAN-5: 56 per cent of jobs are at risk of automation over the next 20 years.
	McKinsey Global Institute, 2017	While less than 5 per cent of all occupations can be automated entirely using demonstrated technologies, about 60 per cent of all occupations have at least 30 per cent of constituent activities that can be automated.
	OECD, 2016	An average 9 per cent of jobs in the OECD are at high risk of automation. A substantial share of jobs (between 50 and 70 per cent) will not be substituted entirely but a large share of tasks will be automated, transforming how these jobs are carried out.
	World Bank, 2016	Two-thirds of jobs in the developing world are susceptible to automation.
	WEF, 2018, The Future of Jobs Report 2018 (Geneva)	Nearly 50 per cent of companies expect that automation will lead to some reduction in their full-time workforce by 2022.
Transition to a sustainable environment	ILO, 2018, World Employment and Social Outlook 2018: Greening with jobs (Geneva)	Implementing the Paris Climate Agenda is estimated to lead to global job losses of around 6 million and job gains of 24 million.
Demographic change	UNDESA, 2017, World Population Prospects: The 2017 revision, key findings and advance tables (New York)	By 2050, the total dependency ratio (ratio of population aged 0–14 and 65+ per 100 population aged 15–64) is projected to increase sharply in Europe (by 24.8 percentage points) and Northern America (by 14.4 percentage points) and moderately in Asia (by 8.5 percentage points), Oceania (by 6.8 percentage points) and Latin America and the Caribbean (by 7.6 percentage points). The total dependency ratio for Africa is projected to decrease by 18.7 percentage points and half of the region’s population will be young (0–24). All other regions will have an aged population.

Source: ILO, (2019) *Work for a Brighter Future. Global Commission on the Future of Work, Geneva, Switzerland, p. 29.*

Technological progress, innovation have caused the industrial revolutions, and in the connection between technology and education the gap can ensure well-being, prosperity, respectively social pain (**Figure 2.b**). But with the digital revolution, there is “a large-scale decline in roles as they become redundant or automated. According to the 2018 Future Jobs Report, 75 million jobs are expected to

be relocated by 2022 in 20 major economies. At the same time, technological advances and new ways of working could also create 133 million new roles, driven by the large-scale growth of new products and services that would allow people to work with machines and algorithms to meet the demands of change demographic and economic." (Brende, 2019) Therefore, these data confirm that "the next wave of automation will play out as previous waves did... The Industrial Revolution made lots of jobs obsolete but replaced them several times over, creating more new jobs than it destroyed. But this time around, there are at least three important differences:

- The transition is happening much faster.
- Machines are replacing human judgment and thought, as opposed to repetitive tasks or manual labour.
- The COVID-19 pandemic instantly highlighted an under-appreciated benefit of automation: It lessens the need for human contact and thus slows down transmission of the virus." (Harbert, 2020)

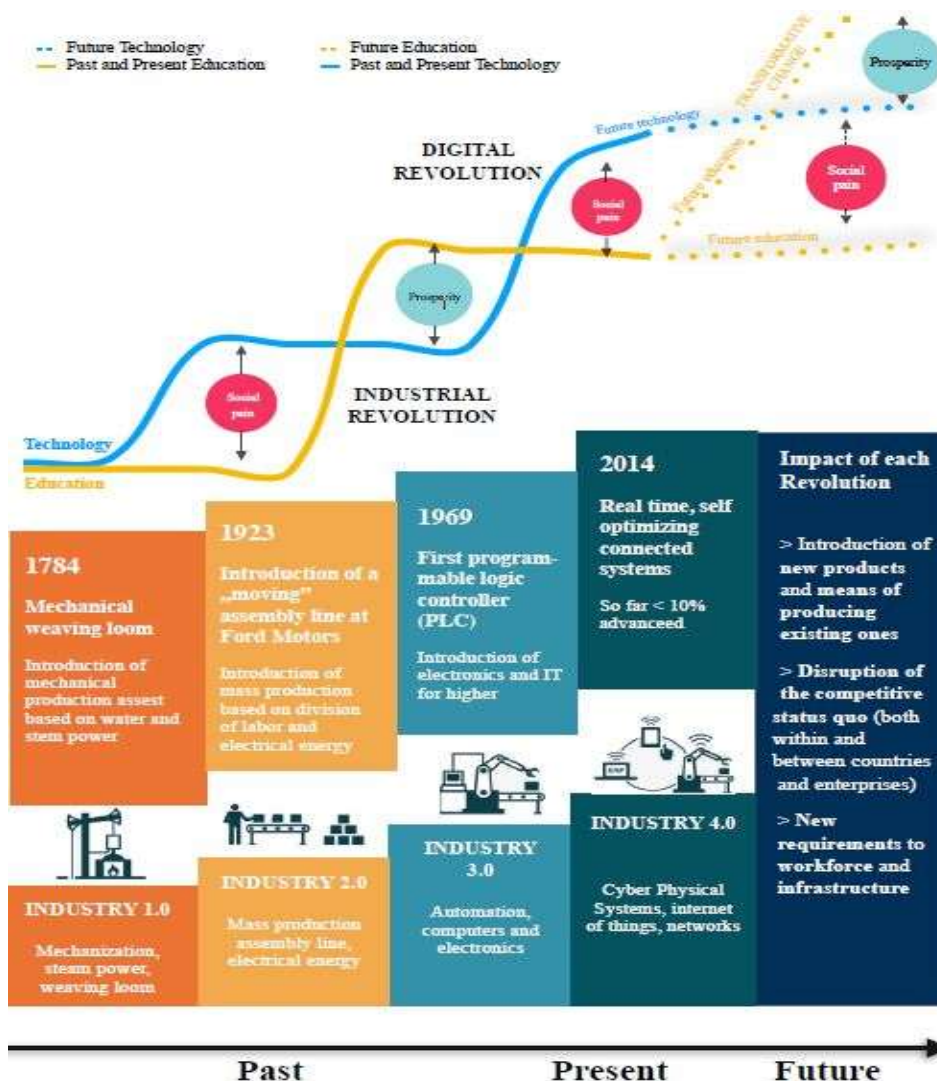


Figure 2.b Digital Revolution

Source: adapted from (OECD, 2019, pp.6-7), (Goldin, Katz, 2010) and (Berger, 2018, p.1)

Therefore, the Covid-19 Pandemic accelerates the process of digitization, online work and telework. The same author points out that "The phrase "future of work" is inextricably linked with fear over how artificial intelligence and automation will replace large swaths of workers. But the implications of such changes aren't clear."

Ravin Jesuthasan and John Boudreau (2018), emphasize how the contradiction between waiting for employees to reinvent jobs and optimize automation without constantly worrying about their own job security can be overcome. Leaders need to provide the tools to engage in the journey of reinventing the employee, as well as the reasons for continuing this (incentives and access to retraining options). "The key is to emphasize the more creative and human aspects of the work. These are skills that cannot be automated, but can be augmented to further increase their value to the organization." (Jesuthasan, Boudreau, 2018)

Technology will shape the workforce in the next industrial revolution. The most important qualifications and skills in the digital age are presented in **Figure 2.c** and **Figure 2.d**. The challenge for companies is to find people with skills and imagination to adapt to various anticipated roles. This will not be easy, as technology and skills will become obsolete faster and faster. People with a high level of soft skills - called "power skills", such as the ability to show empathy, solve problems, communicate, negotiate and learn will be greatly appreciated.

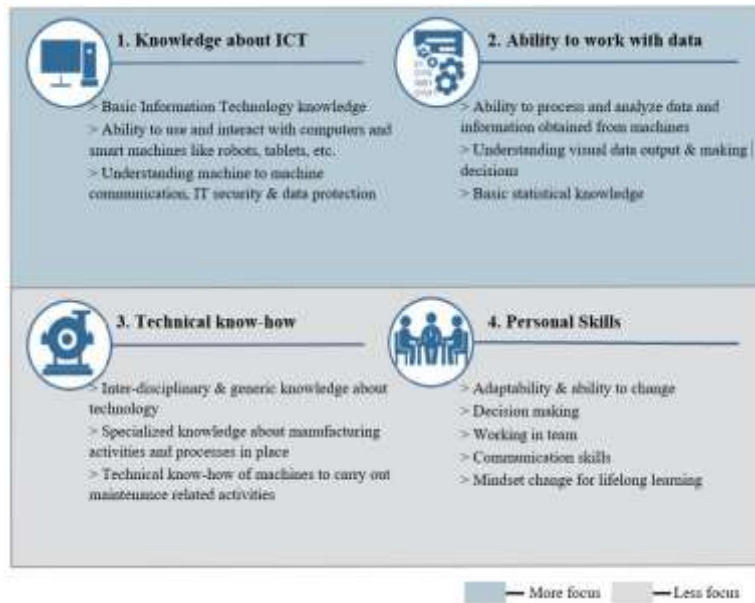


Figure 2.c Important qualifications & skills to have for Industry 4.0

Source: Berger, R., (2018) *Whitepaper Skill Development for Industry 4.0*, p.35

Jesuthasan, a consultant at Willis Towers Watson and author of *Transformative HR* (Jossey-Bass, 2011), believes that the biggest change most organizations will face is the shift from a job-based ecosystem to a skills-based one. Addressing that change begins by recognizing the move away from a traditional one-to-one relationship between a person and a position to a "many-to-many" relationship that continually matches skills to tasks (Ward, 2019).

"The most critical skill in this industrial revolution is 'learning,' says Jesuthasan." "I may not know how the business will change. I need a person with the ability to resume!"

Some human resources experts (Ellyn Shook, Accenture consulting firm; Matthew Schuyler, Hilton Worldwide Holdings) appreciate learning agility, the ability to train and influence, the tacit transfer of knowledge, experiential and essential learning is the adaptation that will become a skill. key. "Humans adapt with proper context (Agovino, 2019)."

In addition, among the 12 actions provided in *The European Skills Agenda* for sustainable competitiveness, social fairness and resilience (EC, 2020) are mentioned "skills for life" where it is expected that "beyond the labour market, we will support adult learning for everyone - young people and adults - on issues such as media literacy, civic competences, and financial, environmental and health literacy."



Figure 2.d Categorization of skills into skill family

Source: World Economic Forum, based on O*NET Content Model, In Roland Berger, *Whitepaper Skill Development for Industry 4.0*, 2018, p.33

So, the paradigm of transition and the future of work in the digital age is found in the approach to emerging skills.

Both the need for institutional restructuring (e.i. The International Labour Organization and the 100th Anniversary of Labour, 2019), the need for governments to reduce unemployment and reduce poverty, and the need for the private sector to have competent employees require continued collaboration in training young people, adults - women and men, affected by the closure of mining activities or now by the interruption of work due to Covid-19. Thus, the determining factor will be how the government, business and education system respond to these challenges.

The analysis presented in this report on the 9 European coal-consuming regions, which are the target regions of the TRACER project, together with good practices developed in WP2 will facilitate in the holistic approach finding solutions and reinventing the implementation of viable solutions suitable for each coal mining area in transition. The report is, in fact, a diagnostic analysis for the design of solutions for the coal transition, included in the strategies and action plans that will be further developed in the TRACER project, customized for each region. The prerequisites for this approach are the transitional objectives formulated by the target regions to overcome social challenges and meet the needs of retraining, together with the European Strategic Legislative Framework and the step-by-step approach to the labour market and the process of social transformation, consisting of three stages and 11 subordinate steps, which can be customized by each coal-consuming region, taking into account their socio-cultural heritage (Mergner , Janssen, Mandic Lukic, 2020, p.12).

3 Bulgaria, Yugoiztochen Region

3.1 State of play of the social environment

3.1.1 Current status of the main social indicators

South-East Region / Yugoiztochen region (NUTS 2 level) occupies an area of 19,664 km² (about 18% of the territory of Bulgaria). It comprises 4 administrative districts – Burgas, Stara Zagora, Sliven and Yambol. The Maritsa East coal mining complex is situated mainly on the territory of the Stara Zagora district (BG344, NUTS 3 level), but some parts come within the territories of Sliven (BG342, NUTS 3 level) and Khaskovo districts (BG412, NUTS 3 level, within the borders of NUTS 2 South-Central Region). Stara Zagora district is situated in the central part of Southern Bulgaria, with a territory of 5,129 km² (approx. 26% of the territory of the SE Region).

The three power plants and the briquettes plant together with “Maritsa East Mines” company form a complex of mines and plants, which have a serious impact on the economies and employment of all districts in the SE region – Burgas, Sliven and Yambol, and of the South Central region districts (Khaskovo, Kardzhali etc.). Specialists, workers and companies from these districts work in the complex or supply the necessary materials – oils, chemicals, repair of basic and auxiliary components, information technologies and others.

Table 3.a BG. Structure of the staff of “Maritsa East Mines” by place of residence (2017)

District	Number	Relative weight, %
Stara Zagora	5,270	73
Khaskovo	965	13
Sliven	559	8
Yambol	319	4
Kardzhali	43	1
11 other districts	87	1

Source: Annual report of Maritsa East Mines EAD, 31.12.2017

The population in the four districts (NUTS 3 level) of the South-East region and its distribution are constantly changing according to the opportunities for development of business initiatives.

The district of Burgas is the largest as a territory and population; the share of people at working age is the highest, due to the better opportunities for development, offered by the district’s location at the Black Sea coast. The aging of the population of Yambol district is the highest. Stara Zagora district, which interests us the most in terms of coal mining and its future, shows a significant downward trend in the percentage of people under and at working age, which can be attributed to the unstable prospects of coal mining. On the other hand, parents do not find working in coal mining attractive enough for their children’s development, education and future professional realization.

Significant differences are also observed in the average life expectancy of the population of the four districts in which the TRACER region falls. The lowest life expectancy is in Sliven district, and the highest in Burgas.

All Bulgarian regions are in the bottom 20 of the list of EU regions in terms of life expectancy. SER has the third lowest life expectancy among all EU regions (European Committee of the Regions, 2019).

The corresponding data are shown in **Table 3.b** below.

Table 3.b BG. Population, age distribution, migration and life expectancy in South-East Region

Category		TRACER Region (NUTS 2)				Stara Zagora district				Burgas district				Sliven district				Yambol district			
years		2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Resident population (no.)		1,052,575	1,046,125	1,039,549	1,032,079	323,685	321,377	319,067	316,356	413,884	412,684	411,579	410,331	191,185	189,788	188,433	186,495	123,821	122,276	120,470	118,897
Age distribution (no.)	< 15y	173,307	172,908	173,792	173,928	49,856	49,746	50,148	50,203	67,340	67,256	67,755	68,004	36,879	36,832	36,876	36,700	19,232	19,074	19,013	19,021
	15-64y working age	628,075	622,358	614,056	606,228	191,245	189,467	186,928	184,590	254,896	253,230	250,522	248,084	111,049	109,887	108,471	106,763	70,885	69,774	68,135	66,791
	> 65y	251,193	250,859	251,701	251,923	82,584	82,164	81,991	81,563	91,648	92,198	93,302	94,243	43,257	43,069	43,086	43,032	33,704	33,428	33,322	33,085
Migration increase (Change of residence /or/ International migration (no.))		-593	-1,373	-991	-1,654	-49	-130	-46	-392	1,116	316	670	531	-942	-952	-837	-1,279	-718	-607	-778	-524
Life expectancy at age 65 (year)	female	The average life expectancy of women at the age of 65 in the country is 17.92 years. There is no statistical data by NUTS																			
	male	The average life expectancy of men at the age of 65 in the country is 14.13 years. There is no statistical data by NUTS																			
Average life expectancy (years)	female					77.6	77.7	77.7	77.9	78.2	78.4	78.6	78.8	76.7	77.0	77.1	76.6	77.1	77.6	77.8	77.6
	male					70.5	70.8	70.6	70.8	71.6	71.7	71.8	71.7	69.8	69.4	69.3	69.2	70.5	70.5	70.2	70.4

Source: NSI

In 2018, SE region ranked third among the 6 Bulgarian statistical regions, with unemployment rate of 5.4% (5.2% country's average). There are significant differences within the region, where Stara Zagora district keeps the lowest level of unemployment (2.3%), while Sliven registered 9.7% in 2018. Stable decrease is observed in the region as a whole, and individually in Stara Zagora and Burgas districts, while for the other two there have been fluctuations during the last years.

The employment rate of the population between 15 and 64 years in the country is increasing (from 55.8% in 2005 to 67.7% in 2018). Against this background, in 2018 the employment rate of the population 15-64 years in the SE region was 66.8%, placing it third in the country. Within the region, the highest employment rate is for Stara Zagora district (71.0%).

The corresponding data related to the labour market in the South East Region and its districts is provided in the next **Table 3.c**.

Table 3.c BG. Overview of the labour market of South East Region

Category		TRACER Region (NUTS 2)				Stara Zagora district				Burgas district				Sliven district				Yambol district			
years		2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Employment rate (%) of population 20-64		60.6	62.3	65.7	66.8	60.3	61.1	70.1	71.0	62.2	63.6	64.8	67.4	55.9	58.9	58.9	61.2	62.8	66.2	67.9	62.3
Activity rate (%) of population 15-64		67.7	67.7	70.8	70.7	66.9	65.0	72.3	72.7	69.4	69.9	71.0	71.1	62.9	64.8	65.8	68.0	71.5	71.7	73.5	68.0
Activity rate (%)³	15-24	26.0	23.9	26.3	23.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	25-54	83.2	82.0	84.3	84.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	55-64	58.0	58.8	61.8	63.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average number of employees by economic activities (no.)	Total economy	295,394	298,121	299,701	297,847	101,646	104,411	105,851	105,668	123,543	123,268	123,233	123,317	37,425	37,336	39,212	38,673	32,780	33,106	31,405	30,189
	Agriculture	12,622	12,915	12,939	13,022	3,821	4,033	3,835	3,976	4,118	4,166	4,313	4,288	2,162	2,186	2,198	2,183	2,521	2,530	2,593	2,575
	Industry	76,796	78,278	78,552	77,176	32,439	34,529	36,105	35,902	20,495	20,516	18,838	18,621	11,206	10,924	12,778	12,418	12,656	12,309	10,831	10,235
	- Mining and quarrying	8,900	8,449	8,182	8,259	7,393	7,337	7,364	7,409	1,086	782	512	512	132	85	70	112	289	245	236	226
	- Electricity, Gas and HVAC	6,685	6,604	6,587	6,577	5,133	5,193	5,186	5,182	889	750	745	754	457	457	447	444	206	204	209	197
	Construction	20,831	19,069	19,546	19,815	5,818	5,526	5,418	5,785	11,542	10,162	10,835	10,876	1,678	1,734	1,744	1,675	1,793	1,647	1,549	1,479
	Accommodation and food services	20,771	21,529	22,680	22,778	3,183	3,397	3,492	3,238	15,395	15,772	16,765	17,203	1,196	1,299	1,369	1,351	997	1,061	1,054	986
	ICT	2,085	2,175	2,163	2,169	612	693	690	695	1,251	1,239	1,218	1,230	90	97	104	82	132	146	151	162
Professional, Scientific and Technical activities	4,884	5,001	5,085	4,954	1,364	1,491	1,554	1,502	2,834	2,815	2,824	2,768	396	394	389	398	290	301	318	286	
Gender employment gap (%)⁴		6.6	7.3	8.0	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Registered unemployed (no./th. inh.)		48,163	37,873	32,698	27,829	12,387	8,877	7,436	6,134	15,970	13,374	12,242	10,688	12,890	10,450	8,907	7,550	6,916	5,172	4,113	3,457
Unemployment rate (%)	female	10.2	7.8	6.8	4.8	9.8	6.0	2.9	2.3	10.3	9.0	8.6	5.3	11.1	9.2	10.2	9.7	12.2	7.6	7.6	8.2
	male	10.6	7.9	7.2	5.9																

³ Country data, Bulgaria, Source: Eurostat⁴ Country data, Bulgaria, Source: Eurostat

Category		TRACER Region (NUTS 2)				Stara Zagora district				Burgas district				Sliven district				Yambol district			
years		2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Unemployment benefits monthly average (euro)		The daily cash unemployment benefit amounts to 60% of the average daily wage or average daily social security income on which social security contributions have been paid or payable to the Unemployment Fund for the last 24 calendar months preceding the month of termination of the social security and cannot be less than the minimum and bigger than the maximum daily amount of the unemployment benefit. The monthly amount of the cash unemployment benefit is determined by multiplying the number of working days in the month to which it relates by the above daily rate. The minimum and maximum daily amount of the unemployment benefit is determined annually by the State Social Security Budget Act. For 2019 the daily minimum amount of the unemployment benefit is BGN 9 and the daily maximum amount - BGN 74.																			
Long term unemployment rate (%)⁵	female																				
	male	39	32	25	20	39	31	25	18	21	14	11	8	56	50	42	35	48	44	32	24
Youth unemployment rate (%) 15-24		17	16	16	15	17	17	18	18	15	15	15	13	20	17	16	16	17	15	13	14
Average nominal monthly net/or/gross wages (euro)	Total economy	4,787	5,062	5,493	5,994	5,454	5,752	6,262	6,744	4,654	4,878	5,254	5,739	4,003	4,314	4,659	5,115	4,117	4,410	4,873	5,530
	Agriculture	4,237	4,521	5,032	5,334	4,014	4,280	4,633	5,142	4,275	4,742	5,270	5,458	3,950	4,327	4,792	4,973	4,757	4,710	5,431	5,731
	Industry	4,747	5,219	5,867	6,365	4,897	5,453	6,252	6,640	5,281	5,763	6,342	6,859	4,004	4,260	4,733	5,213	4,156	4,497	5,084	5,882
	- Hard coal and lignite mining	9,942	10,237	10,658	11,567	10,783	10,903	11,171	12,096	5,559	5,359	5,754	6,756	6,032	6,935	7,001	7,834	6,579	6,859	6,324	6,867
	- Electricity, Gas and HVAC	11,926	12,327	12,992	13,312	13,353	13,540	14,102	14,435	7,140	8,013	8,526	9,005	6,828	7,049	7,422	7,741	8,409	9,123	13,329	12,776
	Construction	4,824	4,666	4,836	5,398	4,838	4,818	5,148	5,788	5,181	4,842	4,955	5,399	3,340	3,891	3,723	4,444	3,874	3,890	4,169	4,949
	Accommodation and food services	3,268	3,458	3,666	4,097	2,810	2,955	3,157	3,452	3,473	3,682	3,883	4,327	2,436	2,672	2,844	3,207	2,522	2,683	2,935	3,387
	ICT	6,050	7,010	7,258	8,287	5,251	6,677	7,273	7,897	6,904	7,792	7,822	9,166	3,954	4,244	4,656	4,735	3,133	3,861	4,481	5,102
Professional, Scientific and Technical activities	6,099	4,995	5,106	5,748	4,847	5,132	5,070	5,551	7,409	5,243	5,445	6,169	3,293	3,828	4,128	4,545	2,894	3,483	3,421	4,331	

Source: NSI, Eurostat

⁵ Calculated as a proportion of long-term unemployed among all unemployed (OECD, 2020).

- *Living conditions*

In 2017, the population at risk of poverty or social exclusion in SE region amounted to 40%, compared to the national average of 38.9%. In terms of this indicator, the SE region ranks second in the country. Compared to 2015, the indicator for the region decreased by 2.3 percentage points and at the national level - by 1.5 percentage points. The at-risk-of-poverty population varies significantly within the districts in the region: Yambol (28.5%), Sliven (48.5%), Burgas (41.7%), and Stara Zagora (38.5%).

The development of the water supply network in the region is higher than the average for the country. Wastewater collection network is at an average level of development. There exist large intra-regional differences in the level of service to the population from wastewater treatment infrastructure. The share of the population served by a system for organized garbage collection is close to the average for the country.

- *Health*

In 2018, there were 46 medical establishments in the SE region with capacity of 6,805 beds. Most of them are concentrated in Burgas (20) and Stara Zagora (14). Problems exist in terms of ensuring equal access to health services for the population in the outermost villages and towns.

The total registered morbidity of the population in 2018 on the territory of Stara Zagora district was 390,353 cases, which is 1.23 cases per person. This includes 164,772 newly discovered cases. The newly discovered morbidity in children from 0 to 17 years was 0.85 cases per person, which is higher than of the population over 18 years – 0.45 cases per person. In the structure of general morbidity in Stara Zagora district, the highest relative share are diseases of the circulatory system (24%) and diseases of the respiratory system (24%) (Regional Health Inspectorate, 2019).

- *Education*

According to the National Statistical Institute, during the 2017/2018 school year, the total number of students in general and vocational schools in Bulgaria was 730,576, of them 21,805 (3%) dropped out due to various reasons. The statistical data shows that from all 13,902 pupils from I to VII grade that dropped out from school in the country, SE region ranks second with 3,094 (22%) pupils, 27% of which from Stara Zagora district. In terms of university graduates, SE region provides 5% of the total higher education graduates in the country, 38% of which from Stara Zagora district.

Table 3.d BG. Education in South East region

Education (2017/2018)	Yugoiztochen Region (BG34)
Kindergartens	262
Educational institutions, of which:	379
<i>general schools</i>	312
<i>art & sport</i>	9
<i>vocational secondary schools & colleges</i>	55
<i>universities</i>	3
Students 2017/2018	
Students I-IV grade	43,705
Students V-VII grade	31,643
Graduated (V-VII grade)	15,577
Students VIII-XII grade	18,583
Graduated (VIII-XII grade)	3,603

Source: NSI

- *Culture*

The schools of arts and culture have a significant place in the educational system of the Southeast region. There are 6 such schools on the territory of the region. About 15% of the national cultural heritage sites are to be found there. Of great regional importance are the theatres in Burgas and the opera house in Stara Zagora. The community cultural centres are well-developed.

Table 3.e BG. Cultural centres in South East region

	Yugoiztochen Region (BG34)
Theatres	12
Cinemas	10
Museums	32
Community clubs	545
Libraries	7
Community cultural centres with operating libraries	506
Radio & TV operators	12+11

Source: NSI

- *Personnel of the mines and TPPs within the Maritsa East complex.*

Table 3.f BG. Personnel of Maritsa East Mines by staff category⁶

Year	2011	2012	2013	2014	2015	2016	2017	2018
Number of staff members, including:	7,219	7,058	7,030	7,130	7,285	7,241	7,243	7,319
Production	5,773	5,547	5,561	5,658	5,839	5,790	NA	NA
Administration	1,130	1,203	1,187	1,195	1,169	1,172	NA	NA
Operating	316	308	282	277	277	279	NA	NA

Source: Maritsa East Mines EAD

Table 3.g BG. Personnel of Maritsa East Mines by education level

Year	2011	2012	2013	2014	2015	2016	2017	2018
Number of staff members, including:	7,219	7,058	7,030	7,130	7,285	7,241	7,243	7,319
Higher education	1,212	1,186	1,229	1,278	1,417	1,458	1,516	
Vocational technical education	3,212	3,188	3,270	3,326	3,374	3,337	5,150	
Upper secondary education	2,251	2,200	2,116	2,184	2,208	2,183	343	
Primary education	544	484	414	342	286	263	234	
Without education	0	0	0	0	0	0	0	

Source: Maritsa East Mines EAD

“AES-3C Maritsa-East 1” TPP employs over 380 people. At the end of 2019, the employees of TPP “Maritsa East 2” amounted to nearly 2,400.

At TPP “Maritsa-East 3 Contour Global” there are almost 500 employees, and in addition about 4,000 employees of its sub-contractors, depending on the activities performed. Most people working on the territory of the plant spend about an hour to get to work. Among them there are residents of the town of Galabovo, but also people from the districts of Khaskovo, Stara Zagora and Yambol - a total of over 40 municipalities.

⁶ Unfortunately, the information from Maritsa East Mines for the last several years is not complete

There is no reliable information regarding the number of sub-contractors to “AES-3C Maritsa-East 1” TPP and “Maritsa East 2” TPP, but it should be noted that some of the sub-contractors serve all three plants.

3.1.2 Comparative analysis

This chapter is meant to compare the key social indicators from the year with the major mining development and from the last historical year (2018).

As there is no decline of coal mining activities in the region, this chapter is not applicable to the region.

3.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

3.2.1 National public policies

According to the EC's country report for 2019 (EC, 2019) the Bulgarian social policies are characterized by:

- High levels of poverty and income inequality
- Regional and spatial disparities
- Children and the elderly people at risk of poverty or social exclusion
- Inequality of opportunity for children of low-skilled and high-skilled parents
- Roma population living at risk of poverty
- Limited support for people with disabilities
- Limited affordability of housing and energy services, especially for vulnerable groups
- Weak impact of the tax and benefit system on reducing poverty and income inequality
- Exclusion from the social security system of certain groups of employees
- Minimum income adequacy and coverage
- Social services are hampered by low quality, limited accessibility and the lack of an integrated approach
- A comprehensive reform of social services under preparation
- Increasing demand for long-term care services.

The social protection system cannot tackle the major social issues. Serious inequalities of income and the high number of people at risk of poverty require active inclusion policies. These challenges also point to the need for targeted support to vulnerable groups, as well as better availability and quality of integrated social and healthcare services and housing. The adequacy and coverage of the minimum income remain limited and there is no objective mechanism for regularly updating it. The impact of taxes and benefits on reducing poverty and inequality is significantly lower than the EU average. This reflects the low level of social spending, the uneven availability of social services across the territory and the limited redistributive effects of the taxation system.

The education system is being modernised at all levels, but significant challenges remain. Persistently high rates of early school leaving and low educational outcomes highlight the need for significant investment in education. This is particularly relevant for addressing the challenges of quality and equality of opportunity in early childhood education and care, school education and vocational education and training. Despite ongoing efforts, higher education is insufficiently aligned with the needs of the jobs market.

The rate of participation in adult learning is one of the lowest in the EU. Inclusion of Roma in education and the high impact of socio-economic status on educational outcomes remain problematic” (EC, 2019).

Institutional structure

The state plays a general role of regulating, controlling and facilitating industrial relations through its institutions. **The Ministry of Labour and Social Policy (MLSP)** is the main national authority dealing with labour regulations and working conditions. It carries out consultations and cooperation with representative organisations of workers and employers at the national level in the development and implementation of policies in the labour market, the protection of the national labour market and training the workforce. There are 9 second-level units subordinated to MLSP:

- State Agency for Child Protection
- Bulgarian National Employment Agency
- Social Assistance Agency
- General Labour Inspectorate Executive Agency – monitors the compliance of the labour legislation on quality of work, as well as health and safety at work.
- Agency for People with Disabilities
- National Institute for Conciliation and Arbitration - facilitates the settlement of collective labour disputes.
- Centre for Human Resources Development and Regional Initiatives – supports human capital and regional cooperation among social sector institutions.
- Social Protection Fund
- Working Conditions Fund – finances activities and events for the improvement of working conditions with national, branch and sectoral importance.

There are no specialised labour courts in Bulgaria - labour conflicts are dealt with by the general courts. Trade unions and their branches are entitled, by the request of employees, to represent them in court (Eurofound, 2020).

The National Security Institute pays unemployment benefits.

The Ministry of Education is responsible for literacy courses of low educated adults.

The National/Territorial Expert Medical Commissions certify disabilities and work capabilities.

Following the Labour Code amendments in 2016, a decision by the Council of Ministers, based on a census on the representativeness of the social partners in Bulgaria, formally recognised five nationally representative employer organisations and two trade unions: Association of Industrial Capital in Bulgaria (BICA); Bulgarian Industrial Association (BIA); Confederation of Employers and Industrialists in Bulgaria (KRIB); Bulgarian Chamber of Commerce and Industry (BCCI); Union for Private Economic Enterprise (UPEE); Confederation of Independent Trade Unions in Bulgaria (CITUB); Confederation of Labour Podkrepa (CL Podkrepa) (Eurofound, 2020).

Documents

The Labour Code is the most important source of labour law. It regulates the labour relations between the employee and the employer and the other relations directly related to them.

The Employment Promotion Act provides for employment services, financing of active employment policy, rights and obligations of employees and employers, procedure of information in case of collective dismissal, employment promotion, stimulation of entrepreneurship, measures for employment creation, employment protection, vocational training, and others.

The Social Insurance Code⁷ regulates the public relations connected with the state social insurance in case of general illness, occupational accident, occupational disease, maternity, unemployment, old age and death, and the additional social insurance.

⁷ <https://www.lex.bg/laws/ldoc/1597824512>

The Innovation strategy for smart specialization (ISSS) of the Republic of Bulgaria was developed in line with the Europe 2020 Strategy, covering the period 2014-2020, and presents the national vision for tackling the public challenges in demographics, sustainable development, intellectual capital and health of the nation.

ISSS identifies the economic priorities within the research and innovation to create a competitive advantage through the development and tuning the country's strengths in research and development to industry needs. The aim is to respond to new opportunities and changes in the market by focusing investments in areas that provide increased value added of the economy and its competitiveness on international markets.

The smart specialization of the South-East Region (SER) is concentrated in the thematic areas of New technologies in the creative and recreative industries, Mechatronics and clean technologies, Industry for healthy lifestyle and bio technology. Specific specializations are set for each individual district within SER.

National Reform Programme (Ministry of Finance, 2020) developed in line with the Europe 2020 Strategy.

In the context of the Europe 2020 strategy and taking into account the higher poverty level registered among certain groups of the population, the Bulgarian government has adopted a National Target for reducing the number of persons living in poverty by 260,000 people by 2020. There are four specific sub-targets within the National Target:

- Reducing the number of children aged between 0 and 18 years living in poverty by 78 thousand people (30% from the total for the national goal and 25% from the number of poor children in 2008);
- Reducing the number of the people aged 65 and over living in poverty by 52 thousand (20% from the total for the national goal and 10% from the number of poor older persons in 2008);
- Reducing the number of the unemployed aged between 18 and 64 living in poverty by 78 thousand people (30% from the total for the national goal and 25% from the number of poor unemployed aged between 18 and 64 in 2008);
- Reducing the number of the workers aged between 18 and 64 living in poverty by 52 thousand people (20% from the total for the national goal and 22% from the number of the working poor aged between 18 and 64 in 2008)

The vocational education and training policies are focused on improving the access, improving the quality, linking the vocational education and training more closely to the labour market and on the practical realization of graduates and those with acquired profession. The focus is on developing dual training as a priority, as well as on training professionals who are in demand on the labour market but are not willing to train in these professions and specialities and to provide staff for areas that are priorities for the development of the economy at regional level.

National target for education by 2020:

- 11% share of early leavers from education and training
- 36% share of the people aged 30-34 having completed tertiary education

Strategy on Employment of the Republic of Bulgaria 2013-2020⁸ was developed in line with the National Reform Programme, to contribute to the implementation of the National Convergence Programme.

National Strategy for Poverty Reduction and Social Inclusion 2020 focuses on employment and educational measures.

⁸ <http://mlsp.government.bg/uploads/1/zakoni/stratzaetost-2013-2020.doc>

National Development Programme: Bulgaria 2030 (Ministry of Finance, 2020) is a strategic framework document, which determines the vision and the overall goals of development policies in all sectors of state governance, including their territorial dimensions. The document sets out three strategic goals which will be implemented by government policies, grouped into five development areas (axes) and puts forth 13 national priorities.

The programme, among others, puts a priority on development of education and skills: *“Special focus of government policy for raising the skills of the working-age population will be to offer effective lifelong learning opportunities. A system of incentives and mechanisms will be put in place to improve the skills of the population (including the elderly) to allow the reintegration of the unemployed into the labour market, including structurally unemployed, long-term unemployed and economically inactive low-skilled workers. Enhancing their skills and bringing them back into employment will help increase macroeconomic productivity while also playing the role of a tool for social inclusion.”*

National strategy for reducing poverty and promoting social inclusion 2020⁹ aims at developing and implementing a unified, consistent and sustainable policy on social inclusion, based on an integrated approach and cross-sector cooperation at national, regional, provincial and municipal level. The goal of this strategy is to improve the quality of life of the vulnerable groups of Bulgarian society and to create the conditions for their fulfilment by reducing poverty and promoting social inclusion.

National Concept for Spatial Development 2013-2025¹⁰ serves as a basis for the regional development planning. The 2019 update of this document establishes the planning necessary for the Operational programme “Regional Development” 2021-2027. In relation to the expected transition away from coal, it specifies the social (employment), ecological, and juridical problems that need to be addressed, but does not go into detail about these.

Action Plan for Employment 2020 (annual)¹¹ - its main priorities are services for job seekers and inactive persons, as well as training of the workforce.

The priority directions and tasks in the field of demographic policy are formulated in the updated **National Strategy for Demographic Development of the Population in the Republic of Bulgaria 2012 – 2030** and are aimed at achieving the following strategic goal – slowing down the pace of population decline with a tendency to stabilize long-term care and high quality human capital, including people with their health status, education, qualifications, abilities and skills. The main purpose of work in the field of demographic policy is to limit the negative effects of demographic imbalances on public finances and social systems (China-CCC, 2020).

3.2.2 Regional and local policies

Regional and municipal development plans are being elaborated in line with the provisions of the Spatial Development Act. All current municipal (and regional plans) cover the period until 2020. The next planning period will be 2021 – 2027 (Integrated Municipal Development Plans). The plans present the strategic vision for development, formulation of objectives, priority areas and measures. Social development is also covered.

Regional Plan for the Development of the South East Planning Region in the period 2014-2020 - analyses the regional socio-economic and ecological state and potential and presents strategic development objectives. The second strategic objective addresses social cohesion and reduction of inter-regional inequalities in SEE through investments in human resources and improvement of social infrastructure.

⁹

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj_o_DJ6NvpAhVSxIUkHdjOACcQFjAGegQIBxAB&url=http%3A%2F%2Fwww.strategy.bg%2FFileHandler.ashx%3FfileId%3D9429&usg=AOvVaw2euie-zwnhoQfOh5gQY0RY

¹⁰

https://www.mrrb.bg/static/media/ups/articles/attachments/0_ANKPR_CORRECTED_30.04.2020%20FIN1dd18d336cc6b50374c5c7c1a5098f55.pdf

¹¹ <https://www.az.government.bg/web/files/PageFile/149/12646/nacionalen-plan-za-dejstvie-po-zaetostta-2020.zip>

The three priorities in this domain cover access to educational, health, social and cultural services, improvement of quality characteristics and competitiveness of human resources, strengthening the administrative capacity of local and regional authorities.

Municipal Development Plan of Stara Zagora 2014-2020¹². The strategic objective in the social field is to ensure equal access to quality education, sustainable employment, rich cultural life and personal development, i.e.: 70% employment of the population between 15 and 64 years; 33% relative share of people with high education compared to the population above 7 years old.

The Regional Development Strategy of Stara Zagora Region 2014-2020¹³ sets the following strategic directions related to social development:

- Improving the labour market by stimulating labour mobility, youth employment, vocational education systems, forms of qualification and retraining and lifelong learning;
- Support for social integration, poverty reduction and promotion of social inclusion of disadvantaged groups;
- Support for optimizing and improving the quality of the health care system and social services, for improving the educational system and preservation and development of culture, cultural heritage and cultural institutions.

Regional administrations elaborate also strategies for development of social services, which address specific social groups and individuals at risk and aim to ensure affordable social protection, quality social services, equal access and opportunities, full and active participation in all areas of public life.

None of the regional and local policy documents includes specific measures related to the coal sector, which is reasonable, taking into consideration the State policy until 2020.

3.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

3.3.1 Recent development of coal transition

For many years, Bulgarian electricity has been built on 3 whales: coal from the Maritza East basin, nuclear power and energy efficiency. The coal plants provided manoeuvrability despite their high minimums, and the Kozloduy nuclear power plant (Kozloduy NPP) provided cheap electricity in the base load. Energy efficiency was highly valued, intensive works were devoted to this area, but low energy prices, including of electricity, made it impossible to justify investment and led to high energy intensity of GDP.

Despite the economic collapse in the 1990-ies, the power sector retained its importance based on the use of lignite from the Maritsa East basin. However, the EC's and Bulgarian policy towards RES have radically changed the priorities in all energy subsectors, including power energy, which has gradually taken the lead due to the abundance of wind and solar sources and the ability of electricity to transform into other types of energy regardless of scale.

Suddenly, Bulgaria and the other countries with similar energy balance found themselves in a difficult situation. Trade unions and leading energy experts tried to put the issue on the table, but their attempts were repulsed by the State, mines and power plants, who preferred not to talk about the future of coal energy, in hope that the country would be able to use mitigating opportunities, and even more so to avoid political battles. In order to avoid discussion of these fundamental perspectives, the Ministry of Energy chose not to participate in EU initiatives, in particular in "*The Coal Regions in Transition Platform*".

¹² https://www.starazagora.bg/uploads/posts/OPR_SZ_proekt_2014-2020.pdf

¹³ <http://www.chambersz.com/pdf/oblastna-strategia-razvitie-stara-zagora.pdf>

The “*Integrated Energy and Climate Plan of the Republic of Bulgaria 2021 – 2030*”, presented in early 2019 by the ME and MoEW and updated at the beginning of 2020, showed that the ME intend to support coal and electricity production in the “Maritsa Iztok” by 2025, after which a gradual reduction of capacity will start with approximately 200 MW annually. This possibility is of course still too general, it does not take into account technological capabilities and specific requirements for management of the electricity system, plant ownership and operating contracts, but showed that the ME understands the gravity of the situation. The public pressure has led to a discussion in the National Assembly on the future of energy coal, which ended with a decision Bulgaria to join the EU Coal Regions in Transition Platform, but on the condition that it does not stop using coal. This absurd decision, due to political struggles, will gradually be dropped, as demonstrated by the Bulgarian NECP.

During the last 1 – 2 years, along with TRACER, several other initiatives dedicated to the topic have started in Bulgaria, such as the Interreg project “DeCarb” and events organized by the Energy Management Institute. Within these and other forums, as well as during TRACER interviews (Personal communication, May 2020), several key ideas for the regional transition to new businesses have been outlined.

Businesses, which would preserve coal mining:

- coal gasification, including carbon neutral gasification process technologies
- carbon capture and storage (CCS)
- use of coal as a fertilizer

Other alternative businesses in the region:

- transformation of the existing coal TPPs into highly manoeuvrable gas-firing TPPs
- production of energy storage solutions, such as batteries for electrical vehicles and large storage for electricity and heat
- production of hydrogen technologies
- development of a new modern industrial zone (using public support)
- enhanced research and innovation activities, driven by the local universities and businesses, in the areas of virtual reality, water purification, modern energy, etc.
- Burgas region, owing to its location at or close to the Black Sea coast, may further develop the transport corridors and the perspectives of the international trading route with China and other countries of the East.

Most of the above will take advantage of the available energy engineering human capacity in the region.

According to others (Personal communication, May 2020), however, none of the possible new businesses is labour intensive, so the region would inevitably be depopulated. They believe that the transition is not so problematic for the current employees in the coal sector and related businesses, because the sector will abate gradually, in parallel with the employee retirement. On the other hand, young employees / workers will be forced either to retrain in accordance with the emerging job opportunities in the region, or to look for work elsewhere in the country or abroad.

3.3.2 Transition objectives. Key issues analysis

The region **does not have** any social (incl. re-skilling) transition objectives. Such are neither defined in any policy document (programme, plan, strategy, etc.) nor identified as a result of a discussion, analysis, etc. The reason is that the transition is a highly sensitive topic for the policy makers and only during the last month they started to venture into this field. The definition of the social and re-skilling objectives can result only from discussions with all interested stakeholders, such as the events in TRACER. Their definition needs to be preceded, or at least go in parallel, with the definition of the technological and business climate (entrepreneurial) objectives.

The below analyses, therefore, do not focus on the achievement of particular transition objectives, but provide only general observations about different transition aspects.

This section includes **PESTEL** (Political, Economic, Social, Technological, Environmental, and Legal) analysis of the re-skilling needs of the Maritsa East region. The analysis addresses a complex issue: transition away from coal of a country with high socio-economic and energy coal dependency. It is important in parallel with the socio-economic factors to consider the energy-related situation too.

For example, Bulgaria's theoretical renewable energy potential is huge, but its utilization would encounter many difficulties and problems, so it is important to assess the impact of Bulgaria's electricity sector transition to RES and the impact of lower overall electricity generation (e.g. to replace the traditional electricity export by electricity import).

Political factors

Decisive measures are needed to restructure and focus on social policy affecting about 40,000 persons – about 16,000 directly employed in the coal sector (nearly 11,000 in the mines and above 5,000 in TPPs) and additional about 24,000 people indirectly employed in related businesses.

In Bulgaria, there are hot debates about the electricity market, in the absence of mutual understanding and the pursuit of a balanced solution. The feud between political parties causes the renewal process to slow down.

Economic factors

Electricity trading rules will significantly impede the participation of inefficient production in the market. For Bulgaria, this refers to the capacity mechanism trade restrictions, as well as to the covering of non-recoverable costs and securing the continuing nuclear energy generation.

Bulgaria is one of the poorest countries in Europe. This provides good economic opportunities for new businesses, but they are difficult to utilize due to insufficiently skilled manpower, small scale of the country, and market limitations (e.g. poor public governance).

The participation of the Bulgarian coal generators in the regional electricity market will be very difficult due to disproportions that happened during the privatization of power plants, delay of key power market elements and still existing non-market elements in the energy sector.

Under the pressure of the European transitional legislation Bulgaria has undertaken measures for introduction of power market and meeting the requirements of the Just Transition Fund. If gas control modules are built at the site of the coal plants, the South East Region (SER) will continue to play an important role in the electrical power system (EPS), but with significantly less manpower.

The export of electricity, whereby the Bulgarian power system assumes the non-recoverable costs caused by erroneous past governmental decisions, should be replaced by electricity trading. Electricity export may be replaced by export of modern technological goods.

Social factors

The human resources released from the mines and TPPs could be employed in new energy and non-energy businesses (see the above section for details), some of which would take advantage of the available energy / engineering expertise in the region.

A significant change in lifestyle and a change in livelihood is required particularly in Maritsa East Coal mining complex, Stara Zagora district and SER.

There would be strong adverse impact on workers in mines and power plants and their families. Similar, but not to such an extent, impact would experience the employees in the related service and construction sectors. It is expected that the structure of manpower will significantly change: employment in mines will gradually decrease, employment in restoration and recultivation activities will increase up to the point when deserted mines become appropriate for agriculture and production of energy crops. Migration to Burgas region, other big cities and abroad may take place, unless extensive development of new businesses is supported.

A set of legislative acts imposing requirements on different ministries – Ministry of Energy, Ministry of Economy, Ministry of Regional Development and Public Works, Ministry of Finance and Ministry of Labour and Social Policy – will have to create an attractive investment environment that does not

differentiate Bulgarian and foreign investors. Parameters should differ according to the country's preference for certain technologies.

Support should be provided to families whose members have lost their jobs, in close cooperation with the trade unions (*Confederation of Independent Trade Unions of Bulgaria and KT "Podkrepa"*).

A decrease of the purchasing power is expected for the social groups affected by the transformation. This will have not only direct effect on these social groups, but also indirect effect on the rest of the region.

There are perspectives 1) to attract investments for replacement activities 2) to re-qualify the workforce 3) to support the market of new industries. These can be supported by research funding from local specific funds and active participation in European programs. Additional support can be obtained by entering immediately into the Platform Coal Regions in Transition and identification of projects for new technologies funded from EIB.

New technologies (e.g. ones listed in the previous section) are one of the most attractive solutions. However, they are better suited for younger workers with high qualification. While the coal sector workers gradually retire, a younger generation of professionals need to be prepared as soon as possible.

In the region, there are various manufacturing activities not related to the coal sector. They come from different countries in the region (Russia, Turkey), from the European Union countries, from China. Technologically mature and advanced Bulgarian companies are of small scale and usually serving companies outside Bulgaria.

Environmental

The environmental benefits of closing Maritsa East mines are huge and numerous. Land restoration activities will be needed. These topics were assessed in Deliverable 3.3 of TRACER (Knoche, D. 2020).

Legal

The legal framework should be amended and prepared so to attract investors to the sites of the closing one after the other mines.

Clean Energy for All Europeans envisages gradual ceasing of fossil fuels use. The new European Commission intends to amend the regulations in direction of increasing the requirements towards a more intensive transition. National policies must reflect the EU policy in accordance with the local conditions, taking into consideration the high socio-economic and energy dependence on coal. The new documents, which will enforce a more intensive regional transition, are crucial, as currently there are no such concrete documents.

3.3.3 Non-market mechanism for recovery of the generating system

The introduction of electricity market in Bulgaria started many years ago but its progress was hampered by various factors, one of which was the ownership of power plants. Large foreign investors received lucrative contracts both in terms of coal and in terms of electricity and service prices, and it gradually turned out that only the state-owned TPP Maritza East 2 was able to participate in the electricity market and provide the necessary market services.

The result of this organization turned out to be deplorable for Maritza East 2 TPP and Maritza East Mines. In order to prevent the financial catastrophe, the Government decided to propose to the National Assembly to amend the Energy Act by repealing the existing "market" relations for one year and to designate TPP Maritza East 2 as the single capacity supplier until fair market rules are introduced.

How realistic this task is will be understood after the end of the deferral period, but it is difficult to expect significant changes provided that the owners of TPP Maritza-East 3 Contour Global and of TPP AES Galabovo have perfect contracts with the National Electric Company. The amendment of the Energy Act violates the requirements of the *Clean Energy for All Europeans* package. From the other hand Article 22 Design principles for capacity mechanisms of REGULATION (EU) 2019/943 sets

strict conditions on the internal market for electricity: “(b) from 1 July 2025 at the latest, generation capacity that started commercial production before 4 July 2019 and that emits more than 550 g of CO₂ of fossil fuel origin per kWh of electricity and more than 350 kg CO₂ of fossil fuel origin on average per year per installed kWh shall not be committed or receive payments or commitments for future payments under a capacity mechanism”.

It is not clear how in one year the rules of the electricity market will be introduced in Bulgaria, provided that no Bulgarian power plant that meets the condition of efficiency required by above mentioned Regulation and can only use the opportunities to sell electricity. Deprived of the opportunity to participate in **the capacity market**, they have no choice but to generate losses and cease operation.

A decision of the National Assembly will be used, which provides state aid only to certain producers through direct assignment and negotiation. The right to maintain a cold reserve will be granted only to the state TPP Maritza East 2, and a capacity mechanism will be introduced from July 1, 2021.

3.3.4 The sketch / scheme of the future workforce structure, in a holistic approach

There are different projections for the transition away from coal, depending on the source of information. According to a projection in NECP, the coal share in the net electricity production will have the following dynamics:

Table 3.h BG. Projected coal share in the net electricity production of Bulgaria

	2020	2025	2030	2035	2040
Coal share in the net electricity production	44.2%	40.4%	30.4%	15.0%	2.3%

Source: NECP

Table 3.i BG. Six scenarios for TPP capacity in the region [MW]

Scenario	2020	2025	2030	2035	2040
Optimistic BAS scenario (2017)	3214	3214	3214	3214	3214
Reference BAS scenario (2017)	3214	3214	2514	1606	0
Pessimistic BAS scenario (2017)	3214	2514	2060	0	0
Very pessimistic BAS scenario (2017)	3214	2060	0	0	0
EU Reference scenario (2016)	3214	3214	3214	2060	1606
Maritza East mines, according to the concession contract	3214	3214	3214	2485	2485

Source: Bosev, 2017

Given that the social impact would be the highest for the coal sector workers and less for the related businesses, an indicative projection about the former (we assume that they are currently 18,000 persons) will be made for each scenario, assuming that the number of employees will change proportionally to the numbers in the scenarios presented in the above two tables.

According to the Register of employed persons of NSI, the average age of the employees of the individual companies in the Maritza East complex is as follows:

- Maritza East Mines - 48 years (32.8% over 50 years);
- TPP Maritza East 2 - 46 years (and over 50 years are 28.9%);
- AES Galabovo TPP - 40 years (and over 50 years are 17.3%);
- Contour Global Maritza East 3 TPP - 45 years (27.4% over 50 years).

