Ref. Ares(2020)6198100 - 31/10/2020

ENTRANCES

ENergy TRANsitions from Coal and carbon: Effects on Societies

D1.1. Factors Description Grid

Note and tools for the conceptual specification

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement nº 883947. The document represents the view of the author only and is his/her sole responsibility: it cannot be considered to reflect the views of the European Commission and/or the Innovation and Networks Executive Agency (INEA). The European Commission and the Agency do not accept responsibility for the use that may be made of the information it contains.

Document Control Sheet

Project Title:	ENergy TRANsitions from Coal and carbon: Effects on Societies - ENTRANCES
Deliverable	**D1.1**
Work package	**1**
WP lead partner	**K&I**
Task	**1.7.**
Number of pages	**38**
Due date	**31/10/2020**
Actual delivery date	**31/10/2020**
Dissemination level	**Confidential**
Main author	**G. Caiati (K&I)**
Contributors	**R. García Mira (UDC), M. Cacace, F. Feudo, G. Quinti (K&I)**

Versioning and Contribution History

Version	Date	Author/Editor	Contributors	Description/Comments
1	19/06/2020	G. Caiati	All	**First version discussed with the consortium**
2	6/07/2020	G. Caiati	G. Quinti	**Add partners feedback and new Para (3.2 and 4.1)**
3	6/10/2020	G. Caiati	R. García Mira	**Add the research questions (Para 3.1.)**
4	28/10/2020	G. Caiati	K&I	**Add Para 5.1. and 5.2 as dis-cussed with the consortium**
5	**31/10/2020**	**G. Caiati**	**K&I**	**Final check and editing**

Document last saved on	***31.10.2020***

Table of Contents

Section 1 – Introduction 4
1.1. The role of conceptual specification in ENTRANCES 4
1.2. The conceptual specification work in ENTRANCES 4
1.3. Factors Description Grid: note and tools for the conceptual specification 5

Section 2 – Cross-disciplinary work in ENTRANCES 7
2.1. Overview 7
2.2. Mechanisms of knowledge integration 7
2.3. The risk of diverging expectations about cross-disciplinary work 8

Section 3 – Conceptual specification starting points 10
3.1. Explicit research questions 10
3.2. Case description map 10
3.3. Ex-ante conceptual Map 10

Section 4 – Conceptual specification tools 14
4.1. Component Description Template 14
4.2. Factors, dynamics and patterns 15
4.3. The Factors Description Template 16

Section 5 – Knowledge integration 18
5.1. Repositioning process 18
5.2. Components Assemblage 18
5.3. Representation and visualisation 19

Annex I – Case Description Map

Annex II – Component Description Template

Annex III – Factors Description Template

Section 1 – Introduction

ENTRANCES – ENergy TRANsitions from Coal and carbon: Effects on Societies – is a three-year project funded by the European Union's Horizon 2020 research and innovation programme. The project finds its framework under the topic "Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition" and call: LC-SC3-CC-1-2018-2019-2020.

1.1. The role of conceptual specification in ENTRANCES

ENTRANCES' **overall goal** is developing a theoretically-based and empirically-grounded understanding of cross-cutting issues related to SSH aspects of the clean energy transition in European coal and carbon-intensive regions, so as to formulate a set of recommendations able to tackle these issues.

The project focuses on the impacts of the clean energy transition on coal and carbon-intensive regions, either in terms of the potential activation or strengthening of **de-territorialisation process**, i.e., the process of progressive weakening of ties between a community and its territory, and conversely as a window of opportunity for triggering their re-territorialisation.

To achieve this goal the research is based on a **Multidimensional Analytic Framework** (MAF) articulated into six components: socio-economic, socio-ecological, socio-technical, socio-cultural, socio-political, and socio-psychological components.

In the **conceptual strand** of the project, WP1 (Conceptual framework), together with WP2 (Methodological framework), will have the role of specifying the Multidimensional Analytic Framework (MAF). The framework will then be used in the **empirical strand** for researching 13 Coal and Carbon Intensive Regions across Europe and develop a set of 13 regional case studies (WP3 and WP4). The data collected will be used also for a comparative analysis leading to the development of a taxonomy of challenges and coping strategies (WP5). Finally, in the **co-creation strand**, the data will be also used to develop models and scenarios and to draft a set of practical recommendations at the regional level and policy recommendations at the European level (WP6).

Accordingly to this overview on ENTRANCES, the conceptual specification can be considered as the foundation upon which the whole project will be implemented.

1.2. The conceptual specification work in ENTRANCES

The conceptual specification in ENTRANCES – carried out in the first work package of the project "WP1 – Conceptual Framework" – is based on a work conducted in parallel on each of the six above mentioned components (T1.1 - T1.6), and accompanied by a

cross-cutting workspace (T1.7). The aim is to further develop and fine-tune the conceptual framework outlined in the proposal, through specifying a set of distinctive factors, dynamics, and patterns for each of the six analytic components of the MAF. For each component, a scoping review of the literature is conducted allowing us to collect, capitalise and use the existing knowledge on different issues related to clean energy transition, de-carbonisation of coal, and carbon intensive-regions and de-territorialisation/re-territorialisation process.

Overall, the conceptual specification itinerary has been operationalised in the following three phases.

- ***Set-up phase*** *(May – June 2020)*: it was the phase dedicated to setting up and organising the conceptual specification work. The draft version of this deliverable has been developed in such a phase, including a set of information and tools for conducting the collection of factors, dynamics, and patterns (see Para 1.3. below).

- ***Identification phase*** (*July – Oct 2020*): it was the phase focused on identifying the factors, dynamics, and patterns to be included in each of the components, through a scoping review of the literature. In this phase, the six components have been formalised using a common framework.

- ***Assemblage phase*** (*Oct – Nov 2020*): this phase (currently ongoing) is dedicated to fine-tuning, harmonising, and coordinating the six components among each other, and to complete the identification of factors, dynamics, and patterns started in the previous phase.

All the phases have been informed by different activities of the cross-cutting workspace (T1.7). This workspace has been created for stimulating an open dialogue among the different partners involved in the conceptual specification so that the different components are harmonised in the Multi-dimensional Analytic Framework (MAF). The passage from one phase to another has been marked by a cross-cutting workspace meeting among all the project partners.

