

Clean Energy Policies and Just Transition for Coal Industry Workers

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ABSTRACT

Indonesia's transition toward clean energy represents an important legal and policy response to climate change, environmental degradation, and the pursuit of sustainable development. However, the gradual reduction of coal dependency also creates significant legal and socio-economic challenges for workers and communities whose livelihoods rely on the coal industry. This study aims to examine the adequacy of Indonesia's legal framework in ensuring a just transition for coal industry workers during the implementation of clean energy policies. The research employs a normative legal method using statutory, conceptual, comparative, and analytical approaches. Primary legal materials consist of constitutional provisions, national legislation, presidential regulations, and international legal instruments related to energy transition, environmental protection, labor rights, and social security. Secondary legal materials include academic journals, books, policy reports, and legal commentaries concerning clean energy governance and just transition. The findings indicate that Indonesia has established a relatively comprehensive legal framework supporting renewable energy development and greenhouse gas emission reduction. Nevertheless, the legal framework governing worker protection during the energy transition remains fragmented and insufficiently integrated. Existing regulations primarily emphasize environmental objectives and renewable energy investment while providing only general labor protection without specifically regulating workforce reskilling, employment transition, income protection, regional economic diversification, and institutional coordination. Consequently, legal uncertainty persists regarding the protection of coal industry workers affected by decarbonization policies. The study concludes that Indonesia requires a more comprehensive and integrated legal framework that harmonizes environmental sustainability with labor rights and social justice. Strengthening legislation concerning just transition, workforce protection, social dialogue, dedicated transition financing, and intergovernmental coordination is essential to ensure that Indonesia's clean energy transition is equitable, inclusive, and capable of supporting long-term sustainable development.

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1. INTRODUCTION

The global transition toward clean energy has become a major policy agenda for addressing climate change, reducing greenhouse gas emissions, and achieving sustainable development. Commitments under the Paris Agreement and the United Nations Sustainable Development Goals have encouraged countries to reduce their dependence on fossil fuels and accelerate renewable energy development. Coal, despite its historical contribution to industrialization and economic growth, remains one of the largest sources of carbon dioxide emissions and environmental degradation. Consequently, governments have adopted policy instruments such as carbon pricing, renewable energy incentives, coal-fired power plant retirement, and energy diversification to achieve net-zero emission targets [1], [2]. Indonesia, as one of the world's largest coal producers and exporters, has also committed to reducing greenhouse gas emissions and increasing renewable energy within its national energy mix through various strategic policies and international partnerships.

Indonesia's commitment is reflected in Law No. 30 of 2007 concerning Energy, Law No. 16 of 2016 concerning the Ratification of the Paris Agreement, Presidential Regulation No. 112 of 2022 concerning the Acceleration of Renewable Energy Development for Electricity Supply, the National Energy Policy, and the Just Energy Transition Partnership. However, Indonesia's legal framework continues to permit coal operations until 2050, creating tension between renewable energy development and the country's continued dependence on coal [3]. Regulatory fragmentation and inconsistencies also weaken the implementation of clean energy policies and may contradict national decarbonization commitments [4]. These conditions raise important legal and social concerns regarding the protection of workers in coal mining, coal-fired power plants, and related industries whose livelihoods depend heavily on the coal sector [5].

The coal industry remains essential to Indonesia's export revenues, employment, regional development, and national energy security, particularly in East Kalimantan, South Kalimantan, Central Kalimantan, South Sumatra, and Jambi. Reducing coal production or accelerating power plant retirement may therefore result in unemployment, declining household income, limited employment opportunities, and regional inequality, especially in coal-dependent communities [4]. A just energy transition must consequently prioritize economic diversification, worker protection, equitable access to renewable energy opportunities, and the interests of marginalized communities [6]. Achieving these goals requires harmonized policies that align international climate commitments with local socioeconomic realities, as well as meaningful stakeholder and community participation in transition planning and decision-making processes [7], [8].

The concept of a just transition has emerged as a key framework for integrating environmental sustainability with labor rights and social protection during the shift toward a low-carbon economy. Initially promoted by international labor organizations and later incorporated into global climate governance, the framework seeks to ensure that workers and communities affected by structural economic change receive adequate protection throughout the transition process. The International Labour Organization (ILO) defines a just transition as greening the economy in a fair and inclusive manner by creating decent work opportunities while protecting vulnerable workers through social dialogue, skills development, social protection, and labor market policies [9]. Likewise, the Paris Agreement recognizes the importance of ensuring "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs," emphasizing that environmental objectives should be pursued alongside economic resilience and social equity.

