DUST | Democratising jUst Sustainability Transitions

Deliverable 2.3: Actor-Process-Event Scheme: Mappings of processes and actor networks in multi-level just sustainability transition policies

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Abbreviation list

Term	Description
APES	Actor-Process-Event-Scheme
BLKG	Federal-State Coordination Committee
D	Deliverable
DUST	Democratising Just Sustainability Transitions
EC	European Commission
EU	European Union
JTF	Just Transition Fund
JTM	Just Transition Mechanism
MLG	Multi-level governance setting
NGO(s)	Non-Governmental Organisations
NJTP	National Just Transition Plan
NPG	National Program Groningen
PNA	Policy network analysis
PwC	PricewaterhouseCoopers
RUS 2030	Regional Development Strategy for Norrbotten 2030
StStG	Structural Reinforcement Act for Coal Regions
TJTP(s)	Territorial Just Transition Plan(s)
WRL	Wirtschaftsregion Lausitz GmbH
WPS	Work package(s)
ZRR	Zukunftsagentur Rheinisches Revier

Executive Summary

D2.3, titled "Actor-Process-Event Scheme: Mapping Processes and Actor Networks in Multi-Level Just Sustainability Transition Policies," aims to assess stakeholder engagement in the development and implementation of place-based just sustainability transition policies in industrial EU regions.

Building upon the theoretical and methodological frameworks outlined in DUST Deliverable (D) 1.1 and 1.2, the Actor-Process-Event Scheme (APES) is integrated into the context of a multi-case study analysis conducted using a combination of quantitative and qualitative research methods in work packages (WPs) 2 and 3. These two WPs working in tandem focus on two key aspects: (1) examining participatory and deliberative processes employed in significant place-based policy initiatives and (2) assessing the depth and quality of participation across these processes and the factors that explain the variations.

In this report, the tried and tested software tool 'APES' is utilized for tracking and mapping stakeholder engagement over time in specific policy-related events. Within the scope of DUST WP2, APES is thus applied to facilitate a comprehensive examination of participatory dynamics within sustainability policies. This approach provides detailed insights into the breadth and depth of the participation of various actors throughout different stages of the policy-making process and within multilevel governance settings.

By utilizing APES to analyse seven key policy measures in EU regions heavily impacted by energy transition commitments, we have uncovered noteworthy differences in stakeholder engagement approaches across regions. Each case study reveals distinct features related to governance levels and the extent and diversity of stakeholder participation, all of which are assumed to be influenced by the prevailing political and administrative cultures, as well as the specific political and socio-economic context of each region.

These findings contribute to a better understanding of the depth and extent of stakeholder involvement in the formulation and execution of sustainability policies, pinpointing effective practices and underscoring opportunities for enhancing inclusive participatory approaches. By shedding initial light on the engagement of community-centred stakeholders in seven distinct industrial regions, this analysis lays the foundation for more in-depth investigations aimed at identifying the determinants of successful citizen involvement in sustainability transitions, particularly for least engaged communities.

Collectively, these case study research analyses, including the present APES examination, can provide guidance for future policy development and implementation efforts that extend beyond the immediate context, offering a blueprint for integrating participatory approaches into sustainability policymaking on a broader scale.

1. Introduction

The core objective of the project 'Democratising Just Sustainability Transitions' (DUST) is to improve our understanding of how territorial responses to just sustainability transitions can be democratised to maximise citizen participation and increase trust in democratic governance. It seeks to enhance our understanding of how policy tools can facilitate the anticipation, planning, and execution of fair sustainability changes at local and regional levels within varying institutional settings. Central to this mission is fostering active and inclusive engagement of citizens and communities, especially those marginalized in society. To achieve this, the DUST project relies on a methodological framework called the APES to analyse the scale, scope, and form of stakeholders' participation in deliberative and representative forms of democratic decision-making in place-based approaches to just sustainability transitions.

Within the DUST Project, WP2 'Measuring the democratic quality of citizen participation in place-based policies for just sustainability transitions' is specifically dedicated to assessing the quality of citizen participation in place-based policies for just sustainability transitions across multiple case studies from different regional institutional contexts across the European Union (EU). This part of the project focuses on examining the depth and intensity of participation in the formulation and implementation of sustainability transition policies within a multi-level governance setting (MLG).

To tackle this, the project utilizes a blend of diverse quantitative and qualitative methodologies outlined in detail in DUST Deliverable 1.2. Within WP2's scope, three key methodological frameworks work in tandem, reinforcing each other. Firstly, the STEP (Stakeholder Engagement and Participation in Policy-Making Processes) index serves as a tool to assess citizen participation performance in just transition policies across eight distinct case study regions.

Secondly, a population survey is conducted across five case study countries to gauge citizens' perceptions, expectations, and capacity to engage in policy formulation and execution concerning just transitions. Lastly, APES aims to appraise the inclusivity of participation throughout the policy cycle. The policy analyses developed within WP2 will, in a later stage, be synthesized in task 2.4, providing guidance for WP3 on opportunities for promoting active subsidiarity and on factors that matter for the participation of marginalised groups.

APES is a tried and tested software tool for tracing and mapping participation of various actors in the policy-related events over time (Hirschi et al., 2005; Serdült et al., 2007; Vögeli et al., 2006; Widmer et al., 2008). As such, APES constitutes a key instrument

within the DUST project, applied to comprehensively analyse the intricate dynamics of stakeholders' participation within policy processes for just sustainability transitions.

APES operates as a multifaceted tool, amalgamating three fundamental components: actors, processes, and events. The tool meticulously traces and delineates the involvement of diverse stakeholders (actors) at different stages of policy formulation and implementation (processes) across various participatory events (provision of information, basic consultation, dialogue, engagement, partnership).

By charting the interactions, roles, and levels of influence among these actors throughout the policymaking continuum, APES aims to offer granular insights into the depth, breadth, and inclusivity of citizen engagement strategies. This instrument serves as a lens to decipher the complexities and nuances inherent in participatory networks, enabling a robust evaluation of democratic quality and the democratization of sustainability transitions.

The report is structured as follows. The next section (section 2) begins with an overview of the current iteration of the APES software application, detailing its functionalities and capabilities in tracing and analysing participation networks.

Subsequently (section 3), the report looks into the conceptualization and implementation of APES within the broader framework of the DUST project. Herein, the report explores the methodological underpinnings and theoretical foundations that underlie this instrument's design and deployment.

Following this foundational exploration, in section 4, the report outlines the application of APES across diverse regional individual case studies. It scrutinizes the depth and breadth of citizen participation within place-based policies for sustainability transitions in different institutional contexts across Europe. In particular, it highlights the intricacies of participation networks, elucidating the varied approaches, strengths, and potential areas for enhancement in participatory strategies.

Then, the report ventures into a comparative analysis (section 5), both across countries and within countries. This comparative assessment unravelling similarities and differences among the examined regions serves as pivotal input into D2.4 and WP3. By juxtaposing findings from diverse case studies, the report seeks to distil the underlying trends, identify best practices, and discern opportunities for more inclusive, comprehensive, and effective participatory processes within sustainability transitions across varied EU regions.

Finally, the report closes with an overview of the main findings from the application of APES and their implications.

2. APES in essence

This section provides an overview of the current version of the APES software application, exposing its primary objectives as well as its main features. This tool aims to provide practical support in the systematic assessment of both the intensity and comprehensiveness of public engagement in the context of just transition policies within specific European regions, spanning across different levels of government and stages of the policy cycle.

2.1. Introduction to APES

As part of the DUST's WP2 and Task 2.3, the intensity of partnership agreements and comprehensiveness of public participation is measured using APES. This established analytical tool allows us to unfold the structural configuration of policy network across different political processes (Serdült et al., 2007). As such, this framework is especially valuable for drawing comparative insights into the democratic quality of policy processes (Vögeli et al., 2006).

2.1.1. Background and purpose of APES

APES is used within DUST to trace and map the structure of a decision-making process. Its primary objective is to understand, measure, and assess the involvement of various actors at distinct stages of the policy cycle in place-based policies for sustainability transitions.

The core principle of APES rests on the understanding that political processes unfold through a series of interconnected events, involving a diverse array of organizations at different decisional levels, in various sectors and policy fields (Hirschi et al, 2005). In contrast to other facets of research in DUST, which are primarily interested in communities and citizens participation, in APES we focused on stakeholder engagement in the sense of "any interested and/or affected party, including institutions and organisations, whether governmental or non-governmental, from civil society, academia, the media, or the private sector" (OECD, 2022, p. 15)

These stakeholders actively seek to influence policymaking, thereby forming intricate policy networks. Analysing these networks substantially enriches our comprehension of the participatory dynamics evident across various stages of the policy process. Following this reasoning, a comprehensive mapping of the involvement of actors in these different events can serve as a good indicator for empirically grasping and operationalizing the structure of policy networks (Serdült et al., 2007). Consequently, this method sheds valuable light on the depth, breadth, and inclusivity of stakeholder engagement strategies employed within specific policy procedures.

Through the meticulous documentation of case studies as well as detailed descriptions of political events, APES hence unravels the underlying processes and actor networks at play in policy formulation and implementation. In this vein, initially narrative-rich and descriptive case studies are transformed into a so-called APES structure and systematizing the empirical information regarding policymaking processes (Serdült et al., 2023). As a result, APES serves as a tool to organize and delineate this information in a structured format, bringing further comparative insights into policy network analyses (PNA).

The systematic structuring of empirical information through APES illuminates the participatory dynamics and networks at various policy stages, aiding in understanding the complex interplay among stakeholders in the policymaking realm. In the context of DUST project, APES offers valuable insights into how well actors or whole actor groups are integrated into just transition policies. Conclusions drawn from APES regarding stakeholder composition and participation intensity, combined with WP2's other quantitative research outputs derived from the STEP index and the citizen survey, will be further expanded upon during WP3's face-to-face research. This mix of diverse quantitative and qualitative methodological approaches aims to comprehensively explore the topic, capturing both the broader overview and the detailed interplay of factors influencing citizen participation in just transition policies within the multi-level context of the EU.

2.1.2. Objectives of APES

APES represents a methodological framework designed to dissect and comprehend the intricacies of participatory dynamics within policy-making realms. Its primary objectives revolve around illuminating who, when and to what extent they are involved in various stages of political processes. In the pursuit of this objective, this methodology significantly contributes a diverse set of goals, as outlined below.

Analysing Stakeholder participation

APES aims to systematically structure empirical information to shed light on the participatory dynamics and networks prevalent in different phases of policymaking. By mapping out the interactions among stakeholders, it offers insights into how various actors engage throughout these processes. It not only identifies the composition of stakeholder groups but also evaluates the depth and breadth of their engagement, providing a comprehensive view of their roles and contributions.

Providing comparative insights

Through its structured analytical approach, APES facilitates comparative assessments across different contexts or case studies. This allows for the identification of commonalities, discrepancies, and best practices in stakeholder engagement within diverse policy landscapes.

Enhancing Policy Evaluation

Illuminating the intricate roles and interactions of diverse social groups throughout different stages of the policy cycle, APES lays the groundwork for informed, evidence-based decision-making practices. Its insights aid in evaluating the inclusivity, effectiveness, and democratic quality of policy processes, guiding potential improvements or refinements.

In summary, APES serves as a versatile tool designed to decode the complex web of interactions among stakeholders in policy-making processes. It aims to offer comprehensive insights into participatory dynamics, stakeholder integration, and the intensity of engagement, thereby enriching our understanding of the quality democracy.

2.2. Components of APES

In practical terms, APES operates by extracting detailed information about the participation of actors within decision-making events and the subsequent processes linking these events. This process enables the transformation of a "thick" description of a policy process as is generally found in case studies (Yin, 2012), into an actor-process-event scheme delineating the interactive landscape among political stakeholders. The tool is concerned with three interconnected core dimensions: 1) Actors, encompassing the different groups involved; 2) Processes, encapsulating the specific stages of the policy cycle; and 3) Events, highlighting crucial occurrences or milestones taking place within the policy process.

2.2.1. The Actor Component

The actor dimension represents the y-axis of APES (see Figure 1 below). This first component focuses on identifying and categorizing the diverse array of stakeholders involved in the policy processes. This entails capturing the individuals, groups, organizations, or entities participating in specific events of the policy process and understanding their roles and influences within the network. Here emphasis is essentially placed on corporate actors characterized as organized expressions of collective interests (Coleman, 1974). These actors are typically categorized into various groups based on the governance levels at which they operate (e.g., international, federal, regional, municipal)[1] and their distinct organizational sphere of action (e.g., public sector, private sector, civil society). In APES, actors actively participating in a specific event of the policy process are represented by a black bullet (•), while those passively involved are denoted by a blue bullet (•). The individuals or groups in charge of specific events are indicated by a red triangle symbol (▲). All stakeholders participating in

[1]This essentially applies to public entities caught in multi-level governance settings, less so to other private and third sectors organizations (Duranton & Venables, 2018)

specific events are then linked (symbolized as: •—•). This representation method helps to visually identify and distinguish the degree and nature of actors' involvement in different events within the policy process.

2.2.2. The Process Component

The process component within APES takes roots in the concept of the 'policy cycle' for public policy analyses (Howlett et al., 1995). This theoretical framework breaks down the lifecycle of policies into a series of stages or phases (see Figure 1). In the existing literature these typically include the issue identification/agenda setting stage, policy formulation; decision-making; implementation; monitoring and evaluation (Cairney, 2019). APES deals with either the complete policy cycle or specific stages within this cycle to grasp the sequential flow of actions involved in the development and implementation of investigated political measures (Serdült et al., 2007). The policy cycle concept is thus a valuable analytical framework to dissect the intricate and multifaceted policy process into distinct and identifiable phases. Within the scope of APES, these stages are refined and aligned with empirically observable events, allowing for a tailored and comprehensive representation of the policy process.

2.2.3. The Event Component

The event dimension constitutes the x-axis of APES (see Figure 1), representing pivotal occurrences or milestones taking place within and around the observed policy process. These crucial events are carefully chosen based on specific characteristics inherent to the policy process under scrutiny as well as parameters of the political system (Vögeli et al., 2006). In this vein, APES typically heavily relies on detailed and comprehensive policy process descriptions frequently found in case studies, which serves as its primary source material (Serdült et al., 2023). Once the framework is delineated, events can be aggregated into phases and displayed on a timeline in the horizontal reference line.

APES is a software tool specifically designed to trace and map participation of various actors in the policy-related events over time (Widmer et al., 2008). The graphical interface automatically links the participating actors with the chronological sequence of events that occurred in the political process under scrutiny. Functioning within a two-dimensional space, APES organizes the involvement of corporate actors along the vertical axis while delineating the policy process into discrete stages and events along the horizontal timeline. Figure 1 below serves as an illustrative example showcasing the visualisation of participatory activities over time using the APES tool.

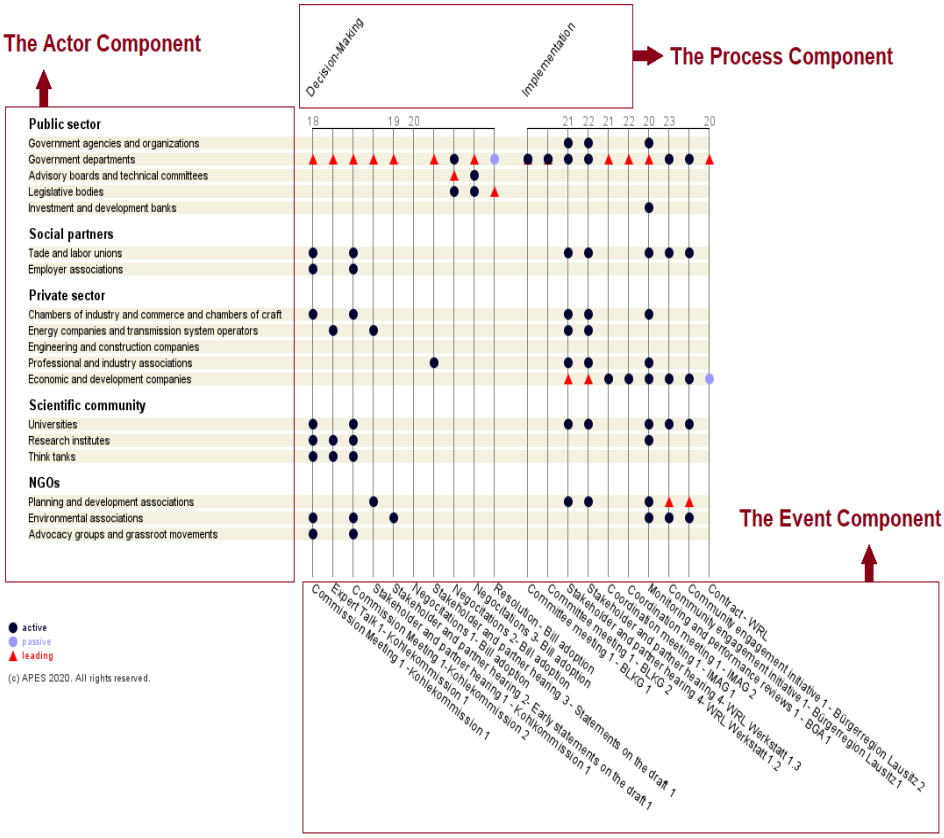


Figure 1. Illustrative example of APES visual representation

3. Design and execution of APES within DUST

This section delves into the conceptualization and implementation of APES within the larger framework of the DUST project. The APES software is here employed as a means of mapping, analysing, and comprehending the participatory processes and dynamics at work within the overarching scope of sustainability transitions in EU structurally weak regions.

3.1. Development and design of APES

Participation networks with metrics for the respective actor groups, phases, and events applicable across different case study contexts and multi-governance participation arenas were first constructed, tested, and refined for the selected multi-level policy processes. Here, the focus lies on outlining the developmental pathway and strategic design of APES as a two-dimensional framework encapsulating actors and events over time. This includes two key aspects: firstly, the classification of actor groups and their organizational distinctive features; and secondly, the identification of policy phases and the subsequent list of participatory events that took place therein.

3.1.1. Specification of the actor dimension

Within the actor dimension, a first crucial step consists in the identification and categorization of influential actors in the dynamics of policymaking. The Governance literature dedicated to unravelling the intricacies of decision-making and policy implementation, has acknowledged a diverse spectrum of key actors from various sectors - public, private, and civil society -, recognized for their substantial impact on the policy landscape (Ansell & Gash, 2008; Bevir, 2012). While it may vary depending on the level of government as well as the specific policy sector that is under discussion, the actor dimension typically includes five groups of stakeholders encompassing 1) Government organizations, 2) Social partners, 3) Market and Businesses, 4) Scientific organizations and 5) Non-Governmental Organisations (NGOs) and interest groups (Sekher et al., 2018). Drawing upon this initial classification, the actor component of APES underwent an iterative development aligned with results obtained from the case studies' desk research conducted in WP3. In this vein, APES first systematically delineates actor groups within a non-exhaustive list of influential corporate actors in sustainability transitions, categorized based on their sphere of operation and influence, defined as actor group 1 in APES. A detailed breakdown of these identified actor groups and their respective types is presented in Table 1 below.

Table 1. APES classification of relevant corporate actor in sustainability transitions

Actor Group 1	Actor Type
Public Sector	• Advisory boards and technical committees • Elected officials and political parties • Government agencies and organizations • Government departments • Investment and development banks • Legislative bodies • State-owned and public companies
Social Partners	• Employer associations • Trade and labour unions
Private Sector	• Chambers of industry and commerce and chambers of craft • Consulting and marketing companies • Economic and development companies • Energy companies and transmission system operators • Engineering and construction companies • Manufacturing companies • Mining companies and refineries • Professional and industry associations • Service Companies
Scientific community	• Research Institutes • Think Tanks • Universities
Civil society	• Advocacy groups and grassroots movements • Charities and community organizations • Civil rights and civic engagement associations • Consumer protection associations • Cultural associations • Environmental associations • Individual residents • Local interest groups and associations • Planning and development associations • Religious or faith-based organizations • Youth associations

As part of the EU Cohesion policy alongside other EU, national and local economic, social, and environmental measures, the specific case of just sustainability transitions investigated in DUST occurs within MLG settings. Consequently, key place-based policies for just sustainability transitions analysed within APES are necessarily marked by complex MLG dynamics featuring the participation of corporate actors operating at different policy levels (Moodie et al., 2022). The APES software tool should hence have been upgraded to allow for the assessment of participation in MLG contexts. In practice, this was supposed to translate into the addition of another actor group level indicating the political scale at which different stakeholders operate (defined as actor group 2 in

APES). Within the realm of just sustainability transitions, the actor hierarchy includes four distinct levels:

1. **The EU level:** This level involves actors and institutions operating at the supranational scale.
2. **The National or Federal level**: Actors at this level primarily engage in country-specific legislation, governance, and regulatory frameworks, tailored to the national context.
3. **The Regional level**: This level incorporates actors working within sub-national or regional governance structures.
4. **The Municipal Level**: Actors at this level focus on local governance, policy implementation, and decision-making processes within smaller community or municipal settings.

However, due to tight project deadlines, the technical updating of the APES software within the allocated time frame was unattainable. Consequently, to accommodate these MLG considerations, a secondary framework was developed and specifically focused at public sector organizations. This framework encompassed a spectrum, targeting: 1) EU institutions and elected representatives, 2) National government bodies, agencies, and elected representatives, 3) Regional government bodies, agencies and elected representatives, and 4) Municipal government bodies, agencies and elected representatives. Other stakeholders including social partners, private sector, scientific community, and civil society organizations are here classified separately as non-state actors which fall outside the scope of MLG processes[2]. This alternative framework served as a strategic adaptation to ensure comprehensive analysis despite the unavailability of the updated APES software within the project's timelines.

This delineation of actors into specific groups and types aims to establish a comprehensive framework for comprehending and analysing the varied range of stakeholders involved in sustainability transitions. While requiring punctual adjustments to suit the nuances of each policy process under scrutiny, it is designed to be applicable across various regional contexts and MLG arenas.

3.1.2. Specification of the time dimension

In conceptualizing the temporal dimension, the APES software traditionally categorizes time into two essential components: phase and event classifications. While the analytical dimension of DUST project distinguishes between various stages, including identification/agenda setting, policy formulation, decision-making, implementation, and monitoring, in practice, it can be challenging to clearly differentiate between these

[2]The MLG scheme is here not applied to non-state actors due to the absence of specific data regarding their levels of action; unlike public sector entities, the actions of non-state actors are less straightforward and more challenging to categorize within the conventional tiers of governance.

stages as they tend to be more fluid and can vary across different territories. To address this, the evaluative dimension combines the initial stages into policy planning (here referred to as the decision-making phase), followed by the policy implementation and monitoring phase.

The decision-making phase represents a critical juncture in the policy process where key choices and determinations are made. This phase encompasses a series of steps involving the identification of policy issues, formulation of potential solutions, and the evaluation of alternative courses of action. Stakeholders engage in discussions, negotiations, and deliberations to arrive at decisions that shape the direction of the policy. APES captures the dynamics of actor participation, events, and processes during this decision-making phase, shedding light on the influential actors and their roles in shaping policy directions.

Following the decision-making phase, the transition policy implementation phase takes centre stage. This stage involves translating policy decisions into tangible actions, programs, or initiatives. APES extends its scrutiny into this crucial implementation phase, mapping out the actors involved, the events unfolding, and the processes at play. It provides a comprehensive view of how policies are put into action, detailing the interactions between governmental bodies, non-governmental organizations, and other stakeholders.

Table 2. APES phase component framework for analysing stakeholder involvement in sustainability transition

Phases	Included Steps
Decision-Making	• Agenda-setting • Policy formulation • Policy adoption
Implementation	• Policy Implementation • Policy Evaluation • Support and/or Maintenance

In a second step, a comprehensive inventory of key events was compiled, drawing the detailed insights provided by DUST D 3.1 which identifies and assesses participatory processes across various just sustainability transition initiatives within case study regions. This compilation stems from participatory activities documented in regional case-study reports as part of Task 3.1. These events encompass participatory procedures unfolding in both the decision-making and implementation phases of policies aimed at just sustainability transitions. Building upon the typology of participatory practices according to depth outlined in D3.1, these events are then categorized into one of five types of participation (1) provision of information; (2) basic consultation; (3) dialogue; (4) engagement; (5) partnership.

The first level, ‘provision of information’, involves the government disseminating information to citizens and stakeholders. This one-way communication serves to inform and educate the involved parties about the policy under consideration. The second level, ‘basic consultation’, involves limited depth of participation with two-way but restricted interaction between government and stakeholders. The third level, ‘dialogue, entails a medium level of participation characterized by a two-way exchange involving dialogue between government and participants. The fourth level ‘engagement demonstrates a medium to high level of participation, fostering a two-way collaborative interaction between government and stakeholders. Finally, the highest level ‘Partnership’ signifies a high level of participation, facilitating multi-directional communication that acknowledges equal standing among all involved parties.

This event conceptualization strategy aims to create a framework adaptable to diverse governance contexts and various place-based policy measures. However, it is important to note that several participatory events may theoretically align with multiple engagement levels across decision-making and policy implementation phases. Events were hence categorized in APES based on the depth of participation it facilitates, using contextual insights acquired from WP 3 case studies. This is necessary to ensure an accurate assessment of each identified event's level of engagement. Following this reasoning, the detailed list of participatory events is as follows:

Decision-Making Phase Events:

- **Commission Meeting:** Classified as Basic Consultation to Dialogue because it involves discussions among commissioners and may include consultations with stakeholders, varying in depth from basic input provision to more interactive discussions (dialogue).

- **Committee Hearing:** Categorized as Dialogue as it specifically entails policymakers consulting stakeholders, experts, and the public on policy matters, emphasizing dialogue-based interactions.

- **Expert Talk:** Falls within Basic Consultation to Dialogue as it involves discussions and engagements between policymakers and experts, varying from basic information provision to more interactive dialogue.

- **Information Day:** Classified as Provision of Information as it is designed to disseminate specific policy information to the public without direct interactive elements.

- **Negotiations:** Classified as Engagement to Partnership due to the nature of discussions and interactions between parties aimed at reaching a consensus or

agreement on policies, varying from engagement to a higher level of partnership involvement.

- **Resolution:** Categorized as Basic Consultation as it represents a formal decision expressing the stance of a legislative body on a particular issue, often involving basic consultations but lacking extensive interactive elements

- **Stakeholder and Partner Hearing:** Placed within Dialogue to Engagement as it involves policymakers engaging stakeholders and partners to gather input on proposed policies, ranging from dialogue-based interactions to deeper engagement levels.

Table 3. APES decision-making phase events according to their depth of participation

Event type	Participation level
Commission Meeting	Basic consultation to Dialogue
Committee Hearing	Dialogue
Expert Talk	Basic Consultation to Dialogue
Information Day	Provision of Information
Negotiations	Engagement to Partnership
Resolution	Basic Consultation
Stakeholder and Partner Hearing	Dialogue to Engagement

Policy Implementation Phase Events:

- **Committee Hearing:** Classified as Dialogue as it involves stakeholders sharing policy-related information and engaging in discussions on policy matters.

- **Community Engagement Initiative:** Ranges from Dialogue to Engagement as it involves policymakers seeking input, feedback, and perspectives from targeted communities, varying from dialogue-based interactions to deeper engagement levels.

- **Compliance Checks and Audits:** Classified as Engagement to Partnership as it involves systematically reviewing policy practices to ensure compliance with established regulations, standards, or guidelines. This process may range from engagement-level interactions to forming partnerships for compliance.

- **Coordination Meeting:** Falls within Dialogue to Engagement as it entails stakeholders sharing policy-related updates and focusing coordinating efforts and aligning activities toward common objectives, involving varying levels of dialogue and engagement.

- **Information Day:** Classified as Provision of Information as it is centered around the dissemination of information, updates, and important details about the policy being implemented, lacking direct interactive elements.

- **Monitoring and Performance Review**: Classified as Dialogue to Engagement because it involves stakeholders' active participation in the systematic collection, analysis, and reporting of data related to policy implementation.

- **Resource Allocation:** Placed within Engagement to Partnership as it involves policymakers deciding on resource allocation for policy implementation, which may range from engagement to a higher level of partnership involvement.

- **Stakeholder and Partner Consultation:** Ranges from Dialogue to Engagement as it involves policymakers gathering stakeholder feedback and concerns regarding policy implementation, involving dialogue-based interactions to deeper engagement levels.

- **Technical Workshop/Assistance:** Falls within Basic Consultation to Dialogue as it provides guidance and expertise to implement policy, varying from basic consultation to more interactive dialogue.

Table 4.APES policy implementation phase events according to their depth of participation

Event type	Participation level
Committee Hearing	Dialogue
Community Engagement Initiative	Dialogue to Engagement
Compliance Checks and Audits	Engagement to Partnership
Coordination Meeting	Dialogue to Engagement
Information Day	Provision of Information
Monitoring and Performance Review	Dialogue to Engagement
Resource Allocation	Engagement, to Partnership
Stakeholder and Partner Consultation	Dialogue to Engagement
Technical Workshop/Assistance	Basic Consultation to Dialogue

The development and design of APES, encompassing the specification of both the actor and time dimensions, form a cohesive framework tailored to the intricacies of sustainability transitions across different place-based policies. These indicators not only capture the diversity of stakeholders involved but also provides a temporal lens to examine their participatory roles over the course of the policy cycle. Once the APES analytical framework has been established, it is applied to specific case study contexts and punctually refined to the particularities of multi-governance participation arenas in region-specific settings.

3.2. Implementation strategy

The APES software tool not only delivers analytical output for the process of event participation over time, but also allows us to generate visual representations of actor networks. This subsection delves into the strategic approach adopted for gathering pertinent data and subsequently analysing it to establish meaningful metrics for the comprehensiveness of participation and stakeholder engagement in just transition policy process. The forthcoming discussion delineates the systematic steps taken to collect and analyse data, providing a comprehensive understanding of the intricacies involved in implementing APES across diverse case study contexts and policy scenarios.

3.2.1. Case selection and data collection

Within the DUST project, WP2 and WP3 work in tandem on the multiple case study research (see DUST deliverable 1.2), generating complementary insights on the performance of citizen participation in place-based just sustainability transitions. APES thus builds on qualitative research approaches carried out within WP3 T3.1 and T3.2 to identify pertinent Just Transition policies across the eight European regions under investigation. DUST multiple case study research covers eight diverse case study areas classified as structurally weak European regions due to their strong dependence on energy-intensive industries, such as coal mining, gas extraction, cement, or steel. The selection of case study areas covers a diversity of European territories falling into five countries that are assessed differently in terms of the maturity of democratic institutions, from the well-rooted democracies in Western and Northern Europe (Germany, Sweden and the Netherlands), to the 'younger' democracies in the post-communist Eastern part of the continent (Bulgaria and Poland). The regions included in the DUST research are listed below (more details in DUST D1.2):

- Bełchatów Area of Transition (Poland);
- Gotland (Sweden);
- Groningen Province (The Netherlands);
- Katowice Coal Region (Poland);
- Lusatian Lignite District (Germany);
- Norrbotten (Sweden);
- Rhenish Lignite District (Germany);
- Stara Zagora (Bulgaria).

All eight case study regions are the locus of multiple policy interventions supporting place-based approaches to sustainability transitions. These include EU-led policies (JTF, Cohesion policy, and other EU-supported and innovation-related interventions), national regional policy (including programmes oriented at smart specialisation; innovation programmes; industrial programmes; rural development programmes; and programmes

that support social innovation initiatives), and spatial planning interventions oriented towards mitigating the impact of sustainability transitions (for instance dedicated city or regional spatial, transport and mobility plans and brownfield regeneration interventions).

Leaning on a preliminary identification of three to four policies to prioritize in each of the case study regions outlined in T3.1 within WP3 (more details in DUST 3.1), a single policy measure per case study was selected by academic partners for APES. This approach was adopted primarily due to time constraints and the need for cross-case comparability, ensuring that the analysis remains manageable and allows for meaningful comparisons across regions.

- **Data availability:** this criterion pertains to the accessibility and availability of information on events and participation of the actors therein.

- **Place-based approach:** this criterion pertains to the degree to which a policy measure aligns with the local or regional conditions of the area under study.

- **Comparability with other cases:** this criterion considers the extent to which the chosen case is comparable to other cases under investigation.

In accordance with this case selection approach, DUST D2.3 delved into one policy measure per case study region. The list of the eight APES selected place-based policy measures per region for just sustainability transitions is presented in Table 5 below.

Table 5. Overview of place-based policies per case study region investigated within the scope of APES

Region	Country	Selected policy
Bełchatów Area of Transition	Poland	Territorial Just Transition Plan of Łódzkie Voivodeship
Gotland	Sweden	Regional Energy and Climate Strategy
Groningen Province	The Netherlands	National Programme Groningen
Katowice Coal Region	Poland	Territorial Just Transition Plan of Silesia Voivodeship
Lusatian Lignite District	Germany	Structural Reinforcement Act for Coal Regions
Norrbotten	Sweden	Regional Development Strategy Norrbotten 2030
Rhenish Lignite District	Germany	Structural Reinforcement Act for Coal Regions

Regrettably, however, the case of Gotland could not be included in the present report due to insufficient data and limitations in gathering the required information within the allocated timeframe. For all other selected regional policy measures, comprehensive event participation data were systematically collected from publicly (sometimes obtained upon partner's request) available sources at the relevant levels of government.

As per our definition, a stakeholder is deemed involved in a particular event if at least one representative actively participates in the event under consideration (Vögeli et al., 2006). Subsequently, based on the depth and extent of their engagement determined through desk research, the nature of their participation was coded as either 'leading' (indicating a guiding or directing role), 'active' (denoting direct and influential engagement), or 'passive' (signifying observational or secondary involvement).

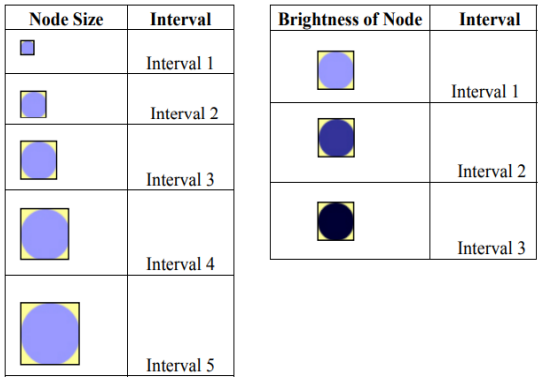
The APES iterative design and execution process laid the groundwork for a thorough exploration of participatory dynamics of just sustainability transitions in the targeted regions. The case selection and data collection strategy centred on data availability, a place-based approach, and comparability with other cases, ensured the relevance and richness of the chosen policies for examination.

3.2.2. APES metrics and data analysis approach

Drawing from diverse datasets encapsulated within the APES framework, the analysis spans actor identities, their roles, affiliations, event details, and the distinct phases of the transition process. The information is subsequently transformed into an actor-process-event scheme in which corporate actors interact by a) event participation and are connected with each other by b) procedural (institutional) linkages (Serdült et al., 2023, p. 6). The overarching objective of APES is to glean insights into the intensity, diversity, and comprehensiveness of actor engagement during the various phases of just transition initiatives. In the realm of APES, three main analytical dimensions merit particular attention in this discussion. These are:

- Breadth of participation;
- Actor-actor centralities;
- Density of the network.

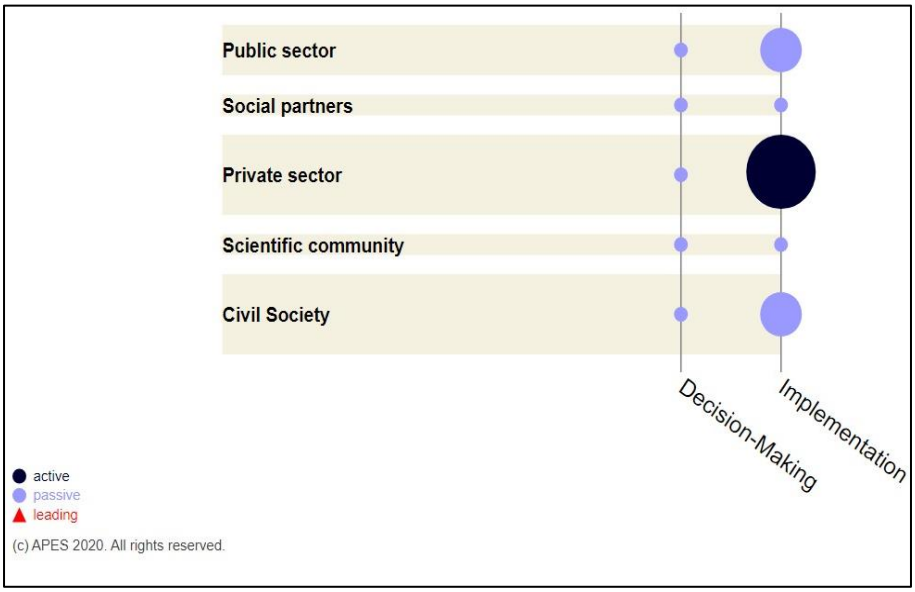
The first dimension computes and quantifies the participation per actor as well as per participation type throughout the entire policy process (see Figure 3). The breadth of participation is performed along two distinct metrics: quantitative participation (i.e sum of all relations) and qualitative participation (sum of active, passive and leading relations). In doing so, this dimension sheds light on both the extent and the nature of stakeholders' involvement in different events related to just sustainability transition policy. For quantitative participation, data is aggregated and categorized within a five-scale interval, denoted by five distinct node sizes (see Figure 2). The largest node symbolizes the highest scale, set as the key reference at 100%. Concurrently, in qualitative participation, all assessed data is organized within a three-scale interval, depicted by three distinctive degrees of brightness (see Figure 2). The darkest node signifies the peak of the scale, also set as the key reference at 100%.



Source: Serdült et al., 2023, p. 14.

Figure 2.Intervals-scales for quantitative participation (on the left) and qualitative participation (on the right)

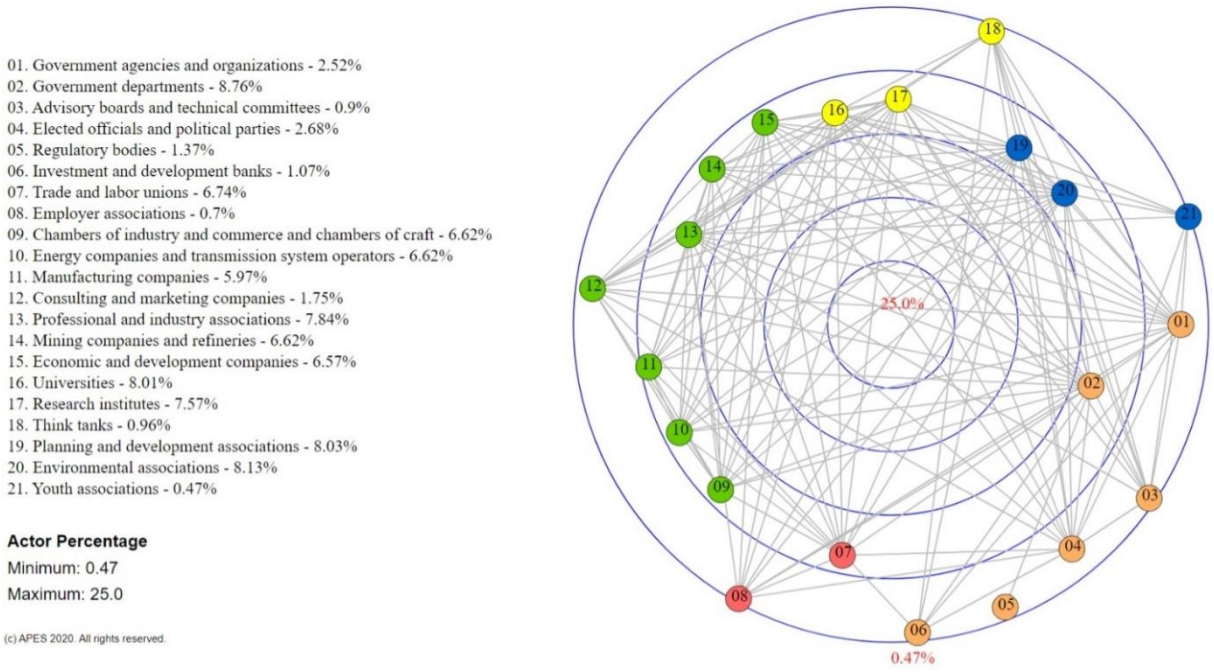
Through these metrics, conclusions on the status of each actor can be drawn. A heightened count and diverse array of corporate actors participating in various phases of the policy process signify a more open and inclusive policy framework (Vögeli et al., 2006, p. 9). Furthermore, active participation by societal actors in policy processes is posited to indicate a more robust influence, while limited or passive involvement suggests a diminished impact on policymaking. This aggregated scheme finally allows the identification and analysis of discerning discrepancies in both the depth and extent of involvement between the different types of actors, offering insights into the state of actors' participation within the realm of just sustainability transitions.



Source: APES for the Structural Reinforcement Act for Coal Regions in Lusatian Lignite District (StStG), Germany.

Figure 3.Illustrative example of the APES actor participation aggregated scheme

The second dimension employs eigenvector centrality to quantify and normalize the influence of each actor within the network. The subsequent visualization of actor networks based on centrality scores unveils key influencers and elucidates their roles in shaping the participatory landscape. Actor-actor centralities are portrayed through a sociogram, visualized as a target diagram (see Figure 4). In APES target diagrams, nodes are positioned based on actors' centrality measures. Each node is then placed on a distinct radius, where those with the highest centrality are closer to the centre, and those with lower centrality values are placed toward the outer edge of the diagram. Leaning on eigenvector centrality, a node is deemed central if it is directly connected to other central nodes (Serdült et al., 2023, p. 21). Commonly used in PNA, this metric reveals stakeholders who hold significant sway on policymaking and are connected to other influential entities. The assumption here is that the most central actors are also the most active ones, as those with high centrality scores are deemed the most integrated and, consequently, hold pivotal roles within the social network.



Source: APES for the Territorial Just Transition Plan of Stara Zagora District, Bulgaria.

Figure 4. Example of an APES target diagram visualising networks of participants in a given policy process

Finally, the overall density of policy networks is evaluated based on the APES actor-actor matrix. This matrix indicates the number of interactions or ties between actors within the defined policy network, with each cell summing up the count of connections between two actors. As indicated in the formula below, network density is calculated by dividing the actual number of existing connections present within the actor-actor matrix by the total possible connections considering all potential ties between actors.

$$Network\ Density = \frac{Actual\ connections}{Possible\ connections}$$

This metric provides insights into the cohesion of the entire policy network, showcasing the overall tightness or looseness of connections therein. Following this reasoning, a high density (closer to 1) indicates a closely-knit structure, suggesting a policy network marked by strong ties and tight interconnections among corporate actors. Conversely, lower density (closer to 0) implies fewer ties between actors, highlighting more fragmented or decentralized arrangements within the policy network.

