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# Breaking Coal Lock-In: Unravelling the Policy Hurdles to Decarbonising Indonesia's Energy Sector

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**ABSTRACT**

*The Indonesian government has ratified the 2015 Paris Agreement, thereby committing itself to a climate commitment to achieve zero carbon emissions by 2060 and to keep the Earth's temperature rise within 1.5 degrees Celsius above the pre-industrial average. This commitment is being implemented in various ways, including the decarbonisation of the electricity sector. This policy was promulgated in Presidential Regulation 112/2022 regarding acceleration of renewable energy development and Ministry of Finance Regulation 103/2023 on the fiscal support of energy transition. In this case, many aspects such as institutionalisation, visibility, intentionality, risk avoidance, and differences of interest appear to lead to procedural policy outcomes which later determine th decarbonisation rate of Coal-Fired Power Plants (CFPP). This article seeks to examine the procedural aspects of the early coal-fired power plant retirement policy innovation, based on Howlett's (2014) theory of climate policy innovation. This research employs qualitative methods, including in-depth interviews with stakeholders and literature studies. This article explains that the policy formulation in Presidential Regulation 112/2022 tends to be procedurally negative and hampers several CFPPs' early retirement processes in West Java and Banten. The weaknesses of this policy are clearly visible in the form of administrative delays and criteria restrictions. By contextualizing energy policy within the broader framework of public governance in Southeast Asia, the article emphasizes the relevance of inclusive, non-Western approaches to policy reform and public service delivery.*

## Introduction

The Indonesian government ratified the 2015 Paris Agreement through Law No. 16/2016, committing to zero carbon emissions by 2060 and limiting global temperature increases to 1.5 degrees Celsius above pre-industrial levels. In its 2022 Enhanced Nationally Determined Contributions (ENDC), Indonesia aims to reduce

greenhouse gas (GHG) emissions by 31.89% by 2030, or 43.20% with international support.

Coal remains a major energy source, contributing 42.38% of Indonesia's primary energy in 2022 (Sujai et al., 2023). The country operates 211 Coal-Fired Power Plants (CFPPs) with a 46 GW capacity, and CO2 emissions from these plants are projected to increase by 8,263 million tons by 2040 (Wahyuni, 2022). Despite providing low-cost electricity, CFPPs are heavily subsidized, with fiscal subsidies alone costing approximately IDR 39 trillion annually (Muhajir et al., 2023). Including broader support, coal subsidies reached around IDR 873 trillion in 2022 (Black et al., 2023; Prasetiyo et al., 2023). One key subsidy is the Domestic Market Obligation (DMO), which requires coal suppliers to sell at least 25% of their coal domestically at lower prices.

State-owned enterprises (SOEs) globally contribute significantly to emissions, with state electricity providers like PLN responsible for 40% of these emissions (Benoit et al., 2019; Benoit, 2020). The government's control over SOEs allows it to regulate emissions and influence PLN's decarbonization efforts through incentives (Babić & Dixon, 2023). However, the reliance on coal complicates the early retirement of CFPPs, particularly as many plants are still young, and the banking sector lacks clear policies for transitioning away from fossil fuel investments.

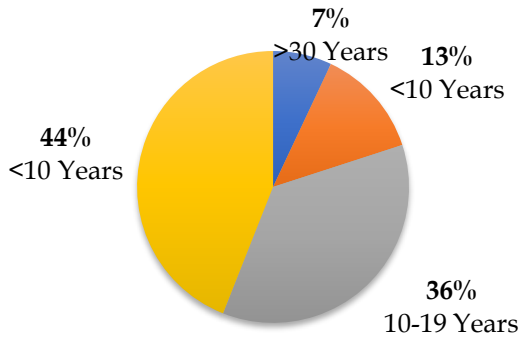



**Figure 1.** Age of Coal-Fired Power Plant in Indonesia

*Source: Listiyorini, Harsono, & Mokhtar, 2023; Lucarelli, 2023; processed by authors*

The government's reliance on coal presents a significant challenge for stakeholders involved in the early retirement of CFPPs. While the low electricity tariffs from CFPPs contribute to a stable energy supply, many of these plants are relatively young, averaging 10-15 years of operation. Funding for energy projects in Indonesia is predominantly sourced from the banking sector, which currently lacks explicit policies to transition away from fossil fuel investments. This focus on energy security and affordability has led to delays in meeting the government's energy mix target of 23% renewables by 2025; as of 2023, only around 13% has been achieved.

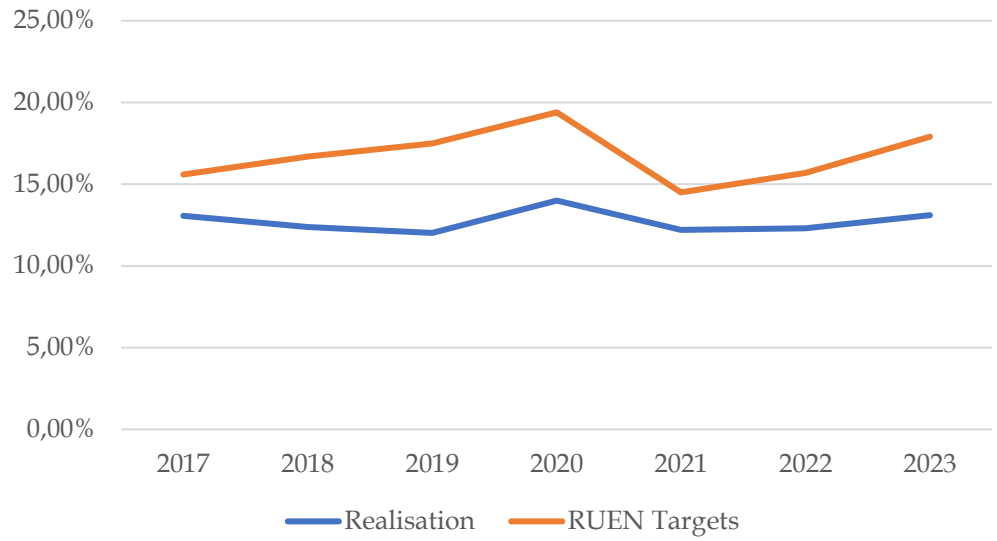



**Figure 2.** Renewable Energy Mix Target and Realisation

*Source: Halimatussaidah,et al..,2023; Kementerian ESDM, 2024; processed by authors*