From a legal perspective, implementing a just transition requires a coherent regulatory framework that

harmonizes environmental, labor, energy, investment, and human rights law. Governments are responsible not only for reducing emissions and promoting renewable energy but also for safeguarding workers' rights to employment, social security, fair working conditions, and economic welfare through workforce retraining, compensation, unemployment protection, labor mobility, and economic diversification. However, despite Indonesia's growing commitment to clean energy, its legal framework remains fragmented. Existing legislation, including Law No. 13 of 2003 on Manpower as amended by Law No. 6 of 2023 concerning Job Creation and Law No. 40 of 2004 concerning the National Social Security System, was not specifically designed to address structural employment displacement caused by decarbonization policies. Consequently, uncertainty persists regarding institutional responsibilities, financing mechanisms, workforce reskilling, compensation measures, and long-term regional economic transformation. This fragmented legal framework also creates governance challenges due to overlapping authorities among government institutions, potentially weakening policy implementation, delaying worker assistance, and increasing legal uncertainty for workers and investors [10]–[12].

Existing academic literature has extensively examined renewable energy development, environmental governance, climate policy, labor market adaptation, and the integration of social justice into climate action. Studies from Europe and North America demonstrate that successful energy transitions are supported by comprehensive labor protection mechanisms accompanying industrial restructuring. Nevertheless, research examining Indonesia's clean energy transition from a normative legal perspective remains limited. Most Indonesian studies emphasize policy implementation, environmental management, or economic impacts, while relatively little attention has been devoted to systematically evaluating the adequacy, coherence, and effectiveness of Indonesia's legal framework in protecting

coal industry workers and operationalizing just transition principles. This gap highlights the need for further legal scholarship to support the development of an integrated and socially equitable clean energy transition in Indonesia.

This study addresses the research gap by conducting a normative legal analysis of Indonesia's clean energy policies and assessing their compatibility with just transition principles, particularly regarding the protection of coal industry workers. Unlike previous studies that primarily emphasize economic and policy dimensions, this research examines statutory regulations, constitutional principles, labor legislation, environmental law, international legal instruments, and comparative legal approaches to identify regulatory strengths, weaknesses, and areas requiring reform. Ultimately, the study seeks to determine whether Indonesia's existing legal framework adequately protects workers during the shift from coal-based energy to renewable energy and to formulate recommendations for developing a comprehensive legal system that balances environmental sustainability, economic competitiveness, labor rights, social protection, and social justice.

2. METHODS

This study employed a normative legal research design, also known as doctrinal legal research, to examine Indonesia's legal framework governing clean energy policy and the protection of coal industry workers during the transition toward renewable energy. This approach analyzes law as a system of legal norms rather than relying on empirical data obtained through interviews, surveys, or field observations. It was selected to assess the adequacy, consistency, coherence, and effectiveness of existing legal instruments in fulfilling environmental commitments while protecting labor rights and promoting social justice. Four complementary approaches were applied: a statutory approach to examine relevant national legislation; a conceptual approach to analyze legal theories and just transition

principles; a comparative approach to identify international principles and foreign regulatory practices; and an analytical approach to evaluate inconsistencies, legal certainty, justice, and social welfare within Indonesia's energy transition framework.

The statutory analysis covered the 1945 Constitution of the Republic of Indonesia, Law No. 30 of 2007 concerning Energy, Law No. 16 of 2016 concerning the Ratification of the Paris Agreement, Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 13 of 2003 concerning Manpower as amended by Law No. 6 of 2023 concerning Job Creation, Law No. 40 of 2004 concerning the National Social Security System, Presidential Regulation No. 112 of 2022, the National Energy Policy, and other relevant governmental and ministerial regulations. The study used primary legal materials consisting of binding legislation, regulations, international treaties, and official policy documents; secondary legal materials comprising journal articles, textbooks, policy reports, research publications, and legal commentaries; and tertiary materials such as legal dictionaries, encyclopedias, official databases, government publications, and bibliographic indexes. These materials were collected through documentary research from official government sources, legal databases, international organizations, academic databases, university libraries, and peer-reviewed journals.

The collected legal materials were analyzed using qualitative normative legal analysis. First, the materials were classified according to their legal hierarchy and thematic relevance to energy transition, environmental governance, labor protection, social security, and social justice. Second, grammatical, systematic, teleological, and comparative interpretation methods were applied to determine legislative intent, relationships among legal instruments, and normative consistency. The analysis then evaluated whether Indonesia's legal framework adequately incorporates essential just transition principles, including labor rights protection, employment and social

security guarantees, workforce retraining, public participation, social dialogue, regional economic diversification, institutional coordination, and legal certainty. Finally, the findings were synthesized through legal reasoning to identify regulatory strengths, gaps, and inconsistencies and to formulate recommendations for integrating environmental sustainability, worker protection, and social justice into Indonesia's clean energy transition.

3. RESULTS AND DISCUSSION

3.1 Indonesia's Legal Framework Governing the Clean Energy Transition

Indonesia has progressively strengthened its legal commitment to the clean energy transition through constitutional provisions, statutes, presidential regulations, and national policy instruments. Article 28H of the 1945 Constitution guarantees the right to a good and healthy environment, while Article 27(2) guarantees the right to employment and a decent livelihood, requiring energy policies to balance environmental protection with workers' socioeconomic rights [4]. This constitutional foundation is reinforced by Law No. 30 of 2007 concerning Energy, which promotes sustainable energy management, diversification, efficiency, and national energy resilience, as well as Presidential Regulation No. 112 of 2022, which supports renewable energy investment and gradually limits the construction of new coal-fired power plants.

Indonesia's international obligations also strengthen its decarbonization agenda. Through Law No. 16 of 2016, Indonesia ratified the Paris Agreement and committed to reducing greenhouse gas emissions under its Nationally Determined Contributions, while participation in the Just Energy Transition Partnership supports coal phase-down and renewable energy financing. However, the regulatory framework remains fragmented and inconsistent because policies promoting renewable energy continue to coexist with provisions allowing coal

operations until 2050, thereby creating policy dualism and weakening the effectiveness of the transition [3]. Although these instruments demonstrate strong commitment to environmental sustainability and energy reform, they still provide limited protection for workers affected by coal-sector restructuring.

Current regulations do not adequately establish mechanisms for worker retraining, compensation, unemployment protection, social security, or economic diversification in coal-dependent regions, increasing the risks of unemployment and social disruption [8]. Addressing these gaps requires a more integrated legal framework, potentially through comprehensive new and renewable energy legislation that explicitly incorporates socioeconomic protection into energy policy [13]. Meaningful stakeholder engagement is also essential to ensure that affected workers and communities participate in transition planning and that clean energy development proceeds in a fair, inclusive, and equitable manner [8].

3.2 Legal Protection of Coal Industry Workers During Energy Transition

One of the main findings of this study is the limited integration between Indonesia's environmental legislation and labor protection framework. Although Law No. 13 of 2003 concerning Manpower, as amended by Law No. 6 of 2023 concerning Job Creation, regulates employment relationships, severance pay, occupational safety, social security, and termination rights, these provisions were not specifically designed to address structural job displacement caused by climate and energy transition policies. Moreover, recent labor law reforms have raised concerns regarding reduced worker protection, particularly in relation to severance entitlements and employment contracts [14]. As coal production declines, workers in mining, transportation, power generation, equipment maintenance, and supporting industries therefore face increasing uncertainty.

Existing protections mainly operate after employment termination rather than supporting a proactive and long-term transition into green industries. Indonesia currently lacks explicit statutory provisions concerning mandatory reskilling, government-funded vocational training, employment opportunities in renewable energy sectors, long-term income replacement, regional economic diversification, and coordinated institutional responsibilities. The absence of these mechanisms is particularly problematic because automation and artificial intelligence may further intensify layoffs and employment insecurity [15]. In addition, there are still no comprehensive legal obligations requiring reskilling or vocational transition programs for workers moving from coal-dependent industries to renewable energy sectors [16].

Legal certainty remains fragmented across environmental, labor, social security, and energy regulations. Although BPJS programs provide limited financial support, they do not constitute a comprehensive policy for managing structural workforce transformation. Fragmented legal arrangements also weaken governance, institutional coordination, and public participation in the energy transition process [16]. Without integrated legal safeguards, coal-dependent workers and regions may face unemployment, declining household income, reduced investment, and widening socioeconomic inequality, demonstrating the urgent need to harmonize labor and environmental laws while strengthening reskilling, income protection, and regional diversification measures [15].

3.3 Compatibility Between Indonesian Law and International Just Transition Principles

The normative legal analysis demonstrates that Indonesia has substantially adopted environmental commitments but has only partially incorporated internationally recognized just transition principles into its domestic legal framework. The International Labour Organization emphasizes several core

elements, including decent work creation, social dialogue, labor rights protection, social security, workforce reskilling, sustainable employment investment, and regional economic transformation. Similarly, the Paris Agreement recognizes the importance of ensuring a just transition of the workforce during climate mitigation. Indonesia has enacted environmental regulations, particularly Law No. 32 of 2009 concerning Environmental Protection and Management, and participated in the Just Energy Transition Partnership, although enforcement weaknesses and regulatory inconsistencies continue to limit their effectiveness [4], [17], [18].

Several Indonesian regulations provide general recognition of labor rights, but they do not yet establish a comprehensive framework for decent green employment, workforce reskilling, or adequate social security for displaced workers [4], [19]. Institutional fragmentation, weak enforcement mechanisms, limited coordination among government agencies, and insufficient participation by marginalized communities further impede the implementation of an equitable transition [18], [20]. Therefore, Table 1 compares Indonesia's current legal framework with internationally recognized just transition principles to identify areas of alignment and the remaining regulatory gaps.

Table 1. Comparison Between International Just Transition Principles and Indonesian Legal Framework

Just Transition Principle	International Standard	Indonesian Legal Framework	Assessment
Renewable energy promotion	Comprehensive	Comprehensive	Strong
Carbon emission reduction	Comprehensive	Comprehensive	Strong
Labor rights protection	Comprehensive	General labor protection	Moderate
Workforce reskilling	Explicit	Limited	Weak
Social dialogue	Strong	Limited institutional mechanism	Moderate
Employment transition planning	Comprehensive	Not specifically regulated	Weak
Regional economic diversification	Comprehensive	Fragmented policies	Weak
Institutional coordination	Integrated	Sectoral approach	Moderate

The comparison illustrates that Indonesia performs relatively well in environmental governance but remains comparatively weak regarding labor transition mechanisms. International legal standards increasingly require governments to integrate labor policy into environmental legislation rather than regulating both sectors independently.

3.4 Regulatory Fragmentation and Institutional Challenges

The study identifies regulatory fragmentation as a major legal challenge in Indonesia's energy transition governance because responsibilities are dispersed among the Ministry of Energy and Mineral Resources, Ministry of Manpower, Ministry of

Environment, Ministry of Finance, Bappenas, regional governments, and PLN. Although each institution has authority within its respective sector, the absence of a binding and comprehensive coordination framework creates overlapping jurisdictions, legal uncertainty, inefficiency, and inconsistent policy implementation across regions [4], [16]. This fragmented structure may also cause renewable energy investment to advance more rapidly than workforce training and adaptation programs, resulting in skills gaps and potential labor displacement before alternative employment opportunities become available [21].

Regulatory fragmentation also creates uncertainty regarding the financing of workforce transition, particularly because

existing legislation does not establish dedicated funds for coal workers affected by mine closures or power plant retirement. Legal uncertainty, policy misalignment, and continued fossil fuel subsidies may further discourage renewable energy investment and complicate the mobilization of domestic and international financing [21]. In addition, differences in administrative resources and fiscal capacity among local governments may lead to unequal implementation, especially in coal-dependent provinces, where progress toward energy transition may vary substantially across regions [22].

3.5 Legal Implications of Coal Phase-Down Policies

Indonesia's gradual coal phase-down creates legal implications across labor, administrative, investment, constitutional, and regional governance law. Mine closures may trigger disputes over employment termination, severance, collective agreements, and workers' rights, while government agencies must ensure transparent procedures for licensing, rehabilitation, investment, and community consultation. At the same time, renewable energy investors require regulatory certainty regarding land, taxation, permits, and power purchase agreements. These interests must be balanced with constitutional protections for environmental quality and socioeconomic welfare, supported by stronger coordination between central and regional governments.

3.6 Proposed Legal Reform Toward a Just Transition

Based on the normative legal analysis, this study recommends enacting a comprehensive Just Transition Law that clearly regulates institutional responsibilities, financing mechanisms, labor rights, compensation procedures, and implementation timelines. Labor legislation should also be amended to require workforce reskilling, vocational education, employment transition assistance, and government-supported retraining for workers affected by

decarbonization. In addition, Indonesia should establish a legally mandated National Just Transition Fund financed through the state budget, international climate finance, carbon pricing mechanisms, and energy transition partnerships to support income replacement, retraining, regional economic diversification, and community development. Stronger inter-ministerial coordination and mandatory social dialogue involving labor unions, local communities, employers, academics, civil society, and regional governments are also essential to ensure an equitable and inclusive coal phase-down process.

4. CONCLUSION

Indonesia has established a strong legal foundation for the clean energy transition through constitutional provisions, energy and environmental legislation, renewable energy policies, and international climate commitments. However, the existing framework remains focused primarily on environmental protection and energy transformation, while the protection of coal industry workers has not been comprehensively integrated. Current labor laws provide general rights related to employment, severance pay, occupational safety, and social security but do not specifically address structural job displacement resulting from coal phase-down policies. Key just transition elements, including workforce reskilling, income protection, employment assistance, regional economic diversification, social dialogue, and institutional coordination, therefore remain fragmented. Indonesia consequently requires an integrated legal framework that harmonizes environmental, energy, labor, and social protection laws through comprehensive just transition legislation regulating institutional responsibilities, financing, retraining, community participation, and regional transformation to ensure a fair, inclusive, and sustainable transition toward a low-carbon economy.

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