

MANAGING THE ENERGY TRANSITION OF COAL REGIONS: A DELIBERATIVE-POLYCENTRIC MODEL. A CASE STUDY OF SILESIA

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Purpose: This article examines a deliberative-polycentric model as a managing model for energy transition of coal regions.

Design/methodology/approach: This study adopts a qualitative, interpretivist research design to investigate governance dynamics within the context of the energy transition in the Silesian region of Poland.

Findings: The study reveals that stakeholders in Silesia perceive the energy transition as a profound socio-economic and cultural shift rather than merely a technological or policy-driven process. Focus group results show a strong sense of uncertainty and identity-related loss among mining communities, accompanied by concerns over job security, inadequate retraining systems, and unequal distribution of transition-related benefits. Stakeholders consistently identified governance fragmentation, weak coordination between institutional levels, and insufficient communication as major barriers to a just transition. At the same time, the research uncovered a clear appetite for more inclusive, transparent, and participatory decision-making processes. Participants expressed support for deeper engagement of local governments, civil society, and SMEs, as well as the institutionalization of deliberative mechanisms such as citizen assemblies or multi-stakeholder forums. Although participants did not use the formal terminology of polycentric or deliberative governance, their expectations aligned strongly with both models—favouring decentralization, shared authority, and long-term dialogue as prerequisites for building trust, legitimacy, and social acceptance during the transition.

Originality/value: This study offers one of the first empirically grounded assessments of how deliberative and polycentric governance models are perceived by diverse stakeholders within a coal-dependent European region undergoing structural transformation. While existing literature often discusses these governance concepts in abstract terms, this research provides concrete, bottom-up insights into their applicability, feasibility, and perceived added value in the specific context of Silesia. By foregrounding lived experiences, power asymmetries, and local expectations, the study bridges a critical gap between theoretical governance models and real-world transition dynamics. It contributes original evidence on how governance innovations could enhance procedural and distributive justice in post-mining regions and informs policy design at regional, national, and EU levels. The findings offer practical guidance for building more legitimate, adaptive, and participatory frameworks capable of supporting socially just energy transitions in structurally dependent regions across Europe.

Keywords: energy transition, coal region, deliberative management, polycentric management, governance, Silesia region.

Category of the paper: research paper.

1. Introduction

The global energy landscape is undergoing a profound transformation driven by mounting environmental imperatives, geopolitical pressures, and socio-economic shifts (Rogala, 2020). Central to this transformation is the transition from carbon-intensive energy systems to low-carbon and renewable alternatives—a process that is not merely technological, but also deeply institutional and political in nature. The European Union's commitment to climate neutrality by 2050, articulated in the European Green Deal, reflects both a strategic and normative response to the climate crisis (European Commission, 2019). However, the implementation of this agenda presents challenges in regions historically dependent on fossil fuel extraction, where economic livelihoods, cultural identities, and governance structures are closely intertwined with carbon-intensive industries (European Commission, 2020).

One such region is Silesia, located in southern Poland, which for decades has functioned as the country's coal-mining core. In this context, the energy transition cannot be reduced to technological substitution or market liberalization alone (Bondaruk, 2019). Rather, it represents a far-reaching social transformation that raises pressing questions related to employment, regional development, and social justice (Kozłowski, 2022). The gradual phasing out of coal affects not only energy systems, but also deeply embedded institutional arrangements and community narratives, making Silesia a critical case for examining the governance of just transitions (Mazurkiewicz, 2019).

Recent academic and policy debates increasingly highlight the limitations of centralized, top-down, and technocratic governance approaches in managing such complex transitions (Anfinson et al., 2023). In response, growing attention has been directed toward alternative governance models that emphasize participation, decentralization, and multi-level coordination. Deliberative and polycentric governance frameworks have been proposed as promising approaches for steering energy transitions in ways that are both socially legitimate and context sensitive. Despite their growing prominence in literature, empirical evidence on how these governance models is perceived and operationalized in coal-dependent regions at the regional (meso) level remains limited.

The purpose of this paper is to examine the deliberative–polycentric model as a governance approach for managing the energy transition in coal-dependent regions, using Silesia (Poland) as an empirical case. The study is significant because the energy transition in coal regions is

not only a policy or technological shift, but also a socio-economic and cultural transformation that raises issues of procedural legitimacy, distributive fairness, and social acceptance.

Methodologically, the study adopts a qualitative, interpretivist research design. Empirical material was collected through three face-to-face focus group discussions conducted in December 2024, involving a total of 20 participants representing key stakeholder categories, including local and regional government, civil society organizations, trade unions, and academic or policy experts. Based on prior research, the study assumes that stakeholders will (H1) perceive existing transition governance arrangements as fragmented and insufficiently inclusive, and (H2) express support for more participatory, transparent, and multi-level decision-making structures consistent with deliberative–polycentric governance.

Although deliberative and polycentric governance models are increasingly discussed in the energy transition literature, there is a notable lack of empirical studies that systematically examine how diverse stakeholders in coal-dependent regions interpret, evaluate, and formulate expectations toward these governance approaches. Research focusing on stakeholder perspectives at the regional level in Silesia remains scarce. By providing bottom-up, stakeholder-centered empirical evidence, this paper addresses this research gap and contributes practical insights relevant for regional, national, and European-level transition policy design.

2. Literature Review and Research Gap

This section reviews the existing literature on deliberative and polycentric governance in the context of energy transitions, with particular attention to coal-dependent regions. To systematically assess the state of knowledge and identify research gaps, a preliminary scoping review was conducted, drawing on peer-reviewed studies from multidisciplinary academic databases. Contemporary debates on energy transitions increasingly emphasize the need to democratize decision-making processes and strengthen public participation across multiple levels of governance (Cook, 2000; Tarasova, 2024). The shift away from centralized, technocratic models toward more inclusive and decentralized approaches reflects growing recognition of the social, political, and distributive dimensions of decarbonization. Central to this perspective is the idea that citizens and local communities should play an active role in shaping transition pathways, an approach grounded in principles of procedural and distributive justice (Chambers, 2003). Deliberative democracy has emerged as a key theoretical framework for analyzing such participatory processes (Dryzek, 2008). Rather than limiting citizenship to formal electoral participation, deliberative models conceptualize democratic legitimacy as emerging from inclusive, reasoned, and open public dialogue (Fishkin, 2003; Dryzek, 2005). In contrast to technocratic governance—where expert knowledge often dominates decision-making—deliberative approaches emphasize transparency, mutual learning, and the integration

of diverse perspectives (Dryzek, 2001). In the context of energy transitions, deliberation is particularly relevant, as decisions regarding infrastructure, energy mixes, and fossil fuel phase-out have direct and uneven impacts on citizens' everyday lives (Chilvers, Kearnes, 2016).

Alongside deliberation, the concept of polycentric governance, which is most prominently associated with the work of Elinor Ostrom (2010)—has gained increasing attention in sustainability and energy transition research. Polycentric governance refers to systems characterized by multiple, interdependent centers of decision-making operating across local, regional, national, and international levels (Hobson, 2009). Such arrangements emphasize subsidiarity, flexibility, and context-sensitive policy design, recognizing the role of municipalities, civil society organizations, energy communities, and citizens as active governance actors.

Given the socio-technical complexity of energy systems, polycentric approaches are often considered more adaptive than monocentric governance models, which may struggle to respond to rapid technological change, institutional diversity, and local variation (Jenkins, 2016). By enabling experimentation, institutional diversity, and horizontal learning, polycentric governance is frequently associated with greater resilience and innovation in transition processes (McCarthy, 2011). An emerging body of scholarship argues that deliberative and polycentric governance approaches are most effective when combined into an integrated framework (Dryzek, 2005; Carcasson, Sprain, 2010). In such models, deliberation enhances inclusivity and legitimacy, while polycentric structures provide adaptability and responsiveness under conditions of uncertainty. This integration is increasingly linked to broader debates on transformative and energy justice, which extend beyond distributive outcomes to address power relations, recognition, and participation (Chilvers, Kearnes, 2016).

Closely related is the concept of energy citizenship, which frames citizens not merely as consumers but as co-producers, co-governors, and innovators within energy systems (Devine-Wright, 2007; Szulecki, 2018). From this perspective, energy transitions are understood as deeply political and social processes requiring new forms of engagement, responsibility, and institutional design.

Despite their normative appeal, deliberative and polycentric governance models face significant practical challenges. The literature identifies persistent power asymmetries, institutional fragmentation, and coordination problems as major barriers to inclusive energy governance (Avelino, 2017; Stirling, 2014). Decision-making authorities often remain concentrated among national governments, large energy corporations, or technocratic institutions, while local authorities, civil society groups, and marginalized communities have limited influence over strategic priorities and resource allocation. Institutional fragmentation further complicates governance arrangements, as energy policy is typically dispersed across multiple sectors and governance levels (Petrovics et al., 2023). While polycentric systems can enable flexibility, overlapping mandates and unclear accountability structures may undermine coordination and strategic coherence. Research increasingly highlights the need to understand

how formal coordination mechanisms (e.g. regulatory frameworks, planning bodies) interact with informal ones (e.g. networks, partnerships, personal relationships) in shaping transition outcomes (Jordan, Schout, 2006). Meaningful dialogue and co-decision-making are also constrained by time pressures, resource limitations, information asymmetries, and the risk of symbolic participation (Fung, 2006; Fishkin, 2010). Without adequate institutional support, deliberative processes may reinforce existing inequalities or lead to stakeholder fatigue rather than genuine empowerment.

Despite the growing literature on deliberative and polycentric governance in energy transitions, several important gaps remain. First, most studies focus on national policy frameworks, urban contexts, or retrospective analyses, while the regional (meso) level—particularly in coal-dependent regions—remains underexplored. Second, there is a lack of empirical research that systematically examines how diverse regional stakeholders perceive, interpret, and evaluate deliberative–polycentric governance arrangements during ongoing transition processes. According to the literature reviewed, there are no studies that directly report on stakeholder expectations toward deliberative and polycentric governance in the context of the energy transition in Silesia. This study addresses this gap by providing bottom-up, stakeholder-centered empirical evidence from a coal-dependent region undergoing structural transformation.

3. Methods

In response to the research gaps identified in the literature, this study adopts a qualitative, interpretivist research design aimed at capturing stakeholder perspectives on governance arrangements in the energy transition of the Silesian region in Poland. The aim of the study is to explore how diverse regional stakeholders perceive the relevance, feasibility, and potential of deliberative and polycentric governance models in supporting a socially just and inclusive energy transition. Rather than evaluating existing governance structures *ex post*, the study focuses on the prospects for their future application and on the conditions necessary for their successful implementation.

A qualitative approach was considered most appropriate due to its capacity to capture the complexity of institutional change, uncover pluralistic viewpoints, and generate context-sensitive insights into stakeholder perceptions, motivations, and power asymmetries. To inform the research design, a preliminary scoping review was conducted (results presented in Table 1), combining critical literature review techniques with structured searches of multidisciplinary academic databases, including Scopus and Google Scholar. Search terms included “energy transition”, “deliberative governance in regional energy transition”, and “polycentric

governance in regional energy transition". The findings of this review informed both the conceptual framework and the methodological strategy of the study.

The analytical themes guiding the research were selected through a combination of deductive and inductive reasoning. Deductively, key thematic dimensions were derived from the literature on deliberative democracy, polycentric governance, and just energy transitions. These strands of research consistently emphasize issues such as stakeholder participation and inclusion, power asymmetries, institutional fragmentation, coordination mechanisms, and procedural justice. Inductively, these themes were further refined through an initial reading of the focus group material, allowing empirically salient issues to emerge from participants' narratives. This combined approach ensured that the analytical framework was both theoretically grounded and empirically sensitive. The analytical themes also informed the structure of the focus group discussion guide and the thematic blocks.

Table 1.

A preliminary scoping review

Element	Description / Findings
Objective (Aim)	To identify and compare governance approaches for managing the energy transition in selected post-mining regions in Europe: Poland, Germany, Greece, and Bulgaria.
Research Question	What governance models (Concept) are applied in post-mining regions (Population) during the energy transition (Context)?
Search Strategy	Databases: Scopus, Web of Science. Keywords used: 'energy transition', 'polycentric governance', 'post-mining regions'. Language: English.
Inclusion/Exclusion Criteria	Included: Peer-reviewed articles addressing regional governance. Excluded: National-level only analyses or purely technical studies without governance focus.
Study Selection Process	Three-step process: 1) Title screening, 2) Abstract review, 3) Full-text analysis.
Data Extraction	Information collected: Author(s), publication year, country, governance model type, and key findings relevant to deliberative or polycentric governance.
Synthesis of Findings	<ul style="list-style-type: none"> Germany: Strong literature on polycentric governance in the Ruhr and Lusatia regions; mostly retrospective. Greece: Policy-driven coal phase-out with emerging local participation; supported by EU and EIB. Bulgaria: Grassroots energy communities forming in coal regions; supported by EU Just Transition Fund, but governance remains largely centralized. Poland: Local civic initiatives are active, but few are formally linked to deliberative or polycentric models; literature is emerging but not model-driven.
Identifying Knowledge Gaps	Limited integration of deliberative and polycentric governance concepts across studies. Few forward-looking models exist for post-mining regional transition.
Implications for Research Design	Scoping review results informed the study's conceptual framework and methodological choice to focus on stakeholder perspectives through focus groups in Silesia.

Source: Own study.

Three face-to-face focus group discussions were conducted in December 2024 in different cities in southern Poland: on 3 December 2024 in Kraków, 5 December 2024 in Zabrze, and 6 December 2024 in Gliwice. Each session lasted approximately 70 minutes and was facilitated by the researcher using a semi-structured discussion guide. In total, 20 participants took part in the three focus groups. Participants were selected through energy transition stakeholder mapping conducted as part of desk research, including the analysis of policy

documents, strategic reports, and publicly available information on key actors involved in the regional energy transition.

All focus group sessions were conducted in person to foster richer interaction and more dynamic discussion. Notes were taken during each session, and the discussions subscribed subsequently. Focus groups can serve as approximations of deliberative forms of engagement insofar as they provide a structured setting in which participants are encouraged to reflect, exchange diverse viewpoints, and collaboratively construct meaning through facilitated dialogue. Although they do not replicate the full complexity of large-scale deliberative forums, carefully designed focus groups can function as small-scale proxies for deliberative democratic practices, particularly when they promote balanced participation and critical reflection (Parkinson, 2006). Previous research demonstrates that under such conditions, focus groups can elicit thoughtful engagement with expert knowledge and enable participants to challenge assumptions and co-produce insights (Davies, Burgess, 2004).

Focus groups were selected as the primary data collection method due to their effectiveness in promoting interactive dialogue, surfacing contested narratives, and approximating deliberative modes of engagement, consistent with the study's theoretical grounding in deliberative democratic theory. The focus groups addressed the following central themes:

- stakeholder participation and inclusion in energy governance,
- perceived power asymmetries and institutional fragmentation,
- experiences with formal and informal coordination mechanisms,
- opportunities and constraints for meaningful dialogue and co-decision-making.

The discussions were conducted in Polish and subsequently translated into English for transcription and analysis where necessary. Participants represented the following stakeholder categories:

- officials from regional and municipal governments,
- civil society organizations,
- trade union representatives,
- academic researchers and policy advisors.

This diversity reflects the multi-level and cross-sectoral nature of polycentric governance and enabled an in-depth analysis of how power relations and institutional roles are interpreted in practice.

The empirical material was analyzed using thematic coding informed by the principles of constructivist grounded theory (Charmaz, 2006). The analytical process unfolded in two iterative stages. First, initial coding was used to identify salient statements and recurring patterns across and within focus groups, with particular attention to participants' descriptions of governance structures, barriers to coordination, and inclusion in decision-making processes. Second, focused coding synthesized these patterns into broader thematic categories, guided by

sensitizing concepts derived from the theoretical framework—namely deliberation, polycentricity, institutional fragmentation, and justice.

To enhance the credibility and depth of interpretation, data triangulation was employed through the analysis of regional policy documents, media narratives, and existing scholarly literature on the Silesian energy transition. While qualitative focus group research provides rich, contextually embedded insights, it also entails certain limitations, including the risk of dominant voices, social desirability bias, and limited generalizability. These limitations were mitigated using trained moderation, the assurance of participant anonymity, and the creation of a safe environment conducive to open and honest expression.

Although the findings are not statistically generalizable, they offer significant theoretical and practical relevance for other post-industrial regions undergoing complex socio-ecological transitions. By foregrounding stakeholder experiences and governance expectations, the study contributes to academic debates on sustainability transitions and provides insights that may inform the design of inclusive and contextually appropriate energy governance frameworks.

4. Results

The focus group discussions explored how diverse stakeholder groups perceive the energy transition in the Silesian region and how they describe key challenges, participation patterns, and expectations related to governance processes. The analysis is structured around four thematic blocks derived from the discussion guide (Table 2), reflecting recurring issues raised across the focus groups.

Table 2.

Focus group thematic blocks

Thematic Block
Perception of the Energy Transition – The Local Context of Silesia
Key Challenges of the Energy Transition in Silesia
The Participation of Diverse Social Groups in the Energy Transition Process
Mechanisms for Enhancing the Quality of Social Dialogue

Source: Own study.

4.1 Perception of the Energy Transition – The Local Context of Silesia

Focus group participants described the energy transition in Silesia as a process deeply shaped by the region's industrial legacy and socio-economic identity. Trade union representatives emphasized that coal mining has historically structured not only employment patterns but also community life and collective identity. As one participant noted:

“This is not just about losing jobs. It's about losing who we are as a region”. “Mining isn't just a job here — it's our history, our families, our way of life”.

For many participants, the transition was framed as a personal and structural rupture affecting entire communities. Several respondents pointed out that the closure of mines entails not only economic loss but also a loss of social status and purpose for groups whose lives have long been connected to the coal sector.

“You’re not just closing mines — you’re closing chapters of people’s lives”.

Although participants generally acknowledged that change is inevitable, discussions were frequently marked by uncertainty and concern. Workers and residents expressed anxiety related to job security, income stability, and the risk of long-term marginalization, particularly among older workers with limited opportunities for retraining.

“We know change is coming, but no one is telling us how we fit into it”.

Local government representatives recognized these concerns while emphasizing that the transition is unavoidable and potentially transformative. They highlighted the need to secure long-term regional development through diversification, innovation, and investment in new sectors.

“This is not just about meeting climate goals. It’s about creating a future for our children that’s not tied to an industry in decline”.

Across stakeholder groups, several shared themes emerged, including the importance of ensuring social fairness, providing targeted support for vulnerable populations, and involving local communities more actively in shaping transition processes.

4.2 Key Challenges of the Energy Transition in Silesia

Participants identified a set of interrelated challenges affecting the implementation of the energy transition in Silesia. One of the most frequently mentioned concerns was the risk of large-scale job losses in coal-dependent sectors, particularly among middle-aged workers with specialized skills.

“We know change is needed, but it’s scary—we don’t know what comes next”.

“These workers can’t just switch overnight. They’ve built a life in one profession”.

The absence of effective retraining and reskilling programs was repeatedly highlighted as a critical issue. Participants feared that insufficient institutional support could lead to long-term unemployment and deepening socio-economic inequalities.

“If no one steps in with real programs, we’re just shifting people from mines to poverty”.

Uncertainty regarding future energy supply also featured prominently in the discussions. Participants expressed concern about the reliability and affordability of energy during the transition period, emphasizing the need for clear and consistent communication from public authorities.

“People are scared of blackouts. They want to know what’s coming next and when”.

At the governance level, participants described existing arrangements as fragmented and difficult to navigate. The involvement of multiple administrative levels was perceived to create unclear responsibilities and coordination problems.

“Everyone talks about cooperation, but no one knows who is actually responsible”.

Access to national and EU funding was also described as challenging, with bureaucratic complexity and political constraints limiting effective implementation. Additionally, participants stressed that certain social groups—such as older workers, rural residents, and individuals with lower educational attainment—face heightened risks of exclusion unless targeted support measures are introduced.

4.3 Participation of Diverse Social Groups in the Energy Transition Process

Across all focus groups, participants raised concerns about limited public involvement in shaping the energy transition. While trade unions and local authorities were generally seen as actively engaged, many other groups—including citizens, NGOs, local communities, and SMEs—were perceived as marginally involved.

“It feels like the same people are always at the table. Others don't even know where the table is”.

Participants attributed this limited participation to several factors, including low public awareness, insufficient information, weak trust in institutions, and limited opportunities for meaningful engagement.

“You can't expect people to take part when they don't understand what's happening or feel they won't be listened to”.

Local governments were widely regarded as potential facilitators of participation due to their proximity to residents. However, participants noted that municipalities often lack adequate financial and institutional resources.

“Local governments want to help, but without resources, their hands are tied”.

Civil society organizations and informal community groups were described as important actors in mobilizing local engagement, raising awareness, and rebuilding trust. Participants also emphasized the role of SMEs in driving innovation and anchoring economic benefits locally.

A recurring theme was the perceived need for decentralization, with participants arguing that decision-making should be shifted closer to the local level to reflect regional diversity and context-specific needs.

4.4 Mechanisms for Enhancing the Quality of Social Dialogue

Participants consistently emphasized the importance of dialogue quality for managing the energy transition. Effective engagement was described as dependent on access to clear, timely, and understandable information about planned changes and their implications.

“If you just send people a flyer or give a presentation, that's not dialogue—that's broadcasting”.

Participants highlighted the need for engagement processes to begin early and continue throughout the policy cycle. Suggested mechanisms included public consultations, participatory budgeting, civic assemblies, and multi-stakeholder forums.

Concerns were also raised regarding the structure of dialogue spaces. Participants noted that discussions are often dominated by a limited number of voices or become emotionally charged, underscoring the importance of skilled facilitation and inclusive formats.

Finally, many participants argued that dialogue should be institutionalized rather than treated as a one-off exercise, with permanent structures established to support long-term engagement.

4.5 Characteristics of a Just Transition: Stakeholder Perspectives

Participants described a just energy transition as one that prioritizes those most affected by socio-economic disruption. A recurring principle expressed in the discussions was that “no one should be left behind.”

“Justice means helping those who lose the most to also gain the most from what comes next”.

Beyond financial support, participants emphasized the importance of inclusive decision-making processes. Many stressed that communities should have opportunities to influence transition strategies, rather than being informed after decisions have been made.

“If justice is the goal, people need to be in the room when decisions are made”.

Participants also highlighted the need for continuous engagement, transparent procedures, and accessible information. The importance of coordination across different governance levels and actors was frequently mentioned, along with support for locally tailored solutions and community-led initiatives.

“Justice is not just about outcomes—it’s about who gets to shape them”.

5. Discussion

The energy transition currently unfolding in Silesia, Poland, represents a complex challenge that extends far beyond technical adjustments or economic restructuring. As demonstrated by the empirical findings, it constitutes a deep social and political transformation, involving shifts in identity, values, and modes of governance. Historically dependent on coal and heavy industry, Silesia faces the dual task of aligning with European decarbonization objectives while simultaneously addressing locally embedded concerns related to employment security, social justice, and community wellbeing (Kowalik et al., 2024; Cappellano et al., 2024). These findings reinforce the growing body of literature emphasizing that energy transitions in coal regions cannot be managed solely through top-down policy instruments but require

governance approaches sensitive to socio-cultural context and stakeholder agency (McCauley, 2017).

The results clearly indicate that stakeholders do not perceive the transition merely as an economic or technological shift. Rather, participants framed it as a rupture in cultural continuity, deeply intertwined with regional identity and collective memory. This perception aligns with research on post-industrial regions, which highlights how the decline of dominant industries often produces forms of existential insecurity, loss of status, and symbolic displacement (Healy, Barry, 2017; Sovacool et al., 2021). In Silesia, coal mining has historically functioned not only as an economic anchor but as a source of social cohesion and intergenerational pride. The findings thus underscore that ignoring these symbolic dimensions risks exacerbating resistance and undermining social acceptance of transition policies.

At the same time, the study reveals a widespread acknowledgment among stakeholders that the transition is inevitable. However, concerns were consistently raised regarding how the process is being governed. Uncertainty surrounding employment prospects, insufficient retraining opportunities, and the perceived inadequacy of support mechanisms for older or less mobile workers emerged as major sources of anxiety. These concerns resonate with earlier warnings that transitions lacking proactive redistribution and reskilling strategies may reinforce structural inequalities and deepen regional decline (Newell, Mulvaney, 2013). The Silesian case thus illustrates the importance of coupling decarbonization objectives with robust social policies capable of mitigating uneven transition impacts.

A central contribution of this study lies in its insight into how stakeholders conceptualize justice in the context of energy transition. The findings demonstrate that justice is understood not only in distributive terms—such as the allocation of funding, jobs, and compensation—but also in procedural terms. Participants repeatedly emphasized that who participates in decision-making, how information is communicated, and whether engagement is meaningful are as important as material outcomes. This aligns closely with multidimensional frameworks of energy justice, which emphasize distributive, procedural, and recognition-based dimensions (McCauley, Heffron, 2018). The frustration expressed by participants regarding superficial or symbolic consultation reflects broader critiques of technocratic governance models that marginalize civil society and local knowledge (Avelino, Wittmayer, 2016; Stirling, 2014).

The findings further highlight significant governance challenges related to institutional fragmentation. Stakeholders described the transition governance landscape as complex and difficult to navigate, characterized by overlapping responsibilities across national, regional, and municipal levels. Difficulties in accessing public and EU funding, combined with limited administrative capacity at the local level, were perceived as barriers to coherent and effective action. These observations reinforce arguments for coordinated multi-level governance frameworks capable of integrating diverse actors while remaining responsive to regional contexts (Ostrom, 2010). In this regard, the empirical evidence from Silesia illustrates how

fragmented institutional arrangements can undermine both efficiency and legitimacy in transition processes.

Although participants did not explicitly employ the terminology of polycentric governance, their expectations strongly reflected their core principles. There was broad support for decentralization, stronger roles for local governments, and enhanced collaboration between municipalities, civil society organizations, and the private sector. Stakeholders envisioned governance arrangements characterized by shared authority, contextual flexibility, and horizontal learning—features widely associated with polycentric systems (Jordan et al., 2018; Sovacool, 2019). These findings suggest that polycentric governance resonates with local expectations not as an abstract theoretical construct, but as a practical response to perceived governance shortcomings.

In parallel, participants articulated a strong demand for deliberative practices that elevate public voice and rebuild institutional trust. Calls for citizen assemblies, participatory budgeting, and inclusive forums point to a normative shift toward democratic experimentation and more dialogical forms of governance. This aspiration reflects what Dryzek (2000) describes as deliberative capacity—the societal readiness to engage in reasoned, inclusive, and reflective dialogue on contested policy issues. Importantly, participants emphasized that engagement must occur early and continuously, rather than being confined to late-stage consultations. This reinforces the argument that deliberation is not only a normative ideal but a functional requirement for sustaining legitimacy and reducing resistance during transformative change.

Taken together, the findings suggest that a deliberative–polycentric governance model may represent not merely an aspirational framework, but a practical necessity in coal-dependent regions undergoing structural transformation. Stakeholders’ emphasis on early engagement, transparent communication, and long-term dialogue underscores the role of procedural justice not only in promoting fairness, but also in enhancing the effectiveness and durability of transition policies. As the data indicate, perceptions of exclusion or predetermined decision-making can quickly erode trust and trigger resistance, undermining transition outcomes.

Finally, the Silesian case illustrates that justice in energy transitions must be understood as a multidimensional and context-sensitive concept. Beyond economic redistribution, participants highlighted the need for recognition, dignity, and meaningful participation—elements essential for addressing the symbolic and emotional dimensions of transition. A just transition, therefore, requires governance arrangements that integrate material support with inclusive decision-making and cultural sensitivity (Fraser, 2009).

By grounding these insights in stakeholder perspectives, this study contributes empirically to debates on governance innovation in energy transitions. It demonstrates how deliberative and polycentric principles are interpreted and valued at the regional level, filling an important gap in literature. In regions like Silesia, where historical legacies, social vulnerability, and political complexity intersect, such governance approaches offer a promising pathway toward transitions

that are not only low-carbon, but also socially legitimate, resilient, and democratically grounded.

6. Conclusions

This study set out to examine how deliberative and polycentric governance principles are perceived by key stakeholders involved in the energy transition of a coal-dependent region, using Silesia (Poland) as an empirical case. By drawing on qualitative evidence from focus group discussions, the research provides a bottom-up perspective on governance challenges, expectations, and opportunities in the context of a just transition.

The findings demonstrate that stakeholders in Silesia perceive the energy transition not merely as a technical or economic adjustment, but as a profound socio-economic and cultural transformation. Concerns related to employment security, regional identity, institutional fragmentation, and uneven access to decision-making processes featured prominently across all focus groups. At the same time, participants expressed a clear demand for more inclusive, transparent, and participatory governance arrangements. Although the terminology of deliberative or polycentric governance was not explicitly used by participants, their expectations closely aligned with the core principles of these models, including decentralization, shared authority, early engagement, and sustained dialogue.

By empirically documenting these perceptions, this study contributes new knowledge to the literature on energy transition governance. While existing research often addresses deliberative and polycentric governance at a conceptual level or focuses on national or urban contexts, this paper provides rare empirical insight into how these governance approaches are interpreted and valued at the regional (meso) level in a coal-dependent area. In doing so, the study addresses a clear research gap and strengthens the empirical foundations of debates on just transition governance.

From a theoretical perspective, the findings support multidimensional understandings of energy justice that integrate distributive, procedural, and recognition-based dimensions. The results highlight that governance processes—how decisions are made and who participates—are as critical to perceived justice and legitimacy as material outcomes. The study thus reinforces the relevance of deliberative and polycentric governance frameworks for analyzing and guiding complex socio-technical transitions in post-industrial regions.

From a practical standpoint, the findings have important implications for policymakers and practitioners. They suggest that effective energy transition governance in coal regions requires moving beyond centralized, technocratic approaches toward models that actively empower regional and local actors. Institutionalized mechanisms such as citizen assemblies, multi-stakeholder forums, and permanent dialogue platforms may enhance trust, improve

coordination across governance levels, and increase social acceptance of transition policies. Importantly, such mechanisms must be supported by adequate resources, clear mandates, and meaningful links to decision-making processes to avoid symbolic participation.

Several limitations should be acknowledged. First, the study is based on qualitative focus group data, which allows for in-depth exploration of stakeholder perspectives but does not permit statistical generalization. Second, although efforts were made to ensure diversity among participants, certain stakeholder groups may still be underrepresented. Third, the analysis focuses on perceptions and expectations rather than on the formal performance or outcomes of existing governance arrangements. These limitations suggest caution in extrapolating the findings beyond the specific regional context of Silesia.

Future research could build on these findings in several ways. Comparative studies across different coal-dependent regions could help assess the transferability of deliberative–polycentric governance principles across institutional and cultural contexts. Longitudinal research could examine how stakeholder perceptions evolve as transition policies are implemented over time. Further work could also explore the interaction between formal governance structures and informal civic initiatives, as well as the conditions under which deliberative mechanisms translate into tangible policy influence.

Overall, this study demonstrates that governance innovation is central to achieving a socially just and politically sustainable energy transition in coal-dependent regions. By foregrounding stakeholder perspectives, it shows that deliberative and polycentric governance models resonate with local expectations and offer a promising pathway for addressing the complex social, institutional, and cultural challenges of decarbonization. In this sense, the paper not only fills an important research gap but also provides actionable insights for designing more legitimate, inclusive, and resilient transition governance frameworks at regional, national, and European levels.

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