These three indicators derived from APES collectively contribute to a nuanced understanding of participatory dynamics, highlighting not only the degree of involvement but also the structural characteristics of the policy network itself. Thus, for each selected policy measure outlined in Table 5, one APES dataset and graphical mapping is established and analysed. This data is further considered to assess the intensity, inclusiveness and comprehensiveness of stakeholder engagement strategies within the broader context of just sustainability transitions across all eight case study regions.

3.2.3. Limitations of APES

APES is a valuable tool in mapping the complex interactions of stakeholders within policy networks in the context of just sustainability transitions. However, it is not without its limitations, which must be taken into account when interpreting the results of such analyses.

Stakeholder-centric software tool

Firstly, APES primarily captures the dynamics between stakeholders who are directly involved in the policymaking process. While this provides a detailed understanding of how various entities like government bodies, private sector firms, and civil society organizations engage with one another, it inherently focuses less on the role of individual citizens. This emphasis on formal stakeholders means that the broader public's perspectives, particularly those of unaffiliated individuals, may be underrepresented. Consequently, the APES might overlook the nuanced influences that the general public exerts on policy through less formal means or grassroot movements.

Interaction-based software tool

Secondly, while APES is adept at illustrating the connections between actors, it does not explicitly reveal the nature of these interactions, especially conflicts. The scheme presents a snapshot of engagement levels and patterns of communication but falls short of capturing the complexities of policy negotiations, which often include disputes, disagreements, and competing interests. By not showcasing these contentious aspects, the analysis could present an overly harmonious view of the policy environment.

Data-reliant software tool

Lastly, the reliability of the APES analysis is contingent on the availability and quality of data. The depth and accuracy of the interaction mapping are dependent on the data sources, which can be incomplete or biased. If data on certain interactions or stakeholders is missing or not publicly available, the APES could provide an incomplete picture of the policy network, potentially leading to misinterpretations about the centrality and influence of certain actors.

The research methodology employed in the DUST project is structured to harness and integrate diverse methodological viewpoints. APES thus represents just one component of a broader methodological triangulation process. While APES provides valuable insights into stakeholder interaction dynamics, it does not fully capture the intricacies and intensity of participation in the development and execution of sustainability transition policies, especially in a multi-level governance context. To address this, findings from APES are incorporated into a wider case study research, utilizing a blend of quantitative and qualitative methodologies. This includes tools such as the STEP-index and the population survey as well as face-to-face research methods such as interviews and focus groups. These methods are particularly effective in uncovering the subtleties of actor-actor interactions and in capturing the viewpoints of individual citizens, with a special focus on least engaged communities.

4. Case studies utilizing APES

This section embarks on the empirical application of APES. Herein, APES takes centre stage as a practical and analytical tool employed to investigate, assess, and decode the intricate dynamics of participatory processes within distinct regional contexts across Europe. The focal point of this section revolves around the empirical utilization of APES within seven individual case studies[3]. Each case study encapsulates a specific policy initiative tailored toward fostering just sustainable transitions within diverse EU regions heavily reliant on coal. The choice to focus on one policy per case study was made due to time constraints and pragmatic reasons. Although the original plan was to compare Territorial Just Transition Plans (TJTPs) across all seven cases, this was not possible as some regions had not yet implemented those plans. Through the empirical lens of APES, this section endeavours to chart, analyse, and elucidate the multifaceted landscape of stakeholder engagement, offering a comprehensive depiction of participatory strategies and dynamics within each unique regional context. In this objective, the APES maximum centrality scores were normalized to a maximum of 25% for actor type assessments and 30% for MLG studies to facilitate better cross-case comparative analysis[4].

4.1. The Territorial Just Transition Plan in Stara Zagora (Bulgaria)

The TJTP is a crucial component in the broader framework of EU initiatives, specifically designed to address the socio-economic transformations required in regions heavily reliant on fossil fuels and carbon-intensive industries (Rösch & Epifanio, 2022). In the case of Stara Zagora District, this plan serves as a prerequisite for accessing the Just Transition Fund (JTF), a substantial financial mechanism within the EU aimed at supporting regions navigating the challenges of decarbonization (Trifonova et al, 2021).

Aligned with the macro goal of the European Green Deal, the TJTP is intricately linked to Regulation (EU) 2021/1056, establishing the JTF (European Parliament, 2021). The overarching goal of this fund is to mitigate the adverse effects of the climate transition by supporting the most affected territories and workers, fostering a balanced socio-economic transition. This includes not only a reduction in coal use but also a profound shift in the operational paradigms of industrialized nations.

[3]We originally intended to include eight cases within this section. It is however essential to acknowledge that the case study for Gotland will not be featured due to challenges in accessing the required data within the designated timeframe.

[4]The selected values for normalization were based on the highest centrality scores observed across all seven case studies, specifically, 23.46% for government departments and 27.25% for regional government bodies for Norrbotten County in the context of the RUS 2030.

Following the launch of the Just Transition Mechanism (JTM) by the EU in 2020, the TJTP drafting phase started in the country, focusing on three major coal-reliant regions: Kyustendil, Pernik, and Stara Zagora. As the largest coal district in Bulgaria, Stara Zagora District is thus a focal point for the development of the TJTP and stands as a crucial component of Bulgaria's broader commitment to a just transition.

Using APES, a comprehensive evaluation of the elaboration of the TJTP of Stara Zagora District is carried out in order to glean insights into the depth and comprehensiveness of participatory processes at play therein.

4.1.1. The Stara Zagora case

Located on the south-east region of Bulgaria, the Stara Zagora district has been traditionally associated with industries linked to fossil fuels, particularly coal mining (CSD, 2023). The Maritsa area within the Stara Zagora province indeed stands as a cornerstone, hosting the largest coal mining and coal-fired power plant area in the country and therefore playing a central role in shaping the district's identity. As these sectors undergo restructuring, the Stara Zagora District faces significant economic shifts and the transition away from carbon-based industries in this region is both complex and critical, requiring careful navigation to mitigate adverse effects on the local population.

The topic of a sustainability transition has gained prominence in the region in relation to EU policies and funding initiatives, such as the EU Green Deal, Recovery and Resilience Facility, and the JTM. Stara Zagora stands out as the region most significantly affected by this transition due to its hosting of four coal-fired thermal power plants and lignite mines. Despite having a relatively low unemployment rate (approximately 1.5%), Stara Zagora has emerged as facing the greatest potential job loss impact, with estimations suggesting around 35,000 jobs at risk due to the coal phase-out (CSD, 2023). Consequently, the issue of sustainability transition has become highly sensitive in the province, as well as in other coal mining regions, and remained largely unaddressed for an extended period.

The development of the TJTP in the Stara Zagora district started in December 2020 (Rösch & Epifanio, 2022). Overseen by the Ministry of Energy, the TJTP for Stara Zagora District receives technical assistance from external consultants, including PricewaterhouseCoopers (PwC). As mandated by Article 11 (3) of Regulation (EU) 2021/1056, the preparation and implementation of the TJTP for Stara Zagora involve a collaborative effort. This undertaking necessitates active engagement from a variety of stakeholders, encompassing regional, local, and urban public authorities.

The development team, composed of experts in energy, economics, and regional and municipal government bodies, worked together to formulate a plan tailored to address the unique challenges and opportunities present within the region. This multi-stakeholder engagement aims to ensure that the TJTP of Stara Zagora District is

developed in harmony with local decision-making entities and benefits from the insights of civil society actors. This inclusive approach is meant to contribute to a holistic comprehension of the social, economic, and cultural aspects of the just transition's impact.

Civil society organizations have played an active role in organizing participatory efforts related to the just transition topic (for more details, refer to DUST 3.1). However, the majority of political discussions and decisions concerning TJTPs have predominantly taken place at the national level. This has resulted in the prevailing belief that these initiatives do not receive sufficient political acknowledgment at all levels of governance, contributing to a somewhat negative sentiment toward the TJTP among part of the local population. This negative perception has in addition been widely imputed to social media propaganda campaigns and narratives portraying regional socio-economic decline and potential energy security losses in the event of a decision to close the state-owned Maritza East Energy Complex.

Challenges stemming from political uncertainties and complexities at the national level have significantly impacted the timeline, causing delays in the plan's finalization. As a result, the formal adoption by the central government only occurred on September 29, 2023, with provisions for the mines to continue operating until the year 2038. However, the plan still needed to be submitted to the European Commission (EC). As of October 2023, Bulgaria was therefore the only country that had not formally submitted its TJTP to the EC, leading to a partial loss of its just transition funding.

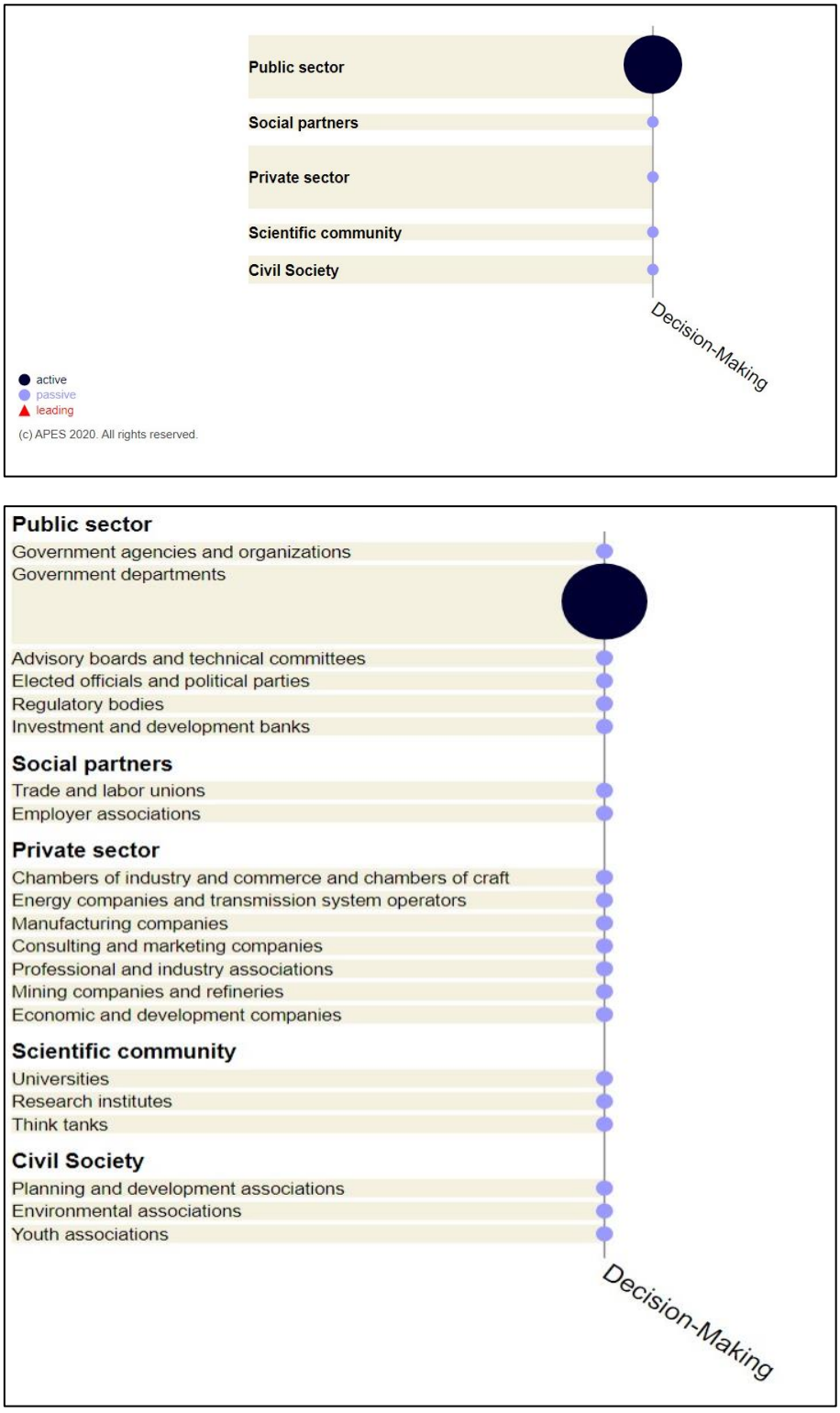
Given the central focus on participation within the discussions and debates surrounding the TJTP in the Stara Zagora district, it becomes imperative to scrutinize the actual depth and quality of engagement at play during the drafting phase of the plan. We therefore employ APES to critically evaluate the collaborative approach adopted during the development of the TJTP in the Stara Zagora region.

4.1.2. Outcomes and findings

As the elaboration of the TJTP of Stara Zagora District was just completed at the time of writing (November 2023), the current analysis exclusively covers the decision-making phase from December 2020 to October 2023. Through detailed analyses of actor participation, actor-actor centralities, and network density, insights into the dynamics of the participatory processes surrounding the development of the TJTP in the Stara Zagora district are presented, shedding light on the key stakeholders, their roles, and the overall structure of the policy network.

Figure 5 below displays the quantitative and qualitative participation of the various actor groups and types throughout the policy-making phase of the TJTP process. The exhaustive list of participants to the TJTP of Stara Zagora District can be found in Table 20 in the appendix section. In terms of participation, the public sector notably takes the

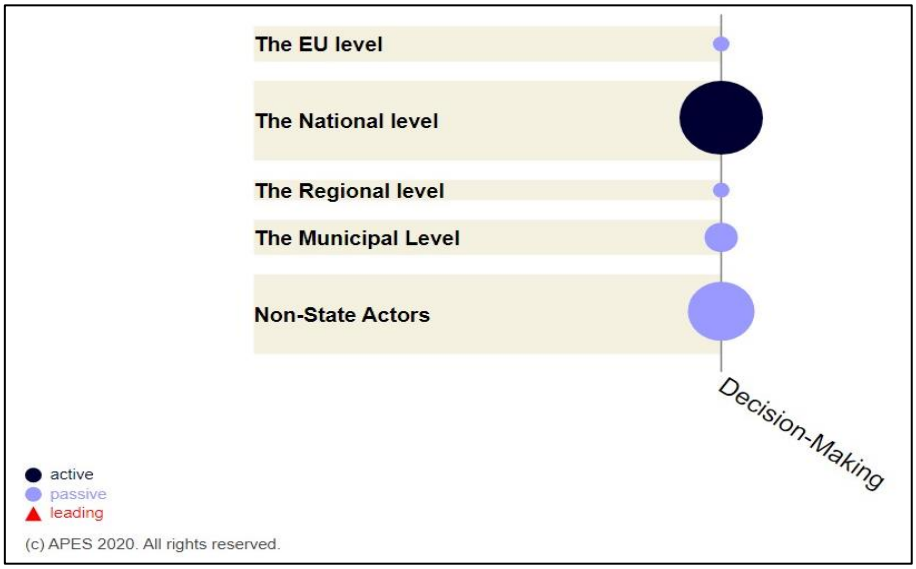
lead, emerging as the most substantial node both in terms of size and degree of brightness. This outcome suggests a predominant and active involvement of the public sector in the TJTP decision-making process.

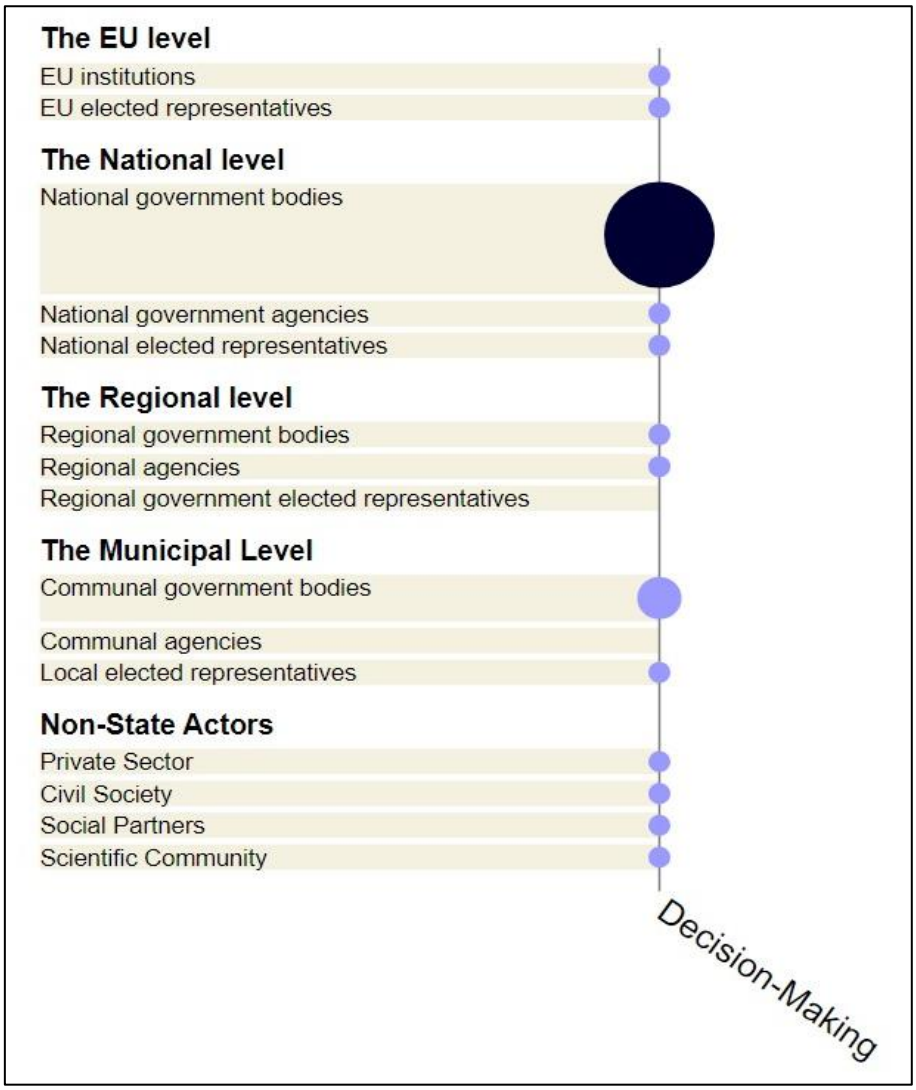


Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 5. The APES actor participation aggregated scheme by stakeholder type as part of the elaboration of the TJTP process

Having a more fine-grained look into the participation of different actor types within each organizational spheres of action, government departments at all levels of the political system hold a prominent and influential role in the formulation and adoption of the TJTP of Stara Zagora District. This result is not surprising to the extent that public sector organizations actively participated in more than 51% of the different participatory events (see Table 21 in the appendix section). Notably, government bodies alone accounted for 35% of this involvement, assuming leading roles in 17% of all participatory events that took place during the decision-making phase. That being said, the elaboration of the TJTP in Stara Zagora occurred within a multi-level governance setting, necessitating a detailed analysis of public sector entities' participation across various governmental levels.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 6. The APES actor participation aggregated scheme by governance level as part of the elaboration of the TJTP process

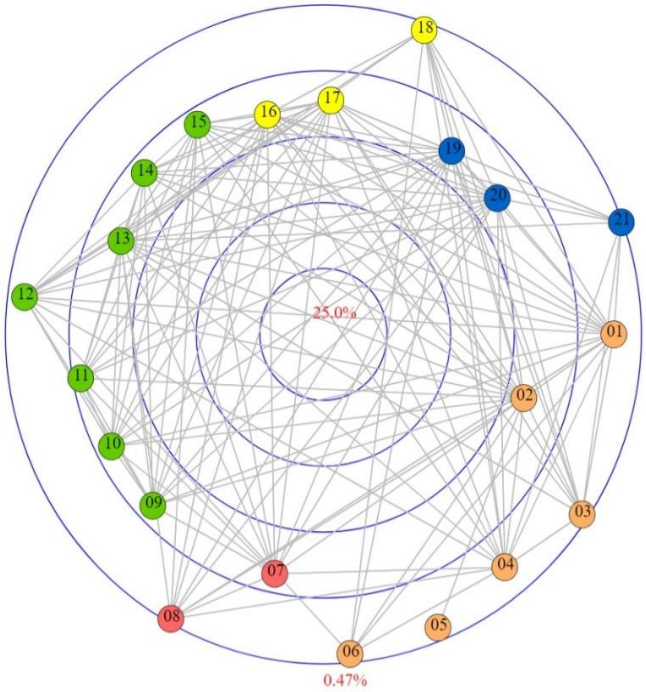
Figure 6 offers a visual analysis of stakeholder engagement across various levels of governance. The national level showcases the highest quantitative and qualitative involvement in TJTP participatory processes. This suggests that national entities, especially central government bodies (typically ministries) are extensively involved in the number of participatory activities and also engage at a deeper, more substantial level. Along non-state actors falling outside the MLG scheme, the municipal level shows substantial quantitative participation to the elaboration of the TJTP in the Stara Zagora district. This is especially true for municipal government bodies, typically municipalities of the Stara Zagora province.

This hierarchical depiction underscores the pronounced dominance of national government bodies, in both quantitative and qualitative dimensions of participation. This is not unexpected within the context of TJTPs. As a precondition to access the JTF, EU Member States are indeed required to produce a TJTP either as a single-wide country or several region-specific TJTPs. In Bulgaria, this task is typically exercised by the central government together with regional and municipal entities and representatives.

1.

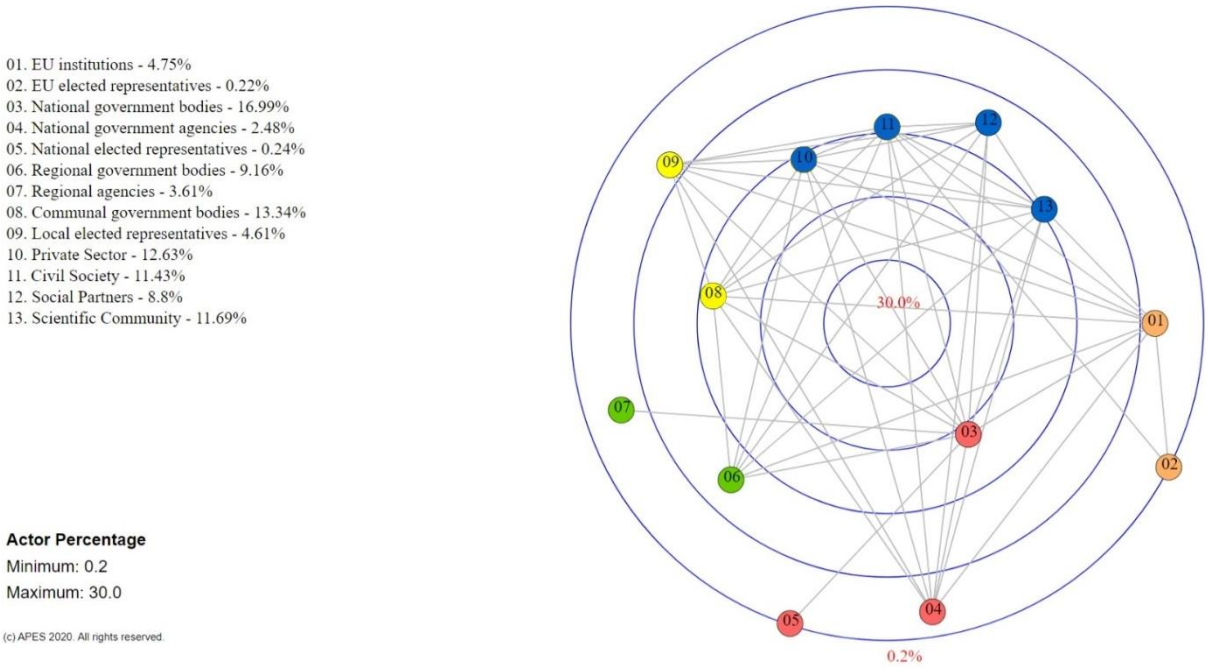
01. Government agencies and organizations - 2.52%
02. Government departments - 8.76%
03. Advisory boards and technical committees - 0.9%
04. Elected officials and political parties - 2.68%
05. Regulatory bodies - 1.37%
06. Investment and development banks - 1.07%
07. Trade and labor unions - 6.74%
08. Employer associations - 0.7%
09. Chambers of industry and commerce and chambers of craft - 6.62%
10. Energy companies and transmission system operators - 6.62%
11. Manufacturing companies - 5.97%
12. Consulting and marketing companies - 1.75%
13. Professional and industry associations - 7.84%
14. Mining companies and refineries - 6.62%
15. Economic and development companies - 6.57%
16. Universities - 8.01%
17. Research institutes - 7.57%
18. Think tanks - 0.96%
19. Planning and development associations - 8.03%
20. Environmental associations - 8.13%
21. Youth associations - 0.47%

Actor Percentage
Minimum: 0.47
Maximum: 25.0



Note. In the graphical representation above, the colour coding of the nodes is as follows: orange denotes public entities, red indicates social partners, green is used for private entities, yellow represents the scientific community, and blue signifies civil society. This colour coding is consistent and applies to all target diagrams presented throughout the report.

2.



Note. In the graphical representation above, the colour coding of the nodes is as follows: orange denotes EU organizations, red indicates national bodies, green is used for regional entities, yellow represents the municipal level, and blue signifies non-state actors. This colour coding is consistent and applies to all target diagrams presented throughout the report.

Figure 7. Networks of participants in the elaboration of the TJTP process by 1. Actor types and 2. Levels of governance

With the highest eigenvector centrality score of 16.99%, the role of national government bodies as key architects of regulatory frameworks and decision-makers is further highlighted by their central position in the policy networks reinforcing their role as influential actors in the policy landscape (see 2. Figure 7). Regional government bodies and to a greater degree municipalities with substantial centrality score of respectively 9.76 and 13.34%, are depicted as vital intermediaries, underscoring a multi-tiered governance landscape. Finally, EU institutions, although positioned with a lower centrality score of 4.75%, still exert some influence on decision-making, suggesting they provide backing to the Bulgarian government's efforts in the formulation and execution of their TJTP.

A closer examination of the TJTP network structure reveals a landscape where influence is shared broadly, instead of being held by a few central figures. When government departments emerge as the most influential actors with a relatively low centrality score of 8.76%, the close second held by universities at 8.1% indicates the lack of overwhelmingly dominant players in the policy network (see 1.Figure 7). This pattern suggests a network characterized by a high degree of actor-actor interactions, where numerous stakeholders play equally significant roles. This distribution of influence

among a diverse set of stakeholders underscores a relatively balanced power structure influencing the TJTP development.

Having a closer look at the involvement of non-state actors, the graph first reveals that the scientific community, particularly universities (8.01%) and research institutes (7.57%), command significant centrality, indicative of their influential role in the network[5]. This hints toward a rather expert-driven or "technocratic" approach to participation, prioritizing technical knowledge, specialized expertise and data-driven insights in decision-making. Such an approach it further emphasized by the notable absence of individual citizens, local associations, or community-based organizations prone to bring the local communities' perspective in the balance.

Although the third sector's perspective on ecological issues is likely articulated through the prominent role of environmental associations, which emerge as influential with a centrality score of 8.13%, there is a discernible focus on economic interests within the participatory process. This economic orientation is initially evidenced by the substantial centrality of planning and development associations, scoring 8.03%, and further by the collective presence of various industry-centric entities.

Within the private sector, the substantial influence of professional and industry associations, with a centrality score of 7.84%, as well as chambers of industry and commerce, energy companies, and mining companies and refineries, all sharing a centrality score of 6.62%, underscores their foreseeable significant role in shaping the economic and strategic direction of the TJTP in the Stara Zagora district.

Moreover, the influence of trade and labour unions, with a notable centrality score of 6.74%, suggests their critical function as key intermediaries within the network, plausibly shaping the dialogue surrounding labour policies to mitigate the negative impacts of just sustainability transition on jobs and the local economy.

Overall, the graph portrays a dynamic network where actors from the different societal spheres and at different administrative levels exhibit some level of influence on the elaboration of the TJTP. Examining the actor-actor matrix reveals an estimated network density of approximately 0.626[6], further reinforcing the idea of relatively interconnected policy network among these actors. This number indicates a tightly knit policy network

[5]In this section, the centrality scores are interpreted in relative terms, providing insight into the distribution of influence among actors within specific networks rather than serving as absolute indicators of influence or importance on a broader scale.

[6]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 278 while the number of possible connections among actors amounts 441 (21*21). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{278}{441} \approx 0.626$.

structure where most actors are directly connected. Table 6 below delves deeper into the standard actor-actor matrix, exploring linkages within but also between sectors and across different levels of governance.

Table 6. APES actor-actor weighted matrix in the context of the TJTP

	Public sector	Social partners	Private sector	Scientific community	Civil society
Public Sector	100	15	83	48	47
Social Partners	15	2	46	18	18
Private Sector	83	46	232	103	103
Scientific Community	48	18	103	26	45
Civil Society	47	18	103	45	26

	EU level	National level	Regional level	Municipal level
EU level	2	7	1	5
National level	7	8	26	38
Regional level	1	26	0	8
Municipal level	48	38	8	4

Notably, both the public and private sectors demonstrate robust internal ties, evident from their substantial connections within their respective groups. Furthermore, these sectors display considerable engagement with one another and with the scientific community and the few civil society entities involved, signifying a strong relationship among these four societal spheres. This pattern reiterates the conceivable tendency toward an engagement strategy that is economically focused and driven by expertise.

In terms of multi-level governance, substantial interactions between national and subnational tiers (regional and municipal entities) are further highlighted. If this indicates a recurring pattern of interactions between national and regional entities, it is important to note that the exact nature of this relationship, whether characterized by conflict or collaboration, requires further exploration during the face-to-face research phase of the DUST project in WP3.

Examining APES, several general conclusions can be drawn regarding the composition of stakeholder groups as well as the intensity of participation within the scope of the TJTP in the Stara Zagora district. The analysis first reveals the presence of a diverse array of stakeholders participating in the just transition planning, spanning across different levels of government (EU, national, regional, municipal) and organizational spheres of action (public, private and civil society sectors). This diversity suggests a comprehensive attempt to include various perspectives in the decision-making process, aligning with Article 11 (3) of Regulation (EU) 2021/1060.

APES unveils a policy network characterized by a rather high degree of interconnectivity, reflecting substantial interaction among the stakeholders involved. A closer examination of centrality scores illuminates the significant participation of experts and key players within the industry, pointing to a participatory approach that might lean heavily towards technical expertise and economic considerations.

While environmental organizations and planning and development associations do provide a voice for the third sector, APES also exposes a marked shortfall in the participation of individual citizens and local communities. Encouraging greater involvement from these grassroots actors could enrich the policy framework, making it more holistic and representative of a broader range of perspectives.

4.2. The Structural Reinforcement Act for Coal Regions in the Lusatian and Rhenish Lignite districts (Germany)

The Strukturstärkungsgesetz Kohlregionen, or Structural Reinforcement Act for Coal Regions (StStG) stands as the cornerstone of Germany's coal phase-out commitment. This legislation, vital for regions heavily dependent on coal mining, particularly in the Rhenish and Lusatian Lignite districts, serves as a foundation for navigating the challenges of Germany's coal phase-out.

Negotiated simultaneously to the European Green Deal, the StStG is pivotal in Germany's efforts towards a largely climate neutral future. The Act is instrumental in mitigating the socio-economic impacts of transitioning away from coal, providing targeted support to the most affected workers and territories. This includes financial support, fostering innovation, and initiatives aimed at stimulating alternative industries, infrastructure development, and job creation. Additionally, the legislation emphasizes bolstering social support structures, like retraining programs and educational opportunities, to offset the socio-economic repercussions of this transition.

The drafting of the StStG followed the recommendations of the specially created Commission for Growth, Structural Change, and Employment and involved collaboration with state governments (Länder) in coal-reliant regions, as well as key market and social actors. This collaborative approach was vital for addressing the specific needs and challenges of regions like North Rhine-Westphalia and Brandenburg, whose economies and political landscapes are significantly shaped by coal and steel industries.

Using APES for evaluation, a comprehensive analysis of the participatory processes in the development and implementation of the StStG is conducted. This analysis aims to provide detailed insights into the depth and comprehensiveness of the collaborative efforts the StStG process, particularly in the coal-dependent regions of Germany.

4.2.1. The Lusatian and Rhenish Lignite districts

The StStG sets an overall concept to support the regions most affected Germany's commitment to gradually reduce and eventually end the use of coal-powered energy by 2038. This is particularly relevant for North Rhine-Westphalia and Brandenburg, regions significantly affected due to their intensive coal production activities in the Rhenish and Lusatian Lignite districts. These districts' reliance on lignite mining and fossil fuels places them at the epicentre of the transition challenges and policy response. Consequently, the state governments of North Rhine-Westphalia and Brandenburg, alongside key regional industry players like RWE and LEAG, have largely contributed to shaping political debates in the strategic planning and execution of this transition-focused legislation.

The Lusatian Lignite district, located in eastern Germany, encompasses the areas of Lower Lusatia (in Brandenburg) and Upper Lusatia (in Saxony). It is historically known for its significant lignite deposits, which have been a primary source of energy production in the region for decades. The lignite mining industry has played a pivotal role in the local economy, providing employment, and contributing to energy generation. In 2019, the Lusatian district accounted for approximately 40% of Germany's total lignite output. During the same period, the lignite sector directly employed about 8,116 individuals, with the broader impact, including indirect employment, affecting around 13,000 people across both Brandenburg and Saxony (more details in DUST D3.1). Given the industry's deep-rooted significance, the transition away from lignite mining is a critical issue, necessitating socially responsible measures to offset potential job losses and economic downturns associated with the structural changes in the district.

The Rhenish Mining area, located in North Rhine-Westphalia in western Germany, is also known for its large-scale brown coal reserves and mining operations. This area ranking as Germany's largest lignite mining region hosts three major opencast mines, producing up to 65 million tons of lignite annually. However, since 2022, there has been a gradual reduction in lignite production. The lignite phase-out directly impacts about 8,000 workers, with an additional 15,000 indirectly affected. Furthermore, approximately 50,000 individuals are employed in energy-intensive industries in the region (see DUST 3.1 for further details). In response to these challenges, the national Commission for Growth, Structural Change, and Employment has highlighted the Rhenish Lignite district as being significantly affected by Germany's policy shift to phase out lignite mining and other fossil fuel sectors.

As core beneficiaries of the StStG, relevant stakeholders from both the Lusatian Lignite district and the Rhenish Mining area institutionalized governance structures connecting national, state and district level and established regional development agencies to ensure the effective implementation of the act and to tailor solutions that suited their

unique needs. The StStG indeed sought to empower affected regions to chart their own paths toward a more diversified and sustainable economy.

This process commenced in 2018 with extensive engagements and consultations with states' (Länder) governmental entities, district authorities, industry representatives, and relevant experts to understand the complexities and unique circumstances of each affected region. Insights gleaned from these consultations played a pivotal role in shaping the framework of the legislation, delineating its objectives, financial mechanisms, and provisions for fostering economic diversification and implementing social support programs.

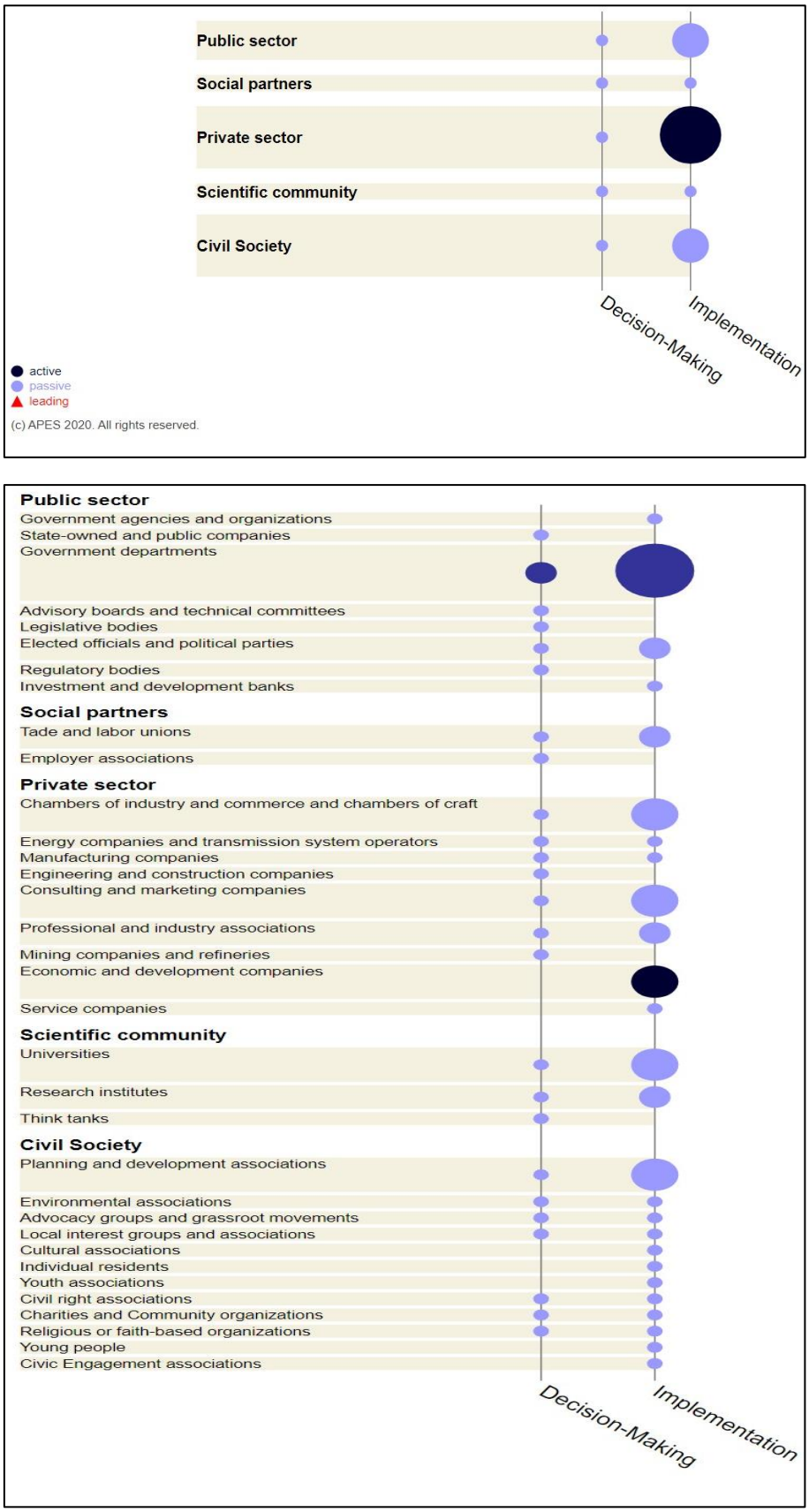
Following its approval in July 2020, implementation plans were formulated in collaboration with regional authorities, local governments, and relevant institutions. These plans detailed how funds would be allocated, which specific projects or initiatives would be supported, and how social support programs would be executed. Applying APES, we assess the depth and comprehensiveness of these engagement strategies in both the Lusatian and Rhenish Lignite districts.

4.2.2. Outcomes and findings

As the formal adoption of the StStG dates back to 2020, the current analysis covers both the decision-making and policy implementation phases from June 2018 to October 2023. Through an in-depth analysis of different actor's engagement levels and influential positions within the policy networks alongside an evaluation of overall network densities, we aim to offer comparative insights into the intricate participatory dynamics surrounding the StStG across two heavily coal-reliant German regions.

4.2.2.1. The Lusatian Lignite district

Figure 8 illustrates the engagement levels of distinct actor sectors—public, social partners, private, scientific community, and civil society—across the policymaking and policy implementation phases within the StStG process in the Lusatian Lignite district. The exhaustive list of participants can be found in Table 22 in the appendix section. At first glance, APES reveals a wide-ranging inclusion of diverse stakeholders at different stages of the StStG process, suggesting an extensive approach to stakeholder engagement within the policymaking landscape.