To support the decarbonisation of power plants in Indonesia, international funding institutions and platforms such as the Energy Transition Mechanism (ETM) and the Just Energy Transition Partnership (JETP), backed by the Asian Development Bank (ADB), are providing crucial financial assistance. Additionally, Presidential Regulation (PR) 112/2022 on the Acceleration of Renewable Energy Development and Ministry of Finance (MoF) Regulation 103/2023 on Fiscal Support for Energy Transition outline the framework for advancing decarbonisation efforts. These regulations require PT PLN to develop a Long-Term Electricity Supply Plan (RUPTL) that prioritises renewable energy and includes measures for 'accelerating the end of the operational period of CFPPs,' referred to as 'CFPP early retirement.'

To climate target, Indonesia needs to reduce its CFPP capacity by at least 11 per cent by 2030 and by 90 per cent by 2045 (IESR & University of Maryland, 2022). The CFPPs slated for early retirement include Cirebon-1 CFPP and Pelabuhan Ratu CFPP, with the status of Suralaya CFPP in Banten still under consideration. However, the roadmap and specific strategies for CFPP retirement have not yet been published, creating uncertainty in the process. Therefore, this research aims to explore how the policy framework for CFPP retirement affects its implementation.

CFPPs retirement formulation and substance are believed to have procedural shortcomings that hinder effective execution. The study focuses on these three CFPPs based on selections made by the MEMR and PLN, which have identified them as candidates for early retirement (Setiawan, 2023; Dewi & Agarta, 2023). The research hypothesis is that the interplay between regulations and national energy needs creates constraints on the early retirement process. The initial section of this study will identify factors contributing to procedural policy issues, followed by an analysis of the provisions in PR 112/2022 and MoF Regulation 103/2023. The final section will discuss the policy implications of these regulations for the early retirement of Cirebon-1, Pelabuhan Ratu, and Suralaya CFPP.

## Literature Review

Decarbonizing the energy sector involves multiple key actors influenced by complex political interests, a dynamic well-documented in previous studies (Karapin, 2016). Structural and procedural aspects of climate policy, though differing in scope, are both crucial (Harrison & Sundstrom, 2007; Falkner, 2009). In Indonesia, the roles of these actors and the associated structures and processes are vital for meeting climate commitments. Bridle et al. (2018) identify political instability in PPA negotiations and local content requirements as barriers to renewable energy investment. Ordonez et al. (2022) highlight the high-risk environment for CFPP financing and the prioritization of infrastructure development and the coal market over climate protection.

State-owned enterprises (SOEs) like PLN play a significant role in decarbonization. Benoit et al. (2022) suggest that PLN could decarbonize effectively if it had operational independence from subsidies, while Babić and Dixon (2023) argue that reliance on subsidies hinders this potential. Wahyuni (2022) critiques the banking sector's role, noting inadequate regulatory frameworks and feed-in-tariff policies for promoting renewable energy. Sujai et al. (2023) find the CFPP retirement policy ineffective due to conflicts of interest and poor framework development. Additionally, the strained relationship between independent power producers (IPPs) and PLN is exacerbated by issues with the power wheeling scheme and reliance on public compensation (Sujai et al., 2023).

Despite the critical role of actors in shaping climate policy in Indonesia, the discourse often overlooks the specific procedural regulatory challenges in energy policy. While climate issues are urgent, public attention to government interventions remains limited (Indonesian Political Indicators, 2021).

### *Decarbonisation in Electricity*

A significant body of research on decarbonisation has developed in response to the increasing global emphasis on climate action, particularly following the Paris Agreement of 2015. Rockström et al. (2017) conceptualised 'decarbonisation' as a strategy to meet the Paris Agreement goals through emission reductions. They introduced aspects of decarbonisation with two main actions: immediate emissions reductions and long-term systemic changes.

Further studies have examined decarbonisation strategies in various national contexts. For example, Germany and EU countries have focused on coal phase-out strategies to reduce emissions, analysing their impact on electricity prices and power production (Keles & Yilmaz, 2020; Gillich et al., 2020). Similarly, China has adopted a decarbonisation approach that includes precise measurements of electricity demand and detailed regional power trade strategies (Burandt et al., 2019). Xiao et al. (2021) extended this research by investigating the role of carbon pricing in accelerating shifts in power generation structures.

Despite these insights, there is a gap in the discussion of specific policy barriers to decarbonisation. Recent studies have critiqued the positivist approach for its lack of consideration of intersecting political interests. Addressing these constraints

requires integrating contextual evidence that considers social, economic, and political factors.