The retirement age depends on the category of labour. For example, miners are “3rd category of labour” and retire at age 45.

Table 3.j presents a very rough estimate for the number of persons in working age who would lose their jobs in the 7 scenarios presented in **Table 3.h** and **Table 3.i**.

Table 3.j BG. Estimated number of persons who would lose their jobs – 7 scenarios

Scenario	2021-2025	2026 – 2030	2031-2035	2036 - 2040	Total
Forecast of the NECP (2019)	0	472	2671	1572	4716
Optimistic BAS scenario (2017)	0	0	0	0	0
Reference BAS scenario (2017)	0	320	1485	5394	7200
Pessimistic BAS scenario (2017)	320	0	7937	0	8257
Very pessimistic BAS scenario (2017)	2863	7937	0	0	10800
EU Reference scenario (2016)	0	0	2863	0	2863
Maritza East mines, according to the concession contract	0	0	483	0	483

The above table actually represents an indication of the re-skilling needs in each scenario.

The regional development (types of businesses, workforce structure, etc.) would depend on the specialization of the region – a topic that will be intensively discussed in the coming months within TRACER and other initiative. At this point, no projections for the future workforce structure in the region can be made.

The below table provides a brief **SWOT analysis** of the social and re-skilling issues in the region.

Table 3.k BG. SWOT analysis of the social and re-skilling issues in Maritza East region

<p>Strengths</p> <p>The region has well developed infrastructure - energy, transport, business, and educational. Availability of qualified engineers, especially in TPPs.</p>	<p>Weaknesses</p> <p>No available plan about the transition. This prevents the preparatory activities and funding allocation.</p> <p>The region is highly dependent socially and economically on the coal sector.</p> <p>Low overall qualification of the workers in the coal mines.</p>
<p>Opportunities</p> <p>Bulgaria may receive substantial financial support of 2.7 billion euros from the Just transition fund¹⁴. A gradual planned transition, taking place in the next 10-15 years, may substantially decrease the re-skilling needs, as the majority of current employees would retire during that period.</p> <p>The region may learn from the good practices of other regions that have already advanced their transition.</p>	<p>Threats</p> <p>Further delay of the transition planning would substantially reduce the opportunities for the region. Such a delay may happen due to political reasons.</p>

3.4 Conclusions

The transition is very complicated and inevitably linked with social changes and difficulties, imposing serious challenges for the employees in the coal mines and TPPs and requiring high public expenditures.

According to Eurostat in 2017 the consumption of lignite in Germany was 44% of the total in the EU, followed by Poland (16%), the Czech Republic and Greece (both 10%), Bulgaria (9%) and Romania (7%). Germany has a plan to invest in phasing out coal-fired power stations by 2038, about €40bn. A rough comparison shows that Bulgaria should invest about 5 times less, i.e. 9 billion euros, which is

¹⁴ <https://www.investor.bg/nachalo/0/a/ek-moje-da-predostavi-na-bylgaria-27-mlrd-evro-ot-fonda-za-spravedliv-prehod-305287/>

beyond the country abilities. The Just Transition Mechanism (JTM) will provide targeted support to regions and sectors that are most affected by the transition towards the green economy.

The joint efforts, activated during the last year, are expected to bring results. Additionally, many young Bulgarian emigrants return to the country and bring international expertise into the development of innovative technologies, which would replace the coal businesses, such as electricity accumulation devices, hydrogen technologies, synthetic fuels, and others. There are feasible opportunities for SER to attached highly qualified human resources, if appropriate State and local policy is in place.

3.5 References and further links

- Bosev G., 2017. Assessment of the situation and development perspectives of Maritza East Mines.
- China-CCC, 2020. Bulgaria social briefing: OUTLOOK OF THE SOCIAL 2020 YEAR, available at <https://china-ccc.eu/2020/03/11/bulgaria-social-briefing-outlook-of-the-social-2020-year-for-bulgaria/>
- EC, 2019. SWD (2019) 1001 final - Country Report Bulgaria 2019 Including an In-Depth Review on the prevention and correction of macroeconomic imbalances, available at https://ec.europa.eu/info/sites/info/files/file_import/2019-european-semester-country-report-bulgaria_en.pdf
- EU, 2019. Communication from the commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM (2019) 640 final, Brussels, 11.12.2019
- EU, 2020. Proposal for a Regulation of the European Parliament and of the Council, establishing the Just Transition Fund, COM (2020) 22 final, 2020/0006 (COD), Brussels, 14.1.2020,
- Eurofound – European Foundation for the Improvement of Living and Working Conditions, 2020. Living and working in Bulgaria available at <https://www.eurofound.europa.eu/country/bulgaria#actors-and-institutions>
- European Committee of the Regions, 2019. European Regional Social Scoreboard. <https://cor.europa.eu/en/engage/studies/Documents/European%20Regional%20Social%20Scoreboard/European-Regional-Social-Scoreboard.pdf>
- Knoche, D., Rademacher, A., Schleppehorst, R., 2020. TRACER Report on the environmental impacts and sustainable reclamation, Project No: 836819, WP 3 – Task 3.4 / D 3.3 available at https://tracereh2020.eu/wp-content/uploads/2020/03/Report_environmental_impacts_sustainable_reclamation_solutions.pdf
- Ministry of Finance, 2020. National Reform Programme, available at <https://www.minfin.bg/en/867>
- Ministry of Finance, 2020. National Development Programme, available at https://www.minfin.bg/upload/43546/Bulgaria%202030_EN.pdf
- National energy and climate plans (NECPs). <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans>
- Personal communication with Valentin Kolev (TU-Sofia), Todor Mihaylov (Maritsa East 2 TPP), Oleg Stoilov (CCI-SZ), Rumyana Grozeva (SZEDA), Mihaela Dineva (SZEDA), Jordan Yankov (Nucleon), May 2020. Anonymous responses.
- Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0001.01.ENG&toc=OJ:L:2018:328:FULL
- World Bank (2017) National policy in favour of the National strategy and action plan (Националната политика в Принос към Национална стратегия и план за действие)
- World Bank (WB) 2017. Национална Стратегия за адаптация към изменението на климата и План за действие, Project 160511, <https://www.moew.government.bg/static/media/ups/articles/attachments/Strategy%20and%20Action%20Plan%20-%20Full%20Report%20-BGcd6d12eb7bc7294e29ac9ee4762fd2d8.pdf>

4 Czech Republic, North-West Bohemia

4.1 State of play of the social environment

4.1.1 Current status of the main social indicators

▪ Demography

The mining region of Northwest Bohemia consists of two administrative districts, Ústecký and Karlovarský district with total population around 800,000 and 300,000 people respectively (**Table 4.a**). The working age population represents about 64-66% of total population in both regions, showing a trend of a slight decline at about 1% for last four years, except for the Ústecký district in 2018. This is mainly due to a gentle increase in the population at retirement age >65 which varies in both regions between 17% and 20%. Population <15 fluctuates around 15% in both regions and during the last 4 years has remained relatively constant. Net migration showed clear/significant migration outside the region, but it was comparatively small and this emigration gradually decreased between 2015 and 2018, and eventually turned into net immigration. Both Karlovarský and Ústecký districts have a percentage of the population who are more than 15 years old with a basic education only (19% and 20% respectively) higher than national average (13% in 2018 based on CZSO data). In contrast in both districts there is lower percentage of university graduates (12% and 11% for Karlovarský and Ústecký district respectively) than the national average (19%, all in 2018 based on CZSO data). A particular problem namely in Ústecký district is the existence of socially excluded communities mainly inhabited by gypsy population. In this district more than 60 such localities were identified where about 20,000 people live, and these localities face social problems such as isolation, lower education and higher criminality.

Table 4.a CZ. Basic population indicators for Ústecký and Karlovarský district in 2015-2018

Category		Ústecký district				Karlovarský District			
Years		2015	2016	2017	2018	2015	2016	2017	2018
Resident population (no.)		822,826	821,377	821,080	819,323	297,828	296,749	295,686	294,896
Age distribution (no.)	< 15y	130,213	130,785	131,548	127,924	44,382	44,413	44,352	44,461
	15-64y working age	547,147	540,254	534,972	535,401	199,349	196,260	193,867	191,556
	> 65y	145,466	150,338	154,560	155,998	54,097	56,076	57,467	58,879
Neto migration		-221	-678	433	948	-928	-703	-410	-54
Life expectancy at age 65 (year)	Males	14.88	14.80	14.95	15.05	15.29	15.23	15.45	15.49
	Females	18.05	18.211	18.46	18.49	18.69	18.97	18.85	18.54

Source: Czech Statistical Office CZSO

▪ Labour indicators

The proportion of the population of a working age that is economically active is higher in the Karlovarský district, than the Ústecký district. In the Karlovarský district it varies between 77.6 % to 81.6% which is more than the national average which is 76.6 %, while in the Ústecký district it is slightly below the national average, ranging from 72.4% to 74.7% (**Table 4.b**).

The proportion of the economically active population has remained more or less constant during the past four years in the Ústecký district, which is also in contrast with the Karlovarský district as well as the national trend, where the proportion of the economically active population has increased over time (**Table 4.b**). The rate of female employment is comparatively high. The gender employment gap is decreasing in both districts, from 2.22% in 2015 to 0,93% in 2018 in Ústecký and from 3.32% in 2015 to -0,38% in 2018 in the Karlovarský district. However, the difference in wages between men and women is more severe. In 2018, in the Ústecký Region, men earned an average of CZK 33,492 and women CZK 27,650, the difference in remuneration between women and men was 17.5%.

This is less than at the national level, where in 2018 the difference in the average monthly wage of women and men was 20%. However, the Ústecký Region shows a higher difference in the remuneration of women and men than the Karlovy Vary Region, where in 2018 men received an average wage of CZK 31,911 and women CZK 26,611 and the difference in remuneration of women and men there was 16.6% (Employee Wage Structure 2019, CZSO). In terms of a year-to-year comparison, we can observe a gradual reduction in the differences in the average wage of women and men in the Ústecký Region: from 19.5% in 2015 to 17.5% in 2018. A gradual decrease can also be observed in the Karlovy Vary region: in 2015 - 18.3%, and in 2018 -16.6% (**Table 4.b**).

Looking at the overall salary level, in 2018 the Karlovarský district was the district with the lowest wages in the country, while the Ústecký district was close to the national median. In both districts the wages in the mining sector were above the district average.

Concerning employment in individual sectors, manufacturing was the most important sector in both districts, followed by various services such as retail, health service, defence and other social services, accommodation, food and transportation. The mining sector employed only 2-3% of employees directly in both districts. This percentage was quite steady in the Ústecký district and decreased in the Karlovarský district. However, despite the fact that the number of people employed in mining was rather low, mining companies still represent important customers for various services and many other jobs may rely on them, indirectly.

The general unemployment rate showed dramatic decrease between 2015-2018 and reached 3.6% and 2.9% in Karlovarský and Ústecký district respectively, which is close to country average (3.1 in Dec. 2018). However, the overall level of unemployment was close to natural minimum unemployment due to fluctuation and other natural cause. The highest unemployment was in young people and people with basic education who in general have greater difficulties in being employed. However, due to generally low level of unemployment is rather driven by low tendency of people to search for jobs rather than insufficient offer in job market. Clearly Covid-19 and the consequent economic slowdown will likely change this positive picture, but there is not enough data to illustrate this. Despite the overall low level of unemployment, the percentage of long-term unemployment is above national average.

Table 4.b CZ. Basic data about employment rate unemployment and salaries in Karlovarský and Ústecký district in 2015-2018

Category/district	Ústecký district				Karlovarský district			
	2015	2016	2017	2018	2015	2016	2017	2018
Year								
Population, total (thousands)	823.3	823.0	821.4	821.4	298.7	297.8	296.7	295.7
<i>Economically active, aged 15+ years (labour force)</i>	396.0	403.4	399.1	399.7	154.7	154.7	154.7	156.3
<i>The employed in the national economy (ILO)¹⁾</i>	366.0	382.6	385.2	385.2	144.3	146.4	149.6	151.8
<i>The unemployed</i>	30.0	20.7	13.9	14.5	10.4	8.3	5.1	4.5
<i>Economically inactive</i>	427.3	419.7	422.3	421.7	144.0	143.1	141.9	139.4
Females, total (thousands)	415.2	414.8	413.8	413.7	151.2	150.6	150.2	149.7
<i>Economically active, aged 15+ years (labour force)</i>	172.1	178.1	175.3	173.4	67.5	67.8	69.7	71.1
<i>The employed in the national economy (ILO)¹⁾</i>	156.9	168.4	167.5	166.2	61.7	63.6	67.0	69.2
<i>The unemployed</i>	15.2	9.7	7.8	7.2	5.8	4.2	2.7	2.0
<i>Economically inactive</i>	243.0	236.7	238.5	240.3	83.7	82.9	80.5	78.5
Men wages Total EUR (27.4 CZK 1EUR)	923	969	1035	1124	880	909	985	1067
Men wages Males EUR	1,016	1,058	1,131	1,222	968	992	1075	1,165
Men wages Females EUR	818	860	927	1009	791	825	896	971
Men woman wage difference %	19.5	18.3	18.1	17.5	18.3	16.9	16.6	16.6
Total employees (thousands)	246.8	382.6	385.2	385.2	144.3	146.4	149.6	151.8
<i>Agriculture, forestry and fishing</i>	4.5	6.9	10.2	8.4	3	3.8	3.6	5.1
Mining and quarrying	5.5	8.4	8.6	10.7	4.7	4.1	3.4	3.0
<i>Manufacturing</i>	75.2	104.1	105.7	101.3	39.1	40.8	45.6	39.9
<i>Electricity, gas, steam and air conditioning supply</i>	3.3	7	8	6.3	1.7	2.1	2.4	1.7

Category/district	Ústecký district				Karlovarský district			
	2015	2016	2017	2018	2015	2016	2017	2018
Water supply; sewerage, waste management and remediation activities	4.7	5.5	5.6	6.9	2.4	1.6	1.8	2.6
Construction	15.2	31.9	30.4	27.1	10.4	9.0	10.4	11.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	23.7	49.6	46	50.2	14.6	15.5	13.7	13.5
Transportation and storage	16.2	28.9	27.1	30.3	8.6	9.0	10.7	11.3
Accommodation and food service activities	5.0	15.7	13	13.8	6.9	7.0	8.0	8.2
Information and communication	2.4	5	5	7.4	0.8	1.2	0.4	0.8
Financial and insurance activities	2.1	6.3	6.9	5.4	1.4	2.0	1.9	1.8
Real estate activities	2.6	1.9	1.4	3.5	0.8	0.7	1.1	1.1
Professional, scientific and technical activities	6.1	10.2	12.9	12.5	4.9	5.4	4.1	5.0
Administrative and support service activities	10.0	9.1	10.5	9.2	4.2	4.4	3.1	3.6
Public administration and defence; compulsory social security	21.4	26.4	28.1	29.7	11.5	11.5	11.3	12.8
Education	20.0	24.8	21.6	21.7	8.7	8.4	7.7	8.9
Human health and social work activities	22.6	24.2	24.6	25.3	14.1	13.2	12.9	13.9
Arts, entertainment and recreation	3.4	6.3	7.3	6.2	3	2.1	2.4	2.7
Other service activities	2.8	7.4	8.4	6.7	2.4	2.9	2.8	2.4
Mining and quarrying %	2.2	2.2	2.2	2.8	3.3	2.8	2.3	1.9
General unemployment rate (%)	7.6	5.1	3.5	3.6	6.7	5.4	3.3	2.9
By age group (years) 15–24	16.8	9.6	10.1	11.1	19.4	12.5	10.9	15.8
25–34	11.9	7.5	4.0	4.3	6.2	6.2	2.8	2.5
35–44	6.1	4.1	2.8	3.2	6.1	3.8	2.2	1.3
45–54	5.0	3.1	2.9	2.6	5.3	5.5	2.6	2.2
55+	4.0	5.0	2.2	2.1	4.3	3.7	3.5	2.6
By education / None and primary education	30.1	26.5	16.2	13.3	21.9	20.5	13.5	10.9
Secondary education without A-level examination	7.0	4.5	3.0	3.5	6.5	5.3	2.6	2.3
Secondary education with A-level examination	4.3	1.9	1.7	1.5	3.7	2.6	2.4	1.9
Higher education	1.7	1.4	1.2	2.4				
Long term unemployment	49.4	45.1	40.7	30.0	45.5	41.9	36.7	23.5

Source: CZSO

- Health and environment

In general, North West Bohemia was known as a region with an unhealthy environment caused mainly by air pollution. This was manifested in several parameters such as a lower life expectancy, larger occurrence of respiratory diseases and lower birth weight as shown by detailed health survey project “Teplice” in 1990s (Šrám et al., 1998). Nowadays most reported ecological indicators have improved substantially (**Figure 4.a**), however Ústecký district still belongs to the region where health individual pollutants exceed official health limits (Céza et al., 2018). Despite the mining impact on ecosystems, due to extensive reclamation work, land use indicators have also improved substantially. The coefficient of ecological stability (based on proportion of ecologically stable habitats to other less stable habitats) in Karlovarský and Ústecký districts is 2.05 and 1.01 while country average is 1.2.

Despite substantial improvements in air pollution and ecological indicators which are now further from the national average, there may still persist belief that region is not healthy.

There is also possibility that historical exposition of population cannot affect the health of the next generation. This question is now subject of intensive research; however, it is premature to make any comprehensive conclusion (Binková et al., 1999).

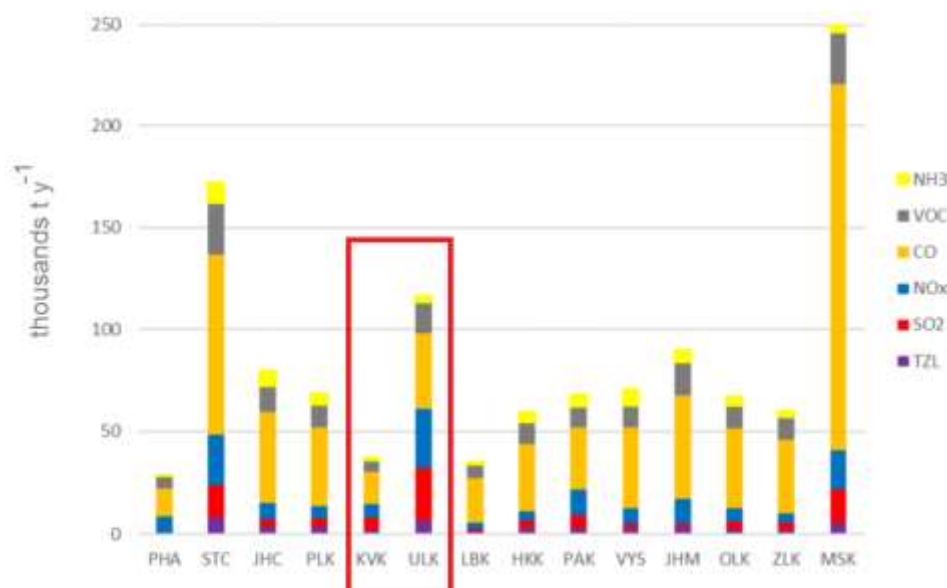


Figure 4.a CZ. Production of major air pollutants emission in thousands of t per year in individual districts of the Czech Republic in 2018. Target districts Karlovarský KVK and Ústecký ULK are highlighted

Source: Czech Hydro meteorological institute, 2018

▪ Living conditions

As far as household equipment is concerned, electricity, water usage and other services, the situation is comparable to the rest of the county. Compared to the national average, more people live in flats and in contrast less people than the national average live in family houses.

▪ Education

In terms of overall statistics, key parameters of elementary school such as the number of children in a class, the number of children per teacher etc. are similar to the national average. A specific problem in the Ústecký district is problematic education in socially excluded localities. A similar situation occurs in secondary education. In the Ústecký district there are two universities, one public and one private, and in the Karlovarský district there is dislocated one faculty of the university which has its headquarters elsewhere. This is not exceptional on a national scale, as the country is small and most students choose universities in larger centres such as Prague or Brno which have a longer historical tradition.

▪ Research and Innovation

Ústecký and Karlovarský districts have the lowest number of personnel working in research and innovation among the individual districts of the Czech Republic. This is true in absolute numbers (237 and 1,114 for Karlovarský and Ústecký districts respectively, while the national average is 4,981) as well as in numbers per 1,000 of residents (1.5 and 2.7 for Karlovarský and Ústecký districts respectively, while national average is 10).

4.1.2 Comparative analysis

Coal was the major source of energy in communist period, and its production has gradually decreased since the political changes in 1989 (Figure 4.b). The initial impact on employment was also reduced by the subsidies for the abatement of coal mining which have been provided to coal companies since 1993 on the basis of the resolution of the Government of the Czech Republic of 9 December 1992 No.691 (Vláda ČR, 1992).

The decrease in coal mining culminated around 1999, and since then the mining activity has shown only a slow gradual decline. The decrease in mining was accompanied by an increase in unemployment rates in these regions. This decrease was even more severe in counties with a larger concentration of mining industry such as Most and Sokolov. This socioeconomic decrease was accompanied by the appearance of socially excluded localities where the combination of low income and a low education level, caused unemployment, poverty and an increased risk of crime. Some ethnic minorities (Romani) are particularly sensitive and more likely to be trapped in this situation. Overall, this decrease was less severe such as in the case of the Karlovy Vary region, where the development of travel tourism and spas has had a significant positive effect on the labour market. After 2005 the whole national economy started to grow, and the unemployment rate started to decrease. However, the development of the Czech labour market was thus significantly affected by the global economic crisis after 2008, which fully affected the economy and the labour market in 2009. The following years 2011 and 2012 marked a very slight recovery, which in 2012 marked the return of the Czech economy to recession. In both years, the recession was reflected in a year-on-year decline in GDP of 0.9%. The negative impact of this recession on the labour market was fully reflected in January 2014, when unemployment reached record levels in the Czech Republic. The most affected were industrial production and related industries, which, due to the gender composition of employment in individual sectors, was reflected in a more significant decline in the employment of men than women. The effects of the economic crisis on employment, resp. unemployment was partially offset by growth in the number of self-employed. This effect was particularly strong in the target region which had just recovered from a massive decrease of coal mining at the beginning of the century.

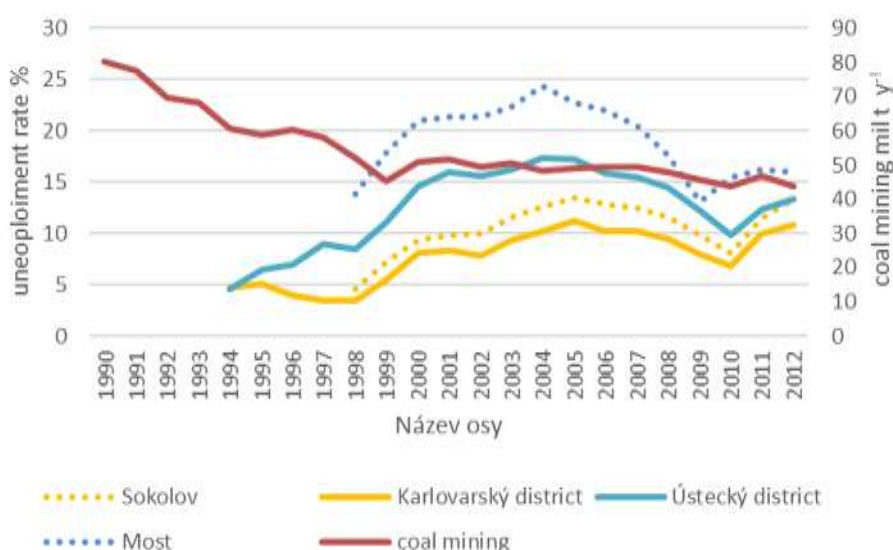


Figure 4.b CZ. Unemployment rate and open cast brown coal mining in Northwest Bohemia, toted line indicate smaller geographic units inside Karlovarský and Ústecký district with higher concentration of mining

Source: CZSO

4.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

4.2.1 National public policies

The basic norm in the field of the labour market is government regulation 2004 Act No. 435/2004 Coll. The Employment Act regulates the provision of the state employment policy, the aim of which is to achieve full employment and protection against unemployment. It regulates several key areas, such as the right to employment and related discrimination, the right of foreigners and the employment of people with disabilities, as well as the employment and tools leading to employability and a generally active employment policy (activating people to take up or change jobs).

The state employment policy is created by the state, and respective state administration in the area of state employment policy in the Czech Republic is performed by the Ministry of Labour and Social Affairs, the Labour Office of the Czech Republic and other entities active on the labour market such as employers and trade unions. In implementing the state employment policy, the state cooperates with other entities active on the labour market, in particular with territorial self-governing units, professional organizations, associations of persons with disabilities and employers' organizations. Labour offices are important not only for the employees themselves, as they offer cooperation with employers and thus stimulate them to employ disadvantaged people. For many jobseekers, the possibility of receiving unemployment benefits is crucial. Another important topic may be retraining, which should help job seekers to get a job. The law regulates an active employment policy, including its instruments. In addition to retraining, this includes various incentives from the employment office and programs that focus on a certain specific group of jobseekers.

The current strategy of the Czech Republic is guided by the Employment Strategy (Employment Policy Strategy until 2020) adopted by the government of the Czech Republic (Ministerstvo práce a sociálních věcí ČR 2014). The employment strategy is derived from the conclusions and goals of national strategic documents, such as the Strategy of International Competitiveness of the Czech Republic 2012-2020, Strategy of Regional Development of the Czech Republic 2014-2020, Priorities and Procedures of the Government in Promoting Equal Opportunities for Women and Men, National Reform Program, relevant departmental documents (Employment Policy Concept 2013-2020), respond to the conclusions and recommendations of European Council documents, etc. The main implementer of the strategy measures is the Labour Office, in cooperation with other public administration bodies, employers, municipalities, regional professional and business associations, consulting and educational institutions, non - governmental non - profit organizations, etc. Strategy has four priorities (Ministerstvo práce a sociálních věcí ČR 2014).

- Priority 1: Promoting access to employment, especially for groups at risk in the labour market

Within this priority, the following two basic problems have been identified, the elimination of which will be the focus of employment policy in the coming years: - Insufficient job creation enabling all people who want to work to find a job, including regional disparities between labour supply and demand. - Difficult access to employment for the most disadvantaged (elderly, young, parents and careers, the low-skilled, people with disabilities and people with other disabilities, especially social disabilities).

- Priority 2: Promoting gender equality in the labour market

Compared to foreign countries, the Czech labour market shows a disparity in equal access to employment between men and women. The basic problems are: lower participation of women in the labour market and lower levels of remuneration for work performed by women than men, and disadvantages for women in the field of career growth. With regard to demographic development (decrease in the labour force), women are one of the most significant potential sources of the labour force, also with regard to the increasing education of women, which is developing more dynamically than for men. In addition to socio-cultural determinants, the primary cause is mainly the relationship between the position in the labour market and the role of women - mothers, i.e. the mismatch between family and working life. The strategy, therefore, focuses on promoting the balancing of family and working life, with an emphasis on the development of childcare facilities or the promotion of flexible work organizations.

- Priority 3: Adapting enterprises, employees and the unemployed to changes and labour market needs

The priority responds to the following basic problem areas: initial education is no longer able to provide the individual with sufficient competencies necessary throughout his professional life, insufficient linkage of initial education to labour market needs - insufficient competencies (especially practical skills) of school graduates to apply in the labour market, lack graduates of technical and apprenticeship fields.

- Priority 4: Development of employment services

Effective and accessible employment services are a basic precondition for fulfilling the goals of the strategy. The need for further staffing of the Labour Office of the Czech Republic so that it is able to provide individualized services to its clients:

The definition of these priorities corresponds to the structure of the OP Employment. Coal regions are not addressed separately in the national employment strategy.

However, all 4 priorities apply to them, in our opinion especially priority 1, because there are a large number of disadvantaged people living in coal regions and priority 3, because with the decline in the use of coal, there will be big changes in labour market conditions.

The strategic framework of employment policy until 2030 (Úřad vlády ČR 2017) which is formed recently has following major aim: "In 2030, the Czech labour market, based on cooperative and effective employment services, will be able to respond to global trends, and will provide both a suitable livelihood for the population of the Czech Republic and sufficient suitable workforce. It will be based on 4 basic pillars:

1. Prediction and prevention - building and developing a system for creating predictions of labour market development, strengthening preventive measures in the labour market.
2. Individualization - employment policy measures will be more individualized and tailored, both in relation to individuals (individuals) and employers and regions.
3. Adaptation - employment policy will support the adaptation of all labour market actors to changing conditions, especially the effects of the 4th industrial revolution, employers, employees and public administration (including the legal environment) will be adapted to these changes.
4. Efficiency - employment policy will be implemented by effective employment services using new technological procedures, broad cooperation and networks, in the centre of which will be the Labour Office of the Czech Republic.

4.2.2 Regional and local policies

Both regions in the Northwest Bohemia coal region have development strategies (Ústecký kraj 2013; Karlovarský kraj 2013). The Strategy for the Ústecký Region (Development of the Ústecký Region) specifies development visions, the available regional and local targets, priorities, strategies and plans in the social – work-force – re-skilling fields on short-medium-long term (until 2050). The strategy has two central topics that are necessary for the future development of the region. These are the 2 pillars of the vision: - economic development linked to the necessary social cohesion and strengthening of the region's human capital (interconnected tasks aimed at increasing the economic performance of the region and thus the "restart" of the socio-economic situation in the region); - infrastructure, equipment and environment (necessary preconditions for the socio-economic development of the region). Both pillars should support both the improvement of the actual socio-economic situation of the region, and the improvement of the image of the region in the eyes of its inhabitants, visitors and investors.

Some objectives of the above-mentioned strategy are in line with the Updated Strategy of Sustainable Development of the Ústecký Region: The Strategy of Sustainable Development of the Ústecký Region is a framework and cross-sectional document, which will be followed by other strategic and conceptual documents within the region (Ústecký kraj 2013).

The labour market is also affected by the Regional Innovation Strategy, in priority area A: Human resources for increasing the innovation and technological performance of the region's economy.

The low level of cooperation with research and development organizations is partly due to the absence of a technical university in the region. There is widespread distrust among companies in the quality, ability and willingness of universities to realize the results needed for companies. A big problem is the lack of suitable experts in the field of R&D or for development or innovative processes implemented in companies.

A much greater and immediate negative consequences of the impending problem is the general lack of qualified technical personnel at all levels of production and management - technologists, production

professionals, including those operating some machines in chemical companies, in engineering or plastics / rubber and others.

Almost all companies involved in research more or less complain that the number of technical secondary schools in the region is declining and that the quality of their graduates has been declining for a long time. The tools by which the region could support research and development are primarily financially simple in nature and include innovation vouchers, proof of concept fund, patent fund.

There is a high demand among companies for closer cooperation with schools in the preparation of graduates, in forms such as internships, teaching people from companies in schools, and generally there is a very high need to support (and increase the quality of) technical education. Companies would also welcome support in the form of "soft tools", networking - connecting manufacturers from different fields or manufacturers and academics - or arranging various types of advice in trying to enter new markets and other soft tools (Ústecký kraj 2013; Karlovarský kraj 2013).

Networking in the Ústecký and Karlovarský regions is covered by two chambers of commerce and society, which are the only legal representatives of entrepreneurs in the Czech Republic, and represent entrepreneurs in negotiations with state administration, local self-government and foreign organizations. It offers extensive consulting and information services, organizes a wide range of educational events, and connects its members with other partners. They help find human resources in the labour market, organize HR meetings, connect schools and employers. Employees are also served by the regional councils of trade unions of the Czech-Moravian Confederation of Trade Unions. More on the website of the Social and Economic Council of the Ústecký Region or the Regional Economic Council of the Karlovy Vary Region (Ústecký kraj 2013; Karlovarský kraj 2013).

The European Union has been supporting and putting into practice regional employment pacts since 1997. Their aim is to develop partnerships and interdisciplinary cooperation in promoting the European employment strategy. A similar type of partnership is used in other countries outside the EU member states. In the Czech coal region, the Employment Pact of the Ústecký Region was established, which focuses on three basic strategic directions - economic development, employment and social inclusion. In practice, it is a broad partnership of institutions and experts, whose aim is to create and implement a set of measures / projects to support employment and education of the population. Other objectives include, for example, support for the creation and maintenance of new and existing jobs, support for technical, vocational and craft education, support for entrepreneurship or support for skills change and related training. Around CZK 1 billion should be set aside from the European Social Fund for the activities that will be covered by the employment pact. The Karlovy Vary region has also been plagued by high unemployment for a long time, which is caused by a whole complex of causes that cannot be understood in isolation, because they are strongly interconnected and influence each other. Therefore, the measures and interventions that should address this situation must be comprehensive and work synergistically. Therefore, the Karlovy Vary Region, together with the Karlovy Vary Business Development Agency started the preparation of the Employment Pact of the Karlovy Vary Region. The agency was established in 2009 in order to ensure coordination of activities in the field of business development in the region. They implement and support activities aimed at supporting local potential through the introduction of innovations, new forms of cooperation, support for education and support for building better conditions for the business environment. We support the cooperation of regional groupings, development efforts of cities, municipalities and regions (Ústecký kraj 2013; Karlovarský kraj 2013).

4.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

4.3.1 Transition objectives. Key issues analysis

Coal regions in the Czech Republic have compiled their visions of a developing region. The Ústecký region is growing economically and educated people are coming to the region for interesting work and good living conditions (Ústecký kraj 2013; Karlovarský kraj 2013). Traditional industries still play an important role in the economy, but modernized ones, using new ideas and new ways of development,

increasing their productivity and not burdening the landscape and the environment. Thanks to favourable conditions for business, a significant sector of companies has grown in the region, based on the use and appreciation of knowledge and creating or successfully developing new technologies. Enterprises in the region innovate and use the results of top domestic and foreign research and development centres, some of which are firmly anchored in the region. The region is one of the important economic and research partners of neighbouring Saxony.

Vision for the Karlovy Vary Region according to the Development Program of the Karlovy Vary Region 2014 – 2020 (Karlovarský kraj 2013): the Karlovy Vary region, an economically prosperous region, open to European challenges and impulses, providing its inhabitants with a space for a quality life based on attractive natural conditions and a socially friendly environment. According to the Karlovy Vary Region Competitiveness Development Strategy, the main priorities of the Karlovy Vary Region include: (i) innovative entrepreneurship and use of research and development results in the business sector, (ii) improving the quality of human resources, improving the availability of qualified, educated and skilled workers, especially in technical fields and (iii) improving the business environment and increasing the inflow of foreign investment into the region.

To monitor the development and planning in all spheres of the impact mining reduction on coal mining areas in the Czech coal regions, the so-called Coal Commission was established following the example of Germany. The Coal Commission was established by Government Resolution No. 565 of 30 July 2019 as an advisory body to the Government, and this resolution also approved the Statute of the Coal Commission (Vláda ČR 2019). The chairmen of the commission are the Minister of Industry and Trade and the Minister of the Environment. The Commission has a total of 19 members. The main goal of the commission is to provide the government of the Czech Republic with objective and, as far as possible, consensual outputs with regard to the future use of brown coal in the Czech Republic, including all related aspects. The working bodies of the Government Council consist of 3 working groups. One of these working groups is to deal with the identification of social and economic impacts, i.e. also, employment.

The main topic of the meeting is the analysis of the possibilities of future diversion from the use of coal in combustion sources, including: determination of the schedule of this diversion; determination of tools and measures to achieve this diversion; quantification of the costs and impacts of diversion and structural change in the regions, in particular: the resulting costs of employment policy; induced costs in the related energy infrastructure; impacts on vulnerable customers (electricity and heat consumers); costs related to compensatory measures for the regions concerned (in close connection with the RE: START program) .

Post mining land offers numerous possibilities for future economic development, many of which are yet to be discovered. An overlooked and unique opportunity for future development is the ownership of large blocks of land which give excellent opportunities for large scale investment, and the building of large-scale industrial facilities which would be difficult to construct elsewhere. Example of such facilities could be polygon for autonomous car testing built by BMW at post mining heaps near Sokolov (Reuters 2017). Autonomous cars are also mentioned as one of the promising fields of future development by Research and innovation strategy of Ústecký district (Ústecký Kraj, 2019).

There are certain factors that should be taken into account when making future decisions about the end mining and transition. In the Ústecký and Karlovarský districts, local open pit mines are almost the exclusive suppliers of brown coal for the entire Czech Republic. The population is not united in their views on the distance from coal mining and combustion, even within the population living near the mines or the population living at greater distances from the quarries.

Both regions have the potential to produce electricity (especially in the windier areas adjacent to the coal basin of the Ore Mountains), as well as the possibility of producing solar energy Hydropower from water pumping between future interconnected reclamation lakes has also been considered. The region has a good predisposition for energy transition thanks to its long-term energy know-how. Investment in the development of research and innovation has also been envisaged, which would certainly contribute to easier energy transformation and mitigation of the negative impact of the cessation of mining on unemployment.

In terms of social environment, human resources and potential for reskilling it should be mentioned that a major decrease in employment in mining sector has already happened, and as is visible from **Table 4.b** the mining industry now employs about 2-3% of the workforce in both regions. On one hand the mines consist to a large extent of technical profession for which there is demand in the labour market, but on the other hand a low proportion of qualified workers (**Table 4.b**) may cause problems with reskilling in more high-tech perspective fields such as autonomous cars etc. There are some positive and negative social issues in coal regions.

The region of interest is already preparing for the transformation, and subsidy programs for reskilling are already being used. Which sectors require which qualifications is being monitored (currently mostly machine operators are missing). Regional authorities want to focus on more effective training of young people to ensure a technically educated workforce is available in the future. A higher demand for craftsmen is also beginning to show. At the same time, a higher level of education for local people will facilitate future retraining (a more educated person accepts the challenge of retraining and manages new skills better). In the case of those trained without having a high school education (approx. 23%), supply does not completely match demand, with employers in the region having a long-term demand mainly for workers in manufacturing, engineering, construction and electrical engineering, with these jobseekers being minimally represented in the register of jobseekers. Re-skilling is less socially accepted by less educated people, especially in socio-economically structurally weaker localities. There is an educational platform in the region, which prepares and fulfils the regional educational action plan (KAP 2019), ensures the acquisition of subsidies for the development of polytechnic education and the operation of technical clubs, supports the development of innovation environment (Smart accelerator), motivates teachers to further deepen their knowledge, introduces into the educational system modern approaches and experimental teaching, interconnects schools and companies, develops career counselling, increases competencies for entrepreneurship, initiative and creativity etc. A summary of opportunities, strengths, threats and weaknesses in the future development of the Czech coal region is given in **Table 4.c**.

In terms of renewables use, biomass production potential is comparable to other parts of the Czech Republic (Werner et al., 2012). Potential for solar energy use in Northwest Bohemia occurs in areas with a comparatively lower potential compared to the southern and south eastern parts of the Czech Republic. However, differences inside the country are not large (Suri et al., 2010). Availability of large areas may be, however, suitable for large scale installation. In contrast with solar energy, wind energy potential in mining areas and their close vicinity in Northwest Bohemia may be comparatively more suitable for wind energy use. In some locations in the target area, density of wind power can reach 200-300 W/m² according to Štekl (2006) and Chalupa and Hanslian (2015).

Among other renewables which have a decent potential in Northwest Bohemia is geothermal energy (Litoměřice, 2013). Town Litoměřice is recently building geothermal heat plant using hot dry rock system with expected production of 15-30 MWt.

Table 4.c CZ. SWOT analysis

<p>Opportunities</p> <p>Post mining lake provide large properties suitable for large scale investment such as BMW polygon in Sokolov post mining sites. Such large pieces of consolidated properties are rare elsewhere.</p> <p>Natural condition brings opportunities for wider use renewables mainly wind.</p> <p>Sectors directly or indirectly related to the automotive industry are gaining in importance at national level,</p> <p>High interest at national level for new carbon-free energy sector (this is an opportunity for the region to use its energy know-how and to relocate appropriate skilled workforce from coal energy to the new sectors).</p> <p>Incentives and high interest at national level for developing the tourism sector.</p> <p>The possibility of using subsidies for the development of structurally affected regions, regeneration of brownfields, retraining of the unemployed population.</p>	<p>Threats</p> <p>In many parts of region climatic conditions are not so suitable for plant production.</p> <p>Large area of the landscape was affected by mining, which affect provisioning of ecosystem services.</p> <p>Economy based on less qualified workers is very sensitive to fluctuation of economy an economic cycle.</p> <p>Large investment in infrastructure is needed to support economic growth.</p>
<p>Strengths</p> <p>Low cost of labour (in comparison with other parts of Czechia which may be interesting for investors</p> <p>Technical qualification and discipline of mining workers.</p> <p>Properties available for building new facilities.</p> <p>Wide portfolio of portfolio of business activities in the region (especially tourism, spa).</p> <p>Natural condition that offer many touristic activities, spa etc.</p> <p>Technically skilled workforce and lower wages can attract investor.</p> <p>Post mining landscape namely large lakes created after mining will provide opportunities for recreational activity.</p>	<p>Weaknesses</p> <p>Low entrepreneurial activity of the local population, few small and medium-sized enterprises, low flexibility of the small and medium-sized enterprise sector.</p> <p>Low purchasing power reducing the demand for small-scale production and services.</p> <p>A significant part of the population is excluded from the labour market due to their low or inappropriate qualifications.</p> <p>Socially excluded communities and concentration of socially disadvantaged population and social problems.</p> <p>Reduced education and inadequate qualifications of the population.</p> <p>Deficits in the structure, capacity and distribution of social and health services.</p> <p>Low development of infrastructure to support small and medium business.</p> <p>Low interconnection of the offer of education at secondary schools and universities with the needs of the local economy.</p> <p>High degree of immigration of (mostly unskilled) labour from abroad and emigration of (mostly skilled) labour outside the region.</p>

4.3.2 The future workforce structure, in a holistic approach

In the Czech Republic, the KOMPAS project (founded by Operational Program Employment) is currently being addressed to support the employment and adaptability of the workforce. It is in the solution of the Research Institute of Labour and Social Affairs, the National Education Fund, the Labour Office of the Czech Republic and regional platforms. The main goals of this project include the prediction of the labour market at the national level and the creation of predictions of regional labour markets.

A sustainable system of reliable predictions and monitoring of the labour market, which will connect the national and regional level and whose results will reflect the significant impacts of technological trends on the labour market and the specifics of regional development, should be finished by the end of 2020.

According to the Deputy Minister for Employment, Jan Marek, and the action plan mentioned above, the following key features will drive the workforce structure in the next period:

- The natural increase in the Czech Republic will be negative, and that therefore the numerical growth of the population will have to be ensured from sources outside the state;
- Although unemployment in the Czech Republic will probably never fall below the level of 2008, the employer sector will not have enough suitable labour resources;
- The level of qualification of the workforce will continue to increase formally very rapidly, with more women than men;
- Unskilled labour will remain more excluded from the labour market in the Czech Republic than in most other EU countries;
- The problem of migration in the Czech Republic (as in all modern economies) will continue to gain in importance in these conditions and it will therefore be very important to effectively shape it;
- The number of foreigners as well as their share in the population and labour force will grow relatively quickly in the Czech Republic;
- The sectoral structure of employment in the Czech Republic will change in the coming years; although industry will continue to be the driving force of the economy, the share of workers in it will continue to decline in line with the pan-European trend and the representation of the tertiary sector will increase. However, the demands on the qualifications of people will increase, especially in industry. The share of agriculture in employment will also fall, but in terms of absolute numbers it is not very significant. The number of construction workers is likely to increase slightly;
- Following the trends in the sectoral structure, the structure of job positions, which is given by the categorization of employment, will also change. The number of workers in the craft professions will decrease and probably also the number of workers in the "operation of machines". It will be very important to strive for the number of workers in these two manual occupations to be shifted as far as possible to the main class 7, i.e. for the production of highly skilled labour to our industrial base as much as possible;
- The task of employers will be to make their job positions more attractive so that pupils leaving primary schools are interested in studying apprenticeships and then working in craft professions;
- The task of state administration and regional self-government will be to ensure the maintenance of a sufficiently wide range and at the same time very good professional level of teaching and study fields so that the education system in the Czech Republic is able to train qualified professionals in required professions;
- They must have a sufficient professional basis and at the same time be flexible enough to be able to respond to the growing demands of employers;
- Labour offices will continue to have an irreplaceable partnership role;
- The level of unemployment in the Czech Republic will be lower than the EU average. This will be due both to our very good location in Central Europe and to the (related) very good connection of our economy to Europe's most important economic area;
- A qualified workforce will be a basic factor for obtaining and maintaining investments in the Czech Republic.

4.4 Conclusions

Since 2011, the economy has been growing and unemployment has decreased, which may however change with the Covid-19 pandemic and the consequent economic slowdown. The main problem of target regions is a lower level of human resources, reluctance to take risks, entrepreneurship, and less attractiveness of regions for foreign and local investors.

The Czech coal region is preparing for future changes (socio-cultural characteristics, reskilling needs and economic changes), especially through the educational platform, employment pacts and chambers of commerce, but also through a rather gradual transition. The successful solution of unemployment and related problems is expected thanks to a very diversified economy.

The economic structure of regions is undergoing a gradual change, with sectors directly or indirectly related to the automotive industry gaining in importance in all regions. On the other hand, the traditional industries of these regions are still among the key components of the region's economies. It is necessary to add that many companies in traditional industries have undergone their own internal transformation, i.e. modernization of production, market change (in product and geographical sense), which has ensured their viability not only in the Czech but also in the European and global markets.

In the future, more jobs will need to be created so that mine closures do not have a generational social impact. It seems to be most advantageous to use the energy know-how of the regions and to relocate the workforce from coal energy to the new carbon-free energy sector.

However, the exact vision of the structure of the labour force cannot be predicted with certainty in the longer term, as there are many unpredictable factors that can influence labour market developments (see Covid-19). However, it is clear that positions related to IT and robotics will increase. Employment in education is also growing, especially thanks to the provision of assistants for disadvantaged pupils following the inclusion of special education.

With economic growth in general, the importance of service branches, manufacturing industry, and the automotive industry will increase. The potential of regions for tourism should be used more significantly, but the offer of new industrial centres should be improved.

Quality resources are needed to develop entrepreneurship and an innovation-based economy. However, the Ústecký and Karlovarský regions belong to the group of Czech regions that have so far benefited the least from the Business and Innovation, Research and Development for Innovation and Human Resources and Employment operational programs.

4.5 References and further links

- Binková, B., Veselý, D., Veselá, D., Jelínek, R., Šrám, J. R.: Genotoxicity and embryotoxicity of urban air particulate matter collected during winter and summer period in two different districts of the Czech Republic. *Mutation Res.* 440, 1999, s. 45 - 58.
- Céza, V E. Čermáková, E. Koblížková, T. Kochová, J. Mertl, J. Pokorný, J. Přech, M. Rollerová, V. Vlčková 2018. *Souhrnná zpráva o životním prostředí v krajích ČR*, Cenia, Praha
- Government regulation 2004: The Employment Act, - Government regulation Act No. 435/2004 Coll.
- Karlovarský Kraji 2013 Program rozvoje Karlovarského kraje 2014-2020, Karlovarský kraj, Karlovy Vary
- KDA 2012. Development Program of the Karlovarský district. Available online: https://www.karpkv.cz/assets/front/documents/P2_PRKK_2014_2020_strategie_3.pdf, May 2020.
- Litoměřice 2013: Web page <https://prvnigeothermalni.cz/cz/o-projektu/projekt-geothermalni-energie-litomerice>
- Minnisterstvo práce a sociálních věcí 2014: Strategie politiky zaměstnanosti do roku 2020, Minnisterstvo práce a sociálních věcí České Republiky, Praha
- Reuters 2017: web page <https://www.reuters.com/article/us-bmw-czech-investment/bmw-to-build-czech-test-track-for-self-driving-cars-idUSKBN1E90Y5>

- Šrám, R. J., Beneš, I., Binková, B., Dejmek, J., Horstman, D., Kotěšovec, F., Otto, D., Perreault, S. D., Rubeš, J., Selevan, S. H., Skalík, I., Stevens, R. K., Lewtas, J.: Teplice Program - the impact of air pollution on human health. *Environ. Health Perspectives* 104, Suppl.4, 1996, s. 699 - 714.
- Štekl J., 2006: Větrná energetika na území ČR a u sousedů. *Alternativní energie* 6/2006
- Šúri, M., Cebecauer, T., Huld, T., Dunlop, D. 2010: Global irradiation and solar electricity potential – Czech Republic, 2010. European Commission Joint Research Centre.
- Úřad Vády ČR 2017: Strategický rámec Česká republika 2030 vznikl v rámci projektu Systém dlouhodobých priorit udržitelného rozvoje ve státní správě, reg. č.: CZ.03.4.74/0.0/0.0/15_019/0002185. Úřad vlády České republiky, Praha.
- Vláda ČR 1992: Usnesení Vlády České Republiky ze dne 9. prosince 1992 č. 691 k programu restrukturalizace uhelného průmyslu, Vláda ČR Praha.
- Vláda ČR 2014: Strategie zaměstnanosti do roku 2020, Rozhodnutí vlády České Republiky 815/2014, Vláda ČR, Praha
- Vláda ČR 2019. Usmolení vlády České Republiky č. 565/2019 o Statutu Uhelné komise. Vláda ČR, Praha
- Ústecký Kraj 2013: Program rozvoje Ústeckého kraje 2014-2020, Ústecký Kraj, Ústí nad Labem
- Ústecký Kraj 2019: Regionální inovační strategie Ústeckého kraje, Ústecký Kraj, Ústí nad Labem
- Werner, C., Haas, E., Grote, R., Gauder, M., Graeff-Honniger, S., Claupein, W., Butterbach-Bahl, K. 2012: Biomass production potential from *Populus* shortrotation systems in Romania. *Bioenergy* 4 (6), 642–653.

5 Germany, Lusatian Lignite District/Economic Region Lusatia

5.1 State of play of the social environment

5.1.1 Current status of the main social indicators

The TRACER target region Lusatian Lignite Mining District is congruent with Economic Region Lusatia representing the NUTS-2 territorial units Brandenburg (DE40) and Dresden/Saxony (DED2). This area covers seven NUTS-3 regions, all self-administrated, namely: the independent town and medium centre Cottbus (DE402) and the more rural and small-town counties/districts Elbe-Elster (DE407), Lausitz Dahme-Spreewald (DE406), Elbe-Elster (DE407), Oberspreewald-Lausitz (DE40B), Spree-Neiße (DE40G), Bautzen (DED2C) and Görlitz (DED2D). A more detailed description of Lusatia is provided already under TRACER deliverable D 3.1¹⁵.

Overall, the Lusatian mining region shows an ageing population as compared with other regions in Germany. The median age is about 50 years, while the national average amounts to 45 years. About one quarter of the population in the counties is 65 years and older and only one eighth younger than 15 years. Within the ages 15 to 29 there is a high surplus of men, especially in the rural, less populated and peripheral areas like Elbe-Elster. In contrast, the counties Dahme-Spreewald and Bautzen, which are closer to the both metropolitan areas Berlin and Dresden, show a more balanced age structure and gender relation. One major reason is that well-educated young professionals leave the region looking for better paid jobs in the large cities, especially rather mobile women (Table 5.a). On the other hand many commuters take the chance to work in Berlin or Dresden - one hour by car or train, but they still live in the region, where the rents are still affordable.

