ENTRANCES

ENergy TRANsitions from Coal and carbon: Effects on Societies

# D3.7 Horná Nitra Case Study Report

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# Abbreviations

| | |
|---|---|
| CAPI | Computer-assisted personal interviewing |
| CAWI | Computer-assisted web interview |
| CCT | Coal and Carbon Territory |
| CET | Clean Energy Transition |
| CSPV | Centre of Social and Psychological Sciences *(Centra spoločenských a psychologických vied SAV (CSPV SAV))* |
| EIB | European Investment Bank |
| ENTRANCES | ENergy TRANsitions from Coal and Carbon: Effects on Societies |
| ESIF | European Structural and Investment Funds |
| EU | European Union |
| FDI | Foreign Direct Investment |
| FG | Focus Group |
| GDP | Gross domestic product |
| HBP | Hornonitrianske Bane Prievidza |
| ILO | International Labour Organization |
| JASPERS | Joint Assistance to Support Projects in European RegionS |
| JRC | Joint Research Centre |
| LMA | Labour Market Area |
| LMA | Labour Market Area |
| MAF | Multidimensional Analytic Framework |
| NACE | European Classification of Economic Activities |
| NGO | non-governmental organisation |
| NUTS | Nomenclature des unités territoriales statistiques |
| OP | Operational Programme |
| RF | Research foci |
| RQ | Research question |
| PAPI | Paper and pencil interviewing |
| PAR | Political Administrative Region |
| SME | Small and medium-sized enterprises |
| SSH | Social Sciences and Humanities |
| WP | Work Package |

# Executive Summary

This case study report presents the results of the ENTRANCES project, (ENergy TRANsitions from Coal and carbon: Effects on Societies). ENTRANCES' overall goals developing a theoretically-based and empirically-grounded understanding of cross-cutting issues related to social aspects of the clean energy transition in European coal and carbon intensive regions and formulating a set of recommendations able to tackle these issues. To achieve this goal, the project investigates the challenges facing carbon intensive regions in transition hinging on the idea that the transition to clean energy should not be considered only as a technological change or an industrial shift but also as a complex and multidimensional process that affects the daily life of local communities.

A coal and carbon territory in ENTRANCES is understood as the territory in which "Coal and carbon" features are represented as a distinctive trait of the local identity or are a key asset for income and employment opportunities. In line with the governmental definition and the Action Plan of The Regional Transformation in Horná Nitra, the coal and carbon territory consists from two districts in self-governing Trenčín region. These districts are Prievidza and Partizánske.

The research methodology was diverse. Socio-economic data has been collected from national sources, in particular the national statistical office, but also firm-level data. Furthermore, Eurostat data has been used to provide an overview of the region's economic, financial and demographic composition based on a descriptive analysis. Sector-specific and region-specific peculiarities were located and processed. The focus group discussion covered territorial stress induced by mine closure and rapid decarbonisation policies introduced in the region of Horná Nitra. The aim of the interviews was to obtain and contrast differential stakeholder assessments of transformative capacities. The text analysis unit was the Political Administrative Region (PAR) in this case the Prievidza district with its towns Prievidza, Handlová and Nováky. A survey was conducted using a structured self-report questionnaire.

Based on the economic structure, Horná Nitra can be characterized as an industrial region. It has a long tradition, especially in the engineering, textile, chemical and rubber industries. At present, it ranks among the economically strongest regions in Slovakia. It also has a high number of small and medium-sized companies – where there are more than 6,500 registered. The most important production branches of the region are automotive, engineering, electrical engineering and electronics industry, chemical industry. Forecasts indicate a decline in the labour force despite a good economic development in the past.

Socio-cultural analysis suggests that major conflicts in the territory are, generally speaking, generated by competition over limited resources. Some projects and development funding can enhance both inter-sectoral and intra-sectoral competition. The future of the region is seen as dependent on central authorities and funding both from the state and EU funds. Moreover, some stakeholders, are afraid that the suggested new design of regional economy, based primarily on SMEs and the services sector affiliated especially with the tourist industry has relatively limited potential. Plans to close mining operations from the beginning are connected to the central decisions and funding with the support of the EU funding.

Despite all the strain situations ongoing in the area, we can identify several coping strategies. One is the vision of further development of small and medium-sized companies, while the most important

production branches of the region are supposed to be automotive, engineering, electrical engineering and electronics industry, chemical industry. Alternatively, this vision looking up at the services sector affiliated especially with the tourist industry as the new potential of the region. We also identified as a possibility a strategy based on a general enhancement of the human capacities of the region. Symbolically, the Horná Nitra region is relatively affected by territorial stigma. It must be noted that the stigma presented here does not have such a decisive power over the interpretation of the region, albeit it has been both openly and latently present in the discourse on Horná Nitra regarding the process of decarbonisation.

Socio-psychological analysis was done based on questionnaire while quota sampling method was used to ensure that the final sample reflected the socio-demographic structure of the population in the Horná Nitra region. The descriptive analysis of the data from our survey shows a mixed picture. On the one hand, there is a strong sense of place attachment and dependence, nostalgia, and a tendency to perceive decarbonisation as an economic threat.

Analysis of the Energy Transition in the Political Administrative Region suggests that the key historical moment that defines the identity of the Horná Nitra was socialist industrialization based on Soviet models of modernization of the economy and society in the second half of the 20th century. We will also mention the psychological aspect prevailing in the period of directive socialism: the profession of miner had a special status until 1989 with higher wages than average wages and extra social benefits, recognition and ideological adoration of mining and miners by the regime and propaganda outlets. No less important historical moment can be considered the disintegration of the centrally planned economy and the application of the method of shock transformation of the economy in the early 90s with abrupt change of ownership, deindustrialization, closure of business, negative social impacts, unemployment, migration. The decision to phase out coal mining in Horná Nitra has been made in 2018 and the mines will be definitely closed after the end of the inflow of subsidies in 2023.

Socio-political analyses operationalised two prevailing narratives – a positive one and a negative one. We label them for the purpose of this study as: (1) Green Region of the Future and (2) Dilapidated House. In the first case, it is a narrative of Horná Nitra as a winner and frontrunner, region which will serve as an example to other regions on how to approach decarbonisation at the regional/local level in the EU. On the opposite side of the spectrum, we find narrative of transformation as yet other example of replacing something which is working with wishful thinking. A transformation together with adverse demographic trends, general problems with global competition and out-migration leads to lagging behind, decline in wellbeing and in the end to dilapidation of the towns and villages.

The most interesting finding of the quantitative evaluation was the assessment of the region's transformative capacity does not significantly diverge between the research team's own assessment when compared to that of the stakeholders. The differences in quantitative evaluation between these two groups are probably due to differential access to holistic knowledge regarding some aspects of the transformation.

The findings of qualitative analysis reflect a broke-down by all the monitored factors of the Transformative Capacity, the opinion of individual groups of actors, variously power-positioned, were along the line of their collective interests. It is also interesting that the opinion of individual

stakeholder groups, as well as the opinion of researchers, did not prove to be completely different. It seems that the whole process of transformation of Horná Nitra is firmly anchored in the current frameworks, and no more fundamental disruptions or changes in the established course can be expected. The biggest challenge posed the problem of capacities at the local level and relational nexus, which would work to integrate the participation of all stakeholders. Community empowerment and involvement are also relatively insufficiently developed.

The EU Green Deal, Fit for 55 and Re-Power EU agreements provide important frameworks for national policies and targets. Operating with the implementation of the already approved targets provides strong arguments for keeping the process on track. This strategy of insistence should be pursued by the regional stakeholders, local governments and NGOs as well.

There are several financial schemes financed by the European Union's ESIF and the Slovak Republic specifically targeting Horná Nitra. The most important sources are European Structural and Investment Funds (ESIF), Recovery and Reconciliation Plan, there are specific provisions in Just Transition Fund.

By utilizing allocated and available resources may Horná Nitra greatly benefit from the external assistance and transform the local economy, address structural challenges and build a resilient society.

There are currently many regions in Europe struggling with mine closure and regional economic transformations. The Platform for Coal Regions in Transition and networking on the international level may provide important incentives for the Horná Nitra and help to utilize opportunities stemming from the financial assistance.

# CHAPTER 1

## INTRODUCTION

# 1 Introduction

The project ENergy TRANsitions from Coal and carbon: Effects on Societies ENTRANCES, which is a three-year project funded by the European Union's Horizon 2020 research and innovation programme, addresses the Social Sciences and Humanities (SSH) aspects of clean energy. ENTRANCES is coordinated by the University of A Coruña and is conducted by a consortium of 14 European partners, including universities, research institutes, networks and umbrella organisations.

ENTRANCES' overall goals developing a theoretically-based and empirically-grounded understanding of cross-cutting issues related to social aspects of the clean energy transition in European coal and carbon intensive regions and formulating a set of recommendations able to tackle these issues. The project investigates the challenges facing carbon intensive regions in transition hinging on the idea that the transition to clean energy should not be considered only as a technological change or an industrial shift but also as a complex and multidimensional process that affects daily life of local communities. In this regard, the project understands the impacts of the clean energy transition on coal and carbon intensive regions, either in terms of the potential activation or strengthening of the de-territorialisation process, i.e., the process of progressive weakening of ties between a community and its territory, and conversely as an opportunity for triggering their re-territorialisation.

One of the key aspects of the project was thus the development of 13 regional case studies dedicated to just as many European coal and carbon intensive regions in transition.[1] All the case studies were based on the application of the same Multidimensional Analytical Framework (MAF) within the project to grasp the multi-faceted aspects of the de/re-territorialisation processes ongoing in the regions.

This report is the one dedicated to the case study of Horná Nitra that was developed by the Centre of Social and Psychological Sciences (CSPV).

Horná Nitra is traditionally region with mining industry that has been for decades the backbone of the whole economy. However, the decision to phase out coal mining in Horná Nitra has been made in 2018 and the mine will be definitely closed after the end of subsidies in 2023.

The report is structured into five chapters: Chapter 2 presents the **conceptual, methodological framework** adopted for the development of the case study, including information on how [Name of the region] has been operationalised in different interrelated units of analysis. Chapter 3 is focused on **the analysis of the Horná Nitra coal and carbon territory**, i.e. the territory heavily dependent on fossil-fuel-based industries or the extraction of fossil fuels themselves, with the lenses of the socio-cultural and socio-psychological dimensions. Chapter 4 provides an overview of the **socio-economic situation** of the region. Chapter 5 covers the **analysis of the clean energy transition** (henceforth CET) underway at the regional level through the lenses of the socio-political and socio-technical dimensions. Chapter 6 presents the main **territorial challenges, associated coping strategies and gender-related aspects** and discusses them in the light of all the dimensions included in the study (i.e. socio-economic, socio-cultural, socio-psychological, socio-political and

[1] https://entrancesproject.eu/project-deliverables/.

socio-technical dimensions). Finally, some conclusions formulated by the case study team complete the Horná Nitra case study report.

# CHAPTER 2

## CONCEPTUAL AND METHODOLOGICAL FRAMEWORK

# 2 Conceptual and methodological framework

## 2.1 Case study objective(s) and organisation

### 2.1.1 Case study objectives

The case study objective can be better understood in light of the research questions of the ENTRANCES project.

1) What are the principal socio-economic, socio-technical, socio-ecological, socio-cultural, socio-political, socio-psychological, and gender-related challenges facing coal and carbon intensive regions in transition? What coping strategies have emerged in recent years?
2) What variables have been most influential in the appearance of the *deterritorialisation* process and how do they interact? What kinds of strategies are the key determinant of success in terms of *re-territorialisation*?
3) What policies or combination of policies would be most appropriate to recover the ties of the territory and community in coal and carbon intensive regions while fostering their transition toward clean energy?

The three questions as a whole, define the logical itinerary of the project, which starts from an in-depth *description* of the current situation of the regions (RQ1), moves to search the *causes* of the de/re-territorialisation process (RQ2), and identify a set of *policies* for fostering the re-territorialisation of the regions (RQ3).

The main aim of the regional case studies is to answer the first research question (RQ1) of the project in all the regions involved in the project, thus also in Horná Nitra. Moreover, the secondary aim of the case studies is to provide the empirical basis for answering the other two research questions, related to the causes of de/re-territorialisation processes (RQ2) and the set of policies needed to activate re-territorialisation (RQ3). However, such two questions will be answered in the next phases of the project respectively through case comparisons (RQ2) and case-related scenario building and policy co-creation (RQ3).

For describing the challenges and coping strategies faced by coal and carbon intensive regions in transition across different dimensions of change, the main aim of this document is to report the answer that the research has found about the case of Horná Nitra.

### 2.1.2 Structure of the case study: multiple foci and units of analysis

To deal with the complex research question presented above (RQ1) the ENTRANCES case studies have been structured into multiple foci and units of analysis. This articulated approach is necessary to enhance the clarity of the study and avoid conflation of concepts as concerns the challenges and the coping strategies of the coal and carbon intensive regions in transition. In this regard, all the ENTRANCES case studies, thus including also the case study of Horná Nitra have been articulated into three research foci and three corresponding units of analysis (Figure 1).

- *RF1: Territorial Change in the Coal and Carbon Territories (CCTs)*. The project decided to focus its analysis of challenges and coping strategies on the territories that are more exposed to the decarbonisation process. To this aim, the concept of Coal and Carbon Territory (CCT) was

developed. CCTs are the territories in which the “coal and carbon” features are represented as a distinctive part of the local identity or are a key asset for the income and employment opportunities of the local community. It is worth noticing that, in many cases, the CCTs are not administrative regions. The focus on territorial change in the CCTs has been considered the “fulcrum” or the “core” of the ENTRANCES case studies.

While RF1 helps clarify that the research is focused on the territorial challenges and coping strategies of the CCT, the dynamics of de/re-territorialisation of this territory cannot be fully understood if not in the light of the other two research foci and related units of analysis.

- *RF2: Structural Change in the Labour Market Area (LMA)*. The case study has investigated the change in the socio-economic structure over the last three decades. This is an essential dimension for understanding the underlying dynamics that affected and that still affect the CCT at the structural level. To investigate structural change, *Labour Market Area (LMA)* was established as a secondary unit of analysis. The Labour Market Area was defined as the area including the Coal and Carbon Territory in which a bulk of the labour force lives and works.
- *RF3: The clean energy transition in the Political Administrative Region (PAR).* If RF2 investigates medium and long period dynamics that are affecting the CCT, the focus on the clean energy transition ensures that the research considers the incipient change triggered by the purposive transformation of the energy system that is promoted to deal with climate change. Such objectives have been recently accelerated through the European Green Deal. In each regional case study, the clean energy transition has been observed at the level of the Political Administrative Region (PAR), i.e. the administrative region encompassing the Coal and Carbon Territories more closely associated with governing the energy transition through a directly elected legislature.

These three research foci and related units of analysis, at least to some extent, overlap with each other. Despite that, they offer different and complementary perspectives in the study of coal and carbon intensive regions in transition. They jointly contribute to understanding the de/re-territorialisation dynamics ongoing in the coal and carbon territory.

The structure of the case study is mirrored in this report as Chapter 3 will deal with territorial change in the CCT; Chapter 4 with structural change in the LMA; and Chapter 5 with the clean energy transition in the PAR.

### Box 1: The three units of analysis

Following the structure of the case study, three units of analysis have been delineated in the Horná Nitra case as shown in Figure 1.

**Figure 1 – Case delineation**


Coal and Carbon Territory | Labour Market Area | Political Administrative Region

**Coal and Carbon Territory (CCT)**

A coal and carbon territory in ENTRANCES is understood as the territory in which "coal and carbon" features are represented as a distinctive trait of the local identity or are a key asset for income and employment opportunities. In line with the governmental definition and the Action Plan of The Regional Transformation in Horná Nitra, the coal and carbon territory consists from two districts in self-governing Trenčín region. These districts are Prievidza and Partizánske. The regional and spatial distribution of the transitional impacts will have some specifications. District Prievidza is bigger and includes four towns Bojnice, Handlová, Nováky and Prievidza. The mining operations are located in the district Prievidza. Although, Partizánské is part of the region, it would not be directly impacted by the transition. It is neither a mining town nor a place where many miners live. We may, however, anticipate some potential secondary effects here. The main development pole in the region is Prievidza. It is not the place of the mining activities itself (this is located outside of the town), but the town provides dwellings for a significant number of the miners, and it is the industrial hub where most of the investors are concentrated. Prievidza is located in the middle and on the crossroads of mining activities. The mining itself is located in Nováky (11 km from the town), Cígeľ (10 km), and Handlová (16 km). The HBP mining company operating the business has headquarters in Nováky a and in Handlová. Mining in Cígeľ started in 1962, and the mine was officially closed in October 2017. The place will now require substantial investments into the re-cultivation and cleaning of the industrial sites.

**Labour Market Area (LMA)**

The labour market area describes the region in which everyone who is living in the region also works in the region, centred around the Coal and Carbon Territory The labour market area describes the region in which everyone who is living in the region also works in the region, centred around the Coal and Carbon Territory. Labour market area in the case of Horná Nitra is Trenčín Region (Trenčiansky kraj). Based on the economic structure, it can be characterized as an industrial region. It has a long tradition, especially in the engineering, textile, chemical and rubber industries. At

present, it ranks among the economically strongest regions in Slovakia. It leads also in the field business of small and medium-sized companies – where there are more than 6,500 registered. The most important production branches of the region are automotive, engineering, electrical engineering and electronics industry, chemical industry. In the past, engineering production was also strongly focused on weapons, generally replaced by new progressive industries are also developing in the region. The main hubs for employment are towns Trenčín, Prievidza and Dubnica. The general situation in the labour market was prior to the COVID-19 pandemic and according to macroeconomic indicators positive. There is various cyclical, structural and institutional barriers to increasing employment in the region and in Horná Nitra SMEs. Transformation of the region and phasing out coal will most likely emphasise already existing tensions and structural problems such as long-term unemployment, low purchasing power affecting upon the market, or increasing demands on social and health services.

**Political Administrative Region (PAR)**

The Trenčín Region (Trenčiansky kraj) is one of the eight Slovak administrative regions. It consists of 9 districts (okresy). The region was established in 1996. It is located in the North-western Western Slovakia, has an area of 4,502 km² and a population of 584,569 (2019). The population density is 130 inhabitants per km², which is more than Slovak average (110 per km²), and the second highest after the Bratislava Region. The Trenčín Region consists of 9 districts: Bánovce nad Bebravou, Ilava, Myjava, Nové Mesto nad Váhom, Partizánske, Považská Bystrica, Prievidza, Púchov, and Trenčín. There are 274 municipalities (obce), including 18 towns, where about 58 % of the region's population live.

In the period of 2002-2005, Slovakia went through the process of substantive decentralisation. The local self-government bodies in Slovakia took over substantial part of responsibilities not only in administration and law enforcement, but also for the economic development of the territory administered by them.

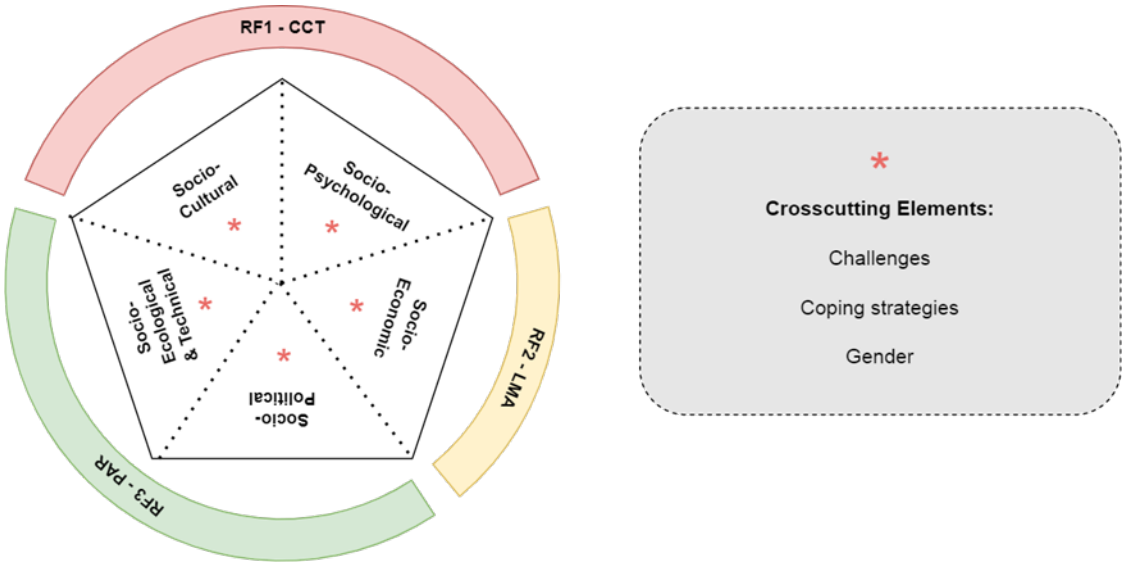
Chairman of Trenčín self-governing region and deputes in the regional parliament are all directly elected. There are also direct elections of all mayors of towns and villages, as well as well as direct election of deputies in local town or municipal councils. Furthermore, heads of the district offices are directly appointed by the government (e.g., in Prievidza and Partizánske). Administrative competencies are thus divided between the state administration and locally elected representatives at the level of municipalities, towns and the region.

## 2.2 Overview of the multidimensional analytic framework

For studying the complex and multidimensional dynamics characterizing the processes of territory in transition, ENTRANCES embrace theoretical and methodological pluralism – a perspective in which the adoption of different scientific approaches is not considered as a problem but as an asset – as its research strategy and it relies on a process of knowledge integration (Isgren et al., 2017). In this regard, the project yearned for adopting multiple approaches without losing their distinctive ontological, epistemic, theoretical, and methodological features (Olsson & Jerneck, 2018). Therefore, a multidimensional analytic framework (MAF) has been adopted. The multidimensional analytic framework is articulated in five components – each relying on a set of specific concepts and

methodology – and three cross-cutting elements, as shown in Figure 2. It also shows how the components relate to the above-mentioned research foci and units of analysis.

**Figure 2 – Overview of the multidimensional analytic framework**




In the following subparagraphs, all the different components will be shortly described with their overall approach, the concepts and the methodology adopted. Two final sub-paragraphs will be dedicated respectively to a synoptic table, showing the main features of all the components together, and to the cross-cutting elements.

### 2.2.1 Socio-cultural component

***Domain of enquiry***

The socio-cultural component relies on the assumption that a territory – even an informal one as the CCT – is a form of social organisation. The component maps whether and in which way the socio-cultural changes associated with globalisation – such as migrations, technological advancement, financial flows, climate change, etc. – are provoking "stress" in the territorial organisation of the CCT. In this respect, the component interprets stress as a pressure to change for the territorial organisation, rather than as the psychological stress produced by socio-cultural factors. The component relies on a theory of the "stress-strain" element of social organisations (Bertrand, 1963), which is devised to analyse change and stability dynamics "in action" in a certain organisation, in our case in the CCT. The core of the theory is simple but insightful: when conflictual or contradictory needs, ideas or processes arise, processes of disorganization take place inducing stress on the organisation which therefore necessitates some sort of adjustment. At the same time, the theory helps us in understanding the stability (or resiliency) of the territorial organisation as all the organisations can tolerate a certain amount of stress. The component identifies the social forces that are exercising pressure at the structural level, the resistance to change – i.e. conflicts or strains generated as a response –, as well as change and stability dynamics in the territorial organisation.

***Concepts***

Stress-strains. The theory is based on the articulation of the "stress-strain" pair. Stress is an element inherent to the social structure in a given institutional or organisational field, that cannot be observed

per se but manifests itself in “strains” of different types such as conflicts, tensions, ambivalences, etc. Therefore, the “strains” can be interpreted also as the manifestation of the stress in action at the structural level.

