



Legal Aspects in the Regulation of Environmental Approval for Co-Firing Biomass Energy Projects in Indonesia

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Abstract—The legal aspects of environmental approval regulations for Co-Firing Biomass energy projects in Indonesia include various elements. Ratification of Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation, which changes the nomenclature and substance of environmental permits to environmental approvals, has become a prerequisite for risk-based business permits. With the changes in these regulations, researchers use a normative juridical approach to examine the regulations governing forestry, licensing, environmental approvals, environmental impact assessments, and other related regulations. In addition, researchers also examine the principles and legal principles used in environmental law regulation related to Co-Firing Biomass. Legal research materials are collected through secondary data collection techniques (library research). It is essential to involve various stakeholders, including environmental organizations, the government, the private sector, and civil society, to ensure that changes in environmental regulations reflect the aspirations of the community and the need for sustainable development.

Keywords—Co-Firing Biomass; Environmental Approval; Legal Aspect; Permission.

I. INTRODUCTION

The largest archipelago in the world, Indonesia is home to a wealth of natural resources.[1] Indonesia's potential natural resources include forests, oceans, natural gas, petroleum, and coal. Forests make up the largest land area in Indonesia. In 2022, according to the Ministry of Environment and Forestry data, the total forest area in Indonesia reached 125.76 million hectares or 62.97% of Indonesia's total land area of 191.36 million hectares.

Indonesia has 120.47 million hectares of land forests and 5.32 million hectares of water forests. Protected forests have the most significant area, covering 29.56 million hectares, or 23% of the total national forest area (see Fig. 1). Following that, permanent production forests cover 29.23 million hectares, conservation areas span 27.41 million hectares, limited production forests occupy 26.8 million hectares, and convertible production forests amount to 12.79 million hectares. In addition, throughout 2022, 16,796 hectares of community-based forests have been utilized, reaching 111.98% of the forest utilization target of 591,761 hectares. In 2022, Indonesia's roundwood production reached 54.66 million cubic meters, achieving 99.38% of this year's roundwood production target of 55 million cubic meters. Nevertheless, forest productivity through afforestation and reforestation covered an area of 591,761 hectares, which is more than 146.84% of the 2023 target of 403,000 hectares.



Fig. 1. Graphic The Forest Area in Indonesia 2022

With Indonesia's vast forest resources, it is not surprising that the government aims to harness this potential, including through the transition to alternative management of renewable energy sources in the country. This management involves the fulfillment of Energy Resources. Energy Resources are natural resources that can be used both as a source of energy and as energy itself. National energy policies are based on principles of fairness, sustainability, and environmental awareness to achieve energy self-sufficiency and national energy security. The Indonesian government is making strides in utilizing biomass to reduce reliance on fossil fuels, especially coal. By employing co-firing technology with biomass, the government also intends to achieve a 23% target for applying new renewable energy sources by 2025. As an alternative to coal in power generation, co-firing technology uses biomass as a partial substitute for coal in power plant boilers. Additionally, this biomass can be sourced from salted raw materials, such as forest, plantation, or agricultural waste.

PT. PLN Persero plans to adopt the use of biomass in 52 Thermal Power Station (PLTU) by 2024.[2] The PLTU locations are spread across various islands in Indonesia, with 13 locations in Sumatra, 10 locations in Kalimantan, 6 locations in Sulawesi, 3 locations in Maluku and Papua, 16 locations in Java and Madura, and 4 locations in Bali and Nusa Tenggara. Of the total 52 PLTUs, 6 PLTUs have implemented co-firing technology with biomass, while 29 PLTUs are in the testing phase. The PLTUs implementing this technology include PLTU Paiton 1 & 2, PLTU Jeranjang, Thermal Ketapang, PLTU Sanggau, PLTU Pacitan, and PLTU Suralaya 1-4. In 2021, PLN plans to conduct trials at 17 PLTUs and begin implementing co-firing technology at another 17 PLTUs. This requires comprehensive preparation, including ensuring the availability of biomass raw materials, government support, and steps to maintain operational continuity. Until now, PLN has increased the use of biomass as a substitute for coal through co-firing technology in 41 Thermal Power Stations (PLTU) throughout the country.

The co-firing PLTU program is an initiative directed by three primary mandates in the law, namely Law Number 30 of 2007 on Energy, Law Number 16 of 2016 on the Ratification of the Paris Agreement, Government Regulation Number 23 of 2021 on Forestry Implementation, and Law Number 11 of 2020 on Job Creation. This program aims to support the energy transformation towards a more sustainable direction and contribute to achieving the targets of global environmental agreements. To make this program successful, cooperation between four ministries is required: the Coordinating Ministry for Maritime Affairs and Investment, the Ministry of Energy and Mineral Resources, the Ministry of Environment and Forestry, and the Ministry of State-Owned Enterprises. This inter-ministerial collaboration is necessary background for implementing the Biomass Co-Firing based Power Generator program and prioritizes implementing clean and environmentally friendly energy sources for the future.

The fundamental change to Law Number 32 of 2009 due to the Job Creation law's ratification is the elimination of environmental permits and their replacement with environmental approvals. This change makes the issue of co-firing biomass in Indonesia even more complex when viewed from the perspective of the legal instruments used. The removal of environmental permits is evident from the deletion of Article 1, number 35 of Law 32/2009, which contained the definition of environmental permits and the introduction of the new term, namely environmental approvals. In addition to the clause in Article 1, number 35 of Law 32/2009, there are also changes in Article 22, numbers 14 and 18 of the Job Creation Law, and several clauses in Law 32/2009 related to environmental permits have been removed.

Given the extremely harsh environmental conditions and Menhut's helplessness to prevent environmental damage, the Minister of Forestry's warning makes sense. This is so because the Mining Law has granted authorization by its procedures. Even in times of despair, regulations have generally supported dredging by helping to set goals related to the nation's environmental interests, fairness, balance, and advantages. However, mining itself is seen as a key supporter of the devastation that takes place in other Indonesian forest regions.[3] This is not much different from the concept of environmental approval after the passing of the Job Creation Law in the sector of biomass co-firing based renewable energy. The Job Creation Law, which is implemented in Indonesia, has altered some provisions related to environmental permits and streamlined the licensing process for development projects, including mining projects. With these changes, environmental approvals are often easier to obtain, although this can pose a greater risk of environmental damage if not closely monitored and well-regulated. Therefore, it is important to carefully consider environmental impacts in any policy or law related to development and mining. Build upon the problem background, the author aims to further examine the management of biomass co-firing projects using multi-purpose forest utilization through licensing and the Legal Aspects of Regulating Environmental Approvals for Biomass Co-Firing Energy Projects in Indonesia.

II. LITERATURE REVIEW

A. Multi-Purpose Forest Utilization Policy

The Multi-Purpose Forest Utilization Policy in Indonesia prioritizes the management of energy plantation forests (HTE) as a crucial source of biomass-based raw materials for energy.[4] The study examines how this policy framework is defined by a normative juridical approach, emphasizing its legal and regulatory aspects.

The goal is to incorporate sustainable forest management activities into this strategy to achieve a well-rounded and diverse approach to exploiting forest resources.[5]

The strategy highlights the significance of sustainable methods, such as logging, energy crop cultivation, and silvopasture, which entails the integration of animals and crops inside the forest.[6] These operations are specifically geared to fulfill the nation's energy requirements while also providing support to various sectors like industry, energy, agriculture, and the environment. The strategy aims to maximize the use of forest resources by employing a versatile approach while also ensuring a balance between economic benefits and social and environmental factors.

By adopting a normative juridical approach, we may establish a solid legal framework to manage forest resources effectively and strictly adhere to regulations and licenses. This technique offers a systematic framework for coordinating actions and stakeholders engaged in forest utilization. The Multi-Purpose Forest Utilization Policy emphasizes the importance of coordinating different activities in a forested region to accomplish sustainable management, economic advantages, and societal requirements within the legal framework.

B. Climate Change Mitigation in the Forestry Sector

As stated in the study, *Climate Change Mitigation in the Forestry Sector* highlights Indonesia's commitment to decreasing carbon emissions and achieving its Nationally Determined Contribution (NDC) goals.[7] This commitment demonstrates the acknowledgment of the forestry sector's crucial role in global climate change mitigation. The evaluation emphasizes various crucial mitigation initiatives that Indonesia is implementing to tackle the consequences of climate change.

First and foremost, there is an emphasis on diminishing deforestation, recognizing that controlling the depletion of forests is crucial in minimizing the emission of stored carbon into the atmosphere.[8] Reforestation is crucial to absorbing additional carbon from the atmosphere, contributing to carbon sequestration. Identifying and implementing sustainable forest management strategies are essential for conserving carbon stocks inside forests and preserving their role as crucial natural carbon sinks.