Table 5.a DE. Demographic key indicators for Germany and Lusatia in 2018

County	Total population ¹⁾ inhabitants	Age < 15 %	Age 15 - 64	Age > 65	Median age (f/m) ²⁾ years	m / 100 f age 15-29 ³⁾ %
Germany DE	82,792,351	13.5	65.1	21.4	45.8 (47.3/44.3)	103.4
Brandenburg DE40	2,504,040	13.0	62.9	24.1	50.1 (51.4/48.6)	112.2
Elbe-Elster DE407	103,455	11.5	61.1	27.4	52.8 (54.7/50.9)	126.6
Dahme-Spreewald DE406	167,319	13.2	63.0	23.8	49.8 (50.9/48.6)	110.3
Oberspreewald- Lausitz DE40B	111,122	11.5	60.2	28.3	52.6 (54.9/50.5)	117.7
Spree-Neiße DE40G	115,456	11.5	61.4	27.0	53.3 (54.7/51.8)	119.3
City Cottbus DE402	101,036	12.1	63.1	24.7	48.5 (51.4/45.3)	120.9
Dresden DED2	1,598,573	13.6	60.9	25.5	48.4 (50.7/46.1)	112.5
Bautzen DED2C	302,634	13.3	59.8	26.9	51.4 (53.3/49.5)	119.1
Görlitz DED2D	256,587	12.4	58.5	29.1	52.7 (54.6/50.8)	116.1

Source: 1) Eurostat 2020a in 2018, 2) Eurostat 2020b in 2018, 3) own calculation, f = females, m = males

¹⁵ https://tracer-h2020.eu/wp-content/uploads/2019/12/TRACER-D3.1_Report_final5.pdf

An older population is usually accompanied by a higher need for medical care. This is particularly problematic in rural areas, for example due to a shortage of doctors, but also due to thinned out public transport.

The de-industrialization of Lusatia and establishing new power plants or at least air filters have also shown positive effects on the environment especially on the air quality, so that Lusatia is now advertised as a recreation and vacation area; “The horizontal Eiffel Tower of Lusatia, Germany¹⁶” and “From mining to dream vacation - Lusatian Lake District¹⁷”.

Nevertheless, mining has shaped Lusatia and the minds of its inhabitants for decades. The mining companies in the region stand out due to good working conditions and above-average pay. In many places there is a positive picture of mining and an understanding of the need for energy generation. A special feature of Lusatia is that there is the Sorbian minority population, which was / is also affected by the land use of the opencast mines. Their needs have been perceived more strongly in recent years.

As **Table 5.b** points out, in the Saxonian reference Dresden (DED2) area there is one-half of the population economic active - little less than in whole Germany and compared to Brandenburg (DE40). Otherwise the rate of youth without employment or training in Saxony turns out slightly lower than in Germany. The same rate is in Brandenburg about 2% higher than in Germany and Saxony.

Table 5.b DE. Demographic and educational information in 2017 and 2018

County	Total economically active population (age 15-64) ¹⁾ in thousand	Youth without employment or training (age 18-24) ²⁾ in %
Germany DE	42,094.0 (50.8%)	8.6
Brandenburg DE40	1,270.7 (50.7%)	10.5
Dresden DED2	776.8 (48.6%)	8.2

Source: 1) Eurostat 2020c in 2018, 2) Eurostat 2020d in 2017

The GDP in all Lusatian subregions is below the German average of 38.400 €/inhabitant. The more rural counties like Elbe-Elster, Oberspreewald-Lausitz, Bautzen und Görlitz even have a GDP below the EU average. The rather weak economic performance corresponds to the number of patent applications which is far below the German average (**Table 5.c**).

Table 5.c DE. Economic aspects in 2012 and 2016

County	GDP ¹⁾ €/inhabitant	GDP ¹⁾ Euro per inhabitant in percentage of the EU average	Patent applications ²⁾ number per million inhabitants
Germany DE	38,400	131	226
Brandenburg DE40	27,000	92	88
Elbe-Elster DE407	23,400	80	60
Dahme-Spreewald DE406	31,000	106	124
Oberspreewald-Lausitz DE40B	25,900	88	38
Spree-Neiße DE40G	31,300	107	14
City Cottbus DE402	33,100	113	64
Dresden DED2	29,400	101	116

¹⁶ https://tracer-h2020.eu/wp-content/uploads/2020/02/7-TRACER_D2.4-Good_Practice_Horizontal-Eiffel-Tower-of-Lusatia-Germany.pdf

¹⁷ https://tracer-h2020.eu/wp-content/uploads/2020/02/11-TRACER_D2.4-Good_Practice_From-Mining-to-Dream-Vacation_Lusatia-Germany.pdf

County	GDP ¹⁾ €/inhabitant	GDP ¹⁾ Euro per inhabitant in percentage of the EU average	Patent applications ²⁾ number per million inhabitants
Bautzen DED2C	25,000	85	66
Görlitz DED2D	25,500	87	48

Source: 1) Eurostat 2020e in 2016, 2) Eurostat 2020f in 2012

Table 5.d below summarises the education levels of the population aged 25 between 64. Therefore, the education of women in the NUTS-2 regions Brandenburg and Dresden is higher than in Germany as a whole, in both categories: secondary and post-secondary non-tertiary education (levels 3-4) and Tertiary education (levels 5-8) according to ISCED (2011). This encouraging result is probably due to the educational system of the former German Democratic Republic, where the share of women with higher education levels was always higher, than in the rest of Germany. The proportion of women with levels 5-8 is even slightly higher than of man in Brandenburg, contrariwise to Germany as a whole.

Table 5.d DE. Population aged 25-64 by educational levels in 2018

County	Secondary and post-secondary non-tertiary education (levels 3 and 4 according to ISCED 2011) in % (f/m) ¹⁾	Tertiary education (levels 5-8 according to ISCED 2011) in % (f/m)
Germany DE	57.5 (59.2/55.9)	29.1 (26.4/31.7)
Brandenburg DE40	64.4 (64.1/64.7)	28.2 (29.3/27.2)
Dresden DED2	62.8 (63.3/62.4)	32.2 (32.0/32.4)

Source: 1) Eurostat 2020g in 2018, f = females, m = males

At present the average unemployment rate in Lusatia is quite moderate with 6.5% (**Table 5.e**) - a mirror image of the positive economic development in Germany over the last 15 years. It ranges from 3.8% (district Dahme-Spreewald) to 8.1% (district Görlitz). For comparison, the mean unemployment rate in Germany is 5.3%. In total 37,415 people are unemployed in all seven administrative districts and 10,677 jobs are vacant at present. In general, skills shortage is a serious problem for the transition process and further economic development, even more as young professionals still emigrate.

Table 5.e DE. Number of unemployed people, unemployment rate and number of vacancies in Germany and the administrative districts of the Lusatia region in February 2020

County	Number of unemployed people	Unemployment rate %	Number of vacancies
Germany DE	2,395,604	5.3	689,594
Brandenburg DE40	78,700	5.9	22,119
Dahme-Spreewald DE406	3,488	3.8	2,068
Elbe-Elster DE407	3,427	6.4	1,012
Oberspreewald- Lausitz DE40B	4,593	8.0	1,070
Spree-Neiße DE40G	3,915	6.5	853
City Cottbus DE402	3,996	7.7	1,142
Saxony in total (DED)	119,750	5.6	37,134

County	Number of unemployed people	Unemployment rate %	Number of vacancies
Bautzen DED2C	7,860	5.0	3,154
Görlitz DED2D	10,136	8.1	1,378

Source: Bundesagentur für Arbeit 2020

5.1.2 Comparative analysis

The Lusatian population amounts to 1,152,603 persons in 2018 (STATISTISCHES BUNDESAMT, 2020), see **Table 5.f**. About thirty years ago approximately 1,432,730 people lived in the districts of the former German Democratic Republic. The strong demographic decline corresponds more or less to the current districts in the German federal states Brandenburg and Saxony (**Table 5.e**). However, a direct comparison between 1989 and 2018 is difficult, because the number and the extension of the former districts of the German Democratic Republic differs from the current situation and the data of the districts refer to different years. The region was represented by 22 districts in 1989 whereas it is as mentioned before now covered by six districts and one district free city.

Table 5.f DE. Summary of the main indicators of the mining activity of the area in 1989 and 2018

Crt. no.	Indicators	M.U.	Period	
			1989	2018
1.	Lusatia population	Inhab.	1,432,730* ¹⁾	1,152,603 ²⁾
2.	Employees in the mining sector	no.	79,016 ³⁾	8,375 ³⁾
3.	Operating mining perimeters	no.	15	4
4.	Active preparation plants	no.	45	4
5.	Exploited strata	no.	1	1
6.	Achieved mining production	mill. t	195.1	60.7
7.	Investments in the mining sector	mill. EUR	-	-
8.	Population below poverty line	%	-	16.9 - 17.1
9.	Unemployment rate	%	-	5.0 – 8.1
10.	Contribution to local budget	%	-	-

Source: 1) Seibert et al. 2018, * population in 1995, 2) Statistisches Bundesamt 2020, 3) Statistik der Kohlenwirtschaft 2018

The economic background: In 1989 15 lignite mines were still in operation. Lignite mining was much more a day's business in lots of places in Lusatia, than it is currently. The mining aimed to fulfil the energy and heating demands of the whole former German Democratic Republic. Investments in mining sectors are mainly based on opening up or expanding new mines. The last new open cast mine was opened in 1985. After that, the main costs of operating the mines are incurred. As a consequence of the political change in 1989/1990 most of the mines and also of the preparation plants, like power plants and briquetting facilities were closed in the early 1990's. Between 1989 and 2018 there had been investments in new technologies for power plants, air filters and so on. The now decided coal exit means that there are hardly any major investments in the mining business field. Investments are focussing on new businesses like photovoltaics, wind craft, Power to X as well as storage the energy like in the project "BigBattery Lusatia"¹⁸.

Most of the private households updated their heating systems and switched from coal to natural gas or oil as fuel. The demand for coal briquettes decreased rapidly, consequently.

Also, the non-effective old power plants could not exist any longer in the framework of the challenge with the other, modern power plant in the west part of the new Federal Republic of Germany and had to close. They also could not meet the higher environmental standards, that concerned their exhaust emissions. As result of that phase of change in the 1990's only four lignite mines are still in operation:

¹⁸ https://tracer-h2020.eu/wp-content/uploads/2019/10/TRACER_D2.1-Big-Battery-Lausitz.pdf

Welzow-Süd, Jänschwalde, Nochten and Reichwalde. The power plants Jänschwalde, Schwarze Pumpe and Boxberg are modern and effective constructions, now. The old systems have been removed and new plants have been built up at the same sites. On the other side, the shutdown of most of the lignite mines and preparation plants caused huge economic cuts for this region, with a loss of approx. 80,000 jobs in the mining and generation industry during the early 1990s.

In contrast to the moderate unemployment rate, there is a rather alarming social disruption of the society - still an after-effect of the structural break in the 1990s. According to DER PARITÄTISCHE GESAMTVERBAND (2019) 16.9% (Saxony), respectively 17.1% (Brandenburg) of the people are living below the poverty line. Unfortunately, more detailed data especially for the Lusatia is not available. But we assume that these values are also more or less representative for the regional situation.

A short explanation to the data basis: The listed poverty rates are based on the so-called "Microcensus of the Federal Statistical Office". This report counts every person as an income poor with their income below 60% of median income lies. This is the total net income of the household including housing allowance, child benefit, child supplement, other transfer payments or grants.

5.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

5.2.1 National public policies

The employment promotion is intended to help ensure that a high level of employment is achieved and that the employment structure is constantly improved and have to correspond to the employment policy objectives of the social, economic and financial policies of the Federal Government (§ 1 I SGB III). The benefits of job promotion should in particular:

1. increase transparency in the training and labour market, support professional and regional mobility and enable the rapid filling of vacancies,
2. promote individual employability by maintaining and developing skills, knowledge and abilities,
3. counteract low-quality employment and
4. improve the professional situation of women by working towards eliminating existing disadvantages and overcoming a gender-specific education and labour market and promoting women at least according to their share in the unemployed and their relative impact on unemployment (§ 1 II SGB III).

KELLER & HENNEBERGER (2018) define the labour market policy in Germany in the following way: The labour market refers to the entirety of all reactive and preventive measures on the part of the public sector to influence what is happening on the labour and training markets. The aim is to support the interplay between job supply and job demand and to counteract the malfunctions and imperfections of labour and training markets. The aim of the labour market policy is not only the reintegration of the unemployed and the integration of school leavers and young professionals into the education and (first) labour market, but also the securing and maintenance of existing employment relationships and the improvement of employment opportunities for job and training seekers.

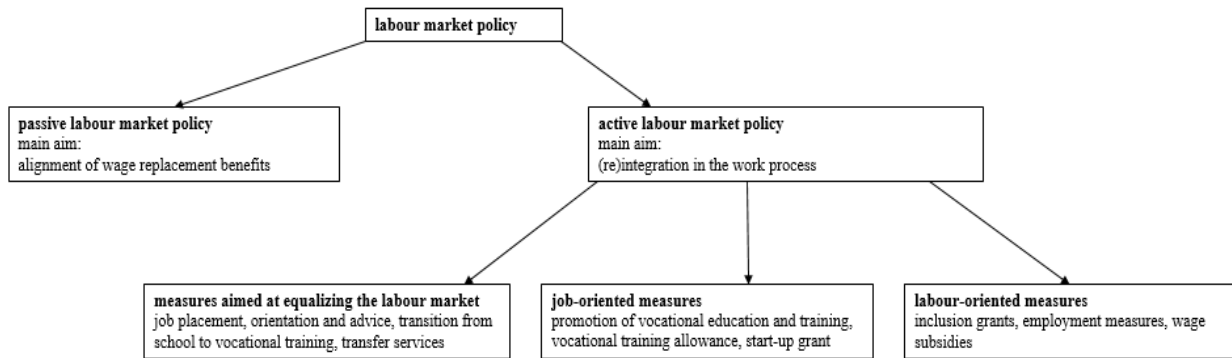


Figure 5.a DE. Labour market policy

Source: adapted from Keller & Henneberger 2018

Social protection is part of the passive labour market policy (**Figure 5.a**). First of all, it is organised according to the insurance principle by an unemployment insurance that provides compensation payments in the event of unemployment. The amount and duration depend on the individual contributions made during employment and on the fulfilment of certain qualifying periods.

In contrast, unemployment benefit, so-called "Arbeitslosengeld II", which was introduced with SGB II by merging previous unemployment benefits with social assistance, is based on the principle of need and aims at a uniform basic security. The funding comes from federal funds (§ 46 SGB II) and thus from the general tax revenue. In the 1990s, the costs were significantly expanded due to the special influence of German reunification. The slump in employment in the new federal states led to the expansion and massive use of all instruments of labour market policy with the aim of a certain stabilization.

As a result of the so-called "Hartz Laws", the level of the contribution rates decreases significantly, which is intended politically as a measure to "reduce non-wage costs". These reductions have consequences for the instruments of active labour market policy (such as the promotion of further vocational training or start-up grants), the expenditure or number of participants of which, despite the demonstrable need, are significantly reduced or suspended - such as the abolition of job creation measures. In other words, the control process is dominated by business management logic based on (cost) efficiency when using the instruments. While the direction of the instruments was changed significantly, the introduction of an anti-cyclical labour market policy or at least cyclically neutral, stable contribution rates was not addressed.

More important for the transition is the active labour market policy, which aims the (re)integration in the work process (**Figure 5.a**). This progress can be divided in three groups equalising the labour market (tools: orientation and advice, transition from school to vocational training, transfer service) and job-oriented measures (tools: promotion of vocational education and training, start-up grant) and labour-oriented measures (tools: inclusion grants, employment measures, wage subsidies).

The providers of state labour market policy are located at three functional levels: The Federal Employment Agency (formerly Federal Employment Agency), ten regional directorates (formerly State Employment Offices), 156 employment agencies (formerly Employment Offices) with approx. 600 branches and approx. 300 job centres (joint facilities) that have been formed by the local employment agencies with independent cities or counties. Self-government takes place within the framework of tripartite committees (employers' associations, unions, regional authorities). Since 2002, the Federal Employment Agency has a three-member board as a management and a tripartite board as a control body. It is not just a matter of converting a three- to two-tier structure of functional responsibilities, but also restructuring or realigning the Federal Employment Agency from a public-law institution with a self-governmental character to a "service organisation" with management structures, as it emerged from the Private sector are known. Since 2003, the state employment offices have been restructured and the regional dimension of labour market policy has been upgraded. The regional directorates control the employment agencies.

5.2.2 Regional and local policies

Since almost 150 years' large-scale industrial coal mining with the related energy-intensive industry is an important economic pillar of the region. Hence it has always been a crucial point and driving force for the prosperity and development of Lusatia. In the former German Democratic Republic (GDR) lignite emerged to the major energy source of the country. In 1989 there were 15 state-owned opencast mines in operation with a production of 188 million tons. Actually, there are 4 lignite mines left with a stable annual coal production of about 60 million tons up to now (60.7 million tons in 2018, LEAG 2019), which is one third of the German lignite extracted.

After the German reunification in 1990 there was a radical structural adjustment of the energy and coal processing industry - some say "buy-out" by West German concerns, a takeover. Due to lack of competitiveness under market conditions and because of obvious ecological risks most mines and over 60 processing briquette factories were closed within a few years. Within the first years after reunification, many sectors of the economy simultaneously recorded very massive declines in employment, for example in agriculture and forestry by 73%, in mining by 64% and in the metal and electrical industry as well as in the other manufacturing sectors by 51% and 45%. As a result of the reunification, the gross domestic product in East Germany fell by 17.3% in 1990, and by 34.8% in 1991.

Of the 9.75 million employed at the end of 1989, less than half were no longer fully employed two years later. 550,000 had gone into early retirement, 800,000 had migrated to the West, 400,000 commuters (balance), 1.3 million short-time workers, 800,000 in other labour market measures and 1.1 million unemployed (OSCHMIANSKY & BERTHOLD, 2020). This structural change was unprepared and driven by surprise by the economic and social effects. Life work performance of the people was not adequately appreciated. There were no ready alternatives for working. Social aid, early retirement and leaving the region were the option during these times. That created serious and far-reaching problems of the individual and collective mentality of a generation.

In the mid-1990s quite a few different projects started to give the region new opportunities for a sustainable development, some examples are mentioned on TRACER-Homepage as Best Practice Examples, like "The horizontal Eiffel Tower of Lusatia, Germany" and "From mining to dream vacation - "Lusatian Lake District". Lighthouse projects like these are a great option for mid- and long-term effects, because it needs quite a while to get them set up. As well there are further information provided on the current role of coal mining and related in Lusatia and on the environmental impacts and sustainable reclamation solutions compared to other TRACER-regions.

Between 1990 and now the number of direct jobs in coal mining (without generation) decreased from 80,000 to 8,000 (MARKWARDT & ZUNDEL 2017, WEHNERT et al. 2018). Right now, around 8,600 people are employed in the regional coal businesses (full-time jobs, full-time equivalents). Thereof coal mining counts for circa 5,500 employees and energy generation about 3,100 workers (LEAG 2019, SEIBERT et al. 2018). In addition, about 12,000 people are working in the related industry and as service providers, together corresponding to about 5% of the regular employments in the region, but it is still an important factor for the vocational training and professional development in the region. In comparison: The Economic Region Lusatia provides overall 413,666 employments, from that in the manufacturing industry sector approx. 70,500.

Right now, every 10th kWh electricity generated in Germany at the moment comes from Lusatian power plants (LEAG 2019) - an important contribution to the national energy security. However, the EU climate and clean energy policy and decided coal-phase out in Germany for the year 2038 are already affecting the lignite mining and power generation. And in fact, the transformation of the national energy production is calling for a reorganisation of the regional energy system and associated "industrial landscape". The social consequences of the deep-going structural change by coal phase-out in 2038 are affecting the whole Lusatia, especially because the residential areas of the workers are distributed all over the region.

Moreover, Lusatia is still one of the fastest shrinking regions in Germany since the reunification in 1990 - in contrast to political statements and actions to beat the possible decline in economic performance. Between 1995 and 2017 the total population decreased by 19.2%.

In the same period the population group of 15 to 65-year-old people relevant to the labour market decreased by 26.1% (SEIBERT et al. 2018). In this time some sub regions have lost more than 25% of the population. But this is not only a result of the fundamental political change in 1989/1990 ("peaceful revolution" followed by the German reunification). RÖSEL (2019) emphasizes, that a different development of the population and economic situation between the western and eastern part of Germany already started at the founding of the German Democratic Republic in 1949 under Soviet control.

The still uncontrolled emigration is alarming because in perspective there remains a negative migration balance and considerable birth deficit: All long-term forecasts are predicting a further decline of potential employees in the region, up to 200,000 to the year 2030 (-17%). The skills shortage (academic and non-academic, technical/commercial) is one of the most serious barriers for regional economic development, already today many training places remain vacant and dropout rates higher than 50% are not unusual. In the worst-case scenario, the labour force will decline by further 30% while the average age increases from 48 to over 53 years - the so-called "brain drain" - an ageing society losing their creative minds (MARKWARDT & ZUNDEL 2017).

5.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

5.3.1 Transition objectives. Key issues analysis

The decided coal phase-out in 2038 will affect around 8,600 people, who are directly employed in the coal sector. In addition, there are working 12,000 people in the related industry and as service providers. All together mining and generation meets only 5% of the regular employments in the region, but these jobs are usually well-paid, which is rare in this region as the comparatively high rate of poverty shows. In fact, for those highly qualified specialists there is a strong need for a new perspective within the region or in adjacent areas as daily commuters.

Ultimately, all efforts to secure follow-up employment opportunities will only make sense when the employees concerned are technically capable and motivated to take on new jobs - ideally in a similar field of activity, e.g. green technologies or environmental industry. The activities in question will be largely related to those currently practiced, but will rarely be the same. Reskilling activities should meet the actual needs on the regional job market and job vacancies. Occupational fields that correspond to the existing lignite mining industry include the following business (ROSA LUXEMBURG STIFTUNG, 2019):

- automation technologies,
- electrical engineering in house building, mechanical engineering or line installation maintenance,
- information and telecommunications installation,
- civil engineering,
- supply and disposal,
- train drivers in railway traffic,
- monitoring and maintenance of railway infrastructure and
- IT application consulting.

But in fact, Lusatia still is a demographical shrinking region disadvantaged in the competition between regions by a massive decline of well-educated employees up to 2030. First of all, this shortage in trained staff and so-called "brain drain" needs to be filled up with young and innovative people to create new ideas and sounding value chains within Lusatia. And in fact, there are already a lot of initiatives in the region to motivate people to move (back) to Lusatia, promoted by cities in the region or the chamber of industry and crafts.

They try to create a start-up feeling and organise round table discussions and other events to share experiences and do networking. This is a first start to get rid of the negative mood, caused by the painful experiences of the hard-structural break in the 1990s and the obvious income and economic gap between Eastern and Western Germany. However, in most cases the subregions/cities are in competition, and a consistent and coordinated concept well financed for the whole region is missing.

Local actors, initiatives and political actors in Lusatia are right now drawing some new visions for the time after lignite. The most discussed and worked out concepts refer to: "Lusatia as energy region", "Lusatia as green region of lakes" / "Lusatian Lakeland" as touristic destination and "Lusatia as industry & service region" (ROSA LUXEMBURG STIFTUNG, 2019).

- "Lusatia as energy region" - Overall the region shows a considerable expertise and socio-economic potential of the development of sustainable green energies, like photovoltaics¹⁹, wind craft²⁰ and Power to X as well as storage the energy like in the project "BigBattery Lusatia²¹".
- "Lusatia as green region of lakes" - This striking idea is not a really new. The concept intends to connect the touristic hotspots and development potentials of the region to start a synergistic touristic development, especially the UNESCO Biosphere Reserve Spreewald and the "Lusatian Lakeland". There are already good marketing experiences with preceding International Building Exhibition "Fürst-Pückler-Land" (IBA) and its implementation projects, which were developed between 2000 and 2010. Some great projects roundabout industry tourism is "The horizontal Eiffel Tower²²" and the "Lusatian Lake District²³" with its floating houses.
- "Lusatia as industry & service region" - This future vision is more driven by political decisions. The aim is to relocate or expand research facilities and to strengthen university education. Future-oriented jobs are also to be created in the administrative area by newly relocated (federal and state) authorities. There are already some successful examples for a conversion of a lignite processing industrial site and a conversion of a lignite-based refinery into a showcase for industrial transition²⁴.

Lusatia is rather structurally weak and affected by emigration and demographic aging, job cuts of this magnitude of roundabout 5% of all employees without replacement cannot be a viable option, no matter how "socially acceptable" it can be designed for those directly affected by job cuts (ROSA LUXEMBURG STIFTUNG, 2019).

In principle, Lusatia has a considerable innovative potential due to the long history as energy district. However, nowadays the patent application is rather low and many commercial decisions are made elsewhere - Lusatia and Eastern Germany as an "extended workbench". Therefore, a functional division of labour with other regions and international acting companies rather than by the region's companies and scientific institutions alone could be more successful (MARKWARDT & ZUNDEL 2017).

In our opinion, the most important point is to stabilise the economic development and job security besides coal industry. It is necessary to strengthen companies with competitive products and services, but also with a regional anchoring and spirit. There are potentials in automation technologies in different clusters besides mining and energy generation, especially environmental technologies, decentralised cycle of matters, food industry, land reclamation, water remediation or construction of floating buildings, etc. Another aspect is, that there are already a lot of industrial and business parks with extension potentials.

¹⁹ https://tracer-h2020.eu/wp-content/uploads/2019/10/TRACER_D2.1-Solar-Park-Meuro.pdf

²⁰ https://tracer-h2020.eu/wp-content/uploads/2019/10/TRACER_D2.1-Wind-Park-Klettwitz.pdf

²¹ https://tracer-h2020.eu/wp-content/uploads/2019/10/TRACER_D2.1-Big-Battery-Lausitz.pdf

²² https://tracer-h2020.eu/wp-content/uploads/2020/02/7-TRACER_D2.4-Good_Practice_Horizontal-Eiffel-Tower-of-Lusatia-Germany.pdf

²³ https://tracer-h2020.eu/wp-content/uploads/2020/02/11-TRACER_D2.4-Good_Practice_From-Mining-to-Dream-Vacation_Lusatia-Germany.pdf

²⁴ https://tracer-h2020.eu/wp-content/uploads/2019/10/TRACER_D2.1-Industrial-Park-Schwarze-Pumpe.pdf

Good job opportunities give people a perspective for living and moving into a region, which creates new ideas and unknown vision for the next years making the difference to other regions- it should be ideally the spark for a self-supporting process and sustainable development. For making Lusatia attractive to other investors, companies and other people like tourists a good and well-structured marketing and mission statement for the region as a whole is so important.

On the other side, the basic infrastructure, concerning traffic and digitisation, is supposed to improve with the so-called "Strukturstärkungsgesetz Kohleregionen" for German coal regions, actually in the legislative procedure, which is steering the use of federal funds for managing the structural change up to 2038 (in sum 14 billion EUR, thereof 43% for the Lusatian region, in three funding periods). Another aspect is the integration of the civil society by participation processes and dialogues. There is also room of manoeuvre for improvement of soft location factors, like culture, creative industries or outdoor and nature-oriented sports. There exist already different options for funding provided by EU-programmes.

Table 5.g DE. Key issues by SWOT and/or PESTEL analysis

<p>Opportunities</p> <ul style="list-style-type: none"> ▪ a lot of (good and bad) experience from the structural break in the 1990s ▪ well-working best practice examples in the region ▪ profound expertise in energy production and conversion 	<p>Threats</p> <ul style="list-style-type: none"> ▪ population fears a repetition of the hard-structural break in the 1990s
<p>Strengths</p> <ul style="list-style-type: none"> ▪ discussion about strategies started already ▪ political will and social consensus to give the region a sustainable economic perspective 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ structurally weak and area - as compared to other regions in Germany ▪ affected by ongoing emigration of young professionals and at the same time rapid demographic aging

5.3.2 Projection of the workforce structure

For the up-coming transition relating to the coal phase-out in 2038 it is necessary to secure jobs and create job replacement strategies. The transition will be plannable ahead, so that it would not be a surprise for the economy and politics. There is the option and need to plan different strategies. These should be developed with the inhabitants of Lusatia, so that the strategies are carried by the population. Out of these strategies it is necessary to create a synergistic structure. For example, the touristic use of floating house, creates a need for construction of these floating houses. Otherwise tourism creates a need for restaurants, hotels, culture, creative industry and sports.

Unavoidable job losses in the coal sector need to be replaced by new job options, which occurred out of the future visions and implementation strategies. The approach has to be reliable and needs to provide planning security for both companies and for local employees. From an economic point of view, the new businesses must allow a sustainable medium to long-term perspective in order to justify the effort for retraining and support measures. Reskilling and training offer need to orient on the demand of professionals and on the interests of the employees but also have to meet the economic needs. The new jobs need to generate a similar value added and income than the former employment structure, otherwise it would be not socially acceptable.

5.4 Conclusions

- Lusatia is still a quite structurally weak area - as compared to other regions in Germany, which is affected by ongoing emigration and rapid demographic aging.
- Job cuts of this magnitude of roundabout 5% of all employees without replacement cannot be a viable option, no matter how "socially acceptable" it can be designed for those directly affected.
- On the other hand, there is already an alarming and ongoing social disparity ("winners and losers"), actually the poverty rate is about 17% of the population, which is a long term-effect of the structural break in the 1990s.
- At this point a most crucial issue should be mentioned: The job loss is also about the question of identities, self-understanding and appreciation for people and their work performance/life achievements.
- There is now the need to find new visions for the development of the region in future. This process has already started (Lusatia as energy, industry and service region, touristic destination, etc.) and will probably be evaluated within the next years - it is not time for resignation but a positive approach.
- Important for the companies and local employees is a well-planned structural change with reliable strategies for alternative businesses on a sustainable medium to long-term perspective.
- One big advantage of the "coal countdown" and upcoming challenges in the next 18 years is, that the economic and social transition process is plannable and controllable ahead.
- The careful analysis of the past years taking into consideration some painful experience gained since 1990 make it possible to avoid social injustice in the transformation process.
- Moreover, it is necessary to integrate the inhabitants of Lusatia in the process of developing new business ideas and concepts - bottom-up-approach.
- For the ongoing development towards the coal phase-out the region Lusatia needs to use all economic and creative potentials within the region and work together with neighbouring areas, sharing their know-how and best practice.

5.5 References and further links

- BUNDESAGENTUR FÜR ARBEIT (2020): Der Arbeitsmarkt im Februar 2020. at: <https://statistik.arbeitsagentur.de/Navigation/Startseite/Startseite-Nav.html> (accessed at 12. February 2020)
- DER PARITÄTISCHE GESAMTVERBAND (2019): 30 Jahre Mauerfall - Ein viergeteiltes Deutschland. Der Paritätische Armutsbericht 2019. 1. Auflage, 76 S., at <https://cloud.paritaet.org/index.php/s/YGZJWLJY5TQzZXm/download>
- EUROSTAT (2020a): Population on 1 January by age group, sex and NUTS 3 region [demo_r_pjangrp3] at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_pjangrp3&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020b): Population: Structure indicators by NUTS 3 region [demo_r_pjanind3] at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_pjanind3&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020c): Employment by sex, age and NUTS 2 regions (1 000) (lfst_r_lfe2emp) at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_r_lfe2emp&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020d): Young people neither in employment nor in education and training by sex and NUTS 2 regions (NEET rates) (edat_lfse_22) at

- https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat_ifse_22&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020e): Gross domestic product (GDP) at current market prices by NUTS 3 regions (nama_10r_3gdp) at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10r_3gdp&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020f): Patent applications to the EPO by priority year by NUTS 3 regions [pat_ep_rtot] at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=pat_ep_rtot&lang=en (accessed at 16. April 2020)
- EUROSTAT (2020g): Population aged 25-64 by educational attainment level, sex and NUTS 2 regions (%) [edat_ifse_04] at https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat_ifse_04&lang=en (accessed at 16. April 2020)
- KELLER, B. & HENNEBERGER, F. (2018): Arbeitsmarktpolitik; <https://wirtschaftslexikon.gabler.de/definition/arbeitsmarktpolitik-28168/version-251804> (accessed at 8. April 2020)
- LEAG - LAUSITZ ENERGIE BERGBAU AG (2019): Bergbau und Kraftwerke - Zahlen und Fakten 2018. https://www.leag.de/fileadmin/user_upload/pdf/LEAG_Zahlen-und-Fakten_2018.pdf. (accessed at 8. April 2020)
- OSCHMIANSKY, F. & BERTHOLD, J. (2020): Angebot und Nachfrage: Entwicklungen seit der deutschen Vereinigung, at <https://www.bpb.de/politik/innenpolitik/arbeitsmarktpolitik/305684/entwicklung-seit-1990> (accessed at 8. April 2020)
- RÖSEL, F. (2019): Die Wucht der deutschen Teilung wird völlig unterschätzt. ifo Dresden berichtet 3, 23-25, https://www.ifo.de/DocDL/ifoDD_19-03_23-25_Roesel.pdf.
- ROSA LUXEMBURG STIFTUNG (2019): Nach der Kohle. Alternativen für einen Strukturwandel in der Lausitz. https://www.rosalux.de/fileadmin/rls_uploads/pdfs/Studien/Studien_4-19_Nach_der_Kohle.pdf (accessed at 9. April 2020)
- SEIBERT, H., WEYH, A., JOST, O., SUJATA, U., WIETHÖLTER, D., CARSTENSEN, J. (2018) Die Lausitz - Eine Region im Wandel. IAB - Regional, Berichte und Analysen aus den regionalen Forschungsnetz 3/2018, 1-63, http://doku.iab.de/regional/BB/2018/regional_bb_0318.pdf.
- SGB - Sozialgesetzbuch - SGB I bis SGB XII. <https://www.sozialgesetzbuch-sgb.de>
- STATISTISCHES BUNDESAMT (2020): Bevölkerung: Kreise, Stichtag (Anzahl), at <https://www-genesis.destatis.de> (accessed at 6. April 2020)
- STATISTIK DER KOHLENWIRTSCHAFT (2018): Braunkohle im Überblick, EXCEL-sheet, at <https://kohlenstatistik.de/downloads/braunkohle/> (accessed at 2. April 2020)
- WEHNERT, T., HERMWILLE, L., MERSMANN, F., BIERWIRTH, A., BUSCHKA, M. (2018) Phasing-out coal, reinventing European coal regions. An analysis of EU structural funding in four European coal regions. Wuppertal Institute for Climate, Environment and Energy, Final Report, 1-61. https://wupperinst.org/fa/redaktion/downloads/projects/PhasingOut_Coal_report.pdf

6 Greece, Western Macedonia Region

6.1 State of play of the social environment

6.1.1 Current status of the main social indicators

▪ Demographics

In 2018, the estimated population of Western Macedonia Region (WMR) was 270.2 thousand inhabitants. This figure ranks WMR into the 11th position among the 13 Greek regions sharing 2.5% of country's population.

Time series (2011 to 2018) outline a population decrease of -4.6%, compared to the national figure -2.9%, ranking the WMR to the 12th position among the 13 Greek regions. Obviously, WMR's population has been shrinking at a higher speed than the rest of the country.

As for the distribution of ages, the following **Figure 6.a** demonstrates the domination of the ages higher than 45 years old. The *ageing index*²⁵ is estimated at 1.484 in 2011 and 1.701, in 2018. The region is ranked into the 3rd (worst) position among Greek regions. It is obvious that young and dynamic population declines at a higher speed than in most other regions.

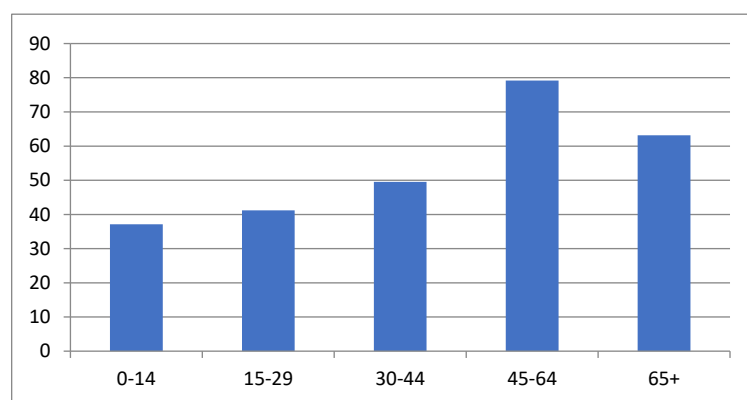


Figure 6.a EL. WMR ages distribution histogram - 2018

Source: Hellenic Statistical Authority

Table 6.a EL. WMR main demographic indicators

Category		Region of Western Macedonia (NUTS 2)							
Years		2011	2012	2013	2014	2015	2016	2017	2018
Resident population (thousands)		283.2	282.8	281.9	281.2	279.5	276.2	273.3	270.2
Age distribution (thousands)	< 15y	42.0	41.5	41.1	40.8	40.0	39.2	38.4	37.1
	15-19y	16.0	17.0	17.4	16.3	14.0	14.9	16.0	16.3
	20-24	13.4	12.3	11.5	12.1	14.2	12.9	11.6	11.4
	25-29	16.0	17.0	16.8	15.7	16.0	13.7	14.8	13.5
	30-44	60.0	57.1	55.6	55.5	53.3	53.6	50.5	49.5
	45-64	73.4	74.9	75.6	76.1	77.4	78.1	78.8	79.2
	15-64	178.7	178.3	176.9	175.7	175.0	173.3	171.8	169.9
	≥65y	62.4	63.1	63.9	64.7	64.5	63.7	63.1	63.1
Ageing Index (%)		148.4	152.2	155.6	158.4	161.3	162.3	164.5	170.1
Change of residence /or/ International migration (no.)²⁶		84	645	92	304	-370	-2,127	-1,484	-1,695

²⁵ The ratio of the population over 65 to the population under 15

²⁶ Estimated net immigration (Newcomers – Population leaving the Region)

Category		Region of Western Macedonia (NUTS 2)							
Years		2011	2012	2013	2014	2015	2016	2017	2018
Life expectancy at age 65 (year) ²⁷	male	18.2	18.1	18.7	18.8	18.5	18.9	n/a	n/a
	female	21.2	20.9	21.6	21.6	21.3	21.7	n/a	n/a

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

Immigration is another important factor that needs to be taken into account. Although it seems that there are not significant residential movements in place, the *immigration balance* (newcomers vs residents leaving the region), is gradually moving to the negative side during the period 2011-2018, (see **Figure 6.b**).

It seems that, besides the negative birth/death balance, immigration has been becoming an additional factor for population decrease last decade.

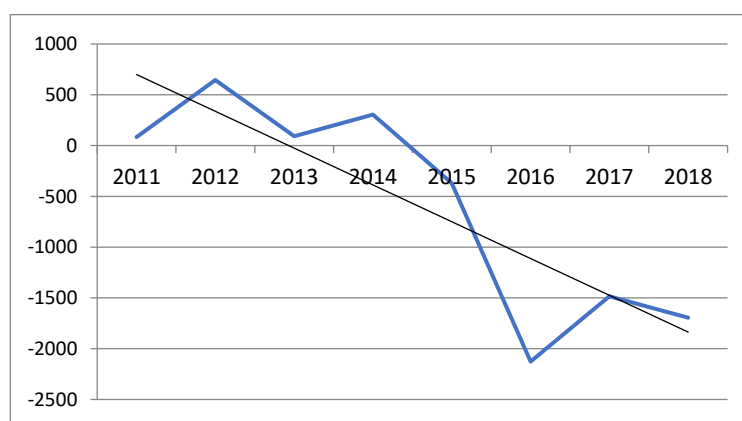


Figure 6.b EL. WMR net immigration

Source: Hellenic Statistical Authority

▪ Employment

In order to investigate the regional characteristics of labour force, three basic parameters are used. The *activity rate*²⁸, the *employment rate*²⁹ and the *unemployment rate*³⁰.

The basic information source for labour force analysis (see **Table 6.b**), is the *labour force quarterly survey*, implemented by the *Hellenic Statistical Authority* (ELSTAT), finalized at a yearly basis. Survey's results may differ slightly from the national census for population and housing that takes place every ten years (last census 2011, next planned at 2021). On the other hand, its rolling type and following statistical adjustments, guarantee that a reliable dataset may depict employment structure in detail.

The regional *employment rate* of population 20-64 in the region was 54.6% in 2018 compared to 54.5% in 2011. A slight negative variation was observed during the years of Greek's economy depression (2012 – 2016), picked down to 49.4 in 2015. During the same period the national figures accounted 59.5% and 59.6% respectively presenting a similar variation over time. By comparing the regional and national figures, it can be concluded that the *regional employment rate is constantly lower than the national one*.

Table 6.b EL. WMR employment indicators

Category	Region of Western Macedonia (NUTS 2)							
Years	2011	2012	2013	2014	2015	2016	2017	2018
Employment rate (%) of population 20-64	54.5	49.2	47.9	51.2	49.4	50.4	52.7	54.6

²⁷ Country index, based on Eurostat methodology

²⁸ the ratio of the total labour force to the population of working age

²⁹ the ratio of the labour force *in work* to the population of working age

³⁰ the ratio of the unemployed population to the labour force

Category		Region of Western Macedonia (NUTS 2)							
Years		2011	2012	2013	2014	2015	2016	2017	2018
Activity rate of population 15-64(%)	male	73.24	71.38	70.88	72.13	74.54	77.31	77.31	77.64
	female	58.37	56.77	56.35	57.44	59.38	61.43	61.43	61.40
Activity rate (%)	15-24	20.0	19.5	19.5	20.1	20.7	21.5	21.5	21.3
	25-44	82.1	81.8	82.5	84.8	89.7	96.7	96.7	99.4
	45-64	67.4	64.1	62.5	62.8	63.6	63.6	63.6	62.7
Average number of employees by economic activities (thousands)	Total economy	90.6	80.4	77.1	82.5	81.2	84.5	84.5	86.2
	Agriculture	16.0	14.0	14.3	15.1	15.4	17.9	17.9	17.8
	Industry	18.3	16.2	14.6	14.3	14.0	17.8	17.8	17.2
	▪ Hard coal and lignite mining	4.6	3.9	3.4	3.1	2.9	3.6	3.4	3.1
	▪ Electricity, Gas and HAC	3.1	2.9	2.8	2.9	2.9	3.9	4.1	4.1
	Construction	5.6	4.9	4.7	6.1	4.5	3.0	3.0	3.1
	Retail, Accommodation and food, communication services	23.8	19.4	18.2	20.7	20.0	21.0	21.0	19.4
	Financing	5.2	4.5	4.7	5.2	4.6	5.2	5.2	5.2
Other Professional Scientific and Technical activities	21.7	21.4	20.6	21.2	22.8	19.7	19.7	23.5	
Gender employment gap (%)		69.1%	63.8%	63.5%	64.3%	61.0%	60.7%	63.9%	66.6%
Registered unemployed (per thousand inhabitants)		95.87	119.93	126.07	111.73	128.85	133.50	127.04	118.14
Unemployment rate (%)	male	26.8	28.6	29.1	27.9	25.5	24.3	22.7	22.4
	female	41.6	43.2	43.7	42.6	40.6	39.7	38.6	38.6
Total		23.1	29.7	31.6	27.6	30.7	31.3	29.1	27.0
Persons in households having all members unemployed (thousands)		24.3	28.7	32.5	28.2	31.7	29.2	26.7	21.9
Unemployment benefits monthly average (euro)		n/a-	n/a	n/a	n/a	n/a	n/a	n/a	399
Long term unemployment rate (%) ³¹	male	6.7	10.9	12.9	10.5	12.5	12.9	12.8	11.5
	female	8.7	12.1	13.4	10.9	13.7	15.3	16.0	15.4
Youth unemployment rate (%) 15-24 ³²		6.2	8.9	8.2	8.0	9.5	8.7	6.7	7.5
Average nominal monthly net/or/gross wages (euro) ³³	Total economy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Agriculture	750	n/a	n/a	n/a	n/a	584		607
	Industry	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	▪ Hard coal and lignite mining	1,169	n/a	n/a	n/a	n/a	1,050	n/a	1,140
	▪ Electricity, Gas and HAC	1,179	n/a	n/a	n/a	n/a	1,047	n/a	1,237
	Construction	964	n/a	n/a	n/a	n/a	773	n/a	771
	Accommodation and food services	846	n/a	n/a	n/a	n/a	634	n/a	668
	Financing	1,287	n/a	n/a	n/a	n/a	1,111	n/a	1,151
	Professional, Scientific and Technical activities	997	n/a	n/a	n/a	n/a	861	n/a	890

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

³¹ Over than 12 months unemployed rate

³² Not entered to labour market yet rate

³³ Source: Labour Institute - Confederation of Greek Unions – 2018, 2017

As regards the *employment rate*, the region is ranked into the 12th position (out of 13) among the Greek Regions for the year 2018, while the *Unemployment rate* is constantly higher than national levels (see **Figure 6.c**).

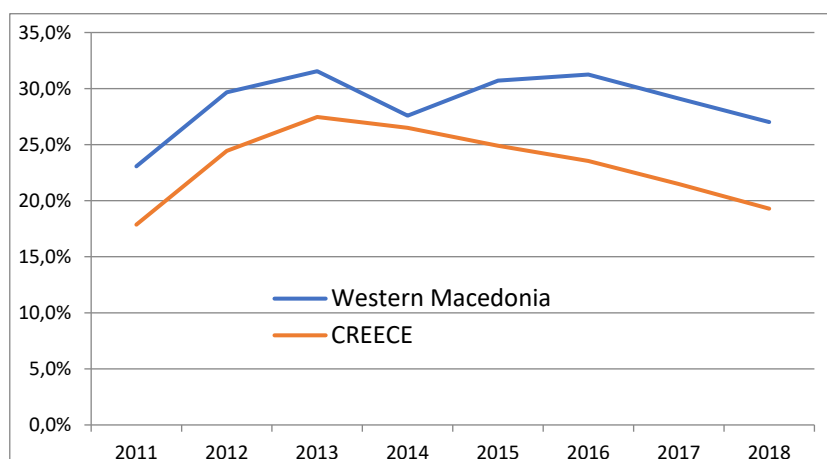


Figure 6.c EL. Unemployment rate
Source: Hellenic Statistical Authority

Total employment in the region accounts to 86,200 persons, compared to 90,600 in 2011, the latter figure indicating region's employment before economic depression.

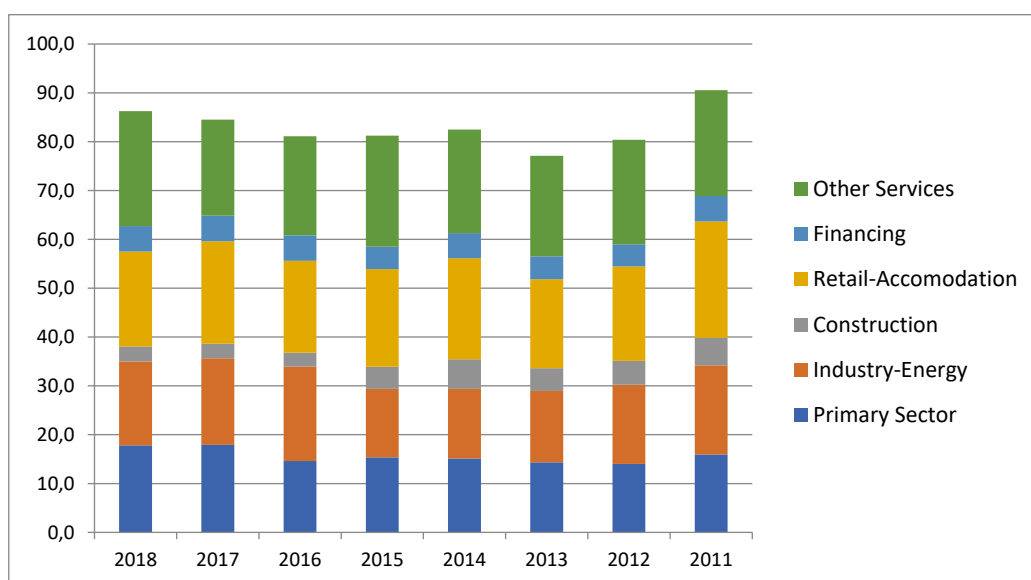


Figure 6.d EL. WMR employment structure (number)
Source: Hellenic Statistical Authority

Examining the graph in **Figure 6.d** it can be summarised that:

- Employment in the *Industry* and *Primary* sectors is dominant, sharing about 20% each;
- Employment in *Construction* accounts for 4% approximately in 2018 compared to 6.2% in 2011, thus reduced by more than 40% probably due to the depression in house construction activities;
- Employment in Retail & Accommodation has been decreased slightly from 26.3 in 2011 to 22.5 in 2018, while employment in *Other services* with 24% (2011) and 27.2% (2018) respectively keeps a significant role. Thorough investigation needs to take place, in order to define the magnitude of the employment of this category that is related (directly or indirectly) with *Industry*.

The above observations need to be further investigated, together with the observed regional specialisation. Regional specialisation can be expressed mathematically by the *Location Quotient* (LQ). LQ is calculated for a specific sector and region as the ratio of the Regional Employment Share of the sector, to the National one, i.e.

$$LQ = \frac{(\text{Employment of sector } i \text{ in the region} / \text{Total Employment in the region})}{(\text{Employment of sector } i \text{ in the country} / \text{Total Employment in the country})}$$

LQ values > 1 indicate sectors that are most important for the region (*exporting sectors*), while values below 1 indicate sectors that are less important for region's development. **Table 6.c** demonstrates clearly that WMR is specialised in industry (including energy & mining) and agriculture.

Table 6.c EL. WMR Location Quotient 2018

Sector	Regional Share (RS%)	National Share (NS%)	QL (RS/NS)
Primary Sector	20.66	12.27	1.68
Industry-Energy	19.93	11.29	1.77
Construction	3.57	3.96	0.90
Retail-Accommodation	22.52	33.92	0.66
Financing	6.05	11.20	0.54
Other Services	27.28	27.37	1.00

Region's specialization in Industry & Energy becomes even more important when the wages offered by each sector are taken into account. As it is clearly demonstrated in **Table 6.b**, *nominal wages* in mining and electricity sectors are estimated at 1,140 € and 1,273 € respectively, far beyond other sectors (771 in construction, 890 in other services and 607 in agriculture). This fact reveals the important role of industry & mining to the local economy as it provides high quality jobs contributing significantly to local income.

Table 6.d EL. WMR employment structure by skilling profile (in thousands)

	Total Employment	Office labour (white-collars) - strong specialisation	Office labour (white-collars) - low specialisation	Labourers (blue-collars) - strong specialisation	Primary Sector	Unskilled
2018	86.2	22.2	24.1	17.6	17.5	4.8
2017	84.5	20.4	23.7	17.9	17.7	4.8
2016	81.1	18.5	24.6	18.9	14.4	4.7
2015	81.2	21.0	21.2	19.8	15.1	4.1
2014	82.5	21.9	20.1	20.8	15.0	4.7
2013	77.1	23.7	14.9	19.5	14.3	4.6
2012	80.4	20.2	20.3	21.8	14.0	4.1
2011	90.6	21.3	24.8	24.9	15.8	3.7

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

Table 6.e EL. WMR employment profile by business type (in thousands)

	Total Employment	Self-employed with employees	Self-employed without employees	Employees	Family business support
2018	86.2	4.0	27.3	52.7	2.3
2017	84.5	5.1	26.9	49.1	3.4
2016	81.1	4.5	25.3	48.4	2.9
2015	81.2	3.3	27.7	45.8	4.5
2014	82.5	3.9	27.6	45.4	5.7
2013	77.1	4.9	24.9	44.3	3.1
2012	80.4	5.2	24.6	47.1	3.4
2011	90.6	6.5	26.7	51.3	6.0

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

Table 6.d outlines the share of people working in office (*white collars*), by-hand (*blue collars*) and labourers in the primary sector. It is important to mention that the number of *labourers with strong specialisation* has been reduced from 24.9 (27.5%) to 17.6 thousands (20.4%), while the number of unskilled and primary sector employees has increased from 19.5 (21.5%) to 22.13 thousands (25.9%).