Strain situation. This is the operational concept adopted for identifying and studying on an empirical base the stress-strain element in the CCT. Three main types of strain situations have been considered: situations of conflicts or disputes (both within and outside the territory), situations of impasses or contradictions, and situations of dependence and related uncertainty. The strain situations are therefore the unit of observation of this component.

Stress vector. It can be defined as a social process that activates stress in the territorial organisation. Stress vectors (or stressors) vary over a wide range of characteristics: for their origins, which can be either from within or from outside; for intensity, as some pressure to change can be stronger than others; for the duration, as some stress-strain can be temporary or contingent while other can be long-lasting in society; for their direction, as each stress vector pushes the territory in a certain direction of change.

Change, resistance to change and ambivalences. The dynamics of change, resistance to change and ambivalence in the CCT are described following four different dimensions of change: the territorial trajectory, by analysing continuities or ruptures; the territorial boundaries, by analysing the distinctiveness or alignments of the territory; the territorial governance by analysing endogenous or exogenous governance; by territorial symbols, analysing both territorial stigma and territorial myths.

***Methodology***

The analysis of stress-strain was based on a focus group mapping (or participatory mapping) of the strain situations in the CCT. The focus group was composed of local key informants who disclosed their local knowledge of the strain situations generated by a variety of globalisation-related factors. The data collected were transcribed and processed into a consistent set of strain situations. An analysis across all the mapped strain situations allowed us to identify stress vectors, recurring strains and change-stability dynamics characterising the CCT.

### 2.2.2 Socio-psychological component

***Overall approach***

The socio-psychological component studies the socio-psychological impacts of the closure of coal mines and carbon intensive industrial units, i.e., the decarbonisation process, on the lives of individuals living in the CCT. The component moves under the assumption that the economic, social, and political uncertainties caused by the closure of mines and coal-based industrial units may be a strong source of stress, uncertainty, and internal conflicts for the local population, as it not only constitutes an existential threat to their way of life and their primary source of livelihood but also it may turn out in a dissatisfactory relationship with the territory. The component investigates how place attachment is threatened by stress, uncertainties, and deprivation induced by the decarbonisation process, and what are the main coping strategies adopted by the citizens living in the different coal and carbon territories.

***Concepts***

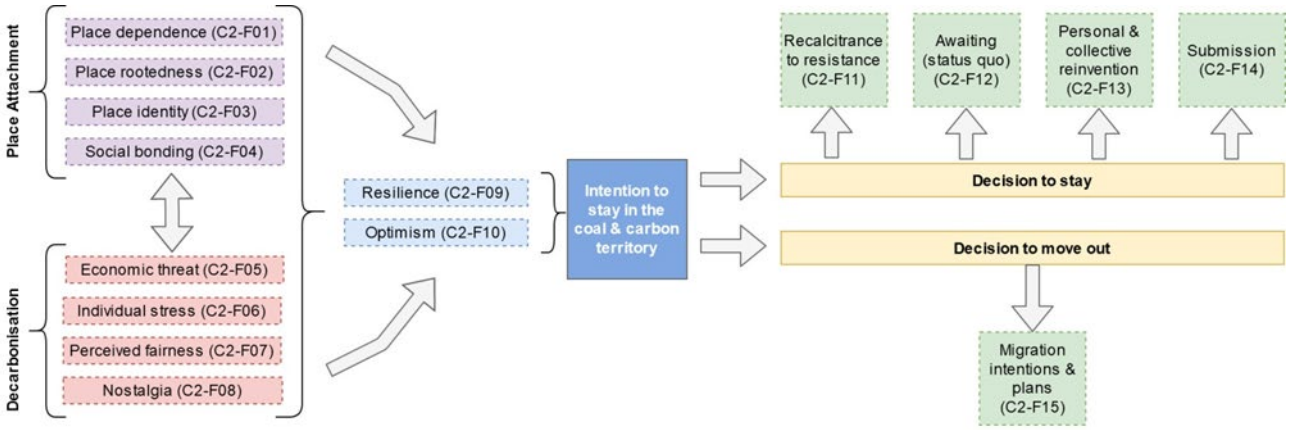
*Place attachment*. The concept of place attachment has been used by scholars to understand the bonds humans share with the physical environment. Leveraging on an integrated model of place

attachment (Raymond et al., 2010), the component articulates place attachment in four dimensions: a) place dependence, reflecting the functional dimension; b) place rootedness, reflecting the cognitive dimension; c) place identity, reflecting the symbolic dimension and d) social bondage, reflecting the emotional dimension. *Resilience*. The term resilience, in psychology, refers to positive adaptation in the face of stress or trauma (Luthar, Cicchetti & Becker, 2000). In the socio-psychological component, the study of resilience is used for achieving a more comprehensive understanding of the response adopted by individuals to the challenges faced by the citizens more directly exposed to decarbonisation in the coal and carbon intensive regions in transition.*EVLN approach*. The possible coping strategies of citizens are identified in this component based on the "Exit, Voice, Loyalty, Neglect" (EVLN) theory, initially proposed by Hirschman (1970) to study responses to decline in firms, organisations, and states (EVL theory). The theory affirms that when dissatisfaction is experienced in a relation – in our case in territorial belonging – there are a few possible and interrelated coping strategies from the individuals.

The above-mentioned concepts have been organised in a single model composed of several factors, organised in different areas, marked with a different colour in Figure 3.

Starting on the left, Place Attachment and Decarbonisation factors reflect how the two joint processes of deterritorialization and de-carbonisation are being perceived by the citizens inhabiting the CCT. On the opposite side of the picture, there are the outcomes, i.e., the dependent variables, that the model tries to explain. In the centre, resilience acts as a "moderator" as individuals with high resilience are more able to cope positively with decarbonisation-induced stress.

**Figure 3 – Overview of the factors in the socio-psychological model**




***Methodology***

The socio-psychological component was surveyed through a structured self-report online questionnaire consisting of 90 items representing 17 socio-psychological constructs (i.e. the different factors of the above-mentioned model). Most of these items and latent constructs are taken from other studies, where different researchers have applied and tested them in different contexts. All the items have been assessed by the respondent using scales.

### 2.2.3 Socio-economic component

***Domain of enquiry***

The socio-economic component focuses on structural change in the economy, i.e., the reallocation of economic activity across different economic sectors (Herrendorf, et al., 2014) and regions. Structural change can lead to a change in a region's economic, financial and demographic composition. The component is thus focused on a descriptive analysis of technological progress, demography, economic inequality, employment and economic activity based on various data sources over the last three decades. The socio-economic component focuses on the Labour Market Area but also relies on the other units of analysis as a reference and as a comparison.

***Concepts***

In the socio-economic component, ten different factors are taken into consideration. All the factors are investigated mainly from a quantitative perspective. The clean energy transition leads to structural change, which impacts the demography (C4-F01). Further, it has direct implications for the depletion of coal reserves (C4-F02), the expansion of alternative energy sources (C4-F03), direct employment and production (C4-F04) in the coal industry and carbon intensive industry, indirect employment and production (C4-F05) effects on other industries. Investments into the stock of capital (C4-F06) will respond to the regional economic development. Further, the clean energy transition can change economic inequality (C4-F07), energy security (C4-F08), technological progress (C4-F09) and migration patterns (C4-F10).

***Methodology***

For the socio-economic component, an extensive set of data was collected from national sources, mainly national statistical offices and Eurostat.

### 2.2.4 Socio-political component

***Domain of enquiry***

The component analyses the narrative battles for the interpretation of decarbonisation and energy transition in the Political Administrative Region of the case study. The component identifies which are the actors that are forming different “constituencies”: the constituency designing the transition, the constituency coping with the transition, or opposing the transition. Through analysing the narratives of such actors, the component investigates how the constituencies understand the benefits and losses from the decarbonisation process. Finally, the component shows the inclusion and exclusion dynamics resulting from technological change in the region.

***Concepts***

The socio-political component relies on the theory of *Technological Dramas* (Pfaffenberger, 1992). This approach understands technological shifts – such as decarbonisation – as technological dramas, i.e., a narrative battle among different actors to determine the meaning and implications of the technology. A technological drama is a discourse of technological “statements” and “counterstatements”, in which there are three recognisable processes: i) technological regularisation; ii) technological adjustment; iii) technological reconstitution. The three processes can be described as follows:

- *technological regularisation*, a design constituency tries to impose change, i.e., to appropriate the technological process so that its features implicitly embody the political aim of altering power relation
- *technological adjustment*, the impact constituency – the people who lose when a new technology is introduced or when a technological shift is ongoing – engage in strategies that try to compensate for the loss of social prestige or social power
- *technological reconstitution*, the impact constituency tries to reverse the meaning of the technology imposed through regularisation. Differently from technological adjustment strategies, the strategies related to technological reconstitution attack the foundation of technical regularisation, and activate a self-conscious "revolutionary" ideology aimed at producing a symbolic inversion and antisignification of the technological regularisation process.

***Methodology***

The socio-political component was based on a semantic analysis of public statements and counterstatements of different social actors about the energy transition and coal phase-out. The analysis was carried out at the level of the PAR and was focused on statements and counterstatements of key regional stakeholders in the public debate.

### 2.2.5 Socio-ecological and technical component

***Domain of enquiry***

The socio-ecological component provides an overview of the capacity available in the case study region to shape its decarbonisation pathway. The focus on transformative capacity allows us to discern how far a region is actually able to deviate from its current (carbon intensive) path toward sustainable outcomes.

Transformative capacity is understood in this context as an evolving collective ability to conceive of, prepare for, initiate and perform path-deviant change towards sustainability within and across the multiple complex systems that constitute the regional or urban area undergoing a clean energy transition (CET). As a systemic capacity, it is not attributable to any single actor but rather results from the interactions and orientations of multiple actors in the regional or urban economic development system involved in shaping its decarbonisation pathways. The diagnosis of transformative capacities thus enhances knowledge of key capacities hindering or facilitating purposeful transformation, ultimately permitting them to be addressed as part of capacity development activities.

***Concepts***

Transformative capacity is strongly influenced by the governance of the regional decarbonisation or clean energy transition in question. Three **governance and agency** components are critical to the ability of a regional development apparatus to foster the transformability of a system: the inclusiveness and multiformness of governance arrangements (C1); polycentric and socially embedded transformative leadership (C2); and the empowerment and autonomy of relevant communities of practice (C3). These elements are preconditions for the transformability of a system: there needs to be connectivity and responsiveness built into governance, effective leadership able to bring people together around a vision, and actors empowered to experiment and innovate. These

three attributes must be developed by stakeholders in capacity development processes to enhance their transformative potential, including enhancing understanding of the systems of which they are a part (C4), engaging in participatory visioning and alternative design scenarios (C5), experimenting with novel solutions to social needs (C6) and ensuring that these innovations can be embedded (C7). Ideally, this can be seen as a learning loop, where system(s) understanding helps inform visions and pathways, which in turn orient experimentation, with successful innovations being embedded and better system understanding resulting from this process. These processes should be fed back into governance through social learning (C8) as well as the effective involvement of actors at different scales (C9) and levels of agency (C10).[2]

***Methodology***

These components were assessed by way of mixed quantitative-qualitative interviews with various stakeholders engaged in the CET. The aim was to obtain and contrast differential stakeholder assessments of transformative capacities. A diverse set of stakeholders were interviewed, representing public, private, third and civil society actors. Respondents were asked to assess statements corresponding to each measure of transformative capacity according to whether and how much they agreed with or disagreed with the statements.[3] They were then asked to elaborate their answers in open follow-up questions, which were subsequently transcribed, coded and analysed.

### 2.2.6 Synopsis of the five components

The features of the conceptual side of the Multidimensional Analytic Framework are summarised in the synoptic table reported in Table 1.

**Table 1 – Synoptic table of the five components of the MAF**

| Component | Research focus | Unit of analysis | Domain of enquiry | Unit of observation | Methodology |
|---|---|---|---|---|---|
| **Socio-Cultural** | Territorial change | Coal & Carbon territory | Stress strains in the territorial organisation | Strain Situations | Focus group mapping |
| **Socio-Psychological** | Territorial change | Coal & carbon territory | Place attachment, decarbonisation, resilience and coping | Citizens | Online survey |
| **Socio-Economic** | Structural change | Labour-market area | Change in the socio-economic structure | The area as a whole | Quantitative data collection |
| **Socio-Political** | The clean energy transition | Political administrative region | Narrative battles to determine the meaning and "appropriation" of the energy transition | Statements & counterstatements | Text research |
| **Socio-Ecological & Technical** | The clean energy transition | Political administrative region | Capacity available in the region to shape its decarbonisation pathway | Multilevel system interaction | Semi-structured interviews |

2 For full elaboration of transformative capacity and its components, please refer to Wolfram (2016, 2019) and Wolfram et al (2019).

3 Possible responses were: 1 – completely disagree; 2 – somewhat disagree; 3 – neither agree nor disagree; 4 – somewhat agree; 5 – fully agree; don't know.

### 2.2.7 Cross-cutting elements

The three cross-cutting elements of the Multidimensional Analytic Framework, i.e. challenges, coping strategies and gender, are nurtured and can be better understood in the light of each and all the components of the MAF.

**Challenge:** In the case study we focus on the challenges faced by the CCT, i.e. from the perspective of the CCT. A challenge can be defined as composed of two elements: (i) a current situation (as the territory makes sense of it); (ii) the specific desired outcome(s) of a process intended to change that existing situation. Please note that a challenge is a social construct as the sense of the current situation only exists in a given social context (i) and that the outcome is desirable by the territory itself (ii). Depending on the state of awareness of the territory, the degree of clarity and definition of the challenges may vary a lot. In this respect, depending on the cases, the territorial challenge(s) may be rather vague or well structured (e.g. in the latter case also including indicators to assess the success in achieving the challenge).

**Coping strategy:** A coping strategy is defined here as the strategy adopted to cope successfully with a territorial challenge. For each challenge, there can be several coping strategies. Depending on the case, two or more coping strategies may be coordinated with each other, but also in contrast and competition with each other. A coping strategy can be articulated in (i) a vision or orientation for the territory; (ii) a set of actions undertaken to fulfil the vision.

**Gender dimension:** The gender dimension highlights how a challenge may affect differently men and women, and how gender differences might be relevant to the coping strategies adopted.

## 2.3 Activities

### 2.3.1 Desk research

The case study started with a desk research activity. The desk research was aimed at (i) delineating the case study across its three units of analysis (CCT, PAR, LMA); (ii) collecting relevant dates and basic information on the region; (iii) collecting information needed for the implementation of the five components (including, inter alia, also a stakeholder analysis at the PAR level). The desk research allowed analysing of a wide set of sources, including documents and reports, available data sets, previous research and studies, policy documents and others. The results of the desk research have been collected in a State of the Art Report.

### 2.3.2 Focus groups (socio-cultural component)

Focus groups (FG) support qualitative measurement on research issues in which an inter-subjective agreement is needed, and for those issues, different types of actors need to triangulate. The analysis focused on the territorial stress induced by globalisation in the CCT. As “territorial stress” is not directly observable, following the socio-cultural component guidelines, the focus group aims at mapping the “strain situations” (i.e. conflicts, impasses, etc.) and related impacts in the CCT.

The analysis focused on the territorial stress induced by mine closure and rapid decarbonisation policies introduced in the region of Horná Nitra. The participants were identified through the following steps. Firstly, a list of desired profiles for the candidates was drafted based on the key informants' types foreseen in the methodology, i.e. community leaders, knowledge keepers, and memory

keepers. Secondly, based on the previous research activities in the region and in collaboration with regional NGO platform Život po uhlí (Life after Coal) we shortlisted potential candidates and selected best representatives in each of the key informants' types. Thirdly, the candidates were approached to ask their willingness to participate. Fourthly, a regular communication was established with potential candidates to check the progress of the organisation and ensure the selection of the right mix for the group. Finally, all selected and agreed participants were present on the spot and ready and there was no need for the last-minute adjustments.

The focus group was conducted in person on February, 8th 2022 in Prievidza. It was composed of eight people. Among eight participants, three were female and five were male. In one case we had a participant with double professional affiliation (local museum manager and elected city council representative). Six out of eight participants were from town of Prievidza, which is the centre of the district and political and main industrial hub of the region. One was from town of Nováky and one from town of Handlová. Given the local context, we consider the composition of the FG optimal for the purpose of the research and the strain situation identified reflect well specifics of the area. At the same time, we make sure that the group is not too big, since it would prevent a chance for everyone to express herself.

After the focus group discussion had been conducted, the data collected were transcribed and processed by the research team. The processing included the following operations:

- Transcript of the focus group recordings
- Cleaning of the list of strain situations. We merged similar strain situations.
- Comparing information with our previous records and data – triangulation of the data from various sources.
- Collection of further information from additional sources. This was proven necessary when the focus group information didn't provide information sufficient for describing the strain situation for an external reader.
- Re-classification of the strain situation types, and related factors based on homogeneous criteria
- Describing the strain situation following the reporting template
- Synthesising the information collected in the territorial anamnesis (across phases and milestones) and the territorial interpretation (describing stigma, nostalgia, emerging visions, and territorial symbols)

### 2.3.3 Survey data collection process (socio-psychological component)

The survey was conducted using a structured self-report questionnaire consisting of 90 items representing 17 socio-psychological constructs. The design of the study was approved by the ethical committee of the CSPS, Slovak Academy of Sciences. Participation in the study was voluntary and anonymous. Data were collected by three external research agencies via an online survey on Qualtrics. The agencies offered incentives to participants that were consistent with local market conditions. Participants were informed of their right to remain anonymous and to withdraw from the

study at any time. Participants signed an informed consent form and were given general instructions on the purpose of the study, aspects of participation, and confidentiality.

A quota sampling method was used in a Slovak case study. The quotas were based on a 2021 Slovak census. In particular, we set quotas for geographical distribution, gender, education, and age distribution. However, given the required sample of 400 participants, the external research agencies collecting the data have found that they cannot meet all the criteria. Therefore, we have to reconsider the criteria and use only geographical distribution and age distribution quotas. Consequently, the final sample, which consists of 470 participants, deviates slightly from the educational and gender distribution of the total population of the Horná Nitra region.

Survey period was October 2021. At the time of data collection, Slovakia was taking strict measures to combat the second wave of the COVID-19 pandemic. For these reasons, it was not possible to collect data through face-to-face interviews (PAPI or CAPI methods). Therefore, the computer-assisted web interview (CAWI) method was used to collect primary data on the socio-psychological well-being and coping strategies of the general population in Horná Nitra. Data collection was conducted by three external research agencies (Datacollect.cz, European National Panel, 2Muse). The managers of these agencies contacted the people in the sample by sending an online invitation to participate in a survey hosted on Qualtrics. Responses were automatically recorded in the Qualtrics application.

### 2.3.4 Socio-economic data (socio-economic component)

Socio-economic data has been collected from national sources, in particular the national statistical office, but also firm-level data. Furthermore, Eurostat data has been used to provide an overview of the region's economic, financial and demographic composition based on a descriptive analysis. Sector-specific and region-specific peculiarities were located and processed. The data will be used further for the comparative analysis and the macroeconomic modelling and simulation in WP5.

### 2.3.5 Text analysis (socio-political component)

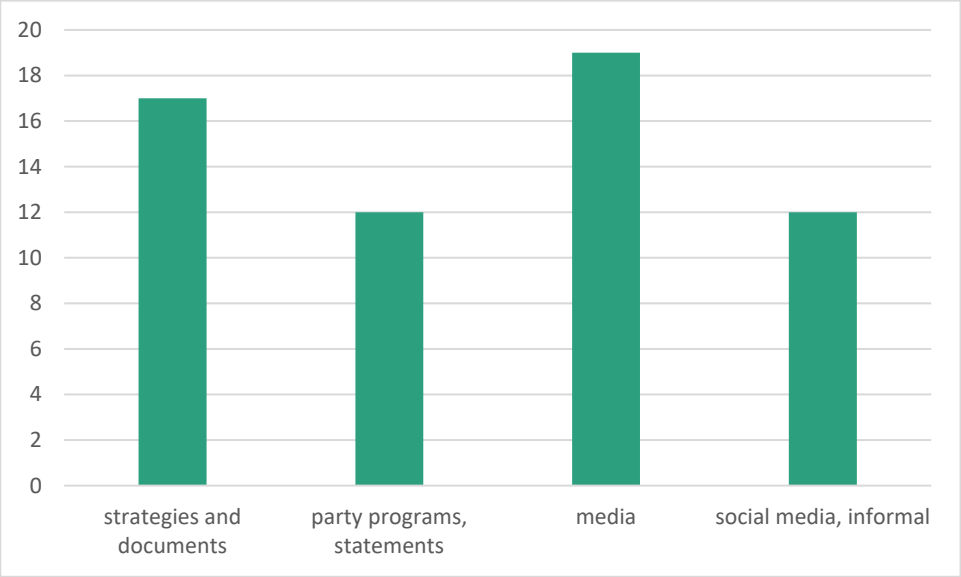
The unit of analysis for the text research method is the Political Administrative Region (PAR) in this case the Prievidza district with its towns Prievidza, Handlová and Nováky. Here are located the coal mining activities, coal-burning power plan and it is the place where most of the miners live. Stakeholders relate to the broader territorial frame, i.e. the Coal and Carbon Territory (CCT).

Employing the method of content text analysis we investigate five levels of sources in the following hierarchy:

- Strategies and official documents, which included government plans and strategies, work programmes, innovation & economic development plans, regional development strategies, action plan for decarbonisation, foresight studies.
- Regional and national newspapers, internet-based e-media.
- Statements, party programs, postings available online.
- Social Media such as Facebook, microblogs and forums.

Figure 4 shows the different types of sources for the text analysis and the number of articles for each class.

**Figure 4 – Types of sources for text analysis**




Note: The number of articles used to analyse local discourse, narratives and field of power is shown for each source type.

Source: own representation.

During the text analysis, we secured that almost the whole stakeholders' spectrum is represented in coded 60 texts. For the analysis, we used a software package for texts MAXQDA. We worked with deductive coding (concept-driven), which means that we start with a predefined set of codes, and then assign those codes to the data from texts. These codes came from 'factors' identified in the initial phases of the research. Then we developed a coding frame that represents the structure of the themes. Since the peak of the debate started with a discussion on the mine closure in 2016, we focused mostly on the period 2016-2021.

### 2.3.6 Semi-structured interviews (socio-ecological and technical component)

Mixed quantitative-qualitative interviews with various stakeholders engaged in the CET have been conducted. The aim was to obtain and contrast differential stakeholder assessments of transformative capacities. In total, 10 stakeholders were interviewed in person and by phone, representing public, private, science, non-governmental organisations and civil society actors. Respondents were asked to assess statements corresponding to each measure of transformative capacity.[4]

The selection of respondents took place in several rounds. we had to reconcile our needs with the willingness of selected actors to participate in our research. Our informant, who works in the region, played a key role. Although we tried to have a balanced list of stakeholders, we did not manage to secure all sectors. At the stage of preparing for the interview, we encountered the problem that the

[4] Possible responses were: 1 – completely disagree; 2 – somewhat disagree; 3 – neither agree nor disagree; 4 – somewhat agree; 5 – fully agree; don't know.

addressed actors refused to participate in the research, often for personal reasons. In the end, the number of respondents stabilized at 14, but due to unsatisfactory and incomplete records, we eliminated four respondents and we were left with a final number of 10 respondents. We were more successful in terms of gender balance. Among the respondents, there were five women and five men. The interviews period was February – April 2022.

### 2.3.7 Data reporting, interpretation and the case study report

The broad set of research activities carried out for the development of the case study implied an extensive data processing and reporting activity. For each of the above-mentioned components, a short report describing the data collection procedure as well as a dataset were produced. This will allow making the data collected available to the public in the future in accordance with the FAIR principles. All the data collected have been interpreted by the case study team with two complementary approaches: through a component-focused interpretation (see Chapters 2-4); in the light of a holistic understanding of the case (see Chapter 5). The results of such an interpretation are reported in the next chapter of the case study reports.

# CHAPTER 3

## ANALYSIS OF THE COAL AND CARBON TERRITORY

# 3 Analysis of the coal and carbon territory

## 3.1 Overview of the CCT region

### 3.1.1 Historical development

The key historical moment that defines the identity of the Horná Nitra was socialist industrialization based on Soviet models of modernization of the economy and society in the second half of the 20th century. The industrial base of the region complemented the chemical industry in Nováky and the footwear industry in Partizánske. After the Second World War, the industrialisation of Slovakia reflected by the development of the coal industry. The administrative and management structures of the mines were going through various stages. On 1 July 1965, the Coal and Lignite Mines were established as a holding company, to which the South Moravian Lignite Mines in Hodonín (now Czech Rep.) were also affiliated. In the early 1970s, after the new reorganization, the holding was transformed into the Coal and Lignite Mining Group. In addition to mining plants, it also covered special-purpose organizations focused on design, mining research, control automation, and later also the engineering base and construction works.

These huge investment projects were associated with extensive social mobility, urbanization and the development of transport infrastructure in the region. Prievidza and Partizánske also became administrative centres. The extensive industrialization of the region itself was preceded by the socialization and transformation of rural areas and agricultural production similarly based on the Soviet model. We will also mention the psychological aspect prevailing in the period of directive socialism: the profession of the miner had a special status until 1989 with higher wages than average wages and extra social benefits, recognition and ideological adoration of mining and miners by the regime and propaganda outlets. No less important historical moment can be considered the disintegration of the centrally planned economy and the application of the method of shock transformation of the economy in the early 90s with the abrupt change of ownership, deindustrialization, closure of business, negative social impacts, unemployment, migration.

After political changes, by decision of the government, at the beginning of 1993, Slovak Coal Mines were divided into seven separate entities. In 1996, the transformation of a state-owned enterprise into a joint-stock company took place. As of June 30, 1996, the state enterprise Hornonitrianske bane was transformed, and on July 1, 1996, the National Property Fund of the Slovak Republic established the joint-stock company HBP (Hornonitrianske bane Prievidza).

In the following period government issued a decision on the privatization of 97 % of the shares of HBP in favour of the acquirer – an employee-joint-stock company. Recently and partly driven by foreseen closure of the mining, HBP started with the diversification of activities and opening new businesses in agriculture and construction.

There are several factors leading to the decision to close the mines by 2023. The state subsidises mining of lignite with surcharges provided to Nováky Power Plant, a thermal power plant, owned by Slovenské elektrárne. The subsidies are increasingly unpopular and are disputed by experts and the public. The rising price of emission trading permits (under Emission Trading System) and evolving emissions norms and investments in “Best Available Techniques" and "Best Available Techniques Not Entailing Excessive Costs" will further undermine the present economic model. There is

decreasing support for the continuation of the subsidy system among the coalition and opposition parties. Phasing out coal has support from part of the local municipalities and business community. The Slovak Republic will have, after the completion of two new blocks of nuclear power plant Mochovce and after increasing their share of RE (obligation affiliated with EU 2030 climate targets), surpassing the current energy produced and continuing the combustion of coal in Nováky Power Plant would be increasingly costly, inefficient, and obsolete.

### 3.1.2 Ecological and environmental situation

The development of industry and the extraction of mineral resources have made the region a highly polluted area. There are negative trends in many key environmental indicators. More than 55 % of the population lives in areas with severely impaired environmental quality. If we look specifically at the water – according to the degree of contamination, we find in the 3rd groundwater quality class as much as 45 % in the Prievidza area, 16 % in the Handlová area, up to 83 % in the Nováky region, and 71 % in the Bojnice area.

The quality of the environment is of increasing concern among the population and is a basic and necessary precondition for the implementation of the development plans in tourism and post-industrial development. The most important pollutants in the atmosphere are sulphur oxides (SO2), nitrogen oxides (NOX), carbon monoxide (CO), hydrocarbons, organic substances, and particulate matter (PM), which are mainly related to large industrial sources (energy, chemical industries). The region of Prievidza is the region most heavily loaded with emissions of solid pollutants in Slovakia. The region is also exposed to extraordinary negative values on the first strides of national statistics in other emission issues (sulphur dioxide, nitrogen oxide, carbon monoxide). Since the stability of the area is heavily influenced by mining activity and since the region faces problems associated with slope deformations, the management of undermined areas and (former) mining areas and facilities is an inevitable question for future investment.

The Nováky power plant was the second largest producer of sulphur dioxide and nitrogen oxide emissions in 2016 and the third largest producer of solid pollutant emissions in the Slovak Republic. Another major source of air pollution in the region is the chemical plant FORTISCH located in Nováky, producing chemical products made from PVC. The plant is among the five biggest producers of solid pollutant emissions in the country. The region of Prievidza is thus ranked among the regions of the Slovak Republic producing the most emissions of basic pollutants and, in particular, sulphur dioxide (in 2016, the second largest producer behind the Košice region) and nitrogen oxides (the third largest producer behind Košice and Bratislava in 2016). Yet, compared to the previous year, this is a fundamental decline.

## 3.2 Socio-cultural component

### 3.2.1 Summary of results

***List of the strain situations mapped***

A total of 18 strain situations (indicated by ≈) were mapped in the focus group. A list of the strain situations and related features is provided in Table 2, classifying each strain situation with respect to (a) type of the situation; (b) areas of change c) stress factors; (d) space; (e) time when it occurred.

**Table 2 – List of the strain situations mapped**

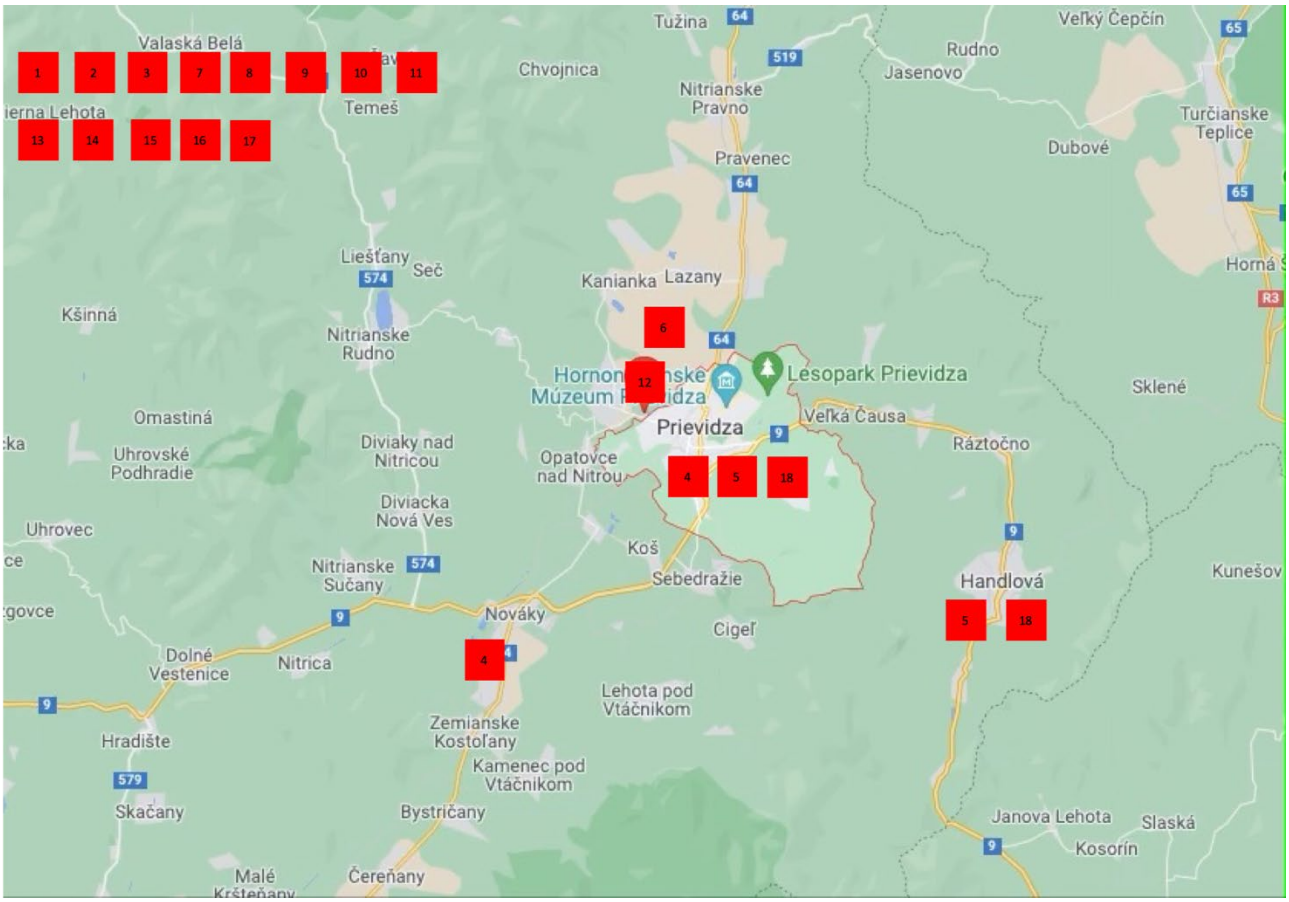
| ♒ | Name | Type | Area | Factors | | Geo | Time |
|---|---|---|---|---|---|---|---|
| | | | | 1st | 2nd | | |
| 1 | Local capacities for change | Endo conflict | Multiple- | F09 | F07 | Horná Nitra | 2010s |
| 2 | Mining company capture over funds | Endo conflict | Finance- | F11 | - | Horná Nitra | 2020s |
| 3 | High speed motorway to Trenčín | Exo conflict | Finance- | F09 | - | Horná Nitra | 2019 |
| 4 | Future of central heating | Endo conflict | Finance- | F09 | - | *Prievidza, Nováky* | 2022 |
| 5 | Structural unemployment | Exo conflict | Ethno- | F01 | - | Prievidza, Handlová | 1990s |
| 6 | Conflict over tourist industry | Dependence | Multiple- | F09 | F10 | Bojnice | 2000s |
| 7 | Administrative bottleneck of investments | Exo conflict | Finance- | F09 | F10 | Horná Nitra | 2018 |
| 8 | Absorption capacities for funds | Endo conflict | Multiple | F09 | - | Horná Nitra | 2004 |
| 9 | Discrepancies between needs and funding | Exo conflict | Multiple- | F09 | F11 | Horná Nitra | 2004 |
| 10 | Weak social care system | Exo conflict | Ideo- | F14 | - | Horná Nitra | 1989 |
| 11 | Demographic decline | Impasse | Ethno | F02 | F01 | Horná Nitra | 1990s |
| 12 | Local landlords | Endo conflict | Finance- | F11 | - | Prievidza, Bojnice | 1990s |
| 13 | Conflicts over agricultural land | Dependence | Ideo- | F14 | - | Horná Nitra | 1990s |
| 14 | Decreasing attractiveness of the region | Endo conflict | Multiple | F07 | - | Horná Nitra | 1990s |
| 15 | Global and regional competition for SMEs | Exo conflict | Finance- | F11 | - | Horná Nitra | 2000s |
| 16 | Conflicts related to distribution of funds | Endo conflict | Multiple- | F09 | F10 | Horná Nitra | 2018 |
| 17 | Social inclusion underestimated | Exo conflict | Ideo- | F14 | - | Horná Nitra | 1989 |
| 18 | Roma ethnic minority integration | Endo conflict | Ideo- | F14 | - | Prievidza, Handlová | 1989 |

Note: The factors refer to the socio-cultural factors, dynamics and patterns identified by the ENTRANCES project in Deliverable 1.2. The symbol ♒ stands for strain situations.

Source: ENTRANCES Focus Group Discussion.

All four types of strain situations have been identified and mapped in Horná Nitra. It is however in many cases difficult to draw a clear-cut demarcation line, as many of the conflicts, disputations and tensions have multiply reasons and are dependent on intertwined internal and external factors. To address this problem, the strain situations have been assigned to one type or the other with a criterion of prevalence, where some of them fit with two or more types.

Figure 5 – Distribution of the strain situation in the geographical map




### *Distribution of the strain situations in the time map*

Table 3 shows the starting year of the strain situations mapped, and the duration of the strain situation. Phases in the process, strain situations and duration below summarise starting years of the strain situations mapped, and the duration of the strain situation. No strain situation was mapped in the period prior to 1989 and all strain situations, in the context of our exercise, belong to phases 5, 6, 6 and 8. These all the strain situations mapped cannot be considered over, and are still openly or latently present in the Coal and Carbon Territory.

**Table 3 – Phases in the process, strain situations and duration**

| Years | Phase | Strain Situation | Duration (years) |
|---|---|---|---|
| **1945-1989** | | No strain situation mapped started in this period | 44 |
| **1989-1996** | 2. Economic transformation | 1990s: Decreasing attractiveness of the region (≈14) | 33 |
| | | 1990s: Structural unemployment (≈5) | 33 |
| | | 1990s: Social inclusion underestimated (≈17) | 30 |
| | | 1990s: Roma ethnic minority integration (≈18) | 25 |
| | | 1990s: Weak social care system (≈10) | 25 |
| **1995 – 2018** | 3. Relatively stable mining operations | 1999: High speed road to Trenčín (≈3) | 23 |
| | | Mid1990s: Demographic decline (≈11) | 25 |
| | | Mid1990s: Local land lords (≈12) | 20 |
| | | Mid1990s: Conflicts over agricultural land (≈13) | 15 |
| | | Global and regional competition for SMEs (≈15) | 10 |
| | | 2000s: Conflict over tourist industry (≈06) | 10 |
| **2018 – 2022** | 4. The coal phase-out | Local capacities for change (≈01) | 4 |
| | | Future of central heating (≈04) | 3 |
| | | Mining company capture over funds (≈02) | 4 |
| | | Administrative bottleneck of investments (≈07) | 4 |
| | | Absorption capacities for funds (≈08) | 4 |
| | | Conflicts related to distribution of funds (≈16) | 4 |

Note: The symbol ≈ represents strain situations.

Source: ENTRANCES Focus Group Discussion.

### 3.2.2 Interpretation

#### *i) Stress vectors*

For each of the factors considered in the research, which identifies a class of possible stressors in the territory, a set of specific stress vectors, i.e. actual change process producing stress in the territory, can be identified by examining the strain situations mapped. While the strain situations have been represented using the "strain" symbol (≈), the stress vectors will be coded in progressive order and marked using another special symbol (↗).

**Planning, activities and resources for change.** The strain situations ≈01 and ≈02 emerging are dated back to the second half of the 2010s, when first plans to close mining operations were announced and the state with the support of the EU started with the allocation of the funds for transformation. These strain situations create nexus with vectors that can be called vectors of change have been identified ↗01 *Activities in diversifying its operation and lobbying for funding.* The mine company management has been very active in diversifying its operation and they actively lobby for funding, while other stakeholders have the impression, that such concentration of funds for the company is unfair. Similar activities can be dated back to the beginning of EU funding in the 2010s. From the perspective of stakeholders, particularly NGOs representative, the rules that are governing spending of funds and implementation of projects are too complicated and too demanding for

administration. It was said, that sometime 50 % of the whole time spend in the project is filled with administrative reporting, and financial reporting to the authorities. This situation (as perceived) thus may result to lack of incentives and discouragement of potential applicants and final users to apply for the EU funding.

**Transfiguration of economic setting.** The vector of change identified ↗02 *Disintegration of economic setting and creative destruction* relates to the disintegration of the centrally planned economy and the application of the method of shock transformation of the economy in the early 90s with the abrupt change of ownership, deindustrialization, closure of business, negative social impacts, unemployment, migration. The key historical moment that defines the identity of the Horná Nitra was socialist industrialization based on Soviet models of modernization of the economy and society in the second half of the 20th century. The industrial base of the region complemented the chemical industry in Nováky and footwear industry in Partizánske. These huge investment projects were associated with extensive social mobility, urbanization and the development of transport infrastructure in the region, towns of Prievidza and Partizánske also became administrative centres. The extensive industrialization of the region itself was preceded by the socialization and transformation of rural areas and agricultural production similarly based on the Soviet model. These facts create the strain situations ≈ 11,≈ 13, ≈ 14. It is also important to mention the psychological aspect prevailing in the period of directive socialism, which is that the profession of the miner had a special status until 1989 with higher wages than average wages and extra social benefits, recognition and ideological adoration of mining and miners by the regime and propaganda outlets. All these factors have significantly contributed to today's nostalgia. Despite destruction, this situation has created at the same time a window of opportunity for the region and its economy.

**Absorption capacity.** It is a fact, that the Horná Nitra region is below the Slovak average in terms of absorption of financial assistance from cohesion and EU structural funds corresponding to strain situations ≈3, ≈7, ≈8, ≈16. In the years 2007-2015, the total amount of regional projects from EU funds was 4.8 billion EUR, while in the Horná Nitra region this amount was 144 mil. EUR. Besides that, the main beneficiary was the public sector, which also means low absorption of EU funds of the private sector. In the area of entrepreneurship and innovation, technical support in the region needs to be improved as well as assistance in drawing on financial support instruments whether EU or national funds, thus improving the absorption capacity of these funds on the private sector and increasing the innovative activity of enterprises. Vector of changed identified forming a nexus to these strain situations is ↗03 *Towards the better 'tailored' and utilized funding*. From the perspective of stakeholders, particularly NGOs representative, the rules that are governing European funds and implementation of projects are too complicated and too demanding for administration. This vector of change thus relates to potential improved and new design of incentives and rules for potential applicants and final users to utilize the EU funding.

**Welfare.** Strain situations ≈5, ≈10, ≈17,≈18 relates to the 1990s with the economic restructuring and its consequences. Social assistance which allows people in situations of job loss and material deprivation to receive substitute resources from the state in the form of services and benefits is by experts considered inadequate for people to cope with various adverse life situations. The allowances provided within this system are financed directly from the state budget, however, plethora of specific conditions must be fulfilled for obtaining a particular allowance. Widespread unemployment in certain areas, demographic changes and continuing economic and financial

restructuralisation create challenges for social welfare. In addition, austerity measures, related to economic problems, also in the region of Horna Nitra, results in the rise of social insecurity. At the same time, poverty-stricken population and especially ethnic Roma population, have been considered as free riders in the welfare and as people who intentionally scrounge, while avoiding to work. We identified the vector of change ↗04 which is called *on a spiral from social security to insecurity and back.* It relates to the number of activities carried out and measures taken by the central and local governments as well as non-governmental organizations, to mitigate the adverse consequences of strain situations, namely concerning the loss of jobs and integration of ethnic Roma into the society. This vector of change conveys the need to fix a disproportion between the seriousness of the social situation and the policies that should address social problems.

**Competition and competitiveness.** Origins of the strain situations 〰4, 〰6, 〰12, 〰15 can be dated back to the 2010s. This conflict is generated by competition over limited resources and markets. Based on FG discussions we have identified a vector of change ↗05 *sectoral and inter-sectoral competition and conflict with regards to the development of new economic structures.* There was e.g. noted conflict between tourist public industry - facilities owned publicly by the region or town - and private tourist investment and also between tourist industry as such on the one hand and environmental protection on the other hand. Inter-sectoral and intra-sectoral competition also pertains the operation of small and medium-sized companies where there are more than 6,500 registered. The most important production branches of the region are automotive, engineering, electrical engineering and electronics industry, chemical industry. While the general situation in the labour market was prior to the COVID-19 pandemic and according to macroeconomic indicators positive, however, there were various structural and institutional barriers to increasing employment in the region and in Horná Nitra SMEs. Transformation of the region and phasing out coal will most likely prolong anxieties along the lines of already existing tensions and structural problems such as structural unemployment, low purchasing power affecting upon the market, or increasing demands on the workforce.

### *ii) Stress-strain*

**Conflict and disputes.** Major conflicts in the territory are, generally speaking, generated by competition over limited resources. Some projects and development funding can enhance both inter-sectoral and intra-sectoral competition. There was e.g. noted conflict between tourist public industry, facilities owned publicly by the region or town, and private tourist investment and also between tourist industry as such and environmental considerations (〰06). Some stakeholders, however, are afraid that the services sector, especially the tourist industry, has a relatively limited potential (〰14). The region has an advantage in comparison with most other regions of Slovakia in the form of available agricultural land, which is not so fragmented and is under the great control of the Slovak Land Fund. However, a large part of the land that would be suitable for agricultural activity cannot be managed because it is blocked by mining activity or former mining activity (〰13). Moreover, some of the stakeholders have considered that investments in human capital are more important than in infrastructure and suggested focusing on more diversified determinants in relation to the absorption of EU funds, not only on the strengthening of infrastructure (〰08).

**Impasses and contradictions**. While the replacement of the heat source after the finishing of mining activity is one of the main topics of the transformation of the Horná Nitra region, there is no clear direction how to go, yet. EU energy policy considers energy efficiency to be the best strategy,

as it meets economic, energy and environmental goals. The Slovak Republic is currently achieving efficiency targets in primary energy consumption, but there is a threat of not meeting the targets in final energy consumption (≈04). Another identified impasse is the administrative requirements regarding the EU funds utilisation. The rules that are governing the spending of funds and implementation of projects are too complicated and too demanding for administration. It was said, that sometimes 50 % of the whole time spend on the project is filled with administrative reporting and financial reporting to the authorities. This situation as is perceived by stakeholders thus may result in a lack of incentives and discouragement of potential applicants and final users to apply for the EU funding (≈07). One of the main impasses and contradictions identified is the integration of the ethnic Roma population. Despite the number of activities carried out and measures taken by the governments as well as non-governmental organizations, to help the Roma, it has not been possible to ensure sufficient integration of the Roma into society. This results in this strain situation we call Roma ethnic minority integration (≈17, ≈18).

**Dependence and uncertainties**. The future of the region is seen as dependent on central authorities and funding both from the state and EU funds (≈01, ≈08, ≈09). Moreover, some stakeholders, are afraid that the suggested new design of the region's economy, based primarily on SMEs and the services sector affiliated especially with the tourist industry has a relatively limited potential (≈14). Plans to close mining operations from the beginning are connected to the central decisions and funding with the support of the EU funding (≈02).

**Strategies for coping with territorial stress**. Despite all the strain situations ongoing in the area, we can identify several coping strategies. One is the vision of further development of small and medium-sized companies, while the most important production branches of the region are supposed to be automotive, engineering, electrical engineering and electronics industry, and chemical industry. Alternatively, this vision looks up at the services sector affiliated especially with the tourist industry as the new potential of the region. We also identified as a possibility a strategy based on a general enhancement of the human capacities of the region. This may include regional leadership, sharing knowledge and opportunities gleaned through engagement across multiple sectors. External assistance may focus on building and developing of the local capacities, providing external know-how and knowledge for the key local stakeholders. It also may include coordination of programs to increase resources and deliver maximum impact, supporting networks and engaging in a wide-range of regional forums to build the region's capacities.