Furthermore, the evaluation emphasizes the significance of incorporating biomass-based renewable energy into the mitigation plan. This entails augmenting the biomass derived from the forest as a sustainable energy resource, which can aid in diminishing dependence on fossil fuels and mitigating emissions.[9] Incorporating these techniques aligns with Indonesia's overarching objective of attaining emission reduction objectives and minimizing the effects of climate change.[10]

Indonesia intends to significantly contribute to the global endeavor to address climate change by acknowledging and applying these measures to reduce its impact. The forestry industry is crucial in reaching the NDC targets and promoting sustainable environmental practices at both national and international levels. This is due to its efforts in conservation and renewable energy programs.

C. Challenges in Biomass Co-Firing Development

The study on *Challenges in Biomass Co-Firing Development in Indonesia* outlines the primary barriers to implementing biomass co-firing to mitigate climate change.[11] The challenges include the availability of biomass, the prices of production, the unpredictability over the seasons, the efficiency of energy, the technology and infrastructure, the policies and regulations, and the sustainability of the market.[12] To tackle these problems, the government, industry, and stakeholders need to work together to secure a reliable biomass supply, minimize production expenses, improve energy efficiency, and implement favorable policies promoting sustainable development. These efforts will contribute to Indonesia's commitment to mitigating climate change.

III. METHOD

The research methodology employs a normative juridical approach, comprehensively analyzing legal principles and regulations governing energy plantation forests, economic and environmental impacts, and legal enhancements for an integrated criminal justice system in Indonesia. This methodology entails a methodical examination of prevailing laws, doctrines, and statutes with the objective of pinpointing shortcomings, suggesting legal modifications, and providing valuable perspectives to enhance the enforcement of laws in these particular circumstances. In addition, the study utilizes library research and applies a normative juridical perspective to evaluate the regulatory framework for environmental approval of co-firing biomass energy projects in Indonesia. The analysis covers pertinent legislation, including Law No. 32 of 2009 and Government Regulation No. 23 of 2021, focusing on the shift from environmental permits to approvals. It also explores the significance of ecological justice, public participation rights, customary law, and reporting obligations. The research seeks to thoroughly understand the legal framework of biomass co-firing projects, considering environmental sustainability, social ramifications, and regulatory adherence.

IV. RESULT AND DISCUSSION

A. Policy on Managing Energy Plantation Forests (HTE) as a Source of Biomass-Based Energy raw materials

The granting of permits for multi-purpose forest utilization is done through licensing.[13] The processing of forest products can be developed and integrated within the area of Forest Utilization Business Permits. This can be achieved with the involvement of state-owned enterprises in the forestry sector and with the approval of social forestry management. This integration creates an opportunity to optimize the sustainable management of forest resources, utilizing the potential of forest products to meet the needs of society and support various aspects, including social, economic, and environmental considerations within the framework of applicable permits and regulations.[14] Examples of multi-purpose activities in the working area of IUPHHK-HTI (Forest Timber Utilization Business License - Industrial Plantation Forest) can include:

- 1) *Primary activities as timber suppliers involve sustainable logging and processing of managed forest wood.*
- 2) *Planting energy forest crops to supply Biomass Power Stations (PLTBm), supporting the development of renewable energy sources.*
- 3) *Development of food agriculture, such as seasonal crops (rice and legumes), to improve food security in the area.*
- 4) *Silvopasture development, involving the integration of livestock and crops within the forest, supports the sustainability of natural resources and agriculture.*
- 5) *Carbon sequestration efforts and environmental services, such as tree planting programs, ecosystem maintenance, and activities contributing to environmental conservation and climate change mitigation.*

These are examples of multi-purpose activities that can be undertaken under forest utilization permits (IUPHHK-HTI) to sustainably utilize forests and support various sectors, including industry, energy, agriculture, and the environment. Joint Forest Utilization (PBPH) based on multi-purpose forestry refers to a forest management approach that integrates various economic and social activities in one forest area to achieve multiple benefits and sustainability in one area. This approach covers a wide range of forestry efforts, including logging, production of non-timber forest products, cultivation of energy crops, agriculture, livestock, carbon sequestration, and environmental services.

Multi-purpose forestry-based Shared Forest Utilization often involves various stakeholders, including local communities, companies, and government, to collaborate at manage forest resources. The aim is to create synergy between diverse interests, such as economic, environmental and social, to ensure forest preservation while providing economic and social benefits to the community. That is an approach that supports sustainable forest management at multiple levels.

Establishing a climate change mitigation plan in the forestry sector is very important to achieve the NDC (Nationally Determined Contribution) targets determined by a country to reduce greenhouse gas emissions and overcome climate change.[15] Mitigation plans include various actions and strategies designed to decrease the impacts of climate change related to the forestry sector.

Mitigation efforts in the forestry sector can include several steps such as reducing deforestation, reforestation, increasing sustainable forest management, utilizing biomass energy, and many more. The establishment of these plans must consider various aspects, including social and economic impacts, and ensure that forests continue to function as important natural carbon sinks. Thus, the establishment of climate change mitigation plans in the forestry sector is a key step in efforts to achieve emission reduction targets and mitigate climate change as agreed upon by a nation.

Certainly, the forestry sector plays a vital role in efforts to reduce carbon dioxide (CO₂) emissions and achieve Indonesia's NDC (Nationally Determined Contributions) targets. The target of 17.2% reflects Indonesia's responsibility to reducing greenhouse gas emissions from the forestry area.[16] Emission reduction efforts in the forestry sector may include:

- 1) *Halting deforestation or reducing its rate is a crucial step in reducing carbon emissions because deforestation releases stored carbon from the forest into the atmosphere.*
- 2) *Reforestation or land rehabilitation efforts can help absorb more carbon from the atmosphere.*
- 3) *Improving sustainable forest management practices and ensuring that forests are well-preserved can help maintain carbon stocks in the forest.*
- 4) *Utilizing Biomass and Renewable Energy by increasing the use of biomass-based renewable energy from the forest can help reduce emissions from fossil energy sources.*
- 5) *Sustainable land management, including peatland management, is also a significant factor in climate change mitigation efforts.*

With a focus on the forestry sector as the largest target for emissions reduction, Indonesia can play a crucial role in reducing its contribution to global climate change and achieving its NDC commitments. This also underscores the importance of maintaining sustainable forest management and forest ecosystems in Indonesia. The development of biomass for co-firing in power plants faces several challenges that need to be addressed:

- 1) *Biomass Availability, Ensuring a sufficient supply of biomass raw materials to meet the power plant's needs is a primary challenge. This can involve challenges in collecting, transporting, and consistently supplying biomass.*
- 2) *Production Costs, Producing biomass as an additional fuel can be costly. This includes costs for planting, processing, and distribution. Initial investment and operational costs also need to be considered.*
- 3) *Seasonal Variability, Biomass, especially from energy crops, may experience seasonal variations in availability. This can impact the resilience of biomass supply throughout the year.*
- 4) *Energy Efficiency, The combustion efficiency of biomass can vary depending on the type of biomass used. Some types of biomass may have lower combustion efficiency compared to fossil fuels.*
- 5) *Technology and Infrastructure, Developing and adapting power plant infrastructure for co-firing requires technical and financial investments. This includes boiler upgrades, equipment, and biomass transportation infrastructure.*
- 6) *Policy and Regulations, Inconsistent or unclear legal and regulatory environments can be barriers to the development of biomass co-firing. Government support and incentives can play a crucial role in promoting this technology.*
- 7) *Market and Sustainability, Ensuring a stable market and sufficient demand for biomass is a critical challenge. Additionally, sustainability aspects of biomass use need to be considered to avoid environmental or social harm.*

To address these challenges, cooperation between the government, industry, and relevant stakeholders is crucial in developing biomass co-firing as part of efforts to mitigate climate change and increase the applicate of renewable energy sources.

B. Legal Aspects in the Regulation of Environmental Approval for Co-Firing Biomass Energy Projects in Indonesia

1) Relevant Regulations

In Indonesia, environmental permitting is primarily governed by Law No. 32 of 2009 (UU PPLH), as amended by the Government Regulation in Lieu of Law No. 2 of 2022 Concerning Job Creation which became Law. This law sets out the requirements for projects that impact the environment, including Co-Firing Biomassa projects. Therefore, such projects must comply with the regulations stipulated in the UU PPLH. The reconstruction and improvement of the Government Regulation in Lieu of Law (Perppu) on Job Creation related to environmental permits, particularly the transformation of permits into environmental approvals, has implications for procedures, community participation, environmental permits, investment limits, and environmental supervision. These steps are crucial in promoting sustainable development from an environmental perspective.

