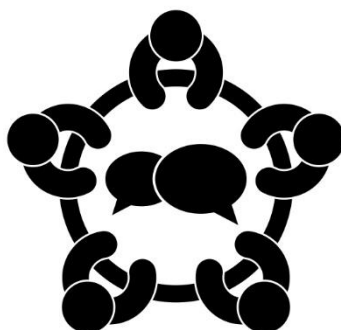




***Analytical report on the outcomes of
the mobilisation process in TRACER
target regions***



WP 5 – Tasks 5.2, 5.3& 5.4 / D 5.2

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TRACER website: www.tracer-h2020.eu

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Abbreviations

ACIVJ	Jiu Valley SMEs Association
AISVJ	Asociatia Institutul Social Valea Jiului / Social Institute Jiu Valley Association
BSERC	Black Sea Energy Research
CRES	Centre for Renewable Energy Sources and Saving Foundation
CULS	Česká zemědělská univerzita v Praze / Czech University of Life Sciences Prague
D	Deliverable
EDP	Entrepreneurial Discovery Process
ENTEL	Energoprojekt ENTEL
ESIF	European Structural and Investment Funds
EU	European Union
FIB	Forschungsinstitute für Bergbaufolgelandschaften / Research Institute for Post-Mining Landscapes
ICT	Information and Communication Technology
ISPE	Institute for Studies and Power Engineering
JRC	Joint Research Centre
LEAG	Regional lignite mining company in Lusatia, Germany
MIPE	Ministry of Investments and European Projects, Romania
MS	Member State
NUTS	Nomenclature of territorial units for statistics
R&D	Research and Development
R&I	Research and Innovation
S3	Smart Specialisation Strategies
S4	Smart Specialisation Strategies for Sustainable and Inclusive Growth
SET	Strategic Energy Technology (Plan)
SRSS	Structural Reform Support
START	Secretariat Technical Assistance to Coal Regions
STRATH	University of Strathclyde (European Policies Research Centre)
SZ REDA	Stara Zagora regional Development Agency, Bulgaria
T	Task
TETI	Thermal Energy Technology Institute, Ukraine (formerly CETI)
UAK	Uniwersytet Rolniczy im. Hugona Kołłątaja w Krakowie / Agricultural University of Krakow
UK	Univerzita Karlova / Charles University
WG	Welsh Government
WP	Work Package

1 Introduction

The TRACER project aims to support nine current and former coal-intensive regions in their transition towards sustainable energy systems. The project has a particular focus on the regions' research and innovation strategies, as well as on the re- and up-skilling that will be required among regional workforces in the transition process. The target regions are:

- Southeast Region, Bulgaria
- North West Bohemia, Czech Republic
- Lusatia Region, Germany
- Western Macedonia, Greece
- Upper Silesia, Poland
- West Region/Jiu Valley, Romania
- Kolubara Region, Serbia
- Donetsk Region, Ukraine
- Wales, United Kingdom

Work Package 5 of TRACER concerns engagement with relevant stakeholders, through an Entrepreneurial Discovery Process (EDP) in the target regions. The aim is to mobilise a wide range of quadruple helix stakeholders (i.e. business, including chambers and business associations; government and public bodies; research and education institutions; and civil society organisations and non-governmental organisations) in each target region to participate in the process of developing a shared vision and priorities for the transition out of coal, and into new sustainable energy systems.

The Entrepreneurial Discovery Process (EDP) is a central element of the Smart Specialisation approach, which is based on research that suggests that innovation depends on cooperation, allowing underused knowledge and innovation capacities to be identified and used more effectively. Smart Specialisation Strategies should therefore be designed based on an inclusive process of stakeholder involvement. This generally involves meetings/workshops/interactions taking place within countries or regions, where different stakeholders come together to build working relationships, share ideas/knowledge, and agree on a common vision and priorities rooted in the region's strengths (or "specialisation").

TRACER has adopted this approach to engaging stakeholders in agreeing a common vision and priorities for energy transition in nine target regions (Tasks 5.2 and 5.4). The stakeholder consultation and engagement work aims to provide a basis for regional stakeholders to develop and take ownership of a strategy for the future (TRACER Work Package 6).

This report (Deliverable 5.2) provides an analysis of the outcomes of the mobilisation process in the TRACER target regions. Section 2 discusses the background to the Smart Specialisation approach and the Entrepreneurial Discovery Process adopted within TRACER regions to help develop a shared vision and priorities for the transition out of coal, and into new sustainable energy systems. Section 3 provides an overview of the regional stakeholder engagement activity undertaken, and Section 4 discusses the outcomes of the mobilisation process. Section 5 provides an overview of the visions and priorities for energy transition which emerged in the target regions through stakeholder discussions. The final section (Section 6) provides a conclusion.

Note that a further report (Deliverable 5.3) will be produced at the end of the project which will comprise the nine regional reports on which this report (Deliverable 5.2) was based. The nine regional reports provide more detail on activities carried out in each of the target regions.

2 Smart Specialisation and the Entrepreneurial Discovery Process

TRACER draws on the EU's 'Smart Specialisation Strategy' (S3) approach which has helped inform EU Cohesion policy since the 2014-2020 period.¹ Smart Specialisation suggests that the most effective way to deliver innovation, and ultimately regional or national economic development, is to support stakeholders to come together to reach an agreement on concentrating public and private interventions and resources on a limited number of priorities, based on national/regional strengths and competitive advantage.

For the TRACER target regions, coal has been an important economic asset upon which regional growth has relied. Therefore, their transition away from this and other fossil fuels towards alternative sustainable energy sources is inevitably a regional economic development issue, with wider implications for the communities of these places. In this context, new areas of economic potential must be identified, explored, and developed, a process which is set out in Smart Specialisation.

TRACER focuses specifically on the experiences of coal intensive regions. Smart Specialisation strategies have since 2014 played a key role in the innovation focus of such regions and in their transition out of coal, partly using the competitive advantages they may have in the production and transportation of energy sources. For example, various European regions have identified clean coal technologies as a Smart Specialisation priority in their 2014-20 innovation strategies.² Moreover, in 2018, two-thirds of all regions and Member States' Smart Specialisation strategies gave priority to R&I capacities and regional potential linked to energy transition actions, with a direct effect in the low carbon economy.³ Some examples of how S3 has supported transition in coal regions, from case studies prepared for the TRACER project guidance to target regions, are illustrated in Box 1 (full cases studies are available in TRACER report D2.2).

Box 1: Smart Specialisation processes supporting transition in coal regions

South Limburg (NL), Asturias (ES) and North-Rhine Westphalia (DE) are three European regions with a history in coal mining and where Smart Specialisation strategies have played an important role in their transition out of coal:

- Mining in the small but coal-intensive region of **South Limburg** (the Netherlands) ended in the 1970s. The region has faced several regional development challenges over the past decades, including high unemployment rates and structural reform. The regional S3 prioritised the fields of chemicals, logistics and life sciences and health, with particular action points to develop for rural areas in the energy transition and sustainability experimentation, high air quality, high quality agriculture, small businesses, social cohesion and sustainable tourism. Flexible new governance structures were developed, fostering more intensive organisation of a region traditionally characterised by small-scale economic development. This has led to increased self-organisation of R&D strategies in functional territorial areas.
- A relatively rural region where mining activity is being phased out is the autonomous community of **Asturias**, Spain. Although heavily subsidised, the mining sector had been declining for decades until final closure in 2019. Current economic developments include renewable energy networks, (rural) tourism, transportation and SME innovation, which partly build on the industrial and mining heritage and energy of the region. The S3 process has helped towards an industrial and service-oriented economic diversification of the region.
- **North-Rhine Westphalia** (NRW) is a German region that includes active and closed lignite and hard coal mines. The region has been a target of federal support for various economic

¹ European Commission (2016) *Implementing Smart Specialisation Strategies: A Handbook*. Luxembourg: Publications Office of the European Union.

² Alves Dias P et al. (2018), *EU coal regions: opportunities and challenges ahead*. JRC Science for Policy Report. Luxembourg: Publications Office for the European Union.

³ Nauwelaers C, Seigneur I and Gomez Prieto J, (2018) *Good practices for smart specialisation in energy: Methodological insights and identification of valuable knowledge*. S3 Working paper Series No. 16/2018, EUR 29313 EN, Publications Office of the European Union, Luxembourg.

restructurings, for example in the Ruhr and Rhineland areas in physical infrastructure and environmental remediation. Longstanding support has come from Land and national levels, and is continuing in the form of funding for completely phasing out coal production. The energy and environment industry is one of the priorities of the S3, with a particular focus on hydrogen.

These regions display geographical diversity, are at different transition phases and have selected different sectors of specialisation. Besides their Smart Specialisation strategies, mining history, wider transition policies, challenges and change-enabling conditions show how (former) coal regions have been handling economic diversification and structural adaptation. Within these different contexts, Smart Specialisation strategies have played a key role in the innovation focus of these regions and in their transition out of coal, partly using the competitive advantages they may have in the production and transportation of energy sources.

Source: TRACER Deliverable D2.2

According to the European Commission: “Smart specialisation is a place-based approach, meaning that it builds on the assets and resources available to regions and Member States and on their specific socio-economic challenges in order to identify unique opportunities for development and growth”.⁴ It is also an evidence-based and bottom-up approach, aiming to achieve regional revitalisation by promoting R&I and regional competitive advantage and aligning it with regional needs. Smart specialisation is seen as:

- *Smart* - it aims to identify the region’s specific strengths and assets;
- *Specialised* - it aims to target research and innovation investment on these strengths; and
- *Strategic* - it aims to support stakeholders to define a shared vision for regional innovation.

The approach draws on EU experimentation with regional innovation strategies since the early 1990s. In the 2014-2020 programme period, every EU region or Member State has been required to develop and agree a Smart Specialisation Strategy (S3) – or a regional/national innovation strategy – as a condition for receiving EU Cohesion policy funding. Non-EU countries and regions are also using this approach to developing strategies for national and regional innovation. This has meant a novel process for many regions, but also a useful form of experimentation in evidence-based and collaborative regional development and innovation.

More recently, and in line with the new European Green Deal which sets green transformation of European territories as a cross-policy focus, a sustainable and inclusive component has been promoted within the Smart Specialisation framework, in the form of Smart Specialisation Strategies for Sustainable and Inclusive Growth (S4).⁵ The European Green Deal is seen⁶ as a broader European or supra-national ‘specialisation’ on sustainability, decarbonisation, and the just transition agenda, setting ambitious targets and objectives for the next decades (e.g., net zero carbon by 2050).⁷ The inclusion of these principles in Smart Specialisation would help these goals be delivered and achieved at the national and regional levels, given its place-based and collaborative approach. It is moreover seen as necessary with the approach being argued to contribute to a better management and organisation of the changes that can arise from the restructuring of the economy and society towards low-carbon alternatives. This new approach in S4 is not limited to sustainability but emphasises the need for Smart Specialisation to be challenge- or mission-oriented, with a heightened responsibility in addressing just transition and societal challenges.⁸

⁴ <https://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->

⁵ McCann, P and Soete, L (2020) Place-based innovation for sustainability, Publications Office of the European Union, Luxembourg, 2020.

⁶ https://www.interregeurope.eu/sites/default/files/inline/Richard_Tufts_-_Smart_specialisation_strategies_for_sustainable_and_inclusive_growth_S4_.pdf

⁷ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁸ Harding R, Nauwelaers C, Cohen C, Seigneur I (2021) Fostering the Green Transition through Smart Specialisation Strategies, EUR 30921 EN, Publications Office of the European Union, Luxembourg.

While this S4 approach further promotes innovation for green transformation in the new 2021-27 period, it is important to note that many regions designed their original S3s already with a strong green focus, notably related to the circular economy.⁹ The second generation of Smart Specialisation will continue to further this as not just a focus of R&I and policy, but also by integrating a sustainable and inclusive focus in the methodological approach. For the time being, S4 is still an optional approach for Member States and regions. Nonetheless, in the new programming period, Smart Specialisation in whatever form (S3, S4 or S4+) is expected to continue to play a major role in regional development. A new thematic enabling condition focuses on “Good governance of national or regional smart specialisation strategy”, composed of seven fulfilment criteria that cover the main success factors of these strategies with respect to design, implementation, monitoring and evaluation.¹⁰ Smart Specialisation’s potential value-added is emphasised in boosting innovation-led growth in EU industrial transition regions, particularly in fostering eco-innovation processes that respond to global environmental and societal challenges.

The TRACER project has incorporated a Smart Specialisation approach into the heart of the project design. Core activities under Work Package 5 included the implementation of an entrepreneurial discovery process to mobilise a wide range of stakeholders in each target region, including the development an appropriate governance structure, and bringing regional stakeholders together to discuss and agree on a shared vision and priorities for coal transition.

2.1 The Entrepreneurial Discovery Process

The Smart Specialisation approach is based on research that suggests that:

- Innovation depends on cooperation between people;
- Many regions have underused capacities, energies and resources – e.g. because of lock-in to narrow patterns of activity and cooperation;
- Social capital and trust matter for innovation and economic development;
- Building wider networks and relationships can enable existing capacities, energies and resources to be released and targeted on shared goals.¹¹

More cooperative methods are thus employed in the S3 process, which can allow for the joint building of a shared vision. Through all the stages of the process, cooperation allows for the identification of existing underused knowledge and innovation capacities that can be explored.

A key aspect of the Smart Specialisation framework is its bottom-up and inclusive approach to stakeholder mobilisation and involvement. This is designated as an Entrepreneurial Discovery Process (EDP), which relies on an interactive and co-creative process in which “entrepreneurs” or stakeholders identify areas of weakness and (potential) strength for the region that can promote its competitive advantage and development.¹² Stakeholders involved should be from at least four main spheres of society – government, industry, higher education/research institutions and civil society (e.g., non-governmental organisations) – based on a quadruple helix model of innovation.¹³ Because S3 aims to widen existing networks and build new connections, it aims to include stakeholders with the resources and capacities to drive strategy-building and implement roadmaps which can build bridges across sectoral boundaries and also create strong connections to entities and markets outside the region. While policy processes run the risk of dominance of certain interest groups, an inclusive bottom-up approach considers often marginalised stakeholders that can contribute with new ideas.

⁹ Ibid.

¹⁰ <https://s3platform.jrc.ec.europa.eu/implementation>

¹¹ See TRACER Task 5.1/Deliverable 5.1 Implementation of the Entrepreneurial Discovery Process in the TRACER target regions: Guidance.

¹² Harding et al. (2021)

¹³ Carayannis E G, & Campbell D F J (2009). ‘Mode 3’ and ‘Quadruple Helix’: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, 46(3/4), 201. <https://doi.org/10.1504/IJTM.2009.023374>

The EDP generally takes place within the region and with regional stakeholders coming together in meetings/workshops/interactions to build working relationships, share ideas and knowledge, and agree on a common vision and priorities/specialisation for the region. While the explicit goal is to create a new formal strategy, an equally important aim is to bring together diverse organisations and individuals to develop relationships, trust and community, and to share and co-create knowledge. In the long term, this may have stronger effects than the formal strategy. In practice, the S3 approach aims to provide a 'container' or structure to support stakeholders to explore possibilities for cooperation and knowledge exchange. It takes a systematic approach to strategy development by providing an analysis of the regional development context, notably strengths and assets; building collective place-leadership through the EDP and building inter-institutional capacity; and creating consensus on a shared vision and formal strategy and its implementation.

2.2 Developing an appropriate governance structure

A high level of continued stakeholder involvement is necessary, not only during strategy design but also during implementation, to build cooperation and maximise potential for innovation. However, retaining active stakeholder participation can be challenging. Retaining continued stakeholder involvement can be encouraged by setting up bespoke structures (e.g., councils, platforms or working groups) with a role in strategy implementation.

The governance model of Smart Specialisation, as mentioned, includes a variety of stakeholders, generally including both the market and the civic society. For decisions to be made on strategic priorities, an inclusive S3 governance structure should be able to prevent policy capture by specific interest groups, powerful lobbies, or major regional stakeholders. This means there is a need to develop collective or collaborative leadership, so that stakeholders are included, feel secure about their participation, and share the responsibility and benefits of the strategy. The decision-making structure should thus be flexible to allow for each actor to have a significant role in one or more phases of the S3 process, in accordance with their characteristics, capacities and expertise.¹⁴ Some degree of steering and mediation should also be involved to provide directionality to the process and manage potential conflicts.

Smart Specialisation encourages institutional change, capacity building and collective action to facilitate the achievement of development objectives. A sound governance configuration is an important condition for its effective implementation, and for an improvement of governance and policy quality overall. This implies engaging with the private sector, intermediate organisations and several other societal actors, as well as promoting synergies across public administrations, agencies and different government levels. Inevitably, governance arrangements and their interplay are context specific, varying across the EU, and dynamic, ideally evolving throughout the process.¹⁵

The management of S3 has, for the most part, been the responsibility of regional management bodies for European Funds, such as regional government authorities. The State therefore still plays a central role in S3, despite the promoted involvement of other partners in the policy process. The government acts as the main organisation responsible for ensuring direction and coherence to the process, often mediating between different needs, capacities and interests, and providing the rules and infrastructure for governance of S3. According to Guzzo and Gianelle (2021), "the government fosters meanings and beliefs among relevant stakeholders and the development of shared visions". S3 strategic decision-making and planning have nonetheless varied across the EU, with in some cases these being firmly in the hands of government bodies without much involvement of other regional stakeholders, and in other cases being more inclusive.¹⁶ Intermediary bodies (e.g., clusters) have also been relevant actors in S3 governance, playing a central role in facilitating collective action. In this sense,

¹⁴ Guzzo F and Gianelle C (2021) Assessing Smart Specialisation: governance, EUR 30700 EN, Publications Office of the European Union, Luxembourg.

¹⁵ Ibid.

¹⁶ Ibid.

these bodies act as ‘boundary spanners’, i.e. “people or organisations with interdisciplinary knowledge or proven experience in interaction with different actors, and who can hence help moderate the process”.¹⁷

Clear attribution of responsibilities for partners involved is necessary to ensure operational and coordination functions and avoid overlaps or inefficiency. For this reason, leadership is a key component of this process, whether in terms of steering from government, or in terms of place-leadership, that is collective and coordinated action toward a desired outcome. Research on S3 across EU regions shows that leadership can help generate and diffuse narratives on innovation strategies and regional development, thicken relationships and promote trust. Moreover, many stakeholders have also reported that S3 has helped introduce informal communication channels, or reinforced existing ones, such as coordination units and interministerial committees.¹⁸ This demonstrates the potential for new methodologies and governance mechanisms to strengthen trust and collaboration between stakeholders.

Research also shows that S3 has contributed towards a more inclusive governance of innovation policy and of the decision-making process overall. Organisations like coordination bodies, thematic working groups, platforms or clusters are strengthening network arrangements and cooperation modalities. Inter-government coordination has generally received more attention under this framework and approach, even though effectiveness of coordination is still argued as requiring improvement.¹⁹

Several challenges remain in relation to developing an appropriate governance of S3:

- Unclear distribution of power and competencies between different levels of government and between involved stakeholders;
- Lack of resources or capacities for the management of the strategy process at sub-national levels;
- Weak or ineffective infrastructure of coordination bodies, coordination mechanisms or communication channels to involve actors at different scales;
- Lack of trust between partners;
- Risk of policy capture in less inclusive governance processes;
- Overlap of responsibilities and initiatives;
- Difficulties in developing common visions that combine the needs, agendas and expectations of the different geographical levels.

The European Commission²⁰ provides a few recommendations that can facilitate this. Namely, it suggests implementing bodies should possess the necessary autonomy and resources to avoid policy capture that can undermine S3’s transformative intent. This should be accompanied by accountability, with appropriate channels for ongoing communication, negotiation and collaboration between private and public actors. Both vertical and horizontal coordination arrangements should be in place to facilitate synergies and reduce overlaps, and capacity-building should be promoted both within the managing authority and in other organisations, to ensure the strategy process can yield wider long-term benefits.

2.3 Agreeing a shared vision and priorities

Building on the EDP, the S3 approach involves a prioritisation exercise which aims to help stakeholders to identify the domains, areas and economic activities where regions or countries have the potential to generate knowledge-driven growth,²¹ and to target investment and resources on these themes. The number and nature of these priorities will vary between regions.

¹⁷ <https://s3platform-legacy.jrc.ec.europa.eu/s3-governance>

¹⁸ Guzzo and Gianelle (2021)

¹⁹ Ibid.

²⁰ Ibid.

²¹ <https://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->

A shared vision is the basis for collective action within S3, guiding multi-actor development work. In this context, it is seen to emerge from a process of knowledge sharing and discussion of the existing and potential regional areas of strength, and as a result of entrepreneurial insight. Actor agency and collective leadership are seen as key components for bridging the usual gap between visionary thinking and operational matters, building trust, and ensuring shared benefits and responsibilities.^{22 23}

The process of agreeing on shared visions and priorities is thus as much rooted in technical and economic evidence and visions, as well as on political and social dimensions of regional development and innovation.²⁴ Discussions in S3 are thus usually organised by the State, with other actors potentially helping in the mediation process (e.g., intermediary bodies, universities), and entrepreneurs or experts help narrow down the focus to relevant themes. Thematic groups are usually formed at this stage to facilitate stakeholder involvement and idea generation on new potential, though related, areas of competitive advantage for the region. Strategic planning is necessary to mature these discussions into finalised regional specialisations that can build new development paths for the region toward a more successful future.

It is important to note that one grand shared vision may be difficult to elaborate and attain. Instead, the Smart Specialisation approach seeks to respect the multitude of visions and values present in a region, and to potentially combine them in creative ways for the benefit of the region's development. Trust between actors and collective thinking is not a given, and therefore these must be nurtured for the institutional environment to be able to sustain new configurations and modes of working.

2.4 Challenges and lessons for S3

The S3 approach is often easier to implement in regions where there are already good and wide-ranging working relationships across organisational and societal boundaries. It is more challenging in more disadvantaged places, given the need to first create the institutional and innovative capacities necessary for the process to be carried out.^{25 26} Still, S3 has the potential to be especially helpful where relationships and knowledge-sharing are more limited, as it provides the methodologies and tools for these to be developed.

There are several challenges to developing effective S3, for example:²⁷

- It depends on the willingness and resources of a range of stakeholders to participate in the EDP;
- There is a need to focus on building connections and trust and not only on agreeing a formal strategy;
- Stakeholders may have very different views and interests, and may find it difficult to agree on a limited number of realistic areas of specialisation;
- Risk of policy capture by 'typical' regional actors, without the inclusion of other participants that may possess relevant knowledge;

²² Nieth L (2020). It takes two sides to build a bridge: Universities as institutional entrepreneurs in knowledge-based regional development [PhD thesis, University of Twente]. <https://research.utwente.nl/en/publications/it-takes-two-sides-to-build-a-bridge-universities-as-institutiona>.

²³ Fonseca L (2022). The role of universities in regional innovation policies and practices [PhD thesis, Universidade de Aveiro]. <https://ria.ua.pt/handle/10773/33444>

²⁴ Sotarauta M (2018). Smart specialization and place leadership: Dreaming about shared visions, falling into policy traps? *Regional Studies, Regional Science*, 5(1), 190–203. <https://doi.org/10.1080/21681376.2018.1480902>

²⁵ Vallance, P., Blažek, J., Edwards, J., & Květoň, V. (2017). Smart specialisation in regions with less-developed research and innovation systems: A changing role for universities? *Environment and Planning C: Politics and Space*, 36(2), 219–238. <https://doi.org/10.1177/2399654417705137>

²⁶ Kroll, H. (2017). The Challenge of Smart Specialisation in less favoured Regions. Fraunhofer ISI, No. R1/2017, 33.

²⁷ McCann, P., & Ortega-Argilés, R. (2014). Smart specialisation in European regions: Issues of strategy, institutions and implementation. *European Journal of Innovation Management*, 17(4), 409–427. <https://doi.org/10.1108/EJIM-05-2014-0052>

- It takes time to develop and agree on a strategy through discussion and cooperation, and the outcomes are uncertain. There is a need to focus on S3 being a process, with a strategy that is adapted as new knowledge becomes available, namely from monitoring and evaluation.

The design and implementation of S3 can be a lengthy process. EDP is also an iterative and ongoing collaborative activity, requiring that plenty of time is allowed for open discussion. This facilitates stakeholders in making their needs known. The need for actors to work together can be embedded at an early stage, for example by requiring cooperative submissions from groups of stakeholders. Where available, S3 should build on existing experience. Participatory consultation processes benefit from drawing on existing networks of actors and pre-existing regional innovation dynamics. On the other hand, it is important to try to involve actors who have not previously been included in consultative processes.

While it is challenging to propose how an S3 process can be successful or effective, given the need for it to be tailored to a specific regional context with its own characteristics and capabilities, there are several general principles which can be helpful. One key aspect rests in providing a structure that supports stakeholders to explore possibilities for cooperation and knowledge exchange, helping to build regional inter-institutional capacity and innovation capacity.²⁸ Similarly, it is important to prioritise building connections, trust and cooperation among stakeholders, as well as strategy-building. Finally, the process must enable stakeholders to voice different viewpoints about present-day realities in the region, and about future directions and goals.

²⁸ Vallance et al. (2017)

4 Overview of regional activities

Activity under Work Package 5 started in 2019, when central guidance was produced for the regional teams on undertaking the EDP process in the target regions. Key stakeholder engagement activities within each target region were to include (as a guide):

- Interviews with 10-15 stakeholders (covering all sectors of the quadruple helix);
- A number of workshops, which together aim for quadruple helix participation.

As the TRACER regions are at very different starting points in their transition out of coal, regional partners were encouraged to be flexible to adapt to regional circumstances e.g. by adapting interview questionnaires and meeting formats.

4.1 Aims of TRACER Work Package 5

The main aim of Work Package 5 was to engage with regional stakeholders in the TRACER target regions i.e.

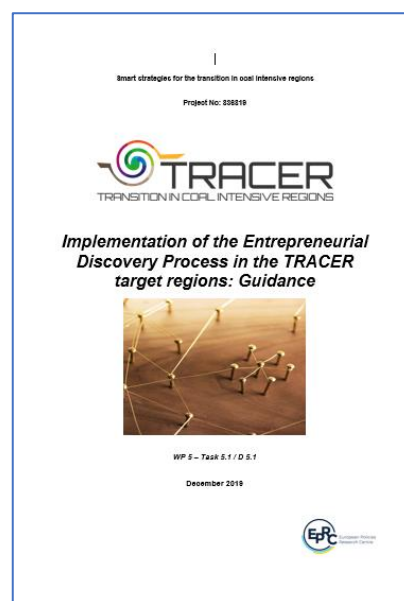
- To tell them about TRACER and to share any results so far;
- To listen to them and collect their views about energy transition in the region in general and especially about potential for new activities in energy R&I;
- To support discussions between different regional stakeholders, and build potential for cooperation.

The TRACER teams in the nine target regions aimed to engage with stakeholders in their regions, including those who: have the capacity to drive strategy-building and implementation; are outside main interest groups and who may be able to contribute new ideas; can bridge across sectoral boundaries or have connections outside the region. To launch this process, a mapping exercise was conducted in each region, mapping the regional stakeholders, including all four sectors of the quadruple helix. These stakeholders then formed the target group for interviews and workshops. Key activities within each target region included interviews with 10-15 stakeholders and a number of workshops, which together aim for quadruple helix participation.

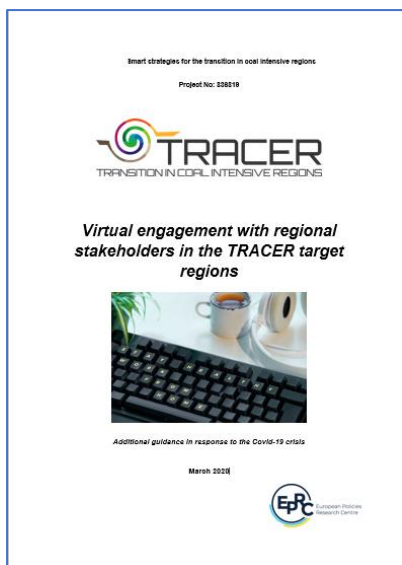
The aim was to collect the views of a wide range of stakeholders in relation to:

- The regional situation in relation to coal production/power and energy-related R&I;
- Opportunities and challenges in developing new activities related to energy R&I;
- Actions needed to support new energy-related R&I in the region.

The TRACER regional teams also worked with regional stakeholders to ensure that structures are in place to support knowledge-sharing and to enable stakeholders to have ownership of the strategy development process. These structures could include either a new working group (with broad-based participation) in each region, or an existing working group which will take on the role of leading on the TRACER strategy. The working group could decide to set up other structures or groups if needed. It was considered from the outset to be very important not to duplicate existing structures – this became even more important as new structures emerged as part of the new 2021-2027 EU Cohesion Policy programme period (e.g. related to planning and strategy development for implementation of the new Just Transition Fund).



4.2 The impact of the COVID-19 pandemic



Additional guidance was developed for the regional teams in March 2020 to take into account the COVID-19 crisis, as the pandemic required everyone to rethink working practices, particularly the ones that involved group work, travel and physical presence.

The stakeholder mobilisation activities under WP5 included events and meetings that had to be cancelled, rescheduled or otherwise altered. Although it is not possible for online meetings to exactly replicate the face-to-face contact and coherence that would occur during physical meetings, there were alternatives that have advantages of their own.

The pandemic introduced the need for stakeholder engagement activity to move online, which involved a learning curve with new platforms and requiring new skills. Mobile technologies have largely changed the context of participatory processes in recent years. Policymakers, academics and practitioners have also embraced elements

of virtual engagement with a wider audience. Virtual connections are important to maintain and develop connections in real space, which is in line with TRACER's aim of using a participatory approach. However, this also means that the success of virtual engagement builds on existing connections and it can be difficult to engage new stakeholders with these approaches. At the same time, this stresses the importance of actively engaging and accommodating potentially new stakeholders or participants, and following up in real space through concrete actions after the crisis, using both online and offline engagement tools.

The participatory process based on virtual methods is essentially different from that using face-to-face interviews and workshops, and so are the data that will be obtained. Some methods are more suitable for online use than others, those that can work well include individual meetings, e.g. for interviews with stakeholders, use of breakout groups, formal presentations from key stakeholders (live or using a pre-recorded presentation), possibly combined with Q&A or a 'roundtable' discussions, and other participatory activities.

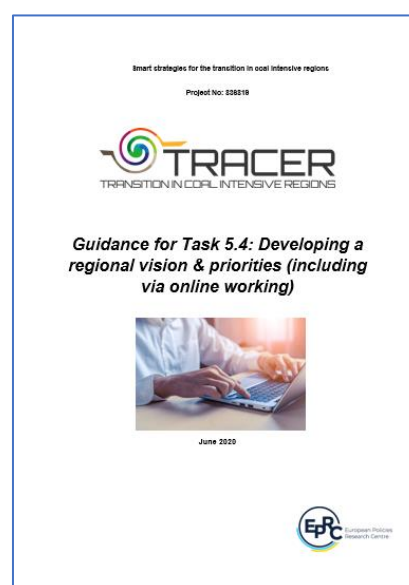
4.3 Building a vision in coal regions in transition

The third set of guidance developed for the TRACER target regions in June 2020 suggested that the regions' visions could be defined in response to the following question:

"What is the overarching developmental goal for the region, in relation to sustainable energy research and innovation, to support transition to a low carbon economy?"

It was suggested that this could include some of the following dimensions:

- *A societal dimension*; e.g. shifting from coal production and use to more sustainable forms of energy, in order to contribute to the wider energy transition and a low carbon economy;
- *An economic dimension*; e.g. developing/expanding a particular sustainable energy industry, with a view to supporting overall prosperity or regional economic development;



- *An employment or skills dimension*; e.g. creating new jobs or transitioning workforce skills, in order to provide new employment opportunities for people in the region, or for particular groups of people (e.g. ex/current miners, young people, researchers...);
- *A research/innovation/technological dimension*; e.g. enhancing specific kinds of R&I capacities, as a contribution to business development and economic growth, or new employment, or new opportunities for universities;
- *A collaborative/engagement dimension*; e.g. increasing opportunities for cooperation among regional stakeholders, in order to enhance social capital.

The guidance also suggested that the regional priorities could be defined in terms of concrete and achievable objectives and focused on the region's existing strengths, resources and emerging opportunities, in an inter/national context (see Box 2).

Box 2: Indicative themes for regional priorities in TRACER target regions

The following themes were suggested as a focus for agreed priorities, related to the region's existing strengths/resources and potential:

- Natural resources or energy sources,
- Geographical location (e.g. proximity to resources or to markets),
- Infrastructure and physical capital (e.g. in relation to energy),
- Funding for investment in physical, human and knowledge capital, and for financing particular types of businesses or particular types of R&I activities,
- Key businesses and other economic actors,
- Human resources and skills,
- Research and innovation infrastructure and capacities, or funding for the diffusion and application of specific technologies
- Governance structures,
- Stakeholder engagement and social capital.

Source: TRACER supplementary guidance for Task 5.4: Developing a regional vision & priorities (including via online working) (June 2020)

The regional shared vision and priorities were to be developed through a collaborative and iterative process with stakeholders. A summary of the regional visions developed in the TRACER regions is included in Section 5.4.

4.4 Activities in the TRACER target regions

The stakeholder engagement activities carried out have varied across the regions. This was anticipated at the project outset, prior to the COVID-19 pandemic. Engagement with stakeholders can be challenging, and the transition out of coal is a sensitive topic in some regions. In addition, the willingness and ability of regional stakeholders to participate will vary widely. Flexibility was encouraged; it was recognised from the start that WP5 activities would need to be tailored to each region and its specific stakeholders.

An overview of the stakeholder engagement activities carried out in the TRACER target regions is provided in Table 1 and Table 2. These activities will be described in more detail in the individual regional reports which make up TRACER Deliverable 5.3.

Interviews had been foreseen with 10-15 stakeholders in each region. Almost all regions were able to meet this target, but with the onset of COVID-19 this became very challenging in some regions, despite strenuous efforts by the regional teams. A total of 175 interviews were carried out in the nine TRACER target regions, covering a broad range of stakeholder groups (see Table 1).

Table 1: Stakeholder interviews in the TRACER target regions

TRACER target region	Type of stakeholder	Government bodies	Other public sector organisations	Business associations, chambers and individual businesses	Universities	Research institutes	Educational institutions	Civil society organisations	Hybrid organisations (e.g. innovation centres or cluster)	Others	TOTALS
Southeast Region, Bulgaria		1	2	4	1	0	0	3	0	2	13
North West Bohemia, Czech Republic		5	1	6	2	1	1	0	0	0	16
Lusatia Region, Germany		1	1	5	2	0	0	3	1	1	14
Western Macedonia, Greece		1	1	0	3	2	0	0	1	0	8
Upper Silesia, Poland		2	1	2	1	3	0	1	0	1	11
West Region/Jiu Valley, Romania		12	0	6	10	0	0	20	0	11	59
Kolubara Region, Serbia		3	1	1	2	0	2	3	0	0	12
Donetsk Region, Ukraine		1	1	2	2	6	0	0	0	0	12
Wales, United Kingdom		7	8	3	3	2	2	4	0	1	30
TOTALS		33	16	29	26	14	5	34	2	16	175

The format for carrying out interviews varied depending on the availability and preference of interviewees, and on the COVID-19 situation prevailing at the time (see Table 3). For example, FIB in Lusatia were able to secure an early start on the interview process in 2019, so were able to carry out more interviews face to face. Interviews were generally lengthy and detailed (e.g. two hours and longer) allowing an in-depth exchange of views. In other regions, a mix of in person, online and telephone interviews were conducted. In addition, where stakeholders were reluctant or unable to participate in an interview, questionnaires were completed and submitted in written format (e.g. in Western Macedonia). In Wales, securing cooperation from stakeholders was facilitated by Welsh Government being a TRACER project partner, and they worked with STRATH to map, mobilise and encourage stakeholder participation, which helped secure a high number of interviews.

Guided online interviews using google forms in Romanian were used in Jiu Valley. The TRACER activities in Romania-Jiu Valley were made more complex, but also supported, by the fact that there were several related initiatives taking place in parallel, including:

- development of the strategy for the transition from coal of Jiu Valley for the period 2021-2030 (EC–DG Reform, through SRSS, under the Ministry of European Funds coordination)
- EC assistance services accessed by all six of Jiu Valley's Mayors through START²⁹
- the development of Territorial Just Transition Plans
- cross-overs with other related H2020 projects for coal regions (i.e. Tipping PLUS, CINTRAN and ENTRANCES).³⁰

²⁹ The Secretariat Technical Assistance to Coal Regions (START) programme supports seven coal regions (including Jiu Valley in Romania) addressing gaps in technical assistance and providing capacity building.

³⁰ <https://tipping-plus.eu/home>; <https://coaltransitions.org/projects/cintran/>; <https://entrancesproject.eu/>

While the intensive bottom-up process of information dissemination, public consultation and engagement in decision making was welcomed in Jiu Valley communities, it was also overwhelming, as key stakeholders were being targeted by different initiatives at the same time. For this reason some stages of the EDP process were assimilated with events organised by START or MIPE (Ministry of Investments and European Projects) or by local initiatives such as the Jiu Valley SMEs Association (ACIVJ).

Overall, 26 workshops were held, engaging over 900 stakeholders, again across a broad range of stakeholder groups (see Table 2). In terms of workshops, flexibility was provided in their quantity and structure, to tailor the approach to the needs of the target regions. For instance, only one workshop was held in Lusatia, as stakeholders expressed a preference for bilateral conversations/interviews. Reasons for this preference included that the stakeholders are already heavily consulted by others, and have only limited time available. It is therefore difficult to raise interest in new projects. However, stakeholders express a preference for more in-depth conversations, which is possible in interview settings. In addition, interviews provide a good opportunity to discuss problems and more personal opinions, and be rather open-minded in a safe atmosphere. Some of the interviewees would not agree to appear and speak at a workshop, because their impression and opinion of the structural change and the coal phase-out in the region are not consistent with policy, so the guaranteed interview anonymity gave them freedom of expression. However, in parallel during 2019, FIB supported LEAG, the regional lignite mining company, with the organisation and conducting of two working group meetings with a wider range of stakeholders.

As the project progressed, the need for flexibility increased – due to the pandemic, and also to incorporate the need to exploit synergies and minimise duplication by working collaboratively with other parallel projects and programmes related to coal transition. For Upper Silesia, UAK were one of the first teams to adapt to the new approach under COVID-19, with an online event using the Cisco Webex platform in April 2020 (postponed from March). The event included statements by participants on the region, presentations on energy transformation and identification of strengths and weaknesses as well as threats and opportunities provided by the transformation, as well as open discussion moderated by UAK.

Workshops were also managed online by TET for the Donetsk region of Ukraine, where four online conferences/thematic round tables were held. These were organised around technical/scientific topics:

- coal power engineering: ways of reconstruction and development;
- disposal of coal beneficiation waste, solid household and agricultural waste in old industrial mining regions on the basis of a circular economy;
- energy diversification of mines as a direction of smart specialisation of mining regions of Ukraine; and
- investment strategies and mechanisms for financing a fair transition.

The stakeholder mobilization process was very active in Bulgaria Southeast region, in part due to the excellent collaboration between TRACER and the DeCarb project,³¹ which resulted in the organisation of six common workshops. The collaboration took advantage of the complementarity of the Bulgarian partners in the two projects, such as: national (BSERC) and regional/local (SZ REDA) knowledge and contacts; expertise in energy (BSERC) and regional development (SZ REDA). Additionally, the higher total budget allowed for the organisation of more and better prepared events, which attracted very high number of relevant participants, both physically present and online. The high number of co-organised events helped to provide comprehensive information about the EU and national developments, best practices from other countries, results of various studies, decarbonisation opportunities for the region, and views (concerns, needs, etc.) of each stakeholder affected by the transition.

³¹ DeCarb is an Interreg Europe project which supports the clean energy transition of nine coal intensive regions across Europe, including the TRACER target region in Bulgaria.

Table 2: Stakeholder engagement workshops in the TRACER target regions

TRACER target region	Type of stakeholder	Government bodies and other public bodies	Business associations, chambers and individual businesses	Universities and research institutes	Educational institutions	Civil society organisations	Hybrid organisations (e.g. innovation centres or cluster bodies)	Others	TOTALS	Number of workshops
Southeast Region, Bulgaria ³²		129	110	40	0	71	0	0	350	4
North West Bohemia, Czech Republic		n/a	n/a	n/a	n/a	n/a	n/a	n/a	320	8
Lusatia Region, Germany		8	9	28	0	2	1	2	50	1
Western Macedonia, Greece		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Upper Silesia, Poland		2	1	3	0	1	1	1	9	1
West Region/Jiu Valley, Romania		46	8	15	0	16	0	0	85	4
Kolubara Region, Serbia		12	0	8	0	3	5	0	28	3
Donetsk Region, Ukraine		9	15	40	0	4	0	0	68	4
Wales, United Kingdom		8	0	6	1	0	2	0	17	1
TOTALS									927	26

In the Kolubara region of Serbia, three workshops were organised by ENTEL, each targeted to a different stakeholder profile. The workshops focused on: the future operation of the open pit mines in the region; the role of Serbia's electric power industry in energy transformation in Kolubara; and future energy strategy in Serbia. The workshops covered the range of implementation possibilities – face to face, online and hybrid. All formats included a series of presentations and allocated extensive time to discussion sessions.

In the Czech Republic, eight workshops were held in the North West Bohemia region. Each event was focused on a particular aspect of coal transition, targeting most relevant stakeholders' groups, such as mayors and representatives of municipalities, school directors, education authorities, business representatives, research institutions, innovation centres, academics and practitioners, and also students of environmental studies aged 16-19 and university students. In general, the workshops addressed regional needs and opportunities and offered diverse interactive activities, including conferences, debates, field trips, and sessions dedicated to particular regional topics. In addition to the face to face interviews, a publically available online survey complemented the workshops. The survey was completed by 140 participants; most of the participants had been contacted by the research team implying that they have a relationship with the mining region, but interestingly, only 54% of respondents live in the North Bohemia region (i.e., Karlovarský and Ústecký district) and 46% of respondents live outside this region.

In Jiu Valley, Romania, four half-day workshops were held following the same structure but targeted at different audiences and thus using different vocabulary (more or less technical). These were supplemented with separate online meetings (e.g. with SME representatives), and

³² Approximate figures, joint with DeCarb project.

tailored to the needs of stakeholders. For example, the workshop scheduled with the six mayors of the micro-region (Petrosani, Vulcan, Uricani, Petrila and Aninoasa) was made up of two events:

- one generated by the TRACER research team, from the desire to synchronise the European initiatives for the Jiu Valley; and
- one organised by CRIT-START in which the TRACER team were invited to actively participate.

The Romanian TRACER partners ISPE and AISVJ also participated in the consultation with stakeholders in the workshops organised by PwC, within the SRSS assistance programme of the European Commission - DG Reform, which took place in the form of nine online workshops.

Table 3: Stakeholder interactions in interviews and workshops

TRACER target region	Interviews	Workshops
Southeast Region, Bulgaria	In person, by telephone and online	Hybrid (online and in person)
North West Bohemia, Czech Republic	In person and online	In person
Lusatia Region, Germany	In person and by email	In person
Western Macedonia, Greece	Online and through completed interview questionnaires	n/a
Upper Silesia, Poland	Online	Online
West Region/Jiu Valley, Romania	Online	Online
Kolubara Region, Serbia	In person and online	Online, in person and hybrid.
Donetsk Region, Ukraine	By telephone and email	Online
Wales, United Kingdom	Online and telephone	Online

The lack of possibility for the implementation of a workshop in the region of Western Macedonia due to the difficulties imposed by the COVID-19 restrictions, exacerbated by the distance of the Greek project partner CRES from the target region, has resulted in the personal interviews with interested regional stakeholders being the main source of data for the gathering of views on the transition out of coal in the region. The impact of this has also been mitigated by extensive interaction and engagement with a wide network of local stakeholders under other TRACER work packages.

5 Outcomes of the mobilisation process

Overall, the activities involving stakeholders were seen as a success by the TRACER regional teams. The reported results vary among the project partners in terms of stakeholders' engagement, type of interactions, achieved consensus and challenges. Nevertheless, in each case there was a significant information exchange. The outcomes, however, depended on stakeholders' attitudes, number of activities organised, previous experiences and compatible programmes. They were influenced not only by the COVID-19 crisis, but (in the context of energy transition) also by the economic situation and the political context.

5.1 Mobilisation of stakeholders – interviews and workshops

Workshops provided an opportunity for stakeholders to interact and exchange views, and created a chance to deliberate on the regions' transition strategy, which was facilitated by thorough preparatory processes. As observed by the Romanian team: *“Workshops preparations included also a well-prepared theoretical background – approach “stakeholder engagement instead of stakeholder management or involvement. (...) Stakeholder engagement includes communicating with, involving, and developing relationships with stakeholders.”*

In some cases, the workshops were combined with other meetings (as in Lusatia, Germany, where the TRACER kick-off meeting was combined with a stakeholder workshop) or supported by projects with a similar focus (as in the Southeast region of Bulgaria, with the DeCarb Interreg project). This had a positive influence on the stakeholders' mobilisation, interest, and the visibility of the events. In other cases (as in the Czech Republic), workshops were organised around particular themes related to coal transition and were targeted at certain stakeholders' representatives, which allowed involvement of more diverse groups of participants.

Despite the difficulties and limitations in organising physical meetings, some regional teams were able to proceed with face-to-face or hybrid events. Where it was decided to proceed with online meetings only, due to COVID-19 restrictions (as in Upper Silesia, Jiu Valley and Wales), or due to the travel distance combined with COVID-19-related travel restrictions (e.g. Western Macedonia), it was reported that the online workshops mostly worked well. Nevertheless, virtual events required adaptation and ensuring the technical expertise required, which was a challenge especially where some stakeholders had less experience with online tools (as in Upper Silesia or Donetsk region). The observed consequences of organising online events were not the same for all target regions:

- *“(...) online communication for many parties has led to a decrease in contacts and interaction.”* (Donetsk region)
- *“Online workshops excluded some activities and, in a way, limited interactions. On the other hand, the on-line form of the workshop enabled more organized discussion as each participant had a time to present his/her point of view.”* (Upper Silesia)
- *“The implementation of in person workshops could definitely contribute to a deeper and extended exchange of opinions and experiences, yet the response of the interested parties has not been affected at all by the “online” version of the communication.”* (Western Macedonia)

To compensate for the lack of physical events, the possibility of live meetings at another date were offered to representatives of mining companies in Upper Silesia, who refused participation in the online workshops. In Wales, the research team increased the number of interviews, as one-to-one communication turned out to be easier and more rewarding while using online methods than larger group meetings.

Although time-consuming, the interviews, in general, allowed the regional teams to obtain more in-depth information. The interviews were mainly held online or through email exchange. In

person interviews only proceeded in Southeast Bulgaria, Lusatia and Kolubara. During both physical and/or online workshops it was sometimes difficult for the participants to fully express their point, due to the sensitivity of the topic or limited time available, thus the interviews helped to secure extended and detailed views from different perspectives. They were a complementary source of information (with more openly shared views) and provided the possibility to focus on a particular topic of interest to the stakeholder (as in Southeast region, Bulgaria).

TRACER events aroused great interest and mobilisation of stakeholders was generally also successful. Some issues occurred due to the availability of stakeholders (e.g. the events overlapped with their work time). As a result, some stakeholders or stakeholders' groups were under-represented: e.g. regional-level stakeholders in Germany and mining companies in Poland. In Wales, there was a noticeable impact of the pandemic on the accessibility of people working in the higher and further education sectors, where workloads increased with moving teaching online, and in public sector organisations including Welsh Government, where some staff were seconded into the government's response to COVID-19.

At the same time, the regional team for Bulgaria's Southeast region and the North West Bohemia region in the Czech Republic, were able to mobilise hundreds of relevant stakeholders, while the involvement of some high-profile people making presentations at the Lusatia workshop increased registration rates. In Jiu Valley, workshops were perceived as pioneering events dedicated to coal transition, while in Kolubara region, the regional team reported that communication between stakeholders on energy transition has certainly improved and they are encouraged to express their views. Similarly in Southeast region Bulgaria, and in Upper Silesia, regular participation of a high number and different types of stakeholders (such as miners and ecologists in Poland) allowed them to develop, communicate, and confront their positions, which resulted variously in some polarisation of views (in Bulgaria) or some movement towards consensus (in Upper Silesia).

It is worth emphasising that these activities took place before November 2021, i.e. before additional stakeholder engagement was pursued under TRACER's Work Package 6. Therefore, it was not possible to look at the whole process and, in some cases, it was too early to predict the full impact of TRACER activities. In some regions, there were a number of support activities for coal regions taking place in parallel. TRACER activities have helped coordinate between these different activities and helped shape input to, for example, National Recovery and Resilience Plans (NRRP) and Territorial Just Transition Plans (TJTP), providing regions with an additional tool and voice in the transition processes.

5.2 Developing visions and priorities for energy transition

TRACER target regions are at different stages of their transition to new sustainable energy sources. This translates into the understanding and planning of the transition out of coal, as well as into the general level of interest, solidarity in the approach and undertaken actions. In some cases, there was a low or a very moderate level of consensus regarding the direction and pace of coal transition possible at this stage or even regarding priorities. Nevertheless, in most cases, progress towards a common vision was reported as being significant (e.g. in North West Bohemia, Lusatia, Western Macedonia, Jiu Valley). Table 4 presents the general approach to energy transition in the target regions, taking into consideration the level of consensus, needs, mobilisation, awareness and implementation, based on the reflections of the regional teams.

Table 4: Approach to energy transition in TRACER regions

	Level of consensus among stakeholders (e.g., on priorities)	Need for additional instruments / integration of existing instruments / policies	Mobilisation of stakeholders (readiness / willingness to act/cooperate)	General awareness/interest in transition	Advancement of transition implementation
Southeast Region, Bulgaria	+	+	++	+++	+
North West Bohemia, Czech Republic	+++	++	++	+++	++
Lusatia Region, Germany	+++	+	++	+++	+++
Western Macedonia, Greece	+++	++	++	+++	++
Upper Silesia, Poland	++	++	++	+++	++
West Region/Jiu Valley, Romania	+	+++	+	+	+
Kolubara Region, Serbia	+++	+++	+	++	+
Donetsk Region, Ukraine	+++	+++	+	++	+
Wales, United Kingdom	++	+	++	+++	+++

+ low ++ moderate +++high

Source: Authors' own elaboration based on reflections of the regional teams in the TRACER target regions

The approach brought by TRACER ensured the broadest possible involvement of stakeholders representing the quadruple helix. The workshops created a solid ground for deliberation, while interviews allowed the collection of detailed information, which has already had several effects:

- **Shifts in stakeholders' attitudes** e.g., enabling local experts and R&I institutes to gain more trust (Kolubara region, Serbia); reducing scepticism and starting to understand that coal transition is an inevitable process in the region (Jiu Valley, Romania and Donetsk, Ukraine).
- **Narrowing the main interests regarding coal transition** e.g., by increasing awareness through intensive information exchange, and establishing the main area of interest: *the development of new technologies for the use of existing energy sources, reducing the impact of the energy generation process on the environment*, as in the Donetsk region, or *transformation in green energy tourism and other industries are seen as the major potential for coal mining region transformation* in North West Bohemia.
- **Establishing networks and new bodies addressing in their activities coal transition or strengthening already existing bodies**, such as the Romanian Jiu Valley Association to coordinate and ensure the implementation of the Transition Strategy, or joint efforts over several coal-related projects in Upper Silesia.

Thus, an important aspect of the TRACER activities was the impact on community building and networking by bringing together different stakeholders (hundreds of relevant participants in some cases – i.e. Southeast region, Bulgaria; North West Bohemia, Czech Republic). An excellent result reported by some TRACER research teams (e.g., Greece) is that since the first stages of the contacts made, all representatives have maintained their interest intact, and they were always willing to provide feedback on different issues.

5.3 Common challenges identified

Stakeholder engagement processes under Work Package 5 of the TRACER project revealed their perceptions of several common challenges related to energy transition. At the time the regional reports were completed, one of the most urgent challenges shared by all target regions related to funding, often due to delays and uncertainty at regional level around the implementation, timing and priorities of future funding programmes. Upper Silesia pointed out that the “*old funding programmes are over, and the new ones have not been announced yet*”. In Jiu Valley, “*future funding conditions (eligibility rules, state-aid intensity, etc.) are unclear*”. In Wales, there was uncertainty about future funding in the context of Brexit and the priorities of successor funds to EU Structural Funds. In this context, the lack of funding for the transition process is seen as a serious problem also for the Serbian economy, accompanied by the social consequences of the associated employment impacts. Similarly, funding is the main challenge identified for coal transition in Ukraine, and is also of high interest in Czechia.

Other common challenges identified through the stakeholder engagement process include:

- **Lack of qualified workers:** an existing shortage of highly qualified workers and professionals was identified in Lusatia, paralysing some R&I activities; Donetsk is rapidly losing skilled workers and production is declining; in Western Macedonia, a basic challenge is how to replenish the jobs that will unavoidably be lost with decarbonisation/re-skilling. In North West Bohemia, participants reported an observed scarcity of craftsmen and workforce for the construction industry; they also expressed a common position that investment in research and education, as well as green energy reskilling, are some of the most urgent needs of the region.
- **A need for capacity building for R&I related to energy transition:** this challenge was noted in Bulgaria’s Southeast region, Western Macedonia, Jiu Valley and Kolubara region. At the same time, the well-developed R&D sectors in Wales and Upper Silesia were highlighted as key regional strengths.
- **Need for complex planning and needs assessments:** In Kolubara region in Serbia, there is an urgent need to develop and invest in R&I to facilitate and speed up the transition process. In Jiu Valley, it was considered wise to ensure a continuous use of both the transmission networks and the remaining infrastructure at the sites of the existing and new coal fired power plants, with no option / technology being left aside.
- **Lack of clear and integrated legislation:** In many cases the legislation is vast and uncorrelated, and related responsibilities are spread between several ministries, causing many blockages in the transition process.

5.4 Promoting regional ownership of TRACER outcomes

In addition to engaging with regional stakeholders in the target regions, one of the TRACER tasks has been to work with stakeholders to develop appropriate governance structures within each target region to take ownership of the TRACER outcomes i.e. the identified visions and priorities for energy transition in the region, and to promote ‘regional ownership’. This ongoing task aims to take into account existing structures and avoid overlap and duplication (for example, by joining existing committees or working groups where possible).

The regions have taken different approaches to the task, to reflect the varied interests and needs of stakeholders, to take into account existing structures, and to promote synergies and complementarities where possible. This has been particularly important in regions where new structures have emerged connected with, for example, planning and strategy development for the Just Transition Fund. An overview of the working groups which are promoting the TRACER outcomes in the regions, particularly as the research progresses through subsequent Work Packages, is provided in Table 5: Overview of working groups. In five regions, an existing working group has been joined, while in four regions a new structure has been put in place.

At the time the EDP work was carried out and reported by TRACER target regions, there was still a considerable amount of research and engagement work to be done. However some early

impacts could already be seen. These range from tangible impacts including: providing a forum for the testing of new ideas (e.g. Lusatia); improving synergies between parallel initiatives (e.g. Jiu Valley); and coordinating input to JTTP and NRRPs (e.g. Southeast region Bulgaria); to softer but equally important benefits such as bringing together disparate groups of stakeholders (e.g. miners and ecologists in Upper Silesia); improving communication channels (North West Bohemia, Kolubara, Donetsk); and drawing on the extensive existing expertise of stakeholders to inform transition processes (North West Macedonia, Wales). Providing an ongoing forum for increased cooperation and communication has been found to be rewarding and productive. Nevertheless, COVID presented many challenges, and the possibility of more face-to-face meetings during the project's lifetime may have facilitated additional networking and new connections.

Table 5: Overview of working groups

TRACER target region	Governance structures to promote TRACER objectives
Southeast Region, Bulgaria	<p>Plan: Joining and extending an existing working group.</p> <p>Working group: 24 members, representing all stakeholders – coal companies, labour unions, businesses and their associations, NGOs, researchers, public authorities.</p> <p>Potential impact: potential input in to JTTP & NRRP.</p>
North West Bohemia, Czech Republic	<p>Plan: Establishing a new working group.</p> <p>Working Group: 7 members representing the Economic and Social Council of the Usti Region, government strategy RE:START, social, research and innovation platforms and industry (mining company).</p> <p>Potential impact: Mobilisation of stakeholders, improved communication on the many parallel strategies.</p>
Lusatia Region, Germany	<p>Plan: Joining an existing working group.</p> <p>Working group: representatives of authorities of LEAG, a recultivation company, tree nurseries, FIB (the regional TRACER partner), different operating farmers, and Ministry staff.</p> <p>Potential impact: generating new value chains for LEAG and operating farmers. Development of value chains by growing special agricultural crops is a promising strategy for the future. LEAG, FIB and PLB started the practical implementation with a field trial.</p>
Western Macedonia, Greece	<p>Plan: Joining an existing working group.</p> <p>Working Group: <i>The Western Macedonia Region Working Team for Coal Platform of Western Macedonia</i>; currently 8 members, representing the Centre of Research and Technology Hellas (CERTH/CPERI), the Regional Operational Programme of Western Macedonia Management Unit, the Regional Development Fund Unit of Western Macedonia, the Regional Development Agency of Western Macedonia (ANKO), the Regional Union of Municipalities in Western Macedonia, the University of Western Macedonia, and the Ministry of Environment and Energy.</p> <p>Potential impact: Mobilisation of stakeholders; TRACER findings could provide a useful/strong/additional tool in the energy transition phase</p>
Upper Silesia, Poland	<p>Plan: Joining an existing working group.</p> <p>Working group: Ongoing participation in existing structures and consultations.</p> <p>Potential impact: Bringing together stakeholders representing very different groups (e.g. miners and ecologists). TRACER partner has the opportunity to</p>

	participate in public consultations etc. and takes part on an ongoing basis in participatory seminars on just transition for the Rybnik sub-region.
West Region/Jiu Valley, Romania	<p>Plan: Establishing a new working group.</p> <p>Working Group: 25-27 members from the business (private/public) environment (30%), research & education (15%), government/public sector (37%), civil society - NGOs and media (18%); especially by of the initiatives in Jiu Valley / JV (SRSS, START-CRIT and TRACER).</p> <p>Potential impact: An integrated approach at Jiu Valley micro-region level, synchronised and in connection with economic & social transformation planning at regional level, under the coordination of a new governance structure representing a common voice for Jiu Valley; investing in human potential and training, and agreement on the main strengths of Jiu Valley micro-region. Managing the synchronisation of some activities carried out especially by 3 of the initiatives in Jiu Valley (SRSS, START-CRIT and TRACER); sharing TRACER EDP best practice on the "4 helix" approach in mapping stakeholders, led to the adoption of this model by the governmental team coordinating Jiu Valley Transition Strategy (SRSS); 3 x TRACER and ACIVJ projects ideas, generated together, taken over and endorsed by all 6 Jiu Valley mayoralities and DG ENER to be further developed within the START-CRIT short list of 10 projects.</p>
Kolubara Region, Serbia	<p>Plan: Establishing a new working group.</p> <p>Working group: 7 members, belonging to the group of 4 helices (i.e. government/public sector, business, research/education and civil society). Each helix is represented by 1-2 members.</p> <p>Potential impact: Improved communication between stakeholders.</p>
Donetsk Region, Ukraine	<p>Plan: Joining an existing working group.</p> <p>Working group: members from the Ministry of Energy.</p> <p>Potential impact: Cooperation with Working Committee on developing of Coal Towns Transition Strategy in Donetsk Region.</p>
Wales, United Kingdom	<p>Plan: Establishing a new working group.</p> <p>Working group: Net Zero Wales: Skills Economies Advisory Forum has been set up; participants include representatives of higher and further education, industry, industry representative bodies, regional skills partnerships, local and Welsh Government.</p> <p>Potential impact: supporting the Welsh Government to progress the green skills agenda and to promote and "to deliver the skills for decarbonisation, sustainable and renewable energies and efficiencies at pace, at competitive whole-life costs and with high assurance".</p>

6 Regional visions and priorities

The following section provides a summary overview of the regional visions and priorities emerging from stakeholder discussions in the TRACER target regions. A more detailed description for each region will be available in the regional reports published as TRACER Deliverable 5.3. The TRACER target regions are all at different stages of their transition out of coal, and their transition into sustainable energy systems – this is reflected in the emerging visions and priorities. The visions and priorities were then carried forward into the next TRACER Work Package (WP6), to help inform the preparation of reports focused on the target regions on:

- projections for the transition to 2030/2050
- research and innovation strategies relating to energy
- the needs for workforce retraining
- roadmaps for energy R&I and skills, related to energy transition
- blueprints for energy transition.

6.1 Southeast Region, Bulgaria

The coal transition has just started in South-East Region in Bulgaria, and, except for a couple of topics, there is no consensus among stakeholders about its direction and pace. However, some consensus could be identified on the following points:

- The region should continue its key role in the energy sector.
- The change must be gradual and well planned by all stakeholders.

There is some consensus that the most promising decarbonisation projects include:

- solar PV
- green hydrogen
- fossil gas electricity capacities
- distributed generation
- energy efficiency in buildings.

The development of a wide range of energy and non-energy opportunities should be considered so that region is no longer dependent on a single sector.

There should be more emphasis on improving the business environment e.g. through State support for infrastructure projects and the development of industrial zones.

6.2 North West Bohemia, Czech Republic

The cessation of mining before the complete extraction of mineable reserves is a sensitive issue in the Czech Republic. The major reason agreed with by regional stakeholders for the cessation of coal mining before the extraction of mineable reserves are environmental concerns – i.e. the negative impact of mining and the coal-based economy on the environment and living conditions of the people in the region, either local or global (via the negative effect on greenhouse gas emissions and global warming). Major problems of post-mining region recovery in the region are identified as low qualifications, low diversity of jobs and environmental issues. There is some consensus among stakeholders in the target region that investment in the environment, research and education, green energy reskilling, and social issues should be prioritised. Transformation in green energy tourism and other industries are seen as the major potential for coal mining region transformation.

6.3 Lusatia Region, Germany

There is a wide range of visions and options emerging from the EDP, but the future vision for the region must include:

- a societal dimension
 - perspectives for the youth especially in smaller cities and villages, making the social aspects of Lusatia attractive by creating an innovative mind-set, self-empowerment of the region and in some areas more implementation of the sorbs
- an employment dimension
 - create transition options for current miners and connected workers
 - attract young people with new and innovative employment opportunities as well as promoting existing jobs where there is a shortage of skilled workers/professionals such as health care, education, craftspeople, etc.
- an economic dimension
 - usage of the competence roundabout energy production for establishing energy storage systems, a new steady energy structure
 - establish a sustainable "soft" landscape tourism
- a technological dimension
 - retrofitting and repowering of existing renewable energy systems such as photovoltaic and wind turbines of the first generation
- a research or innovation dimension
 - with a high level of practical relevance
 - identify new opportunities in the market and trends outside of Lusatia and create related business strategies
- an engagement dimension
 - create spaces for meeting and connection between stakeholders to enhance social capital.

The transition process is already underway in the region. There are currently many regional activities, strategy developments and programmes ongoing in parallel, which are not well-coordinated. There is a strong need for a well-communicated and coordinated transition process. TRACER activities should align with existing strategies/programmes and serve an important communication role in this process.

It is important to create economic alternatives for employment and value creation in the region. Underutilised and marginal agricultural land including reclaimed dump areas represent an asset with economic potential. The cultivation of energy and special crops on reclaimed land can make a substantial contribution to regional energy transition, restoration of degraded and underutilised land and also provide a sustainable and eco-friendly income for the primary sector in the region.

6.4 Western Macedonia, Greece

According to stakeholder consultation in Western Macedonia, the region's production model must be rebooted, regenerated and be ready to be enriched with new activities that will create new jobs. The new production model should be non-dependent on coal, yet maintain its "energy" character and be based on the exploitation of new alternative and environmentally friendly resources and technologies (e.g. RES, hydrogen, energy storage). It should further expand to other sectors (e.g. agricultural, manufacturing, agri-food, mild forms of tourism exploiting the natural landscape and the cultural background).

The regions' significant technological and research infrastructure could be upgraded and expanded to support new business activities – still energy based, but in innovative sectors and / or products. This, coupled with the highly trained technical staff, could constitute a very efficient and powerful tool for the new orientation of the production and economy of the area to alternative (energy and not only) paths.

Priorities identified among stakeholders include capacity building and the re-training / re-skilling of the existing labour force and of the human resources employed in the lignite industry.

The inevitable loss of a considerable number of jobs directly (and / or indirectly) connected to lignite mining and to the operation of coal power plants is an issue of serious concern, which should be dealt with by the implementation of strategic approaches to ensure the replenishment of existing jobs, through a combination of actions and targeted initiatives.

A range of financial and fiscal incentives should be put in place to increase local business activity, attract both domestic and international investment and improve the R&D / R&I potential in the region.

The regions' significant technological and research infrastructure should be upgraded and expanded to support new business activities – still energy based, but in innovative sectors and / or products.

6.5 Upper Silesia, Poland

The energetic transformation of Upper Silesia is an already ongoing process. It is manifested in increasing production of energy from renewable sources and results in improved air quality in the region.

According to the stakeholder consultation, a just transition of the region should take into account goals in three thematic areas: economy, environment and society.

In the area of economy, it is necessary to build an innovative and high-tech industry, a diversified, resource-efficient and energy-efficient economy by increasing the number of companies and creating jobs in sectors alternative to mining and conventional energy.

In the area of environment, it is necessary to build a balanced energy system based on alternative energy sources, effective use of post-industrial areas for economic, environmental and social purposes, an effective system enhancing the mobility of the region by reducing the emissions of transport and improving communication.

In the area of society, the goal should be to build an attractive and effective education system and to raise qualifications, the labour market support system and social activation, and the transformation management system.

6.6 West Region/Jiu Valley, Romania

The vision for the region which emerged from the EDP is: Jiu Valley micro-region revitalised from a social point of view, with a sustainable development, interconnected with the major regional, national and European networks, and having a competitive economic environment.

The integrated transition of Jiu Valley micro-region will be implemented by investing in human potential, education, spirituality and morality, thus creating the right environment and generating the necessary force for the human capital, able to develop the local economy by implementing innovative ideas.

Priorities identified by stakeholders include:

1. Increasing life quality and creating a healthy and sustainable environment for future generations:
 - 1.1. Calibrating local human potential to increase employment and combat social exclusion;
 - 1.2. Upgrading and optimising medical services, together with developing social services to overcome vulnerabilities and sanitary crisis;
 - 1.3. Upgrading and making more attractive the education system, at all levels (primary, secondary, tertiary and higher); enhancing access to education and investing in skills (dual education and re-skilling programs correlated with the market needs) and competences (ICT and foreign languages);
 - 1.4. Supporting the transition to a green economy to protect the environment.
2. Economic diversification, innovation and entrepreneurship:

- 2.1. Reconfiguring the energy sector of the micro-region by capitalising the development potential, on various levels;
- 2.2. Attracting investments, in areas specific to the profile and needs of each city in the Jiu Valley, with potential for a sustainable economic development of the area;
- 2.3. Supporting entrepreneurship by developing specific skills and competences; individual local businesses and new economic initiatives.
3. Sustainable capitalisation of the local specificity:
 - 3.1. Developing an integrated tourist concept of Jiu Valley micro-region;
 - 3.2. Upgrading and diversifying tourism infrastructure and services;
 - 3.3. Developing cultural and sports activities, leisure and creative industries, adapted to the local specifics;
 - 3.4. Certifying, promoting and using local resources in the agri-food and handicraft field.
4. Accessibility, mobility and connectivity:
 - 4.1. Rehabilitating and upgrading of the road and railway infrastructure for connecting the Jiu Valley at territorial, regional and cross-border level;
 - 4.2. Developing an eco-efficient public transport system in an integrated, sustainable and intelligent manner;
 - 4.3. Rehabilitating and developing streets and pedestrian areas with improved accessibility conditions for people with reduced mobility / disabilities, arrangement of public spaces;
 - 4.4. Development of utility networks, communications and street lighting networks.

6.7 Kolubara Region, Serbia

There are many different points of view and a lack of common opinions, however, the shared conclusion emerging from stakeholder discussions is that transition in Kolubara target region to coal phase-out should be planned well in advance. The transition should be gradual and supported by additional hydro pumped storage facilities with the aim to keep the electricity supply stable and minimise dependence on imports.

Transition and reclamation activities should be well prepared before and developed immediately after each mine field closure.

To support the transition process, new energy-related research and innovation (R&I) activities need to be developed, focused on the application of innovative technologies in line with the resources present in the Kolubara region.

The need to form a specialised multidisciplinary institute for national energy matters was proposed.

6.8 Donetsk Region, Ukraine

All participants in the EDP agreed that for many decades the main energy sources in Ukraine have been the extraction of non-renewable natural resources, such as natural gas, coal, etc. However, due to changes in the environmental situation, global trends, price conditions, the introduction of new technologies, the share of non-renewable resources in the energy balance of Ukraine is declining. This is especially true for fossil fuels such as coal. To overcome the negative trends and problems of socio-economic development of coal regions, the transformation of the coal industry of Donetsk region must be accompanied by "Smart Transformation" of territories.

Due to the active development of new technologies, alternative energy sources, changes in the energy market, as well as insufficiently effective formation and implementation of state policy in the field of support for the coal industry in previous years in the relevant areas, there has been a tense situation, in particular in the economic, social, housing and environmental spheres, which may deteriorate due to the beginning of reforms in the country's energy sector, namely the coal industry.

The main priorities identified by stakeholders for smart transformation of Donetsk region are:

- broad public dialogue - open discussion by representatives of State executive bodies and local governments of all problematic issues that need to be addressed, with representatives of trade unions, their associations, employers' organisations, scientific, expert and business environment;
- graduality and phasing out - no shock measures and at the same time no dismissal of employees of coal enterprises without the simultaneous creation of new jobs or social guarantees;
- synchronicity of different processes - attracting new investors, creating new jobs, retraining of employees, etc. to be carried out comprehensively and with the prior consent of central and local executive bodies, local governments and entrepreneurs;
- State budget support - part of the costs associated with the transformation of the coal regions of Ukraine should be borne by the state;
- environmental sustainability - the introduction of a set of environmental measures that will ensure the ecologically balanced functioning of coal regions and allow citizens to effectively exercise their rights to environmental safety;
- long-term - the corresponding qualitative changes in the structure of the regional economy through its transformation will last at least until 2030.

Specifically relating to mechanical engineering, the following priority areas were identified:

- 1) Production of equipment for the implementation of the full cycle of waste management (reloading stations, waste sorting stations, waste processing plants, plastic, glass processing plants, etc.);
- 2) Creation of an industrial machine-building technopark with integration of innovative, economic, investment, logistic and production processes of small and medium business enterprises of Donetsk region with involvement of educational and scientific institutions, investors and authorities in these processes;
- 3) Production of components and consumable parts for machines and mechanisms used for construction and repair of roads;
- 4) Production of equipment necessary for the development of the ceramic production industry, with a high component of automation of technological processes through the involvement of IT enterprises;
- 5) Application of autonomous power supply systems with hybrid alternative sources and hybrid energy storage devices using Smart technologies;
- 6) The use of belt conveyors with variable length of transportation in the creation of competitive machines;
- 7) The use of tower cranes equipped with a bucket elevator and concrete distribution boom in the creation of high-performance, energy-saving and reliable equipment for transporting concrete during the construction of high-rise buildings.

6.9 Wales, United Kingdom

Stakeholders characterised Wales as undergoing a *dual transition* – an incomplete long-term socio-economic transition from coal mining, and the current energy transition to renewables. Both have a profound territorial dimension. The socio-economic transition from coal has lacked (and still lacks) a long-term spatially focused policy framework, with potentially damaging implications for net zero strategies. A transition to sustainable energy in Wales faces significant infrastructure and technological barriers. A major shift in policy focus is needed to address the problems of governance, unequal access and societal involvement. Despite the challenges, Wales has important strengths – research expertise, the industrial bases, internal and external linkages, and collaborative networks. Interviewee's visions highlight the need for political leadership and collective effort in the just transition. Recognising the mistakes of the past is necessary to seize present and future opportunities.

Stakeholders identified three main areas in which new ideas and priorities should be developed: the political, regulatory and financial incentive frameworks; infrastructural and sectoral investments; and labour market, skills and community support. Within these, it is possible to identify priority areas, or areas of need, as well as areas of opportunity.

Overall, the vision-oriented topics and ideas strongly emphasise a place-based approach. Stakeholders underlined the importance of consulting the community regarding its own transition needs, which is paramount to create more useful and efficient strategies, and vibrant communities across Wales. In particular, the specific circumstances in the former coal mining regions in South Wales need to be understood. This enables the Valleys to be recognised as an economically viable and/or productive area, alongside the cities and towns that follow the major transport corridors in South Wales. In the case of North Wales, stakeholders view the area as a potential renewable energy powerhouse, and as a leading region in a net-zero or carbon negative economies.

7 Conclusion

The TRACER project adopted a Smart Specialisation approach – and specifically the Entrepreneurial Discovery process - in engaging stakeholders in nine target coal-intensive and formerly coal-intensive regions. This process aimed to support the regions in their transition towards sustainable energy systems, by contributing to the formulation of a vision and priorities for energy transition. An extensive range of consultation and engagement activity has been undertaken during the last two years, across a broad range of stakeholders. During this period several significant challenges arose. These included the onset of the COVID-19 pandemic, with implications for how stakeholder consultation took place, and the advent of new sources of financial support and technical assistance for coal regions in transition. These frequently involved parallel processes of stakeholder consultation and had implications for how stakeholder engagement should take place, to harness cooperation and consultation, rather than risk confusion, overlap or consultation fatigue. The work took place against a background of a set of coal regions (and former coal regions) with very different sets of starting points and trajectories in terms of their transition out of coal. Overall, the flexible approaches offered by Smart Specialisation allowed the regional research teams to adapt to the changing circumstances.

A number of common messages on the use of Smart Specialisation approaches and their role in transition in former coal regions emerged from case studies which were conducted for earlier TRACER deliverables. These included:

- Transition is a long-term process and often already ongoing in the form of labour market changes and economic restructuring programmes i.e. falling employment and profitability has already been underway for half a century in some coal regions, so that action on climate change is simply “tipping them over the edge”.
- Cooperation, coordination and broad stakeholder participation have been of particular importance in the design and implementation of transition strategies.
- Investment in education, training, technological innovation and the knowledge economy has been key to economic renewal and diversification into new future-oriented sectors in all the regions.
- A range of other interventions have also supported transition, notably investment in physical infrastructure, environmental and landscape renewal, and support for businesses, particularly SMEs.
- National/regional State authorities have played vital roles in ensuring strategic continuity and in providing an overarching framework for implementing strategies, combined with regional / local flexibility.
- An important component of economic diversification policies and restructuring programmes has been the preservation of industrial and mining history.
- Cross-border cooperation with stakeholders in neighbouring EU Member States has contributed to strategies and economic regeneration.

These messages are also coherent with the findings in the TRACER target regions. TRACER has provided a platform for under-represented stakeholders and a valuable communication channel, especially in those regions where multiple strategy development processes (with associated stakeholder consultations) are taking place at the same time. The complex and multi-disciplinary nature of the regional problem has been highlighted – where the actions needed to address the prioritised issues have (*inter alia*) social, technological, R&I, employment, economic and environmental dimensions. Regional visions and priorities relating to energy transition have been developed based on stakeholders’ views, and these have been carried forward into TRACER Work Package 6. They have also informed wider regional strategy development e.g. for the Just Transition Fund. However, wider developments since the consultation work was undertaken (such as the war in Ukraine) may have had a profound impact on stakeholders’ visions and priorities for regional energy transition in the intervening period.

Key lessons identified so far through stakeholders' engagement under the TRACER stakeholder activities include the following:

1. **R&D (R&I) activities and workforce re-qualification needs to support the energy future of the region, and thus require constant enhancement.** The significant technological and research infrastructure and highly trained technical staff are important assets in the transition to "green energy" (Western Macedonia, Jiu Valley, Kolubara). Furthermore, it is necessary to come to an agreement on the need for innovation, business synergies and the circular economy. These may help with funding e.g., attracting foreign investments, where a well-developed R&D sector is seen as a key regional strength. Institutional and innovation capacity should be considered here. As mentioned in Section 2.4, this can be a significant hindrance for less developed and peripheral regions that do not benefit from the infrastructure, skilled workforce, and institutional thickness or dynamics necessary for R&D&I activities to thrive.
2. **It is essential to develop a coherent vision for the region's specialisation and its role in the broader context.** This requires planning over the long term rather than corrective measures. Most of the regional teams reported that their target regions have already undertaken certain steps to define development strategies, including:
 - energy fields (e.g., in Bulgaria: large-scale solar PV, possibly later complemented by energy storage and/or hydrogen, small-scale projects - energy efficiency & RES in buildings, and replacement of some of the coal-fired capacities by combined-cycle gas turbines)
 - using green energy as a leverage for regional tourism development (North West Bohemia, Czech Republic)
 - scale of future energy production (as in Lusatia – where it already is and will continue to be an export region for energy)
 - developing shared view on need for collective effort at all levels to seize areas of opportunity (e.g., digitalization, reskilling in Wales),
 - adaptation to domestic and international frameworks, including climate change mitigation (as observed in Poland, Romania, Serbia, and Ukraine).
3. **Awareness of politically sensitive topics plays an important role.** As the Lusatian example shows, some stakeholders were hesitant to express their position during meetings, due to the specificity of the topic. It worked better for them to have an in-depth conversation at their own office or through e-mail. For several target regions (Western Macedonia, Upper Silesia, Donetsk) the main concern of both the involved stakeholders and of the local community remains the replenishment of the current jobs related to lignite/coal activities. Social issues are extremely important: energy transformation must not deteriorate the living standards of local populations, and many people still see coal as a main energy source (Upper Silesia, Donetsk).
4. **The process should be as interactive as possible and not just informative.** In order to build consensus, it is worth proceeding with a series of meetings to build relationships among stakeholders, especially in places where cooperation is not established yet at a satisfactory level. Also, the discussion should be stimulated

where possible to encourage progress and not just an exchange of views. As the Czech research team reported: *it is necessary to maximise knowledge exchange and optimise the cooperation between different stakeholders' groups, researchers and practitioners in particular.*

5. **The mobilisation toll on stakeholders needs to be considered while planning further activities.** Consultation fatigue is real, and stakeholder engagement should be scheduled carefully, understanding their available time-capacity. It is important to keep in mind that stakeholders may already have many obligatory meetings related to energy transition, they may also be involved in other consultations or they may not have the time to attend every upcoming event.

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