

Smart strategies for the transition in coal intensive regions

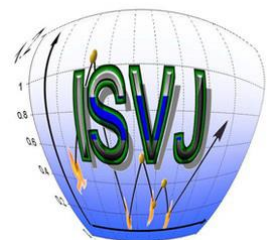
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***Best practice report on labour markets, social  
issues and tourism***

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## Abbreviations

CRIT	Platform for Coal Regions in Transition
EC	European Commission
EE	Energy efficiency
JRC	Joint Research Centre, European Commission
MS	Member States
RES	Renewable Energy Sources
3S	Smart Specialisation Strategy
SEP	Stakeholders Engagement Plan

## Executive Summary

This report aims to identify the best practices related to labour market, retraining/reskilling and social transformation processes and propose a guideline on how to reuse the facilities and infrastructures of the mining activities, especially in the mono-industrial coal regions in transition. The guide can help the stakeholders to find the best alternatives in order to assure the sustainable development of the labour market the region. On these bases, they can take the best decisions regarding to the economic, social and cultural future of the area.

Not every change in society can be seen as a transition, but only those changes that involve people. According to Witold Orlowski, professor of economics, chief economist at PWC, it is useless to have money if there are no people who can effectively use this money: “Without money we have big problems, but the money itself does not build the economy”.

Often, attempts to re-train unemployed people in coal-intensive regions in transition prove to be inefficient for a number of reasons including:

- Structural unemployment and a lack of jobs in the surrounding labour market;
- Insufficient engagement with potential employers to identify needed skills;
- Lack of a holistic approach to the issue of supporting re-trainees;
- Inadequate monitoring and evaluation of success.

A solution in this regard could be the qualification and specialization of people for new occupational fields, replacing the lost jobs by ceasing mining activity. These new areas can be: renewable energy, tourism and services, cultural activities, support for teaching and research activities, health and sports activities.

To increase the level of social acceptance of the transition process from coal, the next key drivers have been identified in this Report:

- A. Support policies (industry, environment, social, education & labour market) and the inclusion of transition away from coal in state level energy and climate policies;
- B. Strategic planning (structures, actions, documents);
- C. Implementation Resources (Human capacity, competences, skills; secured financial support);
- D. Formal dual education, training, retraining/reskilling, apprenticeship and life-long learning programs for working people, their families, and their communities;
- E. Ability of a region to attract new investments;
- F. Sustainable employments;
- G. Proactive stakeholders' attitude and willingness to be engaged in the decision-making process;
- H. Respect for, and protection, of human and labour rights (Australian Councils of Trade Unions, 2016).

Within the TRACER project we refer to the smart transition of coal intensive regions to sustainable energy systems - a complex and long-term process, which involves broader research, innovation and deployment activities in the field.

Main characteristics of the labour market structure and social challenges in coal-intensive regions in transition respectively mono-industrial regions, depopulation, poverty, migration, and aging are common elements for all the mining areas in Europe.

To this aim, this Report is proposing a guideline for a step-by-step strategic approach of the labour market and social transformation process, consisting three main stages and subordinated steps, which can be customised by each coal intensive region considering their socio-cultural heritage.

- Stage I – Diagnosis and planning
- Stage II – Implementation and management
- Stage III – Monitoring, assessment and reporting

Finally, the Report presents and assesses 11 case studies (Best Practices Factsheets), identified in the specialized literature and the analyses performed at European level, which emphasise the most relevant examples of good practices related to the labour market and social transformation process in coal intensive regions in transition. The factsheets are grouped in three main categories:

- Labour market and retraining
- Socio-cultural
- Tourism

It should be noted that the boundaries between these categories cannot be clearly defined, due to the strong cause-effect-cause interrelation between them. For example, in Wales (UK) and Lusatia (Germany) there are very good examples on the training of the employees, with positive impact also on the development of tourism together with cultural and recreational effects.

## 1. Introduction

Industrial transition is a complex and difficult process, with a strong need for stakeholders' involvement. Industrial structural transformations together with social change are long-term processes that have to be appropriately planned and managed during many years. Challenges like the need for skilled workers in jobs of tomorrow in emerging economic sectors, the lack of innovation capacity or the inevitable transition to a climate-neutral economy are looking for sustainable and feasible solutions.

The former European Commissioner for Regional Policy, Ms Corina Crețu said: “achieving a successful industrial transition requires substantial investment in advanced manufacturing, people’s skills and talents, as well as research and innovation (EC, 2019)”.

This is why for the period 2014-2020 EC helped regions to become more innovative and competitive, in the context of “smart specialisation strategies” and is channelling significant shares of Cohesion Policy funding into low-carbon economy, as Member States are required. Additionally, from funding, EC launched pilot actions to assist/support “Regions in Industrial Transition” and “Coal Regions in Transition”.

This clean energy transition process has an extremely substantial social dimension, the main reason being the mono-industrial characteristic of the majority of coal regions. Thus, around 185,000 Europeans are still directly employed in the remaining active coal-mining operations in 41 regions in 12 EU countries. Another estimated 53,000 people work in coal-fired power plants (EC, 2019). Unfortunately, past experience has shown that without long-term planning and support measures, degenerative processes are installed in the local communities, such as: long-term structural unemployment, depopulation, poverty, aging, etc. with significant social-economic impact for generations, wounds difficult to cure.

Related to the transformation towards a climate neutral economy the Cohesion Policy, through the “Coal Regions in Transition” pilot action, is helping regions and cities to develop effective customised solutions for a fair and efficient clean energy transition. Country teams made up of EC experts and the Platform for Coal Regions in Transition (CRIT) provide technical support and capacity building for planning these structural changes with minimum social-economic impact, bringing together all relevant stakeholders from 18 EU pilot coal intensive regions, in 8 Member States (MS) – Czech Republic, Germany, Greece, Poland, Romania, Slovakia, Slovenia and Spain.

Coal still has an important role in the energy mix of these 8 EU countries, but coal production has already been in decline due to decreasing economic competitiveness and environmental impact for some years. While some of the countries has set a phase-out date for coal and are already preparing or implementing coal transition strategies, some are not even considered transition away from coal as a feasible alternative.

In general, industrial transitions generate massive economic and social disruption. History shows that workers and communities are bearing the brunt of such transitions - suffering hardship, unemployment and generations of economic and social depression (Australian Councils of Trade Unions, 2016).

If this transformation towards a climate neutral economy is well managed the clean energy transition could be done in a socially acceptable manner. To this aim, for the next period 2021-2027 the Cohesion Policy Programme will secure the necessary funds to support investments for SMEs, innovation, clean energy, social inclusion etc.

According to EU Joint Research Centre, by 2025, coal-intensive regions in the EU will face the loss of 77,000 direct jobs. The scenario is even worse on the long-term: 160,000 direct jobs are expected to be lost by 2030. Considering this trend, in coal-intensive regions new jobs should be provided in order to avoid social exclusion, as well as the massive relocation of skilled people to regions where employment opportunities are wider (Friends of Europe, 2018).

## 2. Main characteristics of the labour market structure and social challenges in coal-intensive regions in transition

The process of energy transition involves major structural change. Therefore, knowledge of the current social situation and its main characteristics is necessary.

By the end of 2018, 185,000 people were still employed in coal mines across Europe, and another 52,000 worked in coal-fired power plants. The coal industry is also indirectly linked to different economic sectors, such as the production of inputs, equipment, services and consumer goods. According to a study by the European Commission (Joint Research Centre, 2018), another 215,000 workers are dependent on these related activities. The study estimates that about 160,000 jobs could be lost. It is above all local and regional authorities that must now find local responses and solutions to the specific challenges that arise (European Committee of the regions, n.d.).

Transition from traditional industries to clean energy industries comes with high costs at a regional level. EU efforts for meeting its climate and energy policies by 2030 leave behind coal-intensive regions, unable to shift from their core activity (coal mining) to other industries. Rising **unemployment** rate, increasing **poverty** and **declining professional opportunities for younger generations** determine continuous **degradation** and rising **depopulation** in these regions.

Coal-intensive regions lack technological innovation and are **less attractive for investments** as economic modernisation has not yet taken place. From the labour market perspective, the close down of coal mines affects not only direct employees, but also those working in mining equipment industry, supply chain and indirect jobs. Unemployment rate rises and the labour market faces **unbalanced supply/demand ratio**. At the same time, the education profile of former miners is less compatible with current labour market needs both in terms of qualifications and motivation to re-qualify. At a national level, unemployment in coal-intensive regions in transition may not seem so dramatic, as the working population in these regions does not account for a considerable share in total working population. For example, in Poland (the country with the highest employment rate in the coal sector from the EU), the total mining jobs represent only 0.7% of total employment.

Further, in coal-intensive regions there has been observed that population developed a **cultural identity** linked to coal mining. The close down of coal mines not only affects the economy, but also individuals' identity and self-esteem, which are linked to their previous professional activity. Definitely, communities depending on coal mining face dramatic changes, **lack of cohesion** and tend to question their cultural identity.

Another negative consequence of shutting down coal mines is the **necessity to re-locate** to other regions in the country, as new job opportunities are not provided in coal-intensive regions in transition. Hence, in many families one or even more members would need to leave home to find a new job, with impact from both social and psychological perspectives on all family members. In the case of older workers, unemployment is the most likely scenario, as they are prone to refusing re-location. Longer commuting distance to work may be another drawback that leads to **declining job searches**. 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.

If local governments are highly dependent on tax revenues collected from industries that are phasing out, education and other public services are affected, further crashing potential employment opportunities. For younger population, qualitative education is the first big step towards developing new opportunities in such regions.

Even in the case of creating new jobs, the quantitative aspect should be correlated with the qualitative dimension. In many cases, newly created jobs are of lower quality. This is driven by employees' limited skills to perform the job, and short tenure (involving lower payment levels, limited benefits and job



security). Also, the quality of future jobs may be perceived as lower due to absence of guaranteed long-term contracts/**employment sustainability** that was typical for jobs in coal mining.

Often, attempts to re-train unemployed people in coal-intensive regions in transition are inefficient for a number of reasons including:

- **Structural unemployment** and a lack of jobs in the surrounding labour market, often reinforced by **missing skills and educational attainment** in the region;
- **Lack of engagement** with potential employers to identify needed skills;
- **No holistic approach** to the issue of supporting re-trainees considering the numerous barriers to find employment (need to focus simultaneously on employer-employee matching, building skills, career advice, stipends for relocation, counselling and other personal support);
- **Inadequate monitoring and evaluation of success indicators** to ensure stable funding and improve practices over time.

A solution to this would be retaining people at the workplace, ensuring both employment and specialisation for a particular job.

In the paper Enhancing well-being in Mining Regions - Key Issues and Lessons for Developing Indicators (n.d., p.2) the following aspects are highlighted:

- Mining regions face specific impediments and opportunities in generating well-being for their citizens due to the highly concentrated geographical nature of these activities;
- Mining regions and cities make important contributions to national growth and prosperity. The results from empirical analysis find that selected mining regions tend to do better in terms of material well-being indicators (e.g. income) and worse in well-being dimensions that influence quality of life (e.g. health).

Literature review suggests that the coal intensive regions in transition particularly struggle with the following key issues:

- **Income inequalities;**
- **Job opportunities for local workforce and skills mismatches;**
- Pressures on public services and infrastructures;
- **Volatility in housing prices, limited affordability or abandonment;**
- **Depletion of natural capital** (degradation of air, land and water quality) as well as land use conflicts and health impacts that relate to this;
- **Weakened social cohesion and limited civic engagement.**

Increased well-being is needed to secure social acceptance of mining projects and to maintain regional competitiveness and future prosperity. Inequalities weaken social cohesion, increase economic vulnerability and reduce equality of opportunity in mining regions. The degradation of natural capital limits further future development and negatively impacts health. Further, 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. Examining and monitoring progress in well-being dimensions provides an empirical basis to better tailor policies and, ultimately, contribute to more inclusive, sustainable regional growth.

The presence of inequalities between population sub-groups i.e. mining and non-mining workforce as well as indigenous people and women, requires indicators sensitive to capture these issues. Analysing

data on income, housing, education, civil engagement etc. should compare and quantify them. Further, regions with indigenous populations should consider incorporating specific indicators that measure well-being as defined by indigenous people.

**We conclude that main characteristics of the labour market structure and social challenges in coal-intensive regions in transition are the character of mono-industrial regions, depopulation, poverty, migration, and aging of the population. These aspects need to be well analysed, modelled and especially managed, because the success of a fair transition from coal will depend to a large extent on them. More, Moritz T. et al. (2017, p.54) warns us that „If mining cannot be seen as a vehicle for regional development and job creation, community relations may become tense and lead to costly conflicts as well as to other types of business risks for the companies (Söderholm and Svahn 2015).”**

### 3. Drivers for a fair and socially acceptable transition

How some regional economies/communities are able to socially renew themselves, while others are blocked in the industrial decline?

Which are the recommended drivers to help smooth the transformation path to new growth and innovation?

Which are the essential elements that are needed for a social initiatives / projects to be successful and replicable?

Here below we will try to emphasise the **key drivers** that effectively and efficiently steer and facilitate transitions from coal:

**A. Support policies** (industry, environment, social, education & labour market) and the inclusion of transition away from coal in state level energy and climate policies;

- All political, economic, social, technological, environmental and legal factors to converge towards achieving a common goal – a fair and socially acceptable energy transition from coal.

**B. Strategic planning** (structures, actions, documents);

- Governance structures in place to support knowledge-sharing and to enable stakeholders to have ownership of the strategy development process (S. Davies, 2019);
- Smart specialisation strategies in place;
- Enhanced cooperation and coordination of integrated public/private resources (E. Donnari, 2018);
- Anticipation and participatory planning of a transition from coal strategy (Green Peace, 2016);
- Adequate context for creating new value chains for scaling up innovative ideas, developing smart specialisation priority areas.

**C. Implementation Resources** (Human capacities, competences, skills; secured financial support);

**D. Formal dual education, training, retraining/reskilling, apprenticeship and life-long learning** programs for working people, their families, and their communities;

- Aligning the retraining/reskilling, apprenticeship to the needs of the investors.

**E. Ability of a region to attract new investments**

- Developing and implementing specific industry and environmental policies to attract new investment, the growth of new industries and the creation of quality, secure jobs in affected regions (P. Alves Dias, 2018).

**F. Sustainable employments**

- A sustainable employment should be a long-lasting and mutually beneficial engagement between employer and employee;
- In order to become sustainable, an employment needs appropriate social, environmental and economic conditions, together with safe working environment, transparent and constant communication between employer-employee, and motivation through employee's personal and professional development;

**G. Proactive stakeholders' attitude and willingness to be engaged** in the decision-making process;

- A structured stakeholder engagement plan (SEP) in place – robust and detailed to be implemented based on EDP process (Entrepreneurial Discovery Process);

**H. Respect for, and protection, of human and labour rights** (Australian Councils of Trade Unions, 2016);

- Existing program for social protection measures (active labour market policies, access to health services, social insurances, among others).

#### 4. Recommended approach for facilitating a successful and socially acceptable transition

In order to implement a successful and socially acceptable transition process, we consider that it is essential to identify a personalized approach for each coal intensive region, considering the specificity of the socio-cultural heritage, thus leading to sustainable employments, citizens regaining their livelihood and stability. The Policy Review “Innovation in Cultural Heritage Research” (Sonkoly, 2018) underlines “the importance of cultural heritage in society and its potential for social cohesion, economic growth and sustainable development”. Additionally, the Australian National University (Campbell, 2017) stresses out that some of the seeds for a “just” regional transitions to zero-carbon economies may, in fact, lay in a careful understanding of the potential to build on the specific historical context of the regions industrial development and capabilities.

**To this aim, coal heritage is a source of pride for many former coal communities, and heritage and history can be used as an asset. The Ruhr Region is an example of cultural rebranding and of a coal region reinventing itself (P. Alves Dias, 2018).**

Labour market, training/skilling and social transformation processes must follow, from the beginning, step by step, the major restructuring process related to energy transition from coal. Transition processes are different in duration depending on:

- the objectives that each coal intensive region sets as targets,
- the current initial status of the region’s economic and social development,
- the available resources, competences and administrative capacity, and not least on
- stakeholders’ attitude and willingness to actively be engaged in the process.

**Within the TRACER project we refer to the smart transition of coal intensive regions to sustainable energy systems - a complex and long-term process, which involves broader research, innovation and deployment activities in the field.**

Considering the above, **we recommend a step-by-step strategic approach** of the labour market and social transformation process, consisting of the following stages and subordinated steps, which can be customised by each coal intensive region considering their socio-cultural heritage:

##### *Stage I – Diagnosis and planning*

##### ▪ **Step 1– Mapping the targeted audience**

The main categories to be included in the labour market and social transformation process are:

- local and regional governmental entities;
- employers;
- social partners (particularly at regional and local level), informal leaders (helping to build or activate existing social networks) and vulnerable individuals/groups;
- partner organisations operating in the area of reskilling and upskilling, outplacement and
- other worker support services.

When referring to coal industry related workers, we recommend including the following three categories in the targeted audience:

- older workers who lose their jobs and need compensation for income loss;
- middle age (mid-career) workers who need re-skilling and upskilling;

- younger people and new entrants whose employment depends on new jobs created through diversification.
- **Step 2** – Acknowledgment of the **governance structure** already created to support knowledge-sharing and to enable stakeholders to have ownership of the energy transition strategy development process (S. Davies, 2019); this structure will be responsible for developing plans to support the economic diversification of coal mining regions and creating policies that help to stimulate new investment, the growth of new industries, job creation and social transformation.
- **Step 3** – **Assess the current state of play** in terms of social and demographic aspects, labour market and retraining/reskilling needs.

The assessment of the reskilling needs must be performed in parallel with the identification of the labour market structure and the new industries potential, by:

- categorising the levels and types of skills available within a region and
- assessing the transferability of coal mining-oriented skills to other smart specialisation sectors – new potential industrial investments in the region, thus, matching the available skills with those that are required for the future.

Fields related to sustainable energy could be: energy efficiency, greener resources (RES and alternative energies), energy services digitalisation, land and buildings reclamation and use reconversion for urban and rural regeneration oriented to leisure / industrial / cultural tourism, agriculture/vineyards, energy crops; solar energy on abandoned mining land/tailings, etc.

The JRC emphasises, in the “Socio-economic transformation in coal transition regions” Report, the necessity of a detailed understanding of business needs in terms of needed job profile, both in short and long term, with solutions starting from quick retraining, to the introduction of new educational paths/new innovative university curricula (E. Donnari, 2018). Additionally, the Report underlines the need for putting in place mechanisms for skills anticipation since the planning stage, adaptation of curricula and the establishment and development of work-based learning systems, including dual learning systems and apprenticeship schemes.

In the same time, establishing a well-defined link between skills needs anticipation and regional development policies is thus essential to ensure the effectiveness of any active labour market policy targeted to the re-skilling of coal miners (E. Donnari, 2018).

- **Step 4** – **Early involvement of stakeholders** from the planning stage and engagement in the decision-making process.

Develop a Stakeholders Engagement Plan (SEP) based on the Entrepreneurial Discovery Process (EDP) process (S. Davies, 2019) and start running it, Steps 5, 6 and 7 being accomplished together. SEP is a strategy and a timetable for sharing information, engaging and consulting “4helix stakeholders” (S. Davies, 2019), including also the targeted audience of the labour market and social transformation process.

It is of great importance to:

- provide meaningful information in a format and language that is readily understandable and tailored to the needs of the targeted stakeholders;
- to ensure a two-way dialogue that gives both sides the opportunity to exchange views and information, to listen, and to have opportunities to express their views and receive responses.

SEP implementation, through EDP process, generates mutual trust, respect and transparency aiming to: improve 3S implementation performance and related policies, reduce costs and risks, avoid conflict and,

in the end, reach stakeholders' expectations. A correct and constant communication process, including stakeholders' engagement, public awareness, and consultation leads to acceptance.

- **Step 5 – Identify the causes** (internal and external factors) (Mullerbeck, 2015) **generating past and present challenges and barriers**, in order to avoid them in the future;
- **Step 6 – Identify strengths, resources and potentials**; establish opportunities related to labour market and retraining/reskilling;
- **Step 7 – Setting up objectives** for the labour market and social transformation process – what actions need to be done?

For example, **if major demographic changes took place during the decreasing of coal industry, a follow up of the Action plan implementation should be the repopulation of the former coal intensive region by creating sustainable jobs and developing financial support tools for young people.** Preventing depopulation could be also achieved by:

- ensuring or maintaining, as much as possible, **welfare support**, at a moderate-level and on fixed-terms, so that they do not become socially assisted without engagement initiative for retraining/reskilling programs and willingness for voluntary activities.
- encouraging and supporting **entrepreneurship** etc.

Practical support for workers could be also:

- ensuring that information and communication systems within companies provide the right information to workers to enable them to make informed choices;
  - tailored one-to-one support for workers, including individual skills review, career counselling, training opportunities, help with job applications and CVs and practical and financial advice;
  - welfare support, including early retirement options.
- **Step 8 – Drawing up Roadmaps / Action plans** related to the social aspects of the transition from coal, endorsed by key local stakeholders and the governance structure.

## *Stage II – Implementation and management*

- **Step 9 – Secure the necessary resources** to pave the way for an effective implementation of the Action plan for the labour market and social transformation (financial, human capacity and competence, timeline);
- **Step 10 – A proper implementation and manage of the Action plan** for labour market and social transformation, including a constant and transparent stakeholders engagement process;

This is an integrated and synchronised action with the entire strategy for transition in coal intensive regions, including the effort of attracting new industries, in order to merge future investment with retraining/reskilling programs.

In time the implementation results will follow and the quality of vocational education and training, tertiary education and lifelong learning will be improved, while constantly reflecting the labour market needs (E. Donnari, 2018).

In the same time the quality and capacity of public employment services will have to increase, in relation to the changing needs and requirements of the labour market.

For example, in the immediate aftermath of mine and power plant closures the opening of temporary community resource centres offering advice on job opportunities and training, as well as counselling services could be very positively received, e.g. in Wyoming, USA (P. Alves Dias, 2018).

***Stage III – Monitoring, assessment and reporting***

- **Step 11** – Anticipating skills needs through monitoring; evaluating results; making improvements and up-dates; informing stakeholders.



## 5. Success stories and best practices in the labour market, socio-cultural and tourism fields

The transition from coal-based energy generation to clean energy with low carbon emissions is a complex issue, aimed at the complete reinvention of the respective regions, including from a social and cultural point of view.

Viable alternatives for future transformation and development of coal-intensive regions need to be identified together with local stakeholders, who are willing to cooperate, providing support to implement good practice examples and organizational / transition models to better fit with each region's particularities.

For regions where coal is an element of local identification and social cohesion, switching to other economic development models can be very difficult and a global approach is required.

The stage of the transition implementation process is very different in each region. This process requires close cooperation and perfect coordination between all levels of government (national, regional, local), all economic sectors (public and private) and strong involvement of the civil society (local communities, NGOs, trade unions) to ensure not only acceptance but also active involvement.

**“Mine-closure contexts lead to a number of serious social problems which cannot be strictly delineated through any of the grids of individual solutions, government intervention or market resource allocation. This is particularly the case because the problems related to mine closure are at the same time individual** (the lack of adequate household incomes, insufficient formal training for pursuing other career opportunities etc.) **and social-structural** (lack of institutional settings that would provide information on the perceived needs of individuals and communities, leading, in its own turn, to inadequate solutions proposals streaming from governmental/municipal initiatives or business pursuits). A generic framework for approaching the issues related to mine closure effects would have to take into account both the individual and the structural needs and solutions. This would be grounded in an ongoing proactive aggregation and integrations of the efforts of the various categories of stakeholders affected by mine closure difficulties. All the needs could be regarded as entries for various problem-solving mechanisms that would have as outputs multiple and variegated solutions that cohere to help communities, coping with the shortage of opportunities, to generate creative ideas in a proactive setting” (Samuil, Caramidaru, Ionica, 2019, p.3).

Starting with the Dutch experience we can learn some important lessons. In the 1960s, Limburg, a region in the south-east of the Netherlands became the first European region to successfully phase out its coal mining industry. At that time, coal was considered crucial to Dutch national energy security. When natural gas resources were found, the Dutch Minister of Economic Affairs, Den Uyl, presented a plan to close the 11 active mines, in Limburg province, over the coming years, and replace them with gas-based technologies. An interesting fact is that the plan was a long-term perspective on anticipated market conditions in the future and associated forward-looking policies. Nevertheless, the success of this plan was supported by a series of crucial planning and design factors:

1. It was designed as a collective process – the state would lead the mine management, while unions had a strong voice and obtained guarantees that new job opportunities would be created in an equal ratio to job losses generated by mine closures;
2. There was common understanding between stakeholders that the newly adopted technology was a superior alternative to coal. There was unanimous agreement that early closures are preferred as the company would maintain in capacity to guarantee favorable conditions;
3. The transition process expanded over a 25-year time span. The process was carefully managed in order to switch from mining to service sectors such as science and health, logistics and other, service-oriented sectors, combined with traditional industrial sectors.

Currently, the Netherlands needs to completely eliminate coal as a source for electricity generation. Coal represents ~13% of the country's national consumption. Its previous experience with Limburg region may be a valuable lesson learned for its sustainability aims (T., Wehnert, 2017).

Several such initiatives have emerged, and this chapter brings together and highlights the good practices existing in the fields of labour market and retraining, socio-cultural and tourism; 11 best practice models that could become possible current approaches for the transformation of the EU coal regions, targeted by the TRACER project.

The Good Practices Factsheets (**Annexes 1-11**) are grouped in three main categories and summarised in chapters: 5.1, 5.2 and 5.3.

### ***5.1. Labour market and retraining***

#### **Cooperative Training Program at Coal Sites, North Rhine - Westphalia, Germany (Annex 9)**

The cooperative training program in coal mining sites promotes the transition from the high carbon mining industry. This was done by the state of North Rhine-Westphalia in the Ruhr area in 2008. The purpose is to first include young people who have not found a training place, for training within the company. Coal mining and the related industry have shaped the landscape of North Rhine-Westphalia for over 100 years. After the phasing out of coal the potential social impact will affect 8,961 people working in the lignite mines and power stations of the Rhenish district and 14,338 jobs that are directly or indirectly linked to the brown coal sector. It is therefore necessary to identify alternative energy sources, to encourage and support entrepreneurship initiatives by local / regional public authorities and to adopt fiscal instruments / mechanisms to attract investors in the region and thus to ensure the demand for labour.

#### **Apprenticeship in Ebbw Vale Enterprise Zone, Wales, UK (Annex 10)**

The consequence of the mine closure is the significant social impact, despite the repeated efforts of the Welsh Government, which, over the last 30 years, has fought unemployment and economic decline through regional policy. The key finding was the need to develop comprehensive measures to generate economic activity, improve infrastructure, maintain social cohesion and establish effective institutions to implement a stakeholder engagement plan. By restructuring the labour market and retraining professional adults, the Welsh Government supports complex industrial transition processes, directing funds from the state and European budget towards the development of programs for "Education and post-16 skills", focusing on "Apprentices, skills and training". To this end, the Welsh Government offers career guidance and counselling services, along with support policies, both for people over 16 who are looking for a job and for employers looking to recruit apprentices. A good example is the Enterprise Zone in Ebbw Vale, Wales where 7,000 jobs were created to revitalize the area. One of the successful models in Ebbw Vale for improving the critical mass of local skills is the Common Apprenticeship Scheme, where apprentices move between different employers to share responsibility for on-site training goals. This type of common apprenticeship scheme is mainly delivered in the construction and engineering industry, but is becoming increasingly popular in other priority sectors, such as tourism.

### ***5.2. Socio-cultural***

#### **Urban of Silver Mining, Freiberg, Germany (Annex 1)**

The tradition of mining silver ore in Freiberg is over 800 years old, and the Reiche Zeche mine is one of the oldest and richest silver mines in Saxony. Thus, during its existence, more than 8,000 tons of silver were exploited, and Freiberg became the "silver city" of Germany. Extensive mining led to the extraction of rich ores, not only silver but also lead, zinc and copper, but the mine has ceased its activity at the beginning of XX century as a result of the depletion of silver reserves.

Instead of closing the mine forever, losing important testimonies regarding the mining activity in the area, the entire mine heritage was transferred to the Bergakademie-Technische Universität Freiberg, and

the mine became an important object for learning and research. Thus, generations of students have benefited from internships at the Reiche Zeche mine, while specialists in the field have found numerous scientific research directions regarding geological conditions and silver mining.

Over time, there has been an increase of the interest of civil society regarding the history of the mining of silver ore in Freiberg, so that the mine began to be visited by more and more tourists, both from Germany and from other countries. As a result, the mine's infrastructure has been arranged so as to allow the safe visit of the mine by different groups of tourists, the tours having varying degrees of difficulty, so as to satisfy both curious people and mining experts. Today, the Reiche Zeche mine provides an opportunity to explore Freiberg metal ore mining from the 14th to the 19th century in thematic tours.

The conversion of this mining site into heritage objectives with different functions (education, research, exhibition organization, tourism) represents an eloquent example of good practices, because, on the one hand, elements with industrial and historical value were preserved, and on the other hand, it continuously obtains added value by educating and training the specialists, by elucidating some scientific aspects, but also by financial income resulting from the tourist and exhibition activities.

#### **Closed mine vs. Landscape with wind farms, Wales, UK (Annex 4)**

The transformation of valleys into mining sites, with underground and up-to-date mining operations, but also tailings dumps, has contributed to the creation of an industrial landscape in all the valleys of South Wales that can still be seen today. The new energy system has led to the capacity of communities to develop attractive projects for generating their own energy in their area. Wales's policy of obtaining renewable energy from the tides, high flow, waves and wind range by 2035 has a significant share with social, environmental and economic benefits that support the common property, being a very positive development.

Thus, wind energy creates jobs and more. For example, through the Pen y Cymoedd wind power project in southern Wales, which has a life expectancy of twenty-five years, 600 jobs have been secured and over 50 companies have been supported, envisaging insurance with up to 1 billion pounds to the Welsh economy and local communities about 1.8 million pounds a year through a community fund.

In addition, adventure, cultural and industrial tourism have developed in this area. Vattenfall has financed the construction of a 350,000-pound mountain bike trail through the Afan Forces Park and has committed to financing its maintenance for the next decade. The Zip World Slate Caverns movie offers another adventure - Bounce Under, "undoubtedly one of the truly distinct and unique activities that have put North Wales on the world map". The gigantic underground caves in the defunct Llechwedd slate mines are filled with six levels of trampolines, slides and nets. It is an impressive underground experience, due to the wild and diverse landscape. A Victorian slate mine, near the town of Blaenau Ffestiniog, in Snowdonia National Park, is the first underground trampoline in the world.

Within the National Museum Wales is one of the most outstanding museums: The Big Pit National Coal Museum. There are surface and underground tours organized, visiting the objectives of the Mining Galleries, the Pithead Baths and other historic buildings Mining Galleries Pithead Baths Historic colliery buildings. Through the experience offered the slogan displayed on the site is fully deserved: "King Coal: The Mining Experience at Big Pit".

#### **Urban Park - Closed mining areas revitalization, Missouri, USA (Annex 5)**

The mining site has been transformed, currently hosting a museum and a diving area. The Bonne Terre Mine was the largest lead mine in the world. The revitalization process consisted in the transformation of the mine site into a museum and later into a complex tourist attraction, by creating accommodation spaces and diving conditions for. Scuba diving at Missouri's Bonne Terre mine is one of America's top 10 adventures. The most common challenge in the former mining areas is related to the demographics of the region. Usually, with the closure of mines, there is a sharp decrease in residents and an increase in the unemployment rate in the region. From this point of view, the city of Bonne Terre developed (it

went in the opposite direction), the population increasing from 3,219 inhabitants in 1960 (mine closed in 1962) to a population of 7,063 inhabitants in 2018 (more than double). Keeping the museum and dive site in operation is done with the amounts collected from visitors (including accommodation and events) and from donations or sponsorships.

### **The horizontal Eiffel Tower of Lusatia, Germany (Annex 7)**

In 1995, local politicians discussed the conversion of the steel giant into a destination accessible to visitors. Thus, the former F60 overburden conveyor bridge was transformed into the main attraction at the visiting mine and an open-air museum, being integrated in all future cultural and tourism projects located on Bergheider See (Lake Bergheide). The F60 mine is in the centre of a unique adventure area that contributes to the tourism development of the area. In the first year, over 70,000 guests visited the F60 ferry bridge. About 20 jobs and two apprenticeships were created. The young Lusitanian's were trained on the old mining equipment for the leisure and tourism. The project was the key to the success of the structural change process related to the transition in the regions with coal consumption.

### **Petrila Planet-steps towards reactive art, Jiu Valley, Romania (Annex 8)**

The transformation of the Petrila coal mine was the main purpose of an initiative in 2012, significant in the contemporary Romanian landscape. The objective of attracting artists, specialists, authorities and the local public is realized under the umbrella of a multidisciplinary event, in an exercise to imagine the entire Petrila Mine. Residents of the city, students in practice and external volunteers work together with the community of artists, specialist architects and urban planners to create views of a possible future, built from the representation of the industrial past. The recognition of the mine as a heritage site of national importance, in the field of industrial heritage has attracted many tourists from the country and abroad.

## **5.3 Tourism**

### **Abandoned clay quarry vs. Ecotourism in the Eden Park (Annex 3)**

The functional conversion of the clay quarry in Crowell, England through the development of ecotourism provides both social and ecological services. The Eden project, which began as a dream in 1995, opened its doors to the public at an exhibition in 2000, offers a unique experience. This project has allowed the development of sustainable tourism, with its various forms: ecotourism, cultural tourism and adventure tourism in Eden Park, Cornwall. The Eden Project has something for everyone, including a climbing frame for young children, many food options, group and private trips and even a fragrance garden. It is even a "paradise/Eden" on earth!

### **Health and leisure in salt mines, Romania (Annex 2)**

The salt mines are mining sites with a widespread throughout Europe. The salt is mainly exploited in two ways: mechanically and by dissolution. The salt mines where the mechanical exploitation of the salt is realized can become after the mining exploitation, but even during the exploitation, objectives with multiple role: industrial, tourist, recreational or treatment.

The therapeutic role of the saline environment has been known since ancient times, so their arrangement for this purpose is a common practice especially in Romania. Most of the time, the salt mines are equipped with recreational or even religious facilities, so that people can spend quality time while doing treatment especially for diseases of the respiratory system. Salt mines are also important tourist objectives, as examples in this respect are the Wieliczka salt mine from Poland or the Turda salt mine from Romania. An important asset in the transformation of salt mines into tourist objectives is represented by the geological structure, on the one hand, and the type of recreational infrastructures with which the mine is equipped, on the other.

The project for the development of the Turda salt mines after the cessation of the mining activity considered keeping the galleries and operating rooms, as well as some of the oldest salt exploitation

technologies. It is worth mentioning the great interest of the visitors for the mining aspects of the salt mine. Also, modern leisure structures have been built, both for children and adults. All these represent strong points of attraction of tourists, but also of patients with respiratory diseases.

The transformation of the salt mine into a tourist and sanitary objective for the treatment of different diseases represents a source of income for the mining area. Also, the saline that receives a large number of tourists and patients today (about 700,000 in 2018), offers good jobs for the population in the area.

All this confirms that the proper preservation and management of the salt mine is an example of good practice in the field.

### **Green ideas for creative leisure time of Rio Tinto Mining Park, Huelva, Spain (Annexe 6)**

The mining site from the Roman period has been transformed into a leisure center. The Tinto area of the province of Huelva boasts 3,000 years of mining history, from the Phoenicians and then the Romans, until the 1990s. This mine is open to visitors from 2015. It is 10 km from the Minas de Rio Tinto. It consists of a 200-meter mining gallery called Santa Maria, which you go through. The landscape is selenar - mostly devoid of vegetation, with mosses and reddish peaks, gold's, rounded browns, craters and terraces, set on a blue-blue sky, with sulphurous green pools. The Astrobiological Institute of NASA conducts research, together with the University of Madrid, on the microbial life of the area. The Rio Tinto Mining Park offers yet another pleasant and educational experience for all ages and in various fields - from history, geology, chemistry, metallurgy to engineering.

### **From mining to dream vacation, "Lusatian Lake District", Germany (Annex 11)**

Lusatia must become a European model region for structural transition and this is supported by the national government, federal states of Brandenburg and Saxony, local communities and administrative districts, employers, unions and civil society organizations (BMW, 2019, p.74).

Here, mining has been known since 1844 and has brought gross added value of just over 1.2 billion EUR in 2016. But the development of mining, in addition to its beneficial effects, has degraded the environment by polluting air, soil and water on a massive scale. Since 1970, long before the time of Germany's reunification (1990), the problem of phasing out lignite mining was raised; this affected and destroyed the landscape visibly of the Lusatia region. Almost all the mines in the south of Lusatia were closed and the old pits left by the mining process were transformed into a lacustrine district. Moreover, these lakes have beautified the landscape, changed the lives of people, and by their large number (about 3,000) we can metaphorically call Lusatia "a Finland of Germany".

It is one of the successful solutions in the area, with great openness to services, tourism, recreation and mobility/transport.

These achievements are well promoted on international and specialized portals and websites (booking.com, Seen.de, HotelsamSee.com) and on social media. They are intended to provide important, complete and up-to-date tourist information on all lakes in Germany and Europe. It also provides information on what kind of tourism can be practiced (leisure tourism, cultural tourism, sports tourism and field trips, etc.), to whom it is addressed / who can be the ideal clients (depending on age, civil status, hobbies, etc.) and the services offered (accommodation from camping to the higher category hotel, restaurants, sports facilities and equipment - for summer or winter relaxation, spaces arranged for conferences, concerts and other artistic events) and useful tips for protection and safety.

### **Conclusion**

**In conclusion, it can be stated that mining sites can be transformed and reused so that they contribute to the sustainable development of the region in which they are located. In most cases, closed mines and quarries have been transformed into tourist, recreational and/or educational facilities, and in some cases, they have even taken another industrial function.** Due to the adequate professional conversion of the personnel employed in mining, the closure of the mines will not lead to

a significant increase in unemployment. It is worth mentioning that in order to be effective, the retraining programs must take into account the new use of the mining site. In this way, the social problems that are associated with the cessation of mining activities can be avoided. **The rehabilitation and reuse of mining areas also adds new cultural and traditional dimensions, which are important for the future development of local communities. Also, it must be mentioned that the income for local communities coming as a result of the new activities, contribute to ensuring the well-being of the people in the area.**

The process of the energy transition involves economic, technical, social, political and legal uncertainty that limits the forecasting power of the actors affected. Therefore, progress in implementing the measures recommended must be carefully and regularly examined, with readjustments made if necessary.

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## ***Annexes***

Good Practice 1 - Urban of Silver Mining, Freiberg, Germany

Good Practice 2 - Health and leisure in salt mines, Romania

Good Practice 3 - Abandoned clay quarry vs. Ecotourism in the Eden Park

Good Practice 4 - Closed mine vs. Landscape with wind farms, Wales, UK

Good Practice 5 - Urban Park - Closed mining areas revitalization, Missouri, USA

Good Practice 6 - Green ideas for creative leisure time of Rio Tinto Mining Park, Huelva, Spain

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