### *iii) Identity dynamics and ambivalence*

The stress-strain element of the territorial organisation presented above can also be interpreted as a challenge to territorial identity leading to territorial ambivalence, i.e. as the co-presence of opposed, conflicting or contradictory feelings, interpretations and desires about what the territory is and what it is meant for. We will present identity dynamics and ambivalence by leveraging on principles of individual identity singled out by Breakwell in the Identity Process Theory, i.e. continuity, distinctiveness, self-efficacy and self-esteem. With an analogy, these concepts are used here to describe Identity dynamics and ambivalences ongoing at the territorial level.

**Continuity and rupture**. Territorial trajectory is anchored between continuity and discontinuity. Territorial dynamics refers to a change in intensity in time of a given phenomenon and patterns relate to some type of social action which are repeated in time within the territory.

There is a potential marginalisation of the region. With general deindustrialisation, phasing out of mining, the processes of decarbonisation and demographic changes (low population growth and outmigration) it is argued that the region lose its previous importance and vitality. There is perceived discontinuity related to a decrease in human capacities and depopulation. With the deindustrialisation and decarbonisation, there is a notable trend of outmigration, especially of the younger population and economically active population. The age composition of the population is viewed as inadequate for the needs of the territory.

Some fears can be called social inclusion deficiencies. It is perceived that a weak welfare system and lack of integration of ethnic minorities such as Roma can contribute to the loss of social harmony and instigate social problems in the region. There is also a fear of job losses, which represents a strong rupture factor. It is perceived that the newly emerging SMEs sector and tourist industry, from a long-term perspective might not be able to replace employment opportunities and jobs lost by the processes of decarbonisation. At the same time, there are apprehensions that very low purchasing.

**Distinctiveness and alignment**. The boundaries oscillate between resistance to change and change in the attributes that characterize the region. There is a vision of further development of small and medium-sized companies and the development of tourism and spa sectors. 6,500 registered SMSs are located in the region and the most important production branches of the region are supposed to be automotive, engineering, electrical engineering and electronics industry, chemical industry. Tourism & spa sector: a vision looks at the services sector affiliated here, especially with the tourist industry as the new potential of the region. The region's tourist main attractions are concentrated in a small area and the tourist symbol of the region is the neogothic castle Bojnice. Future potential thus might be seen in wellness and spa tourism.

**Self-esteem and Stigma**. Symbolically, the Horná Nitra region is relatively affected by territorial stigma. It must be noted that the stigma presented here does not have such a decisive power over the interpretation of the region, albeit it has been both openly and latently present in the discourse on Horná Nitra regarding the process of decarbonisation. The feature of such territorial stigma identified during the focus group is highlighted below. Features of territorial stigma:

Obsolete economy stigma. The territory is perceived as a region with an outdated inefficient economy, and a mining industry, that does not provide ample opportunities for the rise of modern technology and modern business, including the service sector.

Environmental stigma. The territory is connected with an intensive mining industry and the pollution stemming from it, including environmental and health damages. It is believed that there are adverse impacts of the polluted environment on the health of the population.

Depopulation stigma. The territory is viewed as characterised by social disintegration, outmigration and a low birth rate. It is viewed as not attractive for young people to live in the region, with few opportunities for leisure, entertainment but also few educational opportunities. This is reported to be a negative image for the territory and the inhabitants.

Stigma is reinforced internally and externally. The territorial stigma presented above is produced and reproduced both by the inhabitants of the area and by external actors. The new symbols might be affiliated in Horná Nitra especially with the tourist industry, and with SMEs, which are the new

potential of the region. The region's tourist main attractions are concentrated in a small area and the tourist symbol of the region is the neogothic/romantic castle Bojnice.

### 3.2.3 Gender dimension

The identified strain situation affects the whole population of the region, both women and men. As is true in most of the social phenomena, the impact of these strain situations definitely has its gender dimension. Given the fact, that men are mostly breadwinners, the loss of jobs socially and psychologically affects primarily males, related primarily to strain situations (≈14, ≈5, ≈17, ≈10). However, women experience secondary consequences of these strain situations. Working positions and jobs of women can be also secondarily threatened by the closing of the mining industry. In coping strategies, there is a window of opportunities for women, in the service sector, particularly in the expected development of the tourist industry, despite the negative consequence of stress (≈06, ≈08).

## 3.3 Socio-psychological component

The transformation of the energy system and the decarbonisation process are expected to have a noticeable impact on the socio-psychological wellbeing of the inhabitants of coal and carbon intensive regions across Europe. In this component, we have measured the long-term and short-term impacts of the decarbonisation process on the socio-psychological wellbeing of the people and de/re-territorialisation of the affected regions. It can provide crucial support to policymakers and investors, helping them to make informed decisions on immediate and appropriate measures and actions to retain the population and maintain the demographic, social and economic configuration of these regions, while achieving a sufficient level of decarbonisation in the coming decades.

Our main objective is to measure socio-psychological stress challenged by the ongoing decarbonisation process in the general population of the territories, i.e. in the Coal and Carbon Territory (CCT). Through a quantitative survey, the project aims at creating new knowledge about the impact of different decarbonisation policies implemented in the CCT on people's socio-psychological well-being and their coping strategies to deal with this transition.

### 3.3.1 Summary of results

***Profile of respondents***

The target population was the residents of the two districts of Prievidza and Partizánske located in the Slovak administrative region of Trenčín. In particular, we wanted to focus on the adult population directly or indirectly affected by the ongoing decarbonisation process. In order to determine the level of socio-psychological stress and well-being of all major population in the region, we aimed to collect data from at least 400 respondents.

The most serious direct impact of the decarbonisation process may mostly concern three coal mines located in the Horná Nitra region. As stated before, a significant part of the HBP production is sold to the coal-fired power plant Elektráreň Nováky owned by Slovenské elektrárne a.s. Importantly, the two active mines as well as the Elektráreň Nováky power plant are located in the Prievidza district. The Partizánske district, in turn, could suffer mainly from the indirect effects of the decarbonisation process. For these reasons, we decided to set as a criterion that the study sample should consist of about 80 % citizens of Prievidza district and 20 % citizens of Partizánske district.

Apart from the criteria of district proportions, we wanted to obtain responses from a sample that corresponds to gender, age, and education level of the entire adult population of the region. Therefore, the following criteria were established based on the data of the 2021 Slovak population census:

- 51 % women and 49 % men
- 15 % with elementary education, 35 % with high school without final exam completed, 35 % with high school with final exam, 15 % with university degree
- 24 % being 15-39 years old, 35 % being 30-49 years old, 24 % being 50-64 years old, and 15 % being more than 65 years old.

**Table 4 – Socio-demographic profile of respondents**

| Sample Size | 470 Complete cases | | | | | | |
|---|---|---|---|---|---|---|---|
| **Gender** | Males (150, 31.9%) | | | Females (320, 68.1%) | | | |
| **Age** | 18-30 (109, 23.2%) | | 31-45 (169, 36%) | | 46-65 (162, 34.5%) | | 65+ (30, 6.4%) |
| **Education** | Primary (14, 3%) | | Secondary (310, 66%) | | University (146, 31.1%) | | |
| **Occupation** | Industry (121, 25.7%) | Agriculture (10, 2.1%) | Services (149, 31.7%) | Public Servants (58, 12.3%) | Unemployed (46, 9.8%) | Retired (70, 14.9%) | Inactive (16, 3.4%) |
| **Working in Carbon Industries** | Yes (15, 3.2%) | | | | No (455, 96.8%) | | |
| **Worked in Carbon Industries** | Yes (34, 7.2%) | | | | No (436, 92.8%) | | |
| **Marital Status** | Never Married (103, 21.9%) | With Partner (105, 22.3%) | Married (195, 41.5%) | | Divorced/ Sep. (53, 11.3%) | Widowed (14, 3%) | |
| **Living with dependents** | Yes (204, 43.4%) | | | | No (266, 56.6%) | | |
| **Nativity** | Born in Horná Nitra (393, 83.6%) | | Born in other province (69, 14.7%) | | Born outside country (8, 1.7%) | | |
| **Duration of Stay** | 0-5 years (12, 2.6%) | | 6-10 years (11, 2.3%) | | 11-20 years (26, 5.5%) | 20+ years (421, 89.6%) | |

Note: Number and corresponding proportion are provided. Rounding ensures that the numbers in per centadd up to 100 % in each row.

Source: ENTRANCES survey data.

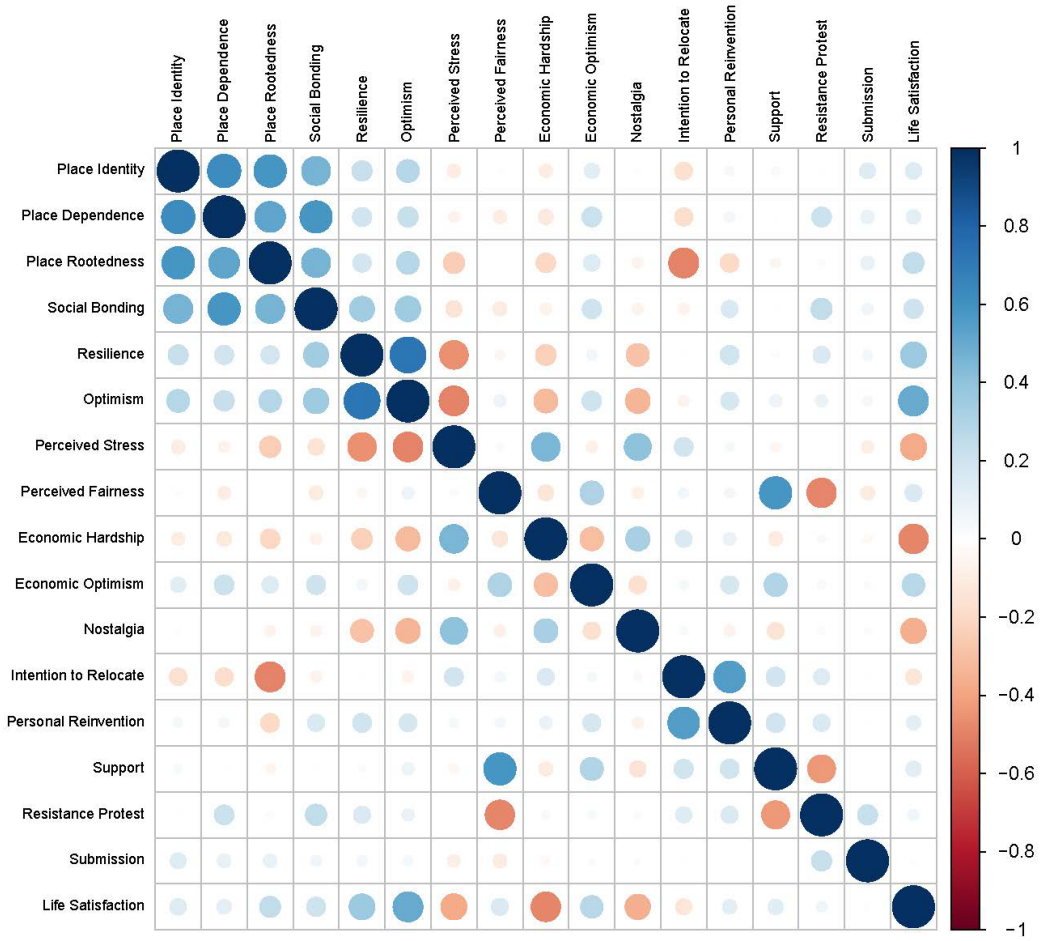
### 3.3.2 Interpretation

***Correlation between different factors related to the socio-psychological component***

In the case study of Horna Nitra, we found a strong positive correlation between the different elements of place attachment, especially place identity and place dependence. Similarly, we found a strong positive correlation between the factors “Resilience” and “Optimism”, which we used as moderators in this study. Both moderators are negatively correlated with the “Perceived Stress”

factor. In terms of coping strategies, there is a strong negative correlation between the factors “Support” and “Resistance and Protest”. Similarly, there is a strong negative correlation between the Perceived Fairness and Resistance and Protest factors and a positive correlation between the Perceived Fairness and Support factors, which is to be expected. The Resilience and Optimism factors have a strong positive correlation with the Life Satisfaction factor, indicating that individuals with higher levels of Resilience and Optimism also have higher scores on Life Satisfaction. On the contrary, Perceived stress and Economic hardship have a negative correlation with Life Satisfaction (Figure 6).

**Figure 6 – Correlation among different factors related to the socio-psychological component**




Note: Pearson's pairwise correlation is used to identify groups of highly correlated factors. It is used to select the factor so that our model can have the highest predictive power using as few factors as possible.

Source: ENTRANCES survey data.

### *Mean score with standard deviations for all constructs*

In the survey, we collected data on several aspects related to the socio-psychological well-being of the inhabitants of the Horná Nitra region facing the decarbonisation process. We collected information on the level of attachment to place (including place identity, place dependence, place attachment and social bonding), the level of resilience and optimism, the threats and impacts of

decarbonisation they face (including perceived stress, perceived fairness, economic hardship, economic optimism, and nostalgia), and the coping strategies used to cope with the adverse impacts of decarbonisation process (including intention to relocate, personal reinvention, support, resistance and protest and submission). All the information is collected with the help of 17 batteries of items in the questionnaire representing different constructs or latent factors. Table 5 below shows the average scores with standard deviation and Cronbach's Alpha for the different factors/The internal reliability coefficients of the scales we used in data collection generally show satisfactory values. Place rootedness has slightly lower internal reliability (α = .62) among the place attachments subscales, but it is still at an acceptable level. The Cronbach's Alpha of submission is the only coefficient that reaches a less than satisfactory level (α = .29). This might be partly due to the fact that only two items measure this coping strategy and it indicates that the meaning of this pair of items is not related closely enough.

**Table 5 – Mean score and standard deviations for all factors**

| Factors/ Latent constructs | Sub constructs | Mean score | Standard deviation | Cronbach's Alpha |
|---|---|---|---|---|
| Place Attachment | Place Identity | 3.99 | 0.71 | 0.93 |
| | Place Dependence | 3.22 | 0.92 | 0.90 |
| | Place Rootedness | 3.61 | 0.54 | 0.62 |
| | Social Bonding | 3.31 | 0.84 | 0.69 |
| Moderators | Resilience | 3.72 | 0.57 | 0.83 |
| | Optimism | 3.77 | 0.58 | 0.77 |
| Decarbonisation Impacts | Perceived Stress | 2.77 | 0.55 | 0.93 |
| | Perceived Fairness | 2.95 | 0.61 | 0.78 |
| | Economic Hardship | 3.17 | 0.89 | 0.86 |
| | Economic Optimism | 2.62 | 0.78 | 0.81 |
| | Nostalgia | 3.00 | 0.72 | 0.86 |
| Coping Strategies | Intention to relocate | 2.54 | 0.92 | 0.87 |
| | Personal reinvention | 2.74 | 0.88 | 0.77 |
| | Support | 3.24 | 0.97 | 0.91 |
| | Resistance and Protest | 2.70 | 0.74 | 0.82 |
| | Submission | 3.26 | 0.61 | 0.29 |
| Life Satisfaction | | 3.17 | 0.79 | 0.84 |

Note: The factor mean is the average of all respondents' scores for each construct. A mean score close to 5 shows a higher value for all constructs, and a mean score close to 1 shows a lower value for all constructs.This change has been made to make the answers more intuitive.Cronbachs' Alpha provides a measure of the internal consistency of a test or scale indicate (Cronbach, 1951); it is expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and, hence, it is connected to the inter-relatedness of the items within the test. The alpha score below 0.7 is not acceptable.

Source: ENTRANCES survey data.

Descriptive analysis of the survey data shows a strong sense of place attachment among Horná Nitra residents, particularly in place dependence (AM = 3.22, SD = 0.92), place rootedness (AM = 3.61, SD = 0.54) and social bonding (AM = 3.31, SD = 0.84). The average scores for resilience (AM

= 2.28, SD = 0.57) and optimism (AM = 3.77, SD = 0.58) as moderators of decarbonisation impacts are quite similar and at a moderate level. Horná Nitra residents scored relatively high on all dimensions of decarbonisation impacts. The good news is that the highest score was achieved on economic optimism (AM = 3.77, SD = 0.58), although it was followed by economic hardship (AM = 3.17, SD = 0.89). The lowest score among decarbonisation impacts was in the perceived fairness of the decarbonisation process (AM = 2.95, SD = 0.61). In terms of coping strategies, our respondents seem to be inclined towards the intention relocate (AM = 2.54, SD = 0.92), but also towards resistance and protest (AM = 2.70, SD = 0.74), and personal reinvention (AM = 2.74, SD = 0.88). Self-reported level of life satisfaction (AM = 3.17, SD = 0.79) was high in the sample from Horná Nitra region constructs.

### *Regional differences in mean factor scores*

A comparison of the mean scores of the different constructs at the EU level shows that people from Horna Nitra region have higher-than-average levels of perceived stress, which may be responsible for their low scores on resilience and optimism about the future of the energy transition compared to others (Table 6).

**Table 6 – Z score and STAN for all factors**

| Factors/Latent constructs | Sub-constructs | Z-score | STEN |
|---|---|---|---|
| Place Attachment | Place Identity | -0.27 | 4.96 |
| | Place Dependence | -0.18 | 5.14 |
| | Place Rootedness | -0.22 | 5.06 |
| | Social Bonding | -0.02 | 5.46 |
| Moderators | Resilience | -0.32 | 4.86 |
| | Optimism | -0.09 | 5.32 |
| Decarbonisation Impacts | Perceived Stress | 0.25 | 6.00 |
| | Perceived Fairness | 0.16 | 5.82 |
| | Economic Hardship | 0.13 | 5.76 |
| | Economic Optimism | -0.13 | 5.24 |
| | Nostalgia | 0.14 | 5.78 |
| Coping Strategies | Intention to Relocate | 0.34 | 6.18 |
| | Personal Reinvention | 0.49 | 6.48 |
| | Support | 0.15 | 5.80 |
| | Resistance and Protest | -0.07 | 5.36 |
| | Submission | -0.15 | 5.20 |
| Life Satisfaction | | -0.32 | 4.86 |

Note: The Z-score indicates how far from the mean a data point is, more technically it is a measure of how many standard deviations below or above the population mean a raw score is. The STEN score (Standard Ten) shows results using a simple standardized scale from 1 to 10 that have a normal distribution. They have a mean of 5.5 and a standard deviation of 2 and are then rounded to the nearest integer. To interpret the STEN scores, all case studies will focus on STEN scores below 4 (which should be interpreted as low compared to the case studies as a whole) and above 6 (the high scores). All STEN scores around 5 show that the case study is not very different from the other ENTRANCES case studies.

Sources: ENTRANCES survey data.

They have higher-than-average levels of Intention to relocate and personal reinvention. Conversely, they have lower-than-average levels of economic optimism for decarbonisation policies. Due to a higher-than-average level of nostalgia for their mining and industrial past, they have a lower-than-average level of life satisfaction.

### 3.3.3 Gender dimension

Gender is one of the important dimensions of our study. Descriptive analysis of the survey data shows that women have significantly higher levels of place identity and place dependence, demonstrating their higher level of place attachment compared to men. There is not much difference in the level of resilience and optimism between the two sexes. Similarly, both sexes have similar scores on the impacts of decarbonization policies. Women have significantly lower score for the support of decarbonisation policies. In contrast, women have significantly higher levels of life satisfaction than men (Table 7).

**Table 7 – Gender differences in mean score for all constructs**

| Factors/ Latent constructs | Sub constructs | Mean score | | T-test (df 504) | P-values |
|---|---|---|---|---|---|
| | | Men | Women | | |
| Place Attachment | Place Identity | 4.08 | 3.95 | 2.135 | **0.03** |
| | Place Dependence | 3.40 | 3.13 | 2.996 | **0.00** |
| | Place Rootedness | 3.63 | 3.60 | 0.647 | 0.52 |
| | Social Bonding | 3.38 | 3.28 | 1.111 | 0.27 |
| Moderators | Resilience | 3.71 | 3.72 | -0.297 | 0.77 |
| | Optimism | 3.71 | 3.79 | -1.490 | 0.14 |
| Decarbonisation Impacts | Perceived Stress | 2.73 | 2.73 | -0.900 | 0.37 |
| | Perceived Fairness | 2.99 | 2.98 | 0.817 | 0.42 |
| | Economic Hardship | 3.06 | 3.22 | -1.861 | 0.06 |
| | Economic Optimism | 2.71 | 2.58 | 1.625 | 0.11 |
| | Nostalgia | 3.01 | 2.99 | 0.102 | 0.92 |
| Coping Strategies | Intention to Relocate | 2.63 | 2.49 | 1.606 | 0.11 |
| | Personal Reinvention | 2.82 | 2.70 | 1.303 | 0.19 |
| | Support | 3.44 | 3.15 | 2.962 | **0.00** |
| | Resistance and Protest | 2.66 | 2.73 | -0.893 | 0.37 |
| | Submission | 3.28 | 3.25 | 0.542 | 0.59 |
| Life Satisfaction | Life Satisfaction | 3.05 | 3.22 | -2.195 | **0.03** |

Note: Mean-score indicates the mean score for all constructs. Mean score close to 5 shows higher value for all constructs and mean score close to 1 shows lower value for all constructs.

Sources: ENTRANCES survey data.

## 3.4 Conclusion

The descriptive analysis of the data from our survey shows a mixed picture. On the one hand, there is a strong sense of place attachment and dependence, nostalgia, and a tendency to perceive decarbonisation as an economic threat. The average scores also indicate a tendency towards a possible relocation, but also resistance and protest against decarbonisation. Nevertheless, the score in life satisfaction was relatively high, as was that for economic optimism. The scores for resilience and optimism as moderators of adaptation to the decarbonisation process were moderate. It also seems that people in Horná Nitra see decarbonisation as a fair and unnecessary protest, although responses to the open-ended question suggest that some of them have reservations about the way the process is being managed by the authorities. However, there is some variance in the profile of our respondents from the perspective of the constructs measured in the survey, and therefore, different segments or groups of participants may deal with decarbonisation differently or have different capacity to cope with it.

# CHAPTER 4

## SOCIOECONOMIC SITUATION

# 4 The socioeconomic situation

## 4.1 Introduction to the socio-economic situation

This chapter provides an overview of the socio-economic situation of the region. Important factors for economic development are population dynamics, labour force, capital stock and technological progress. We refer to the three different delineations of the region, namely the Coal Carbon Territory (CCT), Labour Market Area (LMA) and Political Administrative Region (PAR), as described in Section 2. The delineations correspond to the nomenclature units of territorial statistics (NUTS).

The socio-economic component focuses on structural change in the economy, i.e., the reallocation of economic activity across different economic sectors and regions. Structural change can lead to a change in a region's economic, financial and demographic composition. This report provides a descriptive analysis of technological progress, demography, economic inequality, employment and economic activity based on various data sources.

## 4.2 Determinants of economic development

An important indicator of economic development is real GDP per capita.[5] Real GDP per capita ($Y/N$) can be decomposed into three components, i.e. labour productivity (*Y/L*), employment rate (*L/E*) and share of population in working age (*E/N*):

$$\frac{Y}{N} = \frac{Y}{L} \times \frac{L}{E} \times \frac{E}{N} \quad (1)$$

where *Y* is real GDP, *N* population, *L* employed persons and *E* working-age population.[6]

Labour productivity (*Y/L*) depends on technological progress and capital intensity (Solow, 1956; Solow, 1957). On a sub-national level, there is no data available to analyze the capital stock for the CCT and LMA delineations. Gross fixed capital formation (GFCF) is only available for the PAR and country delineations. The PAR region exhibited higher gross fixed capital formation to gross value added (GVA) ratios from 2000 to 2005 compared to the country. The higher private investment rate in the region is part of the catch-up process observed after the reunification. In addition to private investments, also investments into the public capital stock influence the development of labour productivity. The public capital stock is important for the growth trajectory of a region (Baxter & King, 1993). Technological progress depends on research and development (Romer, 1990; Jones, 2005; Lucas Jr, 2009). Further, technological progress also depends on human capital determined through individual qualifications (Uzawa, 1965; Lucas Jr, 1988; Mankiw, et al., 1992).