### *Procedural Climate Policy*

The theoretical framework by Howlett (2014) is employed in this study to analyse the relationship between the policies outlined in PR No. 112/2022 and the decarbonisation of CFPPs in Indonesia. Howlett's theory of climate policy innovation addresses several factors that contribute to the inadequacy of substantive climate policies 1) Cognitive limitations of policymakers: institutional frameworks restrict policymakers' ability to innovate, often resulting in conservative approaches, 2) Risk avoidance: policymakers may avoid ambitious regulations to prevent potential failures, favoring more normative regulations, 3) Severity and visibility in the public: the impact and public perception of climate issues vary by region, affecting policy priorities, 4) Intensity and deliberateness: governments prioritise policies based on societal pressures and the perceived impact on economic growth or national development, and 5) Opposing interests: divergent interests can lead to symbolic rather than substantive policies. Howlett's framework also categorises potential policy responses into two types: 'negative' procedural actions, which aim to avoid issues, and 'positive' procedural actions, which support substantive climate goals.

**Table 1.** Procedural Policy Tools

| | **Information** | **Authority** | **Budget** | **Organisation** |
|---|---|---|---|---|
| Positive | Provide information | Establishment of an advisory committee | Interest group financing | Institutional reform |
| Negative | Propaganda or information restriction | Group delimitation, criteria establishment | Reduced subsidies or funding | Administrative delay |

*Source: Howlett (2000)*

Consequently, policies in sectors such as climate change policymaking are frequently differentiated according to whether they are oriented towards mitigation or adaptation. Each country faces a distinct level of severity of climate change-related problems, which may influence the likelihood of engagement with one type of policy objective.

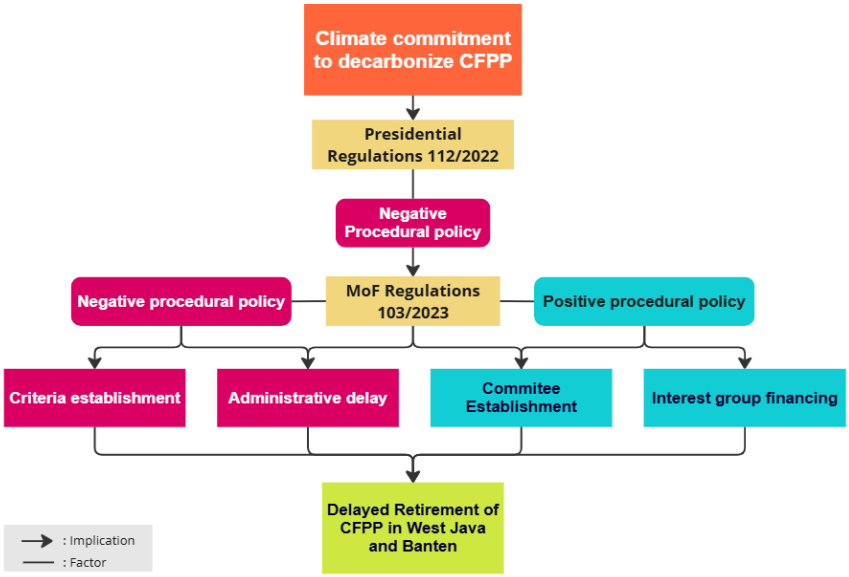



**Figure 3.** Analytical Framework

*Source: Howlett, 2014; processed by authors*

## Research Methods

This research project focuses on national-level policies regarding electricity decarbonisation and CFPP early retirement in Indonesia, specifically within West Java and Banten. A qualitative research approach has been adopted, as it allows for an in-depth exploration of stakeholder perspectives and complex policy issues. Qualitative methods are well-suited for this study because they provide nuanced insights into the experiences and views of individuals directly involved in policy-making and implementation, which quantitative methods might not fully capture.

The study employs semi-structured interviews with key stakeholders to gather rich, contextual data. Informants include: R.W. (IESR researcher), M.S. (CELIOS researcher), H.M. (Sub Coordinator for Preparation of National Electricity Planning and Policy, MEMR), E.S. (Commission VII DPR RI). In total, four informants were interviewed.

These informants were selected based on their expertise and involvement in relevant policy areas. Selection criteria included their roles in shaping or analysing electricity policies and their experience with CFPP issues (Creswell, 2014; Neuman, 2014). To minimise biases, the selection aimed for diversity in perspectives and positions across different institutions. However, potential biases could arise from the informants' institutional affiliations and personal viewpoints.

Ethical considerations were central to this research. Informed consent was obtained from all participants, ensuring they understood the purpose of the study, their role, and their right to withdraw at any time. Confidentiality was maintained by using initials rather than full names and by securing all data in accordance with research ethics guidelines.

Data analysis involved coding techniques, including organising, categorising, and interpreting the information using the Miles and Huberman model (1994). In this study, data reduction begins with the coding of interview transcripts and document extracts. Coding involves categorising and summarising the data into manageable segments, focusing on key themes and patterns related to electricity decarbonisation policies and obstacles to CFPP retirement. The reduced data is then organised and presented using various formats to facilitate interpretation. The final step involves drawing conclusions based on the displayed data. This process includes verifying the conclusions by revisiting the data to ensure accuracy and consistency.

Supplementary data was collected from literature studies, including: CELIOS Publication, ADB report, IESR Energy Transition Outlook, PT PLN report, scientific journals, online media reports from Kompas, CNBC, Bloomberg, and government documents such as National Energy Policy, General Plan for Electricity Supply, and National Electricity General Plan. These sources provided additional context and verification of the primary data, enhancing the study's validity and comprehensiveness.

## Results and Discussion

### *Procedural Climate Policy in the Energy Context in Indonesia*

In the context of Indonesian energy policy, institutionalisation is particularly relevant. The creation of the National Energy Council (DEN) as the principal agency responsible for cross-sectoral energy issues and the oversight of the National Energy Policy (KEN) highlights the entrenched nature of the policy framework. While KEN is intended to guide the achievement of 23% renewable energy by 2025, as mandated by Law 30/2007 concerning Energy, it lacks legal binding force despite being stipulated through Government Regulation (PP) 79/2014.