A fundamental change introduced by the Job Creation Law of 2023 to Law No. 32 of 2009 is the removal of environmental permits and their replacement with environmental approvals. The removal of environmental permits is evident from the elimination of Article 1 paragraph 35 of Law No. 32 of 2009, which contained the definition of environmental permits. The new nomenclature, "environmental approvals," has been established. Moreover, certain provisions related to environmental permits found in Law No. 32 of 2009 have been eliminated, as stipulated in Article 22 paragraph 14 and Article 22 paragraph 18 of the Job Creation Law of 2023. Article 22 paragraph 14 of the Job Creation Law of 2023 abolishes the provisions of Article 36 of Law No. 32 of 2009.

In Government Regulation No. 23 of 2021 Concerning the Implementation of Forestry, multisectoral activities related to co-firing biomass are regulated under Article 118 paragraph (1) letter f. This article states that forest management activities can utilize biomass as an alternative fuel in power plants, including co-firing with coal. Multisectoral activities related to co-firing biomass in Indonesia are conducted to increase the contribution of renewable energy to the national energy mixture, diminish carbon emissions, and build up job opportunities and business prospects in the biomass sector. This activity is regulated in Government Regulation Number 23 of 2021 concerning Forestry Implementation and involves the implementation of biomass as an alternative fuel in power generator, including co-firing with coal.

2) Environmental Impact Assessment (Amdal) Analysis

The most important aspect of environmental approval is the implementation of an Environmental Impact Analysis (AMDAL). Amdal is a legally regulated process for evaluating social, economic and environment impacts of a project. The AMDAL results are used in decision making to assess whether the project is environmentally and socially acceptable. In case of biomass co-firing energy projects in Indonesia, AMDAL is

essential to ensure that the project does not damage the environment and meets safety standards. Apart from that, Amdal can also help develop biomass energy policies, including incentive and disincentive systems for biomass energy development.

In implementation, AMDAL must involve local communities through public announcements and consultations. It is essential to ensure that local communities have the right to obtain information and provide input on projects that will be implemented in their environment. Therefore, the implementation of AMDAL within the framework of environmental approvals can influence the sustainability of biomass co-firing energy projects in Indonesia by ensuring that the projects are environmentally friendly. AMDAL can also help develop biomass energy policies and involve local communities in decision making regarding these projects.

AMDAL is not eliminated in the Job Creation Omnibus Law but is simplified so the regulations are more efficient. The AMDAL is still a requirement for obtaining a business permit, and its principles and basic concepts remain unchanged. The changes in the UU Cipta Kerja related to AMDAL include the integration of environmental permits into business permits, the replacement of the AMDAL assessment commission with an independent team, and the involvement of the affected community in the preparation of the AMDAL. The criteria for determining the important impacts of business activities on the environment are also established. The Perppu Cipta Kerja also maintains the AMDAL requirement and the involvement of the affected community in the AMDAL process.

3) *Principles of Ecological Justice*

Biomass co-firing projects must adhere to the principles of environmental law, including the principles of environmental protection, the precautionary principle, and accountability. These principles underlie many international environmental laws (e.g., Law No. 16 of 2016 concerning the Ratification of the Paris Agreement) that are also applicable in Indonesia. The principles of Ecological Justice must be considered in biomass co-firing energy projects in Indonesia.

Several principles of Ecological Justice that should be considered in the framework of environmental approval for biomass co-firing energy projects in Indonesia are as follows, Environmental Protection Principles. Biomass co-firing projects must consider environmental protection and ensure that the project does not cause harm the environment. Precautionary Principles, biomass co-firing projects must be implemented carefully, taking into account social, economic and environmental impacts. This principles is defined as the uncertainty of the impact of a business or occupation due to the limitations of science and technology.[17] This cannot be used as a reason to delay taking steps to minimize or avoid environmental threats detriment. Principle of Accountability, Biomass co-firing projects must be accountable for their social, economic, and environmental impacts.

In the case of biomass co-firing energy projects in Indonesia, the principles of Ecological Justice are essential to ensure that the project is sustainable and environmentally friendly. By considering these principles, biomass co-firing projects can be implemented while still paying attention to environmental and safety aspects and ensuring that the project does not harm the environment.

4) *Public Participation Rights*

The right to acquire environmental information, the right to community participation in decision making, and acquire to justice are included in procedural rights related to the environment.[18] The community and environmental groups have the right to be involved in the AMDAL process and provide input. It is an important aspect to ensure fairness and accountability in the approval process. In the case of biomass co-firing energy projects in Indonesia, the right to community participation can help ensure that local communities have the right to obtain information and provide input regarding projects that will be implemented in their environment. In its implementation, the right to public participation must be regulated in the form of public announcements and consultations. This is important to ensure that local communities have the right to know and provide input on projects that will be carried out in their environment. In the AMDAL process, local communities and environmental groups can provide input on the social, economic, and environmental impacts of biomass co-firing projects. Therefore, the right to community participation within the framework of environmental agreements can influence the sustainability of biomass co-firing energy projects in Indonesia by ensuring that local communities are involved in decision-making regarding such projects. This can help ensure that the project is sustainable and environmentally friendly and meets the needs of local communities.

5) *Customary Law*

In arranging environmental approvals for biomass co-firing energy projects in Indonesia, customary law also needs to be taken into account. Many energy and natural resource projects are located in areas inhabited by indigenous peoples.[19] Therefore, avowal and defenses of the rights of indigenous peoples is an important element in the regulation of biomass co-burning projects. In practice, avowal and protection of indigenous peoples' rights must be regulated in the form of public announcements and consultations. This is important to ensure that indigenous communities have the right to know and provide input on projects that will be carried out in their territories. In the AMDAL process, indigenous communities can provide input regarding the social, economic and environmental impacts of biomass co-firing projects. By observing customary law, biomass co-

firing projects can be implemented while respecting the rights of indigenous communities and ensuring that the project does not damage the environment and meets safety standards. In the long term, this can help Indonesia achieve the zero carbon emissions target demanded by the world. Thus, customary law in the regulation of environmental agreements can influence the sustainability of biomass co-firing energy projects in Indonesia by ensuring that the projects are sustainable, respect the rights of indigenous peoples, and are environmentally friendly.

6) *Reporting and Compliance Obligations*

Companies or stakeholders have an obligation to comply with environmental regulations and report periodically the implementation of environmental management programs to the competent authorities. This includes providing information regarding environmental impact monitoring, fulfilling commitments stated in the AMDAL, and soon. In the case of biomass co-firing energy projects in Indonesia, reporting and compliance obligations are essential to ensure that the project is sustainable and takes environmental aspects into consideration. In the long term, this can help Indonesia achieve its target of zero carbon emissions as demanded by the world. The implementation of reporting and compliance obligations should be regulated in clear and accountable regulations. This is important to ensure that companies or project holders comply with environmental regulations and regularly report on the implementation of environmental management programs. Therefore, reporting and compliance obligations in the environmental approval framework can influence the sustainability of biomass co-firing energy projects in Indonesia by ensuring that the projects are sustainable and take into account environmental aspects, ensuring that the projects do not harm the environment and meet safety standards.

Environmental law enforcement is defined by G.A. Biezeveld[20] as the application of government legal power to ensure compliance with environmental regulations in several ways, including administrative compliance supervision (inspection, especially in prevention), administrative actions or sanctions in cases of non-compliance (corrective activities), criminal investigations in cases of alleged violations (repressive activities), criminal actions or sanctions in cases of violations (repressive activities), and civil actions (legal lawsuits) in the event of a threat of non-compliance (preventive activities).

Enforcement of environmental laws can be divided into three aspects, administrative environmental law enforcement carried out by government officials, criminal environmental law enforcement conducted through judicial procedural procedures, and civil environmental law enforcement as well as environmental dispute resolution conducted through litigation and non-litigation methods.

V. CONCLUSION

Multisectoral business activities related to biomass co-firing are carried out in Indonesia to increase the contribution of renewable energy to the national energy mixture, reduce carbon emissions, and create job opportunities and business prospects in the biomass sector. In the case of biomass co-firing energy projects in Indonesia, the principles of Ecological Justice are crucial to ensure that the projects are sustainable and environmentally friendly. We need to synchronize Relevant Regulations, Implement Environmental Impact Assessment (AMDAL) Analysis, maintain Public Participation Rights and Customary Law, as well as Reporting and Compliance Obligations.

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