The collapse of the centrally-planned economy was a turning point in the economic fortunes of many Slovak regions after 1989. State support to ineffective productions decreased. Many state-owned businesses were either privatized or closed. There was a rapid increase in unemployment rates in

5 Gross domestic product is not created to measure welfare. It measures the transaction value of goods and services over a specific period (see Eurostat 2014, p. 146). Other measures such as mortality, leisure and inequality show a high cross-country correlation with GDP (see Jones & Klenow 2016). Therefore, GDP is a good proxy for welfare despite its apparent shortcomings. Nevertheless, one should use various indicators to finally assess the welfare of a region (see Fleurbaey 2009).

6 The population in working age refers to the persons aged 15-64 years. Expected effects of legislated pension reforms will increase the participation rate of older persons in the future.

all Slovak districts outside Bratislava. The economic decline coincided with a significant drop in fertility rates in the 1990s. The abovementioned demographic developments resulted in (a) an overall decline in the total population, and (b) a change in the age structure of many Slovak regions, including Horná Nitra.

The Partizánske district is much smaller and its population is about one-third of the Prievidza district. The major employer in the Partizánske district (Rialto footwear) accounts for the low productivity. The footwear industry has to compete with other producers in low-wage countries. Declining unemployment rates have pushed up nominal wages in Slovakia in the last two years. Average nominal wages increased by 3.3 % in 2016 and 4.6 % in 2017. It is difficult to state the extent to which footwear production is sustainable in a period of rising labour costs.

The population of the Prievidza district declined by roughly 4,5 % since the year 2000 after it reached its peak in 1998 (in 1998 141,445 permanent inhabitants had dropped to 135,111 inhabitants by 2017). At the same time the national population remained relatively constant and EU28 population has increased by about 5 % (Figure 7). The population of the Partizánske district dropped from 48,596 to 45,967 (-5.0 %) in the same period. Hence, the region has faced a combined population decline in last two decades. Both low birth rates and high outmigration rates have contributed to the decline. As a result, the region already has a rapidly ageing population (Table 10). Young people were the first to out-migrate from the region. The process of ageing is likely to speed up in the next two decades. The average age of the population was, by two years, higher in the Horná Nitra region than in Slovakia in 2017. The gap is expected to widen to 2.5 years by 2035. The Forecast of Population Development in Slovak districts up to 2035[7] suggests that, if the abovementioned demographic trends continue, the population of the Prievidza district should further decrease to 129,638 (-4.1 %) and the population of the Partizánske district to 43,488 (-5.4 %) by 2035. Both the Prievidza and Partizánske districts should rank in the 10 Slovak districts with the oldest population by 2035.

The population forecast suggests that the age structure of the Horná Nitra region will undergo dramatic changes until 2040. The region will lose significant parts of its children (0-14 years) and prime age (24-54 years) populations. The share of the prime age population in the total population of the Prievidza and Partizánske districts stood at 45 % in 2017 (close to the Slovak average). The respective shares are expected to drop to 33.2 % and 31.2 % by 2040. The shares of the working-age population are expected to develop similarly in the Prievidza and Partizánske districts.

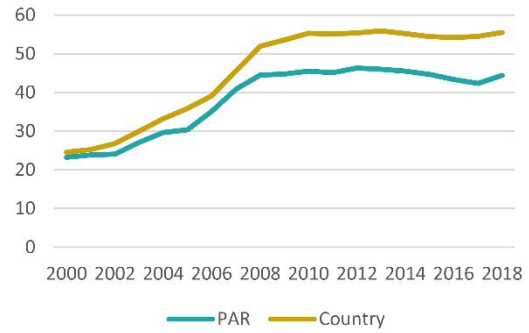
The shares of the elderly population (65 and over) in the total population were already higher in the Prievidza and Partizánske districts (18.6 % and 19.9 %) than the Slovak average (15.2 %) in 2017. Accordingly, the population in working age (15-64 years) has been decreasing in the CCT since 2014. At the EU28 level, the decrease in the last years is almost negligible, but projections indicate a fall in the working-age population (European Commission, 2021). The shares of the elderly population are expected to rise to 33.0 % and 34.9 % in the Prievidza and Partizánske districts respectively by 2040. The abovementioned shares are substantially higher than the Slovak average (26.6 %) in the same year. The forecasted demographic developments suggest that the Horná Nitra region might have to try and cope with a lack of labour force in the next two decades.

7 Šprocha, Vano & Bleha. (2013).

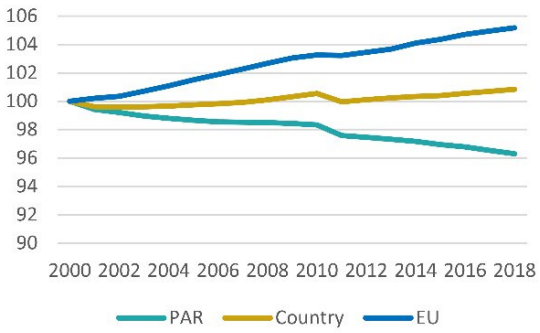
Key socio-economic variables indicate that the Horná Nitra region accounts for the below-average levels of social and economic development in Slovakia. The number of total businesses and foreign-owned businesses (per 1000 inhabitants) is much lower than the Slovak average. The gap in the businesses' intensity has always been skewed by high business intensity in the Bratislava region. The gap, however, widened significantly after 2008.

**Figure 7 – Economic overview**

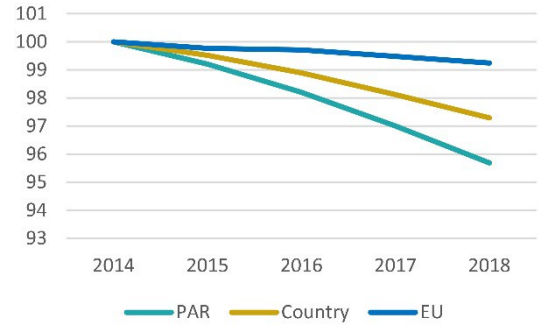
a) Labour productivity (*Y*/L) (EU28=100)



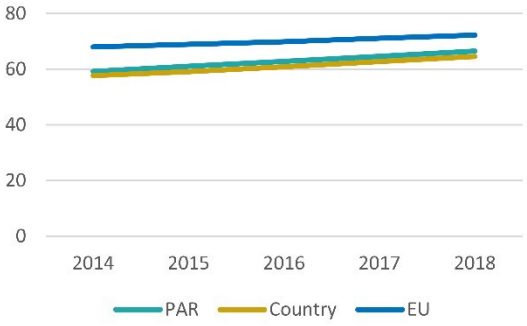

b) Population (*N*) (2000=100)



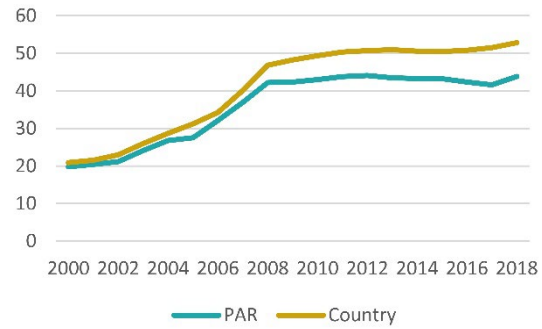

c) Working-age population(*E*) (2014=100)



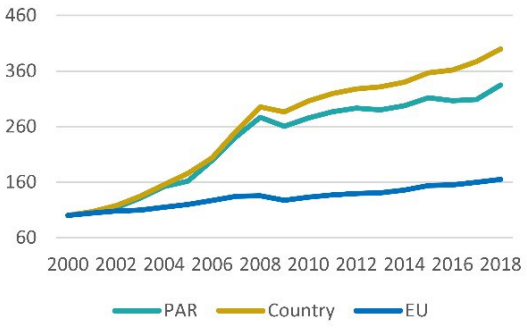

d) Share of employed persons (*L*/*E*)




e) GDP per capita (*Y*/*N*) (EU28=100)




f) GDP (*Y*)




Note: Data for CCT and LMA region equals PAR region.

Sources: Statistical Office of the Slovak Republic and Eurostat.

The unemployment rate decreased steadily both in the Prievidza and Partizánske districts over the 2010s. The decrease in unemployment rates was primarily fuelled by an economic boom and an

increase in total employment in each district in the period 2012-2017. The decrease in the stock of the workforce was a contributory factor to the decrease in total unemployment. The total number of employed people increased by 8.2 thousand (7 %) in the Prievidza district and by 4.5 thousand (10 %) in the Partizánske district. The total number of the economically active population (employed + unemployed) decreased by 1.5 % in the Prievidza district and by 2 % in the Partizánske district since 2012. The demographic developments were responsible for about one-quarter of the total decrease in unemployment rates in the period 2012-2017.

There were 204 unemployed people per job vacancy in the Prievidza district and 184 unemployed people per job vacancy in the Partizánske district in 2012. The number of unemployed people per job vacancy dropped to two in the Prievidza district and three in the Partizánske district by 2017. Regional employers were forced to cope with serious shortages in the labour force by 2017. Some of them used the services of job agencies and hired foreign workers to replace missing domestic labour. The situation in the regional labour markets was somewhat reminiscent of that of 2007-2009 when unemployment decreased sharply and missing domestic labour was supplemented by foreign workers. While numbers of foreign workers were still lower in 2017 than those in 2007-2009, the number of unemployed people per job vacancy was much lower in 2017 than 10 years previously.

In 2000, the GDP per capita in Horná Nitra region was 80 % lower compared to the EU28 level. Although it has increased by almost 250 % since then, the level is only 44 % of the EU28 level.

Finally, the overall economic situation can be described by total GDP growth. An upward trend in GDP is obvious in all regional delineations. GDP in the CCT increased by about 230 % since 2000, even larger than national GDP and compared to 65 % in the EU28.

## 4.3 Sectoral structure

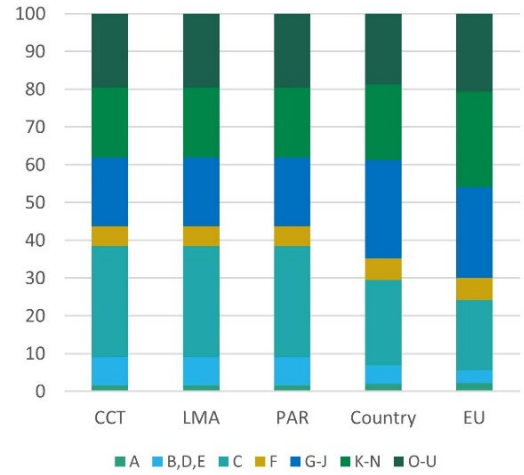
The Horná Nitra region specialises in two key activities. Coal mining and coal-based energy production have been dominant in the Prievidza district (city of Prievidza and towns of Handlová and Nováky). Tourism (spas and culture tourism) has been a complementary industry. The economy of the Partizánske district has been dominated by the footwear, leather and rubber industries and, to a lesser degree, by the production of furniture. The structure of the economy in the Prievidza district diversified in the 2000s. Foreign investors built on the relatively cheap but skilled labour force. They developed activities in the automotive sector, machinery, manufacture of plastics, and production of safety and control technologies. The HBP coal mine and its daughter HBz ranked as the largest employers in the region, but their productivity (in terms of revenue per employee) was quite low. Foreign-owned businesses (Nestlé Slovensko, ILJIN Slovakia, Brose Prievidza, GeWiS Slovakia, FORTISCHEM Nováky) accounted for substantially higher productivity levels. The Partizánske district is much smaller and its population is about one-third of the Prievidza district. The major employer in the Partizánske district (Rialto footwear) accounts for the low productivity. The footwear industry has to compete with other producers in low-wage countries. Declining unemployment rates have pushed up nominal wages in Slovakia in the last two years. Average nominal wages increased by 3.3 % in 2019 and 4.6 % in 2020. It is difficult to state the extent to which footwear production is sustainable in a period of rising labour costs.

Figure 8 shows that the share of manufacturing was almost twice as high as the corresponding share at the EU28 level in 2000, but has been decreasing in the last years. Currently, the share is about 24 %, i.e. still above the national share (21 %) and EU-level (16 %). The share of the construction

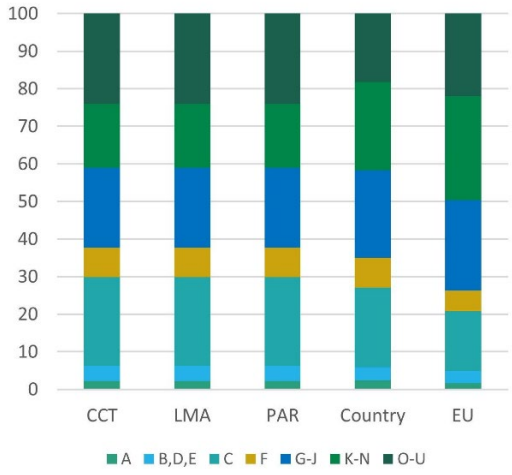
sector is similar to the national level, and slightly higher as the EU level. However, the contribution of the services sector to regional GDP is comparatively low.

**Figure 8 – Sectoral structure**

a) Gross value added in 2000 (in %)




b) Gross value added in 2018 (in %)




Note: The sectors are classified by:A Agriculture, forestry and fishing; B,D,E Mining and Utilities; C Manufacturing; F Construction; G-J Retail and IT; K-N Finance, real estate and other professional services; O-U Other services (Eurostat, 2008).

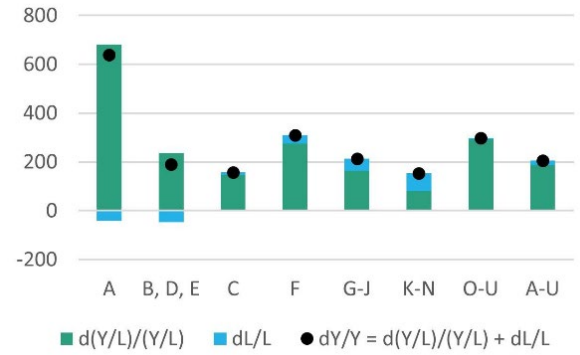
Sources: Statistical Office of the Slovak Republic, Eurostat.

The stock of FDI was EUR 328 million (0.78 % of the total Slovak FDI) in the Prievidza district and EUR 52.6m (0.12 % of the total Slovak FDI) in the Partizánske district. The structure of the economy of the Prievidza district diversified in the 2000s. Foreign investors built made use of the relatively cheap but skilled labour force. They developed activities in the automotive sector, machinery, manufacture of plastics, and production of safety and control technologies. The HBP coal mine and its daughter HBz ranked as the largest employers in the region, but their productivity (in terms of revenue per employee) was quite low by 2017. Foreign-owned businesses (Nestlé Slovensko, ILJIN Slovakia, Brose Prievidza, GeWiS Slovakia, FORTISCHEM Nováky) accounted for substantially higher productivity levels.

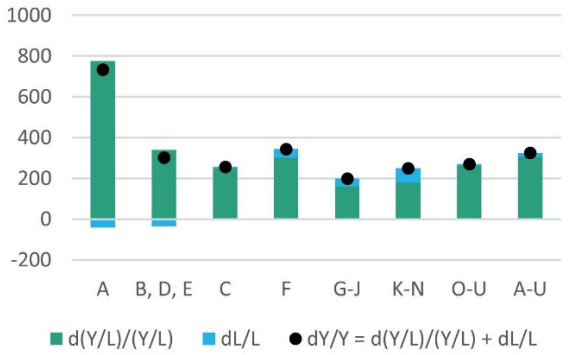
The HBP mining company has been the most important employer in the region. The subsidised jobs in mining have helped to keep unemployment rates and wage levels close to the Slovak average in the last two decades. By 2018, the unemployment rates in the Prievidza district (4.6 %) and the Partizánske district (3.3 %) were lower than the Slovak average (5.4 %). Some employers had to cope with the lack of an available workforce in the Horná Nitra region in 2018. Mining and manufacturing industries were key production activities in the Prievidza district. They, however, tended to be less productive than the Slovak average in terms of value added per inhabitant. The Partizánske district is quite rural. Its manufacturing industries account for the low productivity levels.

**Figure 9 – Growth decomposition (2018-2000)**

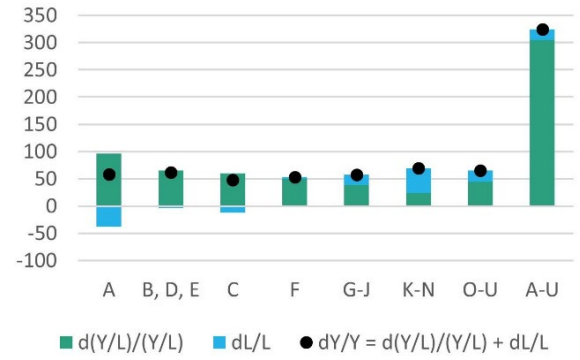
a) CCT, LMA, PAR (in %)



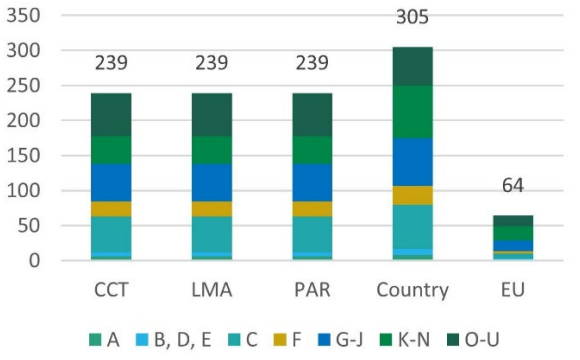

b) Country (in %)




c) EU28 (in %)




d) regional gross value-added growth contribution by sector (in %)




Note: Sectoral growth (dY/Y) is decomposed into labour productivity growth (d(Y/L)/(Y/L)) and labour growth (dL/L). The growth contribution by each sector (i) is the initial share of the sector ($Y_i/Y$) in the year 2000 times the sectoral growth ratebetween 2000 and 2018 ($dY_i/Y_i$). Abbreviations for the sectors are provided in Figure 8 and tabulated in Table 9 in the Appendix.

Sources: Statistical Office of the Slovak Republic and Eurostat.

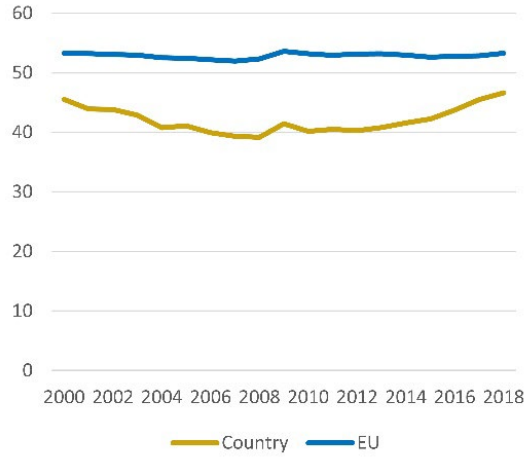
## 4.4 Income distribution

On the sub-national level, harmonized data for the income distribution on a household or individual level is not available for all European case studies. However, it is possible to analyse the development of the functional income distribution in the region. The income approach states that GDP in a region is the compensation of employees (labour income), the gross operating surplus, mixed-income (e.g. compensation of owners), taxes on production and imports fewer subsidies on production.[8] Figure 10a depicts the labour share defined as labour income divided by total gross value added as a key economic indicator for the distribution of income (between labour income and capital income). The national labour share is about 47 % and slightly below the EU28 average (53.3 %). The national disposable income per capita is far below the EU average.

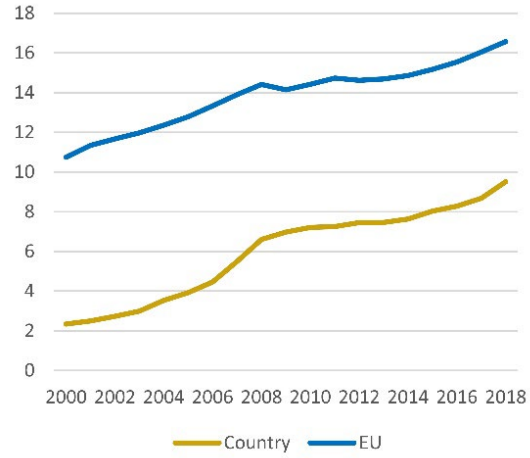
8 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Income_approach.

**Figure 10– Income distribution**

a) Labour share (in %)




b) Disposable income per capita (in ths. Euro)




Note: Labour share is the labour income divided by total gross value added.

Sources: Statistical Office of the Slovak Republic and Eurostat.

## 4.5 Gender dimension

There are unequal outcomes between gender in economic context in the region. This can suggest unequal access to job opportunities and maintaining inequality between the sexes. There are a series of initiatives aimed at regaining citizens and attracting newcomers. Special modules focused on female entrepreneurs: creating a platform on which they could share their business experiences and ideas, creating regional female communities who share an attachment to the region of origin as well as the desire to contribute innovation to the regional economy, thus becoming inspiring examples for other women. When we think about the gender gap, one of the things that probably immediately comes to mind is the pay gap, which refers to the difference in wages and salaries between men and women.

## 4.6 Conclusion

The structure of the economy of the Prievidza district diversified in the 2000s with activities in the automotive sector, machinery, manufacturing of plastics, and production of safety and control technologies. The HBP coal mine and its daughter HBz are among the largest employers in the region, but their productivity (in terms of revenue per employee) declined by 19 % in the period 2010-2017. Other major employers, however, significantly expanded their revenues in the region during the same period. Economic, social, and demographic trends further create a positive environment for the transition.

Mining and energy production from lignite coal have been the main drivers of economic activity and employment in the Horná Nitra region since the beginning of the 20th century. However, since the peak of employment in lignite coal mining in the 1970s, there has been a significant slowdown to date. Since the establishment of the mines and the beginning of the production of energy from lignite coal, these activities have created the main economic dynamism of the Horná Nitra region. At the same time, other branches of heavy industry emerged in the region, such as the chemical industry

or rubber plants, as well as light industry, such as the production of footwear, furniture and agricultural production. At present, the region's economy is not dependent on mining activities, as it has been partially diversified by the advent of mechanical engineering, the production of car parts and the resumption of footwear and building materials production.

# CHAPTER 5

## ANALYSIS OF THE ENERGY TRANSITION IN THE POLITICAL ADMINISTRATIVE REGION

# 5 Analysis of the energy transition in the political administrative region

## 5.1 Overview on the energy transition policies

### 5.1.1 Political system and context

The coal mining exploration opened in the Horná Nitra (today Handlová district) in 1772, mining experiments also occurred sporadically in the 18th and 19th centuries. Purposeful industrial mining began at the beginning of the 20th century in Handlová after the construction of a railway between the towns Handlová and Prievidza. Since then these are the only coal mines in Slovakia where we can talk about economic utilisation. During the Second World War, the first forging by heating in a furnace began in Nováky, where a mining plant was gradually established in 1940.

After the re-installation of capitalism with a plurality system of political parties in 1990 in Czechoslovakia, the company was transformed into the enterprise Slovak Coal Mines (Slovenské uhoľné bane) and at the beginning of 1993, mines were divided into seven separate entities. One of them became the state enterprise called Hornonitrianske bane Prievidza, as the successor organization of the Slovak Coal Mines. It consisted of the branch plants Baňa Cigeľ, Baňa Handlová, Baňa Nováky, Mining Mechanization and Electrification Nováky and the Main Mining Rescue Station Prievidza. In 1996, the transformation of a state-owned enterprise into a private joint-stock company HBP (Hornonitrianske bane Prievidza). In the 2000s the government issued a decision on the privatization of 97 % of the shares of HBP in favour of the acquirer – an employee-joint-stock company. In the 2010s driven by foreseen closure of the mining, HBP started with diversification of activities and opening new businesses in agriculture and construction. The decision to phase out coal mining in Horná Nitra has been made in 2018 and the mines will be definitely closed after the end of the inflow of subsidies in 2023.

### 5.1.2 Decarbonisation process

The main bodies governing the decarbonisation process are:

- the working group set up to coordinate transformation in the region consisting of representatives of governments, ministries, self-governing region Trenčín, municipalities, trade unions and NGOs.
- Partnership Council to define priorities and propose projects for funding from the Just Transition Fund representing key stakeholders from the Horná Nitra.

The first step in the decarbonisation process, in the social-political context, was the development of an Action Plan of The Regional Transformation in Horná Nitra (the latest update from November 2020) and the Territorial Plan of Fair Transformation for the Horná Nitra Region (2022). The working group set up to coordinate transformation in the region continue within the Partnership Council to define priorities and propose projects for funding from the Just Transition Fund. There was bottom-up approach set up in the region, where local stakeholders generate project ideas for funding and approximately 220 project concept notes were submitted by local stakeholders by 2022.

The basic sources of funding for the defined pillars of transformation include:

- Next generation EU (2021 – 2024): The REACT-EU initiative will provide member states with exceptional additional resources to be used to support the economy and employment in the most affected regions and to prepare for green, digital and resilient recovery. The anticipated amount of EUR 261 million for Slovakia (2021-2024).
- Just Transition Fund (2021 – 2024): A key element of financing is JTF, in the budget of EUR 7.5 billion, which is to be allocated to all 27-member states, while the allocation to the Slovak Republic is EUR 179 million.
- European Structural and Investment Funds (ESIF) within the programming period 2014 – 2020: Aiming part of the investments from available operational programs includes Operational Program (OP) Human Resources; OP Integrated Infrastructure; OP Environmental Quality; OP Effective Public Administration; Integrated Regional Operational Program; Rural development program.
- ESI Funds within the programming period 2021 – 2027: The 2021-2027 programming period will play a key role in the region's transformation following the end of state funding for mining activities.
- National support mechanisms: Environmental Fund, Slovak business agency (SBA), Slovak Agency for Investment and Trade Development (SARIO), Slovak Innovation and Energy Agency (SIEA) (support for small and medium-sized enterprises, including households, in the field of innovation, creative industries and the use of renewable energy sources).
- State Budget: The state supports local business using de-minimis schemes and state aid, provides administrative capacities for the development of transformation strategies and co-finance European funds.
- Budgets of Municipalities: Municipalities within their local budgets allocate sources on transformation, especially in soft skills, education etc.
- European Investment Bank (EIB): As of 2021 there were eight projects selected for JASPERS – a joint EU/EIB initiative to support projects receiving EU funds.
- European Agricultural Fund for Rural Development.

The 2021-2027 programming period will play a key role in the region's transformation following the end of state funding for mining activities (2023). The priorities within the programming period 2021 – 2027 will be governed by the partnership agreements between EC and the Slovakia. The key toll will be integrated territorial strategies and investments in the Slovak Republic for individual regions. These are also in the process of development and will be prepared on a partnership basis in accordance with the methodology for the creation of programming documents for the programming period 2021 – 2027 both at the regional and local levels.

### 5.1.3 Public participation

After some mismatched attitudes in the previous decade, there has been consensus on the mine closure and the emphasis is given to organizing the process in a structured way and utilizing available support from the different financial mechanisms. The Trenčín region, Prievidza and Partizánske municipalities are nowadays supporters of the mine closure. There is some resistance

from members of local councils especially in smaller towns to be directly affected by the transformation – e.g. Nováky, Handlová.

Miners from HBP are organized in a local branch of the Slovak Trade Union of Mining, Geology and Petroleum Industry Workers. In the previous decade, during the period of negotiations, they strongly opposed to the mine closure (petitions, protests). However, after the decision on mine closure was adopted their activities ceases.

Among the non-governmental groups, there was Greenpeace's direct action (ending up with jailing some of the activists who entered the properties of the mining company with banners in 2018. GP also sponsored a study on water quality and supported opposition to the mining industry. A local branch of Bankwatch and Friends of the Earth participated in various activities. They have a local campaigner and developed a web page “Life after call” supporting the process of decarbonization on an expert level and through active participation in decision-making processes.

In the context of public participation, it is worth mentioning that there was bottom-up approach set up in the region, where local stakeholders generate project ideas for funding.

### 5.1.4 Clean energy transition (CET)

The first region where Slovakia started with targeted policies and support aimed at decarbonisation is Horná Nitra. The future of coal mining here opened a very important debate and the Government of the Slovak Republic decided that the mining should terminate by 2023. It has received support from NGOs, local municipalities and business community. Decisions and public debates helped to pave a way for future discussion on Slovak economy decarbonisation and regional decarbonisation plans. Yet at the same time, it revealed, that decarbonisation is a rather complicated process in Slovakia with its manufacturing bases and a strong history of carbon intensive industries. It also points out to deeper structural problems of the economy affiliated with demography, structure of the industry with low added value, lower purchasing power, problematic connection of the R&D with practice, and last but not least, weak capacities of the key stakeholders.

The 2019 Action Plan for the Transformation of the Horná Nitra Coal Region provides an example of a complex approach, based on detail analyses of the local conditions and capacities. Yet the implementation process highlights the complexity of the transformation. Successful decarbonisation is time-consuming, inevitably requires a gradual process and building enabling structural changes in the economy aimed at the creation of new labour opportunities.

Replacement of relatively well-paid jobs in the mining or carbon intensive industries with new opportunities needs to build on innovations and technological advancement. All of this in the country constantly struggling with the transformation from low added value production and weak R&D and where the service sector (affiliated especially with the tourist industry) has relatively limited potential.

Successful transformation and decarbonisation depend on the strong national framework and financial instruments accompanied by ability of the local stakeholders, and regional self-government bodies to combine three main strategies or approaches: (i) use relatively favourable structural conditions; (ii) use the available financial instruments as the leverage for creating enabling condition and supporting labour market; (iii) use state-backed policies, subsidies, and incentives to attract FDI to support local capital.

The progress and structural barriers in Horná Nitra generally correspond with evaluations of the Programming period 2007 – 2013 and 2014-2020. Those indicate many problems with the development of functioning policy and management frameworks, as well as with implementing development projects. The Slovak Government adopted the 'Action Plan for Strengthening Transparency and Simplifying Implementation of the ESIF' on 27 September 2017. The Central Coordination Body (CCB) of the Deputy Prime Minister's Office for Investments and Informatization of the Slovak Republic drafted the Action Plan. The Action Plan set 37 policy measures for strengthening transparency and simplifying the implementation of the ESIF projects. Some 18 policy measures targeted decreasing administrative burden. The policy measures accounted for diverse levels of complexity and potential impact. The measures have been implemented since 2017 and it is foreseen, that Horná Nitra will benefit from the changes.

Slovak National Recovery and Resilience Plan, approved by the government and by the EU in June 2021, provides additional incentives for the clean energy transition. It includes Component 4/Decarbonisation of Horná Nitra. Although there are no direct investments allocated in RRP for this reform, it will be of key importance to coordinate many ongoing and foreseen activities in decarbonisation to avoid overlaps and support synergies.

Decarbonisation is addressed in the smart specialisation strategy, but the document does not have a specific focus on Horná Nitra and is more of general nature for the whole country. Trade unions were rather passive after the decision to end of coal mining was approved and they focused more on inside negotiations with the mining company management on conditions and speed of releasing current employees.

The main NGO activities are concentrated around the regional NGO platform Život po uhlí (Life after Coal). The NGOs focused in their work on supporting to implementation of the Action Plan for the Transformation of the Horná Nitra Coal Region. Their main activities are in terms of capacity building of local stakeholders for using opportunities stemming from the final framework and allocated resources for transformation.

Despite the Action Plan for the Transformation of the Horná Nitra Coal Region provides coherent analyses of the situation, it does not include stronger foresight elements. The only available foresight activity so far is demographic prognosis till 2040, elaborated by the Slovak Academy of Sciences and serving as a supportive tool for Action Plan and for the decision-making process.

## 5.2 Socio-political component

### 5.2.1 Summary of results

***Issues, statements and conflicts***

Decarbonization processes at a regional level encompass often complicated shifts in local power, political positions, social statuses and economic benefits. Together with the influence of outside factors a region facing transformation represent the complicated field in Bourdieu theoretical framework, where access to the benefits of decarbonization/transformation, or exclusion from the access to the benefits generated different narratives and positions on the transformation. Interests, positions and motivations of constituencies and stakeholders in the field are differential. The outcome is a situation, where different constituencies are strengthening and propelling changes, or sometimes hindering and slowing down decarbonization. Using the approach of Pierre Bourdieu and relying on

the concept of technological drama we explore the situation. Based on initial empirical research, we categorized main stakeholders' groups (constituencies) and explored the ongoing and emerging social and political conflicts in the "local field of power" (see Bourdieu, 2020), which pertains the decarbonization processes by investigating design constituencies (those who impose the changes) and impact constituencies (those who either cope or resist).

### *Defining Constituencies*

*Constituency 1: Technological regularisation (IMPOSE)*

- European Union and its agencies
- The national government and its bodies
- Self-governing region
- Municipalities
- Environmental groups/ The Life after Coal
- Mainstream nation-wide media

The technological regularisation (or imposing) constituency is formed by the coalition of the European Union and its agencies (European Commission, JASPERS, JRC) who are actively involved in the processes, the central government which is to a great extent influenced by the climate policies and measurable targets and to some extend influenced by programming by the EU funds.

Positions of the Trenčín Self-Governing region and the key regional municipalities went through the process of balancing between pressures from the top (governmental policies, funding) and bottom (concerns over the local economic impacts yet also arising opportunities in financing new investments and projects). Environmental groups in this case represented by Greenpeace, Friends of the Earth-CEPA and The Life after Coal were strong promoters of the immediate ceasing of the mining activities, while Friends of the Earth-CEPA and The Life after Coal focused also on stimulating and steering the transformation process with a perspective to use Horná Nitra as an example for other Slovak regions. Analyses of central media indicate long-term and strongly prevailing support to the decarbonisation.

*Constituency 2: Technological adjustment (COPE)*

- Mining Company
- Slovak Electricity Comp
- Municipalities
- Regional Media

The technological adjustment (or coping) constituency has evolved over the years and it includes former strong opponents of the process. Here we refer especially to the HBP Mining Comp, originally strong opponents who however deliberately develops its other economic activities and diversifies its business. After the final decision on its mine closure, the company has accelerated its coping strategies and focuses on how to use available funding for staying on the market with transformed activities. The HBP invests and develops its agricultural daughter company (using geothermal

energy), planning for energy production from geothermal, transforming its manufacturing and repair shops into a new business (planned reconstruction of train carriages).

Slovak Electricity Comp (operator of the coal-burning PP in Nováky) took in the process a rather neutral position playing with the card of technological feasibility and investments. Municipalities were in the process often divided, sometimes switching their positions based on who was elected as a mayor and/or municipal council member. The typical trajectory has been in changing positions from supporters of the mining industry to accepting the decision and focusing on utilising available opportunities.

*Constituency 3: Technological reconstitution (RESIST)*

- Trade Unions
- Part of the political spectrum

It is difficult to find openly anti-closure and anti-decarbonisation constituencies after 2018 when the decision was taken. The once-hot political struggle fades away after the decision and the opposition has been fragmented and re-focusing on the group interests. Thematized is the efficiency of the process, perceived corruption or incompetence of the local political elites to utilise available opportunities provided by the incoming funding.

***Constituencies, the local field of power and outcomes***

The technological change in Horná Nitra is an outcome of at least three determining positions of the national and regional constituencies.

**Policy and economic framework:** The framework of the European Union policies, ETS and the increasing cost of producing energy from coal matters. The analyses point out the central role of the national government in technological change. The government (backed, or rather pushed by the EU and under the pressure from an increasingly costly model of financing the mining) has a pivotal role in shaping the decision-making process. Lack of real opposition from the side of public and municipalities helped the process. The mining company as the central opposing force did not gather any strong public or media support and was basically isolated in its positions. On the other hand, the resistance of the mining company may have been to some extent motivated also by improving their position in the negotiations process on social transfers and compensations for the mining closure.

**Closure as a topic in national political struggle:** The discussion on the future of coal mining culminated in 2018 during the coalition government led by political party “SMER – Social Democracy”. The government was framed in the public debate as pro-mining, subsiding the economically and environmentally inefficient mining due to some “ideological” reasons. Opposition parties, especially, neoliberal SaS (Freedom and Solidarity) and progressivist PS (Progressive Slovakia) used the issue in political struggle, framing it especially as economically irresponsible to continue with the subsidies.

**Local politics:** On the local level of municipalities has been a gradual shift from widespread support for mining to gradual change. The mining company used to dominate local politics. Former managers from the company often won local elections with backing from the business. Many pro-mining candidates however lost in the last municipal elections (2018) that collided with the peak of the

decision-making process on the future of coal mining. In the key municipalities (Prievidza, Handlova) there were mayors elected or re-elected with anti-mining agenda.

### 5.2.2 Interpretation

The decision to phase out coal mining in Horná Nitra has been made in 2018 and the mine will be definitely closed after the end of subsidies in 2023. The discussion is now focused on policies, activities and steps in the transition.

Within the socio-political context, we may identify several key trends. Firstly, there is a rather significant shift of positions before and after the decision on mine closure. In December 2018, the Slovak Government approved its decision to terminate support for domestic coal by 2023. Given the cost of the mining, without the support are mines not able to operate on the market. Positions prior to December 2018 are more straightforward. The mining company, trade unions and part of the municipalities were opposing the idea of mine closure. Trade unions organised a petition to save the mines. There is a difference in positions of main political parties, where social democrats were supporting continuation, while right-wing neoliberal parties pushed for immediate closure. Sometimes in the free-market style “shut down the mines and nothing happens, people will somehow manage”.

After the 2018 decision, we see consolidation, suppression of the opposition and gradual acceptance of the decision. A shift in the public debate is then on utilising available opportunities, development of the region and future. It is difficult to find openly anti-closure and anti-decarbonisation constituency after the 2018 decision was taken. The once-hot political struggle ceases after the decision and the opposition is now re-focusing on the efficiency of the process, perceived corruption or incompetence of the local political elites to utilise available opportunities provided by the incoming funding.

In our analyses, we operationalised two prevailing narratives – a positive one and a negative one. We label them for the purpose of this study as: (1) Green Region of the Future and (2) Dilapidated House. In the first case, it is a narrative of Horná Nitra as a winner and frontrunner, the region with will serve as an example to other regions on how to approach decarbonisation at the regional/local level in the EU. On the opposite side of the spectrum, we find the narrative of transformation as yet another example of replacing something which is working with wishful thinking. A transformation, together with adverse demographic trends, general problems with global competition and out-migration leads to lagging behind, decline in wellbeing and in the end to dilapidation of the towns and villages.

Using the Framework of 3 constituencies: (i) Technological Regularisation (IMPOSE); (ii) Technological Adjustment (COPE); and (iii) Technological Reconstitution (RESIST) we analyzed the social-political process in the Horná Nitra region. It is difficult to find openly anti-closure and anti-decarbonization constituencies after the decision was taken. The once-hot political struggle ceases after the decision and the opposition is now re-focusing on the efficiency of the process, perceived corruption or incompetence of the local political elites to utilize available opportunities provided by the incoming funding.

### 5.2.3 Gender dimension

The narratives identified cannot be perceived unequivocally as male-dominated or female-dominated. There is definitely a gender dimension to the issue, but it cannot be, based on the data from text analysis, so straightforwardly identified. Women are represented in the local field of power, but mostly through the stakeholders such as NGOs. In the local governments, women are disproportionally in minority. Regarding the stakeholders such as companies, government and industry, women are underrepresented, although it cannot be clearly identified via the text analysis. In most cases, even if there is a spokesperson woman, the position she presents was decided by the institution/organisation, where decision power is held by men.

## 5.3 Socio-ecological and technical component

This section provides an overview of the transformative capacity of the region to shape its decarbonisation pathway. The focus on transformative capacity allows us to discern the extent to which a region is actually capable of deviating from its current (carbon -intensive) trajectory towards sustainable outcomes. Transformative capacity is understood in this context as an evolving collective ability to conceive of, prepare for, initiate and perform path-deviant change towards sustainability within and across the multiple complex systems that constitute the regional or urban area undergoing a CET. As a systemic capacity, it is not attributable to any single actor but rather results from the interactions and orientations of multiple actors in the regional or urban economic development system involved in shaping its decarbonisation pathways. The diagnosis of transformative capacities thus enhances knowledge of key capacities hindering or facilitating purposeful transformation, ultimately permitting them to be addressed as part of capacity development activities. Wolfram (2016) identifies ten interdependent components to assess the transformative capacity of a region. These components are selected based on a literature review. Transformative capacity is strongly influenced by the governance of the regional decarbonisation or clean energy transition in question. Three governance and agency components are critical to the ability of a regional development apparatus to foster transformability of a system: the inclusiveness and multiformity of governance arrangements (C1); polycentric and socially embedded transformative leadership (C2); and the empowerment and autonomy of relevant communities of practice (C3). These elements are preconditions for the transformability of a system: there needs to be connectivity and responsiveness built into governance, effective leadership able to bring people together around a vision and actors empowered to experiment and innovate. These three attributes must be developed by stakeholders in capacity development processes to enhance their transformative potential, including enhancing understanding of the systems of which they are a part (C4), engaging in participatory visioning and alternative design scenarios (C5), experimenting with novel solutions to social needs (C6) and ensuring that these innovations can be embedded (C7). Ideally, this can be seen as a learning loop, where system(s) understanding helps inform visions and pathways, which in turn orient experimentation, with successful innovations being embedded and better system understanding resulting from this process. These processes should be fed back into governance through social learning (C8) as well as effective involvement of actors at different scales (C9) and levels of agency (C10). These components were assessed through mixed quantitative and qualitative interviews with various stakeholders engaged in the CET.

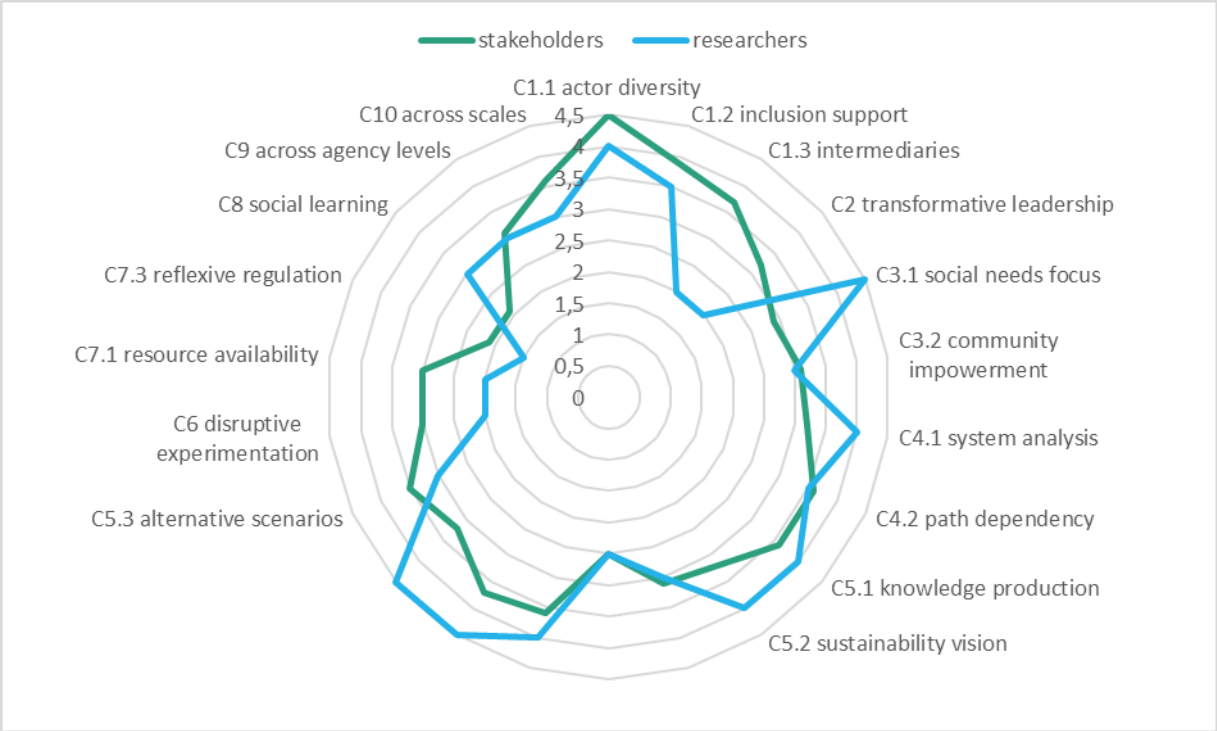
### 5.3.1 Summary of results

#### *Overall Assessment*

The Figure 11 summarises respondents' assessments of components of transformative capacity in the region. Due to the wide range of responses, all measures of central tendency are included.

This chart is an informative visual tool in which multiple factors are compared on a two-dimensional plane. For this, there are different axes emerging from a common central point and the axes are also connected to each other to form different to make it to plot the chart. The most interesting finding of the quantitative analysis was in general the fact that the assessment of the region's transformative capacity by the researchers' team was not significantly different to that of the stakeholders. There was almost complete agreement on factors such as: actor diversity (C1.1); across agency levels (C9); across scales / tiers (C10); community empowerment (C3.2); inclusion support (C1.2). The most significant differences in the evaluation of the region's transformative capacity relate to factors social need focus (C3.1), sustainability vision (C5.2); system analysis (C4.1) and intermediaries (C1.3).

**Figure 11 – Stakeholder assessment of transformative capacity**




Note: Possible responses are: 0 – don't know; 1 – completely disagree; 2 – somewhat disagree; 3 – neither agree nor disagree; 4 – somewhat agree; 5 – fully agree.

Source: Based on ENTRANCES interviews conducted for the case study.

The differences in evaluation between the stakeholders and the researchers were probably due to diverge control of holistic information regarding some aspects of the transformation. For instance, stakeholders who have only sectoral knowledge about the transformation (do not have enough comprehensive knowledge about all aspects of transformation) might consider the vision of transformation as insufficiently clear, insufficiently radical, demotivating to act and providing an insufficient orientation for the activities. However, the research team might comprehend the strategy

of transformation at all levels including the level of the European Commission and central governments, and differently assess sustainability vision factors. This was the case with the factor sustainability vision. Another factor, according to which the opinion of the stakeholders and the researchers significantly diverged, was the intermediaries' factor. By intermediaries, we mean independent actors, individuals or organizations, who bring together several other actors in the transformation process. They facilitate dialogue, agreement and joint action by different stakeholders, e.g. between the public, private and civil sectors, across administrative levels or territorial borders and in relation to different policy areas or activities. These can be for example independent platforms, energy agencies, professional associations or engaged activists. In this instance, the stakeholders gave more weight to this factor than gave the researchers. This may indicate that many of the respondents themselves have been representatives of non-governmental organizations and associations and therefore tended to overestimate the importance of their own work and positions. Conversely, the research team sees the overall context and nexus of relationships complexly and evaluated the intermediaries at the lower range of importance in the transformation process.

Another difference of opinion concerns the social need focus factor which relates to the question 'To what extent do you agree or disagree that the transformation of the region addresses the social challenges?' While the stakeholders did not agree that transformation addresses social challenges, in the opinion of the research team, it is social issues that are one of the key elements of transformation. Social issues, which are associated with unemployment, jobs, living conditions of miners and their families, have been crucial in decision-making since the beginning of the decarbonization process. This is corroborated by strategic documents pertaining to the transformation, which primarily address these issues. According to the researchers the very social aspects are thematized and have great negotiating power in the disputes about the financing of transformation, at the level of the central government, as well as in Brussels.

In general, however, we can say that the discrepancy in factors assessment can be attributed to different knowledge management regarding the transformation. While a group of the stakeholders has information that is narrower and more focused on specific aspects of their activities, the group of the researchers has information that is more contextualized and is also based on data that comes outside narrowly defined transformation and decarbonization issues.

### 5.3.2 Interpretation

#### *Governance and agency*

*C1. Inclusive and multiform governance*

The issue of participation and inclusiveness was viewed by the respondents rather ambiguously. Environmental policy stakeholders indicate that the issue is quite complex, and do not see anyone completely excluded from the process. They suggest to orient attention rather to the question of how the opinions of the various stakeholders are taken into account and reflected in the solutions. At the same time, they think they do not have a detailed overview of the current situation and extent of stakeholder involvement and can't judge whether they are excluded or just not interested. They suggest to put attention the question to what extent individual actors can influence the process.

Regional government representative was adamant in his opinion it is primarily the central government, which is at the helm of the information flow and resources and should directly manage

the process and involvement of the actors into the process. As the respondent elaborated further, in his opinion the Ministry (The Ministry of Investments, Regional Development and Informatization of the Slovak Republic), is the body responsible for the preparation of the transformation, does not inform properly about the activities, who is being involved or not, and the timetable for the transformation.

Insufficient information flow from the Ministry was probably related to the Covid-19 pandemic, which certainly affected the work of each involved entity. For this reason, the various deadlines for the preparation and approval of the various programming documents are probably being postponed. Stakeholders also expressed dissatisfaction with how the issue of the region's transformation was reflected in the implementation of EU investment funds. We have the final year of the programming period and the basic document for the regions' facing transformation has still not been approved.

The most critical attitudes were those by the representatives of environmental NGOs, who expressed dissatisfaction with the lack of government's strategic visions and the insufficient involvement of social actors. They found that those holding a political power do not care about long-term planning and rather follow momentary interests. Moreover, civil society stakeholders consider the general public to be excluded from the planning and implementation of the CET and found that very little information about the transformation has been provided to the general public. They think there is a risk of biased decision making while the views of some groups the interests of certain groups prevail over the interests of the general public.

In summary, there were prevailingly ambivalent positions, on whether or not all actors and stakeholders are involved actively and supported in the transformation process. However, the most critical opinion, in terms of the inequitable and unequal participation of actors, was articulated (rather interestingly), by the representative of region. Opinions on the managing the transformation were rather critical, expressed by all types of stakeholders. The environmental policy stakeholders were critical also about the deficient informal networks: In their opinion it would help the process if the public concerned were also more involved, they had more room to propose solutions. They felt there is a lack of regular information flow about the ongoing state of the transformation process from the national level to local level. Regional government representative sees a problem lies in the strong centralization of the whole process and the method of management, which is profoundly formal. There is an absence of bottom-up management system due to a lack of human capacities at a local level. In contrast, representatives of the local governments had completely opposite opinions and their expressed opinion that management of transformation is going well.

Many critical opinions and a relatively large discrepancy in the answers, indicated that the overall actor network is not balanced, and there is lack of internal cohesion in the whole process, in this context.

Regarding intermediaries: there was a consensus among the main actors in the interviews that a key role is played by the non-governmental organization. E.g. "The Life after Coal" NGOs platform plays a key role, organizing communities, helping with engagement and creating a platform for dialogue. Other intermediaries in the process are independent platforms and activists grouped around Friends of the Earth – CEPA. Local activists are passionate about the issue and well-informed and actively approaching their job. The participation of non-governmental organizations that represent the interests of people in various fields is certainly important. However, these NGOs

and activists cannot sufficiently substitute the work of governments in the process. As was put by local governments' representatives, what may be missing is an institutionalized facilitator, person or entity who would moderate discussion between the various actors involved.

It is necessary to note, however, that our respondents themselves represent various associations and non-governmental organizations and act as intermediaries in their own way. Their assessment of this factor, therefore, overlaps with their own activities - and may be biased. From the point of view of the research team, the role of intermediaries in the process of transformation of Horná Nitra is a bit overrated, because there are mostly direct decisions taken at the level of the central government, at the level of the EC and regions, which have a direct impact on transformation relations but also the discourse about transformation.

*C2. Transformative leadership*

Some respondents were afraid that leadership on a daily basis is insufficient, and that there is a lack of relevant information. The efficiency of leadership depends on the political colour of each entity. A representative of the environmental NGOs expressed concern that there is a gap between official statements and documents on the one hand and social practices on the other hand, between what is stated in the official documents and how is actually conducted implementation. Funding sources are limited and there are many more intentions than real funding. Environmental NGOS stakeholders see a problem lies in leadership capacities. Very serious gap is the reluctance of actors to cooperate - cooperation takes place more declaratively than in reality. Only twenty per cent of projects take place in collaborative partnership and integrated projects are an exception. The biggest problem lies in the fact that no entity wants to take responsibility for the implementation of integrated projects.

In contrast, a representative of regional government expressed quite an opposite opinion and does not think there were any really serious gaps in cooperation between various sectors and stakeholders. The representatives of local governments agreed that the transformation has been oriented toward a profound and substantial change, but stipulated that recent developments call into question the degree of complexity of the procedure. One local governmental official said that he cannot see a profound and complex change. At the moment, according to him, efforts are more focused on the closure of mining activities and eliminating direct consequences such as unemployment and heat management compensation, with little emphasis on the real quality of life in the region.

A representative of the environmental NGO expressed concern about the narrow framework of the entire transformation plan. The just transformation plan itself has narrowed the region's decarbonisation solely to mine closures and coal burning and is too much oriented to helping large mining businesses. Decarbonisation plans, which would also include also buildings sector, small industries, transport and climate protection obligations is absent.

In summary: two sets of views on transformative leadership have been formed. The first group, represented by NGOs drew attention to the narrow, truncated focus of the transformation plans and implementation. The second group, represented by the regional and local government, did not see any serious shortcomings in communication, leadership and cooperation. In the opinion of the research team, the leadership for the energy transition does not equally come from all sectors but is rather driven by the governments and the EC. The transformation certainly has some shortcomings as well in offering motivating visions and collaboration in praxis.

*C3. Empowered and autonomous communities of practice*

According to local government stakeholders not all social needs are properly addressed. Prioritized are education and retraining and part of the funding planned to improve health care and support the transformation of hospitals. Some resources are earmarked in the area of employment support in the small and medium-sized enterprise sector. The same stakeholder also expressed concerns about jobs and employment and see the transformation, if done correctly, will ensure the social development of the region. All the expected green investments in the region are important and may positively affect household budgets and raise living standards.

According to NGOs representatives, the social need that is clearly addressed is an increase in the jobs and retraining opportunities. Some of those who lose their jobs as a result of the decarbonisation will be necessary to retrain, increase their qualifications and develop their "soft" labour skills in preparation for a change of profession.

According to the researcher's social needs are addressed mainly through the issue of employment, retraining and training. In this aspect, researchers can agree with the opinion of the stakeholders. On the other hand, it must be emphasized that the social aspects are given a very important role in the whole design of transformation. It could be said that retraining and compensation for lost jobs are a key pillar of the governmental transformation strategy.

According to social NGOs representatives, the capacity of civil society is insufficiently addressed while there is support for start-ups and the development of small and medium-sized enterprises. NGO support is insufficient and there is also a lack of wider support for local networks and the creation of cooperatives as alternative ways of producing energy. The similar position was expressed also by the local government representative. In his opinion the empowerment of citizens and support of citizens' initiatives is not a primary goal of the transformation strategy and there is no support for individual citizens' as innovators.

In the opinion of researchers' stakeholders clearly and correctly perceived that it is necessary to work with civil societies, non-state actors, and others to build the transformative capacity and communicate with citizens and respond to their concerns, to shape the government decisions and policies that reflect local and citizen interests. In practice, however, they see that these needs are not sufficiently addressed and met.

***Capacity development processes***

*C4. System(s) awareness and memory*

Transfers between different forms of knowledge polarized the opinion of different groups of actors. In the opinion of the local governments, there is a lack of awareness of the systemic relations. In the opinion of environmental NGOs, however, such awareness is gradually forming. Municipal politicians would need some certainty that if they go into cooperation with diverse actors, it will be attractive to their constituents and safe for their political image. The same opinion was expressed by the social NGO representative who elucidated, that stakeholders should take an active interest in immediate surroundings, in the environment in which to raise children. In the opinion of social policy NGOs representative, the main obstacle lies probably between the needs of decarbonisation of industry and services sector and how such a segment would subsequently form the economic backbone of the region. The most critical obstacle to the current slowly-moving transformation is the set end date

of thermal electricity production that indicates discrepancy between political and technical and social dimension. The problem was, as was explained by the environmental actor that each entity/stakeholder goes its own way, prioritization and justification of intentions are not sufficiently addressed.

Thematized was also perceived lack of analytical information on interconnectedness as a critical obstacle to change and the reluctance of municipal politicians to invest in topics beyond the election period. There is awareness of the interconnections between different domains, e.g. the technical and the environmental, but as in many other settings, there is little political will to do so. According to a regional government representative the most critical issue is the merging of technical and environmental aspects. Local government representative thinks there is imperative for solving problems first in the short term and not in the long term.

In summary: it can be said, based on the examination of interviews that the recognition of the systemic relations between social, technical, ecological, economic, and other dimensions and different time frames led to the distinction between short-term and long-term goals by the stakeholders. On the other hand, researchers think that concepts such as path dependency, the relationship between structures and cultures, and systemic interdependencies, are largely abstract and complicated to capture for stakeholders. Therefore, it was very difficult for respondents to specifically consider these factors. Therefore, it was also difficult for them directly to answer the questions related to these factors.

*C5. Sustainability foresight*

(i) vision: NGOs' stakeholders were rather sceptical about the power of vision in knowledge production in process of transformation. A respondent indicated that if something is missing in this process, then it is a vision that we actually want to achieve. So far, in his opinion, this is actually limited to business as usual, where finances and grants are expected.

ii) knowledge production: some respondents from NGOs think that people lack the energy and interest to study and evaluate the available information. An ambiguous position was also articulated by the government representative, since he perceives most available information are of a purely theoretical nature without a solid and practical basis. Opinions on the importance of the whole transformation process, the way of management, implementation and the individual roles and roles of all stakeholders were diverged. Some agree that there is a wide range of information, but that its distribution is insufficient. Although the transformation process takes different forms depending on the specifics of the region, there is a lack of information on how is it in other countries, how long the process has lasted and what the results have been, what will happen if the process succeeds, but also see the consequences if the process fails. Therefore, linking to concrete results already achieved is extremely important.

According to local government representatives there is a lack of consistent, comprehensible and systematic information. At the same time, high-quality and stable professional capacities for planning and coordinating the development of local/regional energy are completely absent. The region would need an expert team consisting of energy and construction professionals and it is important to provide the expert team with adequate methodological leadership, monitoring and control of its activities, as well as with training.

Alternative scenarios: environmental policy stakeholders were rather sceptical about alternative scenarios and pathways. Many alternatives are not yet visible, officially designed transformation is a relatively straightforward process. Respondents do not see any alternative development options. A regional government representative indicated that working with alternative approaches is always more difficult than working with proven and traditional ones and that this may be the reason why alternative approaches to transformation are rejected. NGO's representative has heard of the alternative proposals but they do not know how much they are enforced, how much they are expected to be implemented.

In summary: This section provides different perspectives on knowledge production, vision and alternative scenarios. One connecting line, however, is the perception of the alternatives to the officially adopted strategy they are not in place and that bringing alternative approaches is much more difficult than dealing with those who are officially confirmed and adopted. There are no clearly articulated different scenarios that could lead to alternative future pathways.

#### *C6. Disruptive experimentation*

Regional government representative sees disruption in the field of changing the way of thinking and acting. While e.g. the central government seeks to promote a common approach regarding the refurbishment of buildings it is mainly central government that "gives the notes". Respondents perceive the biggest disruption especially in the institutional area since many approaches are more technical and environmental and social concerns are absent and very difficult to implement. According to the respondent's disruptive experimentation is mostly present in the institutional area.

#### *C7. Innovation embedding and coupling*

What kind of resources are most lacking? According to environmental policy stakeholders insufficient are financial resources. On the other hand, there is a relatively large amount of technical assistance, but it focuses on state administration and self-government. The financing of other activities and civic society is lagging behind. A similar opinion was expressed by local government actor who indicated that not all stakeholders have equal access to finances that may help improve their functioning.

In addition to the lack of funding some stakeholders, particularly from the non-governmental sector, also perceive an insufficient human capacity. Enormous lack of human capacities in turn results in the absence of financial and technical resources and information, because there is no one to create and manage them.

In the opinion of the researchers, resource-oriented questions are related to answers concerning finances, grants, and budgets. Interestingly, stakeholders noticed in their responses and non-monetary, non-financial forms of resources, such as human capacity and the like. This type of answers might indicate that stakeholders see the overall framework of the transformation contextually and are aware of the systemic interconnectedness of the process as well as the sequence of steps.

### ***Relational factors***

#### *C8. Reflexivity and social learning*

The findings for this section corroborate that insufficient monitoring was carried out on all dimensions of transformative capacity development. While governmental representatives indicate that there is

regular monitoring and evaluation of the implementation of the action plan, stakeholders of the social NGOs disagreed and hold that information process is insufficient, evaluations are irrelevant and there is the absence of feedback that may improve the process of transformation of the region. Stakeholders are not aware of any such monitoring system that should be available to all stakeholders.

Some NGO respondents indicated fragmented, partial monitoring. E.g. the numbers of dismissed and retrained miners are monitored or evaluated are the monthly meetings of working groups. The respondent from a social NGO see the transformation and the possibilities of financing as a unique opportunity for this region, which if we do not catch up now, in a coordinated manner, we waste it and the region will remain a grey spot on the map of Slovakia.

Some respondents related the issue of monitoring with the problem of human capacities and believe that the problem of transformation begins and ends with professionalisation of the staff responsible for the transformation. A government office with competencies should be created, which would cover exclusively the agenda of transformation, be based in the region and, through its advisory commissions, mayors, mayors, businessmen, be able to monitor the situation perfectly.

In summary: reflexive monitoring, involving both the process of knowledge production and implementation is just at the beginning and the central government has not yet communicated the proposed system for monitoring and evaluating the transformation. To some extent, this is related to the deficiency of the basic programming document, which contains some monitoring indicators, but the determination of their benchmark value or target value was not set up.

*C9. Cooperation across human agency levels*

Opinions on whether capacity development addresses multiple levels of agency in the public, private and civil society sectors, including individuals, households, social groups, organizations, networks of individuals, groups, and society differed. Some actors emphasized the absence of certain sectors in the process of transformation. The local government representative holds that it would be better to include in the design of transformation building of various community centres and support for NGOs dealing with social issues. Environmental NGOs actor think, there is a lack of awareness of the process and individuals, groups and organizations only hear some transformation but they have no idea what it means and how they could get involved. Conversely, regional governments think that there is substantial involvement of all sectors and actors and in general, any actor who is interested has access to the process.

In summary: Although the involvement of all stakeholders is declared, it is not sure that the needs or requests of all the actors have been heard and addressed. And what's more, the views on the involvement of actors were quite differential, and certainly very subjective and somehow biased. In the opinion of researchers, it is also necessary to distinguish between a formal cooperation and a genuine cooperation of stakeholders in the process.

*C10. Cooperation across political-administrative levels*

The opinion of stakeholders on the questions of capacity development and interaction varied. The local regional government held that the political-administrative level, where actors operate, were intertwined and connected. According to them interactions were strong between the national level and the regional level, and the involvement of local governments was also sufficient. Some cities

have strong interaction with the central government, but some cities need support in this respect. Environmental NGO respondent indicates that the interaction is strong between the national and the EU level. Regional government representative feels the strongest political-administrative coordination at the regional level, while the national level seems to only announce and "comment" documents. In the opinion of social NGOs there is a lack of interactions between national and local levels.

### 5.3.3 Gender dimension

Women were proportionally represented in the group of respondents (5: 5). This cannot be said, however, about the representation of women among the stakeholders organisations or in the governments. Women are more present in the institutions such as NGOs, however, in the governments and businesses they are underrepresented. We have not identified any specific issue (topic, events) that would differentiate between the answers of male respondents and female respondents. We believe that there is a gender dimension regarding regions' transformative capacity, but this should be researched by specifically designed methodology and tools.

## 5.4 Conclusion

Based on the interviews with stakeholders we obtained rather ambivalent picture about the transformative capacity of the region. In many aspects, opinions among different stakeholders were polarized. Regarding the most important question of leadership two sets of opinions have been formed. NGOs stakeholders drew attention to the narrow, truncated focus of the transformation plans and implementation. The second group of stakeholders represented by the regional and local governments, have not seen any serious shortcomings in communication, leadership and cooperation. In our opinion, however, the leadership for the transition is rather driven by the central governments and the EC. Thus, the transformation certainly has shortcomings in democratic, local leadership and strategic visions.

In order to improve the process, it is necessary to empower civil societies, non-state actors, and others to strengthen the transformative capacity. At the same time, it is important to communicate with citizens and respond to their concerns to shape the decisions and policies in such a way that they reflect local interests.

The stakeholders' recognition of the systemic relations between social, technical, ecological, economic, and other dimensions on the one hand and different time frames on the other hand should be improved. Stakeholders were also rather sceptical about the power of vision in knowledge production in the process of transformation. Implementation is actually limited to "business as usual" approach, where finances and grants are seen as the only condition for success. In order things to improve it is necessary to modify the governance. The region would need specialized cross-sector and multi-stakeholders expert team consisting of professionals with adequate methodological leadership and capacities for monitoring of implementation.

# CHAPTER 6

## CHALLENGES, COPING STRATEGIES & GENDER

# 6 Challenges, coping strategies & gender

## 6.1 Challenge 1: Keeping the mine closure schedule and accelerating economic transformation

### 6.1.1 Challenge description

***Current situation***

The decision to phase out coal mining in Horná Nitra has been made in 2018 and the mine should be definitely closed after the end of subsidies in 2023. The plans for gradual closure of the mining activities are developed and under implementation. However, recent changes in the energy markets and the rapid rise of energy prices induce uncertainties. Higher energy prices could push up inflation in the coming months, dampen consumer spending on other products and services, and ultimately slow the economic recovery. Demand for energy from the industrial and commercial sectors is currently driving consumption levels. Most of the country's natural gas demand is met by imports from Russia and so, as a member of the EU, Slovakia will be mindful that EU sanctions related to the Ukraine war will create uncertainty as EU countries hold a united front on reducing its dependency on Russian imports. Nuclear power, which currently accounts for more than 50 % of Slovakia's total power generation, will maintain its dominance of the country's energy generation mix over the next decade, as the country continues to be a net importer of electricity and thermal fuels. Slovakia has good potential coal reserves, these are not currently recoverable. Although the government is looking to expand its renewable power capacity, the Slovakian Government will continue to depend on nuclear power generation during the forecast period. Nuclear power is expected to account for 65 % of the country's generation mix by 2035. These factors may again open discussion on the closure of coal mines again and foresee elections and expected political changes may bring into the public debate questioning of the decision.

***Desired outcome***

The desired outcome is mine closure in 2023 and the transformation of the Horná Nitra region into a decarbonized and decentralized regional sustainable economy.

### 6.1.2 Coping strategies

***Coping strategy 1: Insistence on climate and energy policies implementation***

The EU Green Deal, Fit for 55 and Re-Power EU provides an important framework for national policies and targets. Operating with the implementation of the already approved targets provides strong arguments for keeping the process on track. This strategy of insistence should be pursued by the regional stakeholders, local governments and NGOs as well.

***Coping strategy 1.2: Speeding up regional economy transformation***

The regional economy in Horná Nitra went through fundamental changes in the past years. Heading towards decarbonization and decentralization, the new economy provides already enough employment opportunities and helps to balance losses from the gradual ceasing of the mining operations. Accelerating the transformation provide good bases for irreversibility of the processes.

### 6.1.3 Gender dimension

Even if more women participate in the labour market, the burden of private and care responsibilities, the unpaid work, still rests largely on their backs. Women's increase in working hours doesn't automatically lead to a more balanced sharing of domestic and caregiving work between women and men. Work is the best way to empower women economically. Thus, transformation to a new sustainable and decentralized economy based on SMSs in Horná Nitra provide more job opportunities for women and for a more gender-balanced labour market.

### 6.1.4 Discussion

Keeping the coal mine closure schedule and accelerating economic transformation may provide important impetus for regional coping strategies and for reaching the goals of the decarbonized regional economy. First positive examples from the transformation are also important for getting public support and for building an argumentation basis against attempts to slow down or stop the process of mine closure and regional decarbonization.

## 6.2 Challenge 2: Local capacities and utilisation of available financial assistance

### 6.2.1 Challenge description

***Current situation***

There are several financial schemes financed by the European Union's ESIF and the Slovak Republic specifically targeting Horná Nitra. The most important sources are European Structural and Investment Funds (ESIF), Recovery and Reconciliation Plan, there are specific provisions in Just Transition Fund. The resources are aimed to facilitate the transformation of Horná Nitra economy, address structural and institutional challenges affiliated with the transformation and generally improve the competitiveness of the regional economy. The problem is in local capacities and how much are local stakeholders able and capable to utilize this assistance, which is dominantly bound to specific conditions and requires specific project development, planning and administrative know-how.

***Desired outcome***

By utilizing allocated and available resources may Horná Nitra greatly benefit from external assistance and transform the local economy, address structural challenges and build a resilient society.

### 6.2.2 Coping strategies

***Coping strategy 1: Building local capacities***

This may include regional leadership, sharing knowledge and opportunities gleaned through engagement across multiple sectors. External assistance may focus on building and developing local capacities, providing external know-how and knowledge for the key local stakeholders. It also may include coordination of programs to increase resources and deliver maximum impact, supporting networks and engaging in a wide range of regional forums to build the region's capacities.

***Coping strategy 2: Networking on the regional level***

Networking may include implementing programs and advances policies that connect the economy, community and environment to accelerate inclusive prosperity. Many of these programs may be in

partnership with other organizations and coalitions, and they have a diverse identity. Using local networks, getting to know the family of programs and building peer to peer learning processes, engaging local experts may help to develop local capacities and provide strong impetus for regional development.

***Coping strategy 3: International networking***

There are currently many regions in Europe struggling with mine closure and regional economic transformations. The Platform for Coal Regions in Transition and networking on the international level may provide important incentives for the Horná Nitra and help to utilize opportunities stemming from the financial assistance. There are 42 coal regions in Europe spread across 12 EU member states, and the European Commission has set up a Platform for Coal Regions in Transition to assist them with transitioning to a low-carbon economy.

### 6.2.3 Gender dimension

Capacity building and networking may provide important incentives for the development of projects and practical activities focused on gender issues, helping women's employment and engagement, provide new opportunities for gender-balanced regional economy. It may provide important infrastructure for child care, social care and other forms of help to the families, which may provide deeper assistance for women and help them in daily life.

### 6.2.4 Discussion

There is a strong and very critical public discussion on the (un)ability of local stakeholders to utilize opening opportunities and windows of opportunity, which may soon close with the regional transformation. Years leading to 2023 are crucial for balancing adverse impacts from the mine closure and if the opportunities are not used, decarbonization of the regional economy may be slowed down with all negative consequences for the people.

# CHAPTER 7

## CONCLUSIONS

# 7 Summary

The future of the region is seen as dependent on central authorities and funding both from the state and EU funds. Despite all the strain situations ongoing in the territory, we can identify several coping strategies. The EU Green Deal, Fit for 55 and Re-Power EU provides an important framework for national policies and targets. Operating with the implementation of the already approved targets provides strong arguments for keeping the process on track. This strategy of insistence on the implementation of the national policy targets for the Green Deal should be pursued by the regional stakeholders, local governments and NGOs as well.

The regional economy in Horná Nitra went through fundamental changes in the past years. Heading towards decarbonization and decentralization, the new economy provides already enough employment opportunities and helps to balance losses from the gradual ceasing of the mining operations. Accelerating the transformation provide good bases for the irreversibility of the processes.

There are several financial schemes financed by the European Union's and the Slovak Republic specifically targeting Horná Nitra. The most important sources are European Structural and Investment Funds (ESIF), Recovery and Reconciliation Plan, there are specific provisions in Just Transition Fund. By utilizing allocated and available resources may Horná Nitra greatly benefit from the external assistance and transform the local economy, address structural challenges and build a resilient society.

The major coping strategy identified is based on the building of local capacities. This may include regional leadership, sharing knowledge and opportunities gleaned through engagement across multiple sectors. External assistance may focus on building and developing local capacities, providing external know-how and knowledge for the key local stakeholders. It also may include coordination of programs to increase resources and deliver maximum impact, supporting networks and engaging in a wide range of regional forums to build the region's capacities.

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# APPENDIX

# Appendix

## Regional delineation

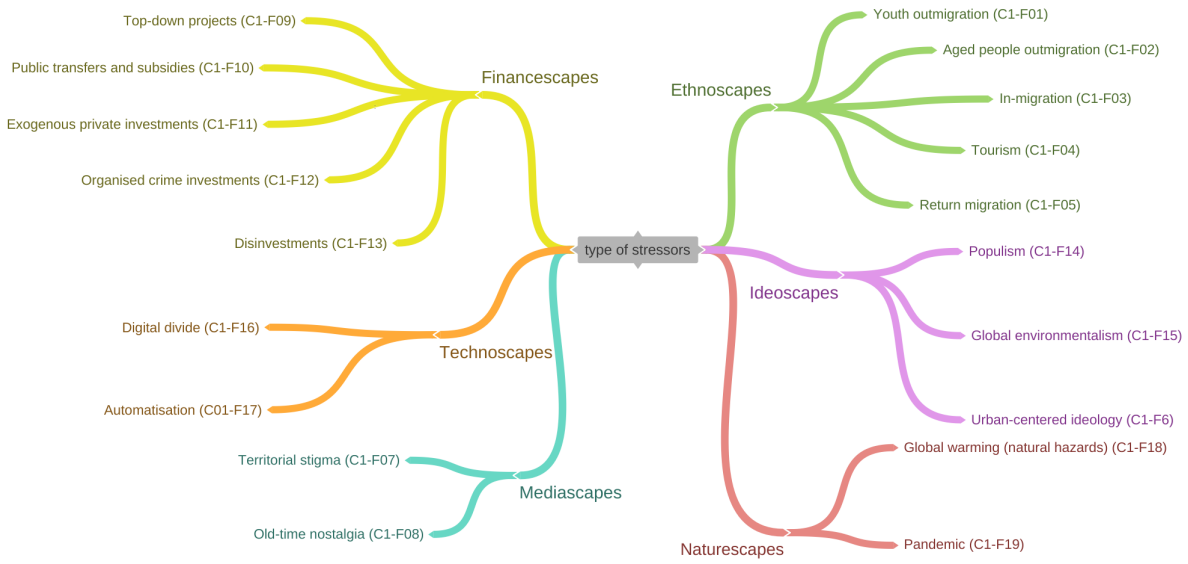
### Table 8 – Case Delineation

| CCT | CCT (NUTS 3) | LMA | PAR |
|---|---|---|---|
| **513881** Prievidza | SK022 Trenčianský kraj | SK022 Trenčianský kraj | SK022 Trenčianský kraj |
| **505315** Partizánske | | | |

Source: own delineation.

## Appendix socio-cultural component

### Figure 12 – Overview of socio-cultural factors




Source: Deliverable 1.2 of ENTRANCES project.

## Appendix socio-economic component

### Table 9 – NACE Rev. 2 classification

| NACE Rev. 2 | Description |
|---|---|
| A | Agriculture, forestry and fishing |
| B | Mining and quarrying |
| C | Manufacturing |
| D | Electricity, gas, steam and air-conditioning supply |
| E | Water supply, sewerage, waste management and remediation |
| F | Construction |
| G | Wholesale and retail trade |
| H | Transportation and storage |
| I | Accommodation and food service activities |
| J | Information and communication |
| K | Financial and insurance activities |
| L | Real estate activities |
| M | Professional, scientific and technical activities |
| N | Administrative and support service activities |
| O | Public administration and defence; compulsory social security |
| P | Education |
| Q | Human health and social work activities |
| R | Arts, entertainment and recreation |
| S | Other service activities |
| T | Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use |
| U | Activities of extraterritorial organisations and bodies |

Source: Eurostat, 2008, p.47.

**Table 10 – General statistical overview**

| | CCT | LMA | PAR | Slovakia | EU28 |
|---|---|---|---|---|---|
| **Territory in sq km** | 1,261 | 4,502 | 4,502 | 49,034 | 4,469,508 |
| **Population** | | | | | |
| **total** | 179,210 | 584,569 | 584,569 | 5,457,873 | 513,093,556 |
| **…female** | 90,876 | 297,364 | 297,364 | 2,792,523 | 262,118,829 |
| **…male** | 88,334 | 287,205 | 287,205 | 2,665,350 | 250,974,727 |
| **Median Age** | 41.7 | 42.1 | 42.1 | 40.6 | 43.1 |
| **Population density** | 142 | 130 | 130 | 111 | 115 |

Notes: Data refer to 2019.

Sources: Eurostat (reg_area3, demo_r_pjangrp3, demo_r_d3dens), Statistical Office of Slovak Republic (om_7001rr, om3704rr, om7005rr).

## Table 11 – Economic data overview

| | CCT-NUTS 3 | LMA | PAR | Slovakia | EU28 |
|---|---|---|---|---|---|
| **Labour Force Population** | | | | | |
| **total** | na | 300,900 | 300,900 | 2,746,300 | 245,797,412 |
| **Unemployment Rate (%) a)** | | | | | |
| **Total (ILO)** | 4.46 | 5.39 | 5.39 | 6.5 | 6.8 |
| **Employment Shares by Industries (%)** | | | | | |
| **Manufacturing** | 34.7 | 40.5 | 40.5 | 24.5 | 13.7 |
| **Services** | 61.2[9] | 31.2 | 31.2 | 68.1 | 74.1 |
| **Mining and utilities** | 7.4[10] | 1.7 | 1.7 | 0.4 | 1.5 |
| **Gross Value Added Total (Bn Euro real)** | na | 7.162 | 7.162 | 80.217 | 14,240 |
| **Gross Value Added Shares (%)** | | | | | |
| **Manufacturing** | na | 23.4 | 23.4 | 21.2 | 15.9 |
| **Services** | na | 61.3 | 61.3 | 64,7 | 73.7 |
| **Mining and utilities b)** | na | 4.1 | 4.1 | 3.6 | 3.3 |
| **GDP per capita (Euro)** | na | 13,857 | 13,857 | 16,444 | 31,084 |
| **in relation to country Ø** | na | 80.5 | 80.5 | 1 | |
| **in relation to EU Ø** | na | 44.5 | 44.5 | 53% | |
| **Disposable Income per capita (Euro)** | na | 690 | 690 | 656 | 16,578 |
| **in relation to country Ø** | na | 105% | 105% | 1 | |
| **in relation to EU Ø** | na | 75.7% | 75.7% | 68.3 | |

Notes: Data refers to 2018 because data on the NUTS 3 level is only available until 2018. Mining and utilities sector covers NACE classification B, D, E.

Sources: Statistical Office of the Slovak Republic (pr3113rr, nu3007ru,v_nu3002_rr, pr3108rr) , Eurostat (nama_10_gdp, nama_10r_2hhinc, tps00203, lfsa_egan2, nama_10_a10, tec00113) and own calculations.

9 Data available only for Prievidza.
10 Data available only for Prievidza.

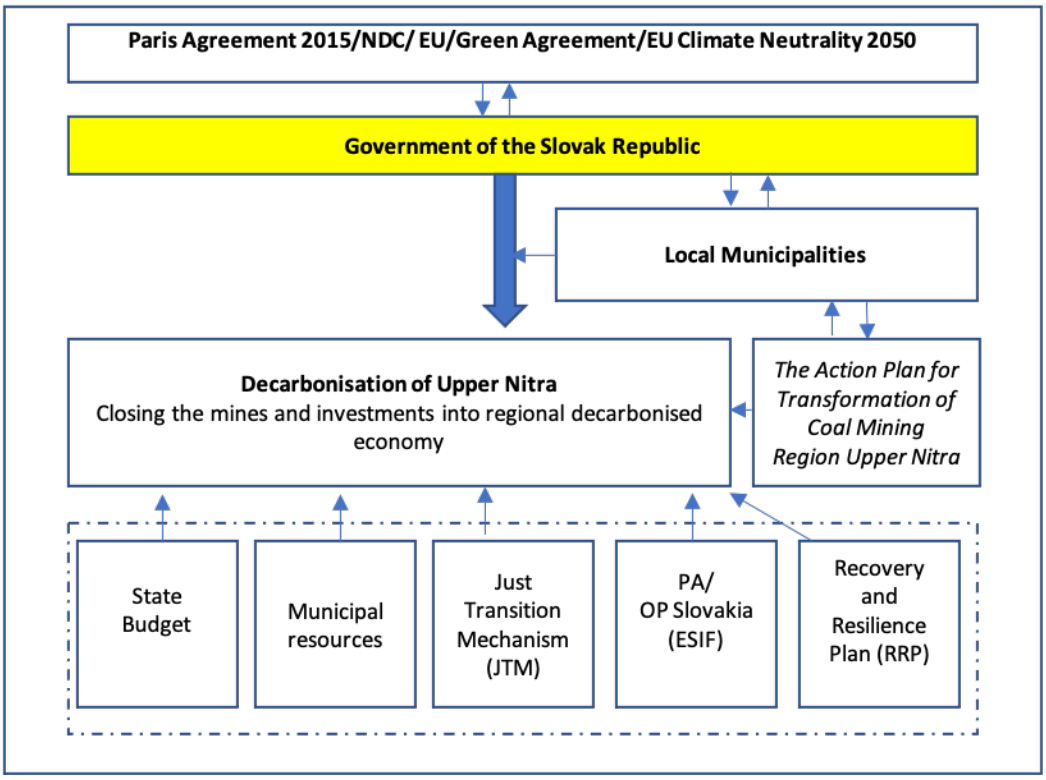
Table 12 – Coal data overview

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **No. of mines** | 3 | 3 | 3 | 2 | 2 | 2 |
| **Production of coal (in tons)** | 1,820 | 1,762 | 1,805 | 1,338 | 1,205 | |
| **No. of coal power plants** | 1 | 1 | 1 | 1 | 1 | 1 |
| **Electricity Generation by Coal Power Plants (in TWh)** | 1.66 | 1.545 | 1.484 | 1.27 | 1.17 | |
| **No. of coal power plants** | 1 | 1 | 1 | 1 | 1 | 1 |
| **Capacity of coal power plants (in MW)** | 486 | 361 | 266 | 266 | 266 | 266 |
| **No. of employees** | | | | | | |
| **in mines** | 1,695 | 1,415 | 2,056 | 1,256 | 1,275 | |
| **in coal power plants** | 261 | 244 | 234 | 230 | 228 | |
| **No. of people employed** | | | | | | |
| **directly with coal** | na | na | 3,060 | 3,017 | 3,017 | |
| **with coal (including services)** | na | na | 3,833 | 3,782 | 3,782 | |
| **Labour compensation (in Euro)** | | | | | | |
| **mines** | 1,023 | 1,089 | 1,066 | 1,067 | 1,240 | 1,267 |
| **coal power plants** | na | | | | | |

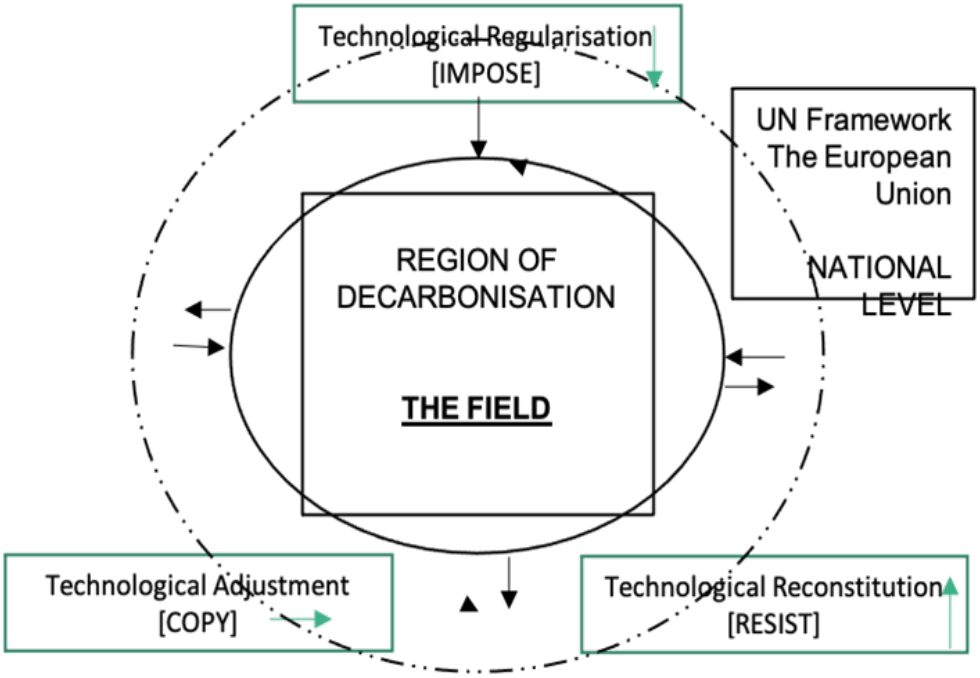
Sources: Seps, a.s. (Slovenská elektrizačná a prenosová sústava, se, a.s (Slovenské elektrárne), HBP, a.s.

## Appendix socio-political component

### Figure 13 – Upper Nitra implementation framework for decarbonisation




### Figure 14 – Technological drama framework



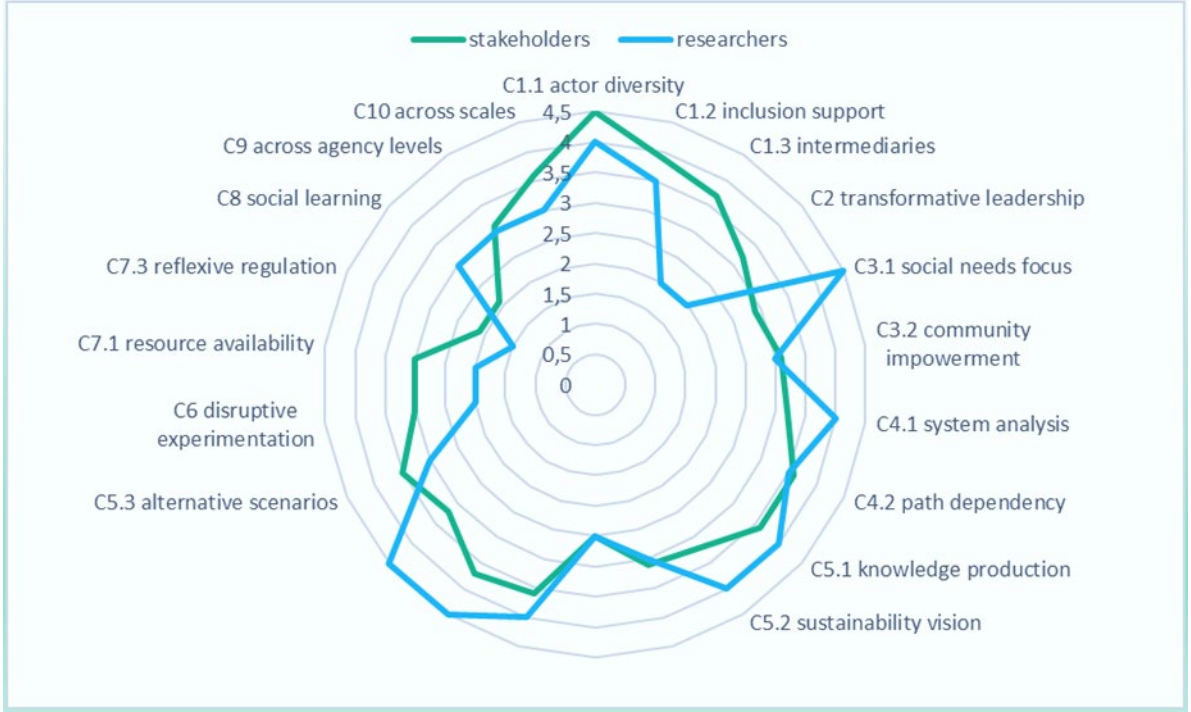
## Appendix socio-ecological and technical component

### Table 13 – List of ENTRANCES interview questions

| T.C. Factor | Description | Corres-ponding Question | Question Text<br>*To what extent do you agree or disagree that:* |
|---|---|---|---|
| **C1.1** | actor diversity | Q2 | "Beyond public authorities, diverse stakeholders – citizens, civil society, businesses, NGOs and academia – are actively participating in steering the clean energy transition." |
| **C1.2** | diverse governance | Q5 | "Governance/steering approaches used for the clean energy transition are varied and hybrid – including formal AND informal processes, centralised AND decentralised, top-down AND bottom-up arrangements, as well as governing through hierarchy, market, and networks." |
| **C1.3** | intermediaries | Q6 | "Intermediaries are playing an influential role in governing the clean energy transition at present." |
| **C2** | transformative leadership | Q7 | "Leadership for the energy transition (i) comes from all sectors (public, private, civil society), (ii) offers motivating visions and (iii) drives collaboration between stakeholders." |
| **C3.1** | social needs focus | Q8 | "The clean energy transition addresses social needs." |
| **C3.2** | community empowerment | Q9 | "Support is given to citizens, innovators and communities of change (e.g., energy cooperatives, local sustainability networks, start-ups) to act autonomously to advance the energy transition." |
| **C4.1** | system(s) analysis | Q10 | "There is a widely shared awareness among stakeholders of the importance of (systemic) interdependencies between the cultural, institutional, socio-economic, ecological, and technical aspects of the transition." |
| **C4.2** | path depen-dency | Q11 | "Stakeholders recognise (systemic) interdependencies between the cultural, institutional, socio-economic, ecological, and technical aspects of the transition as critical obstacles to change." |
| **C5.1** | knowledge production | Q12 | "There is a broad diversity of knowledge produced from different stakeholders that informs the transition (e.g., technical science, social science, civil society, government, industry)." |
| **C5.2** | sustainability vision | Q13 | "The transition vision for [region] is explicit, radical, collectively produced, motivates action and provides clear orientation for stakeholder actions." |
| **C5.2.1** | –explicit | Q13.a | …explicit? |
| **C5.2.2** | –radical | Q13.b | …radical / far-reaching? |
| **C5.2.3** | –collective | Q13.c | …collectively produced? |
| **C5.2.4** | –motivating | Q13.d | …motivates action? |
| **C5.2.5** | –orienting | Q13.e | …provides clear orientation? |
| **C5.3** | alternative scenarios | Q14 | "Present implementation of / planning for the transition makes use of future scenarios, including alternative development options based on stakeholder choices, and addressing uncertainties and (systemic) interdependencies (between the cultural, institutional, socio-economic, ecological, and technical aspects)." |

| | | | |
|---|---|---|---|
| **C6** | disruptive experimen-tation | Q15 | "There is a diversity of experiments undertaken to develop fundamental alternatives to current ways of thinking, organizing and doing." |
| **C7.1** | resource availability | Q16 | "Stakeholders are given access to resources that enhance their organisation and cooperation, their inclusion and participation, or enable vision- and scenario-development and experimentation." |
| **C7.2** | organisational adjustment | – n/a – | – n/a – |
| **C7.3** | reflexive regulation | Q17 | "Regulatory changes have been implemented to support the transition and overcome obstacles." |
| **C8** | social learning | Q18 | "There is monitoring of and active learning of all stakeholders about the transition process that feeds back into its implementation." |
| **C9** | across agency levels | Q3 | "Measures to move the clean energy transition forward actively involve all different types of social actors; including individuals and households, as well as groups, organisations, networks, and associations." |
| **C10** | coordination across scales/tiers | Q4 | "Measures in support of the clean energy transition, as it is presently unfolding, involve strong dialogue and coordination across spatial scales; from local to regional, national, inter- or transnational, and EU." |

**Figure 15 – Stakeholder assessment of transformative capacity**




Note: Possible responses are: 0 – don't know; 1 – completely disagree; 2 – somewhat disagree; 3 – neither agree nor disagree; 4 – somewhat agree; 5 – fully agree.

Source: Based on ENTRANCES interviews conducted for the case study.

Table 14 – Transformative Capacity Scores

| | stakeholders | researchers |
|---|---|---|
| **C1.1 actor diversity** | 4.5 | 4 |
| **C1.2 inclusion support** | 3.9 | 3.5 |
| **C1.3 intermediaries** | 3.7 | 2 |
| **C2 transformative leadership** | 3.2 | 2 |
| **C3.1 social needs focus** | 2.9 | 4.5 |
| **C3.2 community impowerment** | 3.1 | 3 |
| **C4.1 system analysis** | 3.2 | 4 |
| **C4.2 path dependency** | 3.6 | 3.5 |
| **C5.1 knowledge production** | 3.6 | 4 |
| **C5.2 sustainability vision** | 3.2 | 4 |
| | 3.1 | 3 |
| | 2.5 | 2.5 |
| | 3.6 | 4 |
| | 3.7 | 4.5 |
| | 3.2 | 4.5 |
| **C5.3 alternative scenarios** | 3.5 | 3 |
| **C6 disruptive experimentation** | 3 | 2 |
| **C7.1 resource availability** | 3 | 2 |
| **C7.3 reflexive regulation** | 2.1 | 1.5 |
| **C8 social learning** | 2.1 | 3 |
| **C9 across agency levels** | 3.1 | 3 |
| **C10 across scales** | 3.6 | 3 |

Source: Based on ENTRANCES interviews conducted for the case study.

# ENTRANCES

ENergy TRANsitions from Coal and carbon: Effects on Societies

UNIVERSIDADE DA CORUÑA

ENEA

K&I Knowledge and Innovation

IWH Halle Institute for Economic Research Member of the Leibniz Association

Leibniz Institute of Ecological Urban and Regional Development

ZSI

NTNU

eurada

Mineral and Energy Economy Research Institute Polish Academy of Sciences

spi Sociedade Portuguesa de Inovação

wecf France

CARDIFF UNIVERSITY PRIFYSGOL CAERDYDD