First, the overlapping roles of National General Energy Plan (RUEN), National Electricity General Plan (RUKN), and RUPTL—each with different time horizons and scopes—further complicate policy coherence. For instance, while the RUEN, established in 2017, details electricity generation capacity targets, the RUKN provides a 20-year blueprint for electricity planning, and the RUPTL offers a ten-year development plan. The disharmony between these plans has led to discrepancies in electricity generation capacity due to varying assumptions and modelling approaches (OECD, 2021).

The issuance of PR 112/2022 exacerbates this disharmony by introducing scenarios for early retirement of CFPPs that are not aligned with the 2017 RUEN. While the draft RUKN 2023-2060 projects the cessation of coal as an energy source by 2055, with significant emissions reductions anticipated post-2044, PR 112/2022 appears to precede its own legal framework. As E.S, member of parliamentary (June 5, 2024) noted, the schedule for achieving net zero emissions (NZE) and early CFPP retirement ideally should align with the RUKN, which is grounded in the KEN.

*"...if you want to see the schedule for NZE regarding net zero emissions for the energy transition and early retirement of power plants, it is necessary to refer to the RUKN or KEN." (E.S., June 5, 2024)*

**Table 2.** Regulations Making in Electricity and Energy

| Regulation | Institution | Functionality | Referring to |
|---|---|---|---|
| Law 30/2007 regarding Energy | People's Representative Council (DPR RI) | Umbrella law; Basic principles of energy management in Indonesia. | 1945 Constitution |
| Government Regulation 79/2014 regarding KEN | National Energy Council (DEN), President | Implementation law; Guidelines to provide direction for the National Energy Management to achieve its goal of energy independence and security. | Law 30/2007 |
| Presidential Regulation 22/2017 regarding RUEN | President | Explanation of cross-sector KEN planning and implementation; As a reference for the preparation of RUKN and RUPTL. | Government Regulation 79/2014 |
| RUKN 2019-2038 | Ministry of Energy and Mineral Resources (MEMR) | Serves as a reference for regional governments and electricity supply businesses (RUKD) and business area plans (RUPTL) in alignment with national and international environmental commitments, including reducing CO2 emissions. | Government Regulation 79/2014 |
| RUPTL 2021-2030 | National Electricity Plant (PLN) | Provide guidelines and references for the development of PLN's electric power facilities for electricity needs in its business areas in a more efficient, more planned and environmental manner. | Government Regulation 79/2014, RUKN 2019-2038 |
| Presidential Regulation 112/2022 | President | Determines the acceleration of CFPP early retirement and the development of renewable energy-based CFPP. Regulates the purchase price of electricity purchases from renewable energy power plants. | Government Regulation 79/2014; RUPTL 2021-2030 |

| Regulation | Institution | Functionality | Referring to |
|---|---|---|---|
| MoF Regulation 103/2023 | Ministry of Finance (MoF) | Regulates the domestic fiscal incentive mechanism for acceleration of CFPP early retirement and establishment of renewable energy-based power plants. | Presidential Regulation 112/2022 |
| (Draft) RUKN 2023-2060 | MEMR | Serves as a reference for RUKD and RUPTL including the early CFPP retirement, and retrofitting scenario. | Presidential Regulation 112/2022 |
| (Draft) RUPTL 2024-2033 | PLN | Regulates the addition of renewable energy-based power plant development. | Presidential Regulation 112/2022; RUKN 2023-2060 |

*Source: MEMR, 2023; Fajri, 2023; personal interview, R.W., May 20, 2024; personal interview, M.S., May 28, 2024; processed by authors*

Table 2 illustrates the adjustments of the draft RUKN 2023-2060 to align with the government's decarbonisation targets for CFPPs, a shift that was not anticipated in the RUEN 2017. This highlights the procedural nature of the regulations, as they are retroactively aligned with overarching policy goals rather than being derived directly from established legal frameworks.

Do and Burke (2024) argue that institutional barriers significantly hinder the management of CFPP early retirement and the promotion of new and renewable energy sources. A key example is the recent policy allowing the development of captive CFPPs, justified on the grounds of conserving natural resources and supporting economic growth (Resosudarmo, 2023). Despite these justifications, the continued construction of captive CFPPs—which currently make up two-thirds of the CFPPs under development—demonstrates PLN's influence over policy direction. However, PLN's actions often reflect the interests of the coal market rather than a genuine commitment to transitioning towards renewable energy (Do & Burke, 2024: 5).

R.W., IESR researcher (May 20, 2024), noted that captive CFPPs, typically built to power smelters, are relatively young and still under construction. This ongoing development presents a significant challenge, as it extends the lifespan of coal usage in Indonesia, further complicating efforts to retire these plants early.

Second, risk avoidance is further evident in how stakeholders strive to maintain stability in electricity supply costs. H.M., from the Directorate of Electricity Development Programs (May 22, 2024), highlighted that a central focus of the latest RUKN is ensuring fair pricing in electricity distribution. The levelised cost of electricity (LCOE) from CFPPs currently stands at approximately US$ 7 cents/kWh, which remains relatively low compared to retrofitting efforts involving CCS technology, estimated at around US$ 11 cents/kWh.

*"…because there is a need for electricity now and in the future, to fulfill it there must be a new generator that will be built. Regarding CFPP early retirement, the Directorate General of Electricity must ensure that electricity needs are met even if there is a retirement in the future." (H.M., May 22, 2024)*

PLN's financial model faces significant challenges, especially if CFPPs are phased out from the industrial sector. As Bridle (2018) notes, PLN's role as a fuel supplier for diesel generators could diminish, potentially reducing its income stream. Financially, PLN's ability to retire CFPPs hinges on securing international funding commitments. Although the government has supported fiscal subsidies through blended-financing mechanisms from bilateral or multilateral cooperation programs, the current financing arrangements provided by the ETM and the JETP are insufficient to cover the substantial costs involved.

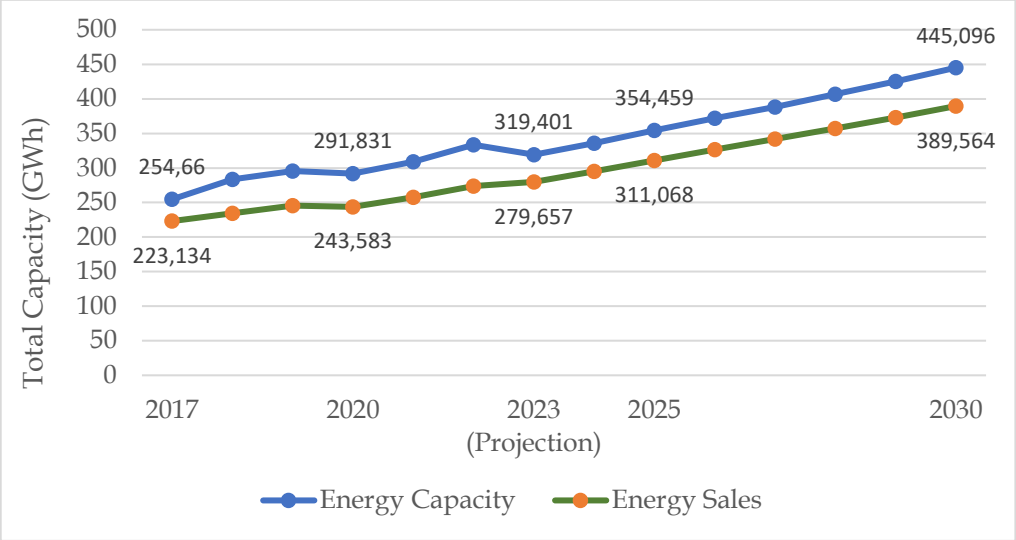



**Figure 4.** Electricity Supply and Demand Forecast 2017-2030

*Source: PT PLN, 2021; MEMR, 2022; Processed by authors*

As illustrated in the graph, the government faces persistent electricity oversupply, a challenge expected to continue for several years. This oversupply results from a mismatch between market consumption projections and actual economic growth. The ongoing oversupply, which has reached approximately 6 GW (Mediatama, 2024), incurs annual costs ranging from IDR 12-18 trillion. Without accounting for the exact elasticity of household income, the projected discrepancy between electricity supply and demand from 2017 to 2030 averages around 43,600 GWh.

The concept of risk avoidance, as discussed by Hood (2014), is evident in the reluctance of authority holders to engage deeply with policies that have long-term societal impacts. This hesitation aligns with the broader tendency of institutional actors to avoid assuming responsibility for policies that require significant change or carry long-term consequences.

The third crucial aspect is the visibility of climate policy, particularly the early retirement of CFPPs. Although this policy is among those with the most widespread

potential impact, it remains poorly understood by the public (Orie, 2024). A survey of residents living near CFPPs revealed that 20 per cent reported health complaints, indicating some awareness of negative externalities. Economically, 85 per cent of respondents indicated they are not employed by nor dependent on CFPPs for their livelihoods (Orie, 2024:4). Despite these impacts, there is a striking lack of awareness about the JETP, with the majority of local residents unfamiliar with the term and believing that current regulations have not effectively supported the transition to clean energy. This environment allows the government to enact non-substantive policies that appear to address energy transition concerns without implementing substantial changes.

The fourth aspect to consider is the intensity and deliberateness of actions taken by policy actors, reflecting their willingness to implement meaningful change. In Indonesia's energy policy, this is evident from the issuance of PR 112/2022, strategically timed just before the 2022 G20 Summit in Bali. A researcher from CELIOS, suggested that there is a correlation between international agendas such as G20 and domestic climate policy (M.S., May 28, 2024).

The G20 Summit, as a key international forum for the world's largest economies, plays a significant role in shaping global priorities and addressing urgent issues, including climate change. At the 2022 Bali Summit, President Joko Widodo reiterated Indonesia's commitment to transitioning away from coal and increasing its renewable energy mix to 34 per cent by 2030 (World Resources Institute, 2022).

Beyond the international agenda, the timing of the early retirement agreements for the Cirebon-1 CFPP and Pelabuhan Ratu CFPP warrants close analysis. The ETM plan, discussed since 2022, only saw the agreement for Cirebon-1 CFPP's early retirement signed in December 2023, with finalisation occurring on May 7, 2024, as announced by the MoF (Republika ID, 2024). Despite these extended discussions, the project was limited to a pilot initiative with a capacity of 660 MW, reflecting a conservative approach to CFPP decarbonisation.

The fifth aspect to consider is the conflicting interests among various sectors, which significantly influence the formulation and implementation of climate policy in Indonesia. Despite the critical need for a comprehensive approach, the division of responsibilities and authority among key players remains inadequate, leading to a fragmented policy landscape (Dutu, 2016; Yoseph-Paulus & Hindmarsh, 2016).

**Table 3.** Institutional Authority and Relationship in Electricity Policy

| Institution | Interest | Functionality | Coordinating |
|---|---|---|---|
| Coordinating Minister of Economy (CME) | Growth of economy, industry, and state-owned enterprises | Oversee the synchronisation of economic policies | MoF and MNDP |

| Institution | Interest | Functionality | Coordinating |
|---|---|---|---|
| Coordinating Ministry of Maritime and Investment (CMMI) | Domestic and foreign energy investment | Supervise and Coordinate MEMR and MoEF policies | MEMR; MoEF; and MNDP |
| Ministry of National Development Planning (MNDP) | National Development | Coordinate energy sector policy budget planning in GHG emission reduction | CME and CMMI |
| Ministry of Energy and Mineral Resources (MEMR) | Energy security | Formulate, implement, and monitor energy policies; Approve RUPTL and set equipment standards | CMMI and PLN |
| Ministry of Finance (MoF) | National budget | Set electricity subsidies, approve loans and PPAs by PLN; formulate fiscal incentives | PLN and CME |
| Ministry of State-owned Enterprises (MSoE) | State-owned enterprises management | Set and review PLN's performance. | PLN |
| Ministry of Environment and Forestry (MoEF) | Climate action in the energy sector | Establish climate targets, measurement, and verification. | CMMI |
| National Electricity Plant (PLN) | Energy supply | Sole off-taker of energy generation and responsible for power plant procurement, in implementing RUPTL | MoF; MsoE; and MEMR |

*Source: OECD, 2021; processed by authors*

This divergence in priorities has resulted in PLN being designated as the implementing agency for cross-sector administrative policies. The findings of Ordonez et al. (2022) suggest that this arrangement has enhanced PLN's bargaining power, positioning it as the dominant actor in a tightly regulated sector. As a result, policies formulated by the cabinet tend to accommodate PLN's interests, ensuring the continuation of its operations. A clear example of this misalignment is the prolonged delay in the ratification of the New Renewable Energy Bill (EBET), which was first proposed on June 14, 2022. Despite its importance as the legal foundation for Indonesia's transition to clean energy, the bill has yet to be ratified. The introduction of the EBET Bill was preceded by sectoral regulations, including PR 112/2022 and MoF Regulation 103/2023, further illustrating the fragmented nature of climate policy.

The five factors discussed above collectively underscore the limitations of PR 112/2022 within the broader context of the government's reliance on coal. While the regulation aims to support the energy transition, it lacks the specificity required to

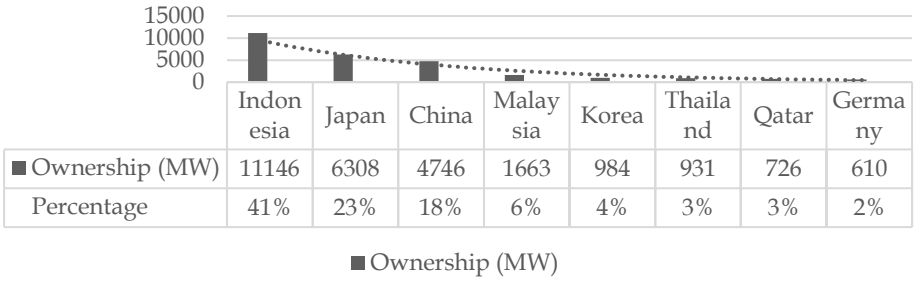
effectively promote the early retirement of CFPPs. Most coal-fired electricity networks are either under construction or governed by stringent PPA (Hamdi & Adhiguna, 2021). According to a study by Brown and Hauber (2021), ETM assistance should be leveraged to accelerate the decommissioning of inefficient power plants at risk of being stranded. However, in the Indonesian context, where the details of PPAs are confidential, selecting CFPPs for early retirement remains a challenge due to the difficulty in ensuring that all stakeholder interests have been adequately considered (Brown & Hauber, 2021).

Moreover, numerous CFPPs operated by IPPs are bound by take-or-pay clauses in their PPAs. A significant portion of these CFPPs is owned by foreign consortiums, primarily Japanese and Chinese companies (Hamdi & Adhiguna, 2021). Indeed, foreign financiers, particularly those from China, hold a majority stake, accounting for 59 percent of total IPP ownership. Currently, Indonesia has seen a trend of sole investment in power generation by China(Tritto, 2021; Bößner et al., 2023).

Existing studies reveal a strong link between Chinese investment and Indonesian energy policies, particularly in coal. Mori (2020) suggests that Chinese investors create a "policy feedback effect" by partnering with Indonesian coal stakeholders, who then lobby for favorable government policies. This was evident during President Yudhoyono's administration when Chinese investors collaborated with the Indonesian coal industry to form joint IPPs with PLN, ensuring access to the Indonesian electricity market.

Clark et al. (2023) support this by noting that China's Development Finance Institutions (DFIs) have been the main public lenders for overseas coal projects but are also well-positioned to lead these plants' early retirement. China has also established over 20 overseas development investment funds, with DFIs as shareholders, to direct capital towards development goals, potentially serving as vehicles for retiring coal assets.

The analysis further indicates that the carbon price needed to justify subsidies for early retirements is low, around half of the US$24 per ton CO2 social cost estimated for China in 2018. Subsidizing early retirements could thus be beneficial for international financiers like China, enhancing its green development image and expanding renewable energy export markets (Clark et al., 2023).




| | Indonesia | Japan | China | Malaysia | Korea | Thailand | Qatar | Germany |
|---|---|---|---|---|---|---|---|---|
| Ownership (MW) | 11146 | 6308 | 4746 | 1663 | 984 | 931 | 726 | 610 |
| Percentage | 41% | 23% | 18% | 6% | 4% | 3% | 3% | 2% |

**Figure 5.** IPP Ownership Diagram by Financing Country

*Source: Hamdi & Adhiguna, 2021; processed by author*

However, the government itself refused to renegotiate the PPA to avoid legal consequences and payment of fines. This means that the use of CFPP retirement fund allocation is of great importance, as it determines not only who benefits but also the amount of the benefit. In the context of public policy, the objective should be to maximise the public interests (O'Flynn, 2010).

### *Procedural Policies in the Midst of Fulfilling Climate Commitments*

The provisions of PR 112/2022 concerning the termination of the operational period of CFPPs have sparked significant debate. A study by CELIOS & the Cerah Indonesia Foundation (2023) challenges the norms established in Article 3 of this regulation. The regulation explicitly excludes the construction of new CFPPs or the expansion of existing ones within the 2021-2030 RUPTL. It also excludes captive CFPPs that contribute to national economic income, as well as CFPPs committed to maximising emissions reductions. These exclusions are further complicated by restrictive criteria linked to National Strategic Projects (PSN). Additionally, the requirements for CFPP retirement are criticised for lacking inclusivity, as key stakeholders such as local governments and civil society were not involved in defining these criteria (M.S., May 28, 2024).

Moreover, the regulation grants discretionary power to the Minister to develop a roadmap for the early retirement of CFPPs, as stipulated in PR No. 112/2022, rendering the policy somewhat partial. This provision notably excludes cross-sectoral institutions like the MSoE, the MoF, regional government actors, and community groups from the roadmap development process. Furthermore, there are no clearly defined criteria for determining the operational end dates of CFPPs owned by PLN or Independent Power Producers (IPPs). As a result, the transparency and accountability of the funds intended to accelerate CFPP retirements are questionable.

R.W. (May 20, 2024) noted that PR 112/2022 is supported by a derivative regulation, namely MoF Regulation 103/2023, which pertains to fiscal support for the energy transition. Article 5 of MoF Regulation 103/2023 requires the establishment of a roadmap for accelerating the end of CFPP operations, along with other considerations of concern to the Minister. However, the roadmap preparation under PR 112/2022 is delegated to the MEMR without a specific deadline or detailed provisions, leading to delays in fiscal support for early CFPP retirements, which hinge on the Minister's publication of a comprehensive roadmap.

**Table 4.** Procedural Policy Framing for Early Retirement CFPP Policy in Indonesia

| Regulation | Provision | Dimension | Attribute | Procedural Policy Tools |
|---|---|---|---|---|
| Article 3 PR 112/2022 | The Minister prepares a road map for accelerating the end of the CFPP's operational period in a sectoral planning document. | Organisation | Negative | Administrative delay |

| Regulation | Provision | Dimension | Attribute | Procedural Policy Tools |
|---|---|---|---|---|
| | The preparation of the road map is carried out in coordination with the minister for finance and the organising minister. | Organisation | Negative | Administrative delay |
| | Criteria for the prohibition of new CFPPs development | Authority | Negative | Criteria establishment |
| | Criteria of accelerated early retirement for self-owned CFPPs or CFPP PPA's contracts developed by IPP or by PT PLN | Authority | Negative | Criteria establishment |
| Article 5 MoF Regulation 103/2023 | Criteria for the utilisation of the Energy Transition for CFPP projects | Organisation | Negative | Administrative delay |
| Article 10 MoF Regulation 103/2023 | Minister authority in establishing Steering Committee and SOE to support Energy Transition Platform | Organisation | Positive | Committee establishment |
| Article MoF Regulation 103/2023 | Provision to Financing the Steering Committee | Budget | Positive | Interest group financing |

*Source: CELIOS & Yayasan Cerah Indonesia, 2023; processed by authors*

The current scheme has significantly hindered the implementation of early retirement for CFPPs, largely due to the absence of a detailed roadmap. Existing regulations lack specificity in several critical areas, such as determining the number of CFPPs to be retired, outlining the process, and establishing a clear financing mechanism.

> "*This presidential regulation is a necessary component of an affirmative policy. It confirms that the government is committed to not rebuilding coal-fired power plants. Furthermore, it provides PLN with a legal basis to cancel the contract being negotiated.*" *(E.S., June 5, 2024)*

This statement reinforces the perception of Presidential Regulation 112/2022 as an affirmative action policy. However, according to Howlett's (2014) interpretation, such affirmative action, when not supported by a comprehensive framework, can be viewed as ameliorative and almost symbolic. Moreover, the regulation introduces vague discretionary terms, such as "paying attention to ministerial policies," without offering clear definitions. This ambiguity allows for

potential alterations to the Ministerial Regulation, which could lead to the cancellation or postponement of CFPP early retirement plans.

In the context of Howlett's (2000) procedural policy framework, the regulations concerning the limited criteria for CFPP early retirement represent a negative procedural policy within the governing authority. The undefined ministerial discretion adds another layer of negative procedural impact by causing administrative delays.

### *Stagnation of CFPP Decarbonisation in West Java and Banten*

The financial challenges of decarbonising CFPPs in West Java and Banten are significant. For instance, early retirement costs for the Cirebon-1, Pelabuhan Ratu, and Suralaya CFPPs are estimated to range from US$300 million to US$3.3 billion (CELIOS & Yayasan Cerah Indonesia, 2023). Additionally, a study by IESR & University of Maryland (2022) estimates that a minimum investment of US$135 billion will be needed to replace 18 CFPPs with an average capacity of 4.5 GW between 2022 and 2030. The retirement costs alone could reach approximately US$4.6 billion.

Systemically, there is a trend of risk avoidance among authority holders. For example, in the case of the Pelabuhan Ratu CFPP, the ETM was not fully utilised as the plant had already reached the effective limit of its economic value (R.W., May 20, 2024). The Pelabuhan Ratu CFPP's early retirement negotiations remain unresolved, even after the signing of the framework agreement on October 18, 2022 (Muliawati, 2024). The government is pursuing an asset takeover scheme with PT Bukit Asam before retiring the CFPP. However, discrepancies in asset valuation between the government and private sector could make reaching an agreement challenging (R.W., May 20, 2024). This dependency on the coal market is not just at the plant level but also at the macro level, as studies by Sujai et al. (2023) and Benoit et al. (2022) indicate, showing substantial reliance on coal for electricity, including by PLN.

The situation at CFPP Suralaya, with a total capacity of 3.4 GW, is particularly concerning as it has yet to secure funding for its early retirement. Instead, as Prasetiyo et al. (2023) report, the plant is moving towards using clean coal technology (CCT) to reduce emissions by approximately 30 per cent. Since September 2023, PT Indo Raya Daya and Doosan Enerbility have been converting Units 9 and 10 (2 x 1000 MW) to co-firing with 60 per cent ammonia (Deny, 2023). However, the future of Suralaya units 3 and 4 remains undecided.

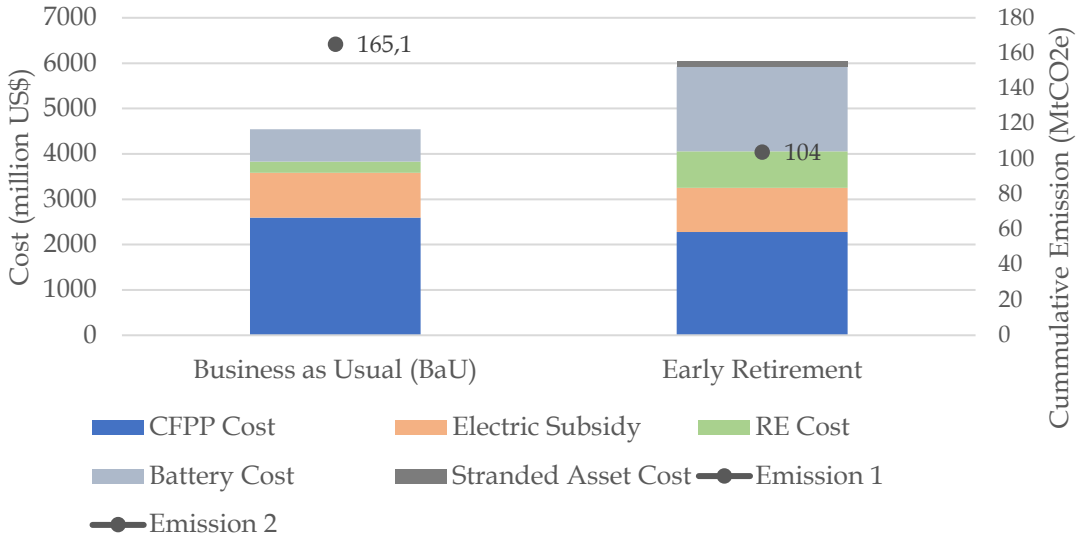



**Figure 6.** Cost and Benefit Comparison for each 1GW CFPP Scenario

*Source: Qamar & Purnomo, 2024; processed by authors*

Contrary to this approach, findings by Qamar & Purnomo (2024) suggest that early retirement of CFPPs is more viable than retrofitting. Their report concludes that early retirement is not only more profitable but also reduces emissions more effectively than CCS technology or retrofitting. Specifically, the emission reduction achieved by retrofitting CCS at CFPPs is estimated to be about 45 percent of total emissions, at a cost of US$324.1 per tCO2e. In contrast, early retirement costs just US$25 per tCO2e, with an emissions reduction of 34-37 percent. The Institute of Essential Reform (IESR) study (2023), titled "Indonesia Energy Transition Outlook 2024," also supports this view, arguing that retrofitting is not feasible under current conditions in Indonesia, where the balance of supply and demand cannot be maintained.

**Table 5.** Policy Implications of Presidential Regulation 112/2022 and Ministry of Finance Regulation 103/2023 on Cirebon-1, Pelabuhan Ratu, and Suralaya CFPP

| CFPP Project | Economic Value | Policy Implication | Status |
|---|---|---|---|
| Cirebon-1 | US$ 300 million | There are no mechanism for managing stranded assets.<br>Lack of comprehensive plan regarding the operational replacement of power plants with new and renewable energy. | An MoU has been signed between ADB and the Indonesian Government in December 2023.<br>Further in-depth studies are being conducted in order to calculate the accelerated financing tenor of seven years from the PPA. |
| Pelabuhan Ratu | US$ 870 million | There are discrepancies in the manner in which | It was signed into a framework agreement in October 2022. |

| CFPP Project | Economic Value | Policy Implication | Status |
|---|---|---|---|
| | | assumptions are employed in the valuation of assets.<br>There has been a delay in the discussion of the provision of CFPP early retirement costs. | In the process of due diligence on corporate funding sources.<br>The lack of a commitment from to provide incentive funding through the JETP represents a constraint on the project. |
| Suralaya | US$ 3,3 billion | There is lack of coordination regarding the determination of CFPP to be retired. | Further funding is still being sought for the early retirement of CFPP.<br>Operational reduction of 4 units or 1,600 MW.<br>Provides the option to use co-firing |

*Source: Sukmawijaya, 2023; CNBC Indonesia, 2023; Mediatama, 2023; Ashri, 2024; Muliawati, 2024; R.W., May 20, 2024; E.S., June 5, 2024; processed by authors*

Table 5 highlights that most challenges stem from financing scenarios, criteria, and retirement planning. The absence of a clear roadmap for the conclusion of CFPPs' operational periods has led to inconsistent financing models. While MoF Regulation 103/2023 provