TRADE UNIONS' COLLECTIVE POWER IN DECARBONIZATION FOR ENSURING A JUST ENERGY TRANSITION SYSTEMATIC REVIEW

Eko Sulistyo[1], Ravik Karsidi[2], Drajat Tri Kartono[3], Akbarudin Arif[4]

[1,4] Program Studi Penyuluhan Pembangunan, Universitas Sebelas Maret, Surakarta, Indonesia
[2] Program Studi Pendidikan Luar Biasa, Universitas Sebelas Maret, Surakarta, Indonesia
[3] Program Studi Sosiologi, Universitas Sebelas Maret, Surakarta, Indonesia

ravik@staff.uns.ac.id
*corresponding author

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ABSTRACT

A just energy transition requires not only technological shifts toward clean energy but also social inclusion and fairness in the world of work. Trade unions play a dual role—protecting workers while shaping energy policy and advancing social justice—yet their strategic contributions remain understudied, especially in comparisons between developed and developing countries. This study conducts a Systematic Literature Review (SLR) using the PRISMA protocol on 25 peer-reviewed publications (2015–2025). Trade union strategies are interpreted using Kalt's (2022) typology—oppositional, reactive, affirmative, transformational—and analyzed through six empowerment dimensions: structural, organizational, advocacy/negotiation, socio-cultural, economic, and ideological. Findings show unions in developed countries predominantly adopt affirmative and transformational strategies, engaging in reskilling initiatives, climate negotiations, and institutionalized social dialogue. Conversely, unions in developing countries rely more on oppositional or reactive strategies due to limited institutional capacity and weaker bargaining positions amid rapid transition policies. The study underscores the need for multidimensional empowerment to strengthen unions' ability to influence policy and safeguard workers during decarbonization. These insights offer practical implications for policymakers and labor organizations committed to equity, sustainability, and socio-ecological justice in energy transitions.

INTRODUCTION

The energy transition toward a low-carbon system has now become an unavoidable global agenda, as the climate crisis becomes increasingly evident and international pressure to reduce greenhouse gas emissions intensifies. International literature emphasizes that the energy transition is not only about technical aspects—such as energy mix, resource diversification, or technological innovation—but also carries complex dimensions of social justice (Lee & Baumgartner, 2022; ILO, 2015). Within this framework, the concept of a just transition emerges as a global norm to ensure that the shift to clean

energy does not create new injustices, particularly for workers and vulnerable communities.

In Indonesia, the commitment to energy transition gained momentum through the Just Energy Transition Partnership (JETP) initiative announced at the G20 Summit in Bali in 2022. This commitment was reinforced by regulations such as Presidential Regulation No. 112/2022 on the Acceleration of Renewable Energy Development and Minister of Energy and Mineral Resources Regulation No. 10/2025 on the National Energy Plan. However, implementation achievements remain far from target: in 2024, the share of renewable energy (RE) only reached 14.68%, well below the 23% target for 2025 (Directorate General of NRE, 2024), even though Indonesia's RE potential is estimated to reach 3,688 GW (Ministry of Energy and Mineral Resources, 2024).

Beyond technical and regulatory aspects, the energy transition has major implications for the world of work. The ILO (2018) estimates that globally this transition will eliminate around 6 million fossil-fuel-based jobs, while simultaneously creating 24 million green jobs. In Indonesia, Faliana (2025) projects the creation of 432,000 jobs in the renewable energy sector by 2030, increasing to 1.12 million by 2050. Nonetheless, the challenges are not simple, including skills gaps, the risk of sudden layoffs, and weak adaptive labor regulations (IESR, 2024). Without adequate strategies for reskilling, social protection, and social dialogue, the transition risks deepening socio-economic inequalities.

In facing these dynamics, trade unions play a crucial role. The ILO (2015) stresses that participatory social dialogue is an absolute requirement for achieving a just energy transition. Trade unions function not only as protective actors safeguarding the welfare of their members, but also as transformational agents capable of expanding workers' capabilities, strengthening bargaining power, and articulating social justice agendas in energy policy. This role is increasingly relevant given the potential conflicts of interest between accelerated decarbonization and worker protection.

However, despite several works mentioning the role of trade unions in energy transition, the available empirical and conceptual studies remain limited. First, most existing research focuses more on technical aspects—energy mix, technological innovation, and regulation—while social dimensions, particularly the role of trade unions, receive less serious attention. Second, many studies position workers merely as impacted parties, rather than as actors influencing the direction of energy transition policy. Third, studies on trade unions in energy transition remain scattered and partial, so no systematic synthesis integrating global and national findings is yet available. The absence of systematic literature reviews also makes it difficult to draw general conclusions on cross-country patterns of union roles. Fourth, the existing literature has not consistently employed the empowerment dimensions—structural, organizational, advocacy-negotiation, socio-cultural, economic, and ideological—to analyze trade union roles. Therefore, there remains wide research space to position trade unions as strategic actors in realizing a just energy transition.

This article seeks to address gaps in the literature on the role of trade unions in energy transitions through a Systematic Literature Review (SLR). The study focuses on three main questions 1) how do trade union strategies respond to energy transition policies, 2) to what extent can trade union empowerment be mapped through six dimensions—structural, organizational, advocacy-negotiation, socio-cultural, economic, and ideological, 3) how can the position of trade unions shift from protective to affirmative or transformational. By answering these questions, this study aims to contribute

theoretically to enriching global labor movement studies while also offering practical implications for energy transition policies in Indonesia and beyond.

Within this framework, the study formulates a conceptual map linking energy transition, its impact on the world of work, and trade union strategies in achieving a just transition. The transition—marked by decarbonization agendas—has implications for fossil-based job loss, reskilling needs, and opportunities for green job creation. This condition places trade unions in a strategic position with a variety of strategies—oppositional, reactive, affirmative, and transformational (Kalt, 2022). These strategies operate within the framework of six empowerment dimensions: structural, organizational, advocacy-negotiation, socio-cultural, economic, and ideological (Rowlands, 1997; Kabeer, 1999; Zimmerman, 2000), rooted in the capability approach (Sen, 1999).

As illustrated in Figure 1.1, the conceptual map shows that the energy transition triggers impacts on the world of work, which in turn open space for trade unions to respond through different strategies. These strategies function within the six-dimensional empowerment framework, simultaneously positioning trade unions not only as protective actors but also as transformational agents linking worker protection with the just energy transition agenda.

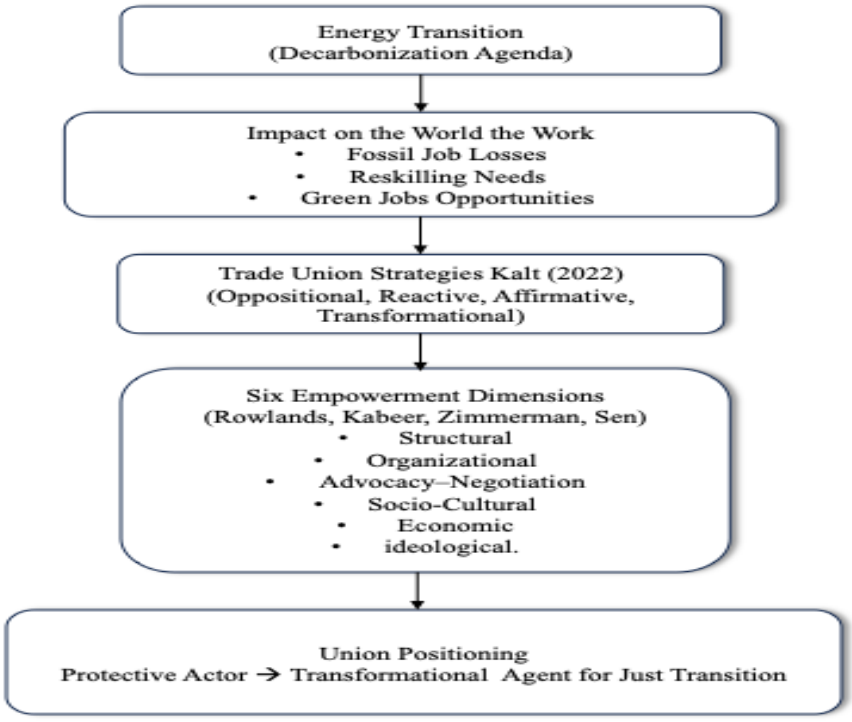

Figure 1. Conceptual Map of Energy Transition and Trade Union Empowerment

The concept of just transition was first popularized by the international labor movement in the 1980s and later mainstreamed by the ILO (2015) in the Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All. The concept emphasizes the importance of ensuring that the shift to a green economy does not generate new injustices for workers and vulnerable communities. Recent literature highlights two main dimensions of just transition: (1) the distributive dimension—ensuring that the benefits and burdens of transition are shared fairly; and (2) the

procedural dimension—ensuring meaningful participation in decision-making processes (Newell & Mulvaney, 2013; Stevis & Felli, 2020). Thus, just transition functions as both a normative framework and a policy instrument to balance decarbonization agendas with worker protection.

Empowerment is a multidimensional concept emphasizing the expansion of individual and collective capabilities to determine the course of their lives. Amartya Sen (1999), through the capability approach, stresses that development is a process of expanding real freedoms so that actors can realize functionings they value. In the context of trade unions, this framework is highly relevant because unions not only protect members' normative rights but also expand collective worker capabilities through reskilling programs, social protection, and green jobs advocacy.

Sen's normative framework is complemented by empowerment theories from Rowlands (1997), Kabeer (1999), and Zimmerman (2000), who outline six main dimensions: (1) structural – legal and regulatory position; (2) organizational – internal capacity and membership base; (3) advocacy–negotiation – social dialogue and bargaining; (4) socio-cultural – solidarity and moral legitimacy; (5) economic – welfare and compensation; and (6) ideological – social justice, industrial democracy, and ecological sustainability.

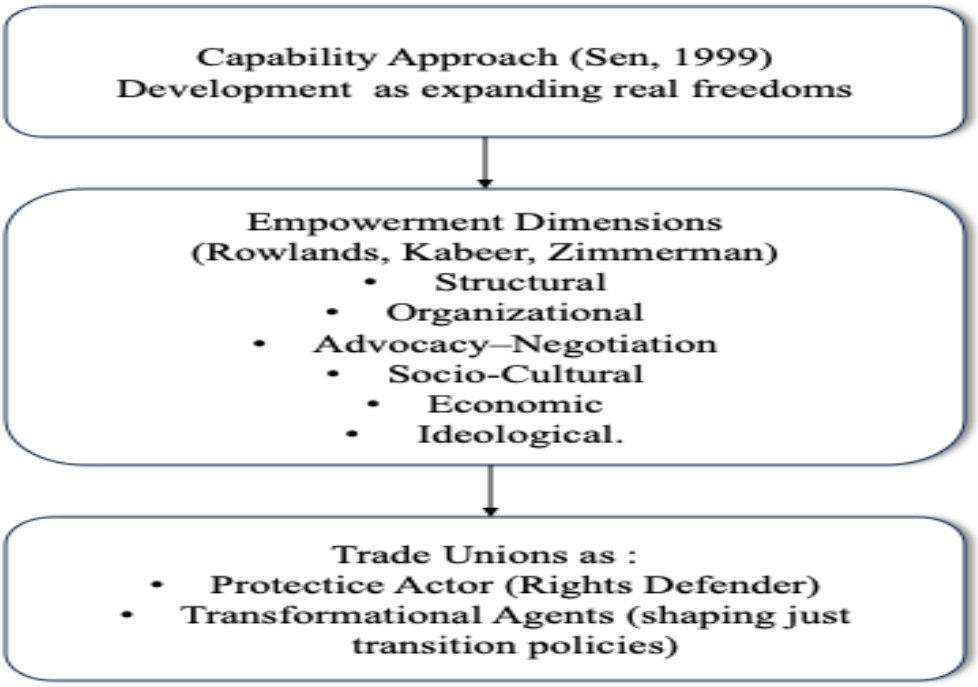

Figure 2. Theoretical Framework of Trade Union Empowerment in Energy Transition

As shown in Figure 2, the integration of Sen's capability approach with the six empowerment dimensions of Rowlands, Kabeer, and Zimmerman yields a comprehensive analytical framework. This theory illustrates that the capacity of trade unions is determined not only by their structural and organizational position but also by their advocacy strength, social legitimacy, economic foundation, and ideological orientation.

Thus, trade unions can be understood not merely as protectors of members' interests but also as agents of change with transformational potential in driving a just energy transition.

Beyond empowerment dimensions, union responses to the energy transition can also be mapped through a typology of strategies. Kalt (2022) identifies four main forms of trade union responses. Oppositional strategies are demonstrated through rejection of energy transition policies perceived as threatening job security. Reactive strategies are evident in defensive stances emphasizing short-term protective demands, such as maintaining minimum rights without shaping transition policy. Affirmative strategies involve union participation in transition schemes to mitigate negative impacts on members. At the highest level, transformational strategies portray unions as actors not only adapting but also actively shaping the direction of the energy transition by advancing social and ecological justice agendas. This typology helps to understand variations in union responses across sectors and countries, while showing the spectrum of positions unions may take in facing structural changes toward low-carbon energy systems.

The literature shows that the role of trade unions in energy transition varies significantly depending on social, political, and economic contexts. In Europe, unions actively push green deal policies through tripartite social dialogue and strengthen workers' positions in sustainability agendas (Evans & Phelan, 2016). In Latin America, litigation related to just transition often intersects with indigenous rights, labor rights, and socio-ecological justice, highlighting the socio-political complexity of energy transitions (Tigre, 2021). Meanwhile, in South Africa, studies by Baker and colleagues (2014; 2019) show tensions between decarbonization efforts and structural challenges such as unemployment, poverty, and inequality in a coal-dependent country.

In Asia, literature indicates that unions tend to focus on job protection and have not fully engaged in transformational agendas (Ford, 2009). In Indonesia, some studies emphasize classical issues such as minimum wages, outsourcing, and social protection (Hadiz, 1997; Tjandra, 2016). Research on union involvement in energy transitions remains limited, though discussions on green job creation and the importance of workforce reskilling are emerging (IESR, 2024). These findings underline the need for systematic syntheses that integrate global and national literature to understand unions' strategic role in energy transitions.

Based on the literature review, this study develops an analytical framework integrating two key elements. First, the six-dimensional framework of trade union empowerment (Rowlands, 1997; Kabeer, 1999; Zimmerman, 2000; Sen, 1999)—structural, organizational, advocacy-negotiation, socio-cultural, economic, and ideological—used to assess unions' collective capacity in facing energy transition dynamics. Second, Kalt's (2022) typology of trade union strategies, which maps responses from oppositional and reactive to affirmative and transformational, highlighting unions' potential role in shaping energy transition pathways.

Integrating these two elements produces a comprehensive conceptual framework: the empowerment dimensions provide substantive categories for assessing capacity, while the strategy typology shows the spectrum of positions unions may take. Thus, this study can analyze trade unions' roles deeply and contextually in achieving a just energy transition.

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METHOD

Research Design

This study employs an SLR design to synthesize academic findings regarding the role of trade unions in the energy transition. This design was chosen because it is able to provide a comprehensive, transparent, and structured overview of the scattered literature, as well as to identify patterns, gaps, and directions for future research (Snyder, 2019). To ensure consistency and scientific accountability, the study follows the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), which have been widely used as international standards in literature-based studies (Moher et al., 2009).

The SLR process was carried out through four main stages: 1) Identification, namely searching for relevant publications through international and national databases; 2) Screening, namely initial selection based on title and abstract to assess relevance to the research focus; 3) Eligibility, in the form of in-depth review of the full text to assess conformity with inclusion and exclusion criteria; 4) Inclusion, namely the determination of final articles that became the core literature for analysis. The overall selection process is visualized in the PRISMA Diagram (Figure 3.1), which depicts how the number of publications was gradually reduced through successive stages of screening and evaluation until only the eligible studies were retained.

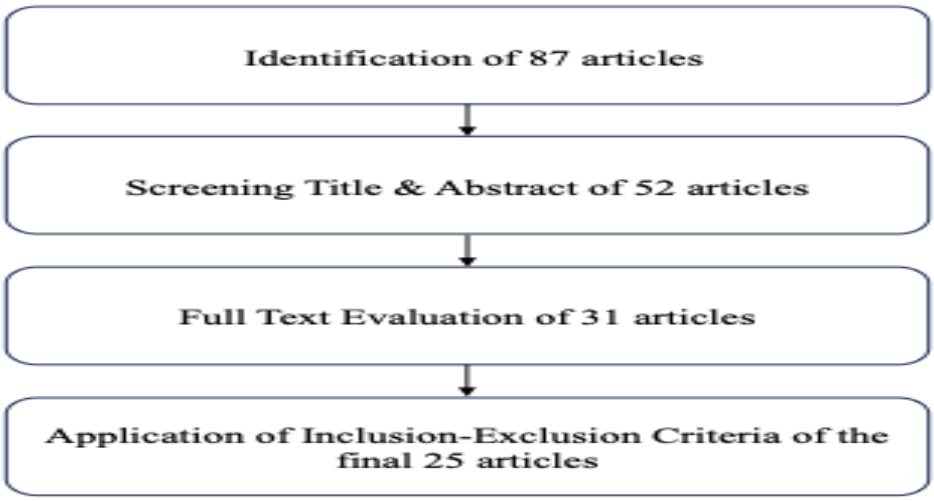

Figure 3. PRISMA Diagram: Literature Selection Process

The PRISMA diagram illustrates the sequential screening of publications. From 87 records identified in international and national databases, 52 remained after title and abstract screening. Following full-text eligibility assessment, 31 articles were considered relevant, and ultimately 25 studies were included in the final synthesis. This visualization enhances methodological transparency and ensures replicability of the review process.

Data Sources and Selection Process

The literature search was conducted through several credible international and national databases, namely Scopus, Web of Science, Google Scholar, and Garuda. The search keywords were designed in combinations representing the research focus, including:

"trade union", "labor union", "just transition", "energy transition", "worker empowerment", and "green jobs". This strategy aimed to capture diverse publications while ensuring relevance to the theme of the study.

The selection process was carried out in stages. At the initial identification stage, 87 publications were obtained. After title and abstract screening, 52 articles were retained. Subsequent full-text review yielded 31 eligible articles. Finally, after applying stricter inclusion and exclusion criteria, 25 articles were selected for analysis in this study.

To complement the visual representation in Figure 3, Table 1 provides a summary of the number of publications retained and excluded at each stage of the PRISMA flow. Presenting both a diagram and a table ensures that the process is not only visually transparent but also numerically precise for reporting purposes.

Table 1. Literature Selection Process (PRISMA Flow Summary)

Stage	Number of Publications	Description
Identification	87	Publications obtained from Scopus, Web of Science, Google Scholar, Garuda
Screening	52	After title and abstract screening
Eligibility	31	After full-text review and application of inclusion–exclusion criteria
Inclusion	25	Final articles included in the analysis

Data Analysis Technique

Data were analyzed using thematic synthesis to organize findings across literature in a structured manner (Thomas & Harden, 2008). The process included thorough reading of the articles, coding of relevant issues such as trade union strategies and forms of involvement in the energy transition, then grouping into themes based on strategy typology (oppositional, reactive, affirmative, transformational) and six empowerment dimensions (structural, organizational, advocacy–negotiation, socio-cultural, economic, ideological). The final stage was mapping into an analysis matrix to display the distribution of strategies and empowerment dimensions in both global and national literature.

To illustrate these analytical steps, Table 2 presents the analysis matrix that cross-maps trade union strategy typologies (Kalt, 2022) with six empowerment dimensions, accompanied by global and national examples that demonstrate the diversity of union responses in just energy transitions.

Table 2. Analysis Matrix of Trade Union Strategies and Empowerment Dimensions

Strategy Typology (Kalt, 2022)	Structural (Legal & regulatory position)	Organizational (Internal capacity, membership base)	Advocacy–Negotiation (Social dialogue, bargaining)	Socio-Cultural (Solidarity, legitimacy)	Economic (Welfare, compensation)	Ideological (Justice, democracy, sustainability)	Examples (Global / National)
Oppositional	Rejects regulations on fossil phase-out; demands legal protection for conventional sectors	Defensive mobilization of members	Minimal or confrontational dialogue with government	Narrative of protecting community identity tied to coal/oil jobs	Demands for severance, pension protection	Ideology of defending status quo against "green" agenda	Coal unions in South Africa, Germany; some Indonesian unions
Reactive	Accepts transition legally but demands gradual implementation	Limited capacity-building, passive membership	Bargaining limited to wages, severance, social security	Weak social solidarity beyond members	Focus on short-term income protection	Lack of long-term ideological framing	South Asia; parts of Indonesian energy unions
Affirmative	Supports legal frameworks for renewables if worker protection ensured	Organizational programs for reskilling, training	Active in tripartite dialogue, negotiation on green jobs	Promotes worker solidarity with environmental movements	Advocates for green job creation with fair wages	Ideology of fairness, limited ecological concern	European unions; Japan; emerging cases in Indonesia
Transformational	Pushes progressive legal reforms, green industrial policies	Strong internal democracy, coalition-building	Shapes policy direction via alliances (state–civil society)	Frames transition as social justice + ecological justice	Advocates for redistributive green economy policies	Embraces industrial democracy, climate justice	Latin American unions; progressive European unions

Validity and Reliability

Research validity was maintained through transparency of the literature selection process with the PRISMA protocol, from identification to the inclusion of 25 articles out of a total of 87 publications. Reliability was reinforced through systematic coding based on the typology of trade union strategies (Kalt, 2022) and the six empowerment dimensions (Rowlands, 1997; Kabeer, 1999; Zimmerman, 2000; Sen, 1999), as well as the application of peer debriefing to minimize bias. This combination ensures that the thematic synthesis can be scientifically accountable and relevant to answering the research questions.

RESULTS AND DISCUSSION

General Characteristics of the Corpus (2015–2025)

This study analyzed 25 publications selected through the PRISMA protocol, representing the diversity of both global and national contexts. Temporally, the literature shows a sharp increase after 2019, peaking between 2023 and 2025 in line with the growing prominence of the Just Energy Transition Partnership (JETP) agenda in Indonesia. Geographically, the studies cover Europe, South Africa, Australia, the United States, Finland,

Hungary, Switzerland, Germany, India, Latin America, and Southeast Asia, with particular attention to Indonesia.

In terms of type, the corpus comprises academic journals, policy reports (ILO, UNDP, IESR, SEI), as well as working and discussion papers (TUED, AWI, arXiv). Thematically, the literature addresses a wide spectrum of issues, including the normative framework of just transition, employment impacts and social protection, institutional power of trade unions, multi-level governance, reskilling and upskilling strategies, and the political tensions between decarbonization and job protection.

To present these distributions more systematically, Table 3 summarizes the characteristics of the literature based on year, study location, issue focus, trade union strategies, and empowerment dimensions.

Table 3 Characteristics of the Literature (2015–2025)

No	Author & Year	Year	Study Location	Issue Focus	Trade Union Strategy (Typology)	Empowerment Dimensions
1	International Labour Organization (Guidelines)	2015	Global	Just Transition (JT) guidelines, norms and policy instruments	Affirmative (tripartite framework)	Structural; Advocacy–Negotiation
2	Evans & Phelan	2016	Global/Australia	JT & environmental justice; discourse construction	Transformational (climate justice coalition)	Ideological; Socio–Cultural
3	Sweeney & Treat (TUED)	2018	Global	Union politics & transformational agenda	Transformational	Ideological; Organizational
4	Baker & Phillips	2019	South Africa	Electricity distribution politics; transition tensions	Reactive → Affirmative (advocacy of protection)	Structural; Economic
5	Burton, Caetano & McCall	2019	South Africa	Coal phase-out, job impacts & planning	Affirmative (participatory planning)	Economic; Structural
6	Clarke & Sahin-Dikmen	2020	Europe (construction)	Social dialogue in green transition of construction sector	Affirmative (sectoral negotiation)	Advocacy–Negotiation; Organizational
7	Stevis & Felli	2020	Global	"Planetary JT": inclusivity & justice	Transformational (critique + inclusion agenda)	Ideological; Socio–Cultural
8	Bonvin	2021	Europe/Switzerland	Multi-level governance & union strategies	Affirmative (top–down)	Structural; Advocacy–Negotiation
9	Borbely, Kovács & Tóth	2021	Hungary	Unions & platform workers	Reactive (exploratory strategy)	Organizational; Structural
10	Kalt	2022	Germany/EU	Typology of union strategies in green transition	O–R–A–T (comparative typology)	Organizational; Ideological

11	Lee & Baumgartner (UNDP)	2022	Global	JT to deliver Paris Agreement (policy mapping)	Affirmative (mainstreamed policy)	Structural; Advocacy–Negotiation
12	Matzat & Schmeißer	2022	Germany	Do unions shape political ideology at work	Affirmative (normative influence)	Ideological; Socio–Cultural
13	Petreski & Tanevski	2023	Eastern Europe	Bargaining power & labor share	Affirmative (strengthening bargaining)	Economic; Organizational
14	ILO (Indonesia – Social Protection)	2023	Indonesia	Role of social protection in JT	Affirmative	Structural; Economic
15	Saleh & Andri (CELIOS)	2023	Indonesia (regional)	JT in regions: opportunities & challenges	Affirmative (regional advocacy)	Organizational; Advocacy–Negotiation
16	Tranggono (Humanis)	2023	Indonesia	Scoping JET Indonesia: actors, issues, initial mapping	Reactive → Affirmative (mapping)	Structural; Organizational
17	Putra & Nurdianto (Global Policy)	2024	Indonesia	JETP politics: policy regime analysis	Affirmative (cross-actor negotiation)	Structural; Advocacy–Negotiation
18	Bobner et al. (SEI)	2024	Indonesia	Coal & JT policy recommendations	Affirmative (policy recommendation)	Structural; Economic
19	IESR (Workforce)	2024	Indonesia	Employment in transition: mapping & action	Affirmative (reskilling/upskilling)	Organizational; Economic
20	Patiroi et al. (LBH/ICEL/Salam)	2024	Indonesia (West Java)	Socio-labor impacts of Cirebon I power plant	Affirmative (local rights advocacy)	Socio–Cultural; Advocacy–Negotiation
21	Santoso & Lestari (JWE L&B)	2024	Indonesia	Legal perspective on JT	Affirmative (normative framework)	Structural
22	Silviana et al.	2025	Indonesia (Pelabuhan Ratu)	Early retirement policy of coal plant; multi-level governance	Affirmative (worker protection)	Structural; Economic
23	Kuitto & Sovacool (Energy Policy)	2025	Finland & US	Institutional power & fossil phase-out (comparative)	Affirmative (institutional role)	Structural; Advocacy–Negotiation
24	Rosemberg (Climate Policy)	2025	Global	Unions, fossil workers & energy transition	Affirmative → Transformational (strategy spectrum)	Organizational; Economic; Ideological
25	Mangang et al. (ERSS)	2024	India	Coal union perspectives on JT	Reactive → Affirmative (lobbying, compensation)	Economic; Advocacy–Negotiation

To further illustrate the temporal patterns, Table 3 displays the annual distribution of publications between 2015 and 2025, clearly showing the surge after 2019 and the peak in 2023–2025.

Overall, the corpus from 2015–2025 indicates a dominance of affirmative strategies, particularly in the Indonesian context, where unions emphasize negotiation, reskilling, and social protection. By contrast, global cases—especially in Latin America and parts of Europe—tend to show more transformative orientations, highlighting broader socio-ecological justice agendas. This contrast underscores the different trajectories of union empowerment depending on political-economic context.

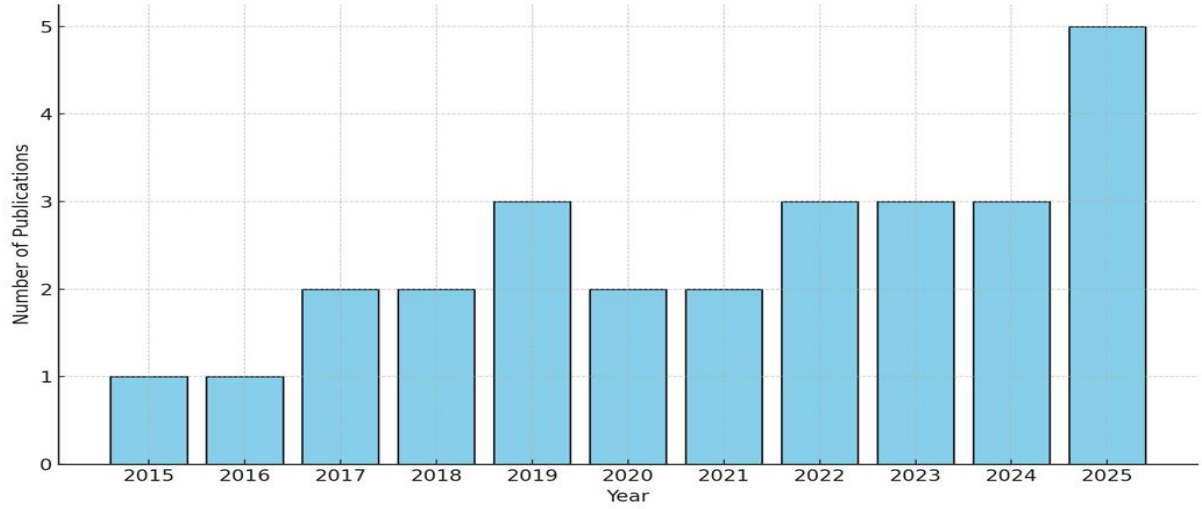

Figure 4. Trend of Publications on Trade Unions and Energy Transition (2015-2025)

Main Trends (2015–2025)

The analysis of the 25 publications reveals five significant trends in how trade unions engage with the energy transition. First, there has been a shift in focus from global normative frameworks (ILO 2015; Evans & Phelan 2016) toward concrete policy implementation and multi-level governance, including in Indonesia through JETP-related studies and regional advocacy initiatives.

Second, union strategies have gradually evolved from reactive—defensive against fossil job losses—towards affirmative, emphasizing negotiations on reskilling, compensation, and safety nets. Some unions even demonstrate transformational tendencies, especially when forging alliances with communities and environmental movements. Third, employment issues remain central, with a strong focus on labor mapping, reskilling/upskilling, and early retirement schemes.

Fourth, there is a growing institutionalization of social dialogue, both at the sectoral level in Europe and across governance levels in Indonesia. Fifth, the literature consistently highlights the justice dilemma—balancing decarbonization demands with job protection—underscoring that the energy transition is a socio-political challenge, not merely a technical one.

Trade Union Strategies and Empowerment in the Energy Transition

Kalt's (2022) typology of trade union strategies—oppositional, reactive, affirmative, and transformational—captures the spectrum of responses unions adopt in navigating energy transitions. These range from resisting accelerated decarbonization to engaging progressively as agents of socio-ecological change. Table 4.2 presents the four typologies, outlining their main characteristics, regional or country examples, and overall union orientation.

Table 4 Typologies of Trade Union Strategies in Energy Transitions

Strategy	Key Characteristics	Regional/Country Examples	Union Orientation
Oppositional	•Rejects energy transition or accelerated phase-out of fossil sectors. • Focus on protecting conventional jobs. • Framed as 'jobs vs. environment.'	Australia, South Africa, Germany (coal mining unions).	Defensive, protective of the status quo.
Reactive	• Accepts transition but emphasizes only basic rights protection (wages, severance pay, social security). • Limited involvement in shaping transition policies.	South Asia, Indonesia (some unions in the energy sector).	Passive-defensive, safeguarding minimum rights without long-term vision.
Affirmative	• Supports transition through negotiations on reskilling programs, social protection, and green jobs. • Oriented toward ecological modernization within the capitalist framework.	Western Europe, Japan, parts of the United States.	Cooperative, constructive within the green transition framework.
Transformative	• Views transition as momentum for structural change. • Advocates economic democratization, public control over energy, and integration of social and ecological justice. • Promotes an agenda beyond green capitalism.	Latin America (for example, Brazil, Bolivia), parts of Europe.	Progressive, positioning unions as agents of social change.

Source: Adapted from Kalt (2022)

Building on this typology, the synthesis also integrates the six dimensions of empowerment—structural, organizational, advocacy–negotiation, socio-cultural, economic, and ideological. This combined framework illustrates how collective union capacities shape the adoption of different strategies.

Table 4 cross-maps the four typologies with the six empowerment dimensions, demonstrating that affirmative strategies often rely on structural, advocacy, and economic capacities, while transformative strategies emerge more strongly when socio-cultural and ideological dimensions are reinforced, for instance through alliances with communities or environmental movements.

Table 5 Synthesis of Trade Union Strategy Typologies and Six Dimensions of Empowerment

Dimension of Empowerment	Oppositional (Resistance)	Reactive (Defensive Minimalism)	Affirmative (Constructive)	Transformative (Progressive)
Structural	Weak, limited to minimum legal protection.	Limited, focused mainly on normative labor rights.	Relatively strong, integrated into transition legal frameworks.	Very strong, pushing for regulatory change and public control.
Organizational	Narrow base, dominated by fossil sector membership.	Low participation, often elitist structures.	Broad and democratic base, bridging workers across sectors.	Participatory base, fostering solidarity across social movements.
Advocacy–Negotiation	Policy rejection, protective lobbying.	Passive involvement, waiting for state/employer initiative.	Active negotiation on reskilling, compensation, and green jobs.	Radical advocacy, advancing transformative socio-ecological agendas.
Socio–Cultural	Traditional "jobs vs. environment" narrative.	Solidarity limited to core workers.	Solidarity extended to include social justice concerns.	Solidarity across classes and communities, linking workers, Indigenous peoples, and environmental causes.
Economic	Focused on preserving wages and traditional benefits.	Demand for minimum compensation without long-term planning.	Access to social protection schemes and fair transition packages.	Advocating redistribution of resources and public funds for a just transition.
Ideological	Status quo ideology, protectionist toward fossil sectors.	Pragmatic, without long-term vision.	Adoption of green modernization within the capitalist framework.	Advocating economic democratization, socio-ecological justice, and agendas beyond green capitalism.

Source: Synthesized from Kalt (2022); Rowlands (1997); Kabeer (1999); Zimmerman (2000); Sen (1999).

Cross-country comparisons confirm that Indonesian trade unions tend to fall within the reactive and affirmative categories, primarily focusing on protection and adaptation through reskilling, compensation, and social dialogue. In contrast, unions in Western Europe and Latin America more frequently demonstrate transformative orientations, emphasizing alliances, social justice, and structural change.

Accordingly, Tables 4 and 5 not only map the variations of union strategies but also highlight the close interconnection between strategic choices and the underlying empowerment capacities that determine unions' positioning in the just energy transition

Synthesis of Findings: Union Strategies and Empowerment Dimensions

The findings show that trade union strategies in energy transitions are largely affirmative, emphasizing social dialogue, reskilling, compensation, and social protection to safeguard workers while adapting to structural change. Yet, some unions display transformational potential when building alliances with communities and environmental groups to advance social and ecological justice.

Among the six empowerment dimensions, structural, advocacy–negotiation, and economic emerge as the core pillars supporting affirmative strategies. By contrast, organizational, socio-cultural, and ideological dimensions gain prominence in transformational cases, where unions expand solidarity and link transitions to broader struggles for democracy and climate justice. Overall, union strategies reflect a dual

character: predominantly affirmative and protective, but with a growing transformational strand that repositions unions as agents of socio-ecological change.

Implications for Energy Sector Trade Unions in Indonesia

International and national literature points to four key implications for Indonesian energy unions. First, unions must strengthen labor databases and workforce mapping to anticipate reskilling and upskilling needs. Second, social dialogue should expand beyond company level to regional and national arenas, ensuring inclusive discussion on issues like early retirement and green recruitment. Third, unions need to advocate comprehensive transition packages combining compensation, training, and job placement in the clean energy sector. Fourth, building alliances with communities, academics, and NGOs is vital to enhance social legitimacy and support transformational strategies.

Research Gaps and Future Agenda

Despite rapid growth in scholarship on energy transition and trade unions between 2015 and 2025, this review identifies four major gaps. First, micro-level evidence on union organization, leadership, and decision-making remains scarce. Second, policy impact evaluations are underdeveloped, as much of the literature emphasizes normative proposals without systematically assessing implementation outcomes for workers and communities. Third, regional and gender perspectives are rarely addressed, limiting insights into inclusivity and intersectional dynamics of just transitions. Fourth, the ideological dimensions of unions—particularly the tension between protectionist and transformative visions—receive relatively little scholarly attention.

Taken together, these gaps underscore the need for deeper, comparative, and interdisciplinary approaches—including qualitative case studies, organizational-level analysis, and intersectional perspectives—to refine theoretical frameworks and generate practical insights for strengthening trade union strategies in navigating energy transitions. At the same time, the findings highlight that while Indonesian unions remain largely reactive–affirmative, international comparisons reveal the potential for more progressive and even transformational roles. This synthesis not only maps existing knowledge but also directly addresses the research questions, thereby laying the groundwork for the conclusions and recommendations presented in the next section.

CONCLUSION

This study demonstrates that trade union strategies in the energy transition span a spectrum from oppositional to transformative, shaped by both internal factors (identity, institutional capacity, democratic practices) and external factors (economic structures, state policies, and coalitions). The analysis of six empowerment dimensions highlights the potential of unions to move beyond a merely protective role toward a more transformational function that links worker protection with broader agendas of decarbonization and social justice.

Overall, affirmative strategies are the most prevalent, relying strongly on structural, advocacy–negotiation, and economic dimensions. Yet, in more progressive contexts, socio-cultural and ideological dimensions become critical, enabling unions to align with community movements and ecological justice agendas. This indicates that unions can act not only as defenders of worker rights but also as agents of socio-ecological change in realizing a just energy transition.

Theoretically, this research repositions trade unions as active actors in the just transition literature rather than passive policy recipients. By integrating Kalt's (2022) typology of strategies—Oppositional, Reactive, Affirmative, Transformative (O–R–A–T)—with the six empowerment dimensions (Rowlands, 1997; Kabeer, 1999; Zimmerman, 2000; Sen, 1999), the study formulates a more comprehensive conceptual model. Enriched by the capability approach (Sen, 1999), this framework underscores the collective capacity of unions to advance socio-ecological justice. Importantly, it also contextualizes the Global South, particularly Indonesia, where trade unions face structural constraints yet retain opportunities to develop progressive and transformative strategies.

From a practical standpoint, the findings stress the importance of: 1) Strengthening tripartite social dialogue to ensure participatory decision-making; 2) Developing reskilling and upskilling programs to prepare workers for green jobs; 3) Expanding social protection for those affected by plant closures and industrial shifts; 4) Enhancing institutional capacities of unions through leadership development, policy access, and strategic alliances with civil society; 5) Ensuring adequate financing—through blended finance, transition funds, and public support—so that energy transition policies are implemented inclusively, fairly, and sustainably.

The limitations of literature-based synthesis constrain the understanding of trade unions' empirical practices. Therefore, further studies should employ qualitative methods (for example, interviews with unions, employers, and policymakers) and quantitative approaches (for example, worker surveys) to capture on-the-ground dynamics. Cross-country comparative analysis is also necessary to map common patterns and strategic variations. In addition, evaluation of policy implementation—particularly Presidential Regulation 112/2022—and the inclusion of gender and vulnerable group perspectives need to be strengthened to provide a more comprehensive account of energy transition impacts. With such approaches, future research can enhance the validity of findings, enrich empirical understanding, and support the strategic role of trade unions in achieving a just energy transition in both Indonesia and the Global South.

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