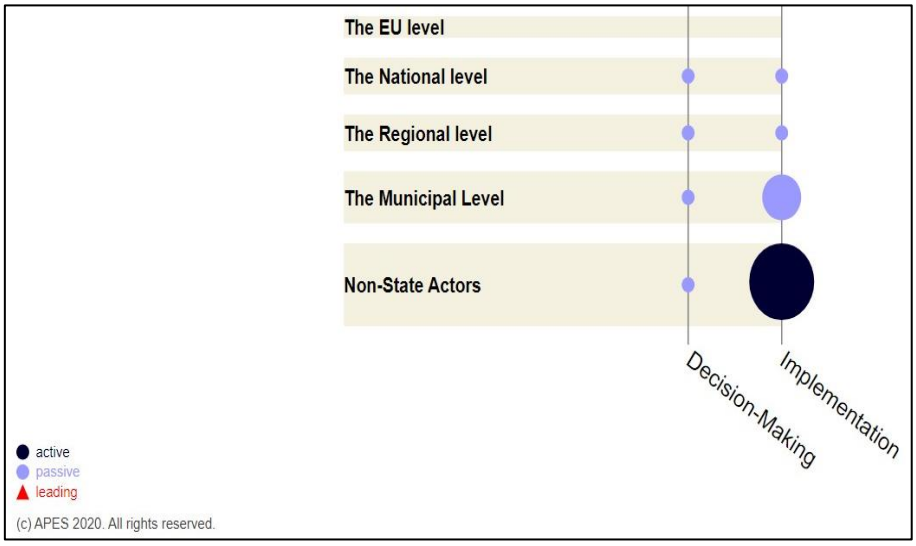


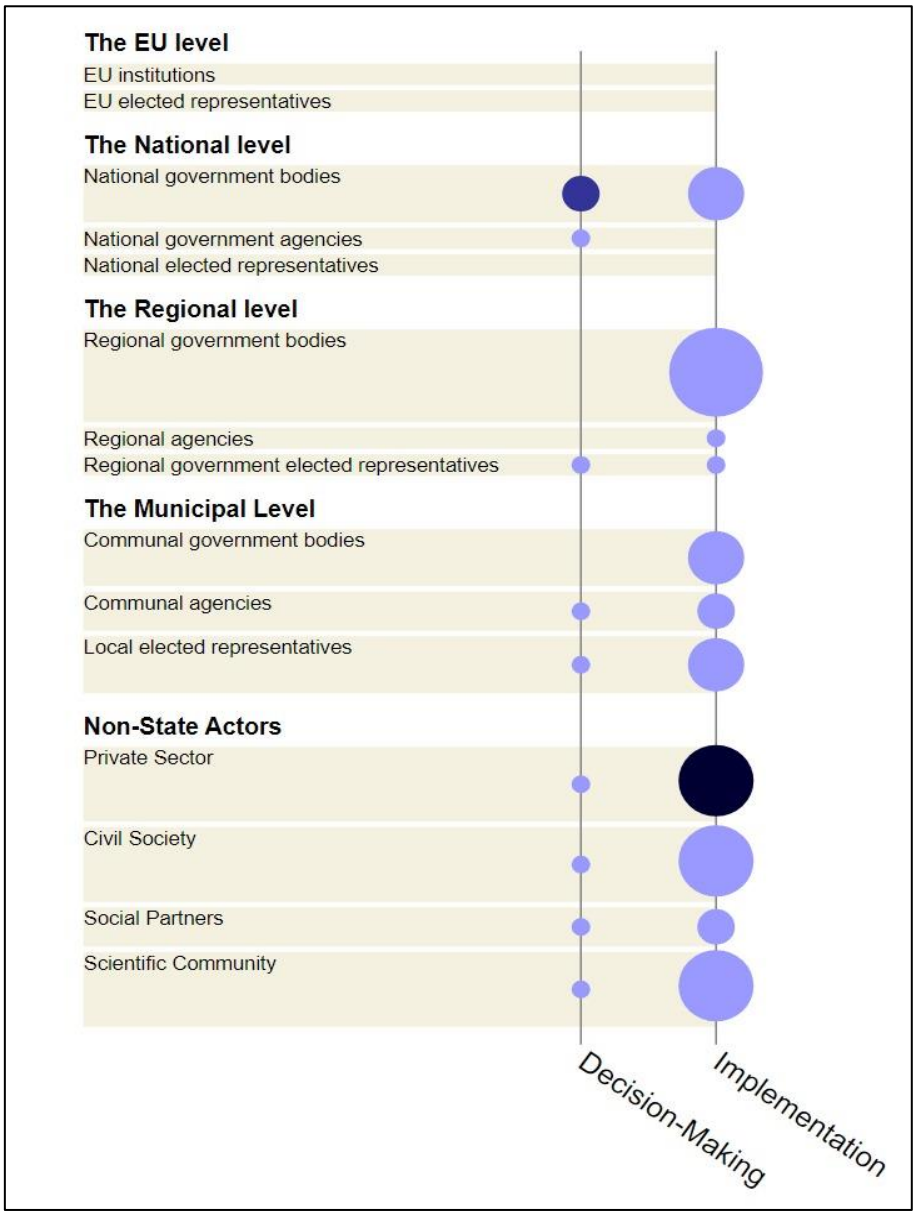
Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 8. The APES actor participation aggregated scheme by stakeholder type as part of the StStG process in the Lusatian Lignite District

Government departments distinctly emerge as the predominant orchestrators of numerous events in the decision-making stage. Their larger node size and darker blue hue underscores their pivotal position, providing expertise, guidance, and institutional support, crucial in shaping the StStG. Delving deeper into the layered participation of the public sector by governance level, it becomes clear that national bodies, and notably the Federal Ministry for Economic Affairs and Climate Action, assumed a central role during the decision-making phase (see Figure 9).

During the policy implementation phase, there was a noticeable shift in the dynamics of participation. Regional government entities, such as the Landesregierung Brandenburg and Sächsische Staatsregierung, along with municipal government bodies like municipalities and mayors, experienced a significant increase in the extent of their involvement, marking a more pronounced role in the process compared to the policymaking phase. This uptick reflects a transition in responsibilities, where these actors took on more active and substantial roles in executing the policy directives established by the earlier decision-making activities.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 9. The APES actor participation aggregated scheme by governance level as part of the StStG process in the Lusatian Lignite District

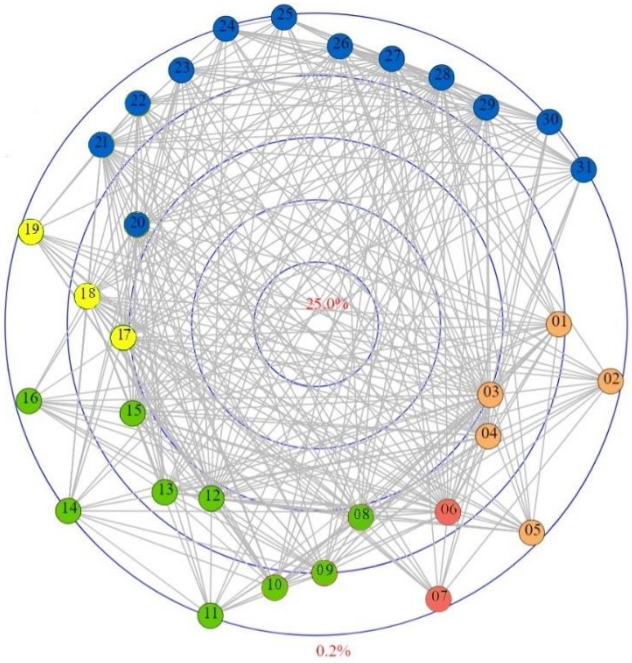
A more detailed examination of non-state actor involvement reveals that the private sector took a prominent role during the policy implementation phase, as displayed in Figure 8. According to Table 23 in the appendix section, private sector entities participated in 33% of the participatory processes associated with the StStG. This heightened level of engagement is largely due to the active participation of key industrial players, such as chambers of industry and commerce, consulting and marketing firms, professional and industry associations, and economic and development companies. The increased involvement of these actors correlates with a pivotal contractual arrangement between the Federal-State Coordination Committee (BLKG) and Wirtschaftsregion Lausitz GmbH (WRL), with the latter taking a leading position in

managing participatory events during the StStG implementation phase in the Lusatian district.

Additionally, in the policy implementation phase, there was a marked rise in the activity of the scientific community, including universities and research institutes, as well as trade and labour unions, and planning and development associations. This uptick signifies heightened engagement levels among these entities. Overall, this policymaking phase showcases an increase in participation from a majority of non-state actors, reflecting a shift towards more inclusive and wide-ranging engagement strategies within the framework of the StStG.

1.

01. Government agencies and organizations - 4.55%
02. State-owned and public companies - 0.84%
03. Government departments - 8.0%
04. Elected officials and political parties - 6.91%
05. Investment and development banks - 0.85%
06. Tade and labor unions - 5.37%
07. Employer associations - 0.8%
08. Chambers of industry and commerce and chambers of craft - 7.34%
09. Energy companies and transmission system operators - 4.1%
10. Manufacturing companies - 2.97%
11. Engineering and construction companies - 0.21%
12. Consulting and marketing companies - 7.05%
13. Professional and industry associations - 5.57%
14. Mining companies and refineries - 0.2%
15. Economic and development companies - 6.98%
16. Service companies - 1.04%
17. Universities - 7.67%
18. Research institutes - 5.29%
19. Think tanks - 0.89%
20. Planning and development associations - 6.93%
21. Environmental associations - 2.14%
22. Advocacy groups and grassroot movements - 1.89%
23. Local interest groups and associations - 1.65%
24. Cultural associations - 0.29%
25. Individual residents - 0.29%
26. Youth associations - 2.22%
27. Civil right associations - 2.39%
28. Charities and Community organizations - 2.32%
29. Religious or faith-based organizations - 2.41%
30. Young people - 0.29%
31. Civic Engagement associations - 0.29%



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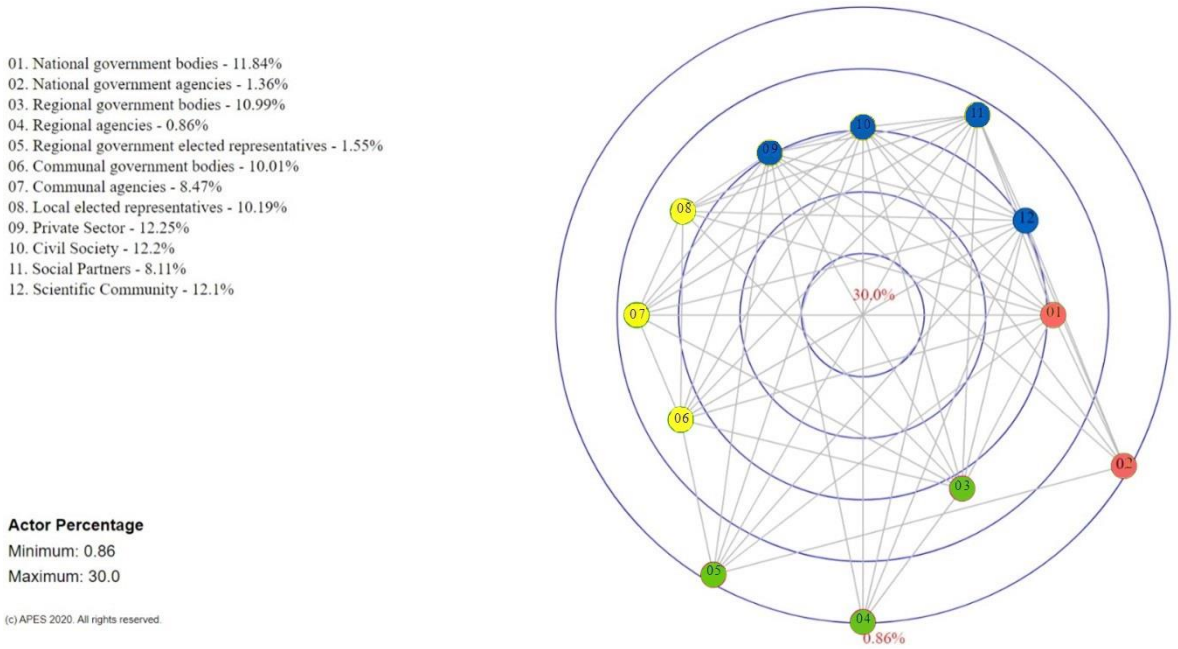


Figure 10. Networks of participants within the scope of the StStG process in the Lusatian District (Germany) by 1. Actor types and 2. Levels of governance

The analysis of centrality scores reveals a highly fragmented structure within the policy network (see 1. Figure 10). With government departments leading at a modest 8% and closely trailed by universities (7.67%) and chambers of commerce and industry (7.34%), the distribution of influence appears relatively balanced among different stakeholders, lacking an overwhelmingly dominant force. This pattern points to a network where various actors share influence and no clear leader prevails, though some stakeholders or coalitions hold marginally more sway than others.

In terms of MLG structure, national government bodies emerge as the most influential within this network, boasting the highest eigenvector centrality score at 11.84% (see 2. Figure 10). Their prominence underscores their critical function in steering policy development. Meanwhile, government entities at the regional and municipal tiers also demonstrate considerable influence in the policymaking sphere, with centrality scores of 10.99% and 10.19%, respectively, suggesting their meaningful involvement in shaping policy at different administrative levels.

Elected officials and political parties, particularly at the local level with mayors scoring a centrality of 10.19%, have a marked presence, signifying their significant sway in the StStG landscape. Taken together, these scores reveal a StStG process characterized by a relatively even distribution of influence across various levels of governance, indicating a multi-tiered approach to policymaking.

At the core of this network lie several highly influential entities, prominently featuring private organizations like chambers of industry and commerce, consulting and

marketing companies, and regional economic and development companies (respectively displaying centralities ranging from 6.91 to 7.34%). The scientific community also plays a pivotal role, with universities standing out with a centrality score of 7.67%, suggesting the strong contribution of academic research and expertise to the policymaking discourse.

Apart from planning and development associations, third sector organizations seem more loosely connected within the policy network with centrality scores ranging between 1.65 and 2.41%. This configuration suggests a rather "technocratic" stakeholder engagement approach, where specialized knowledge and industry-related concerns are given precedence over local communities' perspectives in the formulation and implementation of the StStG in the Lusatian Lignite district.

Overall, the target diagram showcases a complex landscape of engagements where actors from the different societal spheres and administrative tiers contributed to the formulation and implementation of the StStG. Examining the actor-actor matrix reveals an estimated network density of approximately 0.573[7], suggesting a quite dense network where a significant portion of the nodes are interconnected or have relationships. This indicates a relatively high level of interaction or communication among the different entities within the network. The weighted actor-actor matrix, detailed in Table 7, further delineates these interactions, shedding light on the extent of the relationships across different sectors and levels of governance within StStG process in the Lusatian district.

Table 7. APES actor-actor weighted matrix in the context of the StStG in the Lusatian district

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	270	125	658	275	403
Social Partners	125	14	160	84	142
Private Sector	658	160	930	400	575
Scientific Community	275	84	400	108	273
Civil Society	403	142	575	273	548

	National level	Regional level	Municipal level
National level	20	59	113
Regional level	59	10	114
Municipal level	113	114	208

[7]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 662 while the number of possible connections among actors amounts 1156 (34*34). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{662}{1156} \approx 0.573$.

Notably, the highest levels of engagement occur within sectors rather than across them. The private sector has the highest intra-sector weight at 930, reflecting intense internal exchanges potentially driven by shared business interests and economic ramifications. The civil society also has a notably high intra-sector weight of 548, indicating a strong network of communication within various civil groups involved in participatory processes. Additionally, these sectors display considerable intersectoral interactions, particularly with each other as well as with the public sector and, to a lesser extent with the scientific community. The relatively strong ties between private entities and scientific experts once again hints towards a potential prioritization of expert input and economic considerations within the StStG development framework.

From a MLG perspective, substantial interactions between national and subnational tiers (regional and municipal entities) are further highlighted. As evidenced by its balanced interactions with both tiers, the regional level serves as an intermediary, translating national policies into localized actions while also coordinating closely with municipal governments for implementation. The municipal level exhibits the highest level of intra-level interaction, with a score of 208, indicating that municipalities have a dense network of horizontal communication among themselves, which might involve sharing best practices, joint initiatives, and local issue discussions. Their interactions with the national and regional levels are also strong, illustrating the significant involvement of municipal governments in both receiving direction from and providing feedback to higher governance levels.

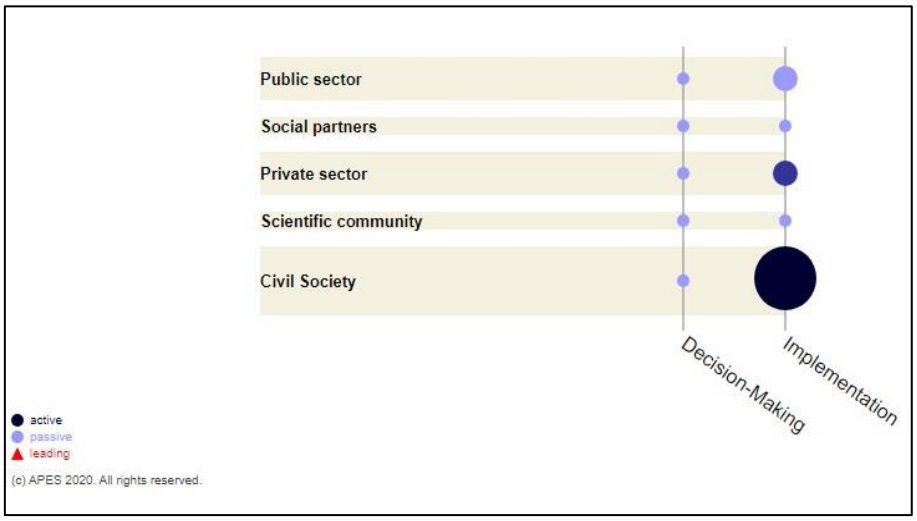
APES offers an intricate portrayal of the network dynamics underpinning the StStG policy in the Lusatian district. It highlights a multi-layered arena of stakeholder engagement, reflecting wide spectrum of contributions from actors at varying levels of governance—national, regional, and municipal—and across distinct sectors of society including the public, private, and civil sectors.

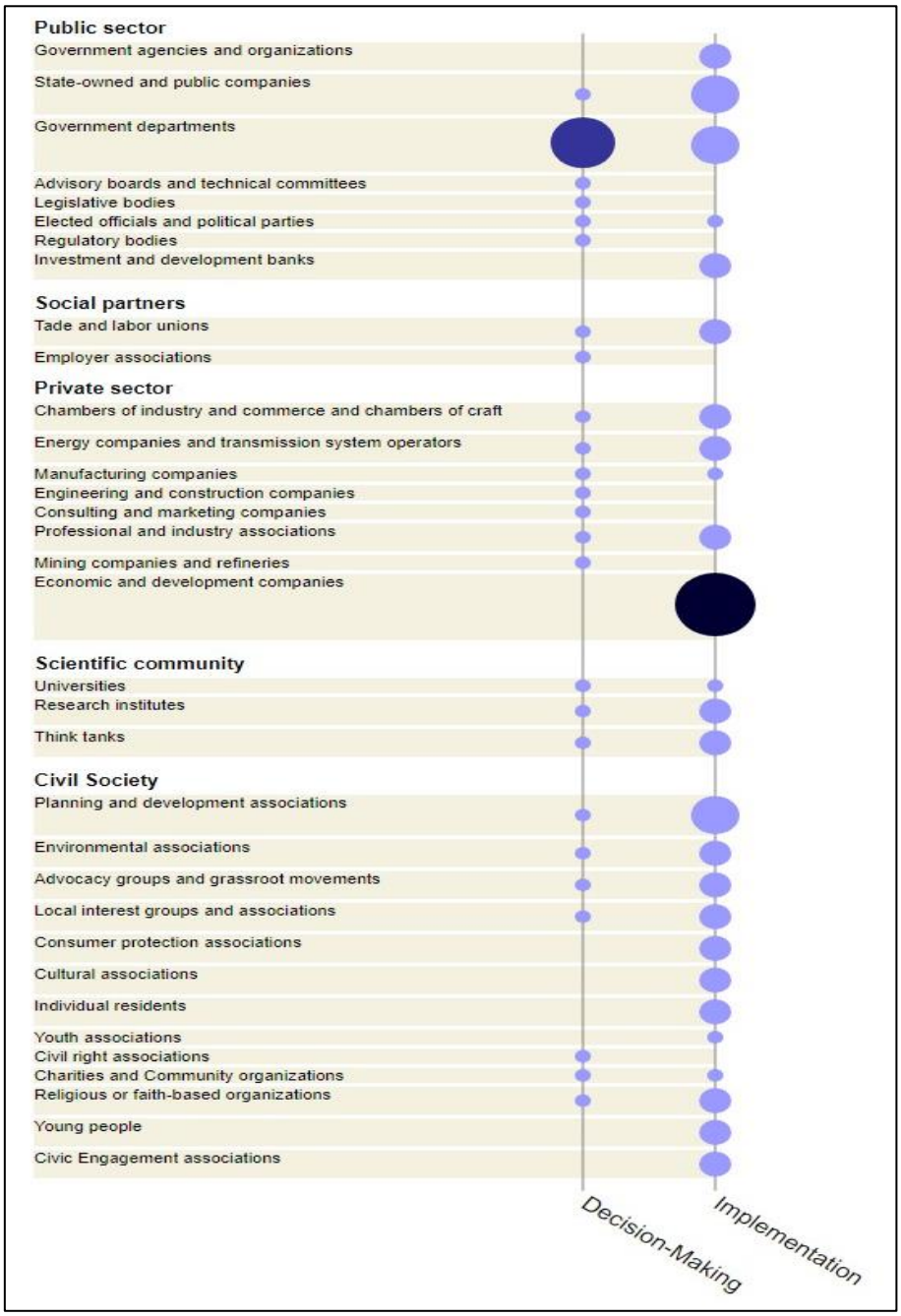
An assessment of centrality scores within this scheme underscores the prominence of entities within the scientific and industrial sectors, evidencing an inclination towards a participatory approach that predominantly values technical expertise and economic interests. This technocratic tilt is further underscored by the limited presence of individual citizens and the marginal participation of grassroots and community-based actors within the network.

The potential for enhancing the policy framework by soliciting and integrating broader grassroots participation is apparent. Such inclusion could broaden the scope of the StStG process in the Lusatian Lignite district beyond technical and economic aspects, potentially encompassing a wider range of societal perspectives and needs.

4.2.2.2. The Rhenish Lignite district

Figure 11 and Figure 12 illustrate the participation of state and non-state actors during the policymaking and policy implementation phases of the StStG process in the Rhenish Lignite district. The exhaustive list of participants can be found in Table 24 in the appendix section. While the policymaking phase mirrors similarities with the Lusatian case, primarily due to the development of StStG at the federal state level, differences emerge in the implementation strategies between the two mining regions.



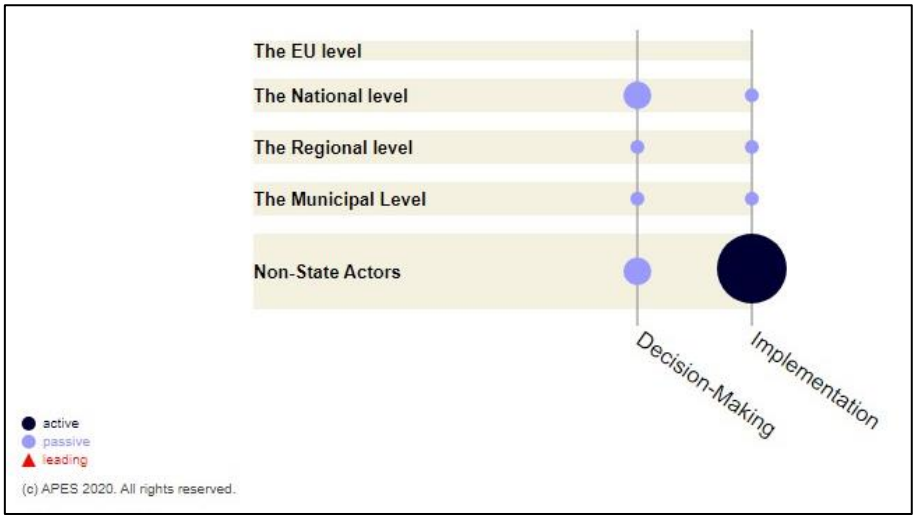


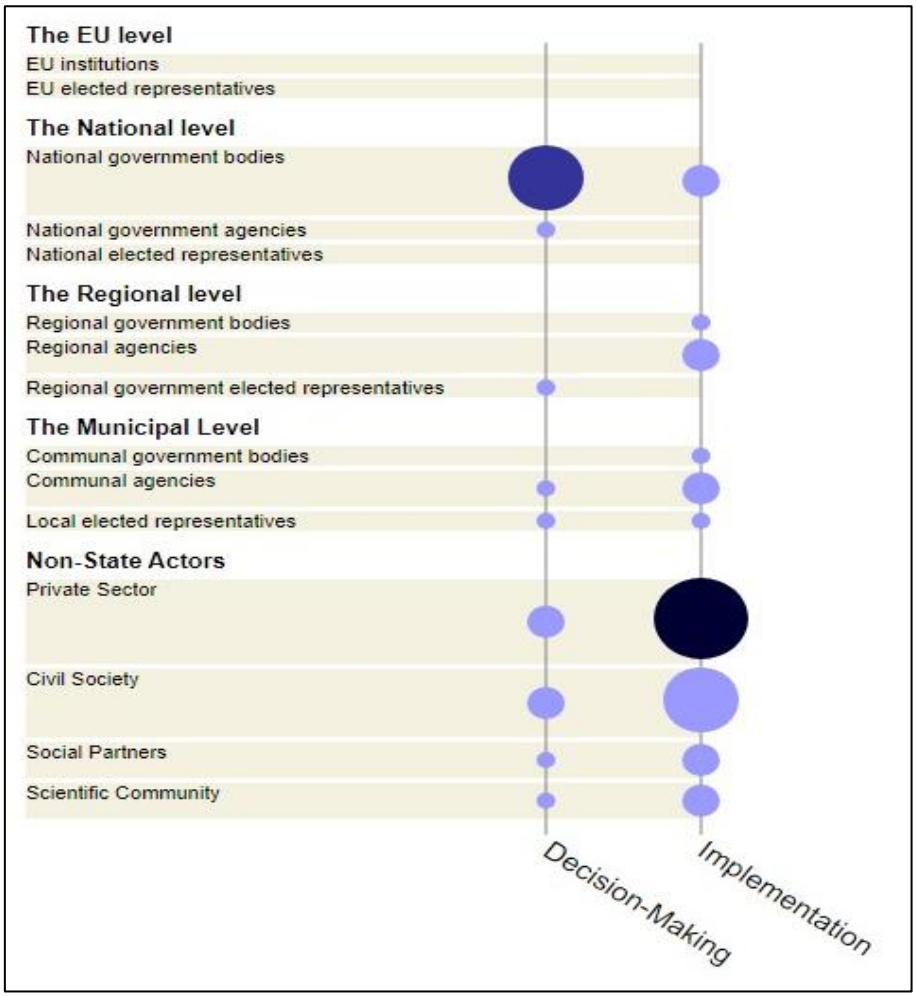
Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 11. The APES actor participation aggregated scheme by stakeholder type as part of the StStG process in the Rhenish Mining Area

Once again, APES reveals a rather broad and inclusive engagement strategy within the framework of the StStG. The public sector, particularly national government departments, assumes a pivotal role, notably conducting the participatory process during the policymaking phase. As illustrated in Figure 12, the policy implementation stage also sees a pronounced involvement from regional and municipal agencies, particularly those associated with the energy and transport sectors.

Moreover, similarly to the Lusatian district, the StStG process in the Rhenish district is marked by a significant role of the private sector, especially economic and development companies. This prominence is largely due to the delegation of responsibilities to the Zukunftsagentur Rheinisches Revier (ZRR) by the BLKG, entrusting it with the leadership of participatory and consultative activities during the implementation phase of the StStG in the Rhenish Lignite district. Despite these similarities, the Rhenish district demonstrates a distinct pattern of stakeholder engagement, diverging in certain aspects from the approach taken in the Lusatian Lignite district.





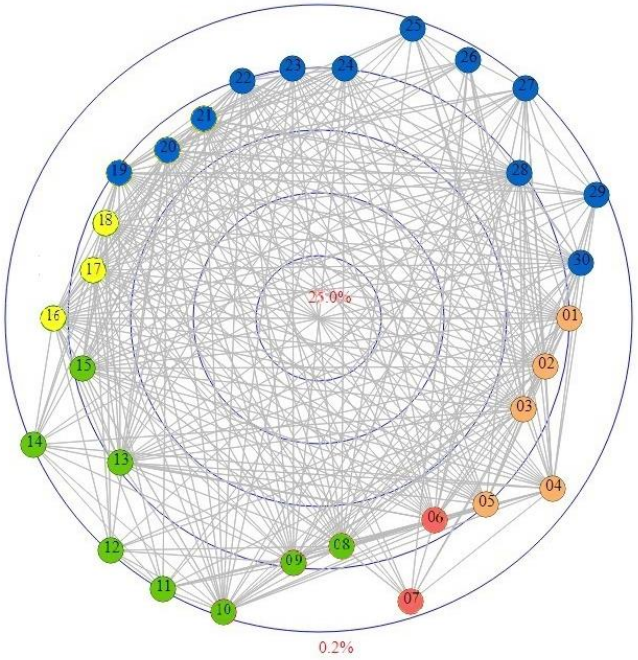
Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 12.The APES actor participation aggregated scheme by governance level as part of the StStG process in the Rhenish Mining Area

In the Rhenish area, there is a pronounced shift towards the inclusion of actors from the voluntary sector, with civil society assuming a particularly active role in the policy's implementation. This contrasts with the Lusatian district, where the private sector's role was more pronounced. Civil society's dynamic participation in the Rhenish Lignite district is marked by a diverse array of organizations and stakeholders, including planning and development associations, environmental groups, advocacy and local interest collectives, consumer protection bodies, cultural associations, and religious or community-based organizations. Notably, there is also a significant engagement from individuals, particularly from the younger demographic. Overall, altogether third sector entities contributed to 37% of all participatory events, underscoring their quantitatively and qualitatively substantial role in shaping the StStG in the Rhenish district (see Table 25 in the appendix section).

1.

01. Government agencies and organizations - 4.13%
02. State-owned and public companies - 5.3%
03. Government departments - 5.79%
04. Elected officials and political parties - 1.68%
05. Investment and development banks - 4.13%
06. Tade and labor unions - 5.24%
07. Employer associations - 1.13%
08. Chambers of industry and commerce and chambers of craft - 5.49%
09. Energy companies and transmission system operators - 4.46%
10. Manufacturing companies - 0.49%
11. Engineering and construction companies - 0.22%
12. Consulting and marketing companies - 0.27%
13. Professional and industry associations - 4.47%
14. Mining companies and refineries - 0.21%
15. Economic and development companies - 4.69%
16. Universities - 3.17%
17. Research institutes - 5.39%
18. Think tanks - 5.21%
19. Planning and development associations - 4.35%
20. Environmental associations - 5.62%
21. Advocacy groups and grassroot movements - 5.41%
22. Local interest groups and associations - 4.2%
23. Consumer protection associations - 4.13%
24. Cultural associations - 4.13%
25. Individual residents - 0.77%
26. Civil right associations - 1.11%
27. Charities and Community organizations - 0.4%
28. Religious or faith-based organizations - 4.32%
29. Young people - 0.74%
30. Civic Engagement associations - 3.03%



2.

01. National government bodies - 11.87%
02. National government agencies - 3.91%
03. Regional government bodies - 4.13%
04. Regional agencies - 8.3%
05. Regional government elected representatives - 3.55%
06. Communal government bodies - 3.46%
07. Communal agencies - 9.09%
08. Local elected representatives - 2.09%
09. Private Sector - 14.46%
10. Civil Society - 14.37%
11. Social Partners - 11.73%
12. Scientific Community - 12.98%

Actor Percentage
Minimum: 2.0
Maximum: 30.0

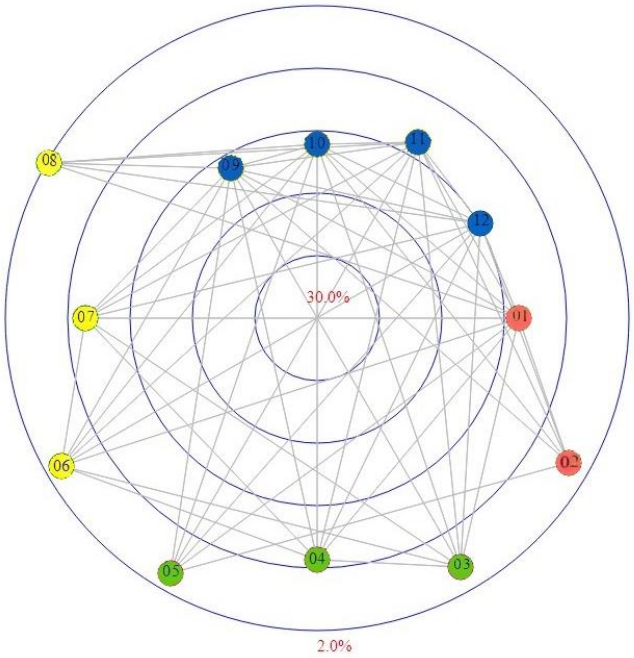


Figure 13. Networks of participants within the scope of the StStG of the Rhenish District (Germany) by 1. Actor types and 2. Levels of governance

In the Rhenish Lignite district, the actor-actor target diagram reveals a network configuration that is markedly different from that of the Lusatian region, as depicted in Figure 13 above. The analysis of centrality scores across different actor types in the first target diagram outlines an even narrower range between the lowest (0.2%) and highest

(5.79%) centrality scores. This compact range points to an even more fragmented distribution of influence among the actors involved in the policy network, where no clear leadership or dominant coalition emerges. The concentration of moderately elevated centrality scores, which span from 3.17% to 5.79% for the majority of entities (20 out of 30), underscores a network that is both densely woven and exhibits substantial interconnectivity.

Within the StStG network in the Rhenish Lignite district, national government entities have a significant presence, as evidenced by their eigenvector centrality score of 11.87%. Other public entities operating at different administrative levels, such as regional and municipal agencies also command notable influence, with centrality scores of respectively 8.3% and 9.09% (see 2. Figure 13). These figures highlight the importance of various administrative tiers in shaping the network's structure.

In addition, a balanced and diverse mix of organizations representing social partners (trade unions), private entities (chambers of industry and commerce), scientific experts (research institutes and think tanks) and civil society organizations (environmental associations and advocacy and grassroot movements) holds pivotal positions within the policy network with eigenvector values going from 5.21 to 5.49%. This reflects a policy environment that is shaped by a diverse array of influential stakeholders at all governance levels and from all societal spheres.

The centrality score analysis collectively depicts a landscape that is broad and inclusive when it comes to managing the coal transition in the Rhenish Lignite district. This is further confirmed by the actor-actor matrix indicating a density of approximately 0.578[8]. This suggests that near 58% of all possible connections among the actors exist within the network, pointing to rather dense policy network with substantial level of connectivity among actors.

Table 8 reveals intricate dynamics and intensities of relationships between various actor groups. Once again, the public sector emerges as a central entity, boasting robust and multi-faceted connections with itself and all other stakeholders. Its interactions, notably with the civil society and private sector, exhibit considerable strength, likely indicating its pivotal role in fostering consultative and participatory processes.

Most notably, the civil society exhibits both strong internal communication but also substantial ties with all other sectors, underscoring its active role and robust engagement within the formulation and the implementation of the StStG in the Rhenish Lignite District. Its profound connections with the public and private sectors underscore

[8]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 668 while the number of possible connections among actors amounts 1156 (34*34). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{668}{1156} \approx 0.578$.

a mutually influential relationship between these three groups of actors, refrying their influential positions within the policy network.

Table 8. APES actor-actor weighted matrix in the context of the StStG in the Rhenish district

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	248	107	316	225	582
Social Partners	107	14	79	51	189
Private Sector	316	79	244	195	598
Scientific Community	225	80	195	104	361
Civil Society	582	160	598	361	966

	National level	Regional level	Municipal level
National level	20	29	14
Regional level	29	10	33
Municipal level	14	33	12

Viewed through the lens of multi-level governance, the intensity of interactions between different administrative levels seems rather minimal. While there is a modest amount of engagement between national and regional levels and between regional and municipal entities, the general interaction pattern does not primarily feature public entities interacting amongst themselves. Instead, the primary interactions are directed towards non-state actors. In the process of policymaking and implementation, it is evident that the bulk of connections occur between public entities and external stakeholders, once again indicating a network where the governance structure is deeply integrated with various stakeholder groups beyond the state apparatus.

The APES analysis reflects a rather comprehensive engagement strategy for managing the coal transition in the Rhenish Lignite district. Overall, the analysis reflects a rather balanced and multi-dimensional involvement of diverse stakeholders from various governance strata but, more importantly from different societal spheres. APES indeed highlights the relatively significant influence of not only industry-relevant actors and technical experts but also labour unions and civil society organizations within the StStG policy network. However, this strategic approach, while ensuring broad participation across various stakeholders, seems to temper the depth and intensity of each participant's involvement.

4.3. The National Program Groningen in Groningen Province (The Netherlands)

The National Program Groningen (NPG) serves as a key place-based policy measure as regard to the Netherlands' commitment toward a more balanced regional development and driving sustainability transition in a region which is particularly affected by fossil fuels extraction and vulnerable to the transition towards more sustainable futures.

This policy measure launched in March 2019 is implemented in a partnership between the government, the province of Groningen and municipalities. It was initiated in response to seismic activities triggered by extensive gas extraction in the Groningen region, but considers wider aspects of economic, social and cultural development in the region and the improvement of well-being of its inhabitants.

Beyond addressing immediate concerns, the program sets out to revitalize the region's economy. It focuses on fostering economic development, generating employment opportunities, and investing in vital infrastructure to rejuvenate the affected areas. Moreover, the NPG prioritizes steering the region toward sustainability by exploring alternative energy sources, advocating for sustainable practices, and advancing innovations in renewable energy and environmental conservation.

The NPG's decision-making and implementation phases were marked by the active engagement of local communities from the affected areas. Employing APES, an assessment of participatory processes within the Groningen Province and municipalities was conducted to offer insights into the depth and comprehensiveness of collaborative efforts surrounding the execution of the program in the Groningen region from its launch in March 2019 up to November 2023.

4.3.1. The Groningen case

The Groningen province, situated in the northern part of the Netherlands, has been a pivotal area for gas production in the country, contributing significantly to the national gas supply for decades. The region has thus been traditionally marked by extensive gas extraction activities. However, over time, seismic activities induced by gas extraction resulted in increased instances of earthquakes, sparking concerns about safety and environmental impact, particularly affecting the local communities.

The area is composed of several municipalities, each with its own characteristics and socioeconomic dynamics. Groningen's municipalities, including the city of Groningen itself, but also Appingedam, Loppersum, and others, have experienced the effects of gas-related earthquakes, prompting a need for targeted interventions to address the damages and risks posed to residents, infrastructure, and the environment. Moreover, the region's economic structure has been impacted by these seismic activities.

The NPG aims to mitigate these effects by focusing on economic, social and cultural revitalization efforts. This involves stimulating economic growth, fostering job creation, improving the quality of life and investing in critical infrastructure and energy transition to support the affected municipalities. In this objective, community engagement lies at the heart of the program, recognizing the importance of involving local residents, stakeholders, and community representatives to ensures that their needs and perspectives are considered within the scope of the NPG.

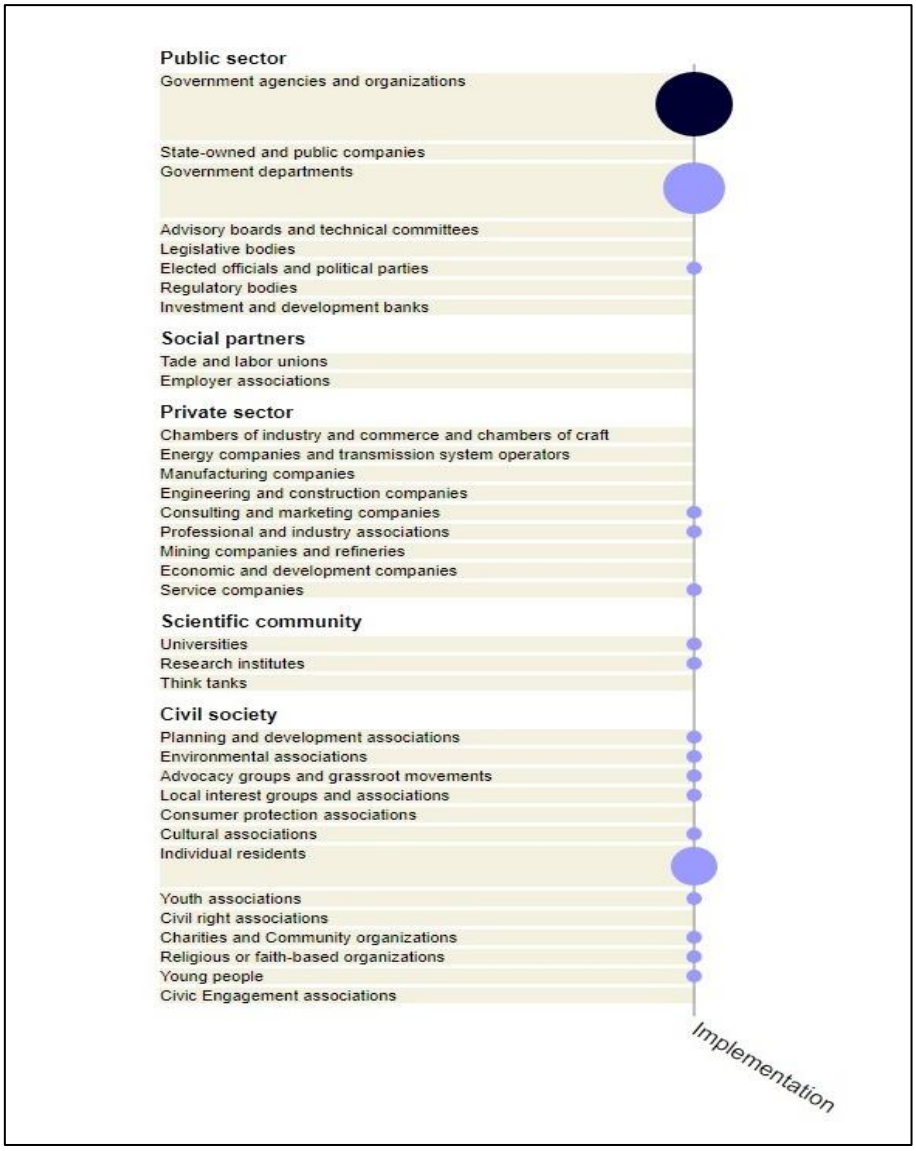
During the elaboration phase, a concerted effort was made to engage various stakeholders, including governmental bodies, local authorities, community representatives, environmental experts, and industry players. This collaborative endeavour was spearheaded by the Dutch government, the Groningen province, and the municipalities within the affected region. The focus was on fostering a collaborative approach, ensuring representation from all involved parties to draft a comprehensive framework that would serve as the backbone of the NPG.

The Toukomst (Future) participatory initiative was subsequently deployed to empower local communities and encourage their active involvement in the implementation of the NPG. This initiative encourages Groningen's residents to propose ideas aimed at enhancing the vitality, economy, and overall quality of life in the region through a diversity of face-to-face and online participatory actions and tools. The initiative epitomized a collaborative effort to engage the local population in decision-making processes that directly impact their community.

Considering the NPG 's strong focus on involving local communities in both the development and execution phases, we undertook a critical assessment to gauge the extent and depth of this participation. This APES-centred evaluation is key to understanding how effectively the NPG has engaged with local stakeholders, including residents, community groups, and local authorities but also stakeholders in the social, cultural, industrial and scientific arenas.

4.3.2. Outcomes and findings

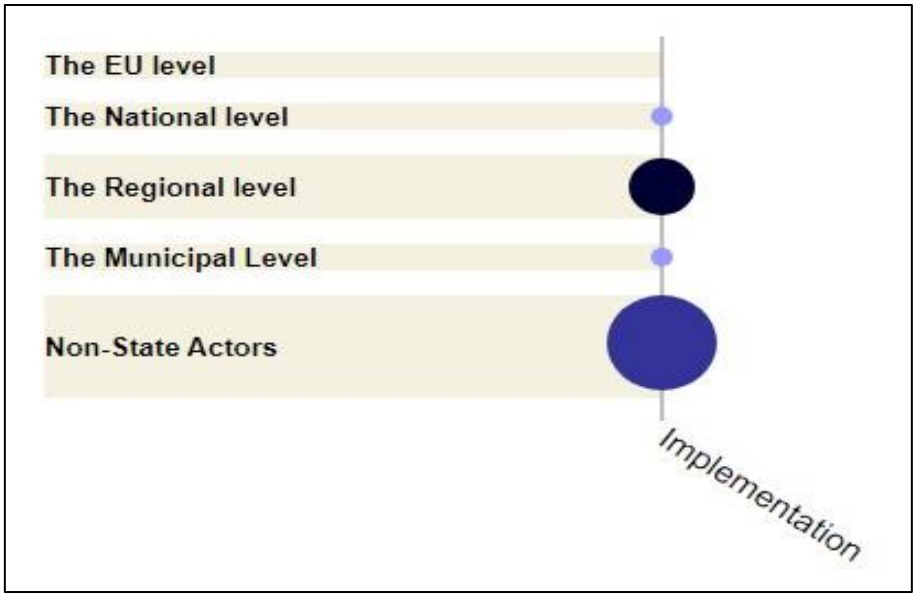
The focus of our analysis on the implementation phase of the NPG is primarily driven by the availability of data. It is crucial to acknowledge that our assessment through APES was constrained to this particular stage due to the lack of accessible data on the policy's decision-making processes. Consequently, the insights and evaluations presented are based on the participatory events and dynamics that occurred between the launch of the NPG in March 2019 until the time of writing in November 2023.

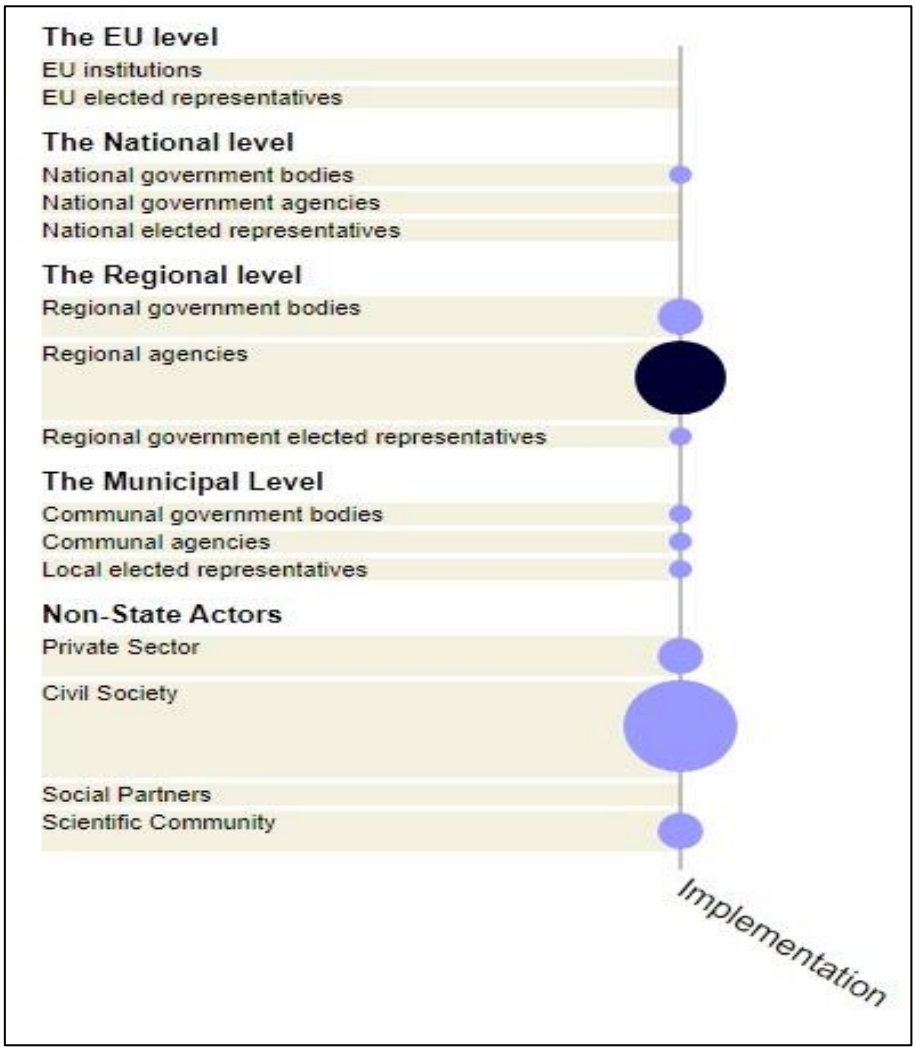


Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 14. The APES actor participation aggregated scheme by stakeholder type as part of the NPG

Figure 14 and Figure 15 offer a graphical representation of stakeholder engagement across various sectors and levels of governance within the NPG. For a detailed inventory of the participants, one can refer to Table 26 in the appendix section. At an initial observation, APES uncovers a wide-ranging participation framework within the program, characterized notably by the significant presence of three key stakeholder groups: regional agencies, government departments operating at federal, regional, and municipal levels, and individual citizens.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 15. The APES actor participation aggregated scheme by governance level as part of the NPG

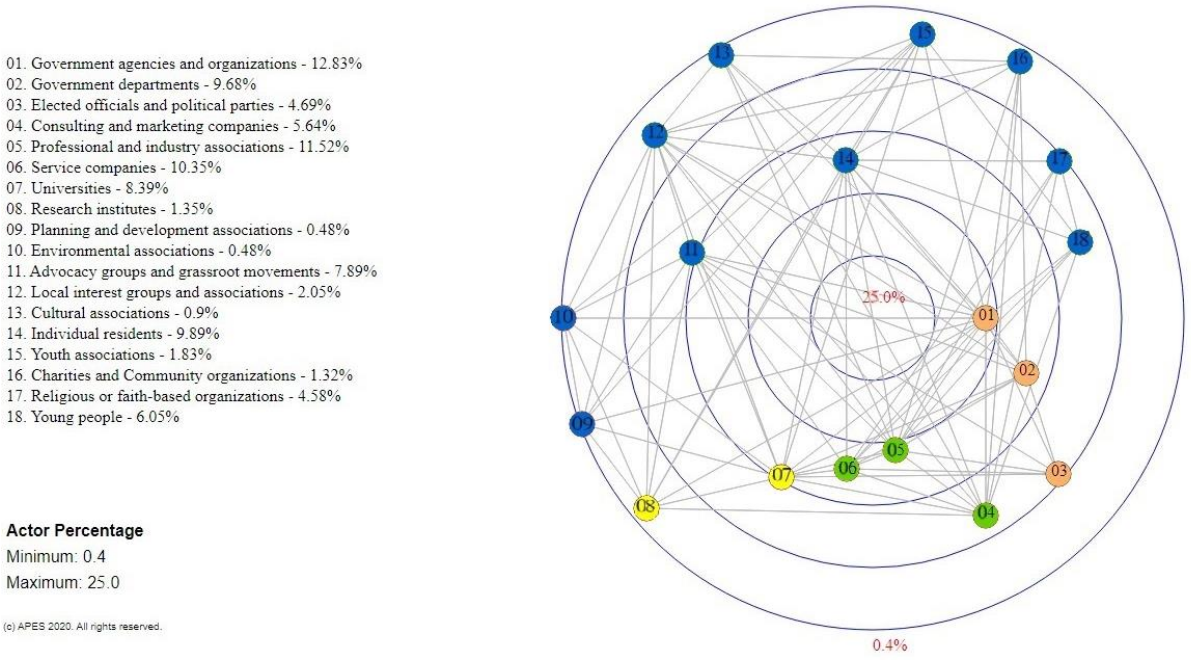
Public sector organizations were notably active in the NPG, taking part in over 43% of all participatory events and, often playing a leading or active role therein (see Table 27 in the appendix section). A closer examination reveals that the participation of regional agencies and departments, particularly the States of Groningen, is especially prominent. However, the notable representation of regional agencies is partly due to the specific coding system used in the APES analysis. This applies mainly to the NPG entity, which is driving the program's implementation in the Groningen area.

In APES, public entities are required to be categorized within a specific governance level. The board of the NPG comprises a mix of governments (including the central government, the province of Groningen, and municipalities within the earthquake area) and various organizations. As such, it straddles the national, regional, and municipal levels in terms of its scope and function. However, given its role in defining and implementing the NPG within the Groningen area, it has been coded as a 'regional agency' for the purposes of this APES analysis. This classification means that the involvement of municipal and

national governments, which also form part of the NPG entity, may not be fully represented in the APES framework. Therefore, while APES highlights the substantial role of regional agencies, it potentially inadvertently underrepresents the significant contributions of both municipal and national levels under the unified banner of the NPG entity.

From a non-state actor perspective, the analysis reveals a significant participation of civil society, with a notable emphasis on individual residents in the implementation of the NPG. In this sense, the NPG seems to go in the direction of a rather narrow and community-centric engagement approach prioritizing the voices of everyday citizens alongside technical experts or industrial entities. By prioritizing the involvement of Groningen residents in participatory initiatives, the program potentially seeks to incorporate the inputs, experiences, and insights of those individuals who are likely to be most impacted by transition interventions.

1.



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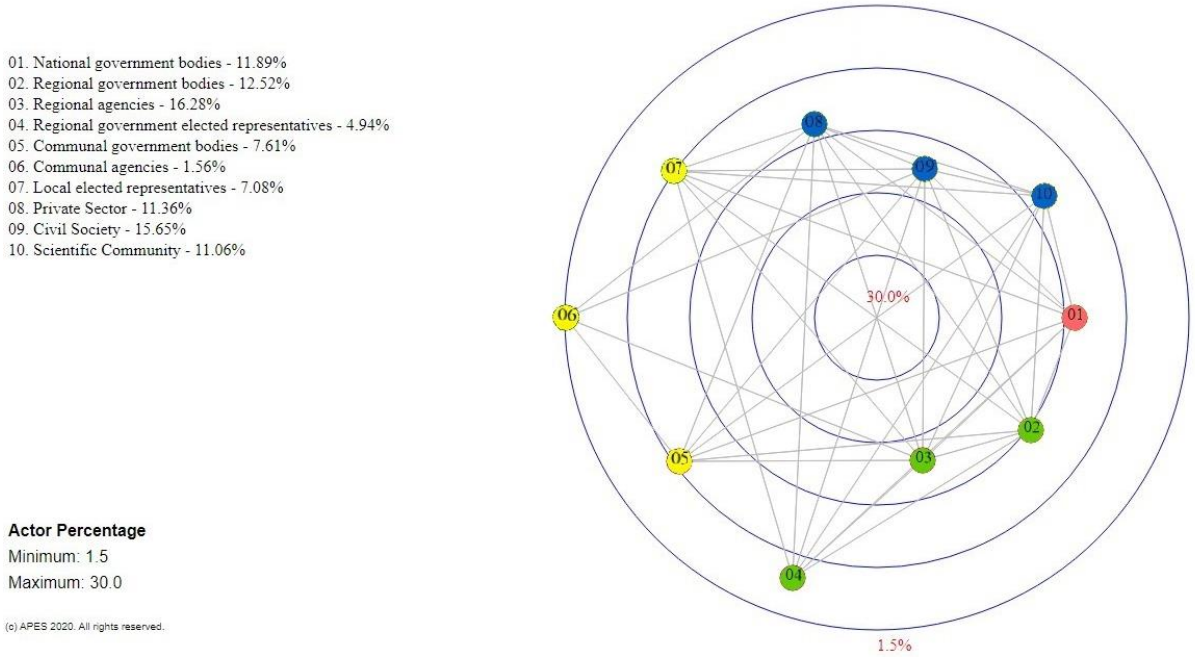


Figure 16. Networks of participants within the scope of the NPG, the Netherlands

Figure 16 above visually represents actor-actor centrality scores, showcasing a spectrum from highly central to less central participants within the network. From an actor type perspective, the eigenvector centrality scores ranging from a minimum of 0.4% to a maximum of 12.76% stress a relatively high disparity in influence within the context of the NPG. With the highest centrality score of 12.83%, government agencies and organizations hold substantial influence, likely acting as central hubs or key connectors within the network. This is more specifically the case of regional agencies (16.28%), in the form of the NPG entity leading most participatory processes when it comes to the implementation of the plan (see 2. Figure 16).

Within the realm of the public sector, government departments at the national (11.89%), regional (12.52%), and, to a lesser extent, municipal level (7.61%) exhibit robust connectivity within the network. Alongside them, local elected representatives at the regional and municipal levels, typically mayors, also hold some influence within the policy network, with centrality scores of 4.94% and 7.08% respectively. These connections between entities operating at different governance levels likely reflect the nature of the NPG as a partnership between the federal government, the province, and municipalities.

Focusing more specifically on non-state actors, certain private organizations have a prominent influence. Notably, professional and industry associations, representing a significant influence of 11.52%, have considerable sway. These associations typically represent the business community, as well as the energy and agricultural sectors.

Additionally, service companies in the housing and health fields hold a relatively high influence, with a centrality score of 10.35% within the network. To a lesser extent, representatives from knowledge institutions, particularly universities, also exhibit substantial influence, demonstrated by a centrality score of 8.39%. This indicates a clear intent to integrate the expertise of both academic voices and industry professionals in the policy-making process.

Interesting in the NPG case is the significant and broad involvement of civil society, encompassing ten different entities. While a majority of them are somewhat loosely interconnected within the network, with relatively low centrality scores ranging from 0.4% to 2.0%, certain specific entities play a highly influential role in the NPG's implementation. Notably, individual residents demonstrate substantial influence with a centrality score of 9.89%, and more specifically young people at 6.05%. Alongside them, advocacy groups and grassroots movements register a significant presence at 7.89%. The strong representation of these groups underscores the program's clear commitment to actively involve Groningen's residents and communities in the plan's execution.

Overall, APES indicates a core-periphery network structure in the NPG. This structure is characterized by a narrow group of highly influential actors, spanning various sectors and administrative levels, who play pivotal roles in the program's implementation. Meanwhile, other participants exhibit more limited influence or interconnections within the network. This observation is further corroborated by the network density of approximately 0.145 observed in the actor-actor matrix[9]. This figure suggests a relatively low level of connectivity or interaction among all entities involved in the policy network.

Table 9. APES actor-actor weighted matrix in the context of the NPG

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	140	0	103	63	150
Social Partners	0	0	0	0	0
Private Sector	103	0	130	38	191
Scientific Community	63	0	38	4	52
Civil Society	150	0	191	52	218

	National level	Regional level	Municipal level
National level	0	80	35
Regional level	80	110	96
Municipal level	35	96	12

[9]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 178 while the number of possible connections among actors amounts 1225 (35*35). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{178}{1225} \approx 0.145$.

Exploring inter-sectoral interactions reveals distinct patterns, as detailed in Table 9. The public sector demonstrates robust ties with other sectors, particularly with the private sector (103 connections) and with the civil society (150 connections). These results highlight significant levels interaction between governmental bodies and non-state organizations. APES further underscores substantial interactions between the private sector and the civil society. This is reinforced by strong intra-sectoral ties, illustrating a foreseeably synergistic network where different sectors not only interact extensively among themselves but also engage effectively with others.

From a MLG perspective, APES underscores substantial interactions between national and regional government bodies (80 connections). This indicates a significant level national-regional ties and exchanges, although the exact nature of this relationship cannot be conclusively ascertained through APES. At the regional level, there is a notable prevalence of self-interaction, potentially hinting a complex internal structure necessitating high levels of communication and coordination within the region. This complexity may stem from the multifaceted nature of the NPG, which spans economic, social, and cultural matters, demanding intensive intra-regional networking. Additionally, the regional level displays strong interactions with both the national and municipal levels, further highlighting its pivotal intermediary role in the NPG governance framework.

The analysis reveals a rich diversity among the stakeholders engaged in the NPG, encompassing various government levels (national, regional, municipal) and functional spheres (public, private, scientific community, civil society). The findings, however, display a core-periphery policy network structure, characterized by the active and deep participation of a relatively limited group of actors who are driving the NPG's implementation.

Alongside specific private and scientific entities, individual residents and grassroots movements notably demonstrate substantial influence within this landscape. The significant involvement of individual residents, in particular, is in line with the NPG's commitment to actively include local communities affected by transition measures. This suggests a deep engagement with local community members, promoting a bottom-up approach that might enable NPG projects and initiatives to be closely aligned with the actual needs and concerns of the Groningen communities and of each municipality.

4.4. The Territorial Just Transition Plans in Bełchatów and Katowice (Poland)

Just as the Bulgarian example of the Stara Zagora province previously outlined, the Polish regions of Bełchatów and Katowice are also eligible to the TJTP. As previously emphasized, the TJTP stands as a pivotal EU-wide strategy amidst the monumental shift away from fossil fuels toward sustainable, renewable energy sources. This comprehensive roadmap is designed to guide and support EU regions heavily reliant on fossil fuels through a transition toward a more sustainable economic and social model through a multifaceted approach.

The overarching objective of the TJTP is to ensure a balanced socio-economic development during the transition to a carbon-neutral economy in the most affected EU regions. In this objective, the TJTP first aims to diversify the economic landscape by investing in alternative industries. Secondly, the plan prioritizes social inclusion through a focus on reskilling, retraining, and providing support for local communities. Lastly, environmental sustainability is a key pillar, with a focus on promoting renewable energy sources, reducing carbon emissions, and addressing environmental degradation caused by previous industries.

Following the EU's introduction of the JTM in 2020, Poland commenced the drafting phase of the TJTPs through a dual-path process (Nowakowska et al., 2021). To ensure harmony and complementarity between the TJTPs and other strategic documents related to climate and energy policy, such as Poland’s Energy Policy by 2040 and the National Plan for Energy and Climate, the Ministry of Climate and Environment was tasked with developing the National Just Transition Plan (NJTP). The NJTP serves as a guideline for regions in formulating their respective TJTPs. Concurrently, efforts were underway to develop individual TJTPs in each of the six provinces identified as particularly reliant on coal, including Eastern Wielkopolska, Upper Silesia, the Wałbrzych sub-region, the Łódzkie region, Western Małopolska, and the Lubelskie region.

The TJTPs of Upper Silesia and the Łódzkie region are hence integral part of Poland's overarching commitment to move away from coal dependence. By applying the APES methodology, the evaluation of participatory processes within these TJTPs seeks to shed light on the depth and comprehensiveness of the stakeholder engagement strategies at play in these two Polish mining regions. This analysis seeks to understand the extent of stakeholder involvement and how their contributions shape the transition plans, reflecting Poland's efforts towards a more sustainable energy transition.

4.4.1. The Bełchatów and Katowice cases

In the Łódz and Upper Silesian Voivodeships, where the Bełchatów and Katowice coal regions are located, deeply entrenched in coal mining and energy production, the TJTP holds tremendous significance. Both Provinces are indeed historically intertwined with mining and coal production, epitomizing Poland's industrial heritage and its reliance on fossil fuels.

Lignite mining and conventional energy production are major economic drivers in the Bełchatów area, situated within the Łódź region of Poland. This region is notably home to Poland's largest lignite-fired power plant, which contributes approximately 25% of the country's electricity. The presence of this traditional industry has propelled the area into becoming one of the wealthiest regions in Poland, embedding the energy sector deeply into its territorial identity. Consequently, the socio-economic impact of phasing out coal in this region, where Bełchatów is a major employer, is a critical concern and has been met with considerable preoccupation by local citizens (see DUST D3.1 for further details).

Upper Silesia stands as the largest hard coal mining region in the EU, employing over 70,000 workers in its mines. The DUST project specifically focuses on the Katowice region, one of the seven coal sub-regions in Upper Silesia. This region is known for producing both steam and metallurgical coal and is characterized by a high concentration of energy-intensive industries. As a result, the gradual and incremental decline in mining, coupled with workforce reductions, has engendered a climate of uncertainty and tension within the mining communities. These changes have significantly eroded trust towards national and, in some cases, regional government authorities, both among the miners and the local administrative bodies (see DUST D3.1).

These situations in both the Bełchatów and the Katowice regions highlight the complexities and challenges involved in transitioning away from traditional coal-based industries in regions where they form a significant part of both the economy and the community's identity. The transition away from coal in these areas is not just an economic shift but a fundamental transformation that impacts the social fabric, identity, and livelihoods of the communities involved. As a result, community engagement was pivotal during both the development and implementation stages of the plans.

In accordance with Article 11 (3) of Regulation (EU) 2021/1060, stipulating that “the preparation and implementation of TJTPs shall involve the relevant partners” (European Parliament, 2021), the TJTPs in both areas involved extensive collaborative efforts with relevant stakeholders, including local governments, industry representatives, labour unions, environmental groups as well as affected local communities to incorporate diverse perspectives into the plan.

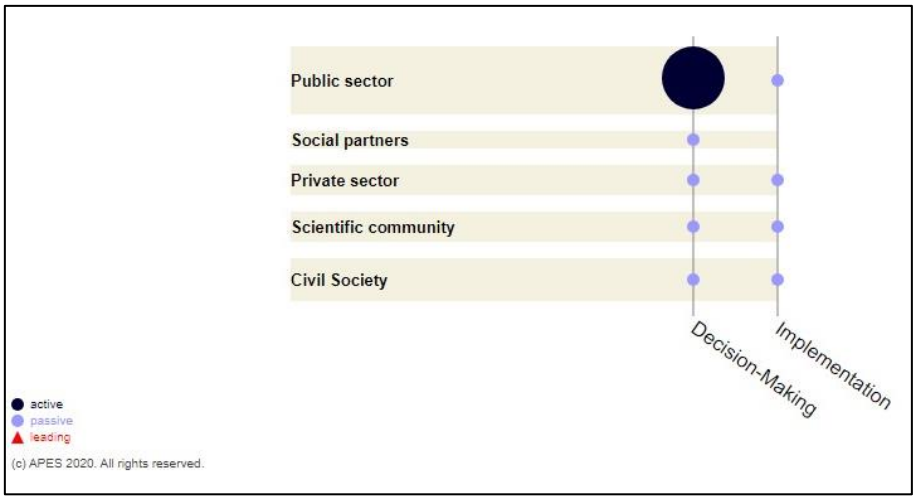
Utilizing APES, we evaluate the depth and inclusivity of stakeholder participation during both the formulation and implementation phases of the TJTPs in the Upper Silesian and Łódz Voivodeships. Through this approach, the present analysis seeks to offer comparative insights into the participatory dynamics at play within the TJTP framework in two seemingly comparable coal-reliant regions.

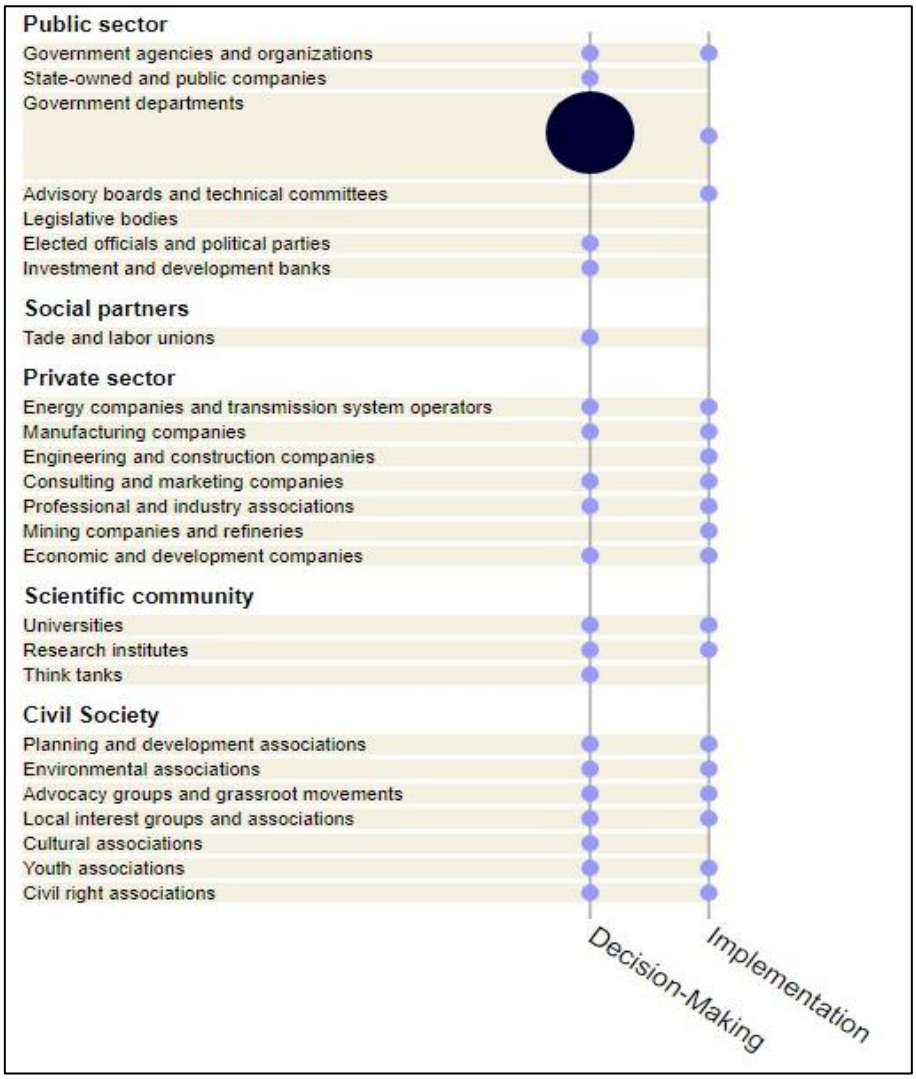
4.4.2. Outcomes and findings

As of December 2022, the EC formally adopted the TJTPs of the Upper Silesian and Łódzkie regions. The analysis conducted in this study covers a crucial period spanning from December 2020 to November 2023 (time of writing), encompassing the decision-making phase and the start of the TJTPs' implementation. By examining various aspects of policy networks such as actor participation, actor-actor centralities, and network density, we aim to shed light on participatory dynamics surrounding the development and implementation of these plans in these two coal-dependent regions of Poland.

4.4.2.1. The Bełchatów area

APES provides a visual representation of actor participation across different sectors (Figure 17) and administrative levels (Figure 18) in the policymaking and implementation phases of the TJTP in the Łódz Voivodeship. An exhaustive list of participants in the TJTP is available in Table 28 of the appendix section. At first glance, the public sector, particularly government departments, stands out as a dominant player during the policymaking phase. These organizations are actively engaged in half of all participatory events and play a leading role in over 24% of them (see Table 29). This result highlights the central role of public entities in orchestrating the participatory processes during the development of the TJTP in the Łódzkie region. However, this dominance wanes notably during policy implementation, where virtually no particular stakeholder prominently stands out. This decrease in engagement from government departments may signify a shift in influence or shared responsibilities among stakeholders as the policy progresses from formulation to execution.

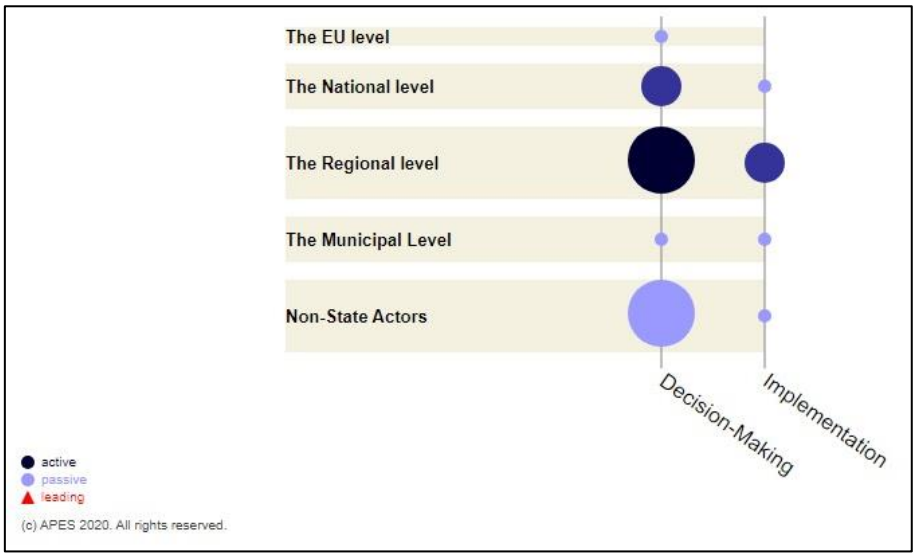


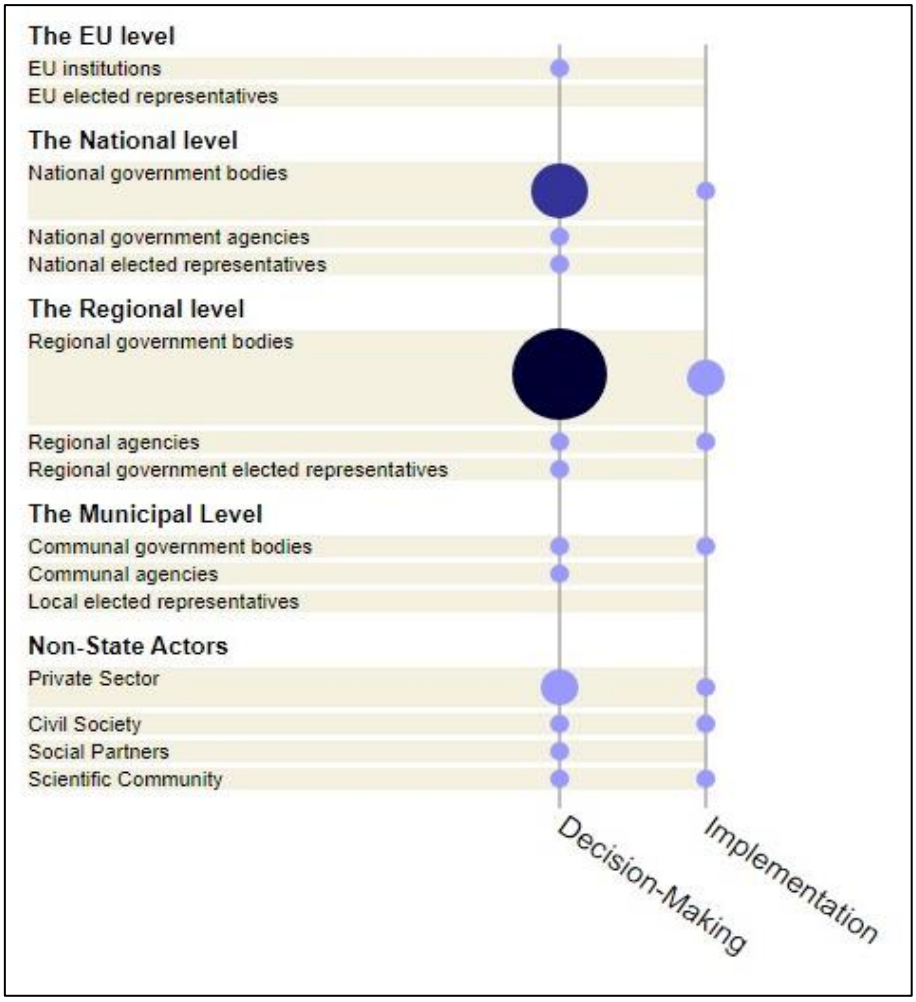


Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 17. The APES actor participation aggregated scheme by stakeholder type as part of the of the TJTP process in Bełchatów

Upon examining the involvement of public entities in decision-making, with a finer focus on governance levels, it becomes evident that regional government bodies, particularly the Marshal of the Łódzkie Voivodeship, are at the forefront of the process (see Figure 18). This leadership role aligns with the responsibilities associated with coordinating the development of the regional plan. National government bodies also play a significant role in the process. The Ministries of Climate and Environment and of Development Funds and Regional Policy are notably active, a participation likely pushed by the simultaneous development of regional TJTPs and the NJTP. Meanwhile, EU institutions, while involved, seem to adopt a more background role. This approach is exemplified by their EC's decision to entrust the consulting firm PwC with the task of supporting the regions in the development of their TJTPs.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 18. The APES actor participation aggregated scheme by governance level as part of the of the TJTP process in Bełchatów

The actor-actor centrality score target diagram further reinforces the prominent roles played by government departments, particularly at the regional and federal levels. These entities demonstrate significant eigenvector centrality values, with regional government bodies at 19.1% and federal bodies at 16.82% (see 2.Figure 19). Municipal government bodies, typically municipalities located in the Łódzkie Voivodeship, also exhibit a notable degree of integration within the policy network, with a centrality score of 10.89%. This data highlights a policy landscape characterized by the near-equal contribution of central government and subnational levels, encompassing both regional and municipal authorities. However, it is here important to note that the nature of this relationship cannot be established through APES alone and requires further investigation in T3.2.While EU institutions appear to have a more peripheral connection, with a lower centrality score of 2.57%, the notable influence of private entities, marked at 14.56% as indicated in 2.Figure 19, could be partly attributed to the activities of the consulting firm PwC.

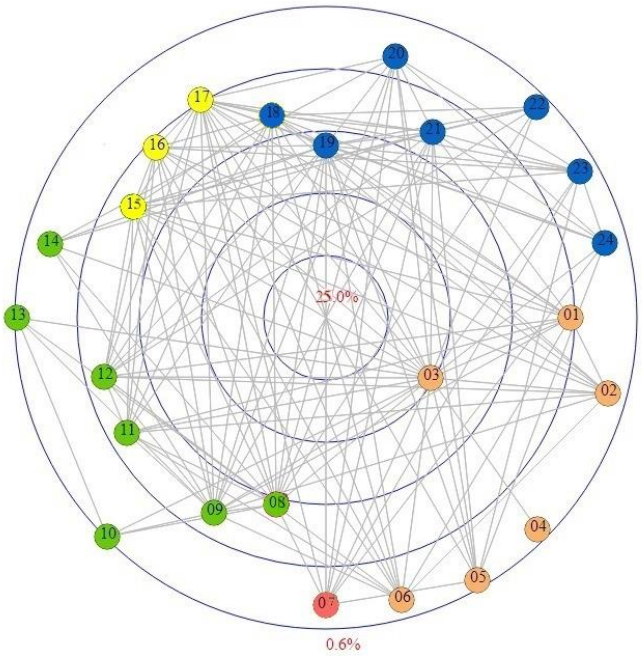
Figure 19 provides additional insights as per the distribution of influence between different types of stakeholders, highlighting a core-periphery structure. Focusing specifically on the involvement of non-state actors, a few participants seem to form a core group that wields substantial influence within the TJTP network. This is typically the case of specific private entities such as energy companies (7.93%), manufacturing companies (5.95%), professional and industry associations (5.65%), and consulting and marketing companies (5.63%) that appear particularly well-integrated in the policy network. This integration highlights the significant role that these actors play in shaping and influencing the elaboration and implementation of the TJTP in the Łódzkie Voivodeship.

Similarly, the scientific community, encompassing universities, research institutes, and think tanks, with centrality scores ranging from 4.3% to 6.09%, also exhibits a considerable degree of interconnectivity with other influential stakeholders. This indicates a robust involvement of academic and research entities, underscoring their foreseeable importance in providing expert insights, data, and analysis to inform the development and implementation of the TJTP. Overall, these findings point toward a somewhat expert-driven or "technocratic" approach to participation, prioritizing technical knowledge and economic considerations in shaping the TJTP in the Łódz Voivodeship.

1.

01. Government agencies and organizations - 4.73%
02. State-owned and public companies - 1.73%
03. Government departments - 12.43%
04. Advisory boards and technical committees - 1.27%
05. Elected officials and political parties - 1.06%
06. Investment and development banks - 1.73%
07. Tade and labor unions - 2.07%
08. Energy companies and transmission system operators - 7.93%
09. Manufacturing companies - 5.95%
10. Engineering and construction companies - 0.69%
11. Consulting and marketing companies - 5.63%
12. Professional and industry associations - 5.65%
13. Mining companies and refineries - 0.69%
14. Economic and development companies - 2.16%
15. Universities - 6.09%
16. Research institutes - 4.93%
17. Think tanks - 4.3%
18. Planning and development associations - 6.92%
19. Environmental associations - 9.22%
20. Advocacy groups and grassroot movements - 3.12%
21. Local interest groups and associations - 6.61%
22. Cultural associations - 1.4%
23. Youth associations - 1.64%
24. Civil right associations - 1.93%

Actor Percentage
Minimum: 0.6
Maximum: 25.0



2.

01. EU institutions - 2.57%
02. National government bodies - 16.82%
03. National government agencies - 0.46%
04. National elected representatives - 1.77%
05. Regional government bodies - 19.1%
06. Regional agencies - 5.63%
07. Regional government elected representatives - 1.77%
08. Communal government bodies - 10.89%
09. Communal agencies - 2.17%
10. Private Sector - 14.56%
11. Civil Society - 11.34%
12. Social Partners - 4.69%
13. Scientific Community - 8.16%

Actor Percentage
Minimum: 0.4
Maximum: 30.0

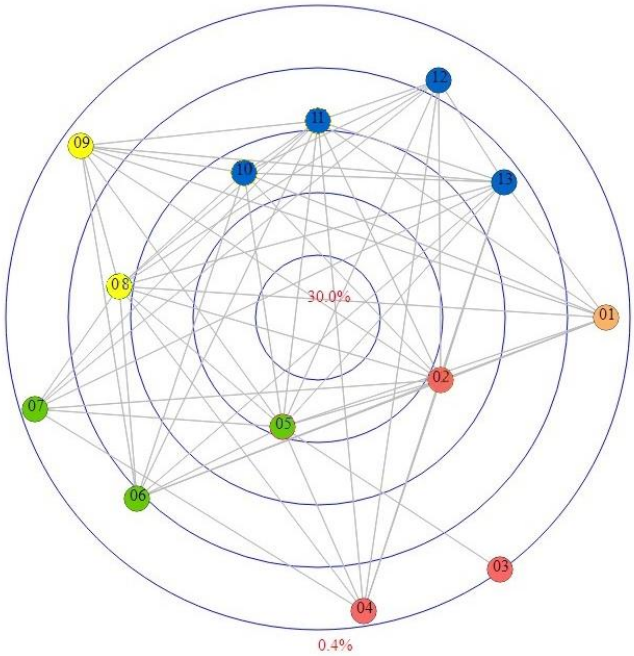


Figure 19. Networks of participants within the scope of the Territorial the TJTP for the Łódzkie Voivodeship, Poland

The integration of civil society entities within the policy network of the TJTP is somewhat limited, with only a few specific organizations having a significant presence. Notably, environmental associations stand out with the second-highest centrality score at 9.22%. This prominence indicates that perspectives related to ecological issues from the third sector are likely to be represented in both the development and implementation of the TJTP. Regional planning and development associations such as BKPPT or ŁARR also play a notable role, evidenced by their eigenvector centrality score of 6.92%. This involvement once again underscores the rather socio-economic focus of stakeholder engagement strategies within the TJTP framework.

In the context of Bełchatów, local communities' perspectives are primarily represented through the actions of local interest groups such as Stowarzyszenie Tak dla Bełchatowa or Bełchatowska Fundacja Sprawiedliwej Transformacji, which have a centrality score of 6.61%. However, the absence of individual residents in these engagement strategies is noteworthy. This gap suggests that the stakeholder engagement strategy within the TJTP is potentially more oriented toward a technocratic approach, prioritizing organized groups and expert perspectives over direct input from individual community members.

The examination of the actor-actor matrix in the context of the TJTP shows an estimated network density of approximately 0.451[10]. This value suggests a reasonably high level of interconnectedness among the various actors involved in the policy network, where information, resource and expertise exchange are likely to be prevalent. Table 10 delves deeper into this analysis, exploring the linkages within and between different sectors and across various levels of governance.

Table 10. APES actor-actor weighted matrix in the context of the TJTP in the Lodzkie Voivodeship

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	34	4	40	22	47
Social Partners	4	0	2	1	5
Private Sector	40	2	52	31	37
Scientific Community	22	1	31	16	23
Civil Society	47	5	37	23	72

	EU level	National level	Regional level	Municipal level
EU level	0	2	2	2
National level	2	2	22	8
Regional level	2	22	18	13
Municipal level	2	8	13	2

[10]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 282 while the number of possible connections among actors amounts 625 (25*25). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{282}{625} \approx 0.451$.

The analysis of the strengths of actor-actor connections within the TJTP framework first shows notable variations in the degree of interconnectedness among different sectors. A pattern of strong ties is evident, particularly between the public sector and other key stakeholders, notably the civil society (47 connections), the private sector (40 connections) and the scientific community (22 connections). This indicates significant influence exchange between these sectors.

Table 10 further highlights relatively substantial interactions between private entities, such as energy and manufacturing companies and professional and industry associations, and scientific experts from think tanks, research institutes, or universities. This indicates that the private sector and scientific community are not only actively involved in the TJTP but are also significantly interconnected, suggesting a potential sharing of expertise and insights between the two societal spheres. Additionally, the analysis reveals significant internal ties within both the civil society and the private sector, likely enabling these sectors to effectively articulate and represent their interests in the TJTP process.

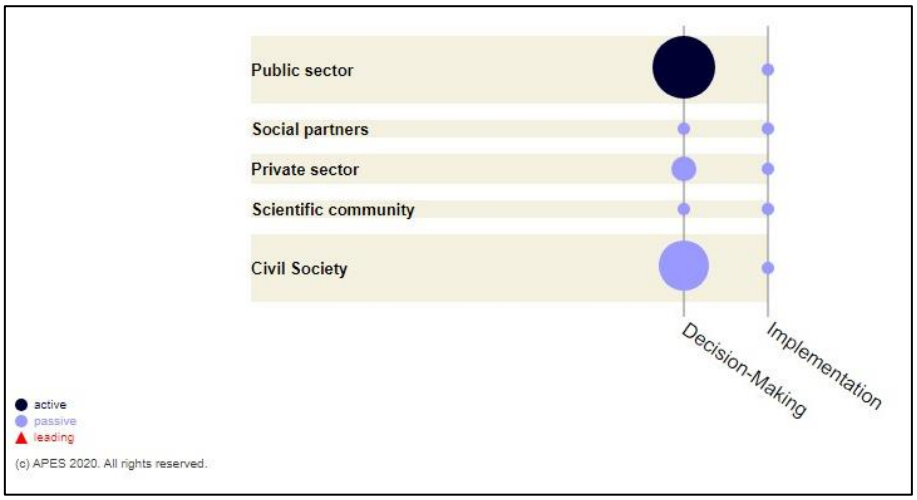
Finally, from a MLG perspective, APES indicates that the strongest interactions occur between national and regional government levels. Such a pattern reflects the critical role of these levels in steering the overall direction of the transition plan. Additionally, the interaction between regional and municipal levels is also highlighted as relatively high. The region seems to play a direct oversight role and engage with municipalities, potentially in aspects of localized policy implementation, regional planning, and in addressing specific needs of communities.

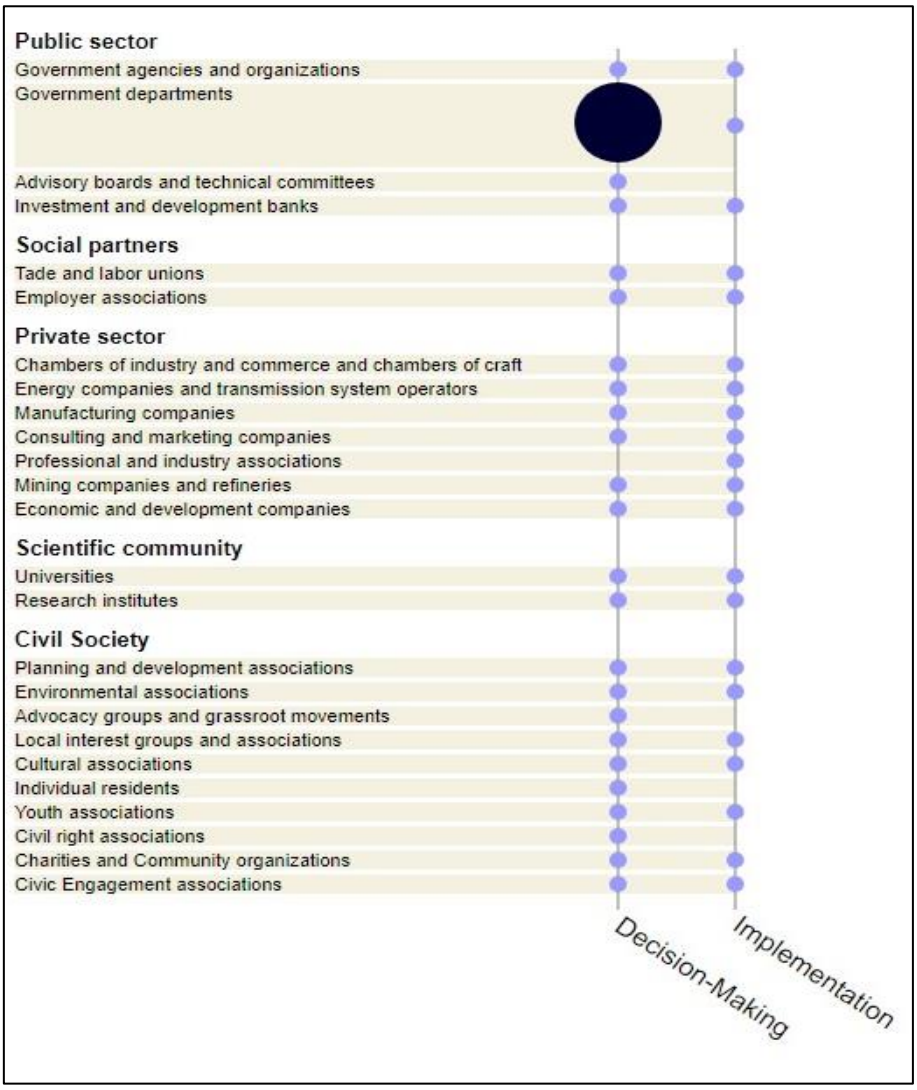
Overall, the analysis suggests that most actor-actor interactions within the TJTP occur between regional government departments, typically by the Marshal of the Łódzkie Voivodeship, and various non-state entities. This pattern of engagement highlights a significant level of influence exchange between regional authorities and non-state actors, including private sector entities, civil society groups, and scientific experts. This illustrates a rather broad and deep stakeholder involvement strategy which may contribute to incorporating a diverse array of perspectives and expertise into the decision-making and implementation processes of the TJTP.

The detailed analysis of centrality scores however reveals the substantial influence wielded by industry-relevant stakeholders, economically driven entities, and technical experts in the TJTP process. Environmental organizations and local interest groups, representing the third sector, also do contribute their perspectives, adding an essential dimension to the TJTP's discussions. However, the APES analysis also highlights a significant gap in the participation of individual citizens and local communities. Encouraging greater grassroots-level involvement could thus potentially contribute to make the policy-making process more inclusive and democratic.

4.4.2.2. The Katowice coal region

Figure 20 and Figure 21 display the APES actor participation aggregated scheme by stakeholder type and governance levels as part of the TJTP process in the Silesian Voivodeship. The exhaustive list of participants can be seen in Table 30 in the appendix section. Initially, in the decision-making phase of the TJTP, the public sector, particularly government departments, is notably dominant in both the extent and depth of their involvement. These departments are engaged in nearly 31% of all TJTP events and take a leading role in 14% of them (see Table 31), underscoring their crucial role in guiding and shaping the formulation of the TJTP for Upper Silesia. This dominant presence however seems to diminish significantly during the policy implementation phase, suggesting a notable shift in the dynamics of influence or the distribution of responsibilities among the stakeholders as the TJTP moves from the formulation stage to execution.





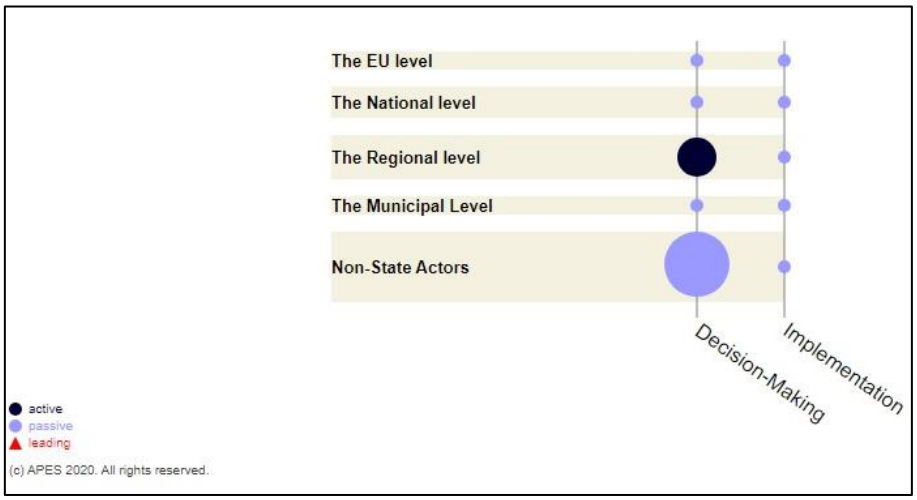
Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

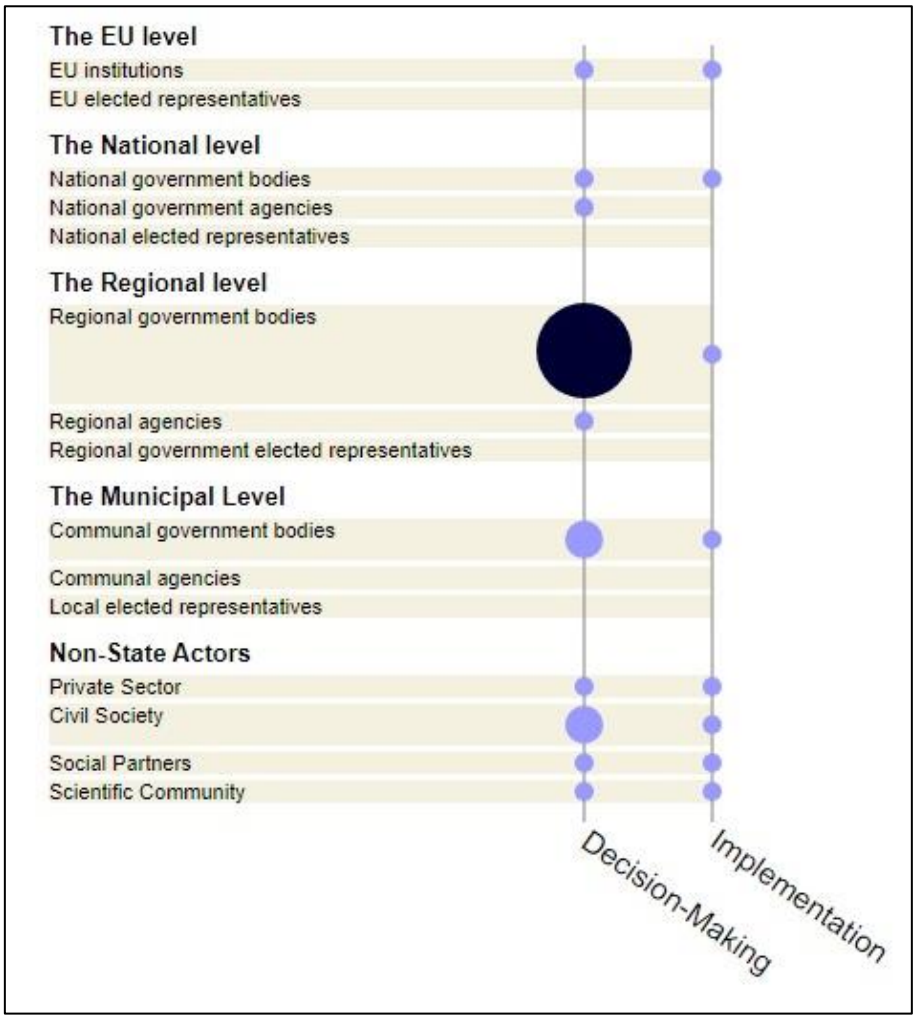
Figure 20. The APES actor participation aggregated scheme by stakeholder type as part of the of the TJTP process in the Silesian Voivodeship

Similar to the dynamics observed in the Łódz Voivodeship, the drafting phase of the regional TJTP in the Silesian Voivodeship was predominantly led by regional government bodies, particularly the Marshal Office of the Silesian Voivodeship (see Figure 21). This leadership role was supplemented by a substantial involvement of municipal government bodies, highlighting a rather decentralized policymaking approach.

The involvement of individual municipalities, such as Katowice, played a significant part in this policy-making process. Additionally, associations of local governments, such as the Silesian Union of Municipalities and Counties (Śląski Związek Gmin i Powiatów), the Upper Silesian and Zagłębie Metropolis (Górnośląsko-Zagłębiowska Metropolia), and the Association of Mining Municipalities in Poland (Stowarzyszenie Gmin Górniczych w Polsce), were integral in this phase.

Once again, the role of European institutions, particularly the EC, in the development of the TJTP seems to be more supportive and advisory rather than direct and front-line. This position is further emphasized by the EC's strategy of engaging PwC to assist the regions in formulating their TJTPs. By enlisting the expertise of firms like PwC, the EC appears to aim for synergy between its overarching guidance and the specialized knowledge of the private sector.This strategy could bolster the capabilities of regional and national governments, equipping them with the resources and insights required to formulate transition plans that not only align with EU climate and energy objectives but also effectively address the distinct circumstances and potential of each region.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 21. The APES actor participation aggregated scheme by governance level as part of the of the TJTP process in the Silesian Voivodeship

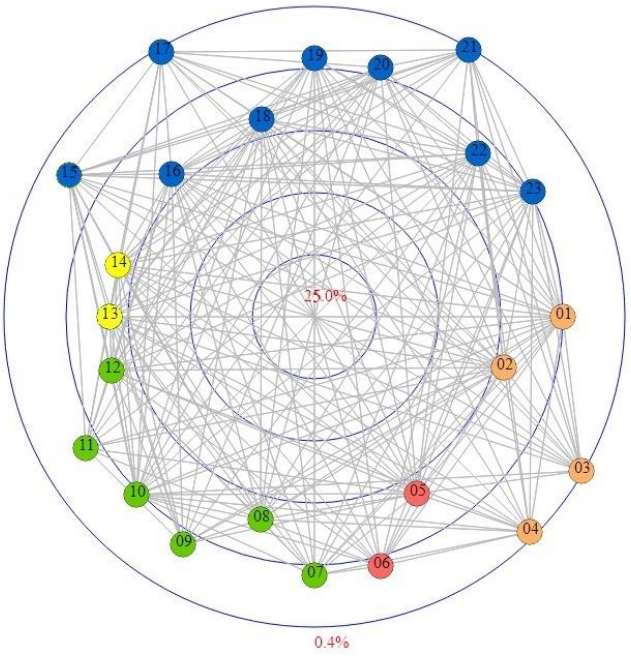
Examining the involvement of non-state actors in the TJTPs reveals significant participation from the voluntary sector and, to a lesser extent, the private sector. This active involvement likely stems from the diverse presence of various societal groups and several private enterprises contributing to the process, as indicated by the participation of 10 distinct entities from the voluntary sector and 6 different groups from the private sector. Overall, the former engaged in nearly 30% of participatory events while the latter were involved in about 22% of them (see Table 31), demonstrating their strong commitment and influence in the TJTP process.

1.

01. Government agencies and organizations - 4.26%
02. Government departments - 7.6%
03. Advisory boards and technical committees - 0.47%
04. Investment and development banks - 0.68%
05. Tade and labor unions - 7.05%
06. Employer associations - 3.63%
07. Chambers of industry and commerce and chambers of craft - 3.63%
08. Energy companies and transmission system operators - 6.67%
09. Manufacturing companies - 3.35%
10. Consulting and marketing companies - 4.04%
11. Mining companies and refineries - 3.32%
12. Economic and development companies - 6.7%
13. Universities - 7.0%
14. Research institutes - 7.13%
15. Planning and development associations - 2.08%
16. Environmental associations - 7.21%
17. Advocacy groups and grassroot movements - 0.64%
18. Local interest groups and associations - 7.05%
19. Cultural associations - 3.63%
20. Youth associations - 3.64%
21. Civil right associations - 0.47%
22. Charities and Community organizations - 5.38%
23. Civic Engagement associations - 4.06%

Actor Percentage

Minimum: 0.4
Maximum: 25.0



2.

01. EU institutions - 1.54%
02. National government bodies - 7.58%
03. National government agencies - 0.6%
04. Regional government bodies - 15.9%
05. Regional agencies - 6.77%
06. Communal government bodies - 14.12%
07. Private Sector - 13.23%
08. Civil Society - 13.95%
09. Social Partners - 12.95%
10. Scientific Community - 13.32%

Actor Percentage

Minimum: 0.6
Maximum: 30.0

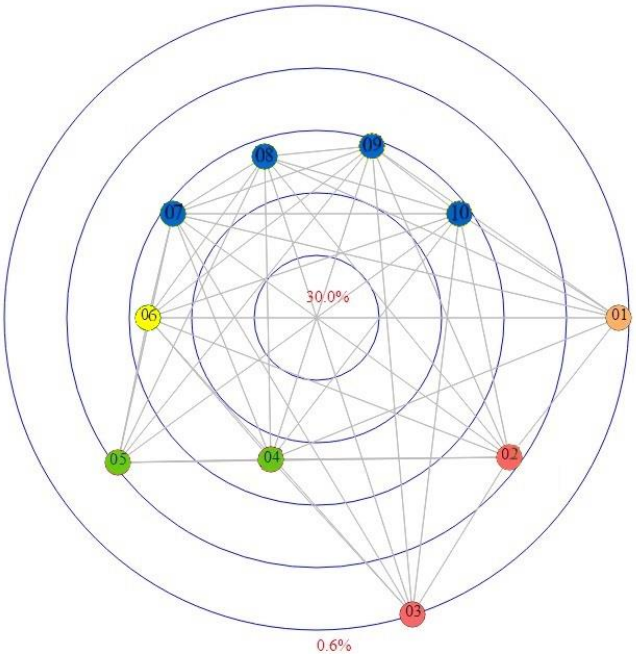


Figure 22. Networks of participants within the scope of the TJTP for Silesia Voivodeship, Poland

The analysis of actor-actor centralities within the Silesian Voivodeship's TJTP reveals a complex and interconnected network structure. With a maximal eigenvector centrality score of 15.9% (see 2. Figure 22), APES further confirms the strong influence of regional government departments, especially through the leading position held by the Marshal Office of the Silesian Voivodeship.

Municipal government bodies also display considerable influence, with centrality scores of 14.12%. This substantial presence aligns with the active involvement of associations of local governments, particularly evident during the drafting phase of the plan, making it more likely that local perspectives and needs are integrated into the TJTP.

Finally, national government bodies, such as the Ministry of Funds and Regional Policy and the Ministry of Climate and Environment, although more in the background, still show a notable level of connectivity with a centrality score of 7.58%. This suggests a notably decentralized policy landscape where the central government yet maintains an active role. Once again, it is crucial to acknowledge that the specifics of the national-local relationship cannot be determined using APES, necessitating additional examination in the field research phase of DUST in T3.2.

Focusing on the involvement of non-state actors in the TJTP reveals a more balanced spread of influence among stakeholders. The range of scores, from 0.47% to 7.6%, points to a diverse field of stakeholders, where no entity monopolizes influence within the network, and even those with lesser scores still have a role to play. This varied landscape of influence points to a policymaking environment where power is relatively well distributed across a range of societal stakeholders, likely bringing their unique interests to the table.

In the private sector, key influential entities predominantly include energy companies (6.67%), with Tauron Polska Energia, headquartered in Katowice, being a prime example. Additionally, economic and development companies (6.7%), such as Katowicka Specjalna Strefa Ekonomiczna (Katowice Special Economic Zone) and Agencja Rozwoju Przedsiębiorczości (Agency for Enterprise Development) play significant roles. These entities likely bring essential industry perspectives, economic insights, and development expertise to the elaboration and implementation of the TJTP.

Trade and labour unions are also notably well-integrated and influential within the policy network of the TJTP in the Silesian Voivodeship. Unions such as Rada OPZZ Województwa Śląskiego, PZZ KADRA, and Związek Zawodowy Górników w Polsce hold a significant position, with a centrality score of 7.05%. This level of involvement indicates the crucial role that these unions potentially play in representing the interests and concerns of workers, particularly in sectors undergoing significant changes due to the transition.

In the scientific community, experts from universities and research institutes also exhibit significant influence within the policy network with centrality scores just above 7.0%. Key institutions contributing to the TJTP process include Uniwersytet Śląski w Katowicach

(University of Silesia in Katowice), Politechnika Śląska (Silesian University of Technology), Instytut Badań Edukacyjnych w Warszawie (Educational Research Institute in Warsaw), Główny Instytut Górnictwa (Central Mining Institute), and IETU. The substantial involvement of these institutions is indicative of the TJTP's probable reliance on academic and research expertise to inform its strategies and actions.

In the voluntary sector, specific entities have a notable influence within the policy network. First, environmental associations, with a centrality score of 7.21%, play a significant role, likely injecting environmental sustainability concerns into both the drafting and implementation phases of the TJTP. Local interest groups also hold substantial sway, with a centrality score of 7.05%. Their involvement presumably plays a significant role in representing and potentially addressing the specific interests and needs of local communities in the TJTP. Additionally, charities and community associations, though to a lesser extent with a centrality score of 5.38%, contribute to the TJTP, likely bringing in perspectives focused on social welfare and community development.

The notable exclusion of individual citizens from the formulation and implementation of the TJTPs for the Upper Silesian region highlights a potential shortfall in engaging citizens at the grassroots level. However, this gap may be partially mitigated by the relatively robust representation of local interest groups and community organizations, which can serve as intermediaries for citizen interests and concerns. Despite such imbalances, the influence within the policy network seems to be distributed in a relatively even fashion among various sectors and levels of governance. This is evidenced by a policy network that is both diverse and tightly interwoven.

Table 11.APES actor-actor weighted matrix in the context of the TJTP in Silesia Voivodeship

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	50	68	158	87	222
Social Partners	68	22	137	71	171
Private Sector	158	137	296	188	416
Scientific Community	87	71	188	50	233
Civil Society	222	171	416	233	472

	EU level	National level	Regional level	Municipal level
EU level	0	3	3	3
National level	3	2	27	13
Regional level	3	27	30	48
Municipal level	3	13	48	0

A closer examination of the APES actor-actor matrix outlines a network density of approximately 0.688[11]. This high-density value further emphasizes a robust level of interconnections and interactions among the various actors involved in the TJTP framework. This suggests a highly interconnected environment, where stakeholders' participation is not only broad but also relatively deep.

Examining the APES actor-actor weighted matrix reveals intricate patterns of interaction among the diverse sectors. The public sector demonstrates extensive intersectoral connections with all the other societal spheres, particularly with the private sector (158 interactions) and the civil society (222 interactions). This likely indicates a concerted effort from government bodies to engage with and incorporate inputs from diverse stakeholders, when formulating and implementing the TJTP.

The analysis, however, also reveals substantial communication dynamics among non-state actors. This is particularly evident in the strong relationships between sector-specific private groups, such as energy and economic and development companies, and societal groups, specifically environmental associations, and local interest groups (416 interactions).

Additionally, the analysis reveals robust inter-sectoral ties between civil society and the private sector with scientific experts (with 233 interactions in the case of civil society and 188 interactions for the private sector) and social partners (171 interactions for civil society and 137 interactions for the private sector). These figures underscore a network structure marked by strong interconnections among a diverse range of actors. The involvement of scientific experts likely brings in a dimension of research-based knowledge and technical expertise, while the interactions with social partners might add perspectives related to labour, community interests, and broader social issues.

Finally, the actor-actor matrix reveals robust intra-sectoral ties within both the civil society and the private sector. Firstly, strong intra-sectoral ties within the civil society sector indicate substantial relationships among various non-governmental organizations, community groups, environmental associations, and other civil society actors, potentially enhancing their ability to articulate common goals and interests when it comes to the TJTP. Similarly, in the private sector, strong intra-sectoral ties suggest that businesses, industry associations, and economic development entities are also in contact with one another. This can lead to a more unified representation of the sector's interests and concerns in the TJTP process.

From a MLG perspective, the regional level, particularly noteworthy for its role in the TJTP, shows a high degree of connections with other levels of government. Firstly, the regional level exhibits some connections with national government bodies (27 interactions).

[11]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 430 while the number of possible connections among actors amounts 625 (25*25). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{430}{625} \approx 0.688$.

Furthermore, the regional level demonstrates even more extensive interactions with municipalities, with 48 connections noted. This high level of engagement with local governments likely underscores the regional level's critical role in facilitating the translation of the TJTP's objectives into local actions and initiatives.

Interestingly, the regional level also shows the highest number of interactions within itself, suggesting a high degree of internal coordination or activity. This could indicate robust internal communication, deemed important for maintaining a unified approach on a wide variety of policy domains targeted by the TJTP within the regional governance structure.

However, as highlighted in previous analyses, most actor-actor interactions within the TJTP appear to occur outside the realm of the state, involving non-state actors like private sector entities, civil society groups, and scientific experts. This trend suggests that while the state plays a crucial role, especially at the regional level, the TJTP's network structure is heavily characterized by multi-sectoral interactions, indicating a rather comprehensive and inclusive approach to stakeholder engagement in the transition process.

This trend is further corroborated by the actor-actor centrality scores, which reveal a tight-knit policy network structure characterized by widespread and deep participatory efforts. This network is indeed composed of influential and interconnected actors from various sectors, indicating a comprehensive level of involvement that cuts across different areas of expertise and interest. Such results suggest a complex interplay of mutual influence, which is deemed important for the multifaceted nature of policy development and implementation in complex environments like that of the TJTPs.

4.5. The Regional Development Strategy Norrbotten 2030 in Norrbotten (Sweden)

The Regional Development Strategy Norrbotten 2030 (RUS 2030) stands as a pivotal territorial policy measure in Sweden's commitment to sustainable transition. Specifically centred in Norrbotten County, which holds significance in Sweden's energy context, the RUS 2030 was developed in response to mining activities and specific environmental challenges within the region.

The RUS 2030 was developed by Region Norrbotten in collaboration with various stakeholders during the 2018. At its core, this strategy endeavors to reduce carbon emissions, promote renewable energy sources, and bolster the resilience of Norrbotten County against environmental challenges. It represents a comprehensive framework enveloping various facets of growth, sustainability, and societal advancement, intending to steer the county toward a more sustainable future.

By setting its sights on maintaining the Earth's average temperature increase below two degrees, the strategy mirrors the national ambition of achieving zero net greenhouse gas emissions by 2045. To achieve this vision, the strategy prioritizes four core areas of intervention, which are considered central to the strategy: 1) High quality of life in attractive living environments, 2) Sustainable transport and accessibility, 3) Flexible and well-functioning competency provision, 4) Smart, sustainable innovations, and entrepreneurship (Utveckla Norrbotten, 2021). These areas not only take into account how the external world affects Norrbotten, but also build upon the county's strengths, opportunities, and challenges.

This strategic plan was crafted and executed with active involvement from local communities in Norrbotten. This vision was established as a foundation for continued extensive and responsive collaboration among all Norrbotten stakeholders and serves as a basis for dialogues at the national level and with the EU, aimed at creating favourable conditions for the development of Norrbotten (Utveckla Norrbotten, 2021).

Utilizing APES for analysis, this evaluation aims to delve into the participatory processes embedded within the RUS, offering insights into the the depth and comprehensiveness of collaborative effort surrounding the elaboration of the regional strategy throughout the year 2018.

It is here important to note that while the analysis intended to include comparative insights by also covering the Regional Energy and Climate Strategy for Gotland, limitations in data accessibility and constraints within the allocated timeframe hindered its inclusion in this report.

In this perspective, it is anticipated that this case will be thoroughly examined and included in subsequent stages of the DUST project, providing a more comprehensive understanding of participatory approaches within the realm of sustainable development strategies in Swedish mining and other resource extractive regions.

4.5.1. Norrbotten County

Focused specifically on Norrbotten County, the RUS 2030 primarily addresses the critical issue of climate change. Norrbotten County, located in Sweden, is distinguished by its unique industrial landscape, characterized by extensive mining activities and a long history of iron-ore extraction. Iron ore mining has been conducted on an industrial scale in Norrbotten since the late 19th century. Currently, Norrbotten is Europe's largest iron ore producer, accounting for approximately 90% of the continent's total output.

In 2016, Norrbotten was thus responsible for 11% of Sweden's total greenhouse gas emissions, predominantly due to heavy industries such as the steel manufacturer SSAB and the mining company LKAB. Fossil fuels, mainly coal and coke used in the steel industry, made up a significant 62% of the county's energy consumption. The steel industry dominates the Norrbotten’s economy, accounting for slightly more than 10% of

all jobs in the region in 2018. This equates to approximately 6,900 individuals, most of whom are employed by the large mining operations (refer to DUST 3.1 for further details).

For the past decade, the region has grappled with several challenges, including a diminishing workforce, difficulties in attracting new residents, and growing opposition to mining due to socio-environmental issues and land use conflicts. Trade unions and civil society groups have therefore expressed concerns that Sweden's commitment to a just and sustainable transition overlooks the potential social impacts of this shift at the regional level.

To address the urgent need for a green transition, the RUS 2030 is pivotal in guiding the region towards a more sustainable energy landscape. This strategy acts as a comprehensive framework, envisioning the region's growth and development across multiple dimensions in the next decade. Its main objectives span a spectrum of ambitions, aiming to fuse sustainable growth, economic vitality, and environmental stewardship into the fabric of the region's future.

One of its primary aims is to diversify the regional economy beyond traditional sectors, fostering innovation and entrepreneurship across industries. The strategy aims to create an innovation-friendly environment, supporting research, development, and innovation in areas such as sustainable energy, ICT, and healthcare. By encouraging entrepreneurship and fostering innovation hubs, the strategy seeks to reduce dependence on traditional industries and enhance economic resilience.

In line with sustainability goals, the strategy emphasizes environmental stewardship and sustainable development. It aims to promote a green transition by encouraging the adoption of renewable energy sources, implementing sustainable practices across industries. Preserving biodiversity, protecting natural resources, and reducing the region's carbon footprint are moreover key targets within the RUS 2030 to ensure sustainable growth in the region while protecting the environment.

The active engagement of diverse stakeholders has been integral to the strategy’s development and implementation, ensuring that these multifaceted facets of the RUS 2030 are rooted in inclusive strategies that consider varied perspectives, expertise, and local insights. In this vein, Region Norrbotten orchestrated an array of engagement initiatives, fostering an environment conducive to diverse voices and perspectives.

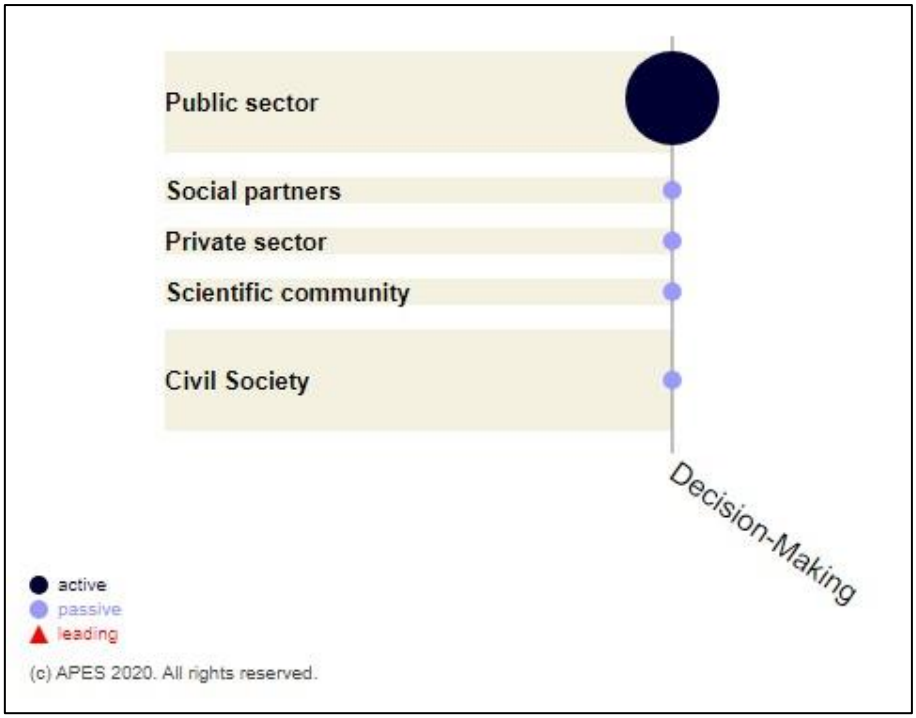
These initiatives comprised extensive consultations, workshops, and engagements initiatives purposefully inviting representatives from local governments, businesses, academic and research experts, civil society, and residents across Norrbotten municipalities. These participatory processes facilitated the identification of regional priorities, challenges, and aspirations, providing a holistic understanding of the regional landscape.

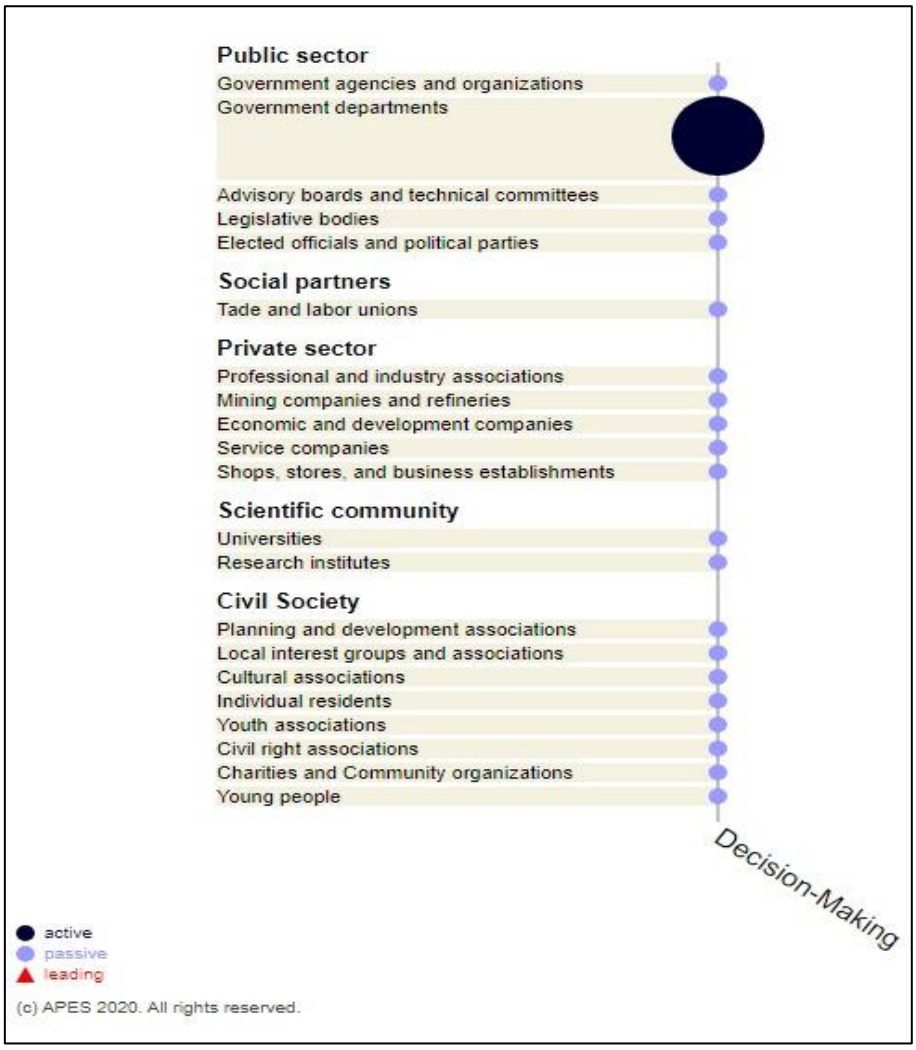
Given the regional strategy's emphasis on collaboration, our evaluation concentrates on the depth and inclusivity of stakeholder participation in the development phase of the RUS 2030 between 2018 and 2019. This APES-centred analysis is crucial for assessing the nature and extent of stakeholder engagement strategies in the context of just sustainability transitions in Sweden.

4.5.2. Outcomes and findings

This section delves into the evaluation of engagement strategies deployed during the decision-making phase of the RUS 2030 in 2018. It is crucial to highlight that this analysis primarily focuses on the decision-making phase due to data limitations concerning the policy implementation stage.

Figure 23 and Figure 24 present a detailed overview of the quantitative and qualitative involvement of distinct stakeholder by sectors and governance levels within the policymaking phases of the RUS 2030. The exhaustive list of participants can be found in Table 32 in the appendix section. Upon initial observation, the policymaking process reflects a broad and diversified engagement strategy spanning different societal actors (trade and labour unions, industrial groups, scientific experts, voluntary sector organizations and individual citizens). This approach is led by public sector entities altogether engaged in more than 78% of all participatory events (see Table 33), and most notably by government departments.





Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 23. The APES actor participation aggregated scheme by stakeholder type as part of the RUS 2030 in Norrbotten County

An in-depth examination of the APES actor participation aggregated scheme, categorized by governance level, reveals the predominant role of regional government bodies in the drafting phase of the RUS 2030. This prominence is largely attributed to Region Norrbotten spearheading most participatory processes. Alongside Region Norrbotten, the County Administrative Board (Länsstyrelsen i Norrbotten) also played a key role in the efforts to develop the RUS 2030.

Note. The presence of 'leadership' or leading organization(s) was not explicitly identified in this context.

Figure 24. The APES actor participation aggregated scheme by governance level as part of the RUS 2030 in Norrbotten County

The actor-actor centrality target diagram emphasizes a pronounced concentration of influence among government departments and agencies. More specifically, APES further highlights the dominant role of regional government bodies, which have the highest eigenvector centrality scores at 27.25% (see 2. Figure 25). This prominence is expected in the context of a regional development strategy that sets social, economic, and environmental objectives aligned with Agenda 2030 for Norrbotten County. Notably regional government bodies, in particular Region Norrbotten, exhibits high interconnectivity with Norrbotten's fourteen municipalities (Arjeplog, Arvidsjaur, Boden, Gällivare, Haparanda, Jokkmokk, Kalix, Kiruna, Luleå, Pajala, Piteå, Älvsbyn, Överkalix, and Övertorneå).

As a result, municipal government bodies, generally through the involvement of the association of municipalities 'Norrbottens Kommuner', demonstrate the second highest centrality score at 22.9%, indicating their strong influence on the elaboration of the RUS 2030. Furthermore, local elected representative, particularly the mayors of Norrbotten's municipalities, also demonstrate notable interconnectivity within the policy network with a centrality score of 5.63%. This seemingly reflects a regional commitment to incorporating local perspectives in the process.

A focused analysis of non-state actors' participation reveals that private entities, voluntary sector organizations, and trade unions are more loosely connected within the policy network. Although influence distribution among different sectors is relatively balanced, it remains low, predominantly falling around the 1.42% mark (see 1.Figure 25). Universities however notably stand out with a commanding eigenvector centrality value of 9.95%, signifying the substantial influence of scientific expertise on the development of the RUS 2030.

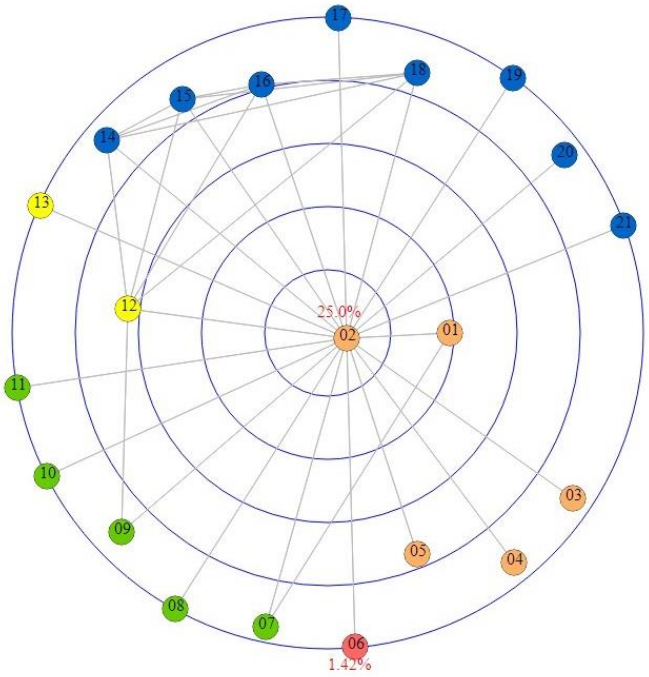
Moreover, certain civil society organizations, such as cultural associations, youth organizations and local interest groups equally show a higher degree of interconnectivity within the policy network, with centrality scores of respectively 5.73% and 4.39%. This suggests an active participation of local communities, typically the youth as well as cultural and ethnic minorities, in shaping the region's future strategy.

However, beyond these specific organizations, other stakeholders — encompassing a wide array of private and civil society actors like professional and industry associations, mining and economic development companies, service providers, individual residents, charities, and trade and labour unions — if involved, tend to hold more peripheral positions in the policy network and therefore exhibit considerably lower levels of influence on the RUS 2030 process.

1.

01. Government agencies and organizations - 15.85%
02. Government departments - 23.46%
03. Advisory boards and technical committees - 2.85%
04. Legislative bodies - 2.85%
05. Elected officials and political parties - 7.13%
06. Tade and labor unions - 1.42%
07. Professional and industry associations - 2.5%
08. Mining companies and refineries - 1.42%
09. Economic and development companies - 3.52%
10. Service companies - 1.42%
11. Shops, stores, and business establishments - 1.42%
12. Universities - 9.95%
13. Research institutes - 1.42%
14. Planning and development associations - 3.06%
15. Local interest groups and associations - 4.39%
16. Cultural associations - 5.73%
17. Individual residents - 1.42%
18. Youth associations - 4.39%
19. Civil right associations - 1.42%
20. Charities and Community organizations - 2.85%
21. Young people - 1.42%

Actor Percentage
Minimum: 1.42
Maximum: 25.0



2.

01. National government bodies - 3.4%
02. National government agencies - 3.75%
03. Regional government bodies - 27.25%
04. Regional agencies - 8.35%
05. Regional government elected representatives - 1.87%
06. Communal government bodies - 22.9%
07. Local elected representatives - 5.63%
08. Private Sector - 7.7%
09. Civil Society - 10.23%
10. Scientific Community - 7.93%

Actor Percentage
Minimum: 1.8
Maximum: 30.0

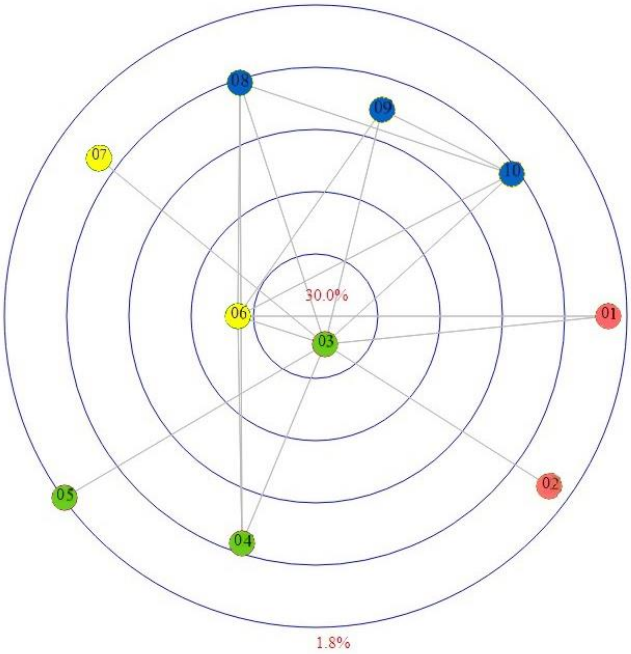


Figure 25. Networks of participants within the scope of the RUS 2030 Norrbotten, Sweden

This rather low level of connectivity or interaction among the entities involved in the policy network is substantiated by the overall network density of approximately 0.145[12]. This figure implies a sparse network where interactions between stakeholders are limited, potentially indicating certain voices or perspectives might be underrepresented or marginalized in the decision-making process.

Analysis of actor-actor interactions within the Norrbotten 2030 strategy reveals that most connections are intra-sectoral, as detailed in Table 12. Predictably, the public sector shows significant internal ties and maintains relatively active connections with other sectors, particularly with the civil society. However, the minimal level or absence of interactions among various non-state actors points to a deficiency in inter-sectoral cooperation. This underscores the potential need for initiatives that encourage wider engagement and cooperation among these entities.

From a MLG perspective, there are notably higher levels of integration between the regional and municipal levels (30 interactions), as well as within the regional level itself. This suggests that these governance layers are more effectively synchronized in their efforts and communication, potentially leading to more cohesive and aligned policy implementation and strategy development. The somewhat frequent interactions between these levels, could facilitate the effective addressing of regional and local concerns and priorities within the scope of the RUS 2030.

Table 12.APES actor-actor weighted matrix in the context of the RUS in Norrbotten County

	Public Sector	Social Partners	Private Sector	Scientific Community	Civil Society
Public Sector	40	1	7	7	13
Social Partners	1	0	0	0	0
Private Sector	7	0	0	1	0
Scientific Community	7	0	1	0	4
Civil Society	13	0	0	4	12

	National level	Regional level	Municipal level
National level	0	6	2
Regional level	6	18	30
Municipal level	2	30	0

[12]Within the APES actor-actor matrix, the standard matrix counts the 1 in case of a relation and 0 in case of no relation. The total number of non-zero values is here 64 while the number of possible connections among actors amounts 441 (21*21). With density = $\frac{Total\ non-zero\ values}{Total\ possible\ connections} = \frac{64}{441} \approx 0.145$.

The APES analysis of the RUS 2030 indicates that the policy-making process is primarily driven and negotiated by public entities. This involves strong ties and connections among regional administrative bodies (Region Norrbotten and Länsstyrelsen i Norrbotten) and various municipal offices and mayors of Norrbotten. However, the observation that non-state entities (with the exception of scientific experts), if present, are more loosely integrated within the policy network may affect the degree to which these non-governmental stakeholders can contribute to and shape the RUS 2030.

Overall, our findings reveal a largely government-led policy network, with regional government bodies and agencies holding significantly higher centrality scores and driving the policy agenda. While local community opinions are likely channelled by mayors and notably active grassroot organizations such as cultural and youth associations or local interest groups, there remains a marked underrepresentation of individual citizens and community organizations. This pattern points towards a potential area for growth in enhancing inclusiveness and cultivating deeper engagement with a wider array of stakeholders when it comes to the formulation and implementation of the RUS Norrbotten 2030.

In exploring actor participation, varying degrees of involvement were observed across regions, indicating both strengths and potential areas for enhancement in engagement strategies. While some regions demonstrated a diversified assembly of actors, showcasing a multifaceted approach to policymaking and implementation, others depicted more limited involvement, particularly among certain societal groups and non-state entities.

The examination of actor-actor centralities unravelled hierarchical structures within policy networks, emphasizing the dominance of specific entities, primarily governmental bodies, and sector-specific stakeholders. These analyses revealed disparities in influence distribution, highlighting the pivotal roles played by governmental departments and select sector representatives in shaping policy discourse and direction.

Furthermore, the assessment of network density offered insights into the intensity of connections and ties among different actor categories. While some regions showcased a low level of interconnectedness, indicating moderate relationships among various sectors, others revealed stronger ties between specific stakeholders, signalling potential for reinforced engagements among less actively involved entities.

Transitioning toward the subsequent phase of this report, our focus shifts to cross-country and within-country comparative analyses. These comparative investigations aim to illuminate similarities and differences among the examined EU regions to potentially unravel underlying trends, identify best practices, and discern opportunities for improvement in stakeholder engagement strategies in the context of just sustainability transitions.

5. Comparative analysis of stakeholder engagement strategies for just sustainability transitions

In the preceding section (section 4), we catalogued the nuances of stakeholder engagement within individual case studies, focusing on their approaches to fostering just sustainability transitions in seven structurally weak EU regions. In this section, a comparative analysis is presented, juxtaposing the previously outlined case-specific results to distil the overarching patterns of stakeholder participation in the place-based just transition policies and derive general conclusions about stakeholder engagement strategies.

This analysis, therefore, concentrates on actor-actor centrality scores to elucidate the breadth and depth of stakeholder engagement, paying particular attention to the roles and participation of community-based organizations and individual citizens. These entities are often at the forefront of experiencing the impacts of policy shifts and are vital to the realization of a transition that is both just and sustainable. To enable meaningful comparisons, centrality scores visualized in target diagrams were once again normalized, with a maximum of 25% for actor type analyses and 30% for MLG analyses[13].

It is here essential to stress that this work is explorative in nature. The comparative framework is constructed with the acknowledgment that our conclusions are bounded by the extent and scope of data available to us. Moreover, the diversity in the nature of policy measures presents an inherent limitation. Although our initial objective was to compare the implementation of identical policies—specifically, TJTPs —across all case studies, pragmatic constraints necessitated a deviation from this uniform approach.

Consequently, these preliminary findings are not conclusive but serve as a foundation for subsequent, more granular analyses within other DUST WPs (especially WP3) and tasks (in particular T2.4 and T3.4). For the purposes of comparative analysis, we dissect the stakeholder engagement strategies at two critical junctures of the policy cycle: firstly, the decision-making phase, where place-based policies for just sustainability transitions are conceptualized and crafted, and secondly, the implementation phase, where policies are put into action.

[13]These values were chosen according to the maximum centrality score value registered across all seven case studies: 23.46% for government departments and 27.25% for regional government bodies registered in Norrbotten County in context of the RUS 2030.

5.1. Comparing the breadth and depth of stakeholder participation in the elaboration of just sustainability transition policies

This section hones in on the breadth and depth of stakeholder participation in MLG settings as part of the elaboration of just sustainability transition policies. A comparative analysis is presented, delving into the nature and scope of stakeholder involvement across six distinct case studies, including:

- The TJTPs for Stara Zagora, the Łódzkie region and Upper Silesia;
- The StStG for the Lusatian and Rhenish Lignite districts;
- RUS 2030 for Norrbotten County.

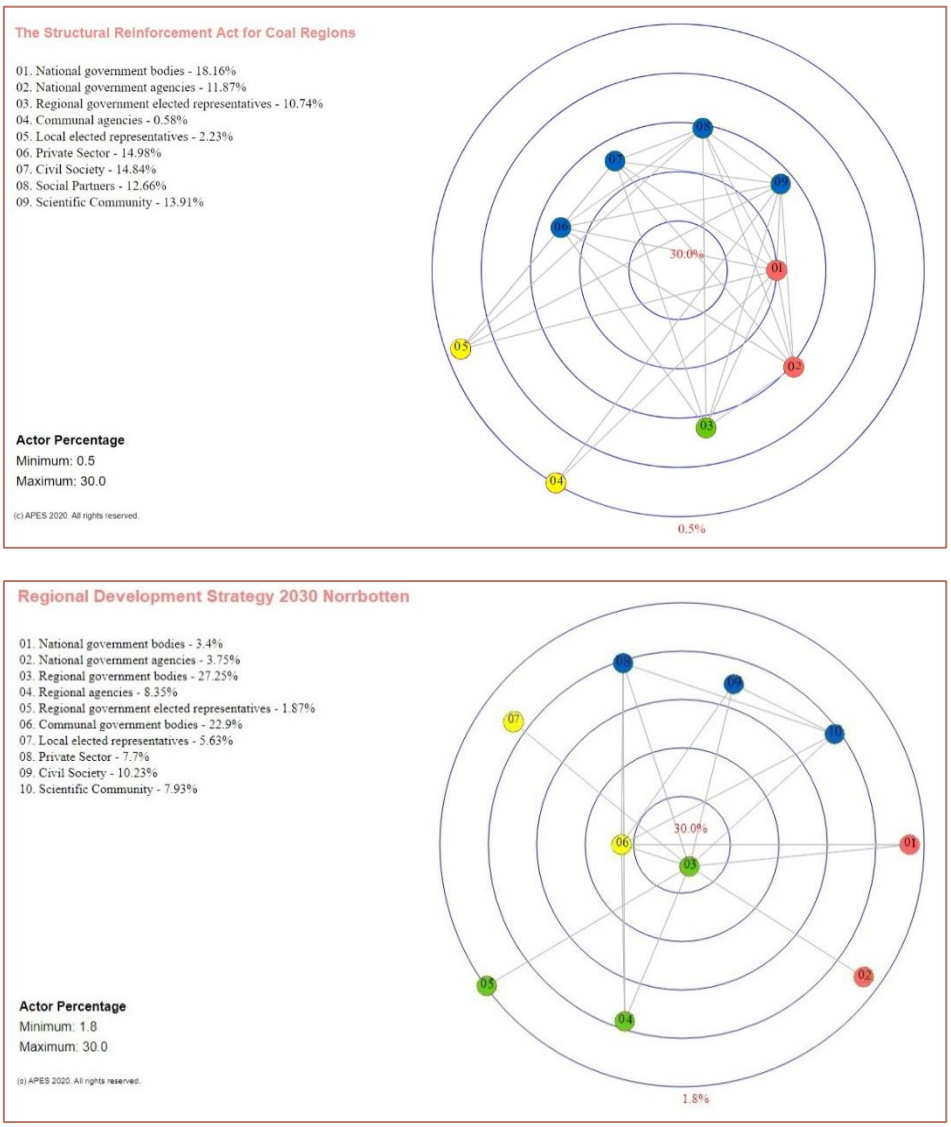
Due to the unavailability of detailed data on stakeholder involvement in the decision-making phase at the time of this writing, the NPG case could not be included here. This limitation notwithstanding, the insights gleaned from the other cases will be instrumental in understanding the dynamics of stakeholder engagement within these policy processes.

5.1.1. Examining government-led stakeholder engagement strategies in MLG settings

In the comparative analysis of just sustainability transition policies, a clear pattern emerges, highlighting the dominant role of government departments at varying levels in steering the participatory processes. This trend is first confirmed in the context of the StStG in Germany and the RUS 2030. Participatory processes in the scope of the StStG, as indicated by Figure 26, are heavily dominated by national government bodies. The high centrality scores for national government bodies (18.16%) and agencies (11.87%) underlines the centralized approach inherent to the federal nature of this policy framework, initiated and directed at the national level. The act, by its nature, calls for a significant degree of coordination with regional governments in coal-reliant regions, which likely explains the relatively high centrality score of the Länder representatives.

Similarly, the RUS 2030 Norrbotten is marked by the prominence of regional government bodies. This is consistent with the policy's focus on addressing the specific needs and aspirations of Norrbotten County. The regional government bodies and agencies, as demonstrated by their centrality scores of respectively 27.25% and 8.35%, are highly present in participatory processes taking place during the decision-making phase. These occur mainly in coordination with municipal government bodies, which may suggest an alignment of the strategy with regional objectives and an attentiveness to the specific socio-economic nuances of the county.

In both instances, the engagement strategies reflect the national administrative structures and political cultures. The German federal system's predilection for national-level policy initiation contrasts with the Swedish model that often empowers regional authorities, especially in matters of regional development. The evident variance in these strategies is a testament of how policy development processes reflect their governance contexts. The Actor-Process-Event scheme in the development of the StStG in Germany and the RUS 2030 for Norrbotten thus offer clear examples of how participation within the realm of policy formulation is shaped by the level of government responsible for its inception.



Note. In the graphical representation above, the colour coding of the nodes is as follows: orange denotes EU organizations, red indicates national bodies, green is used for regional entities, yellow represents the municipal level, and blue signifies non-state actors. This colour coding is consistent and applies to all target diagrams presented throughout the report.

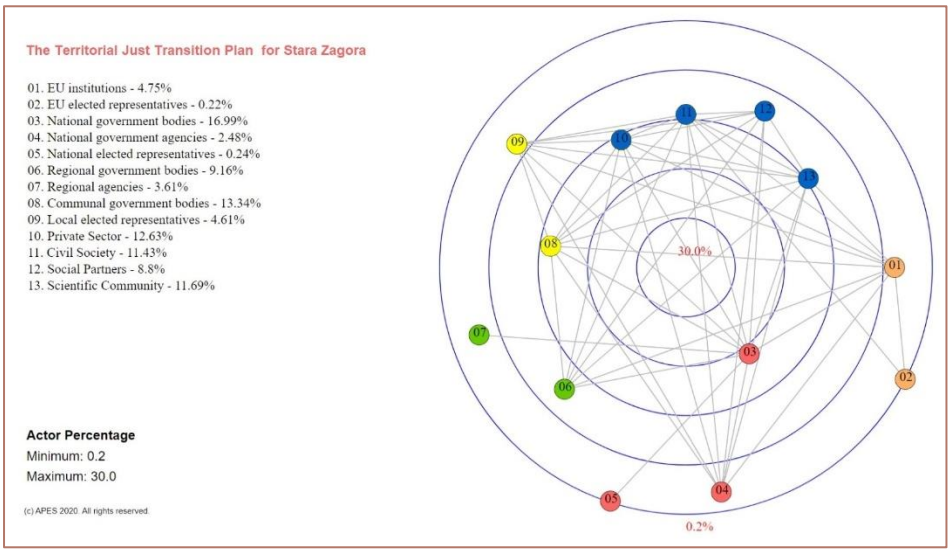
Figure 26. Government-led engagement strategies in the development of the StStG and the RUS 2030 policies

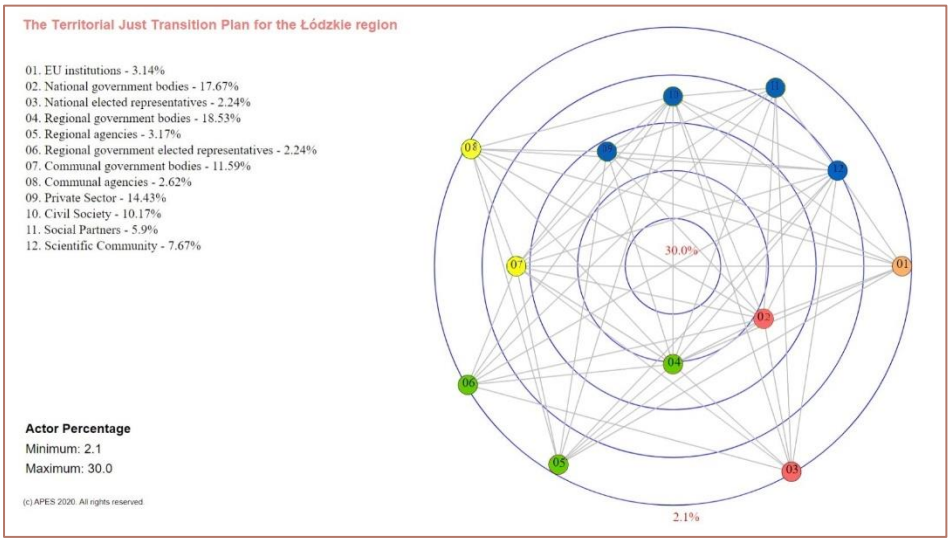
If the specific case of TJTPs further confirms the dominant role of government departments at varying levels in steering the participatory processes, it also offers a more nuanced perspective on the complex dynamics of governance that underlies the pursuit of just sustainability transitions (see Figure 27). Echoing the pattern observed with Germany's StStG, the TJTP for Stara Zagora is similarly influenced by a strong hand from national government bodies, which hold a 16.99% centrality score. This central guidance is complemented by significant input from municipal government bodies (13.34%), hinting a rather balanced approach where national directives are interwoven with local concerns and aspirations during the policy-making process.

In the case of the the development of regional TJTPs in Poland, APES unravels distinct patterns. Firstly, in the context of the Łódzkie Voivodeship, regional government bodies seem to take a slightly more prominent role in participatory processes (18.53%) despite a near-equally strong national government's presence (17.67%). These findings suggest a similar presence of central and regional governments, likely mirroring the relatively strong position of the regions in the Polish territorial administration system, especially when it comes the EU Cohesion Policy.

Furthermore, there is a notable level of coordination with municipal government bodies, which also demonstrate a meaningful role with an 11.59% centrality score. Such a distribution of engagement underscores a multi-tiered approach to policy development, where different layers of government are involved to a significant degree in the elaboration of the transition plan.

Secondly in the case of Upper Silesia, the engagement strategy for the TJTP reveals once again a pronounced role for regional government bodies (16.18%) and agencies (8.72%). These figures indicate that regional authorities are at the forefront of the participatory processes, together with municipal governments, which also exhibit a significant level of engagement at 13.83%. In contrast to the stronger national influence seen in other regions, national government bodies have a lesser centrality score of 8.41%, suggesting that while maintaining a certain level of central oversight, they played a somewhat more reserved role in the plan's development. This shift towards a more decentralized governance model might reflect a closer alignment with specific local economic and social contexts that the regional and local bodies are inherently more attuned to.





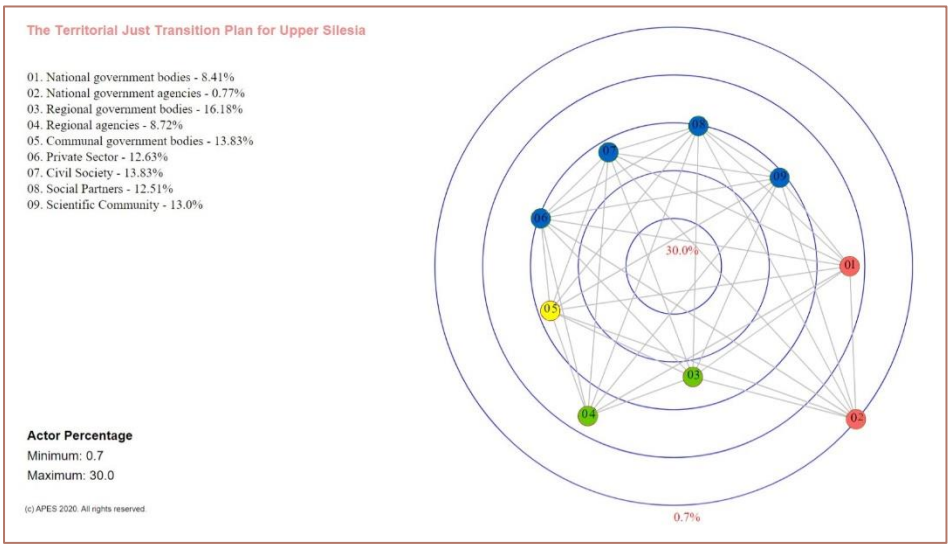


Figure 27.Government-led engagement strategies in the development of TJTPs

Despite being under the same EU policy framework, TJTPs exhibited divergent developmental patterns across the examined regions within the EU. The nuances that set the Polish regions of Łódzkie and Silesia apart could stem from unique local challenges and conflicts, the nature of which requires further investigation in T3.2 to be fully understood. Meanwhile, the contrast in the policy development approach between Stara Zagora in Bulgaria and these Polish regions likely points to the influence of their respective governance systems and political cultures.

Bulgaria's governance, characterized by its unitary nature, often sees the central government in Sofia exerting considerable oversight over national policies, including policies promoting regional development and environmental sustainability. Poland presents a more hybrid system, as the country gravitated increasingly towards decentralization in the run-up and after EU accession, at least until the 2015-2023 period during which the central government sought more centralized policy government and strived to limit the autonomy of sub-national governments. The more decentralized territorial governance system makes regional and local authorities more substantially involved in the drafting of EU's cohesion policy, especially when compared to the Bulgarian context. This is especially pertinent for policies directly affecting local communities - such as TJTPs - that are pivotal in managing the economic and environmental aspects of regional sustainability transitions.

Each country's distinctive administrative structure and approach to policymaking have likely left an imprint on the design and execution of their sustainability transition policies. This is evident in the varied strategies and priorities reflected in the policies across the six EU regions under examination. Table 13 below offers a concise summary of these diverse approaches, particularly highlighting the leading organization(s) responsible for steering policy development in each region. These variations in leadership and governance styles across the six EU regions illustrate how stakeholder engagement strategies echo different national and regional contexts, accommodating diverse administrative systems and local needs within the broader framework of sustainability transitions.

For instance, the elaboration of the TJTP in Stara Zagora and the StStG in Germany predominantly featured national government-led participatory processes. This approach underscores the central role played by national entities in shaping the just sustainability policy landscape in these areas. This is particularly surprising in the German case given its highly decentralized system with substantially autonomous regions. In contrast, the RUS 2030 in Norrbotten was primarily driven by regional authorities, reflecting a governance style that places significant emphasis on regional autonomy and localized decision-making.

The development of TJTPs in the Polish regions of Łódzkie and Silesia, however, was a process with a more equal weight of the central and sub-national authorities. In Łódzkie, national, regional, and, to a lesser extent, municipal entities played a prominent role,

highlighting a multi-tiered governance approach. Meanwhile, in Silesia, partnership was more focused between regional and municipal government bodies, which indicates potential for a stronger emphasis on regional and local issues and priorities in policy development.

Table 13. Comparative overview of government leadership in sustainability policy development across EU regions

Policy Measure	EU Region	Governance approach
Territorial Just Transition Plan	Stara Zagora province (Bulgaria)	National-led policymaking
Structural Reinforcement Act for Coal Regions	Lusatian Lignite district (Germany)	National-led policymaking
Structural Reinforcement Act for Coal Regions	Rhenish Lignite district (Germany)	National-led policymaking
Territorial Just Transition Plan	Łódz coal region (Poland)	Multi-tiered policymaking
Territorial Just Transition Plan	Silesian coal region (Poland)	Decentralized policymaking
Regional Development Strategy 2030 Norrbotten	Norrbotten County (Sweden)	Decentralized policymaking

5.1.2. Examining the involvement of non-state actors in the elaboration of just sustainability transitions

Within the realm of just sustainability transitions, the roles and contributions of non-state actors are pivotal, given that these processes can have tangible social and economic repercussions in structurally weak regions heavily dependent on fossil fuels extraction and energy-intensive industries, such as those studied in the DUST project. The engagement of the market players, but also of civil society organisations and citizens themselves is important not only for finding ways to mitigate the negative impacts of the transitions but also ensure support for these changes and mobilising inputs from these parties into policies that can set the future development pathways for these regions for the decades to come. This subsection delves into the engagement of these critical players, including entities from the private sector, social partners, the scientific community, and the third sector, commonly referred to as civil society. Utilizing APES as an analytical tool, we will dissect the complexities inherent in multi-stakeholder collaborations across various regional contexts. Our comparative analysis is concentrated on examining the scope and depth of non-state actors' engagement to discern cross-case patterns regarding how stakeholders are woven into the fabric of policy development. These preliminary exploratory insights are particularly important as they offer a window into the operational dynamics of policymaking beyond the state apparatus in the regional journey towards sustainable development.

Our comparative inquiry commences with a detailed examination of the TJTPs formulated for Stara Zagora, the Łódzkie region, and Upper Silesia (see Figure 28). In these areas, the development of the TJTPs is marked by the substantial involvement of a spectrum of non-state actors from various segments of society, likely reflecting the influence of EU directives that encourage broad stakeholder participation. In all three cases, government entities have hence facilitated a relatively balanced distribution of influence among participants. This is evidenced by the relatively narrow range - around 7% - spanning the least to the most central non-state actors in terms of their centrality within the TJTP networks.

Upon closer examination of the stakeholder landscape, a notable pattern emerges across all three cases: the significant presence of industry-related entities. This includes the active involvement of chambers of commerce, energy companies, and various professional and industry associations. Additionally, the scientific community stands out as a key collaborator in all three regions, likely indicating a strategic orientation towards data-driven and scientifically informed policy design in the drafting phase of TJTPs. This points to a decision-making framework that leans heavily on technical expertise and economic considerations.

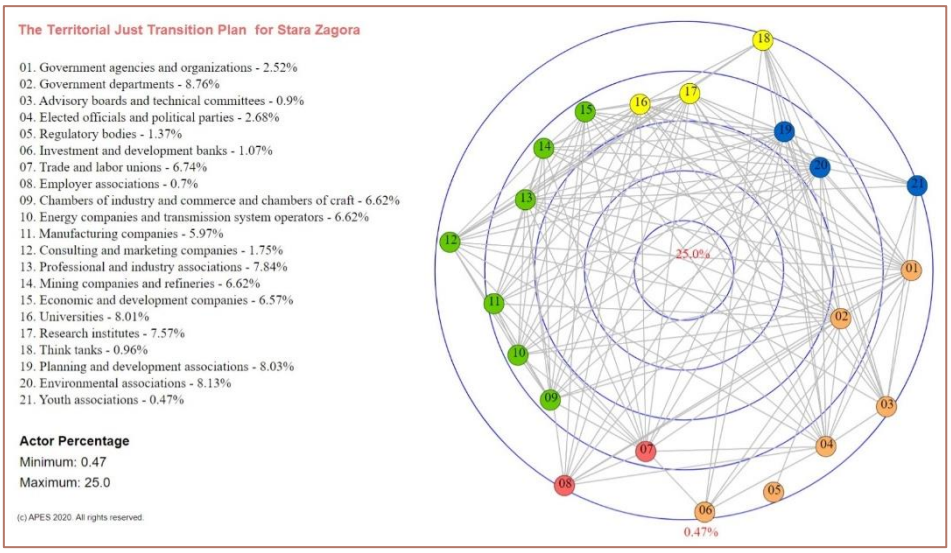
During the development of the TJTPs, active participation was also observed from private groups, which often assumed consultative and advisory roles, particularly in relation to the socioeconomic aspects of these policies. For instance, economic development companies were notably involved in Stara Zagora and Upper Silesia, while consulting and marketing firms, prominently PwC, played a significant role in the Łódzkie region. These entities presumably provided expertise and insights, especially where economic considerations intersected with the goals of the transition plans.

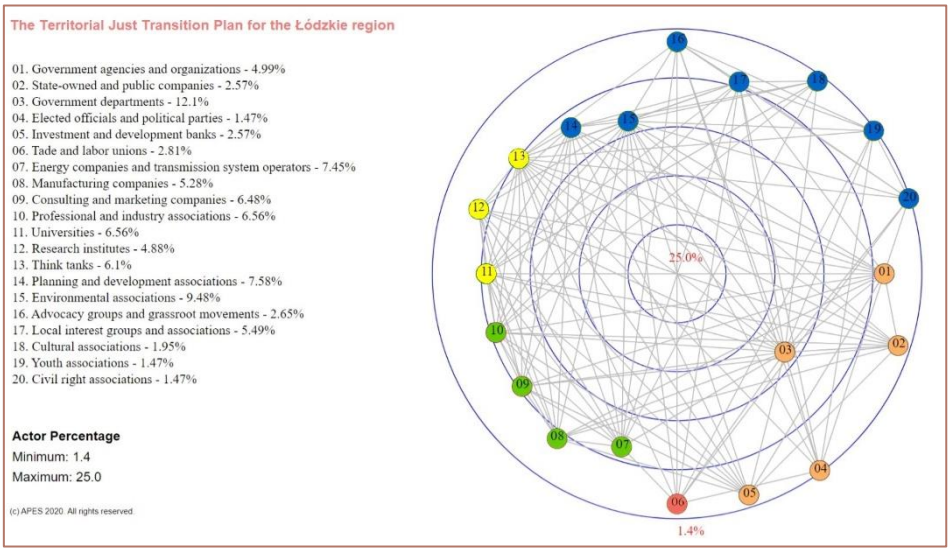
This strong emphasis on aligning the transition plans with economic imperatives was further reinforced by the considerable engagement of labour unions in the formulation of TJTPs within Stara Zagora Province and Upper Silesia, as evidenced by their centrality scores approaching 7%. This substantial engagement underscores the significance attributed to the transition's influence on employment, suggesting that employment-related factors held a central position in the decision-making processes within these two regions.

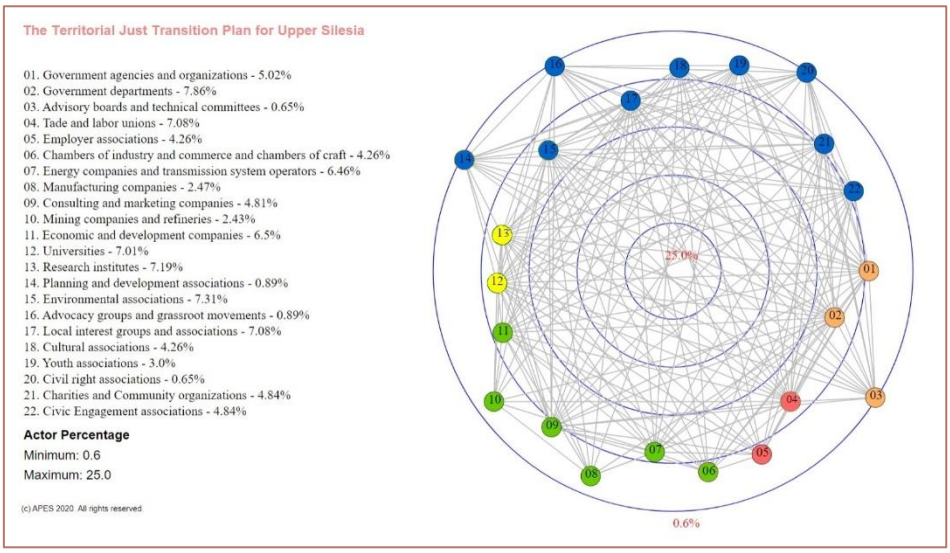
Variations are most apparent in the involvement of the voluntary sector. Environmental associations prominently participate in the decision-making processes across all three regions, suggesting a strong likelihood of environmental considerations being integrated into the policies. In Stara Zagora and the Łódzkie region, regional and local development associations also feature prominently, with centrality scores of respectively 8.03% and 7.58%. Yet, in these regions, other more community-centric groups have a relatively more peripheral connection to the policy network. This suggests that the stakeholder engagement strategy led by governmental organizations leans towards a more

technocratic and economically driven approach, prioritizing the expertise of specialists and the economic ramifications of the transition policies.

In Upper Silesia, the level of engagement from community-based stakeholders is notably more pronounced compared to the other regions examined. Local interest groups and associations in Upper Silesia are particularly active, as reflected by their high centrality scores of 7.08%. Additionally, charities, community organizations, and civic engagement associations display substantial participation in the policymaking process, each with centrality scores approaching the 5% mark. In Upper Silesia, this heightened engagement from grassroots entities and local collective initiatives is thus likely to counterbalance the rather technocratic and industry-focused orientation of the TJTPs, injecting the perspectives and interests of local communities into the equilibrium of the policy-making process. Uncovering which were the factors enabling that stronger engagement of the civil society organisations in Upper Silesia is a task for field research in T3.2. It could also provide valuable lessons for other regions implementing TJTPs.







Note. In the graphical representation above, the colour coding of the nodes is as follows: orange denotes public entities, red indicates social partners, green is used for private entities, yellow represents the scientific community, and blue signifies civil society. This colour coding is consistent and applies to all target diagrams presented throughout the report.

Figure 28. A comparative perspective on non-state actors' involvement in the development of the TJTPs

Juxtaposing the TJTP case studies against the development of the national StStG in Germany reveals similar patterns of non-state actor engagement, especially with the Upper Silesia region (see Figure 29). Both instances exhibit a diverse spectrum of participation among non-state entities, highlighted by a significant range of influence within the policy network. In the German context, this range spans from planning and development associations, which hold a relatively modest centrality, to environmental associations that emerge as the most central non-state actors with a difference of 7.51%. This demonstrates a multifaceted involvement where various stakeholders, including social partners, private sector entities, academic organizations, and civil society groups, contributed to the shaping of the policy, echoing the comprehensive nature of stakeholder engagement similar to that observed in the TJTP of Upper Silesia.

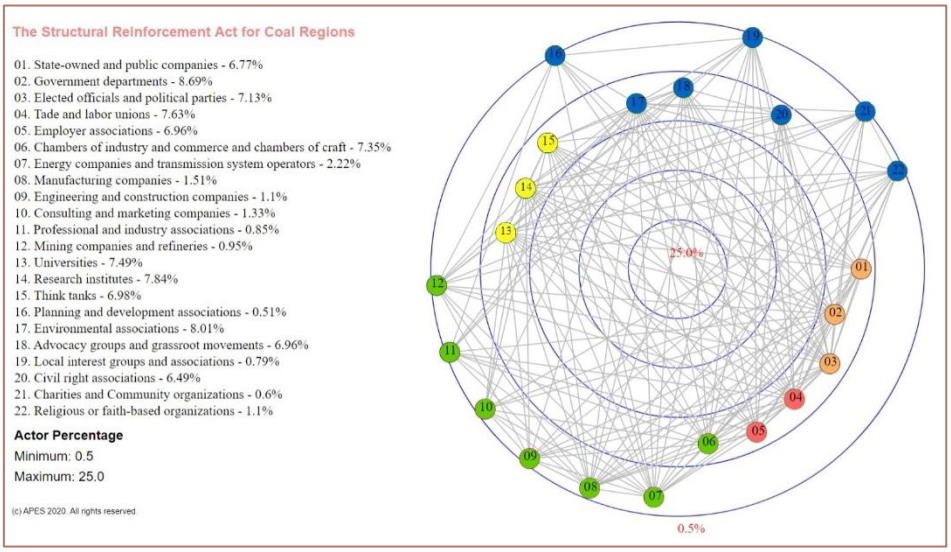
In the context of Germany's StStG, non-state actors exert their influence through well-established, formalized channels, mirroring the nation's corporatist policymaking culture. Here, trade and labour unions alongside employer associations, with eigenvector centrality scores of respectively 7.63% and 6.96%, play a significant role in shaping the decision-making process. Their active participation enhances the likelihood that the social implications of economic transitions, especially those related to labour and employment rights, receive due consideration. Similarly, the voices of industry are presumably prominently represented through Chambers of Industry and Commerce and Chambers of Craft, which hold a notable centrality of 7.35% in the policy network of the StStG, highlighting their substantial input in policy discourse.

Mirroring the trend observed in the creation of TJTPs, the scientific community - represented through universities, research institutes, and thinktanks - played a

prominent role in the development of Germany's StStG. This reflects a policy framework that tends to value expert knowledge and research-driven insights to inform its course. Furthermore, the significant centrality score of 8.01% for environmental associations suggests their influence in the policymaking arena, implying that their involvement increases the likelihood of environmental considerations being more prominently addressed in the discussions. However, it is important to note that while APES indicates a stronger presence of environmental groups in policymaking, its direct impact on policy outcomes remains to be proven in more in-depth analyses.

Finally, similarly to the Upper Silesian region, the perspectives of local communities within the German StStG are seemingly significantly represented through active participation from entities such as advocacy groups and grassroots movements, which hold a centrality score of 6.96%, and civil rights associations, with a score of 6.49%. Additionally, as highlighted in the preceding subsection, the concerns and interests of local communities are further channelled through the involvement of regional and municipal elected representatives, demonstrating a commitment to incorporating localized input and aligning with the needs and aspirations of the affected populations.

This pattern reaffirms a conventional yet inclusive policy-making approach in Germany where the state leads, underpinned robustly by corporatist structures across industry, academia, and civil society. Such a corporatist dynamic showcases a predilection for well-established channels and expert-led contributions within the policy-making process, making it more likely that decisions are informed by a blend of practical industry insights, scientific rigor, and societal considerations.



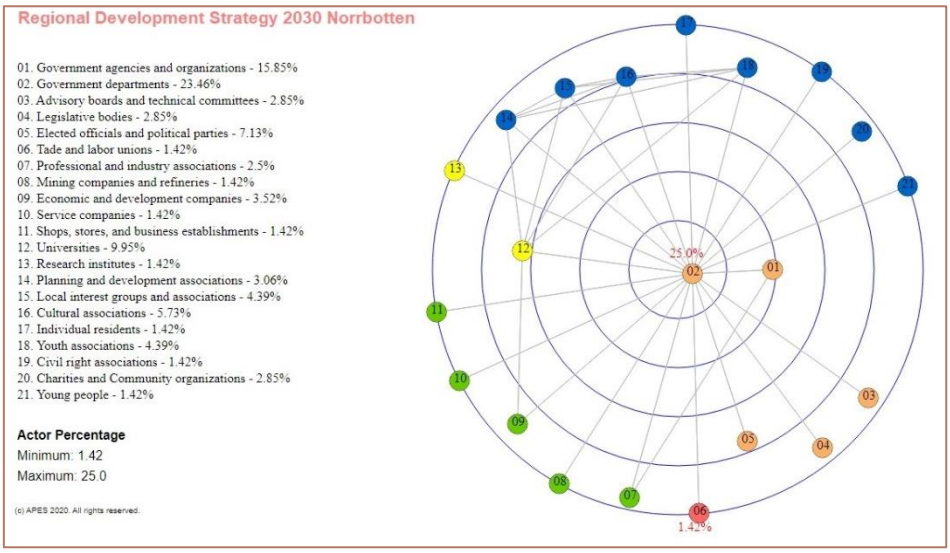


Figure 29.A comparative perspective on non-state actors' involvement in the development of the StStG and RUS 2030

A drastically different approach from the development of TJTPs and of the StStG was taken within the realm of the RUS 2030. In this case, the policy network appears to be significantly less densely interconnected than in the other regions. The elaboration of this regional strategy is characterized by the dominance of regional and municipal government agencies (15.85%) and departments (23.46%). Non-state actors, however, assumed a more peripheral role in shaping this policy, collectively contributing an average centrality score of merely 3%. This divergence seemingly aligns with Sweden's decentralized structure highlighting a governance model where the regional and municipal levels take precedence, relegating non-state actors to a less influential position in the policy-making landscape.

Some specific entities nevertheless stand out. Universities emerge as notable contributors with a substantial eigenvector centrality score of 9.95%, once again underscoring the pivotal role of scientific expertise in shaping just sustainability transition policies. Additionally, the presence of specific civil society organizations, such as local interest groups (4.39%), cultural associations (5.73%), and youth associations (4.39%), signals a somewhat participatory approach that emphasizes the significance of localized knowledge and community-centric viewpoints. This approach is further exemplified by the substantial involvement of mayors (7.13%) in representing the perspectives of their respective communities in the policy-making process.

Each case study points to a different balance in the tripartite relationship between the state, the private sector and the civil society. While the state undoubtedly plays a pivotal role, the diversity in non-state actor engagement across these case studies underscores how stakeholder engagement strategies are influenced by specific governance and regional contexts.This tailored approach speaks to the complexity of just transition processes, which require the integration of diverse perspectives and expertise.

The substantial role of the scientific community across all regions underscores the grounding of sustainability transitions in knowledge and expertise. Moreover, the predominance of the private sector's involvement in Stara Zagora and the Łódzkie region highlights the emphasis on economic viability and market alignment in policy formation. In contrast, the active engagement of organized civil society groups, particularly environmental organizations, and community-based organizations, in Upper Silesia, Germany, and, to a lesser extent, Norrbotten, suggests that just sustainability transitions may encompass more than just top-down technocratic approaches but also integrate input and perspectives from the ground up.

It is worth emphasizing the striking absence or minimal involvement of individual citizens across all six regions under investigation. This highlights that while engagement strategies may emphasize inclusivity and local empowerment, there is a potential drawback. The concerns and interests of local communities are primarily channelled through organized groups or elected representatives, raising questions about the extent of direct and unmediated community influence in the policy process. The findings from this comparative analysis are synthesized in Table 14 below, offering a comprehensive overview of the nature of non-state actors' participation in the formulation of just sustainability transition policies across all six investigated regions.

Table 14. Comparative overview of non-state actors' involvement strategies in sustainability policy development across EU regions

Policy Measure	EU Region	Stakeholder involvement approach
Territorial Just Transition Plan	Stara Zagora province (Bulgaria)	Technocratic and economic-focused
Structural Reinforcement Act for Coal Regions	Lusatian Lignite district (Germany)	Inclusive and corporatist
Structural Reinforcement Act for Coal Regions	Rhenish Lignite district (Germany)	Inclusive and corporatist
Territorial Just Transition Plan	Łódz coal region (Poland)	Technocratic and economic-focused
Territorial Just Transition Plan	Silesian coal region (Poland)	Inclusive and corporatist
Regional Development Strategy 2030 Norrbotten	Norrbotten County (Sweden)	Government-led and community-oriented

The list of predominant actors within the decision-making phase of just sustainability transition policies according to their centrality scores can be found in Table 15 below. It illustrates that the composition of these actors varies significantly between regions and policy measures. For example, in some regions, national government bodies play a central role, while in others, regional or municipal government bodies take the lead. Trade and labour unions, as well as various industry associations, are commonly

involved, along with universities, research institutes, environmental associations, and advocacy groups. This table highlights the diversity of actors engaged in shaping just sustainability policies, paving the way for further in-depth analyses in T2.4, T3.2 and T3.4 to comprehensively understand the extent of their roles and contributions in the policy-making process.

Table 15. List of predominant actors within the decision-making phase of just sustainability transition policies

Policy Measure	EU level*	National level*	Regional level*	Municipal level*	Social partners**	Private sector**	Scientific community**	Civil society**
Territorial Just Transition Plan in the Stara Zagora Province	X	-National government bodies	X	-Municipal government bodies	-Trade and labour unions	-Chambers of industry and commerce -Energy companies -Mining companies -Economic and development companies	-Universities -Research institutes	-Planning and development associations -Environmental associations
Structural Reinforcement Act for Coal Regions in the Lusatian Lignite district	X	-National government bodies	X	X	-Trade and labour unions -Employer associations	-Chambers of industry and commerce	-Universities -Research institutes -Think tanks	-Environmental associations -Advocacy groups and grassroot movements -Civil right associations
Structural Reinforcement Act for Coal Regions in the Rhenish Lignite district	X	-National government bodies	X	X	-Trade and labour unions -Employer associations	-Chambers of industry and commerce	-Universities -Research institutes -Think tanks	-Environmental associations -Advocacy groups and grassroot movements -Civil right associations
Territorial Just Transition Plan in the Łódzkie Voivodship	X	-National government bodies	-Regional government bodies	X	X	-Energy companies -Consulting companies -Professional and industry associations	-Universities -Think tanks	-Planning and development associations -Environmental associations
Territorial Just Transition Plan in the Silesian Voivodship	X	X	-Regional government bodies	-Municipal government bodies	-Trade and labour unions	-Energy companies - Economic and development companies	-Universities -Research institutes	-Environmental associations -Local interest groups and associations
Regional Development Strategy 2030 Norrbotten	X	X	-Regional government bodies	-Municipal government bodies	X	X	-Universities	-Cultural associations -Local interest groups and associations -Youth associations

* When it comes to MLG, actors located within the first three radii (1 being the most central radius and 5 the most peripherical one) are considered.

** When it comes to MLG, actors located within the first four radii (1 being the most central radius and 5 the most peripherical one) are considered.

This choice is made because centrality scores tend to be lower when analysing by actor types, given the larger number of actors involved.

5.2. Comparing the breadth and depth of stakeholder participation in the implementation of just sustainability transition policies

In this section, we delve into the depth and breadth of stakeholder engagement during the implementation of just sustainability transition policies across structurally weak European regions covered by the JTF. Our comparative analysis encompasses five distinct cases, each representing a unique EU-driven or national place-based policy initiative aimed at fostering just sustainability transitions. The selected cases are as follows:

- The TJTPs for the Łódzkie region and Upper Silesia;
- The StStG for the Lusatian and Rhenish Lignite districts;
- The NPG for Groningen.

Notably, two cases covered in the other aspects of the research based on APES, namely the TJTP for Stara Zagora and the RUS 2030 for Norrbotten, are not included in this comparative analysis. The omission of these regions is due to two key reasons. Firstly, the TJTP Stara Zagora was excluded due to the lack of implementation of the policy (or it being in its very early stages) at the time of writing. Secondly, the RUS 2030 for Norrbotten is omitted due to the lack of available data pertinent to this phase of policy implementation.

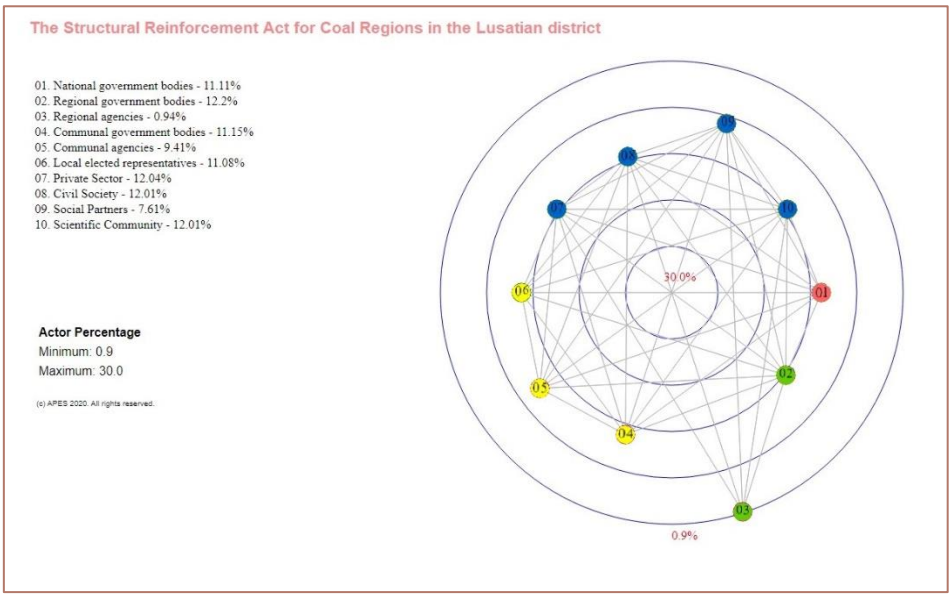
5.2.1. Examining stakeholder engagement strategies in MLG settings during policy implementation

In general, the influence of state actors appears to undergo considerable changes during the implementation phase of just sustainability transition policies, as compared to the policy formulation phase. This shift is evident, for instance, in the case of the StStG in both the Lusatian and Rhenish Lignite districts where no single state actor emerges as significantly dominant within the policy network. Instead, there seems to be a more equitable distribution of influence among various administrative levels, with an average centrality score of approximately 9% in the Lusatian district and near 8% in the Rhenish district across all government levels (see Figure 30).

Compared to the policymaking stage that was essentially led and steered by the Federal Ministry for Economic Affairs and Climate Protection, regional and local authorities have gained prominence within the policy network. In the Lusatian Lignite district, regional government bodies combined register a centrality score of over 13%, while municipal authorities hold a substantial influence of over 20%, and that is excluding the strong influence of mayors and other local elected officials themselves, which stands at

11.08%. Similarly, in the Rhenish Lignite district, regional authorities have a centrality score of nearly 18%, with municipal government bodies holding nearly 20% influence. This shift towards more prominent roles of regional and local authorities may reflect a more multi-tiered approach to policy implementation, aligning with the subsidiarity principle, which advocates delegating the tackling of social and political issues at the most immediate or local level where they can be most effectively addressed.

Furthermore, much like the policymaking phase, the balance of influence between state and non-state entities remains relatively equitable. Notably, non-state actors now maintain an average centrality score of 11% in the Lusatian Lignite district and over 13% in the Rhenish Lignite district, which overall aligns closely with the scores achieved by state entities at different levels of governance. This observation points to a rather comprehensive stakeholder engagement strategy during the implementation of the StStG in coal-reliant regions.



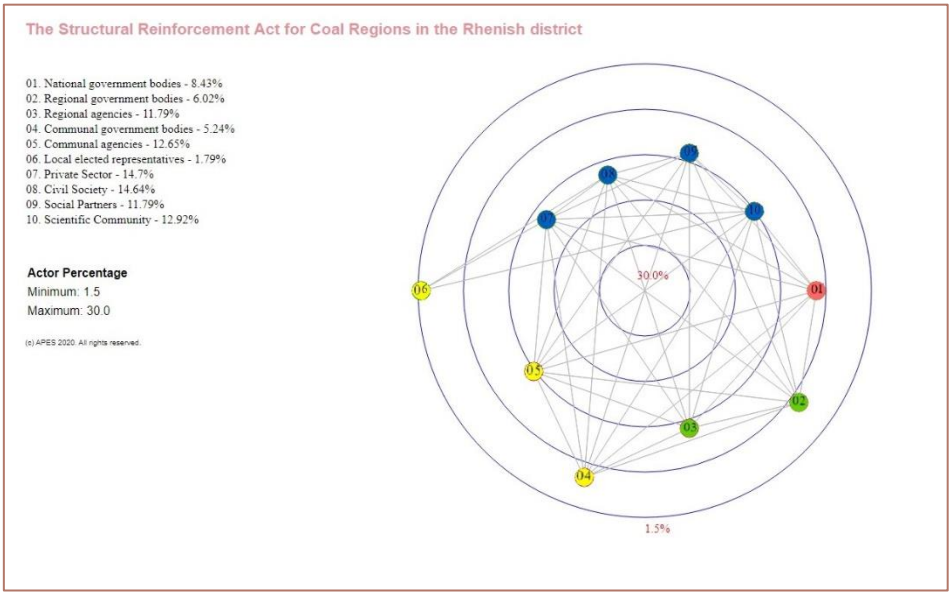


Figure 30. The multi-level governance participation of stakeholders in the StStG implementation

Examining the NPG reveals a narrative that closely parallels the German StStG case. Once again, there is no single dominant state actor within the policy network (see Figure 31). We nevertheless observe a relatively higher influence of regional authorities, all combined displaying an eigenvector centrality of nearly 34%. However, local and national authorities are also highly interconnected within the policy network, with centrality scores of approximately 16.25% and nearly 12%, respectively. This likely reflects the collaborative nature of the NPG, involving cooperative efforts between the national government, the Groningen Province, and its municipalities. Similarly, non-state actors hold major influence at slightly over 38%, once again illustrating a rather inclusive approach to implementation, where various stakeholders work together to achieve the program's objectives.

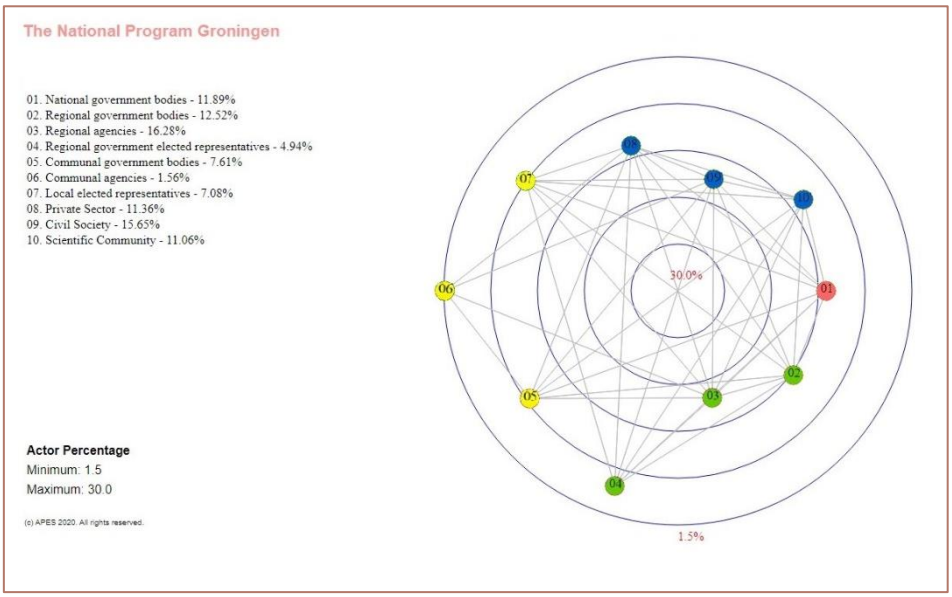


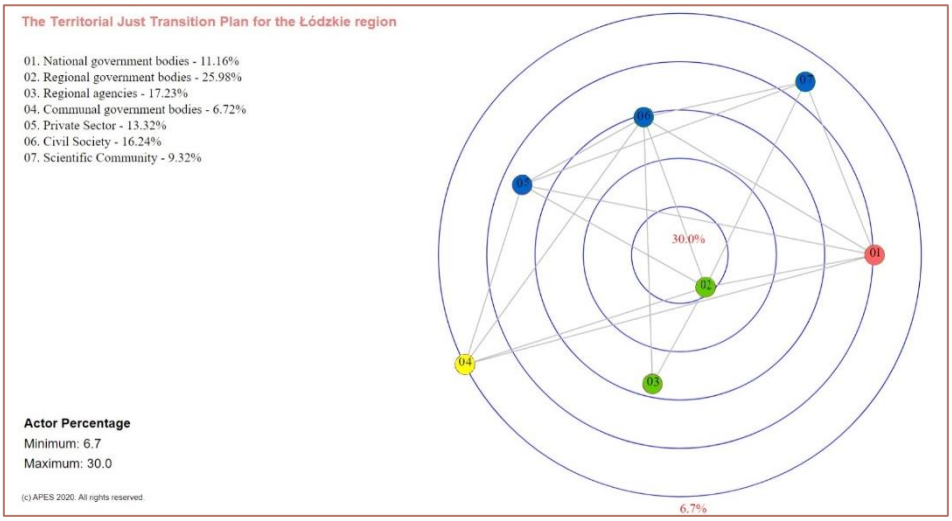
Figure 31. The multi-level governance participation of stakeholders in the NPG implementation

Finally, the implementation of the TJTPs in the Upper Silesia and Łódzkie regions presents different patterns. Both Polish regions indeed display rather decentralized approaches to the execution of their TJTPs, but with unique and distinct strategies for stakeholder engagement (see Figure 32). It is however important to note that these patterns are likely to evolve, as the implementation phase, at the time of writing, was still in a very early stage, leaving room for further development and change in stakeholder dynamics as the process progresses. Possible changing dynamics should be further assessed in future research.

In the Łódzkie region, the centrality scores show a notable dominance of regional government bodies and agencies, with respective scores of 25.98% and 17.23%. This significant emphasis highlights the leading role of regional authorities in the implementation of the TJTP. Alongside them, the strong involvement of national government bodies, with a notable centrality score of 11.16%, further accentuates the

integral role of state actors in carrying out the TJTP in Łódzkie. The pattern emerging here is one where regional authorities, along with a collective of non-state actors holding nearly 39% centrality, steer the course of the plan's execution. This suggests that the Łódzkie region places a strong emphasis on regional government agencies and departments in both policy formation and implementation. This approach may be attributed to unique regional challenges or specific opportunities that necessitate a robust and targeted governmental intervention at the regional level.

In comparison, Upper Silesia seems to adopt a much more balanced distribution of influence, characterized by notable involvement (approximately 15%) from a variety of entities spanning different subnational government levels (both regional and municipal) as well as non-state sectors (including the private sector, civil society, and the scientific community). This decentralized and rather inclusive approach seems to point to a stakeholder engagement strategy that prioritizes diverse contributions when it comes to policy implementation. This strategy is likely shaped by the region's unique and complex socio-economic context and political culture, calling for engagement from multiple sectors to effectively address the diverse challenges associated with the transition process.



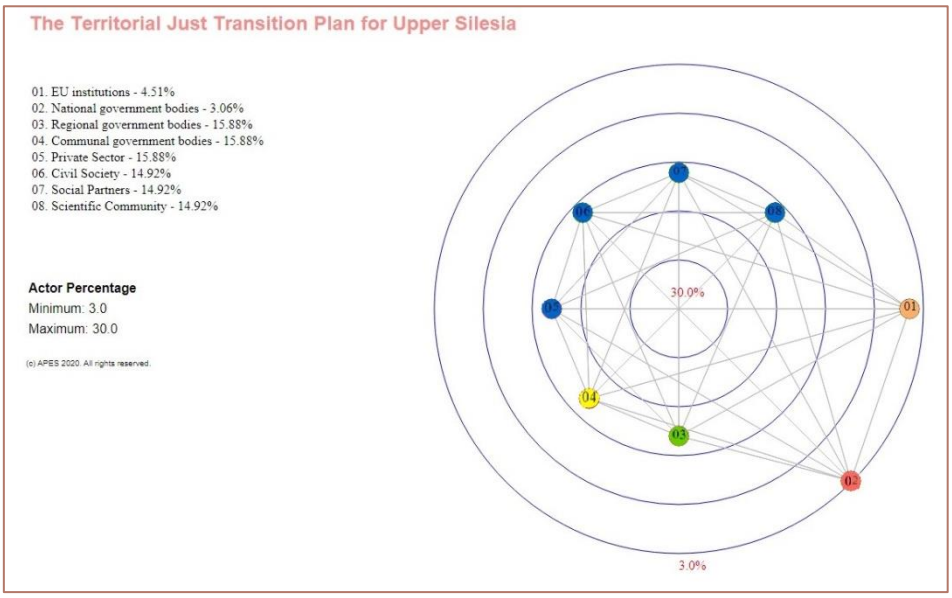


Figure 32. The multi-level governance participation of stakeholders in the TJTPs' implementation in Upper Silesia and Łódzkie regions

The analysis of the various governance approaches across the EU regions for sustainability transition policies reveals different implementation strategies, reflecting the unique political, economic, and social landscapes of the regions in question. Table 16 below offers a concise summary of these varied approaches to policy implementation, with a specific focus on the involvement of different state actors within MLG contexts.

The Lusatian and Rhenish Lignite districts in Germany, and the Groningen Province in the Netherlands tend to follow a multi-tiered approach to policy implementation. This strategy is characterized by robust involvement of national, regional, and municipal government actors, often complemented by the active participation of a diverse array of non-state stakeholders from various sectors in the execution of just sustainability transition policies. The significant increase in subnational governance levels is a noteworthy development, especially in the case of the StStG, which had its policymaking phase primarily directed by federal authorities.

The Łódz and Silesian coal regions in Poland both take a more decentralized approach to policy implementation, albeit with distinct characteristics in each region. The Łódz Voivodeship features an essentially regional-led process, with a leading position of regional government bodies and agencies. Nonetheless, non-state actors remain integral to the policy implementation activities, exhibiting significant centrality within the network. Conversely the Silesian Voivodeship is marked by a more equal distribution of influence between regional and municipal government authorities as well as non-state stakeholders spanning the private, scientific, and voluntary sectors.

The overall findings indicate that, despite occurring in the same country, the policy implementation in the Łódź and Silesian regions exhibited distinct characteristics. These variations may be attributed to region-specific responses to the EU's broader strategic frameworks for just transitions. The underlying reasons for and consequences of these differences are set to be explored in greater depth during the face-to-face research phase of the DUST project.

Table 16. Comparative overview of policy implementation approaches to just sustainability transitions across EU regions

Policy Measure	EU Region	Governance approach
Structural Reinforcement Act for Coal Regions	Lusatian Lignite district (Germany)	Multi-tiered policy implementation
Structural Reinforcement Act for Coal Regions	Rhenish Lignite district (Germany)	Multi-tiered policy implementation
National Program Groningen	Groningen Province (The Netherlands)	Multi-tiered policy implementation
Territorial Just Transition Plan	Łódz coal region (Poland)	Decentralized policy implementation
Territorial Just Transition Plan	Silesian coal region (Poland)	Decentralized policy implementation

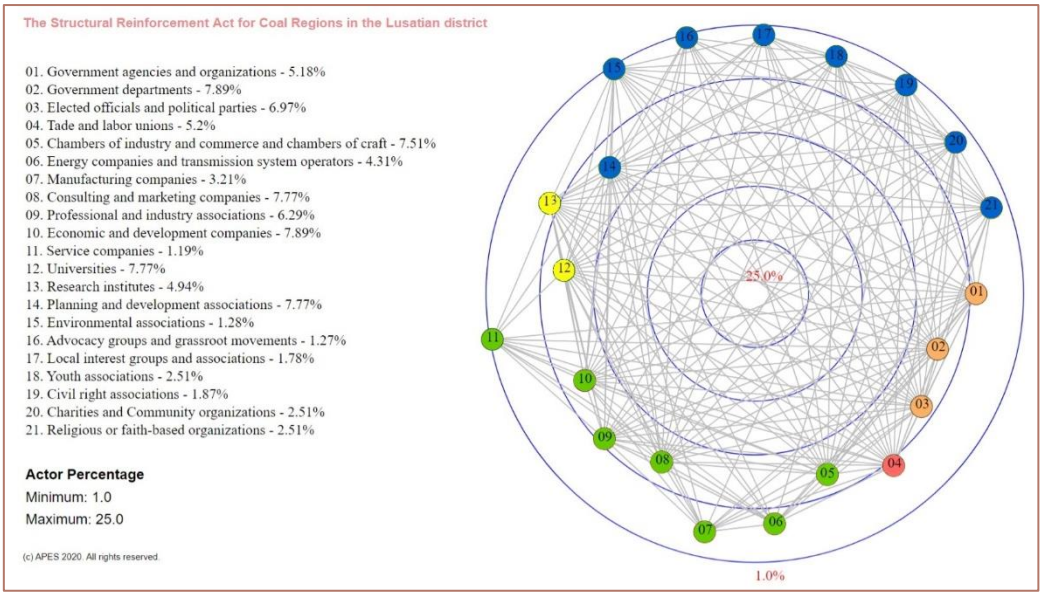
5.2.2. Examining the involvement of non-state actors in the implementation of just sustainability transitions

In contrast to the decision-making phase of the StStG, which was predominantly conducted at the federal level, regional variations in non-state actor involvement became evident during the policy implementation phase (see Figure 33). Both Lusatian and Rhenish Lignite districts exhibit a densely interconnected policy network with a relatively broad spectrum of actors from diverse societal sectors participating. However, in the Lusatian district, certain entities emerged as slightly more influential than others. Notably, chambers of industry and commerce (7.51%), professional and industry associations (6.29%), and economic and development companies (7.89%) played prominent roles, indicating significant engagement from the business community. This trend was further reinforced by the participation of regional consulting firms like DigitalAgentur Brandenburg, which typically focus on promoting (digital) innovation at the regional level.

Trade and labour unions hold a significant role in the policy implementation process within both German regions, signifying a seemingly strong worker representation, as reflected in centrality scores approaching 5%. However, the level of engagement from civil society groups displays some variability, especially within the Lusatian Lignite district. While planning and development associations are notably active (7.77%), other more community-centric stakeholders demonstrate weaker connections within the

policy network, with an average eigenvector value falling below 2%. This observation underscores the rather prominent influence of economic considerations in the policy implementation process. Universities also exhibit a similarly high level of influence at 7.77%, suggesting a relatively technocratic and expert-driven approach to stakeholder engagement throughout the implementation of the StStG.

In contrast, the approach in the Rhenish Lignite district differs, showing a lower overall influence but a more evenly distributed among non-state actors. Involved entities exhibit an average centrality score of 5%, with no single stakeholder emerging as substantially dominant. In contrast to the Lusatian Lignite district, the Rhenish region appears to foster a more active civil society space in environmental and sustainability matters. Entities such as environmental associations, advocacy and local interest groups, cultural associations, or religious and faith-based organizations exceed or approach 5% centrality, indicating significant engagement in the policy implementation phase. However, the absence (or near absence) of individual residents in both cases once again underscores the corporatist orientation to policymaking and implementation in Germany.



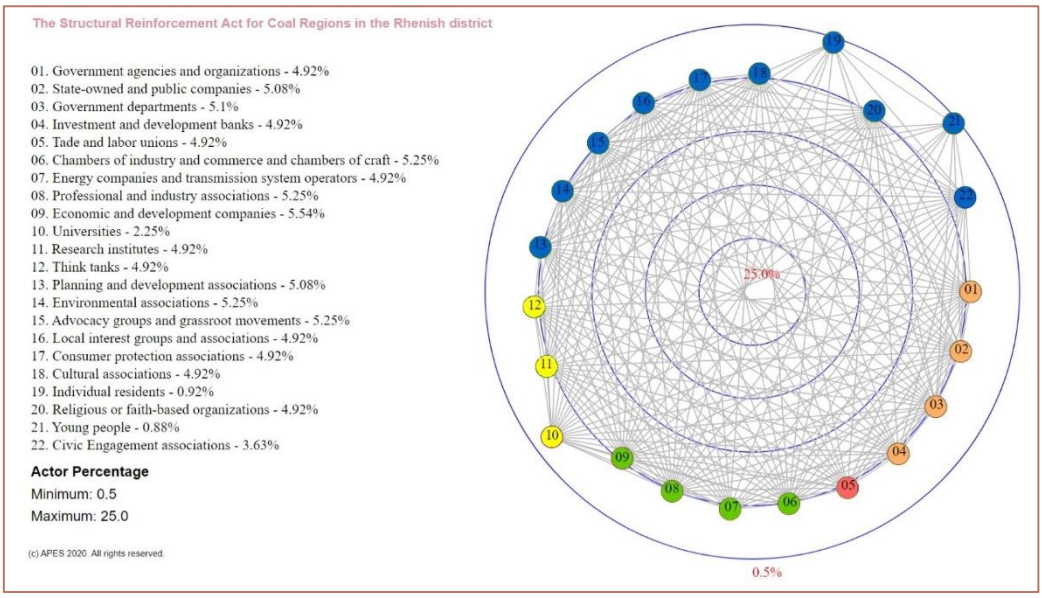


Figure 33. A comparative perspective on non-state actors' involvement in the execution of the StStG in the Lusatian and Rhenish Lignite districts

A markedly different approach was taken in Groningen (see Figure 34), where there is a noticeable emphasis on advocacy groups and grassroots movements (7.89%) and individual residents (9.89%). This emphasis suggests a more mobilized civil society engagement and, consequently, a predominantly bottom-up approach to policy implementation. Comparably to the German Lignite regions, professional and industry associations also hold a significant centrality score (11.52%), along with scientific experts (8.39%), underscoring the importance of industry expertise and input in the region's transition strategy. This probable emphasis on industry expertise is further supported by the significant influence of service companies from the housing and health sectors in policy implementation (10.35%). Overall, the inclusive and rather community-centric approach adopted in the Groningen Province is more likely to foster a diverse range of stakeholders' contributions and inputs, particularly in civil society-led initiatives.

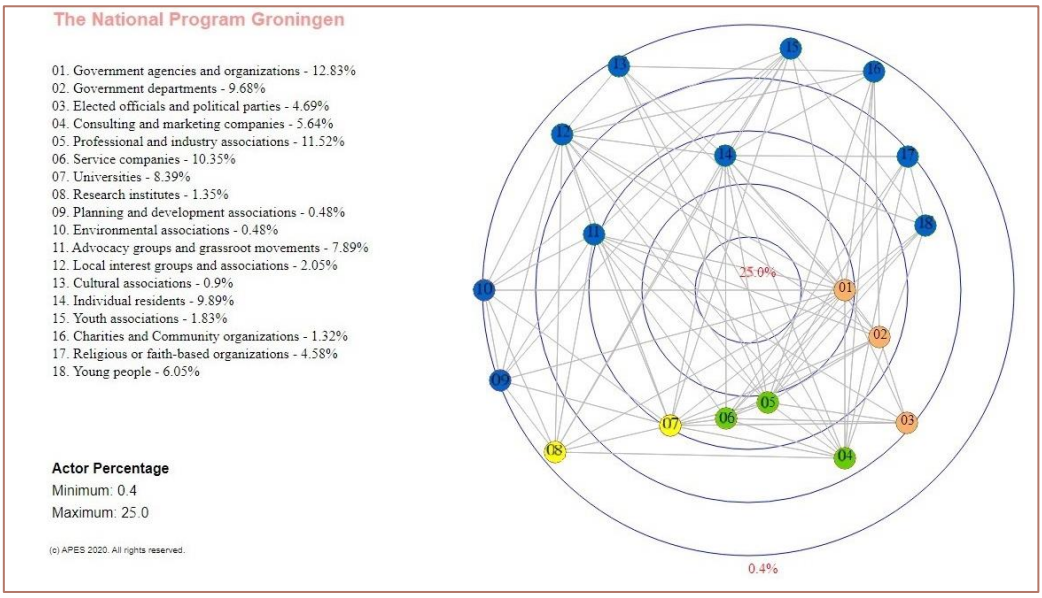


Figure 34. Non-state actors' participation in the execution of the NPG in Groningen

The implementation of TJTPs in Polish regions exhibited distinct patterns in the involvement of non-state actors (see Figure 35). In Upper Silesia, the involvement of non-state actors is more extensive and densely interconnected, with significant participation from trade and labour unions (7.23%), industry-related stakeholders (energy, mining, and manufacturing companies, as well as economic and development groups), scientific experts (universities and research institutes), and civil society organizations (planning and development associations, environmental associations, local interest groups, youth associations, and charities). This rather inclusive and balanced approach to non-state actor engagement, could incorporate a comprehensive mix of insights and expertise in the TJTP execution, taking into account a wide array of societal needs and economic opportunities.

Conversely, in the Łódzkie region, the extent of non-state stakeholders' engagement appears relatively more limited when compared to public stakeholders, with particular entities such as energy and manufacturing companies (9.4%), environmental associations (8.92%), and local interest groups and associations (8.92%) notably standing out. The significant centrality score for environmental associations suggests that these groups are playing a key role, likely advocating for sustainability measures that align with environmental protection and climate goals. Similarly, the strong representation of local interest groups implies a potential commitment to incorporating the specific needs and interests of the local communities that are directly affected by the transition away from coal into the plan.

While individual citizens are notably absent from the process in both Polish regions, the significant influence of organized civil society groups may indicate a potential for a balanced and inclusive stakeholder involvement strategy, more inclined to represent local community interests. Overall, the focus on the aforementioned stakeholders from

different societal spheres (i.e energy and manufacturing companies, universities and research institutes, environmental and local interest groups and associations, etc) in both Polish areas creates potential for implementation of a transition plan tailored to balance economic restructuring with ecological sustainability and social welfare, even though the interests of (subnational) state actors could be more strongly put forward in the Łódzkie Voïvodie. It is however important to note that these dynamics are likely to evolve in the near future, given that policy implementation in these two regions is still in a very early stage at the time of writing.

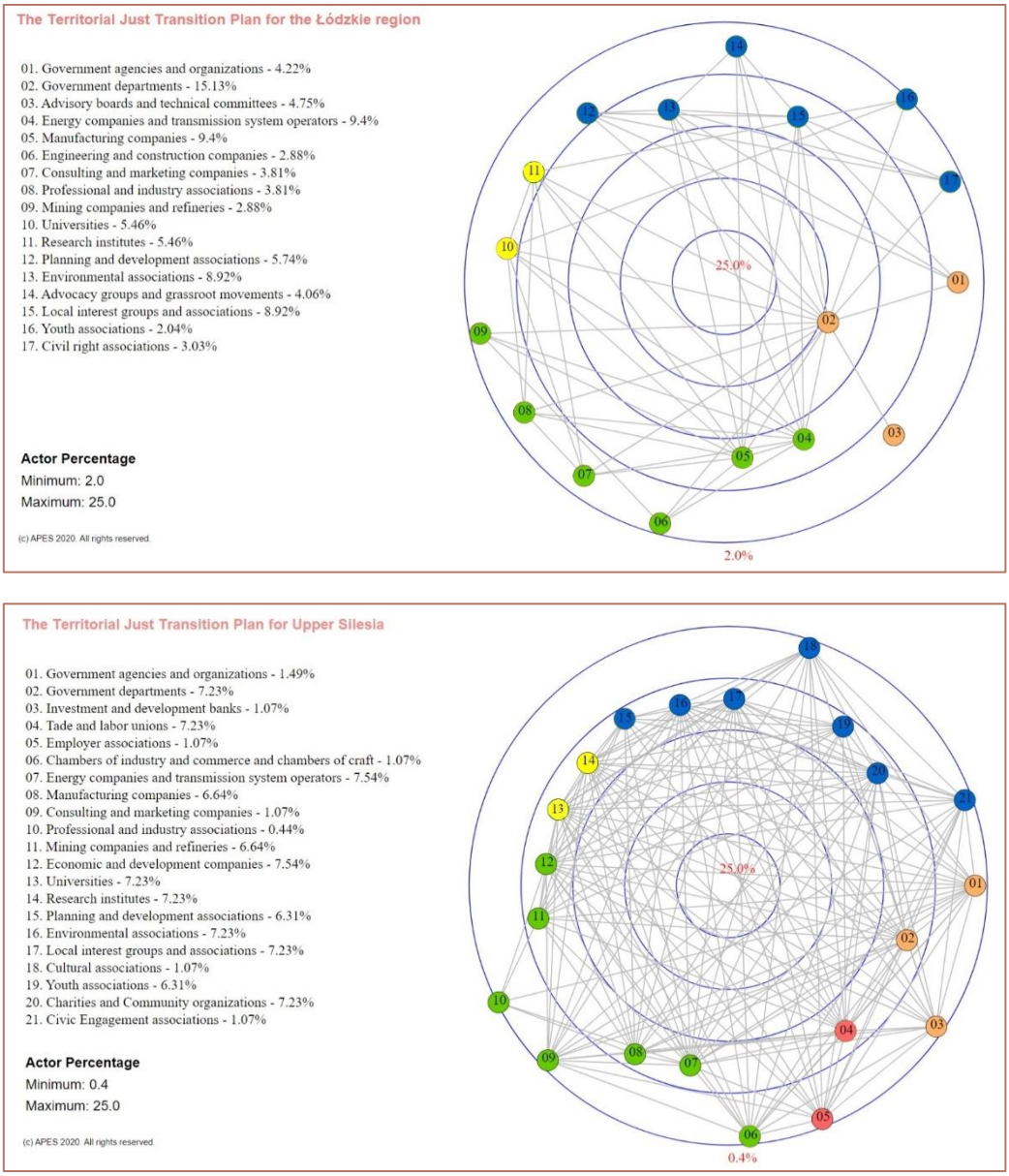


Figure 35. A comparative perspective on non-state actors' involvement in the execution of the TJTPs in the Łódzkie and Upper Silesian regions

The comparative analysis presented above reveals distinct patterns of non-state actor involvement, highlighting different strategies and their potential effects on the implementation of just sustainability transitions across various EU regions. With the exception of the NPG in Groningen, where local residents, especially young people, play a prominent role, it is noteworthy that there is minimal involvement of individual citizens in the implementation of just sustainability transition policies. This underscores that even strategies that feature strong representation of local communities tend to do so through the participation of organized groups such as local interest and advocacy groups, cultural or religious associations, or charities. These findings are summarized in Table 17 below, providing a comprehensive overview of the nature of non-state actors' participation in the implementation of just sustainability transition policies across all five investigated regions.

Table 17. Comparative overview of non-state actors' involvement strategies in the implementation of sustainability policy across EU regions

Policy Measure	EU Region	Governance approach
Structural Reinforcement Act for Coal Regions	Lusatian Lignite district (Germany)	Technocratic and economic focused
Structural Reinforcement Act for Coal Regions	Rhenish Lignite district (Germany)	Inclusive and corporatist
National Program Groningen	Groningen Province (The Netherlands)	Inclusive and and community-oriented
Territorial Just Transition Plan	Łódz coal region (Poland)	Inclusive and corporatist
Territorial Just Transition Plan	Silesian coal region (Poland)	Inclusive and corporatist

Table 18 below provides a detailed summary of the primary actors involved in the implementation phase of just sustainability transition policies. It once again reveals variations in the composition of these actors across different regions and policy measures. Notably, this diversity extends to the level of government involved, with some regions featuring a mix of national and regional government bodies, while others prioritize subnational influence, be it purely regional or involving regional-municipal activities. Additionally, the varying presence of various societal actors, particularly civil society groups, highlights the multifaceted nature of stakeholder engagement in the implementation of sustainability policies. These findings provide initial insights into the structure of policy networks within the realm of just sustainability transition policies, setting the stage for more detailed investigations in T2.4, T3.2, and T3.4 to examine the factors facilitating their participation and assess their actual impact on policymaking.

Table 18. List of predominant actors within the implementation phase of just sustainability transition policies

Policy Measure	EU level*	National level*	Regional level*	Municipal level*	Social partners**	Private sector**	Scientific community**	Civil society**
Structural Reinforcement Act for Coal Regions in the Lusatian Lignite district	X	-National government bodies	-Regional government bodies	-Municipal government bodies	-Trade and labour unions	-Chambers of industry and commerce -Consulting companies - Professional and industry associations -Economic and development companies	-Universities	-Planning and development associations
Structural Reinforcement Act for Coal Regions in the Rhenish Lignite district	X	X	-Regional agencies	- Municipal agencies	-Trade and labour unions	-Chambers of industry and commerce -Professional and industry associations -Economic and development companies	-Research institutes	-Planning and development associations - Environmental associations -Advocacy groups and grassroot movements
National Program Groningen	X	-National government bodies	-Regional government bodies -Regional agencies	X	X	-Professional and industry associations -Service companies	-Universities	-Advocacy groups and grassroot movements -Individual residents -Young people
Territorial Just Transition Plan in the Łódzkie Voivodship	X	X	-Regional government bodies -Regional agencies	X	X	-Energy companies -Manufacturing companies	X	- Environmental associations -Local interest groups and associations
Territorial Just Transition Plan in the Silesian Voivodship	X	X	-Regional government bodies	-Municipal government bodies	-Trade and labour unions	-Energy companies -Manufacturing companies -Mining companies -Economic and development companies	-Universities -Research institutes	-Planning and development associations Environmental associations -Local interest groups and associations -Youth associations -Charities

* When it comes to MLG, actors located within the first three radii (1 being the most central radius and 5 the most peripherical one) are considered.

** When it comes to MLG, actors located within the first four radii (1 being the most central radius and 5 the most peripherical one) are considered. This choice is made because centrality scores tend to be lower when analysing by actor types, given the larger number of actors involved.

6. Conclusion

6.1.1. Analysing stakeholder participation in just sustainability transitions using APES

The main objective of this report is to enhance our understanding of stakeholder engagement and participation in the development and implementation of just sustainability transition policies in EU regions heavily dependent on fossil fuel and carbon-intensive industries. This effort aligns with the prevailing notion in contemporary academic and practical discussions that involving a diverse range of stakeholders is essential for sustainability transitions to be inclusive, equitable, and capable of effectively addressing the multifaceted environmental, social, and economic dimensions. The rationale for engaging various interested and affected parties from different societal spheres is commonly supported by three key arguments.

The Instrumental Rationale: Enhanced Implementation and Acceptance

This rationale highlights the practical benefits of stakeholder involvement. Broad stakeholder participation is said to lead to greater buy-in and acceptance of sustainability initiatives. When stakeholders are actively involved in decision-making, they are more likely to support and engage in the implementation, leading to more successful and sustainable outcomes.

The Substantive Rationale: Holistic Problem-Solving

This perspective emphasizes the quality of decisions and outcomes. Involving a diverse range of stakeholders is assumed to bring varied expertise and perspectives, enabling a more comprehensive understanding of sustainability challenges. This diversity is deemed crucial for developing effective solutions that address the complex interplay of environmental, social, and economic factors.

Normative Rationale: Inclusivity and Equity

The normative rationale is based on ethical and moral principles. It asserts the importance of ensuring that all affected parties, especially marginalized and underrepresented communities, have a voice in the sustainability transition process. This approach is said to be essential to develop solutions that are equitable and consider the needs and concerns of impacted communities, thereby promoting accountability, and trust.

Drawing on PNA, this analysis involves a mapping of “formal linkages between governmental and other actors [...] in public policy making and implementation” (Rhodes, 2008, p. 427). In the context of DUST, this undertaking is crucial in understanding how different actors and processes interact and contribute to the formulation and execution of just sustainability transition practices and policies in

regions heavily dependent on energy-intensive sectors. APES is a key component in this process, serving as a tool for mapping these complex interactions throughout different stages of the policy process, especially in multi-level governance settings.

In the realm of DUST, APES works by identifying and assessing the relationships and dynamics between different actors and the nature of their involvement in participatory activities related to multi-level just sustainability transition policies. By examining these aspects, APES provides initial insights into the multi-faceted stakeholders' integration in sustainability transitions, highlighting how different actors, from government bodies to private sectors and local communities, and processes, ranging from the mere provision of information to full-fledged partnerships, collectively shape the sustainability landscape.

6.1.2. Overview of key APES results across seven EU regions

The empirical application of APES examines the breadth and depth of participatory strategies in sustainable transitions across seven EU industrial regions. These analyses illuminated distinct patterns of engagement, offering valuable perspectives on the diversity and intensity of stakeholder involvement within the development and execution of sustainability transition policies[14]. Highlighting three main characteristics, namely the primary governance level(s) at which stakeholder engagement strategies were carried out, the depth of their participation and the breadth of their involvement, a structured presentation of the main results are displayed:

Territorial Just Transition Plans (TJTP) in Stara Zagora (Bulgaria)

- Primary governance level: National authorities, especially the Ministry of Energy and the Ministry of Regional Development and Public Works, primarily guide the policymaking.
- Depth of stakeholder engagement: The TJTP policy network is dense, indicating strong interconnectedness among participants.
- Breadth of stakeholder engagement: Participation is predominantly focused on the industrial sector and scientific community, suggesting a rather technocratic and economic focused stakeholder engagement strategy.

The Structural Reinforcement Act for Coal Regions in the Lusatian Lignite district (Germany)

- Primary governance level: National leadership, typically via the Federal Ministry for Economic Affairs and Climate Protection, plays a central role in steering the policy framework.

[14]The overview of APES results provided here encompasses both the decision-making and implementation stages of policymaking.

- Depth of stakeholder engagement: The StStG policy network is dense, indicating thorough and intricate linkages among involved stakeholders.
- Breadth of stakeholder engagement: participation is primarily centred around the industrial sector and scientific experts, indicating a rather technocratic and economic focused stakeholder engagement strategy.

The Structural Reinforcement Act for Coal Regions in the Rhenish Lignite district (Germany)

- Primary governance level: Governed predominantly at the national level, with the Federal Ministry for Economic Affairs and Climate Protection setting the overarching policy structure.
- Depth of stakeholder engagement: The StStG is characterized by a dense and well-connected policy network.
- Breadth of stakeholder engagement: Features a balanced engagement across various organized groups and societal spheres, ensuring a rather inclusive and diversified stakeholder engagement strategy.

The National Program Groningen in Groningen Province (The Netherlands)

- Primary governance level: Rather balanced involvement of national, regional, and local authorities, highlighting a multi-tiered governance approach.
- Depth of stakeholder engagement: The policy network is relatively loose and fragmented, pointing to less interconnectedness among participants.
- Breadth of stakeholder engagement: Demonstrates a rather inclusive and balanced engagement strategy, with a particularly strong involvement of local communities and individual citizens.

The Territorial Just Transition Plan in Łódz Coal Region (Poland)

- Primary governance level: Similar presence of national, regional and municipal goverments in the development and execution and the policy, hinting to a multi-tiered policymaking.
- Depth of stakeholder engagement: Exhibits a tightly-knit and interconnected policy network.
- Breadth of stakeholder engagement: Dominated by the industrial sector and the scientific community, indicating a rather technocratic and economic focused stakeholder engagement strategy.

The Territorial Just Transition Plan in Silesian Coal Region (Poland)

- Primary governance level: Substantive involvement of regional and municipal governments, emphasizing a decentralized governance structure.

- Depth of stakeholder engagement: Showcases a dense policy network, reflecting strong engagement and ties among stakeholders.
- Breadth of stakeholder engagement: Demonstrates a rather inclusive and balanced engagement strategy, involving a variety of organized groups from different societal spheres.

Regional Development Strategy 2030 in Norrbotten County (Sweden)

- Primary governance level: Predominantly regional-led, highlighting the importance of regional authorities in guiding policy making and execution.
- Depth of stakeholder engagement: The policy network is loose and less unified, suggesting potential gaps in stakeholder interconnectivity.
- Breadth of stakeholder engagement: Mainly involves regional and local public bodies along with elected officials, focusing on local collectivities' engagement.

In exploring actor participation, varying degrees of involvement were observed across regions, indicating both strengths and potential areas for enhancement in engagement strategies. Each case study exhibits distinctive governance characteristics, spanning from national-level initiatives to multi-tiered governance approaches. These differences likely reflect the diverse political and administrative cultures and structures present in the investigated EU regions. However, it is important to note that while APES can identify the presence of connections between different administrative levels, it does not provide insights into the nature of these interactions, whether they are conflictual or collaborative. A deeper understanding of these dynamics will necessitate further analysis through field research in Task 3.2 and 3.4.

The depth of stakeholder engagement also varies from dense, interconnected networks to looser, less unified structures, indicating differences in the integration and interactions among stakeholders. These variations may have significant implications for policymaking. Dense networks often indicate a high degree of integration and ties among stakeholders but may also not necessarily capture the full spectrum of stakeholder perspectives and interests. In contrast, looser networks suggest less relationships among stakeholders but may allow for a broader range of voices to be heard, especially when it comes to individual citizens.

Furthermore, the breadth of stakeholder engagement spans from focused involvement of specific sectors, such as the industrial sector and scientific community, to more balanced and diversified participation across different groups (organized or not). Table 19 below provides a summary of the diverse stakeholder engagement strategies observed across the seven EU regions. This diversity underscores the complexity of managing just sustainability transitions in varied socio-political contexts, highlighting the need for tailored approaches that consider local dynamics, stakeholder interests, and governance structures to effectively drive and comprehend these processes.

Table 19. Overview of stakeholder engagement strategies in the development and implementation of just sustainability policies across seven EU Regions

Policy Measure	EU Region	Primary Governance level	Depth of Stakeholder Engagement	Breadth of Stakeholder Engagement
Territorial Just Transition Plan	Stara Zagora (Bulgaria)	National level	Dense and interconnected policy network	Technocratic and economic focused
Structural Reinforcement Act for Coal Regions	Lusatian Lignite district (Germany)	National level	Dense and interconnected policy network	Technocratic and economic focused
Structural Reinforcement Act for Coal Regions	Rhenish Lignite district (Germany)	National level	Dense and interconnected policy network	Balanced, diversified and corporatist
National Program Groningen	Groningen Province (The Netherlands)	Multi-tiered policymaking	Loose and disunited policy network	Balanced, diversified and community / resident-centric
Territorial Just Transition Plan	Łódz coal region (Poland)	Multi-tiered policymaking	Dense and interconnected policy network	Technocratic and economic focused
Territorial Just Transition Plan	Silesian coal region (Poland)	Decentralized	Dense and interconnected policy network	Balanced, diversified and corporatist
Regional Development Strategy 2030 Norrbotten	Norrbotten County (Sweden)	Decentralized	Loose and disunited policy network	Government-led and community centric

6.1.3. Lessons learned and future developments

The diverse outcomes observed in the case studies across different European regions highlight several critical lessons about the nature of the policies themselves in sustainable transition strategies but also on the role of governance systems and political cultures.