1.3. Factors Description Grid: note and tools for the conceptual specification

In the context described above, the aim of this deliverable is providing a clear and detailed framework for the conceptual specification work of ENTRANCES. Moreover, the deliverable describes, and provide in the annexes, the actual tools adopted to formalise the six components as well as for identifying their distinctive factors, dynamics, and patterns (T1.1 - T1.7).

This deliverable has been drafted by K&I as Work Package leader by collecting input and feedback coming from the project partners in all the meetings carried out so far (starting from the Kick-off meeting). Moreover, UDC as project coordinator contributed to the document.

A draft version of this text has been presented and discussed during the first Cross-cutting workspace meeting (T1.7, June, 19th 2020) with the name of "Note for conceptual specification". The proposed approach has been successfully experimented since then. A set of adjustments and improvements of the text have been introduced based on the inputs collected in the several occasions of interaction among the partners offered by the cross-cutting workspace activities from June to October (up to the 2nd Cross-cutting workspace meeting on October 6th). In this regard, the draft version of this deliverable has been used as a dynamic document, incorporating the agreed changes and new tools that have been developed from time to time and that were not foreseen at the beginning. In this regard, such a dynamic document has served as a practical tool in the development of the seven tasks of the work package. In the next future, the information and the tools of the deliverable will be used as a common template for the development of the "short report on key factors, dynamics, and patterns" which is foreseen for each of the six analytical components (the tasks from T1.1 to T1.6), and that will be ready for December 2020.

Given that the deliverable doesn't focus only on the grid for describing the identified factors, but entails a broad set of information and tools, its original title "Factors Description Grid" has been integrated with a subtitle: "Factors Description Grid: note and tools for conceptual specification".

Besides this introduction (Section1) the deliverable is composed of three main sections:

- Section 2 provides an overview of the cross-disciplinary work as it is foreseen in ENTRANCES
- Section 3 summarises the conceptual specification starting points
- Section 4 describes the conceptual specification tools
- Section 5 provides information on how the knowledge of the different dimensions envisaged in the MAF is going to be integrated

Moreover, the deliverable contains four Annexes: the Case Description Map, the Component Description Template (data-entry sheet), and the Factors Description Template (data-entry sheet).

The deliverable is not a public report as it is addressed only to the members of the consortium (it has a "confidential" status). The text constantly refers to the project proposal as it has been approved and funded (Description of the Action – DoA in the Grant Agreement).

Section 2 – Cross-disciplinary work in ENTRANCES

2.1. Overview

ENTRANCES adopts a **broad cross-disciplinary approach**[1] designed to go beyond the limits that normally characterise scientific cooperation among different disciplines, namely a loss of epistemic diversity or the lack of integration[2].

A **multidisciplinary** approach (many disciplines side by side) will be adopted in the **conceptual strand**, to involve several perspectives (socio-economic, socio-technical, socio-ecological, socio-cultural, socio-political, socio-environmental, and gender) since the beginning of the research, so that they can equally contribute in defining research questions (WP1) and methods (WP2).

An **interdisciplinary** exercise (many disciplines in a unified framework) will be carried out **in the empirical strand** to integrate the empirical findings in each case study (WP3 and WP4) and the taxonomy of challenges and coping strategies (WP5).

Finally, through adopting a **transdisciplinary** approach (beyond scientific disciplines), in the **co-creation strand**, the results of the research will be tested and integrated with the perspectives of stakeholders at different levels (regional, national, and European) and of different type (decision-makers, researchers, businesses and citizens) (WP6).

2.2. Mechanisms of knowledge integration

In line with the three strands of ENTRANCES and with the three different types of scientific cooperation presented in Para. 2.1., different mechanisms of knowledge integration will be adopted to put together the six components of the Multidimensional Analytic Framework (MAF).

In the **conceptual strand**, where the focus is on multi-disciplinarity, each of the six selected approaches should be re-arranged and fine-tuned based on their specific role in the broader framework of the research (the MAF). While each of the approaches has been originally developed for conducting single-approach research (in their field of competence), in ENTRANCES they should be re-imagined and also re-sized as one out of six components of the research. Rather than mixing-up the approaches, in this phase, each of the components should be informed of what are the core features of the others, and it will be aware of its added-value. This work of **re-positioning** is possible

[1] Cross-disciplinarity is understood as an all encompassing term for multidisciplinarity, interdisciplinarity and transdisciplinarity see Mallaband, B., Wood, G., Buchanan, K., Staddon, S., Mogles, N.M., & Gabe-Thomas, E. (2017). The reality of cross-disciplinary energy research in the United Kingdom: a social science perspective. *Energy research & social science*, 25, 9-18.
[2] A more detailed description of these limits is provided in the Ambition paragraph of the DoA.

only by achieving a good level of mutual knowledge and understanding among the partners. Moreover, the component repositioning will allow to "assembling" each of them with each other. The outcome would be the adoption of six autonomous but yet coordinated approaches in the Multidimensional Analytic Framework (MAF).

In the **empirical strand**, where the focus is on inter-disciplinarity, the six components will be combined in each of the 13 regional cases for developing a regional case study. The common interpretative context of the six dimensions – the de/re-territorialisation processes connected with the clean energy transition of these regions – will allow the integration of the components in a single case study (WP3 and WP4). The main mechanism of knowledge integration in this strand will be the **combination** of the components into the case studies, and it will be possible by using the empirical evidence coming from the study. The same consideration of knowledge integration can be applied to the development of the taxonomy of challenges and coping strategies (WP5).

Finally, in the **co-creation strand**, where the focus is on trans-disciplinarity, the descriptive interpretation provided by the case studies and the taxonomy will be compared with other interpretations connected with the clean energy transition: the socio-economic model, the socio-technical and environmental model, and the stakeholder's knowledge. By adopting a **triangulation** mechanism, these different perspectives will be combined for the development of a set of "calibrated" practical recommendations for the regions.

The table below shows how each knowledge integration mechanism involves a starting point, new elements to be considered, and an integrated outcome.