Table 6.f presents the regional employment profile according to business type. *Self-employed* keep an important share of labour market (29% in 2011 and 31% in 2018), while the number of people working on traditional *family businesses* has decreased from 6.6% to 2.7%. The number of employees forms the basic part of work force in the region accounting 56.6% in 2011 and 61.1% in 2018. Time series present the general pattern observed in depression period, by decreasing during the first period and recovering back in 2018 (see also **Figure 6.b**).

- *Education*

Table 6.f and **Figure 6.e** that follow present the classification of region's population (> 15 years), according to their education level. It is obvious that the region provides high quality & specialised work force, while post graduates have been over-tripled since 2011. High school / college graduates have increased significantly as well.

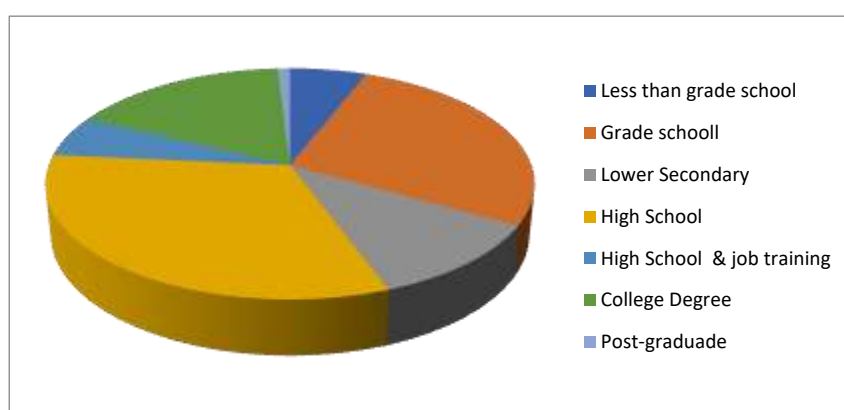


Figure 6.e EL. WMR education level share (%), 2018

Source: Hellenic Statistical Authority

Table 6.f EL. WMR population by education level (thousands)

	Less than grade school	Grade school	Lower Secondary	High School	High School & job training	College Degree	Post-graduate
2018	13.8	63.7	25.9	74.9	13.4	39.2	2.2
2017	12.8	66.1	30.2	70.4	14.0	39.5	1.8
2016	14.6	67.8	31.5	72.5	13.5	35.2	1.9
2015	16.0	74.0	30.2	71.1	12.8	33.6	1.7
2014	16.7	78.6	29.2	68.1	11.7	34.4	1.6
2013	15.2	82.0	29.8	66.7	13.9	31.8	1.4
2012	13.5	88.1	29.4	65.5	14.4	29.3	1.3
2011	17.0	86.1	27.3	66.7	11.9	31.5	0.6

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

- *Entrance to labour market & long-life education*

According to the following **Table 6.g**, there have been up to 6.1 thousand graduates at the age of 30-34 years old just entering, or ready to enter, into the labour market in 2018. This figure provides a useful indicator for the dynamic parts of the labour force that may satisfy jobs offered. On the other hand, there are also 12 thousand individuals at the age of 15-29 that are neither employed, nor in education or training status.

The number of individuals participating in long life education programmes ranges from 9.4 to 11.7 thousands for the period investigated, while the number of pupils in the technical and professional

secondary education (both public and private) have been accounted to 6.4 thousands for 2018, providing a ratio of 23.64 pupils / 1,000 inhabitants.

Both figures, i.e. the *participation in long life education programmes* and the *attendance of professional and technical secondary education*, indicate that skilling and long-life learning, may provide a significant opportunity for region's development.

Table 6.g EL. WMR labour force specific figures (thousands)

	2011	2012	2013	2014	2015	2016	2017	2018
Young people (15 – 29 yr) neither employed nor in education and training status	10.8	14.8	16.5	11.8	12.4	11.0	11.9	12.0
Graduates 30 – 34 yr	4.9	4.4	4.9	5.7	4.4	4.8	4.9	6.1
Long Life Education	9.4	8.8	10.6	12.5	13.6	13.0	12.4	11.7

Source: Hellenic Statistical Authority, 2019 www.statistics.gr

6.1.2 Comparative analysis

Lignite deposits in Western Macedonia Region were first considered as exploitable in 1938 and initial research estimated the proved reserves by 6 billion tones. In late fifties (1956) the construction of the first power generation unit in the area of Ptolemaida (10 MW) was contracted and, since then, the area of Kozani, Ptolemaida and Amyntaio has been the energy centre of Greece. By 2002 the total lignite production reached the pick value of 57 Mtones, while the total installed capacity for power production was 4,200 MWe. Starting from 2002, the exploitation of lignite mines has been declining slightly. However, the extracted volume continued to be significant until 2010 (approximately 50 Mtones providing fuel for 4,438 MWe), and was decisively declined after 2012. Actually, 2011 was the first year of unit decommission (Ptolemaida I). Lignite production accelerated in 2012, but it continued declining the following years together with the decommission of old units (see **Figure 6.f**) reaching approximately 36 Mtones in 2018³⁴.

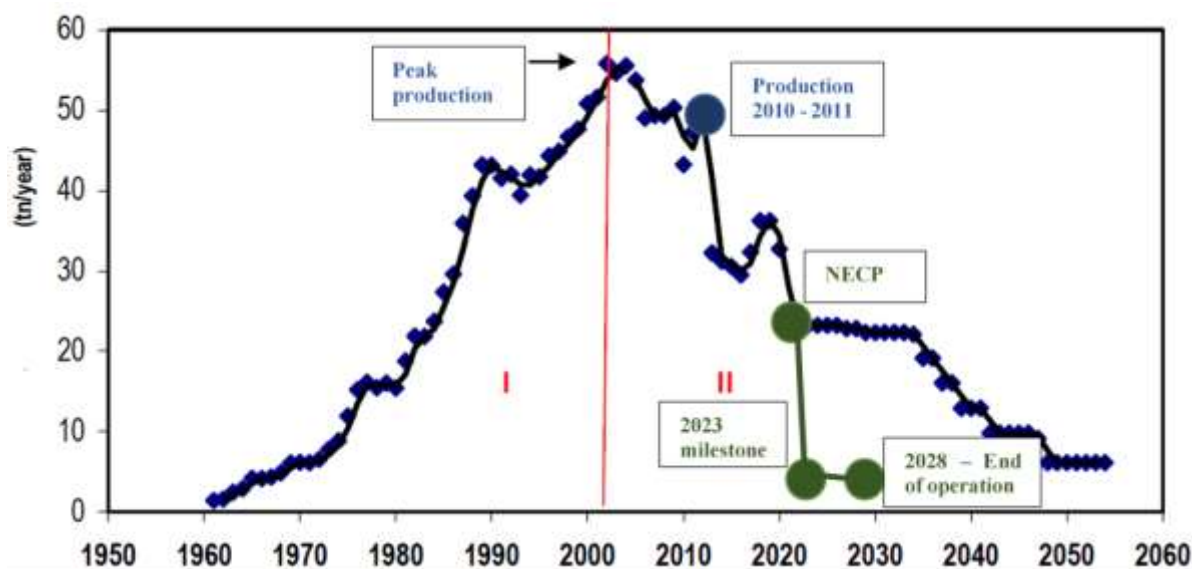


Figure 6.f EL. WMR lignite deposits exploitation timeline

Source: Hellenic Statistical Authority

³⁴ PPC Annual reports, <https://www.dei.gr/el/i-dei/etairiki-koinwniki-euthuni/entupa-gia-etairiki-koinwniki-euthuni>

In 2018 – 2019 the Greek Government elaborated the National Energy & Climate Plan (NECP) providing decisions for the decarbonisation of the Greek Energy System that will lead to the decommissioning of most lignite power units in 2023 (except one unit), as well as the final decommission of the remaining unit in 2028 (see green milestones and lines in **Figure 6.f**).

This plan provides a more accelerated schedule than the expected by PPC, which provided a smoother approach for plant decommissioning (see blue line in **Figure 6.f**).

Therefore, the basic milestones of Western Macedonia's lignite deposits exploitation process have been:

- The *beginning* of lignite extraction and power generation in 1956.
- The *peak period* of lignite exploitation in 2002. Until that period, up to 50% - 60% of total deposits were exploited, in a 'healthy' business environment that favoured continuous development, since lignite increased its role to the national energy system.
- The *start of decline* in 2010, where the plans for decarbonisation of the national energy system were set in the framework of the Climate targets '20-20-20'. By that time, the Public Power Corporation (PPC) lost its role as the dominant player in the Greek Energy Market, Renewable Energy Sources were rapidly developed, and CO₂ emission trading mechanisms provided a burden to production cost.
- The elaboration of the *National Energy & Climate Plan*, in 2018-2019, where the Greek Government set up specific targets for the end-of-life for lignite power generation.
- The *shutdown* of the majority of energy production units in 2023.
- The *end of life* of lignite exploitation in 2028.

The indicators describing demographics and employment in the region were analytically described in the framework of the previous chapter *Current status of the main social indicators*.

However, it is useful to investigate deeper the employment indicators for mining and power production in the area:

- According to available information, PPC full time employees working in mines and power production at a permanent basis were approximately 5,700 in 2011, 4,500 in 2014, and 3,900 in 2018³⁵. During the last decade, the Public Power Corporation, once the sole employer in the region, stopped hiring new employees while a number of its services have been outsourced. This practice resulted in the increase of the mean age of company's work force as well as the shortcomings in specific areas of production process, especially in employees with high technical expertise. On the other hand, the number of employees in mining and energy production sectors, working outside PPC, increased.
- The multiplier of direct to indirect employment in the energy & mining sectors is very high. It is estimated that for each job in mining and power production, 3.28³⁶ more jobs are created and maintained indirectly³⁷.

Previous observations provide a challenging framework for regional social policies. Development of new business areas, reskilling, as well as technology and social innovation, need to be implemented on time.

³⁵ Source: PPC Annual reports, 2011 - 2018

³⁶ Source: Technical Chamber of Greece, Department of WMR, 2012

³⁷ Technical Chamber of Greece, Department of WMR, 2012, TRACER deliverable 3.1

Table 6.h EL. Basic time indicators for lignite mining and power production

	2002 ³⁸	2010	2018	2024	2029
Population below poverty line³⁹ (%)	41.6	37.8	37.3		
Unemployment rate (%)	14.9	15.4	27.0		
Number of employees in PPC (mining & lignite power)		6,800	3,800	1,000	0
Lignite Power Plants, Installed Capacity (MW)		3,873	3,912	615	0
Share of lignite to Gross Electricity (%)	63.3	53.6	32.2	21	0
Mines production (Mt)	57.5	50	25	8.5	0

Source: Greek Statistical Authority & PPC Annual reports

The type of policies implemented need to take into account the special characteristics of the work force which participates in mining & energy production. Such an interesting factor is the age of employees working in the sector charted in the following **Figure 6.g**.

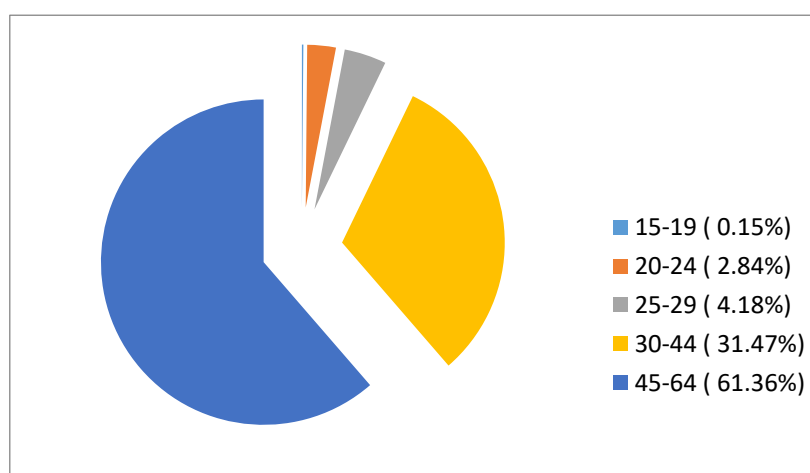


Figure 6.g EL. Age distribution in Industry & Mining in WMR (2011 -2018 average)

Source: Hellenic Statistical Authority

6.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

6.2.1 National public policies

During last decade, Greece suffered from the outbreak of a severe economic and fiscal crisis. The social impact of the crisis has been extremely serious. From the earliest days of the crisis (2010) increasing social inequality threatened social cohesion and protection. Unemployment reached approximately 27% by 2013 while the country managed to recover a part of that depression reaching 17%, by 2019.

During the peak of the crisis, a rise in inequality was observed in parallel with a decline in social protection. Although unemployment doubled, the number of those receiving unemployment benefits remained unchanged. While the percentage of those living in poverty increased, social expenditures fell sharply, so that the significant reduction in the debt would be due primarily to the reduction in social expenditures. The fiscal crisis and persistent economic recession in Greece, in conjunction with the increased emigration of highly qualified young people, particularly towards northern European countries, have had a direct impact on the supply of skills in relation to demand.

³⁸ Methodology review need to be taken into account for best statistical callibration.

³⁹ Projected values for the years 2002 and 2010

Greek society has always been characterised by a strong demand for general education and university studies. Vocational Education & Training (VET) held little appeal for young people and was associated with 'laborious' and 'inferior' manual labour; on the contrary, general education is associated with expectations of improved social standing. Today, young people continue to see vocational education as a last resort, despite unceasing efforts by the authorities to present it as an alternative of equal value with general education. Moreover, the statistics show that those with technical and vocational qualifications have less trouble finding jobs than those with general education.

A crucial issue for the attractiveness of vocational education, both generally and in relation to specific specialties, concerns occupational rights. While the construction sector, to take one example, grew considerably, related specialties in vocational upper secondary schools have seen low participation. This is because there are no established occupational rights for technicians with low or intermediate level qualifications.

Formal Vocational Education and Training leads to the acquisition of certificates recognised nationally by public authorities and includes also education for adults. Vocational Education is provided by the vocational upper secondary schools. These schools (public or private) are founded exclusively by the Ministry of Education and Religious Affairs and may be day or evening schools.

Curricula can be developed in line with the European credit system for VET (ECVET), and take into account, where these exist, related job profiles certified by the National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP).

Non-formal education is provided in an organised framework outside the formal education system that can lead to nationally recognised qualifications. It includes initial vocational training, continuous vocational training and adult learning.

Providers of Continuous vocational training (public or private) outside the formal education system are supervised by the General Secretariat for Lifelong Learning (GSLL) of the Ministry of Education. The specialties offered in public vocational training and the sectors under which they are classified are determined by decision of the Minister for Education in accordance with the needs of the national and local economy and proposals of regional administrations, competent ministries and social partners.

Continuous vocational training and general adult education is provided by the lifelong learning centres (LLCs). The Ministry of Education, through EOPPEP, is responsible for safeguarding quality of non-formal education, evaluating these centres and monitoring their operation.

To decentralise actions in this area administrative bodies have been set up by the Greek regional administrations to manage the national lifelong learning network. Each region may draw up its own programme, which includes investments, in vocational training. The municipalities also can set up LLC's and mobilise the network of lifelong learning bodies in their region, offering programmes linked to the local labour environment and beyond.

Greek Manpower Employment Organization (OAED) role and apprenticeship programmes

The basic organisation implementing social and skilling labour programmes is the Greek Manpower Employment Organization (OAED). The operation of OAED is based on three pillars:

- promotion to employment;
- unemployment insurance and social protection of maternity and family; and
- vocational education and training.

OAED is the public authority and central body managing:

- Active Labour Market Policies for halting unemployment, promoting employment and vocational training for both unemployed and employed people,
- Passive Labour Market Policies with regard to measures for unemployment insurance (regular unemployment benefit) and other social protection benefits and allowances (maternity allowance, OAED day nurseries),

- Active Labour Market Policies for initial vocational education combined with on-the-job training (Apprenticeship system).

Apprenticeship was established by legislative Decree 3971/1959 and is based on the German dual learning system which combines in-class education with paid practical work in a business.

OAED operates a total of 51 apprenticeship schools, which have an average annual enrolment of 10,000 students, depending on the relevant annual announcement. Their courses last two school years (four semesters). They admit students aged 16 to 23 who have completed at least one class of the upper secondary school. The paid practical work takes place four or five days a week in public or private sector enterprises on terms specified in the relevant apprenticeship contract. Participating enterprises are subsidised. The school is responsible for finding work placements for its students.

The institution of apprenticeship has been strengthened across the country by the establishment and operation of 30 vocational education career offices. These aims to systematically link vocational education to the working world by placing students in appropriate jobs in private and public sector enterprises.

6.2.2 Regional and local policies

The regional labour and social strategies, have been planned in the framework of the current Regional Operational Programme (period 2014 to 2020)⁴⁰. The programme aims to support the creation of a competitive and sustainable economy where high-quality jobs, social cohesion and environmental protection are main success factors.

The programme follows the following main development principles:

- a. Economy and entrepreneurship, where the basic objective is to increase the competitiveness of local economy, by supporting innovation and access to international markets;
- b. Environment and infrastructure, where the defined objectives include:
 - The exploitation of local renewable energy sources
 - The implementation of environmental protection technologies
 - The development of crucial infrastructure, and
 - The protection of natural and cultural heritage
- c. The social cohesion and employment, where the main objectives are the strengthening of health system, the development of education and skilling services and the promotion of social economy.

In Western Macedonia, the regional strategy aims to increase the role of Research, Technology and Innovation (RTI) by setting quantified targets, i.e. to double the current share of investments for RTI to GDP by 2020, at the modest level of 0.2% compared to the National 1.2% and European 3%.

In order to achieve the above-mentioned targets, labour educational skilling and long-life learning programmes are targeted to the basic areas of the region which are:

- Energy from RES and Energy Efficiency
- Leather and fur small industry
- Thematic tourism
- Agricultural methods and technologies
- Processing and promotion of agriculture products.

The region still lacks infrastructure in all educational and training levels, so most funding mechanisms of the operational programme are designed to support infrastructure for education.

⁴⁰ Regional Operational Programme 2014-2020 – EC Structural Funds

The total budget of the contracted projects of the Regional Operational Programme belonging to the 'Education & Long-Life Learning' thematic target account for 66 M€ approximately, where the allocated budget for all thematic targets account for 439 M€ (15% share). The most important part of the thematic target's budget has been provided to the development of new infrastructure for the university (40 M€) and secondary education (13 M€).

Public Power Corporation (PPC) on the other hand, acting as the main industrial player in the region, has developed a robust training infrastructure. The programmes organised by its two training structures⁴¹, aim to support the operation of the company by providing training to technicians and engineers. Although, these schools host significant infrastructure and personnel, they have not organised programmes for employees outside the company yet.

It can be concluded that training and long-life learning activities have not been designed to support the forthcoming rapid transition (2023 to 2028). The existing structures are either weak or lacking a vision for a decisive intervention in labour market.

6.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors

6.3.1 Transition objectives. Key issues analysis

Lignite exploitation in Western Macedonia started seventy years ago. In the following three to eight years, this activity will come to an end. As it usually happens, the local economy will suffer from unemployment, shortened income and lack of development vision. Immigration will increase, while local and national initiatives and policies will provide a few new activities, not been able to reverse the general declining trend. The restoration of old mines and the reconstruction of the ecosystem will demand a lot of financial and human resources, which are not easily available for a long period.

The surrounding economic environment will play an important role. In case that national development rates are promising, then there may be good chance for the attraction of new investments; if not, public budget will not be sufficient to cover the basic needs for the transition.

In order to overcome the forthcoming depression, there is a need for coherent regional transition strategies that reflect a wide consensus between the various stakeholders. These strategies would face up with challenges regarding the adaptation of legal framework, the funding of policies, the organization of land uses, the attraction of investments, the development of infrastructure and the strengthening of the local work force.

Among the available options, this report focuses on objectives and policies that exploit best the local potential, trying to exploit the *endogenous resources* of the region. In this regard, we do not oversee the importance of big investments or inspired ideas that may support future regional development. On the contrary, they are welcomed. However, regional transition policies require that *local advantages* need to be discovered and exploited in advance, in order to provide sustainable and resistant development.

The following objectives have already been proposed and discussed by different stakeholders, while there are subject to public dialogue.

a. Primary sector

Agriculture is one of the most robust development options for regional development. The region offers potential for the production of quality agricultural and livestock products such as 'safran', the aromatic plants, and certified products such as cheese and wine.

In addition, the region provides good potential for energy crops and forestry products.

⁴¹ Fast Paced Training Centre of Kardia, Fast Paced Training Centre for Mining Personnel

The development of Agriculture could be used as a *leading test case* for the Greek primary sector, as region's focus on quality products, forestry and energy crops is coupled with national objectives for agricultural development. In this regard, public and private investments, as well as the development of social economy, the introduction of innovative policies in financing and innovation would provide significant advantages. On the other hand, agriculture provides short income compared to other sectors (see **Table 6.b**), and jobs created are usually of 'additional profit' type. In order to overcome this barrier, forms of social economy as well as special incentives for young people should be exercised.

Skilling becomes an important issue. Newcomers need to obtain knowledge rapidly, while traditional farmers should exercise new techniques.

b. Construction, Public Works and Mine Restoration

Infrastructure as well as mine restoration is the first priority for the transition period. This option provides an immediate solution for job maintenance, especially in activities that are related, with mining. Employment in the construction sector has been low compared to the national mean during last decade (see **Table 6.c**). Region's development emerges the need for attracting new public and private investments for infrastructure of any kind such as natural gas, smart distribution networks, road and rail transportation, public buildings, industrial parks, building construction etc.

Infrastructure projects that are in a planning or development phase include the extension of natural gas network and the construction of the new (North to South) road connecting the region with Central Greece.

On the other hand, mine restoration is an immediate answer, not only for remediation but for the maintenance of jobs as well, as international experience proves that transition is best forwarded in cases that former mining companies and staff worked upon restoration.

Mature projects that are at a planning status include the construction of Photovoltaic parks and energy storage facilities, the development of technological parks and university campus, and the restoration of land for forest and agricultural use.

Greece offers a robust private sector in construction engineering, while the region offers a good number of skilled human resources (see also **Table 6.f** and **Table 6.g**) together with a good back end in technical education and long-life learning.

Infrastructure projects require the robust governance, the secure of financing for public or public/private participation schemes, and the adoption of a long-lasting implementation plan. In return they offer long breathing development in depression times, and good quality jobs.

c. Energy Efficiency

The increase of Energy Efficiency (EE) is a basic priority of European and national Energy policy. Greece has set ambitious targets for the reduction of energy intensity. Energy Efficiency policies support the development of projects, products and services in the building sector, transportation, industry, SMEs, municipalities, etc. The increase of energy efficiency supports the climate targets, while at the same time reduces the energy costs in the production chain, improves the status and value of buildings, reduces energy service costs and supports the fight against energy poverty.

WMR forms the coolest climate zone in Greece (zone D). Due to this fact EE projects in buildings are highly required in order to provide best living conditions. At the same time, these projects become more profitable compared to other climatic zones, in terms of the return period of the capital invested.

The implementation of energy efficiency programmes supports the creation of good quality jobs, especially in the building sector (engineers and technicians). Among the various energy sector development options, energy efficiency provides the highest multiplier for job creation. Improvement of energy efficiency options, together with the development of distributed generation of renewable energy and district heating, provide the maximum participation to energy transition by SMEs, municipalities and citizens.

To this end innovative tools, such as the Energy Communities, could play an important role. On the other hand, Public Power Corporation could play an important role by expanding its activities in the energy services sector and extending its dominant role in energy.

The Western Macedonia Region offers a good number of skilled engineers and technicians having experience in energy sector, as well as the educational infrastructure for training (see also **Table 6.f** and **Table 6.g**), therefore the prospects for creating local workforce specialized in energy efficiency are promising.

Western Macedonia Region needs to set ambitious targets for energy efficiency for buildings, being a national *leading test case* for increased energy efficiency. National quantitative targets should be doubled at a regional level. Skilling infrastructure and programmes are a basic factor for such a development and will need to improve further, while financial support and introduction of innovative business models (e.g. energy services) need to be exercised.

d. Education, Research & Innovation

Energy transition provides technological challenges while introducing innovative solutions into the everyday economic and social processes. Regional infrastructures, i.e. university, research centres, technical schools, private companies exercising technology innovation, play leading role in long term development.

The region has developed in the past (for the framework period 2014-2020) its *Smart Specialization Strategy*⁴² setting regional innovation and knowledge-based development priorities. Following the main recommendations of the adopted strategy, the region should not focus exclusively on energy/industry technologies (while these are core regional specialization), but need to adopt a diversified approach (dynamic sectors include energy, leather, livestock & agricultural products, processed food, construction).

To this end, the University of Western Macedonia and local research centres need to further develop their activities. Along with the development of infrastructure and construction of a new University campus, the scientific areas of transition, such as energy technologies, environment, agriculture, innovative financing and social economy should become in the core of education and regional research activity.

Along with the development of RDTI infrastructures, the operation of platform mechanisms offering intelligence to local companies and start-ups, together with the implementation of cluster policies is required. A crucial factor for such a development is time. Investments in education & research are usually time consuming, financial support is rarely uninterrupted and solutions provided are usually out of time. To this end, specific governance and financial mechanisms should put into place in order to provide flexible solutions

e. Renewable Energy Sources

Western Macedonia region offers the most developed and secured energy infrastructure in the country. Renewable Energy Sources, such as wind, photovoltaics, biomass, hydroelectric, together with innovative solutions such as energy storage and power to gas, could be easily developed, especially in post-mining areas. The region offers land availability and potential for all sources of RES, so an ambitious set of targets should be set. Current estimations account the available potential to 4% - 5% of the national target for RES, while investment proposals include innovative solutions, such as energy storage, hydrogen technology, construction of giga-PV plants in old mines⁴³ etc.

The role of public Power Corporation is crucial, since PPC may remain a dominant player for regional RES development.

At the same time, the National as well as European political and investment environment is in favour of such a development (ambitious targets set by the national Energy & Climate action plan and the

⁴² RIS₃ Regional Assessment of Dytiki Makedonia – DG REGIO December 2012

⁴³ Public Power Corporation - 2019

European Green Deal). In order to speed up this development, the following key factors need to be taken into account:

- Legal issues regarding land properties as well as a detailed specification of land uses need to be clarified in advance.
- Participation of the local society in planning, operating and profiting by new installations should be maximized.
- Local RES development using social innovative business models, such as the Energy Communities, should be an important option.
- Development of solutions close to energy demand, such as net-metering and RES district heating, should be actively supported.

RES development may provide a good number of jobs especially in the initial ‘construction phase’, thus providing immediate solutions in employment.

f. Culture & Tourism

Tourism has not been an important option for local development until now. On the other hand, best practices already been developed in regions in transition prove that the tourist sector becomes a major player in post-mining areas. Western Macedonia offers comparative advantages for tourism development, such as the existence of important ecosystems and two national preservation areas (Valia Kalda and Prespes). In addition, the region hosts places with historical and architectural interest, such as stone villages and bridges following the Macedonian architectural style.

New forms of tourism may be promising including industrial tourism (especially in old energy production and mining sites), ecotourism (in natural protected areas), meeting & conference tourism, religious tourism etc. Key factors for tourism development in the area are:

- The immediate planning of infrastructure and remediation projects
- The clarification of land uses in order to avoid conflicts with other types of development

Table 6.i EL. SWOT analysis

Objective	Strengths (S) Weaknesses (W) Opportunities (O) Threats (T) Analysis
<i>a. Primary sector</i>	<p>S: Experience from existing production and associations operation. Potential for specific agricultural products (aromatic plants, ‘saffron’, peaches, forestry, energy crops)</p> <p>W: Land is not available for intensive development, costs are high</p> <p>O: Strong demand for the agricultural products of the region (aromatic plants and ‘saffron’, peaches) demand for energy crops in energy production</p> <p>T: Profits will not be as high as to motivate newcomers.</p>
<i>b. Construction, Public Works and Mine Restoration</i>	<p>S: Robust private sector, skilled personnel</p> <p>W: Return period for infrastructure projects is very long, need for advanced financing (probably by EC institutions)</p> <p>O: Potential for challenging projects with strong innovation added value</p> <p>T: Need for robust governance for a long period</p>
<i>c. Energy Efficiency</i>	<p>S: PPC may play an important role existence of skilled personnel</p> <p>W: Private funding mechanisms (Energy Services market) have not developed yet</p> <p>O: Strong political will for EE at a national and regional level</p> <p>T: Need for steady financing, by public and private financial institutions</p>
<i>d. Education Research, & Innovation</i>	<p>S: Tradition on specific clusters (energy, leather, livestock, agricultural products, food, construction)</p> <p>W: RTDI infrastructure missing</p> <p>O: Political will for further development of university and research centres</p> <p>T: Neighbouring regions and countries are very competitive.</p>

Objective	Strengths (S) Weaknesses (W) Opportunities (O) Threats (T) Analysis
<i>e. Renewable Energy Sources</i>	<p>S: Good potential. PPC may play a significant role, existence of skilled personnel</p> <p>W: Local participation is not as high as to share profits to society</p> <p>O: Strong political will for EE at a national and regional level</p> <p>T: Legal, physical planning and land ownership need to be clarified by the beginning</p>
<i>f. Culture & Tourism</i>	<p>S: Infrastructure has reduced isolation. Unique Culture & Heritage</p> <p>W: There is no experience in the sector, compared to other regions, investments cannot be attracted</p> <p>O: Demand for special sustainable forms of tourism</p> <p>T: Region has not been inside popular destinations; it needs time to build a brand name</p>

6.3.2 The future workforce structure, in a holistic approach

WMR development profile provides advantages, such as its position in the heart of South Balkans (neighbouring with two EU candidate countries - Northern Macedonia and Albania), the existence of technically skilled personnel, the potential for agriculture and sustainable tourism and a university with promising future.

These advantages, together with the available financial support, such as the newly established Just Transition Fund, as well as the Structural Funds for the period 2021 – 2027, may kick-off the development, targeting both at endogenous development and the attraction of innovative investments.

According to the recommendations of the existing Regional Innovation Strategy (RIS3), the region needs to adopt a diversified approach building on existing business clusters and seeking to shift into higher value –added activities with a strong focus on export driven growth.

To this end, the region needs to adopt a more innovation-based development strategy. This strategy should focus on the attraction of young people in employment for all the objectives described in the previous chapter and the reverse of negative immigration trend. Finally, region's goals need to be quality oriented by increasing added value products and services. By the end of this decade, region's employment may become more balanced among primary secondary and tertiary sectors.

In order to reach these objectives, short term together with medium- and long-term actions should be implemented.

- In the short term, the development of infrastructure projects together with land recovery projects will boost the construction sector in order to provide the required added value for the immediate post lignite era, keeping jobs in the region.
- Meanwhile, the implementation of energy projects (Renewable Energy and Energy Efficiency focused) will strengthen the labour market and attract investments in the mid-term. The accelerated development in clean energy will form a good basis for good quality jobs.
- Finally, in the long term, the development of RTD, the boosting of agriculture, together with culture and sustainable tourism will support the transition to a new regional identity aiming at social cohesion, environmental protection and innovation.

Table 6.j EL. Short, Medium- and Long-term results by objective

Objective	Time Line: 2013	to	2040
a. Primary sector	→	→	→
b. Construction, Public Works and Mine Restoration	→	→	→
c. Energy Efficiency	→	→	→
d. Education Research, & Innovation	→	→	→
e. Renewable Energy Sources	→	→	→
f. Culture & Tourism	→	→	→

6.4 Conclusions

During the past 60 years, the region of Western Macedonia has been the energy centre of Greece, while the share of lignite powered electricity has been greater than 60%. Lignite extraction peaked at 57 Megatons in 2002, and remained high until last decade.

In the period 2023 to 2028, lignite mining and power production will be terminated. Approximately 12,000 direct and indirect jobs will be lost, while the overall impact in the local economy cannot be safely estimated. These numbers are not discouraging. B, International experience and best practices in other post-extraction areas, as well as the regional development potential, provide opportunities, so the region may not only overcome the post-extraction shock but, enter to a new era of sustainable development as well.

Agriculture, Energy Efficiency, Construction & Infrastructure development, Renewable Energy Sources, Tourism, Research & Innovation are the areas with strong development potential that may balance the jobs and income lost by extraction termination.

On the other hand, available statistics outline that Western Macedonia Region, presents high structural unemployment rate, old aged labour, distinctive immigration and lack of development dynamism.

Public policies should be implemented in short term and provide financial and administrative stability.

A 'development shock' need to be immediately exercised in order to reverse the forthcoming depression, while, at the same time, may motivate local stakeholders and attract new people in the era.

Social and labour policies are of great importance, since they may strengthen social cohesion, during the transition period. Educational infrastructure, skilling and long-life education may play an important role for the redirection of work force. There is significant potential for improvement, especially in areas of energy technologies, agriculture, leather & Fur where the region may become a development centre.

Since the promising development options present lack of economies of scale, corroboration business models, such as social economy schemes, agricultural associations, clusters of companies, and energy communities would play an important role providing a leading example for the country as well.

6.5 References and further links

Hellenic Statistical Authority: *Labour Force survey, labour Cost survey* www.statistics.gr 2019

ANKO, Kozani Development SA: *Master Plan for Post-lignite development in Western Macedonia*, 2014

- Technical Chamber of Greece, *Western Macedonia department: Assessment of costs and policies for the transition to post – lignite era*, 2012
- GreenPeace Hellas: *The End of Lignite*, 2006
- RIS3 Regional Assessment: *Dytiki Makedonia, A report to the European Commission, Directorate General for Regional Policy*, Unit I3 - Greece & Cyprus, 2012
- Confederation of Greek Unions, Institute for Labour: *Intermediate report for the Greek Economy & Employment*, 2019
- European Committee of the regions: *European Regional Social Scoreboard*, 2019
- European Union: *EU regional competitiveness index*, 2019
- Working Team for Coal Platform of Western Macedonia: *Regional Strategy towards to the transition process of Western Macedonia*, 2018
- Maria Ioannidou: *Vocational Education and Training in Greece*, European Centre for the Development, of Vocational Training (CEDEFOP), 2014
- WWF HELLAS: *Roadmap for the transition of the western Macedonia region to a post lignite era*, 2016
- Public Power Corporation: *Annual Reports* <https://www.dei.gr/el/i-dei/etairiki-koinwniki-euthuni/entupa-gia-etairiki-koinwniki-euthuni>, 2011-2018
- Structural Funds: *Regional Operational Programme for the period 2014 – 2020*.

7 Poland, Upper Silesia Region

7.1 State of play of the social environment

7.1.1 Current status of the main social indicators

At the end of 2018, the population of the Silesian Voivodship amounted to 4 533,565 inhabitants. The downward trend in the number of inhabitants has been maintained for years: compared to 2015, the number of inhabitants at the end of 2018 was lower by 37,284 people. At the end of 2018, people of a pre-working age (up to 15 years of age) constituted 14.5% of the population, people of a working age (15-64 age) constituted 62.9% of the population, and people of a post-working age constituted 22.6% of the total number of inhabitants (**Table 7.a**).

Table 7.a PL. Demographic: resident population, age distribution, change of residence and life expectancy in Upper Silesia region

Category		TRACER Region (Upper Silesia)			
years		2015	2016	2017	2018
Resident population (no.)		4 570,849	4 559,164	4 548,180	4 533,565
Age distribution (no.)	< 15y	642,921	645,442	651,755	655,967
	15-64y working age	2 983,260	2 940,272	2 895,859	2 851,185
	> 65y	944,668	973,450	1 000,566	1 026,413
Change of residence /or/ International migration (no.)		-15,075	-11,685	-10,984	-14,615
Life expectancy at age 65 (year)	female	19.3	19.6	19.5	19.7
	male	15.4	15.8	15.5	15.8

Source: Statistics Poland 2020 (stat.gov.pl)

In 2018, 6,777 residents worked in the agricultural sector (agriculture, forestry, hunting, and fishing), 468,453 worked in industry, 77,343 worked in construction and 42,000 worked in professional, scientific and technical activities. In 2018, there were 80,079 unemployed in the region, of whom 33,318 were men and 46,761 were women (Statistics Poland, 2019; **Table 7.b**).

Table 7.b PL. Labour: employment rate, main economic activities, unemployment rate, unemployment benefits and average nominal monthly wages by economic activities in Upper Silesia region

Category		TRACER Region (Upper Silesia)			
years		2015	2016	2017	2018
Employment rate (%) of population 20-64		64.3	66.9	68.6	69.4
Activity rate (%) of population 15-64	female	67.6	69.9	70.4	71.4
	male	74.3	74.8	75.7	76.3
Activity rate (%)	15-24	31.5	34.0	33.6	33.9
	18-59/64	71.1	72.5	73.2	74.0
	>50	30.2	29.0	29.6	28.4
Average number of employees by economic activities (no.)	Total economy	1 183,257	1 208,729	1 235,747	1 248,785
	Agriculture	6,490	6,692	6,785	6,777
	Industry	449,147	454,305	461,577	468,453
	Hard coal and lignite mining	No data	No data	No data	about 83,000

Category		TRACER Region (Upper Silesia)			
years		2015	2016	2017	2018
	Electricity, Gas and HAC	No data	No data	No data	No data
	Construction	76,120	76,018	75,342	77,343
	Accommodation and food services	16,136	17,326	18,762	18,238
	ICT	16,224	18,233	19,291	20,359
	Professional, Scientific and Technical activities	36,972	38,341	39,499	42,000
Gender employment gap (%)		No data	No data	No data	No data
Registered unemployed (no./th. inh.)		32	26	20	18
Unemployment rate (%)	female	7.5	5.7	4.0	3.5
	male	7.1	5.3	3.8	3.5
Unemployment benefits monthly average (euro)		193.27 in the first 3 months, 151.77 in the next 3 or 9 months			
Percentage of long-term unemployed person (%)	female	32.8	26.0	19.4	No data
	male	40.3	26.3	31.7	No data
Youth unemployment rate (%) 15-29		12.3	9.4	6.8	7.6
Average nominal monthly - gross wages (euro)	Total economy	923.18	943.99	987.78	1066.64
	Agriculture	1082.50	1069.10	1079.98	1129.60
	Industry	1080.95	1085.89	1134.59	1227.06
	Hard coal and lignite mining	No data	No data	No data	No data
	Electricity, Gas and HAC	No data	No data	No data	No data
	Construction	715.13	755.80	797.28	888.57
	Accommodation and food services	499.48	534.00	588.33	619.42
	ICT	1153.23	1197.97	1314.12	1468.13
	Professional, Scientific and Technical activities	969.15	963.62	1021.30	1135.32

Source: Statistics Poland 2020 (stat.gov.pl)

The rate of extreme poverty (population with incomes below the subsistence level) in 2016 in the Silesian Voivodeship was at the level of 3.0%. The rate of relative poverty (where a household's expenditure amounted to 50% less than that of the average household in the country) in the Silesian Voivodeship was at the level of 10.3% of the total population in the region. Since 2013, we have been dealing with a reduction in the level of poverty in the region of Upper Silesia (Regional Centre of Social Policy of the Silesian Voivodeship, 2017).

In 2017, the Silesian Voivodeship had 203 hospitals with 25.4 thousand beds (54.9 beds per 10,000 residents). In the same period, 929.5 thousand patients used the services of hospitals (Silesian Voivodeship 2018). The number of doctors working in the Śląskie Voivodeship was 30.2 thousand (66 doctors per 10,000 residents), nurses and midwives 37.6 thousand (81 per 10,000 residents). In the region, the most common causes of death were cardiovascular disease (44.6% of deaths) and cancer (28.5% of deaths) (Silesian Voivodeship 2019).

In 2013, the gross enrolment rate for primary schools was 98.93% (compared to an enrolment rate of 98.58% for Poland). For vocational schools, the gross enrolment rate was 14.90% (compared to an

enrolment rate of 14.63% for Poland); the gross enrolment rates were 58.92% for general upper secondary schools (with Poland at 59.19%), 48.38% for vocational and general vocational schools (with Poland at 43.75%), and 25.19% for post-secondary schools (with Poland at 19.26%). At the province's 41 universities, constituting 9.4% of the universities in the country, in 2013 there were 144,545 students, i.e. 9.3% of the students in the country. Among them, 58% were women and 42% men (Regional Centre of Social Policy of the Śląskie Voivodeship, 2015).

As at 31/12/2019, the number of registered unemployed persons under the age of 30 was 15.2 thousand, i.e. 22.8% of the total number of unemployed persons. In the discussed group of unemployed, there were 10.3 thousand women (68.1% of the total number of unemployed from this age range).

The total level of internal expenditure on R&D places the Silesian Voivodeship among the three voivodships with the highest scientific and technical potential in Poland. However, comparing the level of expenditure per capita and in relation to GDP, it can be seen that the level of expenditure does not exhaust the entire development potential of the region (for example the ratio of internal expenditure on R&D to GDP in 2012 was 0.63%) (Silesian Voivodeship 2017).

In 2017, 784 libraries were in the Silesian Voivodeship (1 library per 5.8 thousand inhabitants). The book collection of libraries had 16,145.5 thousand volumes. 52 cinemas operated in the Śląskie Voivodeship, which constituted 10.5% of all cinemas in Poland. In 2017, 14 theatres and 3 Philharmonics operated in the Silesian Voivodeship. 69 museums operated in the Śląskie Voivodeship, which constituted 7.3% of this type of institution in Poland. Museums were visited by over 1.6 million people, which constituted 4.3% of visitors in Poland. In 2016, 1519 sports clubs operated in the Śląskie Voivodeship, which constituted 10% of all clubs in Poland (Silesian Voivodeship 2019).

7.1.2 Comparative analysis

At the end of 2018, over 468,453 people were working in the industry, of whom 83 thousand people were working in the mining and quarrying sector. The employed in mining in 2018 has dropped significantly compared to 1990. Achieved mining production also dropped from 150 million tons in 1990 to 63 million ton in 2018 (**Table 7.c**).

Table 7.c PL. Summary of the main indicators of the mining activity of the Upper Silesia region

No.	Indicators	M.U.	Period	
			1990	2018
1.	Upper Silesia population	Inhab.	4 907,930	4 533,565
2.	Employees in the mining sector	no.	388,000	83,000
3.	Operating hard coal mines	no.	70	19
4.	Active preparation coal power plants	no.	6	5
5.	Exploited strata	no.	-	-
6.	Achieved mining production	mill. t	150	63
7.	Investments in the mining sector	PLN	-	-
8.	Population below poverty line	%	-	3.0
9.	Unemployment rate	%	-	3.5
10.	Contribution to local budget	%	-	-

For Upper Silesia (PL22) the year 1990 – year of the first mining exploitation closure was the onset of the crisis or the triggering and exacerbation of social problems in the area:

- about 50 mined were closed in 1990-2018;
- the employment reduction started: from 388,000 in 1990 to 83,000 now;
- the social support alternatives were: severance pays, early retirement and unemployment benefits;
- there were a lot of protests and strikes;

- unemployment rate was depending on the year and number of closed mines;
- government, local public administration and company administration were unprepared, taken by surprise by the economic and social effects;
- there were no ready alternatives solutions at the time.

7.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

7.2.1 National public policies

The basic program is “The program of mitigating the effects in the Silesian region of restructuring of employment in coal mining stone”, launched in 2003 (source: katowice.uw.gov.pl). The assumptions of the program were adopted by the Council of Ministers so that it could be regarded as a central governmental program (Herbst et al. 2003). Nevertheless, it was targeted towards the Upper Silesia region and was realized in practice at the regional level and by regional agencies and authorities. Contrary to above-described strategies of hard coal mining restructuring, “The program of mitigating the effects in the Silesian region of restructuring of employment in coal mining stone” was a region-oriented, and not a sector-oriented, strategy. The program assumed that it was necessary to develop the economy in the region so that it could absorb the miners and workers losing their jobs. A major task of the program entailed raising the competitiveness of the region through the restructuring of the economy, increasing its investment attractiveness and developing the adaptation skills of residents in the regional labour market. Activities under the program were divided into two groups:

- activities directed towards employees of hard coal mining,
- activities supporting the development of the region.

Activities directed towards employees were aimed at workers losing their jobs and at activating the labour market. Activities supporting the development of the region were diverse and included the following:

- activities supporting the development of entrepreneurship,
- activities towards infrastructure development in the region,
- actions to protect the environment and reclamation of post-industrial areas,
- activities for the development of tourism,
- actions resulting from multi-annual programs,
- new institutional solutions.

The support from the "Fund for the development of local infrastructure directed at the development of entrepreneurship" consisted of subsidies for communes and points for the modernization or construction of infrastructure in their area. The amount of the subsidy for a single investment project could not exceed 50% of the eligible costs of the project. There was also a measure called "A line of loans for small and medium enterprises", which supported local small businesses.

Individual amendments to the laws (e.g. Act on the function of hard coal mining) in recent years have introduced the changes in the field of employee benefits. In 2018, the Council of Ministers adopted a Program for the hard coal mining sector in Poland.

The program covers the period up to 2030 and presents the development directions of the hard coal mining sector in Poland along with the objectives and activities necessary to achieve them. However, there are no policies in the aspect related to labour, social protection, and re-skilling domains.

7.2.2 Regional and local policies

The study of Witajewski-Baltvilks et al. (2018) shows that in the scenario of an ambitious climate policy the number of jobs in the mining industry in Silesia in the years 2015-2040 will decrease by 50 thousand. However, this does not mean that so many people will lose their jobs. By 2040, 53 thousand miners will leave the sector naturally for retirement. However, some workers who mines will be closed before they reach retirement age will be forced to change jobs.

The Silesia 2.0 Program for supporting the industry of the Silesian and Western Małopolska Voivodeships (2015) assumes supporting the change in the classification of professional employees of mines. This is done by organizing training, funding for training, co-financing for internships in enterprises (internship vouchers), co-financing for employment (employment vouchers), co-financing for living in the case of taking up a job over 80 km from previous work, grant to start a business, career counselling, job placement, other programs taking into account the individual needs of beneficiaries.

In the program Silesian Direction 3.0. (The Internal Development Program of the Silesian Voivodeship until 2030. Strategic initiative - social partnership 2017) pointed to three key needs in terms of social and development aspects of Upper Silesia:

1. Education - in the sense of access to knowledge for everyone, not just for children.
2. Common knowledge - which is not only a scientific concept but also an important postulate developed during the work of expert groups.
3. Cross-sectorial - as a third postulate integrated with previous ones, takes us to the level of using knowledge in action - by people and institutions from several areas. Cross-sectorial appeared in virtually every project idea as a feature of most of the proposed activities.

The program highlights the following activities

- support for the activation of local communities in revitalized areas. Actions taken under the direction will focus on preventing marginalization and exclusion of local communities living in degraded areas. The activities will aim to restore the inhabitants' sense of value and dignity through their social and professional activation.
- development of entrepreneurship and support for the competitiveness of domestic enterprises. As part of the support provided for people starting their businesses, start-ups, newly established, but also the already existing enterprises. In the framework of the envisaged also activation of the unemployed through counselling, financial support to start testing the ideas in incubation programs and the implementation of the internship program.

7.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors

7.3.1 Transition objectives. Key issues analysis

Upper Silesia region transition objectives in terms of social and workforce/re-skilling needs include:

- awareness of society;
- planning directions for re-skilling, new job offers;
- job offer for mine employees in new enterprises with similar employment status, time to acquire new skills;
- shutting down of extractive industries, not complete and sudden shutdown;
- developing a reliable diagnosis regarding the impact of the transformation process on the labour market in the Silesian Voivodeship. At present, the available test results are characterized by a high degree of generality, and in some areas seem to be mutually exclusive;

- developing a transformation strategy, including a work schedule, to reduce the overlap of negative socio-economic effects;
- development of plans for training programs, vocational courses, employee benefits, and social policy instruments, intended for employees to whom the indicated process will relate;
- support program for mining communes taking into account social changes, including on the labour market.

The external and internal factors that should be taken into account in order to achieve a successful transition in Upper Silesia region are:

- the region's high share in the production of electricity and heat in the country;
- high region's share in the demand for electricity and heat;
- the region's average potential for producing energy from renewable sources;
- large cumulation of industry, including energy-intensive;
- the significant importance of the mining industry in the economy of the region characterized by, among others relatively high employment in the mining sector;
- high social and economic costs of transformation;
- social acceptance of the transformation process;
- development potential of the innovation system in the region, including the designation of smart specializations.

The key facilitating factors in social and workforce fields in Upper Silesia region are:

- the possibility of using professional competences and extensive professional experience in other industries, e.g. in manufacturing;
- increase in competence requirements for employees employed in mining in recent years;
- the use of experience (including negative) related to the restructuring of mining in the 90s;
- availability of external funds (including EU) for raising professional qualifications.

The key obstructive factors in social and workforce fields in Upper Silesia region are:

- relatively high level of remuneration in the mining sector and retirement age privileges;
- the negative approach of employees to the re-skilling;
- the strong position of trade unions, hindering major changes in the sector;
- industrial development, including automation reducing demand for less educated people.

The key issues analysis in terms of social and workforce/re-skilling needs in Upper Silesia region are presented in **Table 7.d**.

Table 7.d PL. Key issues analysis

<p>Opportunities</p> <ul style="list-style-type: none"> – the emerging market for "clean technologies"; – availability of external funds supporting the development of the R&D sector for the smart specialization of the region, including in the field of energy; – the growing importance of energy clusters; – increased costs of energy production from traditional sources related to the CO₂ emission fee; – European Commission support for regions in transformation; – development of a green economy; – availability of external funds aimed at eliminating low emissions. 	<p>Threats</p> <ul style="list-style-type: none"> – changing national energy policy, lack of stability and implementation of adopted goals; – increasing demand for electricity and heat; – high costs of conducting transformation connected with achieving climate policy goals.
<p>Strengths</p> <ul style="list-style-type: none"> – the high energy potential of the region; – high potential for the development of renewable energy sources in the use of biomass; – the high density of heating network; – the high percentage of the population using the gas network; – growing public awareness in the field of environmental protection, including improvement of air quality and revitalization of post-industrial areas; – the strong research center and a developed R&D sector operating in the field of energy and green economy; – the ongoing process of diversifying the region's economy. 	<p>Weaknesses</p> <ul style="list-style-type: none"> – energy industry based on traditional sources; – the low share of energy obtained from renewable energy sources; – medium conditions for the use of geothermal, wind, water, and solar energy; – obsolete power distribution networks; – the large concentration of energy-intensive industries; – the occurrence of the problem of "energy poverty".

7.3.2 The future workforce structure, in a holistic approach

The years 2030 and 2050 seem a distant perspective. However, until this time, the closing of all mines and the creation of a new perspective for employees is too short. After the last unsuccessful transformation in the 90s, cities such as Żory in Upper Silesia needed about 30 years to deal with the problems of unemployment, high emigration, cultural decline, and social demoralization. Today, the authorities of these cities say that they won thanks to determination, persistence and hard work.

Thirty years is the minimum to plan a transformation well, slowly implement its subsequent stages, give residents time to accept changes and re-skilling younger employees and provide older people with the opportunity to work until retirement. It will take a lot of time to attract new entrepreneurs to post-mining areas. Coal mining must be given up, all mining communities are aware of this. The only concern is that this process should be as painless as possible and successful.

According to the expert opinions of the Marshal's Office of the Silesian Voivodeship, by 2030 the use of hard coal in the energy sector will decrease by approx. 28% compared to 2017, and by 2050 by approx. 65%. On this basis, it can be assumed that the employment in the hard coal mining sector will fall at a similar rate. Forecasting changes in the mining sector is difficult, including due to the use of coal not only for energy purposes.