Interestingly, there is no discernible cross-case pattern regarding the effect of centralized or decentralized governance structures on just sustainability transition policies. Countries with predominantly centralized governance structures may adopt either a national-led approach (as seen in Bulgaria with the TJTP) or a multi-tiered and decentralized approach to policymaking (as observed in Poland). Conversely, countries with more decentralized governance systems may choose fully decentralized or multi-tiered governance approaches (like in Norrbotten or Groningen) or a preference for national-level policy initiation (as in Germany when it comes to the StStG). This suggests that beyond a country's underlying political cultures and structures, the nature of the

policy and regional socio-political contexts also play a significant role in shaping the elaboration and implementation of sustainability transition processes.

Similarly, no clear patterns regarding the depth and breadth of stakeholder engagement seem to emerge when examining the structural relationship between organized interests and the state in each country. Policies implemented in Dutch and Swedish regions tend to feature more loosely structured policy networks and prioritize community-focused engagement strategies. This phenomenon can be partly attributed to the strong tradition of civic engagement and public participation in policymaking within these two countries. In the Netherlands and Sweden, a wide array of stakeholders, including NGOs, community groups, and citizen initiatives, indeed often participate in policy formulation and execution.

Conversely, policies implemented in Bulgarian, German, and Polish regions tend to exhibit denser and more interconnected policy networks. A common characteristic among these three countries is their relatively more limited government openness to citizen participation compared to their Dutch and Swedish counterparts[15] (WJP, 2020.). This may partly explain why government departments in these regions often rely more on organized interest groups, such as business, labour, and professional associations, which traditionally have stronger connections with one another. However, it is noteworthy that despite operating within the same policy framework and country, divergent developmental patterns across the examined regions still emerge.

Notable variations within countries can be observed, particularly between the Lusatian and Rhenish Lignite districts in Germany and the Łódz and Silesian coal regions in Poland. In each country, one region (Lusatian and Łódz areas) appears to adopt a more technocratic and economically focused strategy, with a strong emphasis on the involvement of industrial actors, scientific and technical experts, and labour unions. Conversely, the other region (Rhenish and Silesian areas) seems to opt for a more balanced and diversified approach to stakeholder engagement, with a particular focus on involving organized community-based groups such as local interest associations.

These findings underscore the significant influence of contextual and localized conditions, challenges, and conflicts on the nature of participatory processes within the realm of sustainability transition strategies. Factors such as historical, cultural, and political specificities, the unique local economic landscape, and the level of regional public awareness and activism on sustainability issues can potentially lead to divergent approaches to the shaping of transition policies, even among regions located within the same country.

[15]According to the WJP Open Government Index, Sweden holds the top position with an openness score of 0.81. Following Sweden, the Netherlands is ranked 5th with a score of 0.76. Germany is positioned at 15th place with a score of 0.72, Poland ranks 20th with a score of 0.67, and Bulgaria is positioned 49th with a score of 0.54.

While APES has provided preliminary insights into the structure of policy networks, a more in-depth examination of these unique local contexts is essential to fully grasp the complexities of stakeholder engagement and participation in the development and implementation of just sustainability transition policies. The underlying factors contributing to these cross and within country variations could be further investigated and analysed during the upcoming face-to-face research phase of the DUST project in T3.2 and T3.4.

This comparative assessment unravelling similarities and differences among the examined regions sheds preliminary lights on stakeholder participation in the realm of sustainability transitions. These findings will be further refined and expanded upon, feeding into T2.4 meant to offer guidance for WP3 on opportunities to promote active subsidiarity and key factors that influence citizen participation, particularly regarding least engaged communities.

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Appendix

Stara Zagora (Bulgaria)

Table 20. List of participants to the TJTP policy-making process

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Public Sector	EU	Investment and development banks	Bank Swiatowy
Civil Society	/	Local interest groups and associations	Bełchatowska Fundacja Sprawiedliwej Transformacji
Private Sector	/	Consulting and marketing companies	BIOTECHNIKA
Civil Society	/	Planning and development associations	BKPPT
Private Sector	/	Consulting and marketing companies	Bureau Veritas Polska
Scientific Community	/	Research institutes	Central Mining Institute
Private Sector	/	Consulting and marketing companies	Centrum Obsługi Przedsiębiorcy w Łodzi
Civil Society	/	Civil right associations	Centrum Promocji i Rozwoju Inicjatyw Obywatelskich OPUS
Public Sector	Municipal	Government departments	City of Bełchatów
Scientific Community	/	Research institutes	COBRO Centrum Badawczo-Rozwojowe Opakowań
	/	Universities	Collegium civitas
Public Sector	Municipal	Government departments	Commune and City of Kleczew
Private Sector	/	Consulting and marketing companies	Deloitte
Civil Society	/	Environmental associations	Eco legal
Private Sector	/	Energy companies and transmission system operators	Energia Ciepla S.A
Private Sector	/	Manufacturing companies	EPICOM
Public Sector	EU	Government agencies and organizations	EU commission
Civil Society	/	Environmental associations	European climate foundation
Private Sector	/	Manufacturing companies	FARADISE S.A
Scientific Community	/	Think tanks	forum enerji
Social Partners	/	Trade and labour unions	Forum Związków Zawodowych województwa łódzkiego
Public Sector	Municipal	Government departments	Gmina Rząśnia
Scientific Community	/	Research institutes	IETU
Scientific Community	/	Research institutes	innowo
Scientific Community	/	Research institutes	instytut ciężkiej syntezy organicznej blachownia
Scientific Community	/	Think tanks	instytut na rzecz ecorozwoju
Scientific Community	/	Research institutes	Instytut Nauk Ekonomicznych Polskiej Akademii Nauk
Scientific Community	/	Research institutes	itc instytutu energetyki w lodzi,
Civil Society	/	Planning and development associations	ŁARR - Łódzka Agencja Rozwoju Regionalnego S.A.
Public Sector	Regional	Investment and development banks	lodzka specjalna strefa ekonomiczna
Civil Society		Environmental associations	lodzki klaster fala enerji
Public Sector	Regional	Government departments	Łódzkie Marshal Office
Public Sector	Regional	Government departments	Marshal of the Łódź Voivodeship
Public Sector	Regional	Government departments	Marshal's Office of the SilesiaVoivodeship
Private Sector		Manufacturing companies	Maspex

Public Sector	Federal	Government departments	MC
Public Sector	Federal	Government departments	MFRP
Public Sector	Federal	Government departments	ministerstwie rozwoju i teknoloji
Civil Society	/	Youth associations	Młoda Lewica
Public Sector	Federal	Government departments	MNA
Scientific Community	/	Universities	Molecolab Center for Molecular Research
Civil Society	/	Advocacy groups and grassroot movements	Ogólnopolska Federacja Organizacji Pozarządowych
Public Sector	Federal	Government agencies and organizations	Państwowe Gospodarstwo Wody Polskie
Private Sector	/	Energy companies and transmission system operators	PERN S.A
Private Sector	/	Energy companies and transmission system operators	PGE
Private Sector	/	Energy companies and transmission system operators	PGE ENERGIA CIEPLA S.A
Private Sector	/	Energy companies and transmission system operators	PGE GiEK
Civil Society	/	Environmental associations	Polish Green Network Associations,
Scientific Community	/	Universities	Politeknika lodza
Public Sector	Federal	Elected officials and political parties	Posłanka na Sejm
Public Sector	Municipal	Government departments	Powiat de Bełchatów
Private Sector	/	Energy companies and transmission system operators	Przedsiębiorstwo Energetyki Cieplnej Spółka z
Private Sector		Consulting and marketing companies	PWC
Public Sector	Regional	Elected officials and political parties	Rada Powiatowa Nowej Lewicy w Bełchatowie
Public Sector	Regional	Government agencies and organizations	regional Council of Social Dialogue
Public Sector	Regional	Advisory boards and technical committees	Regional Public Benefts Council
Public Sector	Regional	Advisory boards and technical committees	Regional Transition Forum
Public Sector	Municipal	Government agencies and organizations	Regionalny Dyrektor Ochrony Środowisk
Public Sector	Regional	Advisory boards and technical committees	Steering Committee of Regional Operational Programme for Lodzkie 2014-2020
Private Sector	/	Professional and industry associations	Stowarzyszenie forum odpowiedzialnego
Private Sector	/	Professional and industry associations	Stowarzyszenie Klaster-Biogospodarki
Civil Society	/	Local interest groups and associations	Stowarzyszenie Tak dla Bełchatowa,
Civil Society	/	Environmental associations	Undacja ClientEarth Prawnicy dla Ziemi
Civil Society	/	Civil right associations	Undacja Instytut Spraw Obywatelskich,
Scientific Community	/	Universities	Université à Rogowiec
Scientific Community	/	Universities	University of Economics in Katowice
Public Sector	Municipal	Government departments	ustronie morskie
Scientific Community	/	Universities	Warsaw School of Economics
Public Sector	Municipal	Government departments	Widawa Commune,
Public Sector	Regional	Government agencies and organizations	Wojewódzki Fundusz Ochrony Środowiska
Public Sector	Regional	Government departments	Województwem marshal office
Civil Society	/	Environmental associations	ŹRÓDŁA
Social Partners	/	Trade and labour unions	ZZ KADRA KWB Bełchatów

Table 21. Actor participation analysis within the context of the TJTP

Actor group	Total	Active	Passive	Leading
Public Sector	153 54.3 %*	89 58.1 %*	9 5.9 %*	55 36.0 %*
Social Partners	11 3.9 %*	11 100.0 %*	0 0.0 %*	0 0.0 %*
Private Sector	61 21.6 %*	55 90.2 %*	0 0.0 %*	6 9.8 %*
Scientific Community	27 9.6 %*	23 85.2 %*	0 0.0 %*	4 14.8 %*
Civil Society	30 10.6 %*	18 60.0 %*	0 0.0 %*	12 40.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for the TJTP of Stara Zagora District, Bulgaria.

Lusatian Lignite District (Germany)

Table 22. List of participants to the StStG policy-making and implementation processes in the Lusatian district

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Private sector	/	Energy companies and transmission system operators	50Hertz
Scientific community	/	Think tanks	Agora Energiewende
Civil Society	/	Environmental associations	Aktionsbündnisses Klare Spree
Public Sector	/	Elected officials and political parties	Alliance 90/The Greens, German Bundestag
Private sector	/	Energy companies and transmission system operators	Amprion
Civil Society	/	Environmental associations	Association for the Environment
Scientific community	/	Research institutes	Berlin Science Center for Social Research, ,
Private sector	/	Consulting and marketing companies	BET energy , Consentec
Civil Society	/	Religious or faith-based organizations	Bistum Magdeburg
Private sector	/	Consulting and marketing companies	Boston Consulting Group
Civil Society	/	Planning and development associations	Brandenburg 21 e.V.
Scientific community	/	Universities	BTU Cottbus-Senftenberg
Civil Society	/	Environmental associations	BUND Cottbus RevierUPGRADE
Public sector	/	Regulatory bodies	Bundesnetzagentur
Civil Society	/	Local interest groups and associations	Bürgerinitiative Pro
Public sector	Municipal	Elected officials and political parties	Bürgermeister Spreetal
Civil Society	/	Planning and development associations	Bürgerregion Lausitz
Public sector	Federal	Government departments	BWI
Scientific community	/	Universities	Christian Albrechts University in Kiel
Civil Society	/	Environmental associations	Climate Alliance Germany
Social partners	/	Employer's association	Confederation of German Employers' Associations (BDA)
Public sector	Federal	State-owned and public companies	Deutsche Bahn AG
Scientific community	/	Research institutes	Deutsches Zentrum für Luft- und Raumfahrt

Social Partners	/	Tade and labor unions	DGB Kreisverband Spree-Neisse
Public Sector	Municipal	Government departments	district administrator of the Rhein-Erft district
Civil Society	/	cultural association	Domowina
Public sector	EU	Government agencies	ENER EU Commission
Private sector	/	Business association	Ensoe
Civil Society	/	Religious or faith-based organizations	Evangelischen Kirche Berlin-Brandenburg
Civil Society	/	Religious or faith-based organizations	Evangelischer Kirchenkreis Jülich
Civil Society	/	Advocacy groups and grassroot movements	Federal Association of Energy and Water Management
Social partners	/	Employer associations	Federation of German Industries
Scientific community	/	Universities	FH Görlitz-Zittau
Scientific community	/	Research institutes	Fraunhofer Institute for Microstructure of Materials and Systems
Civil Society	/	Charities and Community organizations	Generationen gehen gemeinsam e.V.
Private sector	/	Chamber of industry and commerce and chambers of craft	German Association of Chambers of Industry and Commerce (DIHK)
Social partners	/	Tade and labor unions	German Federation of Trade Unions
Civil Society	/	Charities and Community organizations	German Red Cross
Private sector	/	Energy companies and transmission system operators	GETEC green energy AG
Public sector	Municipal	Elected officials and political parties	Green Future Welzow
Civil Society	/	Environmental associations	Greenpeace Deutschland eV,
Civil Society	/	Environmental associations	Grüne Liga
Private sector	/	Engineering and construction companies	Grünewald GmbH & Co. KG
Scientific community	/	Universities	Humboldt Universität
Scientific community	/	Research institutes	IASS Potsdam
Social partners	/	Tade and labor unions	IG BCE
Private sector	/	Chambers of industry and commerce and chambers of craft	IHK Aachen
Private sector	/	Consulting and marketing companies	Innovationsregion Lausitz GmbH
Civil Society	/	youth associations	KiJuBB Büro Lausitz
Civil Society	/	youth associations	Kinder- und Jugendring Sachsen, Projekt LUPO
Civil Society	/	Environmental associations	Klima-Allianz Deutschland e.V.
Civil Society	/	Manufacturing companies	Knauf Deutsche Gipswerke KG
Civil Society	/	Local interest groups and associations	kobra.net - Netzwerkbüro Bildung in der Lausitz
Private sector	/	Mining companies and refineries	KSC Anlagenbau
Civil Society	/	Cultural associaitions	Kulturlandschaft Lausitz im IBA-Studierhaus e.V
Public sector	Municipal	Elected officials and political parties	Landrat Burgenlandkreis /
Public sector	Municipal	Elected officials and political parties	Landrat des Landkreises Görlitz
Public sector	Municipal	Elected officials and political parties	Landrat des Landkreises Oberspreewald-Lausitz Wissenschaftsstandorte
Public sector	Municipal	Elected officials and political parties	Landrat Landkreis Leipzig
Private sector	/	Energy companies and transmission system operators	LEAG
Scientific community	/	Research institutes	Leibniz-Institut für ökologische Raumentwicklung
Civil Society	Regional	Elected officials and political parties	Linksfraktion Sachsen
Public sector	Municipal	Elected officials and political parties	Mayor of Spremberg
Private sector	/	Mining companies and refineries	MIBRAG
Private sector	/	Engineering and construction companies	Nadebor Firmengruppen

Civil Society	/	Environmental associations	Nature Conservation Germany (BUND)
Scientific community	/	Research institutes	PIK- Potsdam, Fraunhofer
Scientific community	/	Research institutes	Potsdam Institute for Climate Impact Research
Civil Society	/	Charities and Community organizations	RAA Cottbus - Demokratie und Integration Brandenburg e.V.
Civil Society	/	Planning and development associations	Regionalen Planungsverbandes Leipzig-Westsachsen
Public Sector	Regional	Government departments	Representatives of all Brandenburg state ministrie
Private sector	/	Consulting and marketing companies	Rheinisches Revier Future Agency
Private sector	/	Energy companies and transmission system operators	Romonta Bergwerke Holding AG
Scientific community	/	Universities	Ruhr-Universität Bochum
Private sector	/	Energy companies and transmission system operators	RWE
Scientific community	/	Think tanks	RWI
Public Sector	Regional	Government departments	Staatskanzlei Land Brandenburg
Public Sector	Municipal	Government departments	Stadt Hoyerswerda
Private sector	/	Energy companies	stadtwerke Weißwasser
Private sector	/	Energy companies and transmission system operators	STEAG GmbH, PRIOGO A
Civil Society	/	Civic Engagement associations	Stiftung Bürgermut
Scientific community	/	Universities	Technische Universität Berlin
Private sector	/	Manufacturing companies	Trimet aluminum
Private sector	/	Energy companies and transmission system operators	Trinseo
Scientific community	/	Universities	TU Clausthal
Civil Society	/	Environmental associations	Umwelt- und Naturschutzpolitik, BUND NRW e.V.
Private sector	/	Energy companies and transmission system operators	Uniper SE
Civil Society	/	Charities and Community organizations	Unteilbar Südbrandenburg
Private sector	/	Energy companies and transmission system operators	Vattenfall Europe
Social partners	/	Tade and labor unions	Ver.di trade union
Scientific community	/	Universities	Westfälische Wilhelms-Universität Münster
Civil Society	/	Local interest groups and associations	WILDWUCHS E.V.
Private sector	/	Economic development companies	Wirtschaftsregion Lausitz GmbH (WRL) - Werkstätt
Public sector	Municipal	State-owned / public companies	WSW Wuppertaler Stadtwerk

Table 23. Actor participation analysis within the context of the StStG in the Lusatian district

Actor group	Total	Active	Passive	Leading
Public Sector	201 25.2 %*	151 75.1 %*	1 0.5 %*	49 24.4 %*
Social Partners	47 5.9 %*	47 100.0 %*	0 0.0 %*	0 0.0 %*
Private Sector	265 33.2 %*	224 84.5 %*	1 0.4 %*	40 15.1 %*
Scientific Community	106 13.3 %*	106 100.0 %*	0 0.0 %*	0 0.0 %*
Civil Society	179 22.4 %*	177 98.9 %*	0 0.0 %*	2 1.1 %*

*Relative figures rounded to the nearest tenth

Source: APES for StStG in the Lusatian district , Germany.

Rhenish Lignite District (Germany)

Table 24. List of participants to the StStG implementation processes in the Rhenish district

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Civil Society	/	Advocacy groups and grassroot movements	Allgemeiner Deutscher Fahrrad-Club
Civil Society	/	Planning and development associations	Allianz für Nachhaltigen Strukturwandel
Private sector	/	Professional and industry associations	Arbeitsgemeinschaft bäuerliche Landwirtschaft NRW e.V.
Civil Society	/	Environmental associations	BUND Kreisgruppe Rhein Erft
Civil Society	/	Local interest groups and associations	Ernährungsräte Köln, Bonn, Düsseldorf, Aachen, Rhein-Kreis-Neuss
Scientific community	/	Research institutes	Institut für Welternährung
Private sector	/	Professional and industry associations	Landesvereinigung Ökologischer Landbau e.V.
Civil Society	/	Local interest groups and associations	Regionalwert AG Rheinland
Civil Society	/	Local interest groups and associations	Regionalbewegung NRW
Civil Society	/	Cultural associations	Stiftung Schloss Türnich
Civil Society	/	Environmental associations	Stiftung Lebensraum
Public sector	Municipal	Government departments	Bezirksregierung Düsseldorf (Dezernat 32 - Regionalentwicklung)
Civil Society	/	Environmental associations	Bund für Umwelt und Naturschutz (BUND) - Kreisgruppe Düren
Civil Society	/	Environmental associations	Bund für Umwelt und Naturschutz Deutschland NRW (BUND)
Civil Society	/	Environmental associations	Naturschutzbund Deutschland NRW (NABU)
Social Partners	/	Tade and labour unions	deutscher Gewerkschaftsbund (DGB) NRW
Public sector	Regional	Government agencies and organizations	Erftverband
Civil Society	/	Religious or faith-based organizations	Evangelischer Kirchenkreis Jülich
Public sector	Regional	State-owned and public companies	Flughafengesellschaft Mönchengladbach GmbH
Private sector	/	Chambers of industry and commerce and chambers of craft	Handwerkskammer Aachen

Public sector	Regional	Government agencies and organizations	Nahverkehr Rheinland (NVR)
Public sector	Municipal	Government agencies and organizations	Verkehrsverbund Rhein-Ruhr (VRR)
Public sector	Regional	Investment and development banks	NRW.Bank
Civil Society	/	Planning and development associations	Region Aachen Zweckverband
Civil Society	/	Local interest groups and associations	Rhein-Erft-Tourismus e.V.
Private sector	/	Energy companies and transmission system operators	RWE Power AG (Abt. Regionalinitiativen und Projekte)

Table 25. Actor participation analysis within the context of the StStG in the Rhenish district

Actor group	Total	Active	Passive	Leading
Public Sector	139 24.2 %*	72 51.8 %*	35 25.2 %*	32 23.0 %*
Social Partners	34 6.0 %*	28 82.3 %*	6 17.7 %*	0 0.0 %*
Private Sector	120 21.0 %*	68 56.7 %*	18 15.0 %*	34 28.3 %*
Scientific Community	69 12.0 %*	52 75.4 %*	17 24.6 %*	0 0.0 %*
Civil Society	211 37.0 %*	161 76.3 %*	50 23.7 %*	0 0.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for StStG in the Rhenish district, Germany.

Groningen (The Netherlands)

Table 26. List of participants to the NPG implementation processes in Groningen

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Public sector	municipal	Government departments	Appingedam,
Public sector	municipal	Government departments	Appingedam, Loppersum
Civil Society	/	Young people	bbo Emmius Winschoten
Public sector	municipal	Government departments	Central Groningen
Public sector	municipal	Government departments	Central Groningen, Oldambt
Civil Society	/	Individual residents	Citizens
Civil Society	/	Individual residents	Citizens
Civil Society	/	Young people	De Kluiverboom, Noorderpoort College
Public sector	Regional	Elected officials and political parties	Deputee Province Groningen
Civil Society	/	Young people	Dr. Aletta Jacobs College Hoogezand
Public sector	Regional	Government agencies and organizations	Evaluation Committee National Program Groningen
Public sector	Municipal	Government departments	Gronigen
Civil Society	/	Advocacy groups and grassroot movements	Groninger Gasberaad
Public sector	Municipal	Government departments	Het Hogeland
Public sector	municipal	Government departments	Het Hogeland Jurgen Geelhoed
Public sector	municipal	Government departments	Het Hogeland Jurgen Geelhoed
Civil Society	/	Young people	Hogeland College Warffum
Civil Society	/	Youth associations	jimmy's jongerencentrum Appingedam
Civil Society	/	Youth associations	Jong Pekela
Civil Society	/	Youth associations	Jongerencentrum Break
Civil Society	/	Youth associations	Jongerenraad Groningen
Civil Society	/	Youth associations	Jongerenraad Oldambt
Public sector	municipal	Government departments	Loppersum
Public sector	municipal	Elected officials and political parties	Mayor of Appingedam
Public sector	municipal	Elected officials and political parties	Mayor of Loppersum, Delfzijl, Het Hogeland, Groningen
Public sector	municipal	Elected officials and political parties	Mayor of Oldambt
Public sector	municipal	Elected officials and political parties	Mayor of the municipality of Midden-Groningen
Public sector	Municipal	Government departments	Midden-Groningen
Public sector	municipal	Government departments	Minister of Economic Affairs and Climate
Public sector	municipal	Government departments	Minister of the Interior and Kingdom Relations
Public sector	Municipal	Government departments	Municipality of Eemsdelta
Public sector	municipal	Government departments	Municipality of Groningen
Public sector	municipal	Government departments	Municipality of Groningen
Civil Society	/	Young people	Noorderpoort Delfzijl
Public sector	municipal	Government departments	Oldambt
Public sector	Municipal	Government departments	Oldambt
Public sector	Municipal	Government departments	Pekela
Public sector	Regional	Government departments	Provincial Executive of the Province of Groningen
Private sector	/	Professional and industry associations	Representative of the agriculture sector
Private sector	/	Professional and industry associations	representative of the business community
Private sector	/	Professional and industry associations	Representative of the chemistry sector

Private sector	/	Professional and industry associations	Representative of the energy sector
Private sector	/	Service companies	Representative of the health care institutions
Private	/	Service companies	representative of the housing corporations,
Private sector	/	Service companies	representative of the housing corporations,
Private sector	/	Service companies	representative of the housing corporations,
Scientific Community	/	Universities	Representative of the knowledge institutions
Scientific Community	/	Universities	Representative of the knowledge institutions,
Public sector	Municipal	Government departments	Stadskanal
Public sector	Regional		Steering Committee of the National Program Groningen
Civil Society	/	Young people	Ubbo emmius Stadskanaal
Scientific Community	/	Universities	University of Groningen
Public sector	Municipal	Government departments	VeendamWesterkwartier
Public sector	regional	Government agencies and organizations	Waterboard Hunze en Aa's.
Public sector	Regional	Government agencies and organizations	Waterboard Noorderzijlvest
Private sector	/	Consulting and marketing companies	West 8
Public sector	Municipal	Government departments	Westerwolde

Table 27. Actor participation analysis within the context of the NPG

Actor group	Total	Active	Passive	Leading
Public Sector	246 43.2 %*	100 40.7 %*	46 18.6 %*	100 40.7 %*
Social Partners	0 0.0 %*	0 0.0 %*	0 0.0 %*	0 0.0 %*
Private Sector	100 17.6 %*	73 73.0 %*	1 1.0 %*	26 26.0 %*
Scientific Community	47 8.3 %*	24 51.0 %*	2 4.3 %*	21 44.7 %*
Civil Society	176 30.9 %*	176 100.0 %*	0 0.0 %*	0 0.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for the National Program Groningen (NPG), the Netherlands.

Bełchatów (Poland)

Table 28. List of participants to the TJTP decision-making and implementation processes in Bełchatów

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Public sector	EU	Investment and development banks	bank swiatowy
Public sector	Municipal	Government agencies and organizations	Bełchatów
Private sector	/	Consulting and marketing companies	BIOTECHNIKA
Civil Society	/	Planning and development associations	BKPPT
Private sector	/	Consulting and marketing companies	Bureau Veritas Polska
Scientific Community	/	research institute	Central Mining Institute

Private sector	/	Consulting and marketing companies	Centrum Obsługi Przedsiębiorcy w Łodzi
Social partners	regional	Tade and labour unions	Centrum Promocji i Rozwoju Inicjatyw Obywatelskich OPUS
Scientific Community	/	research institute	COBRO Centrum Badawczo-Rozwojowe Opakowań
Scientific Community	/	Universities	Collegium civitas
Public sector	Municipal	Government departments	Commune and City of Kleczew
Private sector	/	Consulting and marketing companies	DELOITTE
Civil Society	/	Environmental associations	Eco legal
Private sector	/	Manufacturing companies	EPICOM
Public Sector	EU	Government agencies and organizations	EU commission
Civil society	/	Environmental associations	European climate foundation
Private sector	/	Manufacturing companies	FARADISE S.A.
Public Sector	Municipal	Government departments	Gmina Rząśnia
Scientific Community	/	research institute	IETU
Scientific Community	/	research institute	instytut ciężkiej syntezy organicznej blachownia
Scientific Community	/	Think tank	instytut na rzecz ecorozwoju
Scientific Community	/	research institute	Instytut Nauk Ekonomicznych Polskiej Akademii Nauk,
Scientific Community	/	research institute	itc instytutu energetyki w lodzi, innowo,
Civil Society	/	Planning and development associations	ŁARR - Łódzka Agencja Rozwoju Regionalnego S.A.
Public sector	regional	Investment and development banks	lodzka specjalna strefa ekonomiczna
Civil Society		Environmental associations	lodzki klaster fala enerji
Public sector	regional	Government departments	Łódzkie Marshal Office
Public sector	regional	Government departments	Marshal's Office of the Łódź Voivodeship
Public sector	regional	Government departments	Marshal's Office of the Silesia Voivodeship
Public sector	regional	Elected officials and political parties	Marshal's Offices
Private sector	/	Manufacturing companies	Maspex
Public sector	federal	Government departments	MC
Public sector	federal	Government departments	MFRP
Public sector	Federal	Government departments	Ministerstwie rozwoju i teknoloji
Public sector	Federal	Government departments	Ministry of Climate and Environment
Scientific community	/	Think tanks	Młoda Lewica
Public sector	federal	Government departments	MNA
Scientific Community	/	Universities	MOLECOLAB
Civil Society	/	Advocacy groups and grassroot movements	National Federation of Polish NGOs (OFOP)
Public Sector	Federal	Government agencies and organizations	Państwowe Gospodarstwo Wody Polskie
Private sector	/	Energy companies and transmission system operators	PERN S.A
Private sector	/	Energy companies and transmission system operators	PGE ENERGIA CIEPLA S.A
Public sector	Municipal	State-owned and public companies	PGE GiEK
Civil Society	/	Environmental associations	Polish Green Network Associations, undacja ClientEarth Prawnicy dla Ziemi
Scientific Community	/	Universities	politeknika lodza,
Public Sector	Municipal	Government departments	Powiat de Bełchatów
Private sector	/	Energy companies and transmission system operators	Przedsiębiorstwo Energetyki Cieplnej Spółka z
Private sector	/	Consulting and marketing companies	PWC

Civil Society	/	Local interest groups and associations	Rada Powiatowa Nowej Lewicy w Bełchatowie
Public Sector	Regional	Government agencies and organizations	regional Council of Social Dialogue
Public Sector	Regional	Advisory boards and technical committees	Regional Public Benefts Council
Public Sector	Regional	Advisory boards and technical committees	Regional Transition Forum
Public Sector	Regional	Government agencies and organizations	Regionalny Dyrektor Ochrony Środowisk
Public Sector	Regional	Advisory boards and technical committees	Steering Committee of Regional Operational Programme for Lodzkie 2014-2020
Private sector	/	Professional and industry associations	stowarzyszenie forum odpowiedzialnego
Private sector	/	Professional and industry associations	STOWARZYSZENIE KLASTER BIOGOSPODARKI
Public sector	Federal	Elected officials and political parties	Stowarzyszenie Tak dla Bełchatowa, Bełchatowska Fundacja Sprawiedliwej Transformacji
Social partners	regional	Tade and labour unions	t undacja Instytut Spraw Obywatelskich
Scientific Community	/	Universities	Université à Rogowiec
Scientific Community	/	Universities	University of Economics in Katowice
Public sector	Municipal	Government departments	ustronie morskie
Scientific Community	/	Universities	Warsaw School of Economics
Public sector	Municipal	Government departments	Widawa Commune
Public sector	regional	Government agencies and organizations	Wojewódzki Fundusz Ochrony Środowiska
Public sector	regional	Government departments	Województwem marshal office
Scientific community	/	Universities	Wrocław University of Economics,
Civil Society	/	Environmental associations	ŹRÓDŁA

Table 29 Actor participation analysis within the context of the TJTP in Bełchatów

Actor group	Total	Active	Passive	Leading
Public Sector	79 51.0 %*	40 50.6 %*	1 1.3 %*	38 48.1 %*
Social Partners	3 1.9 %*	3 100.0 %*	0 0.0 %*	0 0.0 %*
Private Sector	31 19.9 %*	29 93.5 %*	0 0.0 %*	2 6.5 %*
Scientific Community	12 7.7 %*	12 100.0 %*	0 0.0 %*	0 0.0 %*
Civil Society	31 19.5 %*	31 100.0 %*	0 0.0 %*	0 0.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for the TJTP in the Bełchatów region, Poland.

Katowice (Poland)

Table 30.List of participants to the TJTP decision-making and implementation processes in Katowice

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Public sector	Regional	Government agencies and organizations	agencja Rozwoju
Private Sector	/	Economic and development companies	Agencja Rozwoju Przedsiębiorczoś ci S.A. z siedzibą w Żorach
Private sector	/	Consulting and marketing companies	agencja Rozwoju Przedsiębiorczości w Żorach
Public sector	Regional	Government agencies and organizations	agencja Rozwoju Regionalnego w Częstochowie
Public sector	Municipal	Government departments	Aglomeracja Beskidzka, Górnośląsko-Zagłębiowska Metropolia
Civil Society	/	Environmental associations	CEE Bankwatch Network, Polska Zielona Sieć
Civil Society	/	Local interest groups and associations	Centrum Rozwoju Inicjatyw Społecznych CRIS
Civil Society	/	Local interest groups and associations	Centrum Społecznego Rozwoju w Mikołowie
Civil Society	/	Environmental associations	Climate-KIC Polska
Public sector	EU	Government agencies and organizations	eu commission
Civil Society	/	Environmental associations	Fundacja na rzecz Efektywnego Wykorzystania Energii
Civil Society	/	Charities and Community organizations	Fundacja Rozwoju Ekonomii Społecznej
Public sector	Municipal	Government departments	Gliwice
Scientific Community	/	research institute	Główny Instytut Górnictwa
Public sector	Municipal	Government departments	Gmina Szczekociny
Private Sector	/	Chambers of industry and commerce and chambers of craft	Górnicza Izba Przemysłowo-Handlowa
Public sector	Municipal	Government departments	GórnośląskoZagłębiowska Metropolia
Scientific community	/	Research institutes	IETU
Private Sector	/	Consulting and marketing companies	InnoEnergy
Social Partners	/	Tade and labor unions	Kadra
Private Sector	/	Economic and development companies	Katowicka Specjalna Strefa Ekonomiczna S.A.
Public sector	Regional	Government departments	Marshal's Office of the Silesia Voivodeship
Public sector	Regional	Government agencies and organizations	METIS
Public sector	Municipal	Government departments	Miasto Katowice/Urząd Miasta Katowice
Public sector	Federal	Government departments	Minister of Funds and Regional Policy
Public sector	Federal	Government departments	Ministerstwo Aktywów Państwowych
Public sector	Federal	Government departments	Ministerstwo Funduszy i Polityki Regionalnej
Public sector	Federal	Government departments	Ministerstwo Infrastruktury
Public sector	Federal	Government departments	Ministerstwo Klimatu i Środowiska
Civil Society	/	Youth associations	Młodzieżowy Strajk Klimatyczny, Pan Dominik Madej
Civil Society	/	Cultural associations	Muzeum Górnictwa Węgla Kamiennego.
Scientific Community	/	research institutes	nstytut Badań Edukacyjnych w Warszawie

Civil Society	/	Local interest groups and associations	Ochotnicza Straż Pożarna w Kończycach Wielkich
Civil Society	/	Advocacy groups and grassroot movements	Ogólnopolska Federacja Organizacji Pozarządowych
Civil Society	/	Individual residents	Osoba fizyczna
Public sector	Federal	Advisory boards and technical committees	Parliamentary Subcommittee on Just Transformation
Scientific Community	/	Universities	Politechnika Śląska
Private Sector	/	Manufacturing companies	Polska Grupa Zbrojeniowa
Private Sector	/	Economic and development companies	Polska Izba Ekologii, Regionalna Izba Gospodarcza
Civil Society	/	Charities and Community organizations	Polski Klub Ekologiczny
Civil Society	/	Charities and Community organizations	Prezes Fundacji Przyjaciel z sercem z Częstochowy
Public sector	Regional	Advisory Boards and Technical Committees	Rada Działalności Pożytku Publicznego Województwa Lubelskiego
Social Partners	/	Tade and labor unions	Rada OPZZ Województwa Śląskiego
Public sector	Municipal	Government departments	Radny Rady Powiatuw Lublińcu
Public sector	Regional	Government agencies and organizations	Regionalnego w Częstochowie
Public sector	Regional	Government agencies and organizations	ROPS
Civil Society	/	Environmental associations	SAPE Polska
Scientific community	/	Research institutes	Science and Technology Park Technopark Gliwice, Sieć Badawcza Łukasiewicz
Civil Society	/	Civil right associations	Sejmik Osób Niepełnosprawnych Województwa Śląskiego; Sekretarz Śląskiej Rady ds. Seniorów
Public sector	Federal	Government departments	sekretarz stanu, Ministerstwo Rolnictwa i Rozwoju Wsi
Public sector	Regional	Government departments	Silesian Marshal Office
Private Sector	/	Economic and development companies	Śląski
Civil Society	/	Charities and Community organizations	Śląski Bank Żywności
Public sector	Regional	Government agencies and organizations	Śląski Ośrodek Doradztwa Rolniczego w
Social Partners	/	Employer associations	Śląski Związek Pracodawców Lewiatan,
Public sector	Municipal	Government departments	Sosnowiec
Civil Society	/	Environmental associations	STOWARZYSZEN IE „ZRÓWNOWAŻ ONA MOBILNOŚĆ W JAWORZNIE
Civil Society	/	Civic Engagement associations	Stowarzyszenie Aktywności Obywatelskiej Bona Fides
Civil Society	/	Planning and development associations	stowarzyszenie Bielskie Centrum Przedsiębiorczości
Public sector	Municipal	Government departments	Stowarzyszenie Gmin i Powiatów Subregionu
Civil Society	/	Civic Engagement associations	Stowarzyszenie Wspierania Organizacji Pozarządowych MOST
Civil Society	/	Environmental associations	stowarzyszenie Zrównoważona Mobilność w Jaworznie
Private Sector	/	Energy companies and transmission system operators	TAURON Polska Energia S.A
Civil Society	/	Environmental associations	Towarzystwo na rzecz Ziemi
Scientific community	/	Universities	uniwersytet Śląski w Katowicach
Public sector	Municipal	Government departments	Urząd Miejski w CzechowicachDziedzicach
Public sector	Regional	Government departments	Vice-Marshal of the Silesian Voivodeship

Public sector	Municipal	Government departments	wiązek Gmin i Powiatów Subregionu Centralnego Województwa
Public sector	Regional	Government agencies and organizations	Wojewódzki Funduszu Ochrony Środowiska i Gospodarki Wodnej,
Public sector	EU	Investment and Development Banks	worldbank
Public sector	Regional	Government agencies and organizations	WUP Katowice
Civil Society	/	Environmental associations	WWF
Public sector	Municipal	Government departments	Zabrze
Public sector	Municipal	Government departments	Związek Gmin i Powiatów Subregionu Centralnego Województwa Śląskiego z siedzibą
Civil Society	/	Local interest groups and associations	Związek Subregionu Zachodniego z siedzibą w Rybniku
Social Partners	/	Trade and Labour unions	Związek Zawodowy Górników w Polsce

Table 31. Actor participation analysis within the context of the TJTP in Katowice

Actor group	Total	Active	Passive	Leading
Public Sector	147 30.8 %*	63 42.8 %*	17 11.6 %*	67 45.6 %*
Social Partners	39 8.2 %*	34 87.2 %*	5 12.8 %*	0 0.0 %*
Private Sector	103 21.6 %*	89 86.4 %*	14 13.6 %*	0 0.0 %*
Scientific Community	55 11.5 %*	48 87.3 %*	7 12.7 %*	0 0.0 %*
Civil Society	133 27.9 %*	112 84.2 %*	21 15.8 %*	0 0.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for the TJTP in the Katowice region, Poland.

Norrbotten (Sweden)

Table 32. List of participants to the RUS 2030 decision-making processes in Norrbotten

Actor Group 1	Actor Group 2	Actor Type	Actor Name
Private Sector	/	Economic and development companies	ARCTIC BUSINESS INCUBATOR
Public Sector	Muncipal	Government departments	Arjeplog COMMUNE
Public Sector	Muncipal	Government departments	Arvidsjaur kommun
Public Sector	Muncipal	Government departments	Arvidsjaurs kommun
Private Sector	/	Shops, stores, and business establishments	björn Thunborg Viltaffär AB
Civil Society		cultural associations	filmpool nord
Public Sector	Municipal	Government departments	Gällivare COMMUNE
Public Sector	Municipal	Government departments	Haparanda COMMUNE
Public Sector	Regional	Government departments	jämtland
Public Sector	Regional	Government departments	Härjedalen
Public Sector	Municipal	Government departments	Kalix
Public Sector	Muncipal	Government departments	Kalix commune

Public Sector	Municipal	Government departments	Kiruna
Public Sector	Regional	Government agencies and organizations	Länsstyrelsen i Norrbotten
Private Sector	/	Professional and industry associations	LRF Norrbotten.
Scientific Community	/	Universities	LTU
Public Sector	Muncipal	Government departments	Luleå Commune
Public Sector	Municipal	Government departments	Luleå municipality, Staff - Quality & community development
Public Sector	Municipal	Elected officials and political parties	Mayors
Public Sector	Municipal	Elected officials and political parties	Miljöpartiet de Grönas Luleå Kansli
Public Sector	Municipal	Government departments	Norrbottens Kommuner
Public Sector	Municipal	Government departments	Överkalix
Public Sector	Muncipal	Government departments	Pajala COMMUNE
Public Sector	Municipal	legislative body	Parlement sami de Norvège
Public Sector	Municipal	Government departments	Piteå
Civil Society		civil right associations	Rättighetscentrum Norrbotten
Public Sector	Regional	Government departments	Region Jämtland Härjedalen
Public Sector	Regional	Government departments	Region Norrbotten
Public Sector	Regional	Legislative bodies	Regionfullmäktige
Public Sector	Regional	Elected officials and political parties	Riksdag
Public Sector	Regional	Government agencies and organizations	rkm
Private sector	/	Economic and development companies	Seon
Public Sector	Federal	Government agencies and organizations	SIP Swedish Mining Innovation
Public Sector	Regional	Government agencies and organizations	Skogsstyrelsen Norra Norrbottens distrikt
Civil Society		Cultural associations	Studio Acusticum
Civil Society	/	Charities and community organisations	svenska Tornedalingars Riksförbund
Civil Society	/	Charities and community organisation	Sverigefinska Riksförbundets norra distrikt (RSKL norra district)
Public Sector	federal	Government agencies and organizations	Tillväxtverket
Public Sector	Federal	Government agencies and organizations	Trafikverket
	/	trade union	Unionen
Public Sector	Regional	Government departments	Västerbotten
Public Sector	Regional	Government departments	Västernorrland

Table 33. Actor participation analysis within the context of the RUS in Norrbotten County

Actor group	Total	Active	Passive	Leading
Public Sector	100 78.1 %*	36 42.8 %*	5 11.6 %*	59 45.6 %*
Social Partners	2 1.6 %*	2 100.0 %*	0 0.0 %*	0 0.0 %*
Private Sector	6 4.7 %*	6 100.0 %*	0 0.0 %*	0 0.0 %*
Scientific Community	7 5.5 %*	6 85.7 %*	1 14.3 %*	0 0.0 %*
Civil Society	13 10.1 %*	13 100.0 %*	0 0.0 %*	0 0.0 %*

*Relative figures rounded to the nearest tenth

Source: APES for the RUS in Norrbotten, Sweden.