Table 1 – Summary table of knowledge integration mechanisms in ENTRANCES

Strand	Cooperation	Mechanism	Starting point	New elements	Outcome
Conceptual	Multi-disciplinary	Re-positioning	Six approaches	Mutual understanding	Six coordinated approaches MAF
Empirical	Inter-disciplinarity	Combination	Six coordinated approaches MAF	Empirical evidence	Integrated Case Studies & Taxonomy
Co-creation	Trans-disciplinarity	Triangulation	Integrated Case studies & Taxonomy	Models & stakeholders	Calibrated recommendations

2.3. The risk of diverging expectations about cross-disciplinary work

In summary, ENTRANCES embraces **theoretical and methodological pluralism** – an approach in which the adoption of different scientific perspectives is not considered as

a problem but as an asset – and it relies on a process of knowledge integration[3]. In starting the work of conceptual specification, it is important to clarify that this approach to cross-disciplinary should not be confused with other forms of scientific cooperation that are commonly adopted in research practice. To avoid the risk of diverging expectations about cross-disciplinary work, a summary of other forms of scientific cooperation of why they may not fit and be risky for ENTRANCES is provided below.

- **Unification**. Firstly, the project will not (and could not) merge the actual disciplines or their theories and methods into a brand new theoretical approach. Rather it will produce a segmented (multi) framework in which the different components (with their specific theories and methods) are coordinated with the others. Not only the "unification perspective" is not feasible in the short window of time offered by the project for conceptual specification, but it also exposes to risks such as the reduction of the complexity of each approach – where different assumptions and theories cannot be easily merged (or not at all[4]) – and can also degenerate in the so-called scientific imperialism[5] of the more influential partners or more widely accepted approaches.

- **Hybridisation**. Secondly, the project will not dissolve the specific approaches of the six components in a not-specified melting pot of methods[6]. It will rather make explicit the different assumptions, conditions of applicability, and limits of each of the six components. One of the risks of the "hybridisation perspective" is that the research may focus on the methods and overlook the theory and assumptions behind them. Hybridisation may lead to a loss of the diversity and a scarce clarity about assumptions, scope, and limits of the research.

- **Pillarisation**. Finally, the project will not work on separate silos. On the contrary, the project requires high-quality discourse among the different points of view represented in the Multidimensional Analytic Framework and the identification of the appropriate means of knowledge integration (see Para. 2.4.). The "pillarisation perspective" would fail to understand the relationship existing between different aspects of the de/re-territorialisation processes of coal and carbon-intensive regions in transition that can be investigated by adopting different approaches.

.

[3] Isgren, E., Jerneck, A., & O'Byrne, D. (2017). Pluralism in search of sustainability: Ethics, knowledge and methodology in sustainability science. *Challenges in Sustainability*, 5(1), 2-6.
[4] Keating, M., & Della Porta, D. (2010). In defence of pluralism in the social sciences. *European Political Science*, 9(1), S111-S120.
[5] Olsson, L., & Jerneck, A. (2018). Social fields and natural systems. *Ecology and Society*, 23(3).
[6] Ahmed, A., & Sil, R. (2012). When multi-method research subverts methodological pluralism – or, why we still need single-method research. *Perspectives on Politics*, 10(4), 935-953.

Section 3 – Conceptual specification starting points

3.1. Explicit research questions

A **first starting point** for the conceptual specification work is the need to develop a framework able to answer the research questions of the project. Based on the ENTRANCES objectives (in the DoA) a set of three research questions have been made explicit and singled-out with this purpose.

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 de-territorialization process (the latter including aspects such as outward migration and rise of populism) and how do they interact? What kinds of strategies are the most 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?

3.2. Case Description Map

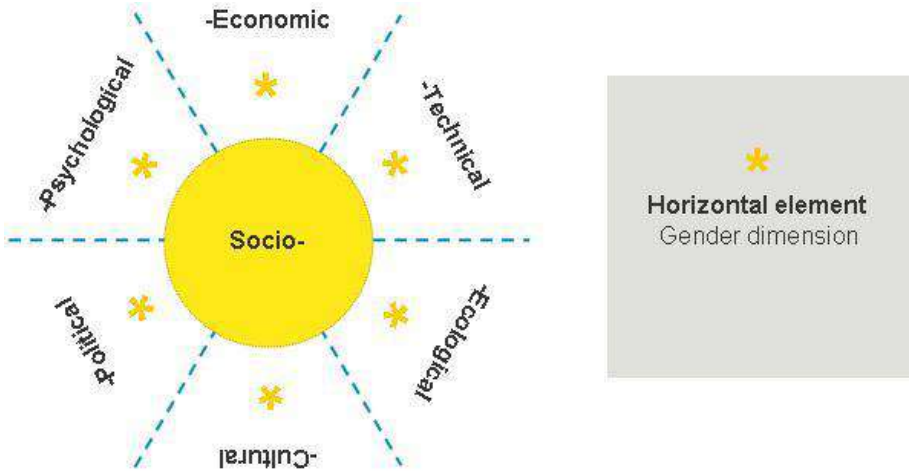
A **second starting point** for the conceptual specification is constituted by the features of the 13 coal and carbon-intensive regions included in the project as case studies. In this regard, a preliminary description of these regions has been provided in a "case description map", so that the basic feature of the set of 13 regions involved may be taken into account for the conceptual specification work. In the case description map, each of the 13 regions has been described based on the "attributes" that make them part of the project cases, i.e. why they can be considered coal and carbon-intensive. Each of the attributes has been synthetically described in a short text. The case description map is a constant reference for conceptual specification, as the components and their related factors should plausibly fit with the different types of regions included in the study.

The Case description Map is reported in **Annex I**.

3.3. Ex-ante Conceptual Map

A **third starting point** of the conceptual specification is the essential description of the Multidimensional Analytic Framework (MAF) as presented in the project proposal. As reported above, the MAF is based on six "socio" components: socio-economic, socio-technical, socio-ecological, socio-cultural, socio-political, and socio-psychological, all crosscut by gender dimension.

Figure 1 - the Multidimensional Analytic Framework (MAF)



A series of already consolidated approaches is adopted (and adapted) as a basis for the six components.

Table 2 – Component and approaches adopted in ENTRANCES

Socio-economic	Socio-technical	Socio-ecological	Socio-cultural	Socio-political	Socio-psychological
Structural change model	Socio-Technical System (STS) dynamics	Socio-Ecological System (SES) dynamics	Socio-cultural stress	Technological Drama	Place attachment

These approaches have been selected for their capacity to contribute under different and complementary perspectives to one of the main objectives of the research: provide a broad and accurate description of the de/re-territorialisation dynamics characterising the clean energy transition in coal and carbon-intensive regions.

It is possible to identify two "hemispheres" of the MAF. The first three components – socio-economic, socio-technical, and socio-ecological – are based on approaches that describe the transition of coal and carbon-intensive regions from a systemic perspective– which relies on concepts such as equilibrium, cycles, organisation, and integration. The other three components – socio-cultural, socio-political, and socio-

psychological –are based on a phenomenological perspective and are focused on particular aspects of the transition of coal and carbon-intensive regions such as de-territorialisation, the rise of populism, outward migrations, etc.

Based on the information collected so far and those already present in the DoA, an ex-ante map of the six components has been drafted, highlighting the rationale of their selection within the Multidimensional Analytic Framework (MAF). This initial conceptual map is aimed at orienting and informing the identification of the factors in each component and constitutes a first elementary basis for coordination among the six approaches and for the work of re-positioning of each approach. This ex-ante map is presented in table 3. For each component, information about the underlying approach, the domain of inquiry, the theories adopted, the primary research method[7] that is foreseen in the proposal and the possible research area[8] are reported.

Table 3 – Ex-ante Conceptual Map – Multidimensional Analytic Framework

Component	Approach	Domain of enquiry	Theories	Primary method	Research Area
Socio-Economic	Structural-change Model	Reallocation of economic activity across sectors	General Economic Equilibrium	Quantitative data collection	Coal/Carbon labour-market regions
Socio-Ecological	Socio-Ecological System (SES)	Ecosystem services and resource management in a given economic, social and political setting	Panarchy, adaptation and resilience / socio-ecological cycles	Semi-structured interviews	t.b.d. based on the socio-ecological system
Socio-Technical	Socio-Technical System (STS)	Energy socio-technical system and transformation capacities	Multilevel STS change: niche, regime and landscape	Semi-structured interviews	t.b.d. based on the socio-technical system
Socio-Cultural	Socio-cultural stress	Socio-cultural stress and strains present at the territorial level	Tensions between social structure and ongoing change	Focus groups	Two “critical communities” in the region
Socio-Political	Technological Drama	Narrative battles to determine the meaning of the technology	Political processes: regularisation, adjustment and reconstitution	Text research	Local and national public debate
Socio-Psychological	Place attachment	Individual cognitive and emotional processes related to territorial change	Personal processes: Affect, cognition, behaviours	Survey	Two “critical communities” in the region

**Sources*: DoA, PPT presentation of the kick-off meeting, bilateral meetings

[7] In the proposal it is foreseen that each component will be surveyed through a primary method and one or more secondary methods, while desk research method will be transversal to all the dimensions (see DoA Section 1.3.b.4).
[8] The area of research for each component is still under specification, but a first idea is already provided in the table. For socio-ecological and socio-technical components, the area specification will be based on the detailed classification of coal and carbon intensive regions.

The work conducted in WP1 will allow defining an ex-post (or final) conceptual Map that will be reported in D1.2 – *Report on multi-dimensional key factors, dynamics and patterns* (February, 2021).

Section 4 – Conceptual specification tools

4.1. Component Description Template

The information contained in the Ex-ante Conceptual Map will be furtherly developed and presented by the task leaders (T1.1. – 1.6) in their "short reports" by adopting a Component Description Template. The aim of this tool is briefly describing the distinctive features of each component thus allowing to combine and align them with the features of the other components.

The Component Description Template is summarised in the table below and a formatted template is provided in **Annex II**.

Table 4 – Component Description Template

Field name	Field instruction
Component	Name of the component
Lead partner	Insert the name of the task leader
Other partners	Insert the name of the other partners involved in the task
Approach	Insert the approach that will be adopted (see Para 3.2.)
Specific question	Insert the research question(s) distinctive of the component
Domain of inquiry	Describe shortly the domain of inquiry of the component (see Para 3.2.)
Theories	Describe shortly the main theories adopted by the component (see Para 3.2.)
Primary method	Insert the primary method envisaged for the empirical research (see Para 3.2.)
Secondary methods	Insert the secondary methods envisaged for the empirical research (see DoA)
Research area	Define the specific research area of the component
Operational concept	If needed, provide an operational concept of the research area
Case diversification	Describe the strategy envisaged for addressing the diversity of regional cases (see Annex IV)

All the fields of the template do not need explanations or have been already presented in the Ex-ante Conceptual Map (see Para 3.3.), except for "Research area operational concept" and "Case diversification".

As regards the first (Research area operational concept), once the "research area" of the component will be defined, an operational concept should be developed (or at least suggested). The operational concept should be general and applicable to all the 13 regional cases of the project. Once defined, the operational concept will be used in the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement nº 883947. The document represents the view of the author only and is his/her sole responsibility: it cannot be considered to reflect the views of the European Commission and/or the Innovation and Networks Executive Agency (INEA). The European Commission and the Agency do not accept responsibility for the use that may be made of the information it contains.

"State of the art analysis" (WP3 and WP4) to identify in each region (and for each component) the actual area of the research. For example, if the socio-cultural component will focus on two communities some operational criteria for identifying and selecting them should be provided, while the actual communities to be involved in each region will be selected during the "State of the art analysis".

As regards the second (Case diversification), each component should find an appropriate strategy for dealing with the diversity of the regional cases included in the project (see the Cases Description Map, in Annex I). The strategies can be different depending on the component. Some examples of strategy are:

- Example 1 – the component is unique, so the same research items (factors, dynamics, and patterns) are applied in all the cases
- Example 2 – the component has different versions based on regional categorisation, so different set of research items will be applied for different types of regions (depending on the regional categorisation adopted)
- Example 3 – the component is based on the regional "attributes", and is formed by generic research items, which applies to all cases, and specific research items, which applies only in cases with certain attributes (such attributes are marked with an X or the ● in the Case Description Map, see Annex I).

4.2. Factors, dynamics and patterns

Based on the Ex-ante Conceptual Map, and the Component Description Template a list of factors, dynamics, and patterns are identified for each component.

The aim is specifying those aspects that "**ex-ante**" are expected to be constitutive of the process of change ongoing in coal and carbon-intensive regions. For each component the specification of factors, dynamics, and patterns is i) based on a specific approach (the ex-ante conceptual map, see Para 3.3.); ii) sifted through a scoping review of the literature; iii) selected through multidisciplinary dialogue.

The term **factor** refers to single elements/phenomena that contribute to determining the elements/phenomena under investigation (e.g., structural-change, socio-technical change, socio-environmental change, socio-cultural change, socio-political change, socio-psychological change).

- *Example (Socio-cultural component)*: ***Education-induced youth migration*** *(young people moving from the coal and carbon-intensive regions to study in another part of the country or other countries). This phenomenon can be considered a factor of socio-cultural stress, as it contributes to creating a tension with the implicit or explicit roles/rules/or value of the territorial system, in this case, the regeneration of the bond with territory across generations.*

The term **dynamics** refers to trends emerging from the interaction among two phenomena of different nature.

- *Example: Education-induced youth migration can determine different dynamics such as intensification of depopulation (parents also leaving), intensification of the process of demographic ageing, decreased social and cultural attractiveness; decreased attractiveness for investments; but also a possibility of return migration and/or remittances.*

The term **patterns** refers to recurrent or stable configurations of elements/phenomena which can be observed in different places, times, or scales.

- *Example: Education-induced youth migration can determine decreased social and cultural attractiveness which in turn can further increase youth migrations thus determining a recursive pattern.*

It is important to stress that the example provided is drawn from the socio-cultural component. Indeed, based on the definition provided for each component, factor, dynamics, and patterns, should have slightly different interpretations. Moreover, in the example provided, factors, dynamics, and patterns are all linked to each other. This is just a case, and not at all a necessary condition, and factor, dynamic, or pattern can be specified one-by-one and it is not needed to find correspondences among them.

4.3. The Factors Description Template

The Factors Description Template[9] is based on the fields reported below, that are supposed to be filled for each record, i.e., the factor, dynamic, or pattern (F/D/P) inserted. A data-entry sheet is provided in **Annex III**.

Table 5 – The beta version of the Factors Description Template: description of the fields

Field name	Field instruction	Field type
Code	Each record (F/D/P) will be labeled with a code as exemplified here: C4-P03 = component 4 (socio-cultural) - Pattern 3	Codified text
Name	Insert the name of the F/D/P	Short text
Type	Indicate the type of element/phenomena (factor/dynamic/pattern)	Single selection
Description	Provide a short description/definition of the F/D/P	Medium text
Examples/Indicators	Provide either a bullet point list of examples of how the F/D/P manifest or a list of factor's indicators	Long text
Type of region	Indicate if the F/D/P applies only to some type of region	Multiple selection

[9] Despite its name, the template is intended as a tool for describing not only factors, but also dynamics and patterns.

Field name	Field instruction	Field type
Gender sensitiveness	Indicate if the F/D/P is gender-sensitive	Yes/No
	If yes, indicate in which way the gender dimension is relevant for F/D/P	Medium text
Primary and secondary methods	Indicate whether the F/D/P can be surveyed with the primary method or not	Yes/No
	Indicate which method(s) is(are) suited to survey the F/D/P	Single selection
Internal relations	If any, indicate which are the F/D/P(s) directly linked with this record (insert codes) and, if needed, shortly describe how these F/D/P are related	Medium Text
Possible overlap	Indicate if the F/D/P may overlap with other components	Multiple selection
Sources	Indicate the main references of the F/D/P	Medium text
Other comments	If needed, insert further comments	Medium text

Section 5 – Knowledge integration

5.1. Repositioning process

As described in Para 1.2., the analytic framework of the project is based on a multi-disciplinary approach. In the conceptual strand of the project (WP1 and WP2) the first key knowledge integration mechanism adopted would be that of **repositioning.**

The concept of repositioning highlights the need that each of the MAF components adjusts and focus its specific approach so that it can match with the others, to form, overall, a semi-coherent and meaningful research scheme, but without losing its distinctiveness and added value.

The re-positioning process is based on the following three elements that have been pursued in the project through specific activities (most of such activities are part of the cross-cutting workspace T1.7).

- *Making explicit the component distinctive features*. For each component, the distinctive features have been made explicit and communicated with the others by using a common language developed within the project. The Component Description Template (Annex II) has favoured this work of self-reflection and self-communication.
- *Nourishing mutual understanding among the six components*. For a successful repositioning, it is necessary that the partners in charge of the different components have an appropriate understanding of the other components approach and views. The project is favouring mutual understanding by organising a set of six research colloquium, i.e., meetings for discussing in-depth one component at a time.
- *Double feedback loop*. A better understanding of the other components triggers a self-reflection of each component that allows adjusting the original approach (as previously formalised) to make it more fitted with the others, thus **activating the repositioning mechanism**.

5.2. Components Assemblage

The process described above is focused on the repositioning of each component. In ENTRANCES project, this process, that can be considered a necessary but not sufficient condition for knowledge integration, is complemented with the assemblage mechanism, i.e., combining the different analytical components in a common semi-coherent framework. The assemblage concept is in line with the needs of ENTRANCES as:

- It refers to heterogeneous entities that are not holistic
- It is formed by an ad-hoc grouping that comes about historically

- The assemblage coherence co-exist with the internal coherence of each of its components
- The assemblage is not based on a central plan or governed by a central brain[10].

In practice, an itinerary – composed of several workshops – is ongoing for assembling the different components. This itinerary is based on the idea of assembling the six components one at a time with a practical step-by-step approach – thus allowing to reduce the complexity of working with several components altogether. During each assemblage workshop different "critical junctures" between the different components are discussed for ensuring their complementarity: a) their domain of inquiry (conceptual juncture), b) their research area (territorial juncture), and c) their foreseen methods (methodological juncture).

5.3. Representation and visualisation

The development of a common understanding of the Multidimensional Analytic Framework is achieved only once it is represented and visualised. For this reason, the outcome of the assemblage workshop will be summarised in a final conceptual map. Moreover, graphic visualisation of the MAF will be produced. Once finalised, such Map will be presented in the D1.2. *Report on multi-dimensional key factors, dynamics, and patterns* (February 2021).

[10] DeLanda, M. (2019). *A new philosophy of society: Assemblage theory and social complexity*. Bloomsbury Publishing.

Annex I

Case description map

CASE DESCRIPTION MAP

Entaglement Region	Coal Mines	Coal Power Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage	Case Partner
Silesia	X	●	●		●	●	IGSMiE PAN
Lusatia	X	X	●			●	IOER
Rhineland	X	●	●			X	IWH
Central Germany	X	●	●			X	IWH
Jiu Valley	X	●				●	UAIC
Sulcis	●	X	●			●	K&I
Upper Nitra	X	X			●	●	CSPS
Brindisi		X	●				ENEA
Krakow Metropolitan Area		●	●		X	●	IGSMiE PAN
A Coruna		X	●			●	UDC
Upper Styria			X				ZSI
Stavanger				X			NTNU
South Wales	●	●	X			X	CU

X= Primary focus ● = Secondary focus

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
Silesia	18 coal mines operate in the region: 15 – state-owned, grouped in 4 companies: Polska Grupa Górnicza Sp. z o.o., Jastrzębska Spółka Węglowa S.A. TAURON Wydobycie S.A. WĘGLOKOKOKS KRAJ Sp. z o.o. 3 – small private mines: PG Silesia Sp. z o.o., ZG Siltech Sp. z o.o., Eko-Plus Sp. z o.o. Production of steam coal gradually decreases due to decreasing demand, while in 5 coking coal mines is stabilized at about 11 million tons (about 20% of the total coal production). About 80 thousand persons are employed in mines. The costs of coal production are high and profitability of operation in long-term perspective is doubtful.	All public power plants located in the Silesia region are hard coal-fired units. Currently, there are five power plants of 5,0 GW, and one unit will be commissioned in October 2020. Operating power plants are as follows: • Jaworzno: 1,345 MW, • Łagisza: 700 MW, • Łaziska 2: 250 MW, • Łaziska 3: 905 MW, • Rybnik: 1800 MW. The new one is Nowe Jaworzno of 910 MW. On top of that, there are several public and no-public heating power plants – their installed capacity amounts of 0,9 GW. These units are key consumers of hard coal in Poland. They used approximately 12,1 million Mg in 2018: • public power plants and public CHPs: 11,7 million Mg, • public heating plants: 349 thousand Mg, • non-public heating plants: 8 thousand Mg.	Silesia is the most industrial region in Poland, the second largest in terms of GDP (12.3 percent Polish GDP) after Mazovia (with Warsaw the capital of Poland) (17.4 percent Polish GDP). There are many large companies in Silesia, including:- ArcelorMittal Poland S.A. It is the largest steel producers in Polad with the 4 branches in Silesia Voivodeship (Dąbrowa Górnicza, Chorzów, Sosnowiec, Świętochłowice) - Konsorcjum Stali S.A. It is one of the major distributors of the steel. There are numerous coking plants, the parent company belongs to the JSW Koks SA capital group (Przyjaźń Branch in Dąbrowa Górnicza, KKZ Branch in Radlin. The Radlin branch of KKZ includes three coking plants: Koksownia Radlin, Koksownia Jadwiga and Koksownia Dębieńsko, which has been in liquidation since September 2018), and Koksownia Częstochowa Nowa. The petrochemical industry is also known - Czechowice-Dziedzice		Hard coal is traditionally one of the most used fuels in households. About 1,4 million tons of coal is used at the Silesia region for heating and cooking puropses. It is estimated that more than half of air pollution in the Silesian Province comes from households. Therefore, an Anti-Smog Resolution was adopted to support the replacement of coal boilers with ecological ones by the end of 2027 at the latest.	The first mine in Silesia region was opened in 1748. The hard coal mining industry was developing gradually reaching the production of nearly 200 million Mg in 80-ties of the twentieth century. In last decade of twentieth century process of restructuration started to adapt coal mining industry to economic criteria and competition rules. This process continues uninterruptedly till now. Sometimes the goals have been achieved, but then the changing conditions on the coal market made the financial efficiency of the industry unstable. From 70 active mines in 1989 now the number has decreased to 18.

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
			Polifarb Cieszyn-Wrocław (paints and varnishes), Boryszew SA branch in Tychy (production of aluminum air conditioning pipes and installation of steel air conditioning pipes). Consumption of hard coal in industry and construction sector in 2018 was 5,4 mln tons.			
Lusatia	– 4 active opencast lignite mines (2x Brandenburg, 2xSaxony) from formerly more than 20 – Extraction: ca. 20 mio. tons yearly each – Company: LausitzEnergieBergbau AG (LEAG, part of Czech EPH holding, since 2016 after Swedish Vattenfall withdraw from carbon-intensive sectors) – Phase-out until 2038 – Ca. 8,000 jobs in coal extraction and procession – Numerous resettlements in the course of mining activity – Perspective after phase-out: flooding, lake development for tourism and nature protection – Active and transformed opencast mines cover a large part of land in the	– 3 active coal power plants: 1. SchwarzePumpe: 1,600 MW, new built 1993-1998, CO2 emissions yearly ca. 11,000,000 t., fuel consumption 36,000 t. daily, efficiency 40% 2. Boxberg: 2.500 MW, partly upgraded, partly new built, CO2 emissions ca. 19,000,000 t. yearly, fuel consumption 50,000 t. daily, efficiency 43% (in new built block) 3. Jänschwalde: 2,000 MW active + 1,000 MW standby, upgraded, CO2 emissions 22,000,000 t. yearly (fourth highest CO2 emissions of all European power plants), fuel consumption 80,000 t. daily (full load), efficiency 35% -> first to phase out	– Chemical industry in connection with mining has historically played an important role (coal gasification and fuel production) – Today 1 mayor plant is active (Schwarzheide,company BASF, 1,900 jobs)			– Mining tradition in Lusatia is relatively young (peak phase during GDR, political goal of energy autonomy) – Coal mine heritage is limited to some lighthouse projects (“Förderbrücke(convey or bridge) F60”, “Energiefabrik(historic power plant) Kanppenrode”) – However, landscape transformation after mining is highly visible in the core mining area

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
	core mining area					
Rhineland	Rhineland extracts most of the lignite in Germany. Roughly 10,000 people are still employed in the lignite industry.	Rhineland contributes the most to the national electricity generation by lignite coal. Nevertheless, the share of workers in the lignite region are mainly working in the extraction of coal. Further, it is possible to restructure existing lignite power plants to operate with other energy carriers.	About 70,000 employees are still working in the chemical industry. Nevertheless, the chemical industry relies more on natural gas than coal as resource and energy carrier.			Long mining tradition in the region. The just transition destroys a lucrative employment opportunity in the region.
Central Germany	There are still active mines operated by MIBRAG. The number of employees as a share of the workforce is considerably lower than in Lusatia	Lignite power plants are still located in the region, but they are not operated by local firms in contrast to Lusatia and Rhineland. Further, it is possible to restructure existing lignite power plants to operate with other energy carriers.	The chemical industry still employs about 23,000 persons. The competitiveness of the chemical industry depends on energy prices. Nevertheless, the chemical industry relies more on natural gas than coal as resource and energy carrier.			The German federal association of the coal industry was founded in Central Germany (DEBRIV).

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
Jiu Valley	Four out of 15 initial coal mines in the Jiu Valley are still active. Out of these four, closure programs for EM Uricani and EM Paroseni are being finalized, and two of the viable exploitations, EM Lupeni and EM Lonea, are still active.	There are two coal-fired power plants / stations in Jiu Valley, Romania: Mintia-Deva (1,075-megawatt (MW)) and Paroseni (150 megawatt (MW)). Both are managed by a company formed in 2012 - Complexul Energetic Hunedoara. Together they form the Hunedoara Energy Complex.				From the 15 initial coal mines in the Jiu Valley, 11 are closed.
Sulcis	– The Monte Sinni coal mine (Nuraxi Figus) has been the last Italian active mine. Its activities have closed 31/12/2018. – The mine conversion/closure plan is still underway. Numerous actions and project proposals have been put in place by Italian National Government and Sardinia Region to enhance and conserve its important socio-economic and phisical resources (SulcisPlan, Plan for the closure of the Nuraxi Figus mine). – The mine site is under a process of conversion for research and innovation use, with projects ranging from algae spirulina cultivation to innovative energy storage techniques, from Co2 storage technologies to cryogenic dinstillation	– Sulcis coal-fired power plant (Enel) "Grazia Deledda' is ' included within the Portovesme industrial center. Currently, this plant is divided in two thermoelectric coal sections with a power generation capacity of240MW and 350 MW. – The phase out of the coal power plant is established for 2025. No reconversion to other fuels is currently planned. – As a consequence of the phase out the industrial activity of the Portovesme industrial center is endangered.	– The Portovesme industrial center (Portoscuso Municipality) was built between 1969 and 1972 to realize an integrated aluminum hub and other metal and mineral processing. The high energy demand of the site is partly satisfied by the Sulcis coal-fired power plant (Enel) "Grazia Deledda" included within the Portovesme industrial center. – A "modernization project for the alumina production refinery located in the municipality of Portoscuso" has been approved by the Sardinian region with environmental regulations to protect the health of workers and the local population. The Portovesme industrial center activity will restart after five years			– Mining tradition in Sulcis dates back to mid 1800 but it has been hugely strengthened in the 30s of 1900 under the impulse of fascist regime. In those years, the city of Carbonia was founded near the big mine of Serbariu as the administrative capital of the mines activities in the Sulcis region. – The Museum of Coal of Carbonia is anchor points of the network of European Route of Industrial Heritage – The Santa Barbara Walk crosses the former mining sites of the area. – Sinkhole characterise the area, some studies have shown a correlation between the emergence of sinkhole and mining-use of land.

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
			of block.			
Upper Nitra	The mining should, according to the binding governmental decree, stop by 2023. Although the regional position of the mining industry has been steadily declining, it is still the economic backbone of the region. The most recent number of mining company employees is 3782 (2019). Besides a threat to direct employees of losing their jobs, we have, according to our calculations, additional 7000 - 10000 indirect jobs that could be affected. Successful closure of the mines will inevitably require a gradual process, enabling structural changes in the economy affiliated with creation of new labour opportunities and investments into decarbonised local economy.	The economic model is built on state subsidies to mining of lignite with surcharges provided to Nováky TPP (ENO), owned by Slovenskeelektrárne (SE). The surcharges are paid by individual households in their electricity bills. TPP is in adjacent area close to the mining site. The subsidies are increasingly unpopular and are disputed by experts and the public. The rising price of emission trading permits (under ETS) and evolving emissions norms and investments to BAT/BATNEEC further undermined the present economic model. The future of ENO is unclear, there plans to transformation of the facilities intoa waste incinerator.			The Nováky TPP (ENO) provides besides electricity also source of central heating to the substantial part of the region. The coal boilers use local lignite and there is extensive network of pipelines distributing hot water to the households and industries. The mining company would like to keep some limited mining operations for coal boilers and use it for the district heating. Alternative plans include transformation to natural gas, or some combination of renewable resources. Future of the district heating is a core issue in ceasing mining operations, it is political issue (cost of heating for the households) as well as environmental issue (source and sustainability of energy production).	In the case of Upper Nitra we deal with underground mining structures. Yet since the mines closure (2023) is rather fast process, it is becoming one of the central issues of the debate on speed and consequences of the process. Revitalization of the underground structures and the surface facilities after mining will have to - in harmony with the law – follow the basic environmental principle of “the polluter pays." However, scope and complexity of the mining impacts on the landscape and the environment will require external assistance. The mining company estimated cost of revitalization at some 94 mil. EUR. On the other hand, there is potential to use part of the heritage for industrial museums, and transformation of some of the facilities into commercial and non-profit activities.

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
Brindisi		The city of Brindisi has two coal electric power plants Brindisi Nord – North -(held by A2A, power 2 x 320 MW, in phase of retrofitting (coal to methane), with no diresct local workers (except from subcontracting firms) Brindisi Sud – South – held by ENEL (Cerano, Federico II) power 4 x 660 MW = 2640 MW, the largest coal electric power plant in Europe (and in Italy of course), which is forecast to stop in 2025. There are directly and indirectly, 1500 workers..	Beside the two coal electric power plants, in the Brindisi area there are some large chemical and petrochemical works (Versalis, LyondellBasell, Jindal e Sanofi) producing many chemicals among which, for example, polypropylene starting from ethylene, butadiene, propylene, butylene, heavy oil and virgin nafta, and an overall turnover for the chemical district of more than 3 Geuro./ year.			
Krakow Metropolitan Area (KMA)	–	There are two main generating units in the KMA: 1. the public CHP in Krakow (thermal capacity of 1,118 MWt, and electrical capacity of 460 MWe), 2. the public power plant in Skawina (thermal capacity of 588 MWt, and electrical capacity of 330 MW). These units produce both electricity and heating in the KMA. The CHP Krakow produces 1.1 $MgCO_2$/MWh. The total volume of CO_2 emitted in 2019 amounted to 1.6 million Mg CO_2. TheSkawina power plant	The KMA is dominated by the metallurgical industry and related to the steel and aluminium industries. There are seven plants of foundries, galvanizing plants, steel production and refractory materials. Steel production is based on energy from coking coal.Although these places provide jobs for inhabitants, the production in these plants has an influence on the environment (air emissions and industrial waste). In consequences, these factors result in the deterioration of health and even threaten life.	–	Around the city of Kraków, in 16 municipalities belonging to the KMA, more than 50% of households use hard coal to heat their houses. The decommissioning of old coal-fired boilers has been ongoing in the surveyed area since 2015. In 2017, over 7,000 boilers were replaced, followed by over 6,000, which accounted for 40% of the replacement in the entire Małopolska region. The overriding objective is to eliminate low emissions by eliminating	There are mining areas in the western part of Malopolskie. There were some mines which operate there since the beginning of the XIX century, and still one of them is operating (Brzeszcze). Miners employed in the mines and their families for a long period (several generations) received coal as part of additional remuneration. The quantities of coal allocated for free were large (from 1.5-3 tons for pensioners, up to 8 tons for working miners), so part of its was resold. These circumstances result in that hard coal

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
		emitted (as a result of heat production) 0.3 million Mg CO_2 in 2019.	The chemical industry in this regionis represented by a dozen or so small companies, which mainly distribute chemistry from their parent companies, and produce on a small scale. They are located in Skawina and Kraków. Their inconvenience is mainly related to odours. The biggest ones include KZG SA tannery in Kraków and VALEO SA in Skawina, which produces and processes the rubber.		sources of PM10, PM2.5 dust and benzo-a-pyreneemissions. The CO_2 emissions are not taken into account in regional emission balances, because the household sector and the sector of small and medium-sized fuel customers (small and medium-sized enterprises, farmers) are not included in the non-ETS sector. There are several non-public heating plants based on hard coal. The heat is produced for the technological needs or introduced into district heating (Bochnia is an example).	has become a common energy-carriers in households in this region. From 2012, mine have begun to change the privilege into financial compensation and largely renounced coal release. However, the tradition of using hard coal for heating and cooking purposes, shaped over many years, remained.

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
A Coruna		Originally the lignite mine located in the municipality was used mixed with imported coal. Subsequently, only imported coal was consumed. In 2008 a Combined Cycle Group (with natural gas) starts operating, and on 12/29/2019 the plant announced the closure, which will be produced along this year. Currently, ENDESA group has made a public Call for investors.	In the vicinity of the Thermal Power Plant there are important companies related to smelting, metallurgy and naval industries.			Originally, there was a great abundance of brown lignite deposits in the proximity of the Central, located in the municipality of As Pontes (A Coruña). An artificial lake located in the town of As Pontes (A Coruna) was planned. This lake was created as a result of the recovery and regeneration works of the open pit mine that took the place of the lake, from which lignite was extracted to supply the As Pontes Thermal Power Plant. The artificial lake created by Endesa to fill the gap in the As Pontes mine was completed in 2012. It is 5 kilometers long and has a maximum depth of 206 meters. For its filling, the waters of the Eume river, which passes through the town, were used, as well as the accumulation of rainfall. It is the largest artificial lake in Europe and is the second freshwater reserve in Galicia, with 547 cubic hectometres, just behind the Belesar reservoir.

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
Upper Styria			Upper Styria is an old industrial core region with focus on steel production. Iron ore mining is performed since the 11th century in the region, and it has the biggest siderite ($FeCO_3$) deposit in the world. Major energy consuming sectors are mining, steel, and paper production. The share of coal in Austria has been dropping from 25.000 TJ in 2005 to 17.800 TJ in 2018 (-30%), however, in industry and therefore in Styria (5.700 TJ) it still is an important factor. The decrease of coal consumption in TJ in Styria between 2008-2018 is only 11%.In industry coal has been substituted to some extent by natural gas (from 5.400 TJ in 2008 to 8.300 TJ in 2018).			

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
Stavanger				The Stavanger Region has been Norway's energy centre for over 40 years, and many major oil and gas industry players, such as Equinor, Aker Solutions etc., have roots in the region. With the aim of providing smart and clean energy solutions, the Norwegian government has placed renewable energy fund in the region. This has led to developing and converting the oil and gas industry into a forward-looking industry, focused on sustainable energy solutions such as development of offshore wind market. However, the region is currently struggling with making this transition, and needs to accelerate the change towards low-carbon energy systems.		

Region	CoalMines	CoalPower Plant	Chemical & steel	Oil extraction	Coal boilers	Coal mine heritage
South Wales	There are four current coal-extraction activities. No new licenses will be provided by Welsh Government. One site is classifiedas a 'land reclamation scheme' (Ffos y Fran), two are open-cast mines (Nant Helen and East Pit) and one is a reopened (2020) drift mine (Aberpergwm).	The final coal-fired power plant closed in 2020 (Aberthaw)	South Wales isone of the main locations for steel production in the UK (9,000 of 23,000 employees in 2016). Job losses have been ongoing in Tata Steel and Liberty Steel since 2015 and are ongoing.			Wales has a significantlegacy of coal mine heritage (including Big Pit - the national museum). Also, negative impacts (environmental, social (incl. Health) and economic costs of coal mining.

Annex II

Component Description Template

Component Description Template

Component | **Lead partner**

Approach

Specific research questions

Domain of enquiry

Theory

Primary method

Secondary methods	☐ Data collection	☐ Interviews	☐ Focus group
	☐ Text research	☐ Survey	☐ Desk research

Case diversification

Research area definition and operational concept

Annex III

Factors Description Template

Factor Description Template

Code: E.g. C3-05

Name:

Type	◯ Factor	◯ Dynamic	◯ Pattern

Factor Description

Examples/Indicators

Type of region

Regions	☐ Silesia	☐ Lusatia	☐ Rhineland	☐ Central G	☐ Jiu Valley	☐ Sulcis
☐ Upper N	☐ Brindisi	☐ MA Krakow	☐ A Coruna	☐ Upper S	☐ Stavanger	☐ South W

Gender-sensitive	◯ Yes	◯ No

Primary Method	◯ Yes	◯ No

Method(s)	☐ Data collection	☐ Interview	☐ Focus Group
	☐ Text research	☐ Survey	☐ Desk Researc

Internal relations (explained)

Possible overlap	☐ Socio-economic	☐ Socio-ecological	☐ Socio-technical
	☐ Socio-cultural	☐ Socio-political	☐ Socio-psychological

Sources

Other comments

ENTRANCES

ENergy TRANsitions from Coal and carbon: Effects on Societies

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement nº 883947. The document represents the view of the author only and is his/her sole responsibility: it cannot be considered to reflect the views of the European Commission and/or the Innovation and Networks Executive Agency (INEA). The European Commission and the Agency do not accept responsibility for the use that may be made of the information it contains.