For example, in the Silesian Voivodship, there are also metallurgical (coking) coal deposits, which is strategic not only in Poland but also in the EU. It can, therefore, be assumed that the employment structure in these mines will not change.

From a regional development policy perspective, sectors with a high level of innovation should be the key driver of change. Therefore, it should be assumed that the demand for highly qualified employees will increase. It should be noted that the development of the renewable energy industry has been observed in recent years. For this reason, this industry will generate jobs, which will entail the demand for skills and qualifications relevant to this sector. Links between the R&D sector and enterprises will also be strengthened. An important factor in the region's development is its good national and global communication. It can be assumed that in the following years the importance of intermodal transport and logistics centres will increase, which will result in the demand for employees in this sector.

7.4 Conclusions

In 2018, there were still 19 hard coal mines in Upper Silesia that employed 83,000 people. For these reasons, the re-skilling needs of the workforce solution in the Upper Silesia region are still a big challenge. This requires both the development of programs at the central (Council of Ministers) and the regional level.

After the last unsuccessful transformation in the 90s, cities such as Żory needed about 30 years to deal with the problems of unemployment, high emigration, cultural decline, and demoralization. Thirty years is the minimum for good planning of transformation. Slowly implementation gives residents time to accept changes and re-skilling younger employees, and provide older people with the opportunity to work until retirement.

On the other hand, Silesian Voivodeship has great development potential. The coal mining dominated the Silesian economy in the past but nowadays other industries such as car manufacturing, transport, machinery, and chemical industries are becoming more and more important. There are nearly 200,000 companies and enterprises operating in the region and 60% of them are in the service sector, producing over 13% of the country's GDP. The Upper Silesia has one of the lowest unemployment rates in Poland. Over 66% of the population is of working age. However, since 1989, the population has been steadily decreasing mainly as a result of demography age structure (natural deaths) and a negative migration balance. Currently, 42% of the active population is employed in the industry and 47% in services. This may indicate the success of the retraining process for employees of closed mines.

7.5 References and further links

- BUKOWSKI M., ŚNIEGOCKI A., WETMAŃSKA Z., (2018) From restructuring to sustainable development. The case of Upper Silesia. Report by Wise Europa for WWF Poland Foundation, Warsaw, Poland.
- HERBST I., et al., (2003) Założenia programu łagodzenia w regionie śląskim skutków restrukturyzacji zatrudnienia w górnictwie węgla kamiennego. Zespół do spraw złagodzenia skutków restrukturyzacji zatrudnienia w regionach, w których następuje restrukturyzacja sektora węgla kamiennego, Warszawa.
- KOBIZE. (2019) <https://www.kobize.pl/pl/fileCategory/id/16/krajowa-inwentaryzacja-emisji> (accessed July 2019)
- POLITYKA ENERGETYCZNA POLSKI DO 2030 ROKU, (2009) Ministerstwo Gospodarki, Warszawa.
- POLITYKA ENERGETYCZNA POLSKI DO 2040 ROKU PROJEKT (PEP 2040), (2018) Ministerstwo Energii, Warszawa.
- PROGRAMME FOR THE HARD COAL MINING SECTOR IN POLAND, (2018) Polish Ministry of Energy, Warszawa.
- PROGRAM ŁAGODZENIA W REGIONIE ŚLĄSKIM SKUTKÓW RESTRUKTURYZACJI ZATRUDNIENIA W GÓRNICTWIE WĘGLA KAMIENNEGO, (2003) Warszawa.
- PROVINCIAL ENVIRONMENTAL PROTECTION INSPECTORATE, (2018) The state of the environment in the Silesian Voivodeship in 2017. Environmental Monitoring Library, Katowice.

- REGIONAL CENTRE OF SOCIAL POLICY OF THE ŚLĄSKIE VOIVODESHIP, (2015) Social policy strategy of Silesian Voivodeship 2006-2020. Update 2015.
- REGIONAL CENTRE OF SOCIAL POLICY OF THE ŚLĄSKIE VOIVODESHIP, (2017) The scale, causes and effects of poverty in the Silesian Voivodship – edition 2017.
- STATISTICAL OFFICE IN KATOWICE, (2019). Report on the socio-economic situation of Silesian Voivodeship in May 2019. <https://katowice.stat.gov.pl/en/> (accessed July 2019)
- STATISTICS POLAND, (2020). Local data bank. <https://bdl.stat.gov.pl/BDL/start> (accessed March 2020)
- STATISTICAL YEARBOOK OF THE REPUBLIC OF POLAND, (2018) Warszawa.
- STATISTICAL YEARBOOK OF ŚLĄSKIE VOIVODSHIP, (2018) Katowice.
- SZPOR A., ZIÓŁKOWSKA K., (2018) The Transformation of the Polish Coal Sector (GSI Report). The International Institute for Sustainable Development.
- SILESIA 2.0., (2015) Program for supporting the industry of the Silesian and Western Małopolska Voivodeships. Kancelaria Prezesa Rady Ministrów.
- SILESIA DIRECTION 3.0. (2017) The Internal Development Program of the Silesian Voivodeship until 2030. Strategic initiative - social partnership.
- WIATROWSKI M., (2019) Just transition in the Silesia Province. Opportunities and Threats. Polityka Insight Research.
- WITAJEWSKI-BALTVILKS J., LEWANDOWSKI P., SZPOR A., BARAN J., ANTOSIEWICZ M., (2018). Managing coal sector transition under the ambitious emission reduction scenario in Poland. Focus on labour. IBS Research Report 04/2018

Websites:

https://ec.europa.eu/energy/topics/oil-gas-and-coal/EU-coal-regions/coal-regions-transition_en

<https://energytransition.org/2017/12/silesian-coal-a-quiet-exit/>

<https://ibs.org.pl/en/events/coal-transitions-in-poland/>

<https://katowice.uw.gov.pl>

8 Romania, West Region / Jiu Valley

8.1 State of play of the social environment

8.1.1 Current status of the main social indicators

During 2015–2018, in the West Region (RO42), population has been constantly decreasing. Hunedoara county and, implicitly, Jiu Valley follow the same trend. In 2018, both population of Jiu Valley and Hunedoara County decreased at a higher pace (1.27% y-o-y for Jiu Valley and 1.15% y-o-y for Hunedoara County) than population of the West region (0.44% y-o-y). The main reasons for the declining population in Jiu Valley are acceleration of the de-industrialisation process, emigration to Western Europe, decreasing natality rate and ageing.

In 2018, population of Jiu Valley represented 35% of Hunedoara County population.

When it comes to age distribution, in 2018, 67.9% of population in West Region was of working age, 14.4% under working age and 17.7% represented the >65 years category. In Jiu Valley, the aging process was slower (13.4% of the populations is >65 years old) and working age population represented 73.6% of the total.

During 2015–2018, migration in West Region recorded negative values, as population leaves the country for prospective professional opportunities in Western Europe. However, values of net migration slightly increased in 2017 and 2018. In Jiu Valley, migration recorded values 6-7 times higher than in the West Region. Increasingly more young people leave Jiu Valley to study in large Romanian university centres (such as Timișoara, Cluj-Napoca and Bucharest) or to take advantage of better professional opportunities either in large cities or abroad. Nevertheless, the migration rate peak in 2016 signals the changes that followed the closure, in 2015, of the deepest underground coal mine in Europe, located in Petritu. Without doubt, the “snowball effect” impacted migration in 2017 and 2018.

Life expectancy rate in both West Region and Hunedoara County followed a positive trend, with annual increase. Unfortunately, there is no data available for life expectancy in Jiu Valley, as well as life expectancy by gender.

Table 8.a RO. West Region (RO42) / Hunedoara County/ Jiu Valley micro-region - population, age distribution, net migration and life expectancy

Category		West Region (RO42)				Hunedoara County (of which Jiu Valley)			
		2015	2016	2017	2018	2015	2016	2017	2018
years									
Resident population* (no.)		1,812,183	1,802,212	1,792,503	1,784,522	403,701 141,142	398,950 139,340	393,154 137,744	388,600 135,989
Age distribution (no.)	< 15y	257,097	256,519	256,899	257,877	55,373 19,420	54,751 18,708	54,075 18,159	53,729 17,589
	15-64y					274,132	268,719	262,743	257,236
	working age	1,256,305	1,240,993	1,225,507	1,211,220	104,722	103,229	101,771	100,134
	> 65y	298,781	304,700	310,097	315,425	74,196 17,000	75,480 17,403	76,336 17,814	77,635 18,266
Net migration plus statistical adjustment (%)		-1.4	-2.3	-0.7	-0.7	-4.3	-7.5	-6.3	-6.0
Life expectancy (year)		75.04	75.28	75.53	76	74.6	74.7	74.9	74.9

*) National statistics (POP105A); black ink - usually resident population at January 1st in Hunedoara; blue ink - Permanent resident population on July 1 in Jiu Valley; Source: National Statistics INS and Eurostat

Regarding labour market, there is little information for Hunedoara County and Jiu Valley. Majority of labour market statistics are available only at NUTS 2 level.

Table 8.b RO. West Region (RO42) / Hunedoara County – labour market data

Category		West Region (RO42)				Hunedoara County (of which Jiu Valley)			
		2015	2016	2017	2018	2015	2016	2017	2018
years		2015	2016	2017	2018	2015	2016	2017	2018
Employment rate (%) of population 20-64		62.0	61.4	63.5	64.5	n/a	n/a	n/a	n/a
Activity rate (%) of population 15-64	female	69.9	67.3	68.2	67.7	73.8	70.3	71.6	72.2
	male	78	77.8	76.9	78.7	74.3	74.3	72	71.6
Activity rate (%)	15-24	25.7	19.3	19.0	16.8	n/a	n/a	n/a	n/a
	25-54	77.2	77.5	79.0	79.3	n/a	n/a	n/a	n/a
	55-64	34.9	36.3	38.4	39.4	n/a	n/a	n/a	n/a
Average number of employees by economic activities (thousand)	Total economy	729.3	713.7	726.7	727.2	105.9 26.5	106.9 24.9	106.8 25.1	105.4 25.0
	Agriculture	77.7	65.0	58.2	51.0	2.9	2.8	3.0	n/a
	Industry	291.8	295.7	312.2	312.5	42.5	40.7	39.3	n/a
	▪ Hard coal and lignite mining	n/a	n/a	n/a	n/a	5.9	5.1	4.3	3.5
	▪ Electricity, Gas and HAC	n/a	n/a	n/a	n/a	2.9	2.7	2.3	n/a
	Construction	35.9	37.5	35.7	33.1	8.0	8.5	8.9	n/a
	Wholesale & retail trade, transport, accommodation and food services	157.9	156.9	158.1	168.6	n/a	n/a	n/a	n/a
	ICT	11.0	8.7	8.7	11.8	0.6	0.7	0.7	n/a
	Professional, Scientific and Technical activities	38.8	32.0	27.7	32.8	1.5	1.7	2.1	n/a
Gender employment gap (%)		21.6	21.6	18.5	20.5	n/a	n/a	n/a	n/a
Registered unemployed (no./th. inh.)		41.4	36.7	33.5	27.5	11.34	10.78	7.89	5.83
Unemployment rate (%)	female	3.1	2.8	2.3	2.0	6.3	6.5	4.6	3.8
	male	2.8	2.4	2.1	1.6	5.9	5.5	4.4	3.1
Long term unemployment rate (%)		18.2	22.3	16.5	12.9	n/a	n/a	n/a	n/a
Youth unemployment rate (%) 15-24		19.8	17.4	n/a	n/a	n/a	n/a	n/a	n/a

Source: Eurostat data on employment by gender (lfst_r_lfe2emprr), activity rates by gender and by age (lfst_r_lfp2actrrj), employees by sector (nama_10r_3empersj), gender employment gap (tepsr_lm220), unemployment (lfst_r_lfu3persj), unemployment rates by gender and age (lfst_r_lfu3rtj), long-term unemployment (lfst_r_lfu2ltu), National Commission for Strategy and Prognosis – Projection of the main economic and social indicators until 2021

Table 8.c RO. West Region (RO42) / Hunedoara County – Average nominal monthly gross wages

Category		West Region (RO42)			Hunedoara County		
					(Jiu Valley)		
years		2015	2016	2017	2015	2016	2017
Average nominal monthly gross wages (euro)	Total economy	551	606	676	473	491	573
	Agriculture	434	547	610	383	424	470
	Industry	605	674	714	522	530	597
	Hard coal and lignite mining	947	850	923	949	852	931
	Electricity, Gas and HAC	905	899	987	876	844	936
	Construction	396	435	477	392	379	448
	Accommodation and food services	299	341	395	279	325	370
	ICT	1,108	1,333	1,372	587	545	615
	Professional, Scientific and Technical activities	654	643	732	530	665	630

Source: INS (FOM107E)

In the West Region, in 2018, industry represented the sector with the highest number of employees out of total working population, although the number of employees marginally increased in this sector. A positive aspect is the declining long-term unemployment rate in the region.

West Region performs well in terms of labour market indicators due to strong economic performance of large cities such as Timișoara and Arad. Nevertheless, this does not hold true for Jiu Valley, where closure of coal mines and related activities generated a dramatic growth in rate of unemployment. In 2015, unemployment rate in Jiu Valley stood at 25–30%, one of the highest rates in Romania. However, unemployment rate has been reducing on the back of rising depopulation process.

With regards to gross income, during 2015–2017 it increased across all sectors in both West Region and Hunedoara County. This was mainly on account of legislative initiatives at national level.

Table 8.d RO. Jiu Valley – Occupied population by categories of activity sectors, 2015

Territorial Administrative Units	Total employees	of which by sectors					
		Primary		Secondary		Tertiary	
		Number	%	Number	%	Number	%
Petroșani	14,085	20	0.14	6,487	46.05	7,578	53.8
Aninoasa	1,737	3	0.17	1,376	79.21	358	20.61
Vulcan	7,362	1	0.01	5,691	77.3	167	22.68
Uricani	2,746	-	-	2,134	77.71	612	22.28
Petrița	5,802	2	0.03	4,796	82.66	1,004	17.3
Lupeni	6,077	4	0.06	4,196	69.04	1,877	30.88
Bănița	75	1	1.33	8	10.66	66	88
Total	37,884	31	0.08	24,688	65.17	13,165	34.75

Source: National Agency for Employment

As per **Table 8.a** 65.2% of employed population was operating in the secondary sector in 2015. The average number of employees in Jiu Valley micro-region had a significant negative trend being cut with 34% in 2018 (24,971 employees) compared to 2015. Focusing the analysis on the hard coal mining industry **Table 8.e** the average number of employees decreased by 41% from 2015 to 2018, the impact of laid off being more pronounced for male employees (44%) and the 25y-54y age group (42%).

The average monthly net wage in Jiu Valley mining industry reached in 2018 almost 1000 EUR, and in 2016 the compensatory salary for layoffs was of about 780 EUR monthly during 6 months.

Table 8.e RO. Energy and hard coal mining industry in Jiu Valley

Energy and coal industries	Years	Average number of employees (no.)							Average monthly net wages (euro)
		Female	Male	15y-24y	25y-54y	55y-64y	> 64y	Total	
CEH – Paroseni CHPP	2015	161	337	3	439	56	0	498	711
	2016	155	313	1	433	32	0	466	643
	2017	119	240	1	315	43	0	359	799
	2018	107	224	1	265	63	2	331	982
CEH – Mining Divison	2015	784	3,585	98	3,995	276	-	4,369	806
	2016	806	3,277	69	3,757	257	-	4,083	728
	2017	725	2,827	50	3,250	252	-	3,552	764
	2018	657	2,415	161	2,749	162	-	3,072	976
SNIMVJ	2015	253	1,231	0	1,444	40	-	1,484	846
	2016	197	815	0	986	26	-	1,012	853
	2017	152	622	0	740	34	-	774	903
	2018	110	297	0	380	27	-	407	1072
Hard coal mining industry (CEH Mining and SNIMVJ)	2015	1,037	4,816	98	5,439	316		5,853	816
	2016	1,003	4,092	69	4,743	283		5,095	753
	2017	877	3,449	50	3,990	286		4,326	789
	2018	767	2,712	161	3,129	189		3,479	987

Source: TRACER questionnaires from CEH and SNIMVJ

These layoffs further highlight the high impact of coal mines shut down on employment and social security.

Table 8.f RO.Jiu Valley – Unemployed population, 2015

Territorial Administrative Units	Number of unemployed	Total population	Percentage of total population (%)
Petroșani	1,513	37,160	4.07
Lupeni	843	23,390	3.60
Vulcan	946	24,160	3.91
Petritla	905	22,692	3.98
Aninoasa	116	4,360	2.66
Uricani	230	8,972	2.56
Total	4,553	120,734	3.77

Source: (Davidoiu, 2017)

Another concerning aspect is the rising number of people at risk of poverty. Closure of coal mines was not compensated with creation of new job opportunities, generating situations such as Aninoasa, a city where unemployed population outnumbers employed population (in 2018, unemployment rate stood at ~22%). Further, people earning low incomes and high number of socially-assisted persons add up to those unemployed, generating a concerning image of those living at risk of poverty or even below the poverty threshold.

Table 8.g RO. Jiu Valley – Poverty rate by ages and gender categories

Age groups, Years Gender	Total population (inh.)	Poverty rate: people below the poverty line / total number of people (%)						Average for 2010- 2015
		2010	2011	2012	2013	2014	2015	
0-17	23,088	31.3	32.9	34.6	32.1	32.0	29.9	32.1
18-64	83,046	19.2	21.0	21.0	21.5	21.3	21.1	20.8
≥ 65	14,600	16.7	14.1	15.4	15.0	14.7	14.3	15.0
The weighted average for the entire population	120,734	21.2	22.4	22.9	22.7	22.5	22.0	22.3
Male	59,475	21,0	22,3	22,6	22,9	22,6	21,7	22,2
Female	61,259	21,4	22,5	23,2	22,5	22,4	22,3	22,4
Weighted average for the entire population	120,734	21,2	22,4	22,9	22,7	22,5	22,0	22,3

Source: Calculated based on INS data

Regarding the **health system**, the majority of Jiu Valley localities have a well-developed medical infrastructure. There are 3 hospitals with integrated ER, 5 medical dispensaries, 60 general practitioner offices (all private) and 38 private medical centres. However, Aninoasa is well behind the rest of the micro-region, as it has only 2 general practitioner offices, but has access to medical services being located in the vicinity of Petroșani municipality. 70% of the doctors in Jiu Valley are active in the public medical system, and 30% in the private system – which includes all general practitioners, majority of dentists and chemists, and 20% of the average medical staff.

Jiu Valley **education system**, in 2018, registered 21 school units: 3 preschools, 7 primary and secondary schools, 9 high schools, one post-high school, and one university, summing up 20,507 enrolled students, out of which 73% in pre-university education system. Graduation rate was very low in 2018 in high-schools (22%) due to lack of attractiveness and connection with the labour market needs. In the same year 3,297 students (from Romania, Republic of Moldova and other countries) were enrolled in higher education programs (bachelor's, master's, postgraduate courses, doctorate and postdoctoral programs) with 20% graduation rate. Higher graduation rates would be achievable if school laboratories were equipped with appropriate equipment and more PCs would be available in schools and high-schools (9.5% of the students had access to a PC). In 2018, primary and secondary schools had 42 laboratories, and high schools 52. A similar situation of lack of research infrastructure is at the University of Petroșani for their 115 laboratories.

In order to increase the socio-professional insertion of graduates and reduce youth unemployment rate, the vocational and **dual education system** in Jiu Valley is more and more developed. Dual education programs are organized by the Technical College “Constantin Brâncuși”, Petrila, the Technological High School Lupeni, the Technological High School "Retezat", Uricani together with private or public companies in fields of specialisation as: mechanics, electromechanics, tourism and constructions. Dual education is more sought after than vocational education, being a more viable alternative for the young generation.

Nonetheless, in 2019 was launched an **R&D** cooperation between “Planeta Petrila” NGO and the robotics team RO 063 Wafy from “Colegiul Tehnic Constantin Brâncuși”, Petrila. Planeta Petrila supported the participation of RO 063 Wafy team, in a national robotics competition organised in Jiu Valley (Robotics Valley). Further, RO 063 Wafy transferred their knowledge to peers in Petroșani, aiming to further consolidate interest for new professions among high school students. Robotics Valley II is planned to take place in August 2020. Additionally, in March 2020, “Urban Lab Valea Jiului” another community co-creation initiative was launched, aiming to improve both natural and artificial environment in Jiu Valley by promoting the railway patrimony, proper green spaces maintenance and involvement of a NGO supporting cultural development (Ianza Art Inter Cultural).

In terms of **cultural environment**, only in Petroșani there are available a theatre and two museums.

However, the touristic potential of Jiu Valley is sustained by the mountains and ski resorts in the area, picturesque landscapes, industrial tourism in post-mining era, the intangible cultural heritage preserving local specific tradition, folk craftsmen etc. The region has 94 tourist reception structures that accommodated about 35,000 tourists in 2018, and the infrastructure is continuously expanding. Unfortunately, the absence of an integrated management of the area slows down and trips the touristic development of Jiu Valley.

8.1.2 Comparative analysis

In 1997, Jiu Valley counted 17 coal mines that employed majority of working age population in the region (43,791). As of December 2019, 2,724 people were employed in the 4 remaining mines, out of which 2 are planned for closure.

During 1997–2018, Jiu Valley population has dramatically diminished. Further, number of employees in the mining sector reduced 10 times during this period, after 13 coal mines were closed. The effects are easily visible: 10.25% of Jiu Valley population was below the poverty line in 2018. In contrast, Hunedoara County was one of the most prosperous counties in Romania at the beginning of the 1990s.

Table 8.h RO. Summary of the main indicators of the mining activity – Jiu Valley

Crt. no.	Indicators	M.U.	Period	
			1997	2018
1.	Jiu Valley population	Inh.	167,456	135,989
2.	Employees in the mining sector	no.	43,791	3,479
3.	Operating mining perimeters	no.	17	4
4.	Active preparation plants	no.	5	1
5.	Exploited strata	no.	12	3
6.	Achieved mining production	mill. t	10.5	0.538
7.	Investments in the mining sector	mill. ROL*	128.59	-
8.	Population below poverty line	%	-	10.25
9.	Unemployment rate	%	-	1.26
10.	Contribution to local budget	%	76	1.71

*) ROL/USD = 7167.94 in 1997 according to the National Romanian Bank

Year of closure of the first mining exploitation in the area

The year (period) of the onset of the crisis or the triggering and exacerbation of social problems in the area

- *how many closed mining exploitations*
- *how many laid off*
- *laid off based on job analysis or randomly (who wants to!)*
- *social support alternatives*
- *protests (until strike)*
- *unemployment rate (% or margins)*
- *government, local public administration and company administration - prepared or taken by surprise*
- *the existence or not of alternative solutions at the time*

Jiu Valley micro-region, RO 42

1997

1997-2005, the process continues

- *6*
- *18,000 in 1997, over 29,000 afterwards*
- *randomly (who wanted)*
- *compensatory payments, modest values for people without financial and entrepreneurial education*
- *yes, sometimes sporadic claims events other times organized - strikes*
- *43%*
- *unprepared, taken by surprise by the economic and social effects*
- *there were no ready alternatives, people remarking "they gave us money so we don't work!" - a serious problem of deteriorating the individual and collective mentality (waiting for the social aid)*

8.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

8.2.1 National public policies

Transition from a mono-industrial region, based on coal mining, is supported by national legislation and initiatives, as local councils have done little to revigorated economy in Jiu Valley and minimise the impact of mines closure.

European Council Decision 2010/787/EU provide the framework for state aid to facilitate the closure of uncompetitive coal mines within SNIMVJ. The financial support is approved annually through Government Decisions. Such a Government Decisions was approved in March 2020.

GD no. 230/2020 approves the granting of state aid to facilitate the closure of uncompetitive coal mines within SNIMVJ for the year 2019 and provides for granting state aid to cover the following costs of closing down the three mining units (Petrila, Paroşeni and Uricani) of the former CNH: costs for compensation payments to employees who lose their jobs, professional reconversion costs, costs for covering the electricity consumption and the equivalent of coal for employees and costs for the closure of the underground works and the connection with the surface.

Restructuring measures were inappropriately planned in comparison to the aggressive mine closures during 1990–2018. Transition management from mono-industrial to economic diversification did not sufficiently support former miners' professional reconversion programs or the curricula were not market-oriented. Several restructuring programmes (Mustață, 2019) were carried out between 2000 and 2012, mainly funded through two loans granted by the World Bank to the Romanian Government; the programmes were implemented in 2000-2006 and 2005-2012.

In April 2004, the government of Romania approved a mining sector strategy that lays out plans for restructuring the sector and meet the requirement of European Union (EU): to eliminate all subsidies to minerals other than coal by 2007 and to coal mines by 2010. In 2006 the degree of subsidies reached 62-64% (Fodor, 2016).

As per European Commission's Country Report for 2020, Romania has not yet eliminated the subsidies for fossil fuels in energy production and transport. WB Report (World Bank, 2005) is underlining "The absence of a hard budget constraint on mining companies has led to an increasing dependence on subsidies despite mass layoffs. Combining explicit subsidies with hidden subsidies has generated a fiscal impact of about 0.5 % of GDP by the year 2004. Although social protection obligations have been met, the mining towns affected by sector restructuring have faced severe hardships in the form of high unemployment and a decline in quality of life, local infrastructure, and social services".

In 2020, European Funds Ministry launched an initiative to fund projects for "Improving the level of professional competencies and increasing employment rate for unemployed and inactive people in Jiu Valley in correlation with the needs of labour market". 2 million euros are available to fund projects aimed at reducing unemployment, especially long-term unemployment among people aged 55–64 years in Petroşani, Vulcan, Petrila, Aninoasa, Lupeni and Uricani. Each project can be granted a maximum of 400,000 euros.

Bankwatch Romania presents a success story (Mustață, 2019) the Social Development Scheme for Mining Communities (SDSMC), a programme developed with the support of IBRD, with a decision-making process involving local communities' members, which achieved social cohesion and a full implementation of the proposed projects: 36 finished projects, of which 21 aimed to refurbish roofs of apartment buildings in Petrila, Petroşani and Uricani, and another 9 projects restored road infrastructure in Aninoasa, Valea de Brazi and Câmpu lui Neag, totalling to almost 16 restored km of infrastructure. The rest of the projects aimed to install sewerage systems and channel rivulets.

According to the EC's country report for 2019 the Romanian social policies are characterized by:

- High levels of poverty and income inequality
- Regional and spatial disparities
- Children and the elderly people at risk of poverty or social exclusion
- People with disabilities have limited support to achieve independent living and access employment.
- Roma population living at risk of poverty
- According to the European Pillar of Social Rights, social transfers have a low impact on reducing poverty and income inequality
- The minimum inclusion income reform is not yet completed
- The high level of housing deprivation hampers social inclusion
- Social security for atypical workers is inadequate
- Social services are characterised by uneven territorial distribution and insufficient coverage and quality
- Integration of services is progressing at a slow pace
- The old-age pensions have been increasing although some structural challenges remain unaddressed
- The long-term care sector is not ready to deal with a rapidly ageing population.

The educational system is underfinanced and administrative capacities to modernise it require strengthening. The acquisition of basic (38) and digital skills (39) faces significant challenges. Investment in education remains one of the lowest in the EU (3.7 % of GDP compared to 4.7 %). This gap is particularly relevant at pre-primary and primary levels of education (40) which are key to preventing early school leaving, ensuring equal opportunities and tackling inequalities later in life. Recent legislative measures postpone until 2022 the legal requirement for allocating the equivalent of 6 % of GDP annually on education.

This threshold has never been reached. Strategic planning, aligning system-monitoring to educational priorities and improving the use of results at central, county and school level is faced with challenges (OECD, 2017).

The Ministry of Labour and Social Protection (MLSP) works in accordance with: Decision No. 12/2017 of 12 January 2017 on the organization and functioning of the Ministry of Labour, as subsequently amended and supplemented.⁴⁴ Is the main national authority dealing with labour regulations and working conditions. It carries out consultations and cooperation with representative organisations of workers and employers at the national level in the development and implementation of policies in the labour market, the protection of the national labour market and training the workforce.

There are 7 second-level units subordinated to MLSP:

- National Authority for Persons with Disabilities
- National Authority for the Protection of Child's Rights and Adoption
- National Agency for Equal Opportunities for Women and Men
- National Agency for Payments and Social Inspection
- National Agency for Employment (National Agency for the Occupation of the Labour Force)
- National House of Public Pensions

⁴⁴ <http://www.mmuncii.ro/j33/index.php/en/ministry/management>

- Work Inspection.

Since 1990, Romania has been a full-right member of the International Organisation of Labour, correlating its legislation with the international conventions and standards of labour.

The transition process in Romania is in a tight connection with the problems of the labour market. The development and the permanent improvement of the labour market represent a priority for the transition to the market economy.

This objective requires the existence of an adequate institutional environment that contributes to the evolution of the national economy on the whole.

The efficient administration of the places of work as well as the prevention of the unemployment increase can't be accomplished outside a legislative environment, outside some specialized institutions of the labour market with financial-economic autonomy.

The administration of the human resources, of the professional forming and improvement, and the protection of the unemployed can't constitute the exclusive attribute of the state. The sharing of the responsibilities between the state, syndicates and the employers' union, the creation of some specialized institutions with a tripartite managerial system, represent a vital requirement for the continuity of the labour market reform.

The main specialized institution is represented by The National Agency for the Occupation of the Labour Force and respectively The County Agencies for the Occupation of the Labour Force which have begun to function since the 1st of January 1999 and whose aim is the professional training of the labour force and social protection of the unemployed.

According to the Law no. 145/1998 modified and added by the Emergency Ordinance no. 294/2000 and to its Legal Status approved by the Government Decision no. 4/1999, The National Agency for the Occupation and Professional Training, respectively The County Agencies for the Occupation and Professional Training, take over in their administration, based on a protocol, from the Ministry of Labour and Social Protection, the fund for paying the unemployment benefit, the fields, the spaces and the assets used by the County General Directions for Labour and Social Protection, respectively the ones used by the Labour Force and Unemployment Offices from these Directions (Irimie, et al., 2003).

The main objectives of The National Agency for the Occupation of the Labour Force are:

- the institutionalization of the social dialog in the direction of the occupation and professional training;
- the application of the strategies in the direction of the occupation and professional training;
- the application of the social protection measures for the unemployed.

In the organizational chart of these agencies are provided departments/offices/services with profiles specific to the labour market: labour mediation, professional guidance, psychological inquires, personnel improvement, registration, first guidance and general mediation, as well as other departments which are directly involved upon the labour market.

The advantages of the new organization are, mainly, the decentralization of the activity and the partnership between the Syndicates, the Employers' Union and the State. The major disadvantage is given by the fact that the financial resources of the Agency for the Occupation of the Labour Force are limited due to the very big debts which are registered by the major economic agents.

The County Agencies for the Occupation of the Labour Force and that of Bucharest have established Local Agencies to provide services for the occupation of the labour market.

Besides the National Agency for the Occupation of the Labour Force, nowadays, in Romania, are more categories of organizations that deploy activities upon the labour market, organizations generic denominated 'mediation centres', (Unemployed clubs - Job Club, The Informing and Documentation Centres for Youth – INFOTIN, Personnel consulting/ recruiting firms).

The PAEM Labour Mediation Centres. The Programme of Active Measures for Fighting Against the Unemployment (PAEM) is a European Union programme (PHARE) that follows the developing of the institutional capacity for projecting and putting into practice, at a local level, some active measures for occupying the labour force. In numerous localities in Romania there have been established mediation centres. After the closure of the financing period by the PAEM, these centres will continue to function only if they succeed to assure their financial independence, through the attraction of others financial sources. In some localities, the PAEM mediation centres continue the activity of the County and the Local Agencies for the Occupation of the Labour Force, and in other localities they represent the only institutions, which provide mediation services.

There is a well-coordinated institutional mechanism, which is a necessary condition for the use of effective policies and for the implementation of priority interventions.

In the short term, the directions of action adopted by Romania in this document are substantiated in order to support the achievement of the national employment target (70% employment rate in 2020 for the 20-64 age group) assumed as a result of the global objectives set in the Europe Strategy 2020.⁴⁵

These refer to:

- I. Improving the functioning of the labour market:
 - I.1. Reform of labour relations legislation
 - I.2. Reform of legislation on social dialogue
 - I.3. Combating undeclared work
 - I.4. Prolongation of active life
- II. Facilitating transitions from unemployment or inactivity to employment:
 - II.1. Changing the legal framework in the field of employment stimulation
 - II.2. Active employment measures
 - II.3. Developing the institutional capacity of the Public Employment Service - at national, regional and local level
- III. Strengthening professional skills:
 - III.1. Reform of the legal framework on vocational training
 - III.3. Continuing vocational training of workers
- IV. Increasing the quality of employment of rural residents, young people and women:
 - IV.1. Increasing the competitiveness of the agricultural sector and ensuring the long-term sustainability of rural areas
 - IV.2. Integration of young people and women into the labour market.

In line with the Community Strategic Framework - Europe 2020 Strategy, a number of regulatory documents were developed and implemented at national level in order to set national priority targets:

- Labour Code (Law 53 of 2003, updated);
- Romania's national strategy for sustainable development - Horizons 2013-2020-2030 (SNDDR), approved by Government Decision no. 1460/2008;
- The strategy for improving the system of elaboration, coordination and planning of public policies at the level of central public administration, approved by Government Decision no. 870/2006;
- National Strategy for Research, Development and Innovation 2014-2020;

⁴⁵ The National Employment Strategy 2014-2020, elaborated in the EMPLO-NET project, SOP HRD 2007-2013

- The national employment strategy 2014-2020, approved by Government Decision no. 1071/2013;
- The strategy of vocational education and training in Romania for the period 2016-2020, approved by Government Decision no. 317/2016;
- National Lifelong Learning Strategy 2015-2020;
- National strategy for the development of social services, approved by Government Decision no. 1826/2005;
- Strategy on social inclusion of people with disabilities 2015-2020. Social policies - from the "rehabilitation" of the individual to reforming society;
- Social Assistance Reform Strategy, 2011;
- The Romanian Government's strategy for social inclusion of Romanian citizens belonging to the Roma minority for the period 2015-2020, approved by Government Decision no. 18/2015;
- National Health Strategy 2014 - 2020, approved by Government Decision no. 1028/2014;
- The national strategy "e-Romania", approved by Government Decision no. 195/2010;
- Law no. 76/2002 on the unemployment insurance system and employment stimulation, updated 2019 and completed with the Government Emergency Ordinance no. 30/2020 on technical unemployment of 75% of the average gross salary for 2020 in the context of the crisis caused by COVID-19;
- Law no. 116/2002 on preventing and combating social marginalization, approved by Government Decision no. 1149/2002, updated;
- Law no. 416/2001 regarding the guaranteed minimum income, with the subsequent modifications and completions;
- Government Decision no. 488/2005 on the approval of the national system of social inclusion indicators;
- The national qualifications framework in Romania, approved by Government Decision no. 918/2013.
- These documents are a natural and absolutely necessary step, as this is a national transposition of the concerns recorded at Community level.

8.2.2 Regional and local policies

As a territorial-administrative structure, specialized in the sector of the administration and the protection of the labour force, the Hunedoara County Agency for the Occupation of the Labour Force is the main promoter of the occupational policies (defined as the sum of the community efforts in the field) and of the fight against the unemployment in the county. This institution has initiated developed and implemented strategies and programmes to diminish the negative effects of the unemployment and to promote actions with economic support for the occupation of the labour force in Hunedoara County. The Hunedoara County Agency for the Occupation of the Labour Force has developed 14 Local Agency of providing the for occupation of the labour force and 2 Centres of Professional Training in Deva and Petrosani. Within the Jiu Valley's there are in: Petrosani, Lupeni, Vulcan, Aninoasa, Petrila and Uricani.

As of now, local authorities in Jiu Valley local authorities did not succeed in delivering results for development of common public policies to boost the process of transition from mono-industrial sites to urban centres with divers' economies through inter-institutional cooperation initiatives or at the level of the local stakeholders. Jiu Valley needs initiatives for adopting fiscal instruments with a significant impact, which local authorities can use to attract investors, the emigrated labour force and the layoffs (former miners). The only notable local initiative in some of the municipalities and cities in the Jiu Valley is the fiscal instrument to encourage citizens purchasing hybrid and electric vehicles by reducing by 50-90% the tax rate, and reducing rents for SMEs.

Insufficient local institutional capacity and necessary competences, communication gaps at stakeholders' level, unwillingness to get involved, and the lack of a proper local budget leads to absence of initiative from local authorities. A proactive attitude is a must-have in the current context.

In July 2019, "Jiu Valley Partnership for a Right and Fair Transition", a MoU, was established and signed. It includes commitment and pro-active involvement of all 6 local councils in Jiu Valley, aiming to support:

- governance development
- transition process planning and implementation
- projects identification and adequate financial mechanism and funds for deployment
- co-creation of a roadmap to pave the way to a sustainable energy transition and socio-economic development in the benefit of their citizens.

In the field of regional policies ADR Vest is performing the following activities: drawing out regional planning reports, strategies and action plans; developing thematic and sectoral analyses and syntheses using specific tools for regional planning; preparing information dissemination and promotion materials (leaflets, flyers, posters etc.) for the West Region; coordinating diversified studies and analysis.

The analysis of regulations at sectoral, regional or local level aims at transposing from national level in order to solve issues identified. Thus, at regional and local level, the following recent relevant documents outline the policies in the area of interest:

- The national legislative framework regarding regional development has as central point the Law no. 315/2004 which defines the basic objectives of the regional development policy in Romania, establishing the institutional framework, objectives, competences and instruments specific to the regional development policy in Romania, observing three principles: subsidiarity, decentralization and partnership;
- The Regional Development Plans performed for all 8 development regions by each Regional Development Agencies;
- Specific policy documents for RO42 (West Region), as:
 - RIS3 Strategy, ADRV, 2016⁴⁶
 - Jiu Valley Strategy for the transition from coal 2021-2030, developed by the Ministry of European Funds having as consultant PriceWaterhouseCoopers, selected by European Commission which finances this Study through the Structural Reform Support Service (SRSS), Bucharest, 2020

Additionally, each administrative unit (municipalities, cities or independent communes) in Jiu Valley have formulated their Development Strategy and the Local Development Plan, followed by a series of Decisions of the Local Council solving the priority social policy problems.

8.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

8.3.1 Transition objectives. Key issues analysis

For Jiu Valley, TRACER target region transition objectives in terms of social and workforce/re-skilling needs are as follows:

⁴⁶ ADR Vest (2016). Framework Document R&I strategy regional intelligent specialization, <https://s3platform.jrc.ec.europa.eu/regions/RO42/tags/RO42>

- understanding the area profile by creating a digital platform through searching, analysis and updating the main local resources: demographics, education, infrastructure, brownfields, renewable energy potential, quality of life;
- establishing an educational profile based on the local resources: the consortium between the University of Petroșani, high schools and schools is tailored upon the area profile and the just transition objectives;
- creating a resilient / antifragile economic environment, placing the Jiu Valley as a hinge between two just transition NUTS 3 regions: Gorj and Hunedoara;
- public investment for quality of life and amenities: educational and health infrastructure, social welfare, sustainable housing, culture, local food chain, green areas.

Objectives of development strategy for Jiu Valley:

- consolidation of CEH through establishment of an energy holding that would include power plants and hydroelectric plants from Hațeg-Bumbești area;
- financing investments in modernisation of mines and carrying out exploration works;
- financing investments in SACET and water-sewerage system of Jiu Valley;
- using European funds for investments in use of renewable energy sources;
- stimulating creation of new job opportunities through development of private sector and attracting new investments, R&D and technological transfer, companies and SMEs competitiveness;
- investing in modernisation and rehabilitation of infrastructure;
- supporting and consolidating of sectorial activity, with focus on industry, construction, tourism, manufacturing and associated services, and agriculture;
- implication of local community in regional development;
- transformation of natural environment in one that supports a diversified economy and a good life quality through greening programmes and activities;
- promoting and presenting the area and its opportunities on local, regional, national and international markets;
- enhancing professional public administration.

Key external factors that need to be considered for achieving a successful transition in Jiu Valley are the following:

- dependency on the central government will to fund major infrastructure projects: skiing resorts, railroad, express roads, maintenance on the current national roads;
- Jiu Valley is part of the Western Development region, the second most important economy in Romania, but with a distinct profile from the rich counties of Timiș and Arad, thus representing a poor area in a rich region;
- urban vine in the middle of the highest quality protected environment areas;
- the neighbouring area in the south is another coal transition region: Gorj.

The internal factors that might hamper the success of Jiu Valley transition are the ones listed below:

- small market dimension: a population diminished year by year, over 100.000 inhabitants;
- political fragmentation: 6+1 local authorities;
- mixed character: urban and dense in the core but rural on the fringe / edges;
- the population is getting older year by year;
- brain drainage of the young people to the most important national academic cities.

8.3.1.1 SWOT analysis for community capital in Jiu Valley

SWOT analysis comprises three synergic components of community capital, in the context of Development Strategy in Jiu Valley:

- industrial and agricultural potential;
- infrastructure and public works;
- human resources. (Irimie, 2014)

Each of these components and analysed and the results are highlighted in **Table 8.i**, **Table 8.j**, and **Table 8.k**, respectively.

Table 8.i RO. Industrial and agricultural potential – SWOT analysis

<p>Strengths</p> <p>SMEs sector active and aggressive Highly qualified, available workforce Considerable R&D possibilities available A university that commenced and makes efforts to continue adaptation High standards for higher education Management of industry reorganisation Creative and optimistic management/entrepreneurs in large and small companies strong entrepreneurial possibilities in existent SMEs Considerable SMEs re-orientation towards manufacturing Important resources are available in tourism, wood processing, agriculture, forestry, as well as in farming Entrepreneurs are decided to establish businesses in Jiu Valley Development of institutional platforms to support start-ups</p>	<p>Weaknesses</p> <p>Absence of SMEs support policies Existent natural resources are not evaluated at their real value Bank policies is not market-oriented, loan market is a sales market Mining is inefficient Information necessary for SMEs and industry to do long-term planning are hard to find Organisations that support SMEs partly satisfy SMEs' requirements Poorly directed support (business incubator) Absence of proper organizing of business sector, lacking lobby power Weak market orientation outside Jiu Valley Reduced number of new investors State enterprise syndrome: no major decisions are made for the future Unprofitable operations of state-owned enterprises High, useless bureaucracy in SMEs Absence of bi-directional connections between companies Lack of interest from foreign investors Lack of community spirit Absence of spaces that could offer necessary infrastructure for establishment of an industrial park Old economic structure, old machinery, with high physical and moral wear and tear Increased personnel fluctuation between various economic branches Absence of a mechanism for selective stimulation of industrial activities and non-pollutant industries promotion with high added value</p>
<p>Opportunities</p> <p>Great potential in tourism, wood processing, farming, agriculture, forestry and waste processing Spaces and buildings available for new entrepreneurs Strong possibilities for export, engineering services (design, software) Constructive role of syndicates and civil societies for development of the region Development possibilities for industrial enterprises</p>	<p>Threats</p> <p>Drastic reduction of CNH SA activity Tourism development depends on infrastructure development Diminishing purchasing power affects industry development Without considerable investments, many state-owned enterprises will enter liquidation Lack of active role of Government threatens industries survival chances Reduced number of industrial enterprises as compared with qualified human resource available Raising the standard of living, raising salaries, respectively, will lead to clients moving in other regions that produce in lohn</p>

Table 8.j RO. Infrastructure and public work – SWOT analysis

<p>Strengths</p> <p>Roads, energy supply, water and sewerage system, public transport and railway are systems in good condition</p> <p>Existence of beltway in Petroșani and Normandia bus stop, a mini airport for emergency medical interventions</p> <p>In development of water and sewerage system good management competencies have been observed</p> <p>Good cooperation between local authorities in development of waste collection system</p> <p>Some local councils improved infrastructure using public works programmes</p> <p>Municipal/county and local councils elaborated several proposals and good ideas for infrastructure</p> <p>Dynamic management of Work and Social Protection Direction, that intervened very fast in the creation of public works programmes</p> <p>Jiu Valley was capable to attract substantial capital for Public Works Programmes and Active Measures for labour market Rehabilitation, modernisation and acquisition of equipment for the specialised ER of emergency hospital of Petroșani through Regio program</p>	<p>Weaknesses</p> <p>Hot water and heat supply, urban waste collecting, selection and storage</p> <p>Telecommunications and natural gas are underfinanced</p> <p>Local authorities' funds for co-financing programmes of public works are strictly limited</p> <p>Governmental funds for public works are not sufficient</p> <p>Financing investment programmes, even when included in budget, are partly assured</p> <p>Considerable funds are spent uselessly</p> <p>Unemployed people and women have reduced participation in public works programmes</p> <p>Poor technical condition of certain roads, streets and railways</p> <p>Public transport is technically equipped with obsolete means of transport</p> <p>State of advanced wear of railway means of transport</p> <p>Absence of centralised sewerage system, heat and gas supply in Colonie area, as well as in Parângu Mic area</p> <p>Relatively high cost of mobile telephony apparatus and services</p> <p>Streams regularized in low proportion and poor condition of the bridges over them</p>
<p>Opportunities</p> <p>Projects recommended for infrastructure will have a positive effect on economy, unemployment and living conditions in Jiu Valley</p> <p>Political support (partly financial support, as well) is available for infrastructure projects</p> <p>There is the possibility to self-finance several public works programmes in Jiu Valley</p> <p>Touristic potential can be the engine for infrastructure development and vice-versa</p> <p>A tighter cooperation between local authorities will improve quality of infrastructure projects and will accelerate their accomplishment</p>	<p>Threats</p> <p>Lack of appropriate measures, laws and policies will lead to rapid deterioration of buildings</p> <p>Inefficient investments in electricity sector will reduce necessary fund for development of other projects</p> <p>Degradation of living conditions will determine the need to make other investments in infrastructure</p>

Table 8.k RO. Human resources – SWOT analysis

<p>Strengths</p> <p>Major share of adult population (20–60 years) – over 50% of total population</p> <p>Professional capacities of Jiu Valley workforce</p> <p>Presence of know-how university transfer facilities</p> <p>High level of instruction in profile high schools is appreciated by the industry</p> <p>Existent facilities for training at several large companies, authorised for adult vocational training</p> <p>High interest from unemployed people, especially women, for training courses</p> <p>Companies interest in offering other companies their training capacities</p> <p>Up-to-date statistics on unemployment situation</p>	<p>Weaknesses</p> <p>Mono-industrial nature of basis professions in Jiu Valley</p> <p>Weak know-how marketing, weak level of knowledge of strategic restructuring in companies affected by structural changes</p> <p>Ex-miners hesitate in working for salaries lower than those in their previous occupation</p> <p>Weak institutional basis for unemployment services in Jiu Valley</p> <p>Little institutional support for educational institutions that try to diversify course areas</p> <p>Negative general demographic balance from simple demographic reproduction – de-natalist attitude</p> <p>Acute lack of jobs</p> <p>High increase of unemployment rate</p> <p>Compensatory payments for laid off miners, which produces social laziness</p>
<p>Opportunities</p> <p>Decentralisation of labour market activities and involvement of those capable to provide services in private domain</p> <p>High training requirements and consulting services</p> <p>Establishment of human resources policies for all education institutions</p>	<p>Threats</p> <p>Problems resulting from social exclusion</p> <p>large-scale protest actions</p> <p>Potentially high levels of future unemployed people</p> <p>High criminality and violence</p>

8.3.1.2 PESTLE Analysis applied to the Jiu Valley

PESTLE Analysis it serves the organization in the key aspects of its development: on the planning process to launch a new service or product or when exploring a new market or new market opportunities. It is, basically, an instrument that gathers all the Political, Economic, Social, Technological, Legal and Environmental issues that cannot be controlled by the organization, but that have to be addressed and their implications must be understood.

In the case of a functional urban area (FUA), the situation is similar. Even if they are autonomous, FUAs are dependent by every process, in all the PESTLE framework fields. The context of former industrial areas introduces additional conditioning, given by their social and economic vulnerability and their dependency on the closed industry. The PESTLE analysis can get a much clearer understanding of the environment. In the following paragraphs, we apply the PESTLE Analysis framework to the Jiu Valley, giving comments about the influence of individual factors.

In the case of Political factors, the most important issues regard the main policies and influences exercised by the national and county government on the local context. Being a former mono-industrial area, the Jiu Valley is largely dependent on the mining company, of state ownership.

Table 8.l RO. PESTLE Analysis: Political factors

Political factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
Government's instability and the successive changes in their components, correspondent to the political changes in general elections – impacts the national politics and programmes applied to the former mono-industrial areas.	Extremely likely	Extensive	Permanent
Dependency on governmental funds for major investments, largely observable in the case of political incompatibility between local mayors and the ruling party	Likely	Significant	Permanent
Dependency on party nominations for the leadership of major public enterprises: the mining company - CEH, the mining closure company - SNIMVJ etc..	Critical	Certainty	Until the closure of all mines 2018 / 2024

In the case of external Economic factors, we must highlight the importance of coal in the Energy sector, the importance of the Simeria – Filiasi railroad corridor in the European freight network and the road connection to the southern Romania. Coal is not seen as an important resource. Its role is only highlighted in case of energetic emergency situations, when the energy harvested from renewable resources was too low to maintain the national average consumption. Also, the railroad's importance was seen in April, 2017, when a train derailment on the route from Simeria to Petroșani caused a major interruption in the freight train circulation. The freight trains travelling from Arad to Craiova and back were diverted on alternative routes, causing massive economic losses for companies. The corridor crossing the Jiu Valley is a major asset, guaranteeing the access to European economic corridors and markets for large scale production.

Table 8.m RO. PESTLE Analysis: Economic factors

Economic factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
The low importance of coal in the national energetic strategy – the risk of not being necessary anymore, losing the competition to imported coal	Extremely likely	Extensive	Until 2050
The instability regarding the railroad corridor – vulnerable to damages	Potential	Significant	Until 2024
The modernization works for DN66, the only connection to Southern Romania – impact of partial road closure	Certainty	Extensive	Until 2018

In the case of external Social factors, the most important issue regards the social mobility or migration, caused by the economic depressions. The main attractors are the Western Europe (especially Spain, Italy, Germany or England) and the major urban areas in proximity (Timisoara, Cluj-Napoca, Craiova or Bucharest) (**Table 8.n**).

Table 8.n RO. PESTLE Analysis: Social factors

Social factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
The vulnerability in competition to the quality of living in the major urban centres in the vicinity	Extremely likely	Extensive	Permanent
The poor image of people in Jiu Valley, being associated to the so-called "Mineriade" uprisings	Certainty	Moderate	Permanent

In the case of external Technological factors, we refer to the major European trends that influence the evolution of our society. Nowadays, the R&D sector is the main driver of Economic change and evolution to Industry 4.0. The main research centres in the Jiu Valley are the University of Petroșani and INSEMEX, an explosion analysis specialized institute.

The main issue regards the rapid changes in terms of new technologies and the lack of capacity to innovate and keep up with them (Table 8.o).

Table 8.o RO. PESTLE Analysis: Technological factors

Technological factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
The competition to the major technical R&D centres in Romania: Bucharest, Timisoara or Cluj-Napoca	Extremely likely	Extensive	Permanent
The rapid technological advances	Certainty	Extensive	Permanent

In the case of external Legal factors, the main issues are the equal treatment of urban and rural areas in the Jiu Valley, as part of the same urbanized territory, the lack of policies dedicated to the former industrial regions and the lack of legislation for the merge of settlements.

Table 8.p RO. PESTLE Analysis: Legal factors

Legal factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
The lack of policies dedicated to the former industrial regions	Certainty	Critical	Permanent
The lack of legislation for the merge of settlements	Certainty	Significant	Permanent
The equal treatment of urban and rural areas in the Jiu Valley, leaving the rural areas without	Certainty	Important	Permanent

In the case of external Environmental factors, one of the main issues is the low quality for the infrastructure connecting the Valley to the central and southern areas of Romania, and also with the other basins in the Southern Carpathian chain. Other factors include the unstable weather conditions, unfit for agriculture and the uncertain system for recycling and waste disposal.

Table 8.q RO. PESTLE Analysis: Environmental factors

Environmental factors – outside Jiu Valley FUA's control	Level of Risk	Impact Level	Time- frame
Low quality of infrastructure, better on the North-South (Deva-Craiova) axis but very low on the East-Western (Orsova-Brezoi) axis.	Certainty	Important	Permanent
Harsh and instable weather conditions, with basically no winds that keep the polluted air in the basin, and extreme manifestations: storms, hail, thermal inversions, frosts in warm seasons etc..	Certainty	Significant	Permanent
Uncertain recycling and waste disposal facilities	Certainty	Important	2018

In conclusions, based on the synthetic information presented above, we can underline the main factors that drive the redevelopment of the former industrial micro-region of the Jiu Valley.

The most important issue is that Europe passes through a time of changes, when the new trends emerge in respect to the environment to the goal of social, economic and political sustainability. In this

framework, the role of areas such as the Jiu Valley is to understand its role in this continental construct and act as it is expected. Today, the former industrial area is no longer a benefit for the higher hierarchy administration, but more like an ill urban area that needs to heal and resettle its purpose. Main factors influencing decisions in these directions can be observed in all the six categories of the PESTLE analysis, but the most influential ones are based on Political decisions (also manifested in Legal and Economic aspects), and Social uncertainties. The purpose, for medium and long term, is to transform the Jiu Valley into a resilient and compact urban area.

8.3.2 The future workforce structure, in a holistic approach

The future workforce structure is seen as part of a resilient / antifragile local economic environment, delivering wellbeing through the sustainable exploitation of local resources. Being a pocket inhabited nucleus attached to the A1 economic development corridor, Jiu Valley will be a metropolitan area guided by one major characteristic: the wellbeing of its constituent communities. This is only achievable through understanding the local resources and their sustainable potential, connecting a valuable natural surrounding protected area in the mountains with an easily reachable anthropogenic development axis in the valley.

The most important aspect is the massive reduction of the migration of the young population and the establishment in the area of some social categories in search of a quiet and safe lifestyle. In this respect, the profile of the local economy will not focus upon one major activity, but on a mixture of components: knowledge, bio economy, tourism.

This vision will be observed in practice through a mixture between the large-scale coordination (public sector employees in local administration and education) and the community-based approach: the production of energy, food, goods and knowledge in self-sufficient neighbourhoods. This mixture allows for the creation of proximities between workplaces and housing, between production and living. However, the differentiation of the Jiu Valley from any other productive city is produced by the huge potential for active tourism, a bonus of facilities that improve the current lifestyle in the localities of the Valley. In this respect, the workforce will have the following roles:

- to create high quality goods that can be exported to a national or international scale;
- to create social synergies for communities as powerful as the ones in the mining past;
- to create wellbeing through high-quality touristic, cultural, educational, health and social services.

8.4 Conclusions

Jiu Valley has been witnessing declining population, increasing rate of unemployment and rising number of people at risk of poverty or social exclusion. These social phenomena were generated by aggressive closure of mines, backed by the local authorities' incapacity to manage the situation and cooperate among them and with companies in the region in order to develop viable long-term strategies. After 23 years from the closure of the first mine, local authorities still lack initiative and do not have cohesive policies for social protection or economic development.

Statistical data on Jiu Valley microregion further darkens the grey image of an area that was once one of the most prosperous regions in Romania.

We can underline the main factors that drive the redevelopment of the former industrial micro-region of the Jiu Valley. The most important issue is that Europe passes through a time of changes, when the new trends emerge in respect to the environment to the goal of social, economic and political sustainability. In this framework, the role of areas such as the Jiu Valley is to understand its role in this continental construct and act as it is expected. Today, the former industrial area is no longer a benefit for the higher hierarchy administration, but more like an ill urban area that needs to heal and resettle its purpose.

Main factors influencing decisions in these directions can be observed in all the six categories of the PESTLE analysis, but the most influential ones are based on political decisions (also manifested in legal and economic aspects), and Social uncertainties. The purpose, for medium and long term, is to transform the Jiu Valley into a resilient and compact urban area.

The lack of vision for the national energy sector in the past and the lack of planning for the mining industry restructuring process have produced an economic, social and cultural shock for Jiu Valley micro-region.

However, starting with 2019, both locally and nationally, there is an emulation, which can be beneficial to the area, if all stakeholders will have a common and integrated vision on the transition from coal and will act consistently, pursuing the objectives with minimal political interference. Thus, in 2019, the Memorandum on the "Jiu Valley Partnership for Fair Transition" was signed in Brussels to achieve the objectives of energy transition and economic development in Jiu Valley communities, even if great efforts of persuasion were made by the civil society and officials from the Coal Regions in Transition Platform. Further on, the application for technical assistance was validated by the EC through the START program, in order for the Partnership members to formulate viable projects for the whole micro-region, together with the adequate funding sources. In parallel, the Ministry of European Funds gained the EC support through SRSS for the elaboration of the Economic, Social and Environmental Development Strategy of the Jiu Valley 2021-2030, carried out by the consultant designated by the EC - PricewaterhouseCoopers (PwC). Moreover, it is anticipated that Jiu Valley will be the beneficiary of a tool for implementing territorial strategies in an integrated manner (ITI). There are also other ongoing projects developed by the local public administrations, the County Council via ESIF 2014-2020 and the Intercommunity Development Association (ADI) for zonal public transport (e.i. Jiu Valley Green Line). But not least, local initiatives aimed at co-creating new cultural opportunities and RDI in the micro-region are becoming more often. The current TRACER project is an opportunity "now or never" for Jiu Valley. 20 years of inactivity on behalf of the local councils cannot be erased or compensated by 2-3 years of intensive efforts, but in the long run, by the synergy of joint efforts in projects implemented in the micro-region and especially of people, Jiu Valley could change and thrive again.

8.5 References and further links

- Adevarul.ro (July 2018). Orașul în care trăiesc mai mulți șomeri decât salariați, dar oamenii nu acceptă orice job. Cum arată dezastrul pieței muncii din fostele centre industriale: https://adevarul.ro/locale/hunedoara/orasul-traiesc-mai-someri-decat-salariați-oamenii-nu-vor-job-arata-dezastrul-pietei-muncii-fostele-centre-industriale-1_5b3f61ccdf52022f75ebf802/index.html.
- ADR Vest (2014). Evaluare teritorială – Regiunea Vest. Timisoara, Romania.
- ADR Vest (2016). Framework Document_R&I strategy regional intelligent specialization, <https://s3platform.jrc.ec.europa.eu/regions/RO42/tags/RO42>
- ADR Vest (2020). MFE prelungeste termenul de depunere a proiectelor în sprijinul șomerilor și persoanelor inactive din Valea Jiului: <https://adrvest.ro/mfe-prelungeste-termenul-de-depunere-a-proiectelor-in-sprrijinul-somerilor-si-persoanelor-inactive-din-valea-jiului/>.
- Danciu M.-I., Irimie S. I., Irimie S., Zeininger L., Challenges in Applying the New Economy in a Postindustrial Socio-Economic System. Case Study: Jiu Valley, Romania, The Freiberg Research Forum - 68th "Berg- und Hüttenmännischer Tag" (Forum of Mining and Metallurgy) (68th BHT 2017), Scientific Reports on Resource Issues 2017, vol. 1, pp. 212-223, Freiberg, Germany, June 8th - 10th 2017.
- Davidoiu, T.A. (2017). Rolul exploatarei huilei din Valea Jiului asupra viitorului durabil al regiunii (U.o. Petrosani, Ed.) Doctoral thesis.
- European Commission. (2019). Country Report Romania 2019 Including an In-Depth Review on the prevention and correction of macroeconomic imbalances, SWD(2019) 1022 final, Brussels, 27.2.2019, available at: https://ec.europa.eu/info/publications/2019-european-semester-country-reports_en

- European Commission. (2019). Communication from the commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM (2019) 640 final, Brussels, 11.12.2019
- Eurostat Regional statistics by NUTS classification
https://ec.europa.eu/eurostat/web/regions/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_BQqmHeCfV1BE&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1
- Fodor, D. e. (2016). Mineritul in slujba dezvoltarii durabile a Romaniei. Academia de stiinte tehnice din Romania.
- INS. (n.d.). *INS - serii de date*: http://statistici.insse.ro:8077/tempo-online/#!/pages/tables/insse-table_
- Irimie, S.I. (2014). Managementul dezvoltării durabile al unui sistem energetic comunitar – cu referire la Valea Jiului, Editura Politehnica, Timișoara, pp. 58-63
- Irimie, S., Băleanu, V., Hodor, P. (2003). The analysis of the labour market at the level of the Hunedoara county, Annals of the University of Petrosani, Economics, University of Petrosani, Romania, vol. 3, pages 111-116.
- Irimie, S., Băleanu, V., Hodor, P. (2003). The problems of the labour market in Romania, Annals of the University of Petrosani, Economics, University of Petrosani, Romania, vol. 3, pages 103-110.
- Ministry of Energy. (2018). *Strategia Energetica a Romaniei 2019-2030, cu perspectiva 2050*. Bucharest.
- Ministry of Labour and Social Protection, <http://www.mmuncii.ro/j33/index.php/en/ministry/management>
- Mustață, A. L. (2019). Retrained and forgotten - Measures for mitigating the impact of layoffs from the mines in the Jiu Valley. Bankwatch Romania.
- OECD (2017). Review of Evaluation and Assessment in Education: Romania, available at: <http://www.oecd.org/publications/romania-2017-9789264274051-en.htm>
- Romania-Insider.com (December 2018). Wages by regions. Where are the best paid employees in Romania? <https://www.romania-insider.com/wages-by-regions-where-are-the-best-paid-employees-in-romania>.
- The National Employment Strategy 2014-2020, elaborated in the EMPLO-NET project, SOP HRD 2007-2013.
- World Bank (2005). Poverty and Social Impact Analysis of Mining Sector Reform in Romania: A Policy Note: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/940921468758986818/poverty-and-social-impact-analysis-of-mining-sector-reform-in-romania-a-policy-note>.
- Timotion. (2020). Planeta Petrila: Robotics Valley 2020, available at: <https://www.timotion.ro/proiecte-2020/planeta-petrila-robotics-valley-2020/>

9 Serbia, Kolubara Region

9.1 State of play of the social environment

9.1.1 Current status of the main social indicators

- Demographic

The Kolubara coal basin with its related sectors (mining supply and power generation chain) belongs to two statistical NUTS 2 regions: Sumadija and West Serbia region [RS21] (affected municipalities: Lajkovac, Ub and Arandjelovac) and Belgrade region [RS11] (affected municipalities: Obrenovac and Lazarevac). The data for all categories are given for the [RS11] and [RS21] regions and their affected municipalities except for the life expectancy at the age of 65 years, which are available only for the Republic of Serbia (RS) as a whole. **Table 9.a** shows the total resident population in the [RS11] and [RS21] regions and in related municipalities by age, and the life expectancy at age of 65 for Serbia.

Table 9.a RS. Resident population in the Republic of Serbia, total and by age, and life expectancy (2015-2018)

Category		NUTS 2: [RS21] region [RS11] region				Lajkovac, Ub, and Arandjelovac Obrenovac and Lazarevac				
		2015	2016	2017	2018	2015	2016	2017	2018	
Resident population (no.)		1,972,183 1,679,895	1,956,786 1,683,962	1,941,130 1,687,132	1,924,816 1,690,193	15,046 28,068 44,823 72,323 57,735	14,962 27,808 44,516 72,246 57,444	14,851 27,603 44,197 72,209 57,136	14,721 27,407 43,834 72,124 56,865	
Age distribution (no.)	< 15 years	286,995 246,412	283,719 249,395	279,766 251,508	275,350 253,638	2,149 3,917 6,446 11,231 8,909	2,136 3,860 6,387 11,266 8,943	2,107 3,824 6,288 11,297 8,973	2,085 3,779 6,106 11,272 8,998	
		15 - 64 years (working age)	1,310,821 1,133,715	1,292,079 1,126,763	1,272,446 1,119,960	1,250,987 1,112,334	10,142 18,748 30,210 48,514 39,903	10,034 18,539 29,783 48,033 39,348	9,891 18,310 29,294 47,496 38,764	9,701 18,076 28,798 46,924 38,144
	> 65 years		374,367 299,768	380,988 307,804	388,918 315,664	397,479 324,221	2,755 5,403 8,167 12,578 8,923	2,792 5,409 8,346 12,947 9,153	2,853 5,469 8,615 13,416 9,399	2,935 5,552 8,930 13,928 9,723
		Change of residence/or/migration (no.)		-4,305 7,309	-3,476 6,504	-4,087 6,437	-4,050 6,978	n/a	n/a	n/a
	Life expectancy at age of 65 years in Serbia	Female	12.78	13.23	13.00	13.37	n/a	n/a	n/a	n/a
		Male	8.05	8.46	8.34	8.68	n/a	n/a	n/a	n/a

Source: Statistical Yearbook of the RS, Statistical Office of the RS

The resident population of the [RS21] region is declining from year to year, while increasing in the [RS11] region. In the affected municipalities, however, the population declines, both for population group under 15 years of age and for the working age group. An exception is the municipality of Lazarevac, where the population group under 15 years of age is increasing. The population group over 65 years of age is increasing both in the [RS11] and [RS21] regions and in the affected municipalities.

In terms of internal migration, it is net negative in the [RS21] region, meaning that the migration was larger from than into the region.

On the contrary, in the [RS11] region the migration is net positive, meaning that the number of immigrants to is much higher than the number of emigrants. These trends remain the same over the period 2015 - 2018.

Life expectancy at age of 65 years in the Republic of Serbia increases every year, with the higher life expectancy for female than for male in all years. In 2018 the life expectancy at age 65 for females 13.37 years and for males was 8.68 years.

- *Labour*

Labour data for the period 2015-2018 are presented in **Table 9.b** and **Table 9.c**. **Table 9.b** below presents data on employment, unemployment and activity rate. For 5 affected municipalities some data are not available.

Table 9.b RS. Registered employment, activity and unemployment rates for the period 2015-2018

Category		NUTS 2: [RS21] region [RS11] region				Lajkovac, Ub, and Arandjelovac Obrenovac and Lazarevac			
Years		2015	2016	2017	2018	2015	2016	2017	2018
Total number of employees (no.)	Total economy in the [RS21] and [RS11] and directly affected municipalities	470,555 670,296	475,397 669,845	486,165 691,555	500,520 717,998	3,428 5,833 10,881 13,319 20,650	3,528 5,928 10,573 14,653 22,913	3,503 6,178 10,763 15,211 22,718	3,492 6,339 11,415 16,948 22,815
	Agriculture, forestry & fishing	5,976 5,086	5,617 4,542	5,553 4,460	5,682 4,240	16 605 31 200 14	458 29 22 39 19	29 545 28 16 127	29 577 34 17 118
		Industry - Coal mining	5,892 8,158	6,060 9,267	5,745 9,934	5,623 9,770	1,486 130 178 18 7,690	1,516 142 112 19 8,705	1,313 545 100 15 9,266
	Industry - Electricity, Gas and HAC	7,973 9,460	6,980 9,807	6,430 9,318	6,172 8,744	15 46 122 1,633 1,010	18 20 117 2,027 1,176	- 47 81 1,945 763	3 38 83 1,925 748
Average number of employees by the selected economic activities in the [RS21] and [RS11] statistical regions and directly affected municipalities (no.)	Construction	20,552 34,830	31,665 33,265	21,837 34,292	23,597 36,785	96 198 267 424 745	152 277 260 600 800	164 295 295 626 740	171 345 381 692 824
	Accommodation and food services	16,776 22,962	17,829 23,735	18,670 25,315	20,254 27,854	57 114 604 248 809	61 139 554 290 667	65 163 364 352 718	64 166 378 386 693
	Information and communication technologies (ICT)	5,274 33,379	5,278 33,603	5,673 36,238	n	23 52 84 79 45	15 52 83 236 83	15 46 99 177 99	7 51 103 155 105
	Professional, Scientific and Technical activities	12,253 50,078	13,045 49,462	13,341 52,619	14,286 54,884	78 140 314 366 306	15 52 344 426 335	50 144 310 440 329	50 152 333 366 355
	Employment rate of population 15-64 years of age, (%)	53.0 53.0	55.8 56.9	57.2 60.3	58.1 62.9	n/a	n/a	n/a	n/a
	Gender employment gap (male-female), (%)	17.7 10.8	16.0 9.1	16.6 8.3	15.4 11.6	n/a	n/a	n/a	n/a
	Activity rate of active population (15-64 years), (%)	Female	55.6 60.0	58.3 62.7	58.8 65.4	60.8 65.7	n/a	n/a	n/a
Male		73.3 71.2	74.0 73.0	75.1 74.4	75.6 76.1	n/a	n/a	n/a	n/a

Category		NUTS 2: [RS21] region [RS11] region				Lajkovac, Ub, and Arandjelovac Obrenovac and Lazarevac			
Years		2015	2016	2017	2018	2015	2016	2017	2018
Activity rate, (%)	15-24 years	n/a	29.8 27.9	29.8 28.8	30.0 26.1	n/a	n/a	n/a	n/a
	25-64 years	n/a	73.6 74.5	74.5 76.6	75.9 78.2	n/a	n/a	n/a	n/a
Registered unemployed (number per thousand of inhabitants)		152,200 141,500	125,600 121,900	125,500 106,700	128,100 87,700	n/a	n/a	n/a	n/a
Unemployment rate (15-64y), (%)	Female	19.6 19.4	17.1 15.6	15.9 13.1	16.3 11.8	n/a	n/a	n/a	n/a
	Male	16.5 18.5	14.7 16.2	13.5 13.8	13.8 10.3	n/a	n/a	n/a	n/a
Youth (15-24y) unemployment rate, (%)		n/a	34.0 35.5	32.1 32.0	33.4 29.9	n/a	n/a	n/a	n/a
Long term unemployment (per thousand of inhabitants)	Female	n/a	44.5 37.9	37.3 29.9	40.2 25.1	n/a	n/a	n/a	n/a
	Male	n/a	47.5 42.0	43.1 35.5	42.9 25.9	n/a	n/a	n/a	n/a

Source: Municipalities and Regions in the RS, Labour Force Survey in RS and Statistical Yearbooks of the RS, Statistical Office of the RS

Evidently, the employment rate is increasing year by year in both regions [RS11] and [RS21]. In 2018 this rate was the highest in the [RS11] region (62.9%), even higher than the national employment rate (58.8%). Activity rate of population aged 15-64 years was higher for male than for female. Average number of employees by economic activities shows that the majority of employees lives in Lazarevac municipality, and almost 40% of employees from that municipality works in the coal mining sector.

The number of unemployed citizens is declining (except for a slight increase in the [RS21] in 2018) so that the unemployment rate of active population decreases for both male and female. Unemployment is lower in the [RS11] region than in the [RS21] region. Long-term unemployment has the same trend. **Table 9.c** presents the monthly average net wages for those employed and state aid for those unemployed.

Table 9.c RS. Average nominal monthly net wages and unemployment benefit for the period 2015-2018

Category		NUTS 2: [RS21] region [RS11] region				Lazarevac, Lajkovac, and Ub Arandjelovac and Obrenovac Lazarevac			
Years		2015	2016	2017	2018	2015	2016	2017	2018
Average nominal monthly net wages (€/month)	Total economy in the regions [RS11] and [RS21] regions and affected municipalities	506	503	499	520	273	256	393	281
		305	310	338	363	317	315	353	378
		457	467	507	513	433	426	450	433
						530	530	557	558
Average nominal monthly net wages in the selected economic sector of Serbia (€/month)	Agriculture forestry&fishing	312	317	355	420	n/a	n/a	n/a	n/a
	Industry - Lignite mining	584	589	534	650	n/a	n/a	n/a	n/a
	Industry - Electricity, Gas, HAC	614	615	662	682	n/a	n/a	n/a	n/a
	Construction	343	346	364	370	n/a	n/a	n/a	n/a
	Accommodation and Food	220	228	249	268	n/a	n/a	n/a	n/a
	Information and communication technology - ICT -	683	716	789	704	n/a	n/a	n/a	n/a
	Professional, Scientific and Technical activities	564	597	623	515	n/a	n/a	n/a	n/a
Monthly average state aid for the unemployment, (€/month)		433	344	317	319	n/a	n/a	n/a	n/a

Source: Municipalities and Regions in the RS, Labour Force Survey in RS and Statistical Yearbooks of the RS, Statistical Office of the RS

Among municipalities affected by mining the highest wages are recorded in Lazarevac. The highest average wage in Serbia is in the Information and Communication (ICT) sector, followed by Electricity, Gas and HAC and Hard coal and lignite mining sectors. The average monthly unemployment benefits paid by the state to the unemployed in 2018 was 319 € per month, down from 433 € in 2015.

- *Living conditions*

The Kolubara target region is above the Serbian average wealthy region. The at-risk-of-poverty rate in the [RS11] statistical region varies by municipalities between 4.8% and 15.9%, and in the [RS21] region between 24.5% and 25.7% (these persons are not necessarily poor, but are at the higher risk of poverty than the others). In 2018 the average at-risk-of-poverty rate was 24.3% in Serbia and, compared to 2017, it was lower by 1.4%. However, the real at-risk-of-poverty or social exclusion rate amounted to 34.3% (these persons are at risk of poverty or are severely materially deprived or live in households with low work intensity), and it was lower by 2.4% relative to 2017. The at-risk-of-poverty threshold in Serbia is 141 €/month on an average for a single person household, while for a household with two adults and one child aged below 14 years the threshold is 253 €/month, and for a four-member household with two adults and two children aged below 14 years is 295 €/month.

Observed by age, the at-risk-of-poverty rate in Serbia shows that the most exposed to the poverty risk are individuals aged 18-24 years (29.1%), and individuals up to 18 years of age (28.8%). The lowest at-risk-of-poverty rate was recorded for the group of persons aged 65 years and over (21.1%). By the type of household, individuals in households composed of two adults with three or more dependent children were at the highest risk-of-poverty (53.6%), followed by individuals below 65 years, living in single-person households (37.2%). According to the activity status for persons aged 18 years and over, the most exposed to the at-risk-of-poverty were unemployed persons (49.0%), while the lowest at-risk-of-poverty rate was recorded for employees working for employers (6,8%). In case of self-employed persons, this rate was 31.0%. The at-risk-of-poverty rate for retired persons in Serbia was 17.1%.

- *Health*

Both, lignite mining and electricity generation in Kolubara target region impact considerably the human health, irrespective of the environmental protection measures taken as stipulated by the laws. The health of human population in the Region is endangered by the air, soil and water pollution from mining activities, as well as from emissions of particulate matters and oxides of sulphur and nitrogen generated by burning lignite in the boilers of the power plants. For that reason, each of the affected municipalities have primary health care centres. Besides, municipality of Lazarevac has the hospital for special diseases and municipality of Arandjelovac has the hospital for special diseases and one general hospital.

The most endangered are vulnerable groups (children and elderly people), as well as those employed on or living in the close vicinity of the mining and power generation activities. The most of the professional diseases are detected within the employees on the lignite mining and on power generation. The state-owned Electric Power Industry of Serbia (EPS) is continuously controlling the health of its employees through regular checking of their work abilities. From **Table 9.d** below it is evident that the employees on lignite mining in the Kolubara mining basin are much more exposed to some kind of the professional diseases (limited ability or disabled to work) than the employees on power generation in the „Nikola Tesla" thermal power plants fired by the coal transported by a special rail from the Kolubara mines.

Table 9.d RS. Health status of employees on lignite mining and power generation in 2018

Activity	Lignite mining		Power generation	
	Number of employees	%	Number of employees	%
Number of employees examined	9,081	95.11	1,608	98.83
Employees found able to work	5,158	56.80	1,447	89.99
Employees with limited ability to work	3,765	41.46	137	8.52
Employees found disabled to work	158	1.74	24	1.48
Total number of employees	11,907	100.00	2,039	100.00

Source: Environmental Report PE EPS, Belgrade, May 2019

- *Education*

Education infrastructure in the Kolubara target region consists of pre-school, primary and lower education, upper-secondary education, higher schools and faculties and art academies. In the [RS21] region in 2018 were 811 pre-schools (of which 2 in Lajkovac, 1 in Ub and 17 in Arandjelovac), 1,404

primary and lower secondary schools (of which 14 in Lajkovac, 32 in Ub and 23 in Arandjelovac), 143 upper-secondary schools (of which 1 in Lajkovac, 2 in Ub and 3 in Arandjelovac), 13 higher schools and 15 faculties and art academies. More developed educational infrastructure is in the [RS11] region: 665 pre-schools (of which 28 in Obrenovac and 41 in Lazarevac), 334 primary and lower secondary schools (of which 33 in Obrenovac and 33 in Lazarevac), 114 upper secondary schools (of which in Obrenovac 3 and in Lazarevac 3), 23 high schools and 71 faculties and art academies, mostly in [RS11].

The number of enrolled populations by level of education for the school year 2017/2018 was as follows:

- In the [RS21] region the number of enrolled in preschool was 50,075 (of which 450 in Lajkovac, 531 in Ub, 1,144 in Arandelovac); in primary and lower secondary education was 155,201 (1,159 in Lajkovac, 2,070 in Ub, 3,763 in Arandelovac); in upper-secondary education was 71,716 (of which 407 in Lajkovac, 407 in Ub, 1,733 in Arandjelovac); in higher education was 25,957 (of which 8,319 in high schools and 17,638 students in faculties and art academies).
- In the [RS11] region the number of enrolled in pre-school was 69,320 (of which 2,213 in Obrenovac and 1,888 in Lazarevac); in primary and lower secondary education was 130,032 (of which 6,376 in Obrenovac and 4,891 in Lazarevac); in upper-secondary education was 60,442 (of which 1,790 in Obrenovac, 1,559 in Lazarevac); in higher education was 144,948 (of which 21,220 in high schools, and 123,728 in faculties and art academies).

The number of graduated students in tertiary education for the school year 2017/2018 by regions was as follows:

- In the [RS21] region the number of graduated students was 4,935 (2,188 from higher school and 2,747 from faculties and art academies) out of which 3,121 female and 1,814 male students.
- In the [RS11] region the number of graduated students was 24,579 (4,951 from high schools and 19,628 from faculties and art academies) out of which 14,434 female and 10,145 male students.

The early school leaving rate of young people (aged 18-24) in Serbia with completed primary school in 2018 was 6.8% (35.3 thousand).

The participation rate of adults in some form of formal or non-formal education or training in 2016, in Serbia was 19.8%, slightly higher than in 2011 (16.5%), but well below the average of the EU Member States (45.1%). In some form of education and training in the 12 months preceding the survey, women participate slightly more than men (21.4% vs 18%). The participation rate is highest among the 25-34-year-old population (29.2%). Most often, lifelong education is attended by women, aged 25-34, with a university degree who are employed and live in the urban environment.

Dual education scheme in the upper-secondary education has just begun to be implemented in the Republic of Serbia since the 2019/2020 school year, so there are still no available statistical data.

- *Youth*

The number of young people (age 15-24 years of age) in Serbia who are neither in employment, nor in education and training, declines year by year and 2018 was 119.6 thousand down from 134.1 thousand in 2016 and 137.0 thousand in 2017. This positive trend is not only a consequence of an increase in the number of young people employed and a decrease in the number of unemployed, but also of a negative trend, i.e. a decrease in the size of the population aged 15-24 years.

- *Research and Innovation (R&I)*

In the [RS11] region the number of R&I organizations is the largest in the business sector (65), followed by tertiary education (57). The situation in the [RS21] region is reversed (12 R&I organizations in business sector and 15 tertiary education).

Innovation of product/services and innovation of production process have an equal share in total innovation. The most of innovation is in manufacturing, IC and Professional, scientific and technical activities.

There is also a Startup Academy that gathers, helps and educates domestic start up entrepreneurs in Serbia. In addition, many existing companies provides not only financial but also professional support

and assistance to start ups. There are more than 45,000 new start-ups each year in Serbia, but no precise data on new startups in the [RS1] and [RS21] regions.

- *Culture and sport infrastructure*

Cultural infrastructure consists of cinemas, theatres, museums, radio and TV stations, libraries. In 2018, there were 32 cinemas, 21 theatres, 39 museums, 88 radio stations, 44 TV stations and 607 libraries in the [RS21] region. In the [RS11] region there were 19 cinemas, 25 theatres, 47 museums, 28 radio stations, 16 TV stations and 601 libraries in 2018.

In the affected municipalities there are numerous sports facilities such as: sports centres, stadiums, ice halls, swimming pools. For example, in Lazarevac there is a large number of sports and recreation centres and sports terrains, including a football stadium, concrete playgrounds for basketball, volleyball and handball, indoor pool a sport and recreational centre with lake, forest and recreation terrains. In Obranovac, there is a sport centre with large hall for basketball, volleyball, handball, tennis, box, karate and judo, and two Olympic and one children swimming pool. There is also a football stadium. In the municipality Arandelovac, there is a sport centre with large hall for basketball, volleyball, handball, box, karate and judo. There is also a football stadium and a sports and tourist complex which includes large and small pools, outdoor volleyball and basketball and beach soccer courts. In the municipality Lajkovac, there is a sport hall for basketball, volleyball, handball and mini football and also a football stadium. In the municipality Ub, there is an outdoor sports and recreation centre which consists of football stadium, playgrounds for handball, basketball, tennis, judo, kickbox, and athletics.

9.1.2 Comparative analysis

There were no cases so far of normal mine closure in the Republic of Serbia to compare with. A disaster due to methane explosion in the Aleksinac underground coal mine in 1983 killed the entire morning shift of 90 miners, and caused permanent closure of that mine. The rest of miners was not left jobless (some continued to work in other coal mines, some retired and some were assisted to open private jobs). Another kind of disaster was the unfortunate bombing of Serbia by NATO forces in 1999, when all miners and other employees of Serbian nationality (about 7,000 in total) were forced by the Albanian majority to leave their jobs in the lignite mines and thermal power plants in the southern Serbian province Kosovo and Metohija. They all moved northward and most of them was employed either in other two mining and power generation basins (Kostolac and Kolubara) of the Electric Power Industry of Serbia (EPS) or in its power transmission and distribution services in Central Serbia and in the northern Serbian province of Vojvodina.

In its attempt to reduce costs of operation and maintenance, the Electric Power Industry of Serbia is reducing the number of employees on the account of raising labour productivity and implementing automation facilities into all of its working processes. With somewhat less than 14,000 of employees in the Kolubara target region, of which about 12,000 in mining and related services and about 2,000 in power generation, this is not expected to change significantly (e.g. for mining and related service the change was from 11,907 at the end of 2018 to 11,880 in May 2019) until the new 350 MW power plant Kolubara B starts operation to compensate for the closure of the smaller capacity power generating units by the year 2023 as decided by the National Emissions Reduction Plan (NERP). Although the new plant would call for some increase in lignite excavation including further extension of the mining area towards the west (Radljevo field, **Figure 9.a**), the number of employees is not expected to increase considerably because of a small (about 12%) increase in total coal demand over the existing.

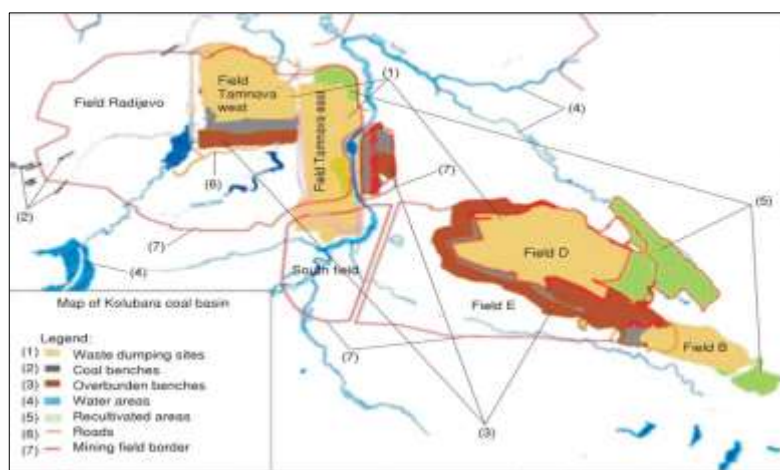


Figure 9.a RS. Lignite mining fields in the Kolubara mining basin

Source: Jakovljević, M., et al., 2015

9.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

9.2.1 National public policies

National public policies related to labour, social protection and workforce re-skilling are in jurisdiction of the Ministry of Labour, Employment, Veteran and Social Affairs (MLEVSA) that holds several subordinate sectors. The Labour and Employment Sector (LES) is in charge of issues related to labour and employment, as well as of legislation and by-laws in that domain. Each year, National Employment Action Plan (NEAP) is formed to further elaborate the goals and priorities set out in the adopted public policy documents in the area of employment policy. The Family and Social Welfare Sector (FSWS) is in charge of preparation of strategic documents, draft laws and other draft regulations in the field of social protection, family protection, population policy and family planning, as well as approval of the appointment of the director of social welfare institutions and other legal affairs related to performing the social protection activity

Serbia is the member of the Council of Europe, and actively pursues social cohesion by achieving adequate level of social protection, stimulation of employment, protection of worker's rights, ensuring the protection of the most vulnerable social groups, promotion of equal opportunities for all citizens and prohibition of social exclusion and discrimination. At the end of 2018 Government of Serbia adopted its Social Protection Development Strategy (SPDS) intended to improve the social status of citizens on a personal, family and broader social issues.

As the candidate country for the EU membership, Serbia participates (through its MLEVSA) in the EU-funded Employment and Social Innovation (EaSI) program. The EaSI instrument coordinates actions at the EU and national levels in the areas of employment, social affairs and inclusion, supports social protection systems and labour market policies, boosts employment opportunities by developing an open labour market, and enables access to finance for vulnerable groups and micro and social enterprises, as well as develops methods of vocational training and re-skilling. The last was particularly important re-skilling program for IT sector in Serbia, which, starting from 2017, covered so far over 1,200 people in 8 cities, with more than 750 additional participating in the National Employment Services (NES) programs. The training programs included both employed and unemployed participants and have been conducted by state educational institutions, private faculties, civil society organizations, as well as private companies. The plan is to train 2,000 more candidates in 2020.

9.2.2 Regional and local policies

Regional and local policies in the Kolubara target region are currently guided almost exclusively by the national energy policy, but with due regard to the wellbeing of the local population. The reason for the national involvement is the fact that more than a half of the total national electricity generation in

Serbia is based on the lignite being mined there, and that the state-owned Electric Power Industry (EPS) is the major employer of the local population in Unite mines and at power power plants.

With the current Serbian energy policy, the coal is still regarded as the major energy source for the foreseeable future, and therefore the national transitional policy may rather be step-wise, but with the regional and local social policies following the inevitable changes towards low carbon energy sources.

Due to its important national role in coal mining and energy production, Kolubara coal basin falls within the special-purpose areas that require a special way of organization, development and protection. Therefore, the analysis of current situation and future development opportunities of this coal basin is the subject of various planning documents being drawn and adopted at national, regional and local levels. When drafting these documents, various local initiatives and activities of different non-governmental organizations (NGOs), citizen's associations, as well as national, regional and local authorities and institutions are consulted. Besides mining and electricity generation, these planning documents define the long-term post-mining development of this region by placing emphasis on agriculture, fisheries, forestry and different types of tourism. This requires re-skilling of the workforce outside of the energy sector and education of new generations for a more sustainable development in the post-mining period.

9.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factors

9.3.1 Transition objectives. Key issues analysis

The objectives in terms of social and workforce/re-skilling needs

It is well understood that, to enable the transition process to be carried out in a successful manner, it is necessary to take appropriate steps well in advance and draw-up social, workforce and re-skilling plans and programmes and to include, in addition to the state authorities, regional and local authorities and planning agencies, as well as the scientific and educational institutions (in the fields of energy, economy, agriculture, forestry, tourism, etc.). As a result, these issues would address both, national and local priorities and take into account various aspects, which will allow to consider challenges in a timely manner and to observe all the opportunities that may arise in the transition process.

An important step in defining the strategy and plans is to identify the jobs for which there is a demand, meaning to analyse the labour market in the region to be affected by the mine closure. In that respect, the main objectives on which the development of the Kolubara target region will be to create conditions for the existence and development of the traditional and new agricultural activities, as well as creating conditions for the development of fisheries and tourism through the development of small and medium-sized enterprises that will ensure the collection, processing, transport and placement of agricultural products, wood processing, etc. Also, of particular importance is the development of social care institutions that will assist people in the transition process as well as an increase in the level of education of the population by involving a wide range of people in re-skilling process and developing new skills and activities.

The five local communities depending on coal mining in the Kolubara target region will face dramatic changes, particularly so as the local infrastructures are highly dependent on tax revenues collected from mining activities that are phasing out. The health-care, education and other public services are affected, further crashing potential employment opportunities. Also, newly created jobs are usually of lower quality involving lower payment levels, limited benefits and job security due to absence of guaranteed long-term contracts/employment sustainability that was typical for jobs in coal mining.

The key external and internal factors that should be taken into account

The expected phase-out of coal mining and the transition towards a low carbon economy makes the Kolubara target region of particular interest for Serbia, not only from the energy supply point of view, but also from the social issues and workforce concentration points of view. In parallel with the major objective to make use of the well-developed energy infrastructure and qualified workforce in the post-

coal situation, the land reclamation gains increasing importance on the way to a sustainable post-mining landscape development in creating and restoring an attractive environment worth living for the regional population. This is of particular importance to preserve the young enterprising people from migration to the other regions or abroad (brain-drain) to ensure the future regional development.

Of course, the remaining strong infrastructure and long tradition in generating electricity is of particular importance for further development of the energy sector based on low-carbon fuels (natural gas, biomass) or solar radiation. This will not only keep the qualified people employed in their former field without or very limited re-skilling, but also replace at least a part of the current electricity generation in the region.

To cope with a variety of negative impacts of the transition in the coal intensive regions, many factors should be considered, both external and internal ones. Increased well-being is needed to secure and to maintain regional competitiveness and future prosperity in post-mining period. Also, good infrastructure and service delivery is needed to attract and retain workers. Improving well-being in mining regions calls for place-based policies that address these specific needs. The close down of coal mines affects individuals' identity and self-esteem, which are linked to their previous professional activity and well-being dimensions as basis to contribute to more inclusive, sustainable regional growth.

Of course, in focus must be the transition objectives in terms of social and re-skilling issues, with the impacts of internal and external factors taken into consideration. One of the important issues is the provision of financial support not only for re-skilling, but also for stimulating the development of other activities through favourable credit and loan instruments, procurement of machinery, etc. Financial institutions also need to be involved in making plans and support programmes. For instance, plans for infrastructure development should include not only good roads, but also sport infrastructure, such as: playgrounds, running paths, team sports courts for the future growth of sport tourism.

The key issues in social and workforce (re-skilling) fields

With the closure of Kolubara coal basin, a large number of people will lose their jobs. Some of them will accept re-skilling, while others will refocus on farming - agriculture. A small number will go outside their place of residence in search of a new job, while on the other hand, a number of employees, particularly the older age structure, will not be ready for re-skilling even if left unemployed. Also, the attempts to re-train the unemployed people in post-mining in coal-intensive regions in transition may be found inefficient for a number of reasons. Regardless of what group of people they come from, there is a need to provide at all levels (national, regional and local) well-developed strategies that will address social, re-skilling and labour issues for people who will lose their jobs in post-mining times to come.

The lack of funding can be a significant factor that may adversely affect the transition process. The shortage of work and therefore the shortage of money, make people less social, less likely to attend sports and cultural events.

SWOT Analysis

One of the challenges that may occur during the transition process is the willingness, ie. the absence of people's willingness to accept change. Although it involves a large number of workers (the number of employees in Mining Basin Kolubara in May 2019 was 11.880, of which 6.625 were employed in open pit mines and the rest was employed in other companies within the Mining Basin Kolubara), their qualification structure is unfavourable, meaning that only 20% is a highly educated staff.

Table 9.e RS. SWOT analysis

<p>Opportunities</p> <p>Development of agriculture, forestry and service sectors</p> <p>Utilization of part of abandoned production warehouse and other capacities and facilities that can be adapted to the new business programmes, small and medium-sized enterprises, as well as building the new energy capacities</p> <p>The willingness of international stakeholders to support development through loans and grants</p> <p>Encouraging transfer of land, livestock and technical resources from holdings, losing their interest and strength to deal with agricultural production, into the hands of economically and demographically vital households</p>	<p>Threats</p> <p>Lack of willingness of people to re-skill</p> <p>Lack of experience regarding mine closure,</p> <p>Slow harmonization of regulations and activities related to land protection in spatial development policies, environmental protection, etc.</p> <p>Demotivation of landowners for organizing agricultural production under conditions of foreign competition on the domestic market</p> <p>Lack of legal and institutional standards for implementation of regulations in the field of use and protection of agricultural and forest land</p>
<p>Strengths</p> <p>Good quality of the agricultural land</p> <p>Proximity to the capital city of Belgrade for placement of the agricultural and other products</p> <p>Well-developed regional infrastructures</p> <p>Potential of Renewable Energy Sources, in particular PV solar and biomass</p>	<p>Weaknesses</p> <p>Unfavourable age structure</p> <p>Underdeveloped private sector, as well as public-private partnership</p> <p>Poorly diversified economic structure</p> <p>Delays in the implementation of land reclamation programme through afforestation</p>

9.3.2 Projection of the workforce structure

The economic structure in the observed area is poorly diversified, and is dominated by the mining and energy sector and manufacturing industry, while the share of agriculture and services sector is low. The current regional workforce structure accounts for a high percentage of non-agricultural population (about 90%), so that the closure of the coal mines will lead to a major change in the workforce structure in the Region. Since the Kolubara target region comprises a good quality agricultural land (GQAL), it is necessary to provide institutional, organizational, technical, economic and socio-psychological conditions for organizing agricultural holdings and ensuring sustainable production. A significant increase in the share of workforce in agriculture can be expected. Since the development of agriculture also entails the development of a whole range of activities that make a logistic support to the agricultural production: food collection, storage, transport and processing, an increase in the share of employees in the service sector can be expected. Also, the developing forestry, turning tailings ponds into lakes and restoring the national cultural monuments will create conditions for tourism to develop, that would lead to an increase in the number of employees in the tourism sector.

There will be major changes in the energy sector and significant reductions in the number of employees, both in the mining and electricity generation. Of course, the electricity can be produced from renewable energy sources, but to the extent limited by the natural and spatial conditions. As the lands degraded by mine activities are often not suitable for cultivation of crops used for human or animal nutrition, the idea of its use for production of energy crops may be more promising. Apart from biomass production, the solar energy production is one of the most challenging possibilities to support a sustainable development of the region after close-down of mining. The region offers good opportunities to build utility scale solar power plants on large state-owned surface areas left after lignite mining is over (average annual quantity of daily solar radiation on a horizontal plane in the target region is 3.8 kWh/m²day), but this would ensure permanent employment for only a small number of people. Those employees will remain in a slightly modified energy business, without or with minor re-skilling needs.

9.4 Conclusions

The Kolubara target region is above Serbian average developed region. This results from a favourable geographical and road infrastructure position and particularly from an intensive development of mining and energy sectors. Further development of the region in post-mining period will predominantly be oriented towards a gradual shift of activities from the primary and secondary economic sector to the tertiary and quaternary sectors. The re-skilling of the workforce should be channelled in this direction.

The re-skilling the workforce is a rather complex and time-consuming process. This will involve a large number of institutions, individuals and authorities. Positive and negative experiences of the regions that underwent a transition process should be used. It is particularly important to provide adequate financial support from both domestic and international financial institutions.

To enable the re-skilling to be a successful process, it should commence on time. When developing strategies and plans for the re-skilling process, it is necessary to take into account various aspects of that process, including sustainable development, preservation of economic and social vitality and cultural and historical heritage of the region. For that purpose, it is necessary to carefully analyse the qualification structure of employees who will lose their job in the transition process, in order to make the re-skilling an opportunity that will make them feel useful members of the society in their living environment.

In many cases, however, shutting down coal mines makes it necessity to re-locate workforce to other regions in the country looking for new job opportunities, including relocation of families. In the case of older workers, unemployment is the most likely scenario, as they are prone to refusing re-location. Overall, many former mining employees would feel discouraged to search for new jobs as they have limited to inexistent opportunities in the community they belong to, after coal mines are closed down.

9.5 References and further links

- Statistical Yearbook 2016, 2017, 2018 and 2019, Statistical Office of the Republic of Serbia
- Municipalities and Regions in the Republic of Serbia, 2015, 2016, 2017 and 2018, Statistical Office of the Republic of Serbia
- Bulletin - Labour Force Survey in the Republic of Serbia, 2016, 2017 and 2018, Statistical Office of the Republic of Serbia, Belgrade
- High education in the RS, 2015/2016, 2016/2017 and 2017/2018, Statistical Office of the Republic of Serbia
- Poverty in the Republic of Serbia 2006 – 2016, Revised and new data, Social Inclusion and Poverty Reduction Unit, Government of the Republic of Serbia, Belgrade, August 2017
- Assessment of Absolute Poverty in Serbia in 2018, Government of the Republic of Serbia, Social inclusion and poverty reduction unit, Belgrade
- Health Statistical Yearbook of the RS, 2015, 2016, 2017, and 2018, Institute of Public Health of the Republic of Serbia
- Electric Power Industry of Serbia 2018 Environmental Report PE EPS, Belgrade, May 2019
- Spatial plan of the Kolubara coal basin mining area, Book 1, Mining institute, Zemun, 2016
- Draft Spatial plan of the special purpose area for the construction of the TPP Kolubara B, Ministry of Construction, Transport and Infrastructure, Republic of Serbia, Belgrade, 2020
- Jakovljević, M., et al.: Biomass Production as Renewable Energy Resource, Thermal Science, Year 2015, Vol. 19, No. 3, pp. 823-835
- Social Protection Development Strategy 2019-2025, Draft, Ministry of Labour, Employment, Veteran and Social Affairs, Republic of Serbia, Belgrade, 2019
- National Plan for Emission Reduction of the Major Polluting Matters from Old Large Combustion Facilities, Official Gazette of the Republic of Serbia, No. 10, 06.02.2020, pp. 225-259
- Performance Monitoring Report of the European Union Programme for Employment and Social Innovation (EaSI) 2017-2018, Directorate-General for Employment, Social Affairs and Inclusion Directorate F - Investment and Planning, Brussels 2019

- Supporting “Generation Start-Up”: Opportunities for Serbia, Case Study, Microfinance centre, Warsaw, November 2017
- Annual work programme for grants and procurement for the European Union Programme for Employment and Social Innovation ("EaSI") for 2020. [Commission implementing decision c(2019)7630 of 30 October 2019], European Commission Directorate-General for Employment, Social Affairs and Inclusion, Brussels 2019
- Mid-term evaluation of the EU programme for employment and social innovation - EaSI Framework Service Contract VC/2013/0083 Final Evaluation Report, ICF consulting, ICF Consulting Ltd, Brussels, November 2017
- Tourism Development Strategy of the Republic of Serbia 2016 – 2025, Government of the Republic of Serbia, Ministry of trade, tourism and telecommunications, Belgrade, 2016

10 Ukraine, Donetsk region

10.1 State of play of the social environment

10.1.1 Current status of the main social indicators

- *Demographic indices*

Population accounting in the region has certain features. Starting from 2015, statistical information on this issue is formed based on the available administrative data for the state registration of new-born babies, deaths and change of registration of residence, but not including the data on the territory where public authorities temporarily do not exercise their powers. According to estimates, the share of the residents in the territories controlled by authorities amounts to 46% of the population in the region, or 1,909.4 thousand persons (of which, according to UN estimates, 1 million are female and 0.9 million male).

Number of children in the region's population is decreasing. In the structure of population of the region, the share of age group "0-14" years reduced from 20.6% in 1990 to 12.3% in 2018. Number of new-born babies declines each year: in 2013, there were 30% less new-born babies compared to year 1990 (in general in Ukraine for the same period this figure shows decline by 23.0%). Comparative analysis of demographic ageing in Donetsk area and in Ukraine proves that in 1990 the population of the region was younger than in Ukraine in general (the share of disabled age people was 1.1 percentage points (p.p.) lower). Later the population of Donetsk region "began to age" and according to the official data from Donetsk statistical administration the share of the age group "65 years and above" became 3.5 p.p. greater than the same index in the state. High age coefficients prove that the population in the region is demographically very old and ageing indices exceed the same readings for Ukraine in the whole.

Table 10.a UA. Demographic situation in Donetsk region

Category	Donetsk Region				Small administrative unit				
	2015	2016	2017	2018	2015	2016	2017	2018	
Permanent population, thousand people (no.)	4 284.4	4 252.3	4 231.2	4 187.6	343.4	340.9	337.1	333.0	
Distribution by age, th. people (no.)	< 15	557.7	542.6	532.1	516.6	NA	NA	NA	47.3
	15-64	2 977.7	2 930.5	2 887.7	2 832.0	NA	NA	NA	226.6
	> 65	749.0	779.2	811.4	839.0	NA	NA	NA	59.1
Migration decrease of the population	-9.2	-3.6	-23.9	-10.3	NA	NA	NA	NA	
Lifetime expectancy at age of 65 y (year)	Female	Since 2014 the data for this index in Donetsk region is unavailable			NA	NA	NA	NA	
	Male				NA	NA	NA	NA	

Source: *Regions of Ukraine, 2016-2018 (statistical survey)*. State Statistics Service of Ukraine, Kyiv, 2017-2019; *Population of Ukraine, 2018 (demography yearbook)*. State statistics office of Ukraine, Kyiv, 2019; *Data from the Main Department of Statistics in Donetsk Region*

Since 2014, due to the start of hostilities on the territory of the region, the outflow of population is observed. In 2014, migration negative balance amounted to 10.7 thousand people, in 2015 – 9.2 thousand people, in 2016 – 3.6 thousand people. In 2017, the second wave of population outflow began. Total reduction of population due to migration in 2017 achieved 23.9 thousand people, and next year 2018, it amounted to 10.3 thousand people.

- *Labour market*

Characteristics of the workforce. Donetsk region traditionally was characterized with high quality and professional level of employees' potential: 72.5% of population in the region has a higher education, basic higher education and professional technical education (average index for Ukraine is 69%). But during the period 2013-2018 because of hostilities, economic downturn and enhanced emigration processes there is an exacerbation of a number of problems in the functioning of the local labour market.

In 2018, in the territory where Ukrainian public authorities exercise their power, total population in the age group 15-75 years, potentially suitable for employment, amounts to 1,483 thousand people, which, according to estimations equals 77.7% of the total number of populations, living in the above territory. At the same time, 58.1% of the population in this category are the economically active people, or actively search for job (average index in Ukraine is 62.6%). Highest economic activity is observed among the population of the age group 35-49 years – 82.0%; the lowest is among persons for people in age category 50-70 years (36.2%). Among young people aged 15-34 this index amounts to 61.8%. Economic activity of the male population is 76.2%, and female – 62.9%. Also, the difference is observed in the population activity at the labour market, depend on the level of education. Most active population are those having higher (75.9%) and basic (68.9%) higher education. The lowest index is between persons with initial general education, or uneducated (11.1%).

In years 2013-2018, there was a reduction in the employed population, rising unemployment, and an outflow of skilled workers. Thus, in 2018, compared to 2013, the number of employed populations decreased by more than 1.1 million people, or 62%; the unemployment rate increased by 6.2 (percentage points) and amounted to 14.4% (on average in Ukraine - 9.1%). At the same time, there are significant differences in the unemployment rate depending on gender: in 2018, the unemployment rate for women was 8.3%, for men - 18.9%. In the registered labour market in 2015, the number of unemployed was 2.5 times higher than the number of vacancies. In 2016-2018, there was a gradual stabilization. The number of vacancies in 2018 increased 1.5 times compared to 2015, the number of unemployed decreased by 40%. In 2018, with the increase in the number of vacancies, the existing disparities in the labour market intensified. Thus, the demand for skilled workers exceeded the local offer by 38%, workers for maintenance, operation and control of technological equipment - by 12%, for the simplest professions – by 24%. According to the survey of employers regarding their need for professional staff, there is a demand for working professions (drivers, painters, electric and gas welders, mechanics, repairmen, electricians, seamstresses, etc.) and specialists (accountants, doctors, engineers). This situation, in particular, is due to the fact that in recent years there has been an increase in the outflow of population and, first of all, of highly qualified personnel, including key areas of the budget sphere (medicine, education, etc.).

Table 10.b UA. Main indicators of the labour market

Category		Donetsk Region			
		2015	2016	2017	2018
years					
Employment rate (%) of the population⁴⁷					
<i>Employed population of working age, in % to the population of the corresponding age group</i>		59.0	58.5	58.2	59.5
Activity level (%) of working age population	Female	61.4	62.1	61.0	62.9
	Male	76.9	75.0	76.5	76.2
Average number of employees by economic activity (thousand persons)	Total by economy	756.3	748.4	734.3	741.0
	Agriculture	65.2	63.6	62.9	64.1
	Industry	247.0	232.9	200.9	191.9
	Construction	26.5	29.4	30.4	30.4
	Accommodation and food services	8.3	8.2	8.8	9.5
	ICT	10.9	9.9	9.0	9.0
	Professional, scientific and technical activity	13.2	12.8	12.2	13.8
Registered unemployed (thousand person)					
<i>Unemployed population aged 15-70 year old (by ILO methodology)</i>		121.4	122.9	125.3	120.4

⁴⁷ Percentage to economically active population aged 15-70 years

Category		Donetsk Region			
		2015	2016	2017	2018
years					
Unemployment rate (%) Percentage to economically active population aged 15-70 years	Total	14.2	14.6	15.1	14.4
	Female	9.0	11.3	7.4	8.3
	Male	19.37	16.6	20.6	18.9
Average unemployment benefit (euro)		58	60	84	82
Average duration of job search by the unemployed (according to the ILO methodology), months		7	8	8	8
Youth unemployment rate (%), aged below 35 years		16.2	36.9	33.5	33.0
Average nominal monthly net / or / gross wage (euro)	Total by economy	205.8	211.6	258.8	301.4
	Agriculture	135.5	133.5	171.1	203.3
	Industry	222.2	227.4	279.2	321.5
	Construction	140.4	149.8	211.3	262.4
	Accommodation and food services	114.3	114.8	150.0	149.1
	ICT	201.2	210.1	320.5	378.9
	Professional, scientific and technical activity	359.3	454.7	479.7	490.5

Source: Statistical Yearbook of Ukraine for 2018. State Statistics Service of Ukraine. Zhytomyr, 2019; Regions of Ukraine, 2016-2018 (statistical collection). State Statistics Service of Ukraine, Kyiv, 2017-2019; The main indicators of the labour market. Main Department of Statistics in Donetsk Region. Available at: <http://donetskstat.gov.ua/statinform1/robota1.php>.

▪ Revenues of the population

Living conditions. Until 2014, the income of the population of the region per capita significantly exceeded the figure over Ukraine. Wages were and remain the main source of income for the population of Donetsk region. Despite the difficult situation in Donbass due to the armed conflict, the region still ranks second in the country after Kyiv, in terms of wages, which in 2018 exceeded the average in Ukraine by 9.3%. By the level of average wages in January 2019, the highest paid among the main economic activities were employees of the metallurgical complex (423 €), enterprises for the production of coke and refinery (422 €), coal industry (393 €), public administration (358 €), enterprises for production and supply of electricity, gas, steam and air conditioning (353 €), trade (345 €).

The share of cash income in the total resources of households increased. At the same time, the share of wages remained almost at the level of 1999. The item of income from entrepreneurial activity and self-employment increased significantly from 3.0% in 1999 to 7.5% in 2018. Moreover, this indicator was much lower in 2013 (3.5%). On the one hand, this may mean the development of conditions that stimulate individual entrepreneurship, on the other - to indicate that due to self-employment, the working population of the region is trying to solve the problem of unemployment.

The region is characterized by a **high degree of wear of communal infrastructure and housing**. The main part of communally owned residential buildings has physical wear and tear from 41% to 80% and more (57.9% of the total area). About 80% of housing needs repair. As the region receives the largest number of internally displaced persons in Ukraine, the issue of providing the population (especially privileged categories) with housing is extremely important for the region.

▪ Health infrastructure, occupational diseases

The network of health care facilities of Donetsk region is represented by 135 health care facilities, which, in particular, include 33 primary health care centres, 46 hospitals, 2 psychiatric hospitals, regional trauma and children's hospitals, regional intensive care hospital, 2 perinatal centres, 8 dispensaries, 3 sanatoriums, a hospital for veterans of war, a centre for AIDS prevention and control, 2 blood transfusion stations, an emergency medical centre, etc.

The timeliness of medical care is negatively affected by the fact that all health care facilities of the third level of medical (highly specialized) care remained in the territory not under the control of the Ukrainian authorities. As a result, since the beginning of the armed conflict, more than 10,000 patients have been referred to multi-profile regional hospitals in Kyiv, Kharkiv, Dnipropetrovsk, and Zaporizhia regions.

- *Education*

With the onset of hostilities, many higher education institutions moved to new locations. For example, Vasyl Stus Donetsk National University currently accepts students in Vinnytsia (Vinnytsia Oblast), and a branch has been opened in Donetsk Oblast. In the 2018/2019 academic year, there were 27 higher education institutions in the Donetsk region, which accepted almost 33,000 students. It should be noted that over the past five years (since 2014) the number of institutions has increased by 11 units, which can be explained by their gradual relocation from the territory not controlled by the Ukrainian authorities. In general, as of 1 May 2019, 39.3 thousand students were studying in higher education institutions (in 2016, 14.6 thousand persons were enrolled in higher education institutions, in 2017 – 12.8 thousand persons, in 2018 – 12.1 thousand persons). The problems of functioning of the relocated institutions of higher education remain: lack of educational premises; significant loss of material and technical base, primary documentation, human resources and student contingent; lack of housing for scientific and scientific-pedagogical workers and students.

In comparison with other regions of Ukraine in terms of the number of technical vocational schools, Donetsk region ranks 2-nd together with Kharkiv region (45 institutions each) after Dnipropetrovsk and Lviv regions (58 institutions each); and by the number of students who study in them holds 8th place. Training of workers is carried out in 14 areas of economic activity, covering more than 110 working professions.

At the same time, even before 2014 in the Donetsk region there was a tendency of decreasing the potential of vocational education. Thus, per 10 thousand population, the total number of students and pupils and their ratio between levels of education (vocational (technical vocational) educational institutions: universities of III levels of accreditation: universities of III-IV levels of accreditation) were:

1995 - total number of pupils / students per 10 thousand person - 395 person; the ratio is 3.2: 3.2: 3.7;

2005 - total number of pupils / students per 10 thousand person - 585 person; the ratio is 1.5: 1.2: 7.3;

2013 - total number of pupils / students per 10 thousand person - 397 person; the ratio is 2.1: 2.2: 5.8.

Thus, the number of pupils and students per 10,000 of population decreased in peacetime in 2013 compared to 1995 and since 2005. The quantitative parameters of human capital reproduction are deteriorating. A significant contribution to the formation of this negative trend is the aging process and the growing migration of young people abroad to obtain a European education. There was a significant deformation of the structure of training towards the training of specialists with basic and complete higher education. While the real sector of the economy today needs the most skilled workers.

- *R&D*

The conduct of hostilities in the Donbas caused the loss of most of the scientific and innovative potential, which was concentrated mainly in the administrative centre - Donetsk. In total, in 2018, compared to 2013, the number of organizations engaged in research and development decreased by 46 units, or 3.7 times, and amounted to 17 organizations. This is 2 units more than in 2016 and 1 unit less than in 2017. The result was a reduction in the share of research institutions in the region in the total number of institutions in Ukraine as a whole (from 5.5% in 2013 to 1.8% in 2018). Compared to 2013, the number of employees involved in research work decreased by more than 42 times, or by 9.3 thousand people.

- *Culture: cultural infrastructure; sports infrastructure*

In 2018, 1 theatre, 16 museums, 430 libraries, 382 clubs, 49 schools of aesthetic education, 16 parks of culture and recreation, 11 film demonstrators operated on the territory of the region, controlled by the Ukrainian authorities. During 2015-2018, the network of museums was partially restored. However, the museum funds of the largest of them remained in the occupied city of Donetsk.

As a result of the loss of control by the Ukrainian authorities over part of the region, its infrastructural potential in the field of sports has significantly decreased: the total number of physical culture and sports facilities decreased by 2.6 times and amounted to 3118 objects (compared to 8115 objects in 2013). As a result of the implementation of a consistent policy of restoration and development of sports infrastructure in the region, starting from 2014, there is an annual increase in the total number of sports facilities. In general, during 2014-2018, their number increased by 12.4%.

10.1.2 Comparative analysis

After the collapse of the USSR, the workload of enterprises decreased, and, accordingly, decreased the electricity consumption. The main part of thermal power energy production is coming from the coal-fired power plants. Accordingly, coal production also began to decline. For some time, illiquid mines tried to be maintained operational and not to be closed. But after the adoption of the Resolution of the Cabinet of Ministers of Ukraine No. 280 in March 28, 1997 "On the course of structural restructuring of the coal industry" the program of closing unpromising mines and open casts mines came into force, which significantly affected the coal sector in Donetsk region.

Table 10.c UA. Main indicators for Donetsk region mining activity (except the area under occupation)

№	Indicators	Unit	Period	
			1997	2018
1.	Population of the region	th. person	2 365	1 909
2.	Employees in the coal sector	th. person	69.1	42.9
3.	Number of mines in operation	units	33	22
4.	Number of coal beds under development	units	124	79
5.	Amount of coal mined	Mt	28.3	11.1
6.	Investment in coal industry	million UAH	328	4 343 (21.3% investment to industry)
		million dollars	180	155
7.	Population below the poverty line	%	NA	31.7
8.	Level of unemployment	%	0	14.4
9.	Contribution to the local budget	%	NA	NA

10.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

10.2.1 National public policies

First National Ukrainian programme for coal industry, known under the short name "Coal", and enacted in 1994, had a positive restructuring component: the document foresaw commissioning 28 million tons of production assets at the new and refurbished mines, and shutting down 48 coal enterprises.

Though, closing of the mines within context of the "Coal" programme had evidently "a sanitary" character, i.e. those were the mines, as a rule, that depleted their stock (up to 3-4 years of operation), with production costs substantially exceeding the price of coal, and having complicated geological conditions. An average stock at the mines subject to shutdown amounted to 3.7 million tons as of 01.01.1993. And neither of the enterprises had a status of the city-forming.

Liberal economic rush, that was speeding up in the beginning of 1990ies caused coal industry enterprises to reject the support from the state, which put them on an edge of bankruptcy.

Thus, before the "Coal" programme managed to step into force in 1995, powerful sprouts appeared of the British made policy of mass shutdown of the mines. Formally this trend was legitimated by the Resolution of the Cabinet of Ministers of Ukraine No.280 dated 28 March 1997 "On the course of

structural rebuilding of the coal industry”, which contained programme of the shutdown for unpromising mines and open cuts. Albeit the Resolution stated same motives for mines shutdown as the “Coal” programme, there is a reason to argue that behind this stayed the incentive to get rid of small mines, so liquidation lists were compiled ignoring the state of industrial stock, specifically, brand composition, and social consequences, and mostly included mines with annual production capacity below 300 thousand tones. According to the programme, in total 81 coal enterprises had to be shut down, with total industrial coal supply above 1 billion tones. Required expenditures for the programme implementation amounted to about 2 billion UAH (approximately 800 million USD), which on yearly basis meant: in year 1996 – 41 enterprises (394 Mt of industrial coal supply, with spending on shutdown 625 million UAH, more than 300 thousand dollars); 1997 – 14 enterprises (233 Mt; 504 million UAH, 250 million dollars), 1998 – 9 enterprises (106 Mt; 224 million UAH , more than 100 million dollars), 1999 – 17 enterprises (124 Mt; 404 million UAH, 100 million dollars).

Large coal residual volumes were rarity for the mines scheduled to shutdown according to the “Coal” programme, but this became an ordinary fact for the objects that were subjected for liquidation according to the new programme.

Liquidation projects for mines appear to be quite expensive (with 0.95 probability 26±9 million dollars), while physical liquidation itself does not take first place in expenditures (about 14% to mitigate ecological consequences, 30% stand for social costs).

One cannot but mention the expensiveness of sustaining the mines in the process of their liquidation. As a rule, standard time for enterprise shutdown does not exceed 27 months, including social and environmental issues. Irrespective to reasons (financial or administrative), the delay in project deployment causes the rise of its cost estimates, sometimes, several times. In the times, when in Ukraine the shutdown of mine was a business exceptionally of the enterprise itself, – which was natural, – the works were done fast and in coordination. The picture has changed when for mass restructuring the special entity SE “Vuglebudrestrukturizatsia” was established in 1996, assigned for shutdown of the mines, and liquidators acquired their own interests in projects realisation, especially in timing of orders. Nobody expected that mines restructuring shall become such a long-term campaign. Ukraine provides an example of slow restructuring of mines, low efficiency of which hinders the wide-scale modernization of the industry in general.

Analysis of all governmental regulations on development and restructuring of the industry proves their mostly declarative character in defining priorities of industry reformation and mitigation of social problems. Neither state programme contains cost calculations associated with the series of social, environmental entries that accompany the restructuring process (creation of new jobs, professional training of the fired miners, putting the objects of social infrastructure on the balance of communities, overcoming the depression of the mining towns).

10.2.2 Regional and local policies

There is no regional or local policy at all. The “Strategy of Donetsk region development for the period until 2027”, elaborated in 2019, contains only general phrases on the need to promote the restructuring of human capital involved in coal industry and to ensure a fair transformation of coal industry and raising the efficiency of the control of energy resources.

This Strategy Project has it’s tasks: Reducing the disparities between supply and demand, Updating of the regional system of Professional education, Development of small and medium enterprises, as the driver of structural transformations. To meet these tasks, it is planned to

- strengthening communication between business and institutions of higher and professional education,
- introduce of professional training and improving skills of unemployed women and men, promoting the development of micro-business and self-employment initiatives,
- support of cooperation and creation of associations between industrial enterprises and establishments of Professional education that will prepare specialists for work at the enterprises,
- introduce of financial support Tools (direct or partial reimbursement of interest rates on loans) for the implementation of small and medium enterprises of investment projects that imply creation of new jobs and/or have an innovative component.

During entire previous period of reformation of the industry, a stepwise monopoly existed for a decision-making by the scheme: The Cabinet of Ministries – Ministry of Coal and Energy – Ukrvuhlerestrukturizatsia – its affiliates – Regional administration (in a minor scope).

10.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

10.3.1 Transition objectives. Key issues analysis

At present, in the region of Donetsk region, where coal industry enterprises are concentrated, there is an urgent need for transformation that can solve social issues and problems of retraining of labour resources. The rapid decline in coal production in the region, including the closure of mines, has led to depression of mining towns and villages. The existing experience of restructuring the coal industry, which began in the 90s of the last century, has shown low effectiveness of measures.

The main purpose of the transformation within TRACER is to find new approaches to the restructuring of the mine assets, the formation of social support policies and retraining of laid-off miners.

One of the main goals of the transformation of the TRACER target region may be the diversification of the main activity, i.e. coal mining. It is most likely that this will be done in the direction of converting mines into powerful electricity storage facilities, forming energy hubs in places of concentration of mines. Other possibilities for a real transformation of the old coal mining regions are unlikely to exist.

External factors:

- steep development of "green" (wind and solar) energy, which requires comparable in terms of electricity production storage facilities, which are suitable for coal mines. In Germany and Spain, projects are underway to build hydroelectric power plants on the basis of decommissioned mines;
- the possibility of creating international energy hubs to regulate resource flows in the integrated power system;
- sufficiently high level of engineering personnel and developed technological base of the domestic economy;
- availability of educational services, which provides opportunities for young people from mining regions to receive training that is not related to the mining industry (such as IT technologies, language learning, economic activity, etc.);
- existing foreign experience in the transformation of the economy in the mining regions.

Internal factors:

- sufficient coal reserves, good technical condition of some mines, for example, Pivdenodonbasska No.1 names after Surgaya, production of scarce coking coal at Pokrovsk, which is the newest and largest coal enterprise in Ukraine;
- a large number of deep mines, which promotes the development of efficient energy storage;
- qualified and disciplined personnel of coal enterprises;
- social circumstances that motivate local communities to be active in the structural transformations of the region;
- the difficulty of retraining staff, due to the specifics of mining;
- low mobility of the local population, as evidenced by the presence of several generations employed in the same enterprise living in the same village.

Table 10.d UA. SWOT analysis

Opportunities: energy diversification of mines activities	Threats lack of political will and lack of investment funds
Strengths understanding the possibility of preserving the centres of the coal industry in the market arena; preservation of jobs; material support for the existence of local communities	Weaknesses the need and at the same time the complexity of organizing powerful multinational consortia for investment, design, construction and operation of energy hubs in places of accumulation of deep coal mines; the need to retrain a sufficiently large part of the personnel of coal enterprises; cost of projects; dependence on institutional support from the European Union; shrinking cities-effects in mining regions.

10.3.2 The future workforce structure, in a holistic approach

Prospects for the development of old-industry mining regions in Ukraine should be defined as rather pessimistic, as evidenced by European experience, and American – even more. Depression in the mining towns of West Virginia with abandoned settlements, methane emanations, burning waste heaps, warns of the likelihood of man-made and social catastrophe. In addition, the most vulnerable are the Ukrainian regions where deep-loss state-owned mines are located, neither for development nor for the closure of which the state has funds. Without establishing powerful international consortia to convert mines into energy storage facilities, the development of mining regions is likely to follow the American scenario.

Already now, due to the crisis in the Ukrainian energy sector, the share of electricity generated at coal-fired power plants has decreased. This led to overproduction of coal and temporary shutdown of the most powerful coal mining enterprises in Donetsk and Dnipropetrovsk regions.

10.4 Conclusions

In recent years, social problems in the Donetsk region have grown significantly. This is due to the closure of coal mines and conduction of hostilities in this region. It raises the question of the existence of cities and towns that have been associated with coal mining. Therefore, it is necessary to develop detailed projects for the construction of large enterprises in such cities and reskilling of a large number of specialists, which will involve cooperation both public and private enterprises with the use of co-financing opportunities under European and world programs. At the same time, state programs for financing of mine closure processes do not work effectively.

The main producers of electricity in the region are coal-fired power plants, which use the local coal. The main mines that mined that type of coal remained on the occupied territories. Therefore, there are local shortages in electricity and heat supply. This requires considering the need of building new energy sources based-on renewable energy sources (such as biomass, solar energy, wind), which will also save jobs in the region and reduce the outflow of young people.

10.5 References and further links

Permanent population by age groups and gender by cities (city councils) and districts of Donetsk region – Vuhledar city, Dobropillia (city council), Myrnohrad (city council), Novohrodivka city, Pokrovsk (city council), Selidove (city council), Toretsk (city council) – by the end of year 2018

- [http://donetskstat.gov.ua/statinform1/demohrafichna-ta-sotsialna-statystyka/naselennia-ta-mihratsiia/chyselnist-postiynoho-naselennya-\(-za-otsinkoyu-\)-za-okremymy-vikovymy-hrupamy-ta-stattyu-po-mistakh-\(-miskradakh-\)-ta-rayonakh/](http://donetskstat.gov.ua/statinform1/demohrafichna-ta-sotsialna-statystyka/naselennia-ta-mihratsiia/chyselnist-postiynoho-naselennya-(-za-otsinkoyu-)-za-okremymy-vikovymy-hrupamy-ta-stattyu-po-mistakh-(-miskradakh-)-ta-rayonakh/)
- Revenues and spending of the population by regions of Ukraine (2002-2018). http://www.ukrstat.gov.ua/operativ/operativ2008/gdn/dvn_ric/dvn_ric_u/dn_reg2013_u.html.
- Average monthly nominal salary of full-time employees. Regions of Ukraine (statistical collection). State Statistics Service of Ukraine. 2018. Kyiv, P. 113.
- Development programme for the coal industry and social sphere of the mining regions for the period until 2005/ Adopted by the Resolution of the Cabinet of Ministers of Ukraine No.141 dated 2 March 1994.
- Amosha A.I., Cherevatsky D.Yu., Kuzmich O.Yu. Development strategies for coal mining in the Central Donbass region: monograph. – Donetsk: IEP NAS Ukraine, 2008.– P. 14.
- Cherevatsky D.Yu., Koshechkova I.M., Chelyakh D.D. Analysis of experience the mines shutdown in Ukraine, Miners Forum 2013: Int. Conf., Dnipropetrovsk, 2-5 October 2013 – Dnipropetrovsk: National mining university, 2013. – Vol. 1.– pp. 27-32
- Restructuring of coal industry of Ukraine: intentions, results, prospects // National security and defense. – 2003.– № 8.– pp. 3-37.
- Analytical note "On the assistance of coal industry modernization in the process of structural transformation of the old industrial regions". [Electronic resource]. – Access: <https://niss.gov.ua/doslidzhennya/regionalniy-rozvitok/schodo-spriyannya-modernizacii-vugilnoi-promislovosti-v-procesi>
- “Strategy of Donetsk region development for the period until 2027”.

11 United Kingdom, Wales

11.1 State of play of the social environment

11.1.1 Current status of the main social indicators

Table 11.a provides an overview of socio-economic data for the three NUTS 3 areas which comprise the ex-coal-mining region of the South Wales Valleys (UKL15-17), as well as the wider NUTS 2 region (West Wales and the Valleys, UKL1). These NUTS 2 and NUTS 3 areas in general show more negative socio-economic indicators than Wales as a whole – which in turn is below the UK average on certain indicators, such as GDP per capita.

Table 11.a UK. Key socio-economic indicators

Category	years	West Wales and the Valleys (UKL1)					Central Valleys (UKL15), Gwent Valleys (UKL16), and Bridgend & Neath Port Talbot (UKL17)				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Resident pop. (no.)		1,948,946	1,954,376	1,960,764	1,963,646	1,968,383	920,079	923,162	926,566	926,615	928,791
Age distribution (no.)	< 15y	322,242	323,251	324,725	325,519	325,864	157,940	158,632	159,590	160,092	160,384
	15-64y	1,219,049	1,217,289	1,216,367	1,211,240	1,210,098	587,110	586,659	586,512	582,909	582,385
	working age										
	> 65y	407,655	413,836	419,672	426,887	432,421	175,029	177,871	180,464	183,614	186,022
Net migration plus statistical adjustment		3.6%	4.1%	2.8%	4.3%	n/a	n/a	n/a	n/a	n/a	n/a
Life expectancy at 65 (year)	female	20.2	20.4	20.6	20.4	n/a	n/a	n/a	n/a	n/a	n/a
	male	18.1	18.2	18.2	18.2	n/a	n/a	n/a	n/a	n/a	n/a

Source: Eurostat data on population (demo_r_pjangrp3), net migration (TGS00099) and life expectancy (demo_r_mlifexp)

Employment rates in the Valleys area have increased since 2005, so that the difference between the Valleys and Wales as a whole is now modest.⁴⁸ Employment rates among women, and part-time working, have also risen. These changes have been driven by a number of factors, including increased daily commuting to jobs outside the region, notably to cities and towns to the south of the Valleys (including the main cities of Cardiff, Newport and Swansea). Employment rate statistics are summarised in **Table 11.b**.

Higher employment rates also reflect a fall in inactivity rates, which had risen significantly following the closure of collieries in the 1980s-90s (see Section 11.1.2). Inactivity rates (excluding students) in the 7 Valleys local authority areas fell from a range of 25.7%-32.9% in 2005 (Wales: 24.5% and UK: 20.9) to 20.5%-23.7% in 2019 (Wales: 19.7% and UK: 17.4%).⁴⁹

Nevertheless, a higher percentage of the Valleys' population is on income-related benefits (19-25% in 2015) and on employment related benefits (16-22% in 2015) than in Wales as a whole (18% and 14%). This discrepancy also holds for data relating to the working-age population i.e. c. 54% of the Valleys population lives in areas where there are more than 175 benefit claimants per 1,000 of working age population (compared to the Wales average of 33%).

The gap between the Valleys and the Welsh average in terms of Gross Domestic Household Income (GDHI) per capita has narrowed since 2005,⁵⁰ although the overall Welsh level remains below the UK level. On key income/poverty indicators, however, the Valleys continues to underperform the Welsh average. In particular, wage levels have deteriorated since 2005, relative to the Welsh average.

⁴⁸ Valleys Taskforce (2018) *Our Valleys, Our Future: Evidence Paper*. <https://gov.wales/sites/default/files/publications/2018-05/valleys-taskforce-summary-of-evidence.pdf>

⁴⁹ Statistics Wales, Labour Force Survey, updated 22 January 2020

⁵⁰ Valleys Taskforce (2018) *op. cit.*

Average median gross weekly earnings ranged from £275-£333 in 1997 (Wales: £301) to £468-£613 in 2019 (Wales: £535). Similarly, child poverty rates are higher in the Valleys, as indicated by a higher percentage of school pupils who are eligible for free school meals in the Valleys than in Wales as a whole.

Table 11.b UK. Labour market statistics

Category		West Wales and the Valleys (UKL1)				Central Valleys (UKL15), Gwent Valleys (UKL16), and Bridgend & Neath Port Talbot (UKL17)			
		2015	2016	2017	2018	2015	2016	2017	2018
years									
Employment rate (%) of population 20-64		73.4	75.9	75.0	75.7	68.5	69.4	70.4	70.8
Activity rate (%) of population 15-64	female	70.3	71.3	71.0	71.5	64.5	65.9	66.4	66.4
	male	78.3	79.6	78.8	81.1	72.5	73	74.5	75.4
Activity rate (%)	15-24	58.3	57.7	58.3	61.7	64.6	63.5	64.3	66.5
	25-64	78.1	79.8	78.6	79.6	n/a	n/a	n/a	n/a
	55-64	57.7	62.5	61.9	65.0	n/a	n/a	n/a	n/a
Average number of employees by economic activities (thousands)	Total economy	642	641	659	n/a	236	235	238	n/a
	Agriculture	14	15	16	n/a	1	1	1	n/a
	Industry	83	79	78	n/a	48	49	46	n/a
	Hard coal and lignite mining	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Electricity, Gas and HAC	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Construction	34	35	35	n/a	12	12	12	n/a
	Wholesale & retail trade, transport, accommodation and food services	178	181	180	n/a	59	58	58	n/a
	ICT	10	12	17	n/a	4	6	7	n/a
Professional, Scientific & Technical activities; administrative & support services	55	52	52	n/a	23	21	20	n/a	
Gender employment gap (%; 20-64 years)		7.7	8.5	8.4	9.9	n/a	n/a	n/a	n/a
Registered unemployed aged 20-64 per 1000 total population		25.0	19.5	18.0	18.6	n/a	n/a	n/a	n/a
Unemployment rate (%) aged 20-64	female	4.9	3.8	4.0	3.6	6.8	5.8	5.4	5.3
	male	6.4	4.9	4.3	4.8	7.6	6.15	5.9	5.7
Long term unemployment rate (%)	Total	2.3	1.4	1.2	1.7	n/a	n/a	n/a	n/a
Youth unemployment rate (%) 15-24		21.0	12.8	12.7	12.3	21.6	17.6	17	18.5
Median gross monthly pay, all Wales, converted from Sterling to Euro at a rate of €1 = £0.89453 (ECB rate at 31.12.2018)	Total economy	1,917	1,956	2,003	2,059	n/a	n/a	n/a	n/a

Source: (1) Eurostat data on employment by gender (*lfst_r_lfe2emprt*), activity rates by gender and by age (*lfst_r_lfp2actrtj*), employees by sector (*nama_10r_3empers*), unemployment rates by gender and age (*lfst_r_lfu3rtj*), number of unemployed per 1000 population (calculated by author based on *lfst_r_lfu3pers* and *demo_r_pjangrp3*); (2) UK Government data on median gross monthly pay (Annual Survey of Hours and Earnings, downloaded 11 February 2020). (3) Stats Wales data on employment and activity rates at the regional level (<https://statswales.gov.wales/Catalogue>).

Life expectancy (and healthy life expectancy) of both males and females is lower in the Valleys than in Wales as a whole. Life expectancy for men in the Valleys was 76.0-77.9 years in 2010-14 (Wales: 78.3 years), while healthy life expectancy was 59.6-63.4 years (Wales: 65.3). For women, life expectancy was 80.2-82.0 years in 2010-14 (Wales: 82.3 years), while healthy life expectancy was 59.3-63.4 years (Wales: 64.4).

The Valleys is also below the Welsh average on a number of health indicators. Around 44% of the Valleys population lives in areas where the low-weight birth rate is higher than 6 per 1,000 live births (Wales: 35%). Adults in the Valleys report less healthy lifestyles compared to Wales as a whole (e.g. higher smoking rates, and a higher percentage of the adult population which is overweight or obese).

Although skills levels have improved since the mid-2000s, educational attainment remains lower in the Valleys than in Wales as a whole. Around 64% of the Valleys population lives in areas where more than 29 per cent of adults have no qualifications (Wales: 35%). A lower percentage of 18-19-year olds enters higher education in the Valleys' local authority areas (19-31% in 2015) than in Wales as a whole (32% in 2015). Similarly, 21-28 % (2015) of 16-24 years olds in the Valleys are Not in Education, Employment or Training (NEETS) compared 19% in Wales.

Research and innovation activities in south Wales are mainly located in and around the main cities of Cardiff, Swansea and Newport, both in the university sector and in the business sector. There are a number of universities in the wider south Wales region but most of these are located outside the Valleys. However, the University of South Wales has a number of campuses, including one in the Valleys (Pontypridd) and also works in partnership with Further Education Colleges to provide access to higher education in the Valleys.

11.1.2 Comparative analysis

Industrial-scale coal-mining in South Wales began with the Industrial Revolution in the 18th Century, and soared in the 19th Century, with employment peaking at 290,000 in 1918, and production peaking at 60 million tonnes in 1913. The coal industry underwent depression and contraction in the 1930s, leading to a rise in poverty and unemployment. The coal industry was taken into State ownership ("nationalised") from 1947, with the aim of stabilising employment and ensuring investment. However, the coal sector contracted further in the 1960s, before recovering somewhat following the 1973 oil crisis. The UK government decided to cut the coal industry further in the 1980s, as part of a broader shift away from nationalised industries and steps to reduce the power of trade unions. The bitter year-long coal strike of 1984-85 failed to stop the colliery closures and led to significant social upheaval and divisions, as well as economic hardship in the affected communities.

In the late 1980s and 1990s, "the main labour market response to coal job losses was not an increase in recorded unemployment but rather a surge in the number of men who withdrew from the labour market into 'economic inactivity', mainly on incapacity benefits. Initially, many of the additional incapacity claimants were ex-miners but through competition for jobs the claims spread more widely as worklessness often came to rest with the less healthy in the workforce."⁵¹

The last State-owned colliery in Wales closed in 1994 but a small number of privately-owned deep or surface mines have operated since then. In 2020, the only licensed deep-mine that produces coal is East Pit (Amman Valley), while Ffos y Fran (Merthyr Tydfil) and Nant Helen (Ystradgynlais) are the only active opencast mines. A small number of other licensed sites are on a 'care and maintenance' regime.

The impact of the colliery closures in the 1980s-90s continues to be seen today in the ex-mining Valleys region of South Wales e.g. in terms of below-UK-average activity rates, higher dependence on welfare benefits, lower skills levels, poorer health, shorter life expectancy, and other measures of economic and social deprivation.

⁵¹ Beatty, C, Fothergill S and Gore T (2019) State of the Coalfields Report. Economic Conditions in the Former Coalfields of England, Scotland and Wales. Report to the Coalfields Regeneration Trust.

Table 11.c UK. Coal employment and production in the South Wales Valleys Coalfield

	Employment	Number of collieries	Coal production (million tonnes)
1913	232,800	2000	57
1918	290,000	n/a	n/a
1947	144,930	214	n/a
1970	38,000	52	n/a
1980	25,328	35	n/a
1990	1200	3	n/a
2018	90 (deep mines) 280 (opencast) 350 (total)	n/a	0.01 (deep mines) 1.0 (opencast) 1.0 (total)

Source: L. Radulov et al. (2019) Report on the current role of coal mining and related policies in the TRACER target regions, TRACER Deliverable D3.1. Also: Welsh Government (2016) Fifty Years of Regeneration in the Valleys – What can we learn? pp.19-22, <https://gov.wales/sites/default/files/publications/2019-08/fifty-years-of-regeneration-in-the-valleys-what-can-we-learn.pdf>

11.2 Public policies and legislation in the labour, social protection and education (re-skilling) fields

11.2.1 National public policies

Institutional structure of national policies related to labour, social protection and education

Responsibility for public policies related to labour, social protection and education is divided between a) the UK Government and Parliament and b) the Welsh Government and National Assembly for Wales:

- The UK level (Department for Work and Pensions, DWP) is responsible for employment policy, social security schemes, child support, pensions and industrial relations.
- The Welsh Government is responsible for education, training and skills, as well as social welfare, and economic development.

Welsh Government is the main body involved in developing, implementing and monitoring skills-related policies in Wales, working with UK Government (DWP), the local authorities, further and higher education sectors, work-based learning providers, third sector, private sector and delivery partners. EU funding through the European Social Fund has been an important source of funding for skills and training activity.

Welsh Government's main policy documents related to employment and skills

The current **programme for Government in Wales - Taking Wales Forward**⁵² - makes commitments related to employment and training including reshaping employability support for job-ready individuals and those furthest from the labour market to acquire the skills and experience to gain and maintain sustainable employment, and creating employment and training hubs in areas of high economic deprivation.

Delivery of these commitments is expanded upon in '**Prosperity for All: The National Strategy**'⁵³, which describes skills and employability as one of five priority areas where early intervention is seen as crucial. The other, related, areas are early years, housing, social care and mental health. Welsh Government's **Economic Action Plan**⁵⁴ sets out the approach to be taken, which includes a move away from a focus on individual sectors towards a focus on the foundational economy (care, tourism, food and retail) and developing stronger regional partnerships.

⁵² <https://gov.wales/sites/default/files/publications/2017-08/taking-wales-forward.pdf>

⁵³ <https://gov.wales/sites/default/files/publications/2017-10/prosperity-for-all-the-national-strategy.pdf>

⁵⁴ <https://gov.wales/sites/default/files/publications/2019-02/prosperity-for-all-economic-action-plan.pdf>

Underpinning this approach is the **2015 Well-being of Future Generations Act**⁵⁵ which requires public bodies in Wales to consider the long-term impact of their decisions, to work better with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change. The long-term vision is an economy founded on high quality skills. Low skill levels are identified as the single biggest barrier to building the Welsh economy, and often the biggest barrier for individuals to gain meaningful work.

The Prosperity for All strategy proposes the development of a **new Employability Plan for Wales**, responding to the different skills needs of each part of Wales. In this context, priorities include ensuring people are equipped to deal with the changes brought by the advent of the fourth industrial revolution, with a focus on digital skills, higher skills training and lifelong learning. Government plans include: working with Regional Skills Partnerships to anticipate future skills needs, focusing on priority growth sectors identified within regions and aligning programmes to those needs; delivering 100,000 all-age apprenticeships aligned to economic requirements and using them to raise overall levels of skills in the workplace; and reviewing all existing skills and work-based learning programmes to ensure they meet the current needs of the economy and can respond flexibly to emerging requirements. The strategy also states that the Welsh Valleys will be used as a test bed for a place-based approach to enhancing employability. The Employability Plan was published in 2018,⁵⁶ and announced a new employability programme, Working Wales⁵⁷, to consolidate existing programmes and deliver a new joined-up approach to employability and skills support.

Alongside these policy documents, in recent years there have been **major reviews of the skills system** including apprenticeships and governance in the further and higher education sectors. For instance, a strategy on **apprenticeships** was published in 2017 covering a five-year period.⁵⁸ Welsh Government priorities include: investing in higher level skills particularly in STEM and technical areas; driving inclusivity, equality and equity of opportunity; responding to current and projected skills gaps; and delivering apprenticeships through the medium of Welsh and/or bilingually. It is notable that investment in apprenticeships and training facilities has in the past complemented investment in R&I (e.g. at the SPECIFIC renewable energy facility in Neath).⁵⁹ While the apprenticeship strategy does not focus on particular places within Wales, the work is due to start in the **Valleys Taskforce** area.

In terms of the **transition to a low carbon economy**, Wales' Employability Plan states that Welsh Government will try to maximise employment opportunities arising as a result of climate change prevention and mitigation, both in terms of high skills and as an entry point into the jobs market. Specific examples provided in the Plan include working with housing insulation programmes to encourage local employment, and initiating an employment programme planting trees for people with mental health issues. In terms of higher skills, it is worth noting that there has been strong growth in research in renewable energies within Welsh universities.⁶⁰ Related, Low Carbon and Energy & Environment are two of the 'Grand Challenge' areas prioritised for support under the Welsh Government's **Sêr Cymru programme**, which supports research fellowships with the aim of increasing research capacity in Wales.⁶¹

Policies related to transition out of coal

The responsibility for coal and energy policy are divided between the UK Government and Welsh Government. Energy policy, including electricity, oil and gas, coal, nuclear energy, heat and cooling, and energy conservation, and nationally significant energy infrastructure are largely reserved to the UK Government, but the Welsh Government has powers in relation to specific policy dimensions related to transport, energy and the natural environment.

⁵⁵ <https://futuregenerations.wales/about-us/future-generations-act/>

⁵⁶ <https://gov.wales/employability-plan>

⁵⁷ <https://workingwales.gov.wales/>

⁵⁸ <https://gov.wales/sites/default/files/publications/2018-03/aligning-the-apprenticeship-model-to-the-needs-of-the-welsh-economy.pdf>

⁵⁹ <https://gov.wales/employability-plan> p28.

⁶⁰ Welsh Government (2017) Public Good and a Prosperous Wales – Building a reformed PCET System, Welsh Government Consultation Document.

⁶¹ https://www.hefcw.ac.uk/policy_areas/research/research_initiatives.aspx

For example, the 2017 Wales Act states that any licence that authorises coal-related operations in Wales require approval of the Welsh Ministers. This applies to operations under new licenses and under variations to existing licences, thus slightly increasing the influence of the devolved government over emission levels from the power sector for developments with a smaller capacity. In this context, the Welsh Government is currently in the process of finalising a **new coal policy** on the exercise of the Wales Act and the transition out of coal (June 2020)⁶². The responses forthcoming from the consultation will inform Welsh Minister's decisions in relation to applications.

In June 2019, the Ministry of Environment, Energy and Rural Affairs set out Welsh Government's ambition to bring forward a target for Wales to achieve **net-zero emissions** by no later than 2050. This builds on the UK Committee on Climate Change report, which recommends a 95% reduction in Welsh 1990 emissions by 2050. The specific decarbonisation measures are summarised in the leading policy document *Prosperity for All: A Low Carbon Wales. Wales' commitment to tackling climate change*. This commitment is based on the projected negative climate change effects for Wales, but is also motivated by economic and equality-related reasons in line with the 2015 Future Generations Act (see above). It identifies pathways for each high-emission sector, including power generation, transport, industry and agriculture.

These measures follow on from previous ministerial announcements that set a 70% renewable electricity target for Wales by 2030, a commitment which is recognised through the Welsh Planning Policy. The 20-year **National Development Framework** (2020-2040) will reflect the changes that will be required across Wales to mitigate climate change, with one of the national priorities being decarbonisation of its energy production. The decisions made in recent years, as well as the chosen decarbonisation trajectory have initiated a process of large-scale changes to energy generation technologies used, in particular solar and on- and off-shore wind power.

The UK government is committed to **phasing out unabated coal-fired power generation** by October 2024. In 2018, the Department for Business, Energy & Industrial Strategy (BEIS) increased the emission limits of CO₂ for electricity production to such a level (450g / kWh) that it obliges polluting power plants to cede production.⁶³ The policy identifies South Wales as one of two areas that will be affected most by this decision. BEIS intends to accompany this shift with supporting an economy that delivers skilled, well-paid jobs and creates the conditions for competitive businesses, as stated in the Clean Growth Strategy.⁶⁴ The losses in activity associated with the closure of unabated coal generators will be compensated by increased activity in new, clean generation, smart energy and related technologies. In February 2020, the deadline for ending unabated coal was brought forward from 2025 to 2024.⁶⁵

11.2.2 Regional and local policies

There is a long history of public policies to support transition out of coal in the Valleys, with the earliest government interventions dating back to the 1930s, in response to high unemployment and poverty as demand for British coal and other industrial products fell. South Wales was among the areas identified as a 'Special Area' in 1934 which led e.g. to the creation of a trading estate in Treforest (Pontypridd) and funding to attract business investment.⁶⁶ There was significant public investment in land reclamation and stabilisation in Wales from the mid-1960s, particularly following the Aberfan disaster of 1966, when a colliery spoil tip collapsed into homes and a school, killing 116 children and 28 adults.

When the Welsh Development Agency was set up in 1976, it was tasked not only with promoting foreign direct investment and support for local businesses, but also with the reclamation and regeneration of ex-industrial land. The closure of almost all remaining collieries after the 1984-85

⁶² <https://gov.wales/coal-policy-wales>

⁶³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/672137/Government_Response_to_unabated_coal_consultation_and_statement_of_policy.pdf.

⁶⁴ <https://www.gov.uk/government/publications/clean-growth-strategy> (October 2017).

⁶⁵ <https://www.gov.uk/government/news/end-of-coal-power-to-be-brought-forward-in-drive-towards-net-zero>.

⁶⁶ D. Gareth Evans (2000) *A History of Wales 1906-2000*. Cardiff: University of Wales Press.

miners' strike was accompanied by public funding for the re-training and self-employment of miners, as well as support for business innovation and skills.

Since the creation of an elected Welsh Assembly and Government in 1999, the Valleys have been an ongoing focus of policy attention, in terms of investment in infrastructure (including improvements to key road links across the Heads of the Valleys), as well as skills, innovation and business support. The Valleys have received significant funding from EU Cohesion policy, for infrastructure, skills development and business investment and innovation, with Objective 2 funding in 1994-99 and Less Developed (or equivalent) status since 2000.

The following sub-sections outline Welsh Government policies related to: (a) skills development in general (the Regional Skills Partnerships) and specifically in relation to the transition to low carbon activities; and (b) a key initiative for the former coal-mining region in Wales (the Valleys Taskforce).

Regional Skills Partnerships

Welsh Government provides the national framework for employability under which regional and local activity takes place. Wales' three Regional Skills Partnerships are voluntary bodies tasked by Welsh Government since 2014 with analysing economic challenges and likely growth areas to identify the skills needed in the workforce.⁶⁷ Each RSP is structured differently, reflecting existing regional arrangements.⁶⁸ All are chaired by private sector employers and are constituted as unincorporated partnerships. The accountable body within the partnerships varies. Members include local employers, local councils, employers' organisations, public sector bodies, higher and further education, and the third sector, with Welsh Government attending meetings as an observer.

With annual funding from Welsh Government, the RSPs engage with regional employers and collect labour market information. They produce Regional Employment and Skills Plans to advise Welsh Government and influence the provision of skills based on regional economic need. The plans build on existing regional development initiatives such as Enterprise Zones, City Deals, Growth Deals and cross border collaborations. The plans are refreshed every three years and provide recommendations to Welsh Government to influence the prioritisation and deployment of skills funding including Apprenticeship and Further Education allocations, as well as recommended adjustments to apprenticeship numbers.

The three Regional Skills Partnerships are coterminous with Welsh Government's more recent regional geography, as set out in the Economic Action Plan. The RSPs are:

- North Wales Regional Skills Partnership;
- South East Wales Cardiff Capital Region Skills Partnership; and
- South West and Mid Wales Regional Learning and Skills Partnership.

While the Regional Skills Partnerships focus across all sectors, one particular area of concern is the transition to a low carbon economy and society. According to Welsh Government's plan for cutting emissions and supporting the growth of a low carbon economy - **Low Carbon Wales**,⁶⁹ the Welsh Government plans to work closely with the RSPs to identify low carbon-related skills needs at a regional level working with employers. Annual Reports outlining this information will be prepared for Welsh Government and used to inform the deployment of skills funding, via a new strategic planning system for post-16 education. Low Carbon Wales also notes that there is an opportunity for the RSPs to identify regional priorities around the decarbonisation agenda.

Valleys Taskforce

A ministerial taskforce was set up in 2016 to improve prosperity in the South Wales Valleys.⁷⁰ The approach is characterised by extensive and ongoing community and citizen engagement, underpinning identified action plan priorities. Relating to skills and employment, the vision for 2021 is

⁶⁷ <https://businesswales.gov.wales/skillsgateway/skills-development/regional-skills-partnerships>

⁶⁸ SQW (2019) Independent Review of Regional Skills Partnerships' Evidence-Based Planning. Report to Welsh Government, May 2019.

⁶⁹ https://gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf

⁷⁰ <https://gov.wales/sites/default/files/publications/2019-11/delivery-plan-2019-2021.pdf>

to close the current employment gap between the Valleys and the rest of Wales, and to ensure employment levels in the South Wales Valleys are the same as the Welsh average.

This will imply assisting around 7,000 unemployed or economically-inactive people living in the Valleys into work (at the current level). Key achievements in 2018-19 included:

- £1.5 million allocated to Valleys-based Foundational Economy projects
- 125 business support workshops held across the Valleys
- 809 people provided with one-to-one support or through workshops
- 1,391 unemployed people receiving employability support.

Seven Strategic Hubs will act as a focus for job creation. In addition, public sector jobs will be relocated to the Valleys to help support the local economy and provide a basis to develop job opportunities locally. The foundational economy will be supported, including through the Foundational Economy Challenge Fund.⁷¹ The creation of local jobs will be supported through the roll out in the Valleys of TUC Wales' **Better Jobs Closer to Home** campaign, specifically through the launch of four commercial pilots to test the use of procurement levers to intervene where local supply chains can create jobs.⁷² A range of entrepreneurship and business support activities will also be established/strengthened.

11.3 Transition objectives in terms of social and re-skilling issues. Impact of internal and external factor

11.3.1 Transition objectives. Key issues analysis

Macro objectives

Despite improvements in some socio-economic variables in recent decades, the Valleys still underperforms the Wales (and especially UK) average on indicators relating to quality of life, household disposable income, and quality of employment opportunity (see Section 1). This picture is affirmed by a consultation with local people which was carried out by the Valleys Task Force in 2017,⁷³ which highlighted:

- The lack of local job opportunities, especially jobs with prospects for progression to higher skill and wage levels;
- The prevalence of precarious jobs (zero-hour contracts, temporary and agency work);
- The need for policy to support people to get into employment;
- The need for further guidance and support for local businesses;
- Transport challenges in accessing employment.

This section identifies a number of core objectives, drawing on Welsh Government⁷⁴ (including Valleys Taskforce⁷⁵) strategic documents, as well as other studies⁷⁶ and Section 1 of this report.

⁷¹ <https://businesswales.gov.wales/foundational-economy>

⁷² <https://www.tuc.org.uk/news/wales-tuc-valleys-communities-need-better-jobs-closer-home>

⁷³ Arad Research (2017) *Talk Valleys: Engagement Programme*. Final Report to Welsh Government.

⁷⁴ Welsh Government (2016) *Taking Wales Forward 2016-2021*. Cardiff

Welsh Government (2017a) *Prosperity for All: Economic Action Plan*.

Welsh Government (2017b) *Public Good and a Prosperous Wales – Building a reformed Post Compulsory Education and Training system*. Consultation Document WG31891.

Welsh Government (2018a) *Rural Education Action Plan*. Cardiff.

Welsh Government (2018b) *Employability Plan*. Cardiff.

Welsh Government (2019) *Investing in an excellent workforce*. Cardiff.

⁷⁵ Arad Research (2017) *op. cit.*

Welsh Government (2017) *Our Valleys, Our Future: Evidence Paper*. Cardiff: Ministerial Taskforce for the Valleys.

⁷⁶ Fawcett J and Gunson R (2019) *A 21st Century Skills System for Wales: Challenges and Opportunities*. Edinburgh: IPPR.

Objective 1: Ensure long-term funding for economic development and workforce skills in the Valleys, following the termination of EU Cohesion policy funding after the UK leaves the EU

- The UK Government could support this goal by meeting its commitment to providing funding equivalent to existing Cohesion policy receipts to structurally weaker regions, e.g. via the Shared Prosperity Fund and other UK-wide instruments, while the Welsh Government could ensure that sufficient resources are allocated to structurally weaker areas of Wales, including the Valleys.

Objective 2: Improve conditions for business creation and investment in the Valleys, with a view to increasing local job opportunities (especially more secure and higher waged jobs) e.g. by:

- Continuing to invest in core infrastructure, including major transport connections, notably upgrading the Heads of the Valleys road linking the north end of the Valleys with the English Midlands (and so increasing potential for supplier firms to locate in the northern Valleys), as well as upgrading the regional public transport network (via the South Wales Metro macro-project), and investing in community transport pilot projects, to facilitate shorter-distance commuting.
- Continuing to provide a range of types of public funding for business creation, investment and innovation (delivered Wales-wide via the Development Bank for Wales), and considering whether there is a need for targeted forms of business support for the Valleys and other structurally weaker areas, including in the field of low carbon and sustainable energy.
- Working with the Regional Skills Partnerships to target investment in education and training, including workforce skills, in order to ensure the local availability of skills needed by potential business investors.

Objective 3: Explore potential to enable the Valleys to benefit further from public sector employment and public contracts, as well as the foundational economy, in order to increase (especially more secure and highly waged) employment, e.g. by:

- Investigating possibilities to relocate existing public sector jobs to the Valleys and/or introducing laws/rules to ensure that any new public sector jobs are located in structurally weaker areas.
- Monitoring (and potentially mainstreaming) the Better Jobs Closer to Home pilot initiative, (see Section 11.2.2) which aims to develop and implement ways of using public procurement to maximise benefits for local communities, specifically in low carbon and sustainable energy fields.
- Piloting (and, where appropriate, mainstreaming) support for the foundational economy (e.g. via the Foundational Economy Challenge Fund, see Section 11.2.2) and social enterprise, including in the field of low carbon and sustainable energy.

Objective 4: Increase education and skills levels e.g. by:

- Continuing to invest in improvements in educational outcomes, particularly increases in the percentage of young people going to higher education, and reductions in the number of young people who are Not in Education, Employment or Training (NEET).
- Working with universities and their umbrella bodies to identify action needed on education, training, skills and apprenticeships in the Valleys, including further possibilities to expand higher education provision in the Valleys e.g. by building on existing cooperation between the University of South Wales and Further Education Colleges.
- Targeting areas that are at risk of lower educational quality and school closure, such as rural areas. Plans and investments focus on strengthening organisational structures, equity and excellence, and supporting the community and educational functions of schools.

Objective 5: Support research and innovation in the Valleys e.g. by:

- Ensuring that public funding and guidance for innovation is marketed and delivered effectively to businesses in the Valleys.
- Assessing potential for publicly funded research capacities and projects in the Valleys.

Objective 6: Reduce barriers to employment e.g. by:

- Investing in childcare and social care in order to enable people with caring responsibilities to enter paid employment.
- Make paid employment more attractive e.g. by the recommendations of the 2018 Fair Work Board and 2019 Fair Work Commission.⁷⁷

Key internal and external factors for a successful transition

Key internal and external factors to be taken into account in the Valleys include:

- Low GDP per capita and, especially, low productivity levels (both in the Valleys and in Wales as a whole), compared to the UK and EU averages.
- Topographical challenges which make transport and interconnection difficult, e.g. for business input-output linkages and labour markets.
- Environmental and soil damage in former mining and other industrial areas, which limits new developments such as housing and renewable energy infrastructure.
- Demographic changes and population ageing i.e. the number of people aged 16-64 is projected to decrease by 4.2 percent between 2016-2041, while the number of people aged 65 and over is projected to increase by 36.6 percent.⁷⁸
- Welsh Government's institutional shift since 2019, of dividing Wales into regions, with the Valleys being divided between the South East and South West regions, along with the relevant coastal areas in the south-east and south-west. The identification of priorities for economic development, along with skills provision, will increasingly take place at the regional level.
- Division of the Valleys into seven local authority areas, which vary in terms of economic potential and socio-economic linkages.
- Economic uncertainties caused by Brexit, notably in relation to future trading relationships with the EU and the rest of the world, and the implications for different business sectors and individual businesses.
- The loss of long-term funding, earmarked for economic development in the Valleys, via EU Cohesion policy, due to Brexit, and uncertainties around the timing, amount, governance and priorities of replacement funding from the UK Government and Welsh Government. The European Social Fund has provided important funding for training and skills-related activity, while the European Regional Development Fund has allocated complementary funding for business investment, innovation and infrastructure.
- Uncertainty around the future division of competences between the UK and Welsh Governments under the devolution settlement. Similarly, policy decisions at UK level can impact on employers/employees in Wales. E.g., in 2017, UK Government introduced a UK-wide apprenticeship tax on large employers (those with a 'pay bill' of more than £3 million), to be collected across the UK through the tax system and funding vouchers for apprenticeships. At the same time, Welsh Government delivers a separate Apprenticeship Programme. The introduction of the UK tax had particular implications for employers with a cross-border workforce because Welsh Government funding and priorities apply where an apprentice works in Wales for 51 percent or more of their time.⁷⁹
- Recent and ongoing Welsh Government reviews of skills, apprenticeships and education policies may take time to embed but also provide an opportunity for policy-makers to adapt to labour market changes, as well as an opportunity to continue strengthening the engagement of employers and workers in upskilling. The further education college sector in particular has been strengthened by mergers within the last decade. In addition, the 2016 review of higher education funding and student finance arrangements in Wales (the Diamond Review) aimed to widen access to higher education, support labour market demand for skill, strengthen

⁷⁷ <https://gov.wales/sites/default/files/publications/2019-05/fair-work-wales.pdf>.

⁷⁸ Universities Wales (2019) op. cit.

⁷⁹ <https://businesswales.gov.wales/skillsgateway/skills-and-training-programmes/apprenticeships/apprenticeship-levy>

provision of part-time and postgraduate higher education, and improve the long-term financial sustainability of higher education in Wales.⁸⁰

- Welsh Government's Well-being of Future Generations Act,⁸¹ which sets a legal obligation on all public bodies in Wales to consider the long-term impact of their decisions, and aims to prevent persistent problems such as poverty, health inequalities and climate change.
- Macro strategic challenges and their implications in terms of skills shortages/mismatches and working practices e.g. the Covid-19 pandemic, climate change and decarbonisation; automation, artificial intelligence and digitalisation. E.g. a fifth of the Welsh workforce is in manufacturing, transport and storage, and public administration, which are seen to be at greatest risk from negative impacts from automation and artificial intelligence.⁸²

Key issues in relation to the social and workforce (re-skilling) fields

Arising from these internal and external factors, the key relevant issues in relation to the social and workforce (re-skilling) fields include:

- Shifts to more diverse and higher skilled patterns of labour market activity in the Valleys will depend on effective policy intervention to address structural factors relating to the socio-economic context, transport networks (linked to the topographical situation), and macro strategic challenges.
- The uncertain context for business activity and investment due to the impact of the Covid-19 pandemic, as well as Brexit, imply a need for local monitoring (e.g. by the Regional Skills Partnerships) and flexible responses to shifts in job losses and growth, and in the types of skills demanded on the labour market.
- Investment in economic development and workforce re-skilling after 2020 will depend on steps by UK and Welsh Governments to compensate for the loss of EU Cohesion policy funding for the Valleys, but there is currently no certainty about such funding.
- Welsh Government reviews of skills, apprenticeships and education policies need to be responsive to changing skills and labour market needs in the Valleys, including in the renewable energies sector.
- The energy transition is likely to reduce further the demand for lower skilled jobs and increase demand for more highly skilled labour related to renewable energy technologies – so specific investment in relevant skills and job creation is needed in the Valleys, given that the region's labour markets are skewed towards lower skilled jobs.

Table 11.d UK. Summary SWOT analysis for Wales - Social challenges and re-skilling needs of the workforce

<p>Opportunities</p> <p>Increased regional working and regional approach to skills provision</p> <p>Recent/ongoing Welsh Government reviews and reforms providing an opportunity to adapt and monitor developments</p> <p>Stronger employer and learner engagement</p>	<p>Threats</p> <p>Impact of automation, AI, digitalization on workforce</p> <p>Uncertainty around impact of Brexit on business activity, trade and investment</p> <p>Uncertainty around impact of Brexit on public funding for skills-related policies and economic development (replacing EU Cohesion policy funding)</p> <p>Demographic changes</p>
<p>Strengths</p> <p>Political will to address the required changes</p> <p>Recent changes to skills systems</p>	<p>Weaknesses</p> <p>Ageing population</p> <p>Cross-border nature of skills system with England, and potential impact of policy changes made at UK level</p>

⁸⁰ Welsh Government (2016) *Review of Higher Education Funding and Student Finance Arrangements in Wales* <https://gov.wales/sites/default/files/publications/2018-02/higher-education-funding-final-report-en.pdf>

⁸¹ Welsh Government (2015) Well-being of Future Generations (Wales) Act. Cardiff

⁸² Universities Wales (2019) Solving Future Skills Challenges in Wales. Cardiff.

Existence of Regional Skills Partnerships	Geographic variation in employment rates and opportunities, especially affecting rural and Valleys communities
Ability of Wales to move quickly in policy terms	
New student support and HE funding package introduced in 2016	Underemployment and in-work poverty, short-termism and low paid jobs

11.3.2 The sketch / scheme of the future workforce structure, in a holistic approach

The future of the Valleys' workforce structure up to 2030/2050 will be shaped by a range of socio-economic, political and technological changes which can already be identified, but whose specific impacts are not clear.⁸³ For example, demographic shifts and population ageing imply longer working lives, while emerging technologies (e.g. artificial intelligence and digitalisation) are almost certain to have profound impacts on working patterns and practices. At present, it is impossible to foresee whether the Covid-19 pandemic will be short-lived or have sustained effects on global and local labour markets.

In addition, the UK's scheduled departure from the EU (end of 2020) may well lead to labour market restructuring but this is difficult to predict because there is no clarity on the UK's trading relationships with the EU or the rest of the world, and so no information on implications for different business sectors. It also remains unclear whether and how EU Cohesion policy funding for the Valleys will be replaced by UK or Welsh Government funding after 2020, and there remains a risk that public investment earmarked for structurally weak areas such as the Valleys will diminish over time, leading to poorer quality infrastructure, training, and support for business investment and innovation.

Focusing on the Valleys in particular, the current trend of labour market and social integration of sub-areas of the Valleys with contiguous areas of south Wales and the wider UK economy (notably the major agglomerations of Cardiff, Swansea, Newport and the English Midlands) is likely to continue. Some areas of the Valleys may thrive on such integration, sometimes as commuter belts rather than as locations of innovative business activity, while other areas may continue as pockets or even swathes of socio-economic deprivation.

In terms of the coal industry, it is highly probable that, by 2030, there will be no remaining jobs in this sector in Wales, given commitments by both UK Government and Welsh Government to end remaining coal production and coal-fired industry by 2030.

In contrast, there is an economy/society-wide shift towards energy sources that do not depend on fossil fuels, with a focus on the following sectors, where there are likely to be shifts in the workforce structure and growing demands for diverse skills and re-training:⁸⁴

- By 2030: shift towards current renewable energy growth markets, i.e. onshore and offshore wind, and large-scale solar PV developments.
- By 2050: development of the large-scale deployment of other clean energy technologies, including hydropower (tidal and wave energy) and hydrogen.

Existing links between the energy sector and societal wellbeing goals are also likely to expand and to generate demand in other labour markets, particularly in line with the Welsh Government's Well-being of Future Generations Act. Energy transition policies are thus influencing and transforming job prospects and skills required in the cultural, social, economic and environmental sectors. Examples are found in housing (cold and damp prevention), local 'energy economies', transport (active travel, clean vehicles), and restoration of natural areas and ecological networks.

⁸³ Fawcett J and Gunson R (2019) *op. cit.*;

Universities Wales (2019) Solving Future Skills Challenges in Wales. Cardiff.

Welsh Government (2015) *op cit.*; (2018) *op. cit.*;

Welsh Government (2019) Digital 2030: A strategic framework for post-16 digital learning in Wales. Cardiff.

Welsh Government (2019) Wales 4.0: Delivering Economic Transformation for a Better Future of Work. Cardiff.

⁸⁴ UKCCC (2019) Net Zero – The UK's Contribution to Stopping Global Warming. London: UK Committee on Climate Change.

11.4 Conclusions

Employment in the coal industry in Wales has been falling since the 1920s, with particularly strong contractions in the 1930s and 1980s-90s, and is expected to be phased out completely by 2030. Nevertheless, the old coal-mining area of the South Wales Valleys continues to be marked by the legacy of coal and related industries, with below-average income and wage levels, a prevalence of lower skilled and more precarious employment, and poorer quality of life (e.g. on health indicators).

There is also considerable variation with the Valleys, with those areas with stronger connections with neighbouring agglomerations typically showing strong labour market performance. The Valleys are currently facing significant labour market and skills challenges relating to uncertainties around Brexit and Covid-19 and their potential impact on business activity and investment. Key questions remain, for example, on how UK Government and Welsh Government will replace EU Cohesion policy funding for economic development and skills after 2020. Nevertheless, the Welsh Government and other stakeholders in Wales (including via the Regional Skills Partnerships) are endeavouring to ensure an effective response to these challenges and ongoing support for labour market and skills development in the Valleys, including in the renewable energies sector.

11.5 References and further links

- ARAD RESEARCH (2017) TALK VALLEYS: ENGAGEMENT PROGRAMME. FINAL REPORT TO WELSH GOVERNMENT, JULY 2017: <https://gov.wales/sites/default/files/publications/2018-05/talk-valleys-engagement-programme-final-report.pdf>
- BEATTY C, FOTHERGILL S AND GORE T (2019) STATE OF THE COALFIELDS REPORT. ECONOMIC CONDITIONS IN THE FORMER COALFIELDS OF ENGLAND, SCOTLAND AND WALES, REPORT TO THE COALFIELDS REGENERATION TRUST: <https://www.coalfields-regen.org.uk/wp-content/uploads/2019/10/the-state-of-the-coalfields-2019.pdf>
- EVANS D. G. (2000) A HISTORY OF WALES 1906-2000. CARDIFF: UNIVERSITY OF WALES PRESS.
- FAWCETT J AND GUNSON R (2019) A 21ST CENTURY SKILLS SYSTEM FOR WALES. CHALLENGES AND OPPORTUNITIES. INSTITUTE FOR PUBLIC POLICY RESEARCH SCOTLAND, EDINBURGH, JULY 2019: <https://www.ippr.org/files/2019-07/a-21st-century-skills-system-for-wales-july2019.pdf>
- SQW (2019) INDEPENDENT REVIEW OF REGIONAL SKILLS PARTNERSHIPS' EVIDENCE-BASED PLANNING. REPORT TO WELSH GOVERNMENT, MAY 2019: <https://businesswales.gov.wales/skillsgateway/sites/skillsgateway/files/documents/sqw%20report%20on%20regional%20skills%20partnerships.pdf>
- UKCCC (2019) NET ZERO – THE UK'S CONTRIBUTION TO STOPPING GLOBAL WARMING. LONDON: UK COMMITTEE ON CLIMATE CHANGE, MAY 2019: <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>.
- UNIVERSITIES WALES (2019) SOLVING FUTURE SKILLS CHALLENGES IN WALES: <https://uniswales.ac.uk/media/solving-future-skills-challenges-in-wales.pdf>
- WELSH GOVERNMENT (2019) PROSPERITY FOR ALL: A LOW CARBON WALES: https://gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf
- WELSH GOVERNMENT (2019) OUR VALLEYS OUR FUTURE DELIVERY PLAN 2019-21: <https://gov.wales/our-valleys-our-future-delivery-plan>
- WELSH GOVERNMENT (2019) WALES 4.0 DELIVERING ECONOMIC TRANSFORMATION FOR A BETTER FUTURE OF WORK. REVIEW OF DIGITAL INNOVATION FOR THE ECONOMY AND FUTURE OF WORK IN WALES. SEPTEMBER 2019: <https://gov.wales/sites/default/files/publications/2019-09/delivering-economic-transformation-for-a-better-future-of-work.pdf>
- WELSH GOVERNMENT (2018) EMPLOYABILITY PLAN: <https://gov.wales/sites/default/files/publications/2019-03/employability-plan-2.pdf>
- WELSH GOVERNMENT (2017) ALIGNING THE APPRENTICESHIP MODEL WITH THE NEEDS OF THE WELSH ECONOMY, FEBRUARY 2017: <https://gov.wales/sites/default/files/publications/2018-03/aligning-the-apprenticeship-model-to-the-needs-of-the-welsh-economy.pdf>

- WELSH GOVERNMENT (2017) PROSPERITY FOR ALL: ECONOMIC ACTION PLAN:
<https://gov.wales/sites/default/files/publications/2019-02/prosperity-for-all-economic-action-plan.pdf>
- WELSH GOVERNMENT (2017) PUBLIC GOOD AND A PROSPEROUS WALES – BUILDING A REFORMED PCET SYSTEM, WELSH GOVERNMENT CONSULTATION DOCUMENT.
- WELSH GOVERNMENT (2016) TAKING WALES FORWARD 2016-2021:
<https://gov.wales/sites/default/files/publications/2017-08/taking-wales-forward.pdf>
- WELSH GOVERNMENT (2015) WELL-BEING OF FUTURE GENERATIONS (WALES) ACT 2015:
<https://futuregenerations.wales/wp-content/uploads/2017/01/wfgact-english.pdf>
- WELSH GOVERNMENT (2016) REVIEW OF HIGHER EDUCATION FUNDING AND STUDENT FINANCE ARRANGEMENTS IN WALES <https://gov.wales/sites/default/files/publications/2018-02/higher-education-funding-final-report-en.pdf>

12 Conclusions

Transition to a coal-free Europe is a difficult and expensive process, both economically and socially. Major concerns across TRACER target regions are the rising rate of unemployment (worsened by current Covid-19 restrictions) generating higher poverty and social exclusion, entrepreneurs' reluctance in taking risks and reduced attractiveness of previously coal-intensive regions. Thousands of direct and indirect jobs are lost after coal mines closure and unemployed population has been left with little to no professional options after they were laid off.

Regions need to be prepared to respond to demographic and economic changes through:

- regeneration strategies for transition, benefiting from generous grants for implementation and trigger the development of adequate public policies;
- holistic policies and socially innovative practices and programmes;
- adequate management in diversifying the local economic base and exploiting local resources;
- integrated socio-economic and step-by-step approach tailored to the local specificities.

Social and labour policies are of great importance, since they may strengthen social cohesion, during the transition period. But policies response is usually lagging behind the negative social impact of transition, which leaves deep wounds in changing societies.

When developing social and labour transition strategies and action plans, it is necessary to take into account various aspects, including sustainable development, preservation of economic and social vitality and cultural and historical heritage of the region.

To this aim, educational infrastructure, training and long-life education through workforce upskilling and reskilling are playing an important role for the redirection of the work force, thus being necessary to carefully analyse the qualification structure of employees who will lose their job in the transition process. The reskilling strategy should aim at endowing workers with skills matching the labour market in terms of its long run needs. Having an awareness of gaining skills for a sustainable future would firmly motivate the youth to pursue new career challenges linked to their regional setting.

Educational institutions and training contexts will have to update their educational offers to suit a labour market that requires more versatile skills embedded in a meta-aptitude of learning to learn. No matter the pace of updating the curriculum and educational supply, it is very plausible that the content of professional knowledge would rather soon become obsolete, while gaining overreaching abilities for continuous life-long learning, earning a sensitivity to learning-by-doing, are traits that would contribute to successfully fulfilling an great set of work assignments.

With the aim of adaptation and survival, many large companies and start-ups go through a process of transformation that includes modernization of production, market expansion and product diversification. With economic growth in general, the importance of service branches, manufacturing industry, automotive industry will increase. The potential of TRACER coal intensive regions for tourism should be used more significantly, correlated with the offer of new industrial centres which should be improved. The tertiary and quaternary sectors gain an increasingly higher share in total businesses in these regions, reflecting the shift from coal-intensive activities to a more sustainable economy model.

Opportunities have to be identified in order to strengthening and stimulating the economic activity in TRACER regions, creating conditions for businesses to be supported by regional and municipal authorities focusing on emerging activities especially in high-tech and knowledge-based activities. On this current Covid-19 global background, digitalisation brings considerable job creation potential, especially in innovative, high productivity businesses and for well-educated, highly skilled people.

The regeneration of the target regions depends on national and European objectives in terms of social, economic and political sustainability. For many of these regions it is a last chance to "take the train of change" and revitalise economy and society for the benefit of all people, of each country and the EU overall.

Bibliographical sources

- Agovino, T., (May 4, 2019), Jobs of the Future. Technology will re-shape the workforce in the next industrial revolution, <https://www.shrm.org/hr-today/news/all-things-work/Pages/jobs-of-the-future.aspx>
- Berger, R., (2018) Whitepaper Skill Development for Industry 4.0, available at <http://www.globalskillsummit.com/whitepaper-summary.pdf>
- Brende, B., (April 15, 2019). We need a reskilling revolution. Here's how to make it happen, World Economic Forum blog, <https://blogs.worldbank.org/jobs/we-need-reskilling-revolution-heres-how-make-it-happen>
- Epsing-Andersen, G., (1990). The Three Worlds of Capitalism, University Press, Princeton
- European Commission (EC), (2014). Assessing the Implications of Climate Change Adaptation on Employment in the EU Final Report & Annexes, Brussels, Belgium, p.1
- European Commission (EC), (2016). Commission Staff Working Document. Employment and Social Developments in Europe 2015, Chapter 3.1. Skills, Brussels, Belgium, p.2
- European Commission (EC), (2020) Skills Agenda for sustainable competitiveness, social fairness and resilience, Brussels, Belgium, p.19 available at file:///C:/Users/Gloria/AppData/Local/Temp/Communication_30June_v2.pdf
- European Council, (2019), A New Strategic Agenda 2019 – 2024, Bruxelles, Belgium, <https://www.consilium.europa.eu/media/39914/a-new-strategic-agenda-2019-2024.pdf>
- Goldin, C., Katz, L., (2010) The Race between Education and Technology, Belk nap Press
- Grey, C., (2016). A Very Short, Fairly Interesting and Reasonably Cheap Book About Studying Organizations, Fourth Edition, SAGE Publications Ltd, London, UK
- Harbert, T., (July 25, 2020), Technology and the Future of Work: Which Way Will We Go? <https://www.shrm.org/hr-today/news/all-things-work/Pages/technology-and-the-future-of-work>.
- International Labour Office (ILO), (2015) Sustainable Development Goals, SDGNOTE Green Jobs, Geneva, Switzerland, available at https://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/genericdocument/wcms_561751.pdf
- International Labour Office (ILO), (2019). Work for a Brighter Future. Global Commission on the Future of Work, Geneva, Switzerland
- Jesuthasan, R., Boudreau, J., (2018). Reinventing Jobs: A 4-Step Approach for Applying Automation to Work, Harvard Business Review Press, UK
- Junker J-C., (2014), A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change, Strasbourg, France
- Kelemen, M., Bunzel, D., Willis, P., (2009). Why Work? A culturally informed critique of past and present interpretations of shop floor interpretations of work, Annals of the University of Petrosani, Economics, 9(4), pp. 27-36
- Mergner, R., Janssen, R., Mandic Lukic, J. (Eds.), (March 2020). TRACER Report on outcomes, lessons learnt and guideline for the transition in coal intensive regions, Project No: 836819, WP 2 – Task 2.7 / D 2.7, available at https://tracer-h2020.eu/wp-content/uploads/2020/05/TRACER-D2.7-outcomes-and-guidelines_Final.pdf
- OECD, (2019) Future of Education and Skills 2030: OECD Learning Compass 2030. A Series of Concept Notes, pp.6-7 available at http://www.oecd.org/education/2030-project/contact/OECD_Learning_Compass_2030_Concept_Note_Series.pdf
- OECD, (2020) Long-term unemployment rate (indicator) available at <https://data.oecd.org/unemp/long-term-unemployment-rate.htm>
- Policy Learning Platform, (30.06.2020). Opportunities for the low-carbon economy in the COVID-19 Recovery Plan, https://www.interregeurope.eu/policylearning/news/9074/opportunities-for-the-low-carbon-economy-in-the-covid-19-recovery-plan/?no_cache=1&cHash=093477826eaa750f99df25d25a5f1d74
- Sweet, S., Meiksins, P., (2020). Changing Contours of Work. Jobs and Opportunities in the New Economy, Fourth Edition, SAGE Publications, Inc., CA, USA
- The Economic Times, <https://economictimes.indiatimes.com/definition/labour-market>

- Ward, D., (January 8, 2019). Tips for Applying Automation to Work, HR Magazine's Book Blog, <https://www.shrm.org/hr-today/news/hr-magazine/book-blog/Pages/tips-for-applying-automation-to-work>
- World Economic Forum, based on O*NET Content Model, (2018) In Roland Berger, Whitepaper Skill Development for Industry 4.0, <http://www.globalskillsummit.com/whitepaper-summary.pdf>.

List of Tables

Table 2.a The EC four skills objectives for 2025	15
Table 2.b Estimations of future labour market transformations.....	17
Table 3.a BG. Structure of the staff of “Maritsa East Mines” by place of residence (2017)	21
Table 3.b BG. Population, age distribution, migration and life expectancy in South-East Region	22
Table 3.c BG. Overview of the labour market of South East Region	24
Table 3.d BG. Education in South East region.....	26
Table 3.e BG. Cultural centres in South East region.....	27
Table 3.f BG. Personnel of Maritsa East Mines by staff category	27
Table 3.g BG. Personnel of Maritsa East Mines by education level.....	27
Table 3.h BG. Projected coal share in the net electricity production of Bulgaria.....	36
Table 3.i BG. Six scenarios for TPP capacity in the region [MW]	36
Table 3.j BG. Estimated number of persons who would lose their jobs – 7 scenarios.....	37
Table 3.k BG. SWOT analysis of the social and re-skilling issues in Maritza East region	37
Table 4.a CZ. Basic population indicators for Ústecký and Karlovarský district in 2015-2018.....	39
Table 4.b CZ. Basic data about employment rate unemployment and salaries in Karlovarský and Ústecký district in 2015-2018	40
Table 4.c CZ. SWOT analysis	49
Table 5.a DE. Demographic key indicators for Germany and Lusatia in 2018.....	53
Table 5.b DE. Demographic and educational information in 2017 and 2018	54
Table 5.c DE. Economic aspects in 2012 and 2016.....	54
Table 5.d DE. Population aged 25-64 by educational levels in 2018	55
Table 5.e DE. Number of unemployed people, unemployment rate and number of vacancies in Germany and the administrative districts of the Lusatia region in February 2020	55
Table 5.f DE. Summary of the main indicators of the mining activity of the area in 1989 and 2018 .	56
Table 5.g DE. Key issues by SWOT and/or PESTEL analysis	62
Table 6.a EL. WMR main demographic indicators	65
Table 6.b EL. WMR employment indicators	66
Table 6.c EL. WMR Location Quotient 2018	69
Table 6.d EL. WMR employment structure by skilling profile (in thousands)	69
Table 6.e EL. WMR employment profile by business type (in thousands)	69
Table 6.f EL. WMR population by education level (thousands).....	70
Table 6.g EL. WMR labour force specific figures (thousands)	71
Table 6.h EL. Basic time indicators for lignite mining and power production	73
Table 6.i EL. SWOT analysis	79
Table 6.j EL. Short, Medium- and Long-term results by objective.....	81
Table 7.a PL. Demographic: resident population, age distribution, change of residence and life expectancy in Upper Silesia region	83
Table 7.b PL. Labour: employment rate, main economic activities, unemployment rate, unemployment benefits and average nominal monthly wages by economic activities in Upper Silesia region	83
Table 7.c PL. Summary of the main indicators of the mining activity of the Upper Silesia region.....	85
Table 7.d PL. Key issues analysis.....	89
Table 8.a RO. West Region (RO42) / Hunedoara County/ Jiu Valley micro-region - population, age distribution, net migration and life expectancy	92

Table 8.b RO. West Region (RO42) / Hunedoara County – labour market data	93
Table 8.c RO. West Region (RO42) / Hunedoara County – Average nominal monthly gross wages	94
Table 8.d RO. Jiu Valley – Occupied population by categories of activity sectors, 2015	94
Table 8.e RO. Energy and hard coal mining industry in Jiu Valley	95
Table 8.f RO. Jiu Valley – Unemployed population, 2015	95
Table 8.g RO. Jiu Valley – Poverty rate by ages and gender categories	96
Table 8.h RO. Summary of the main indicators of the mining activity – Jiu Valley	97
Table 8.i RO. Industrial and agricultural potential – SWOT analysis	105
Table 8.j RO. Infrastructure and public work – SWOT analysis	106
Table 8.k RO. Human resources – SWOT analysis	106
Table 8.l RO. PESTLE Analysis: Political factors	107
Table 8.m RO. PESTLE Analysis: Economic factors	107
Table 8.n RO. PESTLE Analysis: Social factors	108
Table 8.o RO. PESTLE Analysis: Technological factors	108
Table 8.p RO. PESTLE Analysis: Legal factors	108
Table 8.q RO. PESTLE Analysis: Environmental factors	108
Table 9.a RS. Resident population in the Republic of Serbia, total and by age, and life expectancy (2015-2018)	112
Table 9.b RS. Registered employment, activity and unemployment rates for the period 2015-2018	113
Table 9.c RS. Average nominal monthly net wages and unemployment benefit for the period 2015-2018	114
Table 9.d RS. Health status of employees on lignite mining and power generation in 2018	115
Table 9.e RS. SWOT analysis	121
Table 10.a UA. Demographic situation in Donetsk region	124
Table 10.b UA. Main indicators of the labour market	125
Table 10.c UA. Main indicators for Donetsk region mining activity (except the area under occupation)	128
Table 10.d UA. SWOT analysis	131
Table 11.a UK. Key socio-economic indicators	133
Table 11.b UK. Labour market statistics	134
Table 11.c UK. Coal employment and production in the South Wales Valleys Coalfield	136
Table 11.d UK. Summary SWOT analysis for Wales - Social challenges and re-skilling needs of the workforce	143

List of Figures

Figure 1.a Total population on 1 January at TRACER target regions level (th.inh.);	9
Figure 1.b Median age of population at TRACER target regions level (years);	9
Figure 1.c Life expectancy at 65y in TRACER target regions (years).....	9
Figure 1.d Population age distribution at TRACER target regions level in 2018 (%)	10
Figure 1.e Gender gap in employment (20y-64y) in TRACER target regions (%);	10
Figure 1.f Employment rates (20y-64y) at national level vs. TRACER region (%) in 2018; UA* (15y-70y)	10
Figure 1.g TRACER target regions average number of employees (15-64y) in coal mining vs. total economy, 2018 (thousand).....	11
Figure 1.h TRACER target regions total (20-64y) and youth (15-24y) unemployment rates (%); DE* youth 18-24y; PL* youth 15-29y; UA* working age 15-59y	11
Figure 1.i Participation rate in education and training (25-64y) in TRACER target regions (%).....	12
Figure 2.a ILO Green Jobs Potential.....	16
Figure 2.b Digital Revolution	18
Figure 2.c Important qualifications & skills to have for Industry 4.0	19
Figure 2.d Categorization of skills into skill family	20
Figure 4.a CZ. Production of major air pollutants emission in thousands of t per year in individual districts of the Czech Republic in 2018. Target districts Karlovarský KVK and Ústecký ULK are highlighted	42
Figure 4.b CZ. Unemployment rate and open cast brown coal mining in Northwest Bohemia, toted line indicate smaller geographic units inside Karlovarský and Ústecký district with higher concentration of mining.....	43
Figure 5.a DE. Labour market policy.....	58
Figure 6.a EL. WMR ages distribution histogram - 2018.....	65
Figure 6.b EL. WMR net immigration	66
Figure 6.c EL. Unemployment rate.....	68
Figure 6.d EL. WMR employment structure (number).....	68
Figure 6.e EL. WMR education level share (%), 2018	70
Figure 6.f EL. WMR lignite deposits exploitation timeline	71
Figure 6.g EL. Age distribution in Industry & Mining in WMR (2011 -2018 average).....	73
Figure 9.a RS. Lignite mining fields in the Kolubara mining basin	118

List of Annexes

Annex 1 – Comparative analysis regarding the public policies and legislation in the labour, social protection and education (re-skilling) fields

Public policies can be seen as a network of interconnected decisions, which aims to determine the achievement of certain goals (work, socio-economic, education) at local, regional, national and, finally, community level. Finally, for a good interrelationship at Community level, such policies should be harmonized so that international cooperation can take place on the same coordinates.

Country / TRACER target region	National public policies / Regional and local programs	
BG / BG34 Yugoiztochen	National	<p>In BULGARIA, the main characteristics of the social policies refers to the high levels of poverty and income inequality, regional and spatial disparities, children and the elderly people at risk of poverty or social exclusion, limited support for people with disabilities, limited affordability of housing and energy services, especially for vulnerable groups etc. According to the Bulgarian partners, the social protection system cannot tackle the major social issues and the serious inequalities of income and the high number of people at risk of poverty require active inclusion policies. Regarding to the education system, it is being modernised at all levels but significant challenges remain. Persistently high rates of early school leaving and low educational outcomes highlight the need for significant investment in education. This is particularly relevant for addressing the challenges of quality and equality of opportunity in early childhood education and care, school education and vocational education and training. Despite ongoing efforts, higher education is insufficiently aligned with the needs of the jobs market. In Bulgaria, the state plays a general role of regulating, controlling and facilitating industrial relations through its institutions. The Ministry of Labour and Social Policy (MLSP) is the main national authority dealing with labour regulations and working conditions.</p>
	Regional	<p>In BULGARIA, at the regional and local levels, the development plans are being elaborated in line with the provisions of the Spatial Development Act. All current municipal (and regional plans) cover the period until 2020. The next planning period will be 2021 – 2027 (Integrated Municipal Development Plans). The plans present the strategic vision for development, formulation of objectives, priority areas and measures. Social development is also covered.</p>
CZ / CZ04 Severozápad	National	<p>In CZECH REPUBLIC, the basic norm in the field of the labour market is government regulation 2004 Act No. 435/2004 Coll., The Employment Act, which regulates the provision of the state employment policy, the aim of which is to achieve full employment and protection against unemployment. It regulates several key areas, such as the right to employment and related discrimination, the right of foreigners and the employment of people with disabilities, as well as employment and tools leading to employability and generally active employment policy (activating people to take up or change jobs). The state employment policy is created by the state, resp. state administration in the area of state employment policy in the Czech Republic is performed by the Ministry of Labour and Social Affairs, the Labour Office of the Czech Republic and other entities active on the labour market such as employers and trade unions. In implementing the state employment policy, the state cooperates with other entities active on the labour market, in particular with territorial self-governing units, professional organizations, associations of persons with disabilities and employers' organizations. Labour offices are important not only for the employees themselves, as they offer cooperation with employers and thus stimulate them to employ disadvantaged people.</p>
	Regional	<p>CZECH REPUBLIC have development strategies at regional and local level for the both regions in the Northwest Bohemia coal region (Ústecký kraj 2013; Karlovarský kraj 2013). The Strategy for the Ústecký Region (Development of the Ústecký Region) specifies development visions in Summarize the available regional and local targets, priorities, strategies and plans in the social – work-force – re-skilling fields on short-medium-long term (until 2050). Strategy has two central topics that are necessary for the future development of the region. These are the 2 pillars of the vision: - economic development linked to the necessary social cohesion and strengthening of the region's human capital (interconnected tasks aimed at increasing the economic performance of the region and thus the "restart" of the socio-economic situation in the region); - infrastructure, equipment and environment (necessary preconditions for socio-economic development of the region). Both pillars should support both the improvement of the actual socio-economic situation of the region, and the improvement of the image of the region in the eyes of its inhabitants, visitors and investors. Some objectives of the above-mentioned strategy are in line with the Updated Strategy of Sustainable Development of the Ústecký Region: The Strategy of Sustainable Development of the Ústecký Region is a framework and cross-sectional document, which will be followed by other strategic and conceptual documents within the region (Ústecký kraj 2013).</p>

DE / DE40 and DED2 Brandenburg Dresden	National	In GERMANY, the providers of state labour market policy are located at three functional levels: The Federal Employment Agency (formerly Federal Employment Agency), ten regional directorates (formerly State Employment Offices), 156 employment agencies (formerly Employment Offices) with approx. 600 branches and approx. 300 job centres (joint facilities) that have been formed by the local employment agencies with independent cities or counties. Self-government takes place within the framework of tripartite committees (employers' associations, unions, regional authorities). Since 2002, the Federal Employment Agency has a three-member board as a management and a tripartite board as a control body. It is not just a matter of converting a three- to two-tier structure of functional responsibilities, but also restructuring or realigning the Federal Employment Agency from a public-law institution with a self-governmental character to a "service organisation" with management structures, as it emerged from the Private sector are known. Since 2003, the state employment offices have been restructured and the regional dimension of labour market policy has been upgraded. The regional directorates control the employment agencies.
	Regional	Regional and local policies in GERMANY refer to the Lusatia, where industrial coal mining with the related energy-intensive industry is an important economic pillar of the region. Hence it has always been a crucial point and driving force for the prosperity and development of Lusatia. Right now, every 10th kWh electricity generated in Germany at the moment comes from Lusatian power plants (LEAG 2019) - an important contribution to the national energy security. However, the EU climate and clean energy policy and decided coal-phase out in Germany for the year 2038 are already affecting the lignite mining and power generation. And in fact, the transformation of the national energy production is calling for a reorganisation of the regional energy system and associated "industrial landscape". The social consequences of the deep-going structural change by coal phase-out in 2038 are affecting the whole Lusatia, especially because the residential areas of the workers are distributed all over the region.
EL / EL53 Dytiki Makedonia	National	In GREECE, the basic organisation implementing social and skilling labour programmes is the Greek Manpower Employment Organization (OAED) The operation of OAED is based on three pillars: <ul style="list-style-type: none"> • promotion to employment; • unemployment insurance and social protection of maternity and family; and • vocational education and training. OAED is the public authority and central body managing: <ul style="list-style-type: none"> • Active Labour Market Policies for halting unemployment, promoting employment and vocational training for both unemployed and employed people, • Passive Labour Market Policies with regard to measures for unemployment insurance (regular unemployment benefit) and other social protection benefits and allowances (maternity allowance, OAED day nurseries), • Active Labour Market Policies for initial vocational education combined with on-the-job training (Apprenticeship system).
	Regional	The regional labour and social strategies in GREECE have been planned in the framework of the current Regional Operational Programme (period 2014 to 2020). The programme aims to support the creation of a competitive and sustainable economy where high-quality jobs, social cohesion and environmental protection are main success factors. The training and long-life learning activities have not been designed to support the forthcoming rapid transition (2023 to 2028). The existing structures are either weak or lacking a vision for a decisive intervention in labour market.
PL / PL22 Slaskie Voivodship (Upper Silesia Region/)	National	In POLAND, the basic program is "The program of mitigating the effects in the Silesian region of restructuring of employment in coal mining stone", launched in 2003 (source: katowice.uw.gov.pl). The assumptions of the program were adopted by the Council of Ministers so that it could be regarded as a central governmental program (Herbst et al. 2003). Nevertheless, it was targeted towards the Upper Silesia region and was realized in practice at the regional level and by regional agencies and authorities. Contrary to above-described strategies of hard coal mining restructuring, "The program of mitigating the effects in the Silesian region of restructuring of employment in coal mining stone" was a region-oriented, and not a sector-oriented, strategy.
	Regional	In POLAND there is the program Silesian Direction 3.0. (The Internal Development Program of the Silesian Voivodeship until 2030. Strategic initiative - social partnership 2017). Actions taken under the direction will focus on preventing marginalization and exclusion of local communities living in degraded areas. The activities will aim to restore the inhabitants' sense of value and dignity through their social and professional activation. As part of the support provided for people starting their businesses, start-ups, newly established, but also the already existing enterprises. In the framework of the envisaged also activation of the unemployed through counselling, financial support to start testing the ideas in incubation programs and the implementation of the internship program.
RO / RO42 Vest / Valea Jiului	National	In Romania, The Ministry of Labour and Social Protection (MLSP) is the main national authority dealing with labour regulations and working conditions. It carries out consultations and cooperation with representative organisations of workers and employers at the national level in the development

	<p>and implementation of policies in the labour market, the protection of the national labour market and training the workforce.</p> <p>In line with the Community Strategic Framework - Europe 2020 Strategy, a number of regulatory documents are developed and implemented at national level and national priority targets are set:</p> <ul style="list-style-type: none"> • Labour Code (Law 53 of 2003, updated); • Romania's national strategy for sustainable development - Horizons 2013-2020-2030 (SNDDR), approved by Government Decision no. 1460/2008; • The strategy for improving the system of elaboration, coordination and planning of public policies at the level of central public administration, approved by Government Decision no. 870/2006; • National Strategy for Research, Development and Innovation 2014-2020; • The national employment strategy 2014-2020, approved by Government Decision no. 1071/2013; • The strategy of vocational education and training in Romania for the period 2016-2020, approved by Government Decision no. 317/2016; • National Lifelong Learning Strategy 2015-2020; • National strategy for the development of social services, approved by Government Decision no. 1826/2005; • Strategy on social inclusion of people with disabilities 2015-2020. Social policies - from the "rehabilitation" of the individual to reforming society; • Social Assistance Reform Strategy, 2011; • The Romanian Government's strategy for social inclusion of Romanian citizens belonging to the Roma minority for the period 2015-2020, approved by Government Decision no. 18/2015; • National Health Strategy 2014 - 2020, approved by Government Decision no. 1028/2014; • The national strategy "e-Romania", approved by Government Decision no. 195/2010; • Law no. 76/2002 on the unemployment insurance system and employment stimulation, updated 2019 and completed with the Government Emergency Ordinance no. 30/2020 on technical unemployment of 75% of the average gross salary for 2020 in the context of the crisis caused by COVID-19; • Law no. 116/2002 on preventing and combating social marginalization, approved by Government Decision no. 1149/2002, updated; • Law no. 416/2001 regarding the guaranteed minimum income, with the subsequent modifications and completions; • Government Decision no. 488/2005 on the approval of the national system of social inclusion indicators; • The national qualifications framework in Romania, approved by Government Decision no. 918/2013. <p>These documents are a natural and absolutely necessary step, as this is a national transposition of the concerns recorded at Community level.</p> <p>EU funding through the European Social Fund has been an important source of funding for skills and training activity.</p>
Regional	<p>In the field of regional policies ADR Vest is performing the following activities: drawing out regional planning reports, strategies and action plans; developing thematic and sectoral analyses and syntheses using specific tools for regional planning; preparing information dissemination and promotion materials (leaflets, flyers, posters etc.) for the West Region; coordinating diversified studies and analysis.</p> <p>The analysis of regulations at sectoral, regional or local level aims at transposing from national level in order to solve issues identified. Thus, at regional and local level, the following recent relevant documents outline the policies in the area of interest:</p> <ul style="list-style-type: none"> • The national legislative framework regarding regional development has as central point the Law no. 315/2004 which defines the basic objectives of the regional development policy in Romania, establishing the institutional framework, objectives, competences and instruments specific to the regional development policy in Romania, observing three principles: subsidiarity, decentralization and partnership; • The Regional Development Plans performed for all 8 development regions by each Regional Development Agencies; • Specific policy documents for RO42 (West Region), as: <ul style="list-style-type: none"> - RIS3 Strategy, ADRV, 2016 - Jiu Valley Strategy for the transition from coal 2021-2030, developed by the Ministry of European Funds having as consultant PriceWaterhouseCoopers, selected by European Commission which finances this Study through the Structural Reform Support Service (SRSS), Bucharest, 2020 <p>Additionally, each administrative unit (municipalities, cities or independent communes) in Jiu Valley have formulated their Development Strategy and the Local Development Plan, followed by a series of Decisions of the Local Council solving the priority social policy problems.</p>

RS / RS11 and RS21 Region Beograda Region Sumadije i Zapadne Srbije	National	In SERBIA, the national public policies related to labour, social protection and workforce re-skilling are in jurisdiction of the Ministry of Labour, Employment, Veteran and Social Affairs (MLEVSA) that holds several subordinate sectors. The Labour and Employment Sector (LES) is in charge of issues related to labour and employment, as well as of legislation and by-laws in that domain. Each year, National Employment Action Plan (NEAP) is formed to further elaborate the goals and priorities set out in the adopted public policy documents in the area of employment policy. The Family and Social Welfare Sector (FSWS) is in charge of preparation of strategic documents, draft laws and other draft regulations in the field of social protection, family protection, population policy and family planning
	Regional	Regional and local policies in SERBIA (the Kolubara target region) are currently guided almost exclusively by the national energy policy, but with due regard to the wellbeing of the local population. The reason for the national involvement is the fact that more than a half of the total national electricity generation in Serbia is based on the lignite being mined there, and that the state-owned Electric Power Industry (EPS) is the major employer of the local population in Unite mines and at power plants. With the current Serbian energy policy, the coal is still regarded as the major energy source for the foreseeable future, and therefore the national transitional policy may rather be step-wise, but with the regional and local social policies following the inevitable changes towards low carbon energy sources
UA / Donetsk	National	For UKRAINA, can be mentioned First National Ukrainian programme for coal industry, known under the short name "Coal", and enacted in 1994, had a positive restructuring component: the document foresaw commissioning 28 million tons of production assets at the new and refurbished mines, and shutting down 48 coal enterprises. Though, closing of the mines within context of the "Coal" programme had evidently "a sanitary" character, i.e. those were the mines, as a rule, that depleted their stock (up to 3-4 years of operation), with production costs substantially exceeding the price of coal, and having complicated geological conditions. An average stock at the mines subject to shutdown amounted to 3.7 million tons as of 01.01.1993. And neither of the enterprises had a status of the city-forming.
	Regional	In UKRAINA there is no regional or local policy at all. The "Strategy of Donetsk region development for the period until 2027", elaborated in 2019, contains only general phrases on the need to promote the restructuring of human capital involved in coal industry and to ensure a fair transformation of coal industry and raising the efficiency of the control of energy resources. During entire previous period of reformation of the industry, a stepwise monopoly existed for a decision-making by the scheme: The Cabinet of Ministries – Ministry of Coal and Energy – Ukrvuhlerestrukturizatsia – its affiliates – Regional administration (in a minor scope).
UK / WALES UKL1 West Wales and The Valleys	National	In WALES, the responsibility for public policies related to labour, social protection and education is divided between a) the UK Government and Parliament and b) the Welsh Government and National Assembly for Wales: <ul style="list-style-type: none"> • The UK level (Department for Work and Pensions, DWP) is responsible for employment policy, social security schemes, child support, pensions and industrial relations. • The Welsh Government is responsible for education, training and skills, as well as social welfare, and economic development. <p>Welsh Government is the main body involved in developing, implementing and monitoring skills-related policies in Wales, working with UK Government (DWP), the local authorities, further and higher education sectors, work-based learning providers, third sector, private sector and delivery partners. EU funding through the European Social Fund has been an important source of funding for skills and training activity.</p>
	Regional	Regarding to the policies related to transition out of coal in WALES, the responsibility for coal and energy policy are divided between the UK Government and Welsh Government. Energy policy, including electricity, oil and gas, coal, nuclear energy, heat and cooling, and energy conservation, and nationally significant energy infrastructure are largely reserved to the UK Government, but the Welsh Government has powers in relation to specific policy dimensions related to transport, energy and the natural environment. There is a long history of public policies to support transition out of coal in the Valleys, with the earliest government interventions dating back to the 1930s, in response to high unemployment and poverty as demand for British coal and other industrial products fell. South Wales was among the areas identified as a 'Special Area' in 1934 which led e.g. to the creation of a trading estate in Treforest (Pontypridd) and funding to attract business investment. The Valleys have received significant funding from EU Cohesion policy, for infrastructure, skills development and business investment and innovation, with Objective 2 funding in 1994-99 and Less Developed (or equivalent) status since 2000.

Annex 2 – Transition objectives - key issues - SWOT analysis in TRACER target regions

This section aims at presenting the various common patterns exhibited by the different TRACER regions in terms of the key transformation objectives, internal and external factors and the SWOT components from a reskilling venture point.

The objectives in terms of social and workforce/re-skilling needs

For most of the TRACER regions, where communities are enacting upon an array of development objectives, these objectives are, at least in part, driven or assigned to local actors by the regional public authorities. An advantage of this strategic arrangement might consist in a centralized strategic pattern giving coherence to various local solutions, but there is also a certain risk of sliding on the slippery slope of assessing the solutions through their political impact, rather than their measurable social effect on the transitional region.

In order to ensuring the realism of the transition objectives and measures, some of the TRACER partners have identified the need for reviews and studies that would forecast the elements of the social context in the aftermath of the transition.

Transition objectives have in view aspects pertaining the following domains:

- ensuring funding for long-term investments, creating job opportunities;
- dislocating public services to affected areas, so that new job would be available to locals;
- developing a business-friendly environment (in terms of taxation or subsidizing);
- updating the educational offer along market needs;
- ongoing funding of research and innovation;
- generating innovative solutions for land usage;
- enhancing agricultural and touristic opportunities through subsidizing start-ups in these economic branches;
- identifying and exploiting alternative energy sources.

Amidst the various scenarios proposed for the economic future of regions in transition, the most prevalent are: developing the regions into energy regions, reusing the land for agricultural pursuits or building up value chains through natural or industrial tourism. (For more on best practices in tourism for mining areas see TRACER D.2.4 report). While one of the sectors might prevail in the blueprint of a transition strategy, the various stakeholders will always think in terms of the structure of an economic value chain that is by no means homogenous in respect to the economic sector. No matter which economic strategy is envisioned by the strategic objectives, there is a salient need for branding and marketing the region in terms of its new regional and international identity, be it touristic, energetic or agricultural.

A useful strategic tool could be a calendar parallelizing the following development routes: investment efforts in infrastructure; energy efficiency improvements and educational reskilling needs for new rising sectors (such as tourism and agriculture)

The key external and internal factors that should be taken into account

In the mining regions where some of the industrial restructuring has already occurred in the 1990's, people are predisposed to conceive the energetic transition in terms as abrupt and socially painful as the events of the 90's. Some workers exhibiting a set of prejudices that are misrepresenting the bigger context of some Eastern countries that not only underwent an energetic transition, but a wholesale shift of economic systems, transitioning from socialist to capitalist societies.

Where there is a lack of experience in the social side of mine closure, local decedents can take advantage of various toolkits and professional standards dealing, at a rather practical level with assessing and solving social issues. The TRACER documents and deliverables (such as best practices reports and deliverables – such as D.2.4. and D.2.5.) might also serve a part of a guiding instrument.

Many guides pointing to best practices in mine closure indicate the reskilling and job creating opportunities generated by complying with the legal and social environmental requirements that lead to the productive re-usage of the industrial landscape. Approaching the closure phase of mining management as an instance of project management might directly assign deliverables for mining units. The deliverables of the project closure phase might consist in trainings for reskilling employees and be assigned indicators such as the number of reskilled workers, which would occupy a new job in a certain number of months after the official closure of the mining unit.

Most of the regions identify the three-folded significance of the need for future investments in infrastructure. Infrastructure investments might designate an occupational long-term solution for recent unemployment foreseen through mine closure. Investments in infrastructure provide the context for construing transport facilities (as an instance of foundational economy endowments) that would both ease the work force dislocation to nearby jobs and further the interest of investors from outside the area when looking for new production sites.

Legal issues related to land ownership and allocation shall occur especially in regions where mining companies are state-owned or where part of a previously socialist economic regime. (For more details on land reclaiming see TRACER report on D.2.5.)

The necessity of a mix of funding is present in all the regions in order to credit the new direction of the local economies. Most of the regions regard EU funding as an opportunity, while some would suggest the involvement of financial institutions through micro-credits helping local job creating ventures. (For more on funding for regions in transition see TRACER D 2.3.)

The key issues in social and workforce (re-skilling) fields

In the coal mining areas, most of the workers are poorly qualified and part of an older population. While reskilling young or educated workers does not posit many challenges, reskilling the unqualified elders is grieved by personal traits and age, hence aiming at a benefits scheme could alleviate the future unemployment for such categories of workers. The youth are more likely to adapt to new technologies required by reskilling and to take entrepreneurial risks and apply for financing opportunities in the transitional context.

Atypical work contracts, short term and part time, are not attractive for a work force used to high hourly wages and to stable forms of contracting. Where atypical contracts are the only option for some part of the population the increase regional income disparity and lead to in-work poverty. One of the obstacles of reskilling consist in older qualified workers comparing their prospective future wage, according to their newly acquired social status, to their previously high wage rate.

The reskilling needs are to be correlated with the yearly rate of unemployment for different scenarios of closing mining units. In terms of the content of reskilling, most of the partners envision the relocation of highly qualified mining workers in new jobs produced by a transition to producing other types of energy. Remaining active in the energy sector would require less professional accommodation and establish a sense of continuity and personal significance with their work roles. Of course, the technical adequacy of former mining specialists for new jobs in the energy sector is an issue related to, but distinct from, their personal motivation for reskilling.

Reskilling might aim at finding local jobs and hence avoiding brain drain and regional depopulation, but might also be individually driven and aim mainly at diminishing poverty indicators even while people could relocate.

Most common themes in SWOT analyses

The SWOT elements presented hereafter are some of the most common themes and issues signalled by the TRACER partners.

<p>Opportunities</p> <p>High interest at national and international level for new carbon-free energy sources</p> <p>Natural conditions for touristic facilities</p> <p>Availability of UE/public funding for regions in energetic and structural transition</p>	<p>Threats</p> <p>Demographic changes</p> <p>Reluctance to accept employment for lower wage rates</p> <p>Impact of automation, AI, digitalization on workforce</p>
<p>Strengths</p> <p>Discussion about strategies started already</p> <p>Political will to address the required changes</p> <p>The regions may learn from the available good practices</p> <p>Expertise in energy production and conversion</p>	<p>Weaknesses</p> <p>Ageing population</p> <p>Low overall qualification of the workers in the coal mines</p> <p>Investment in infrastructure is needed to support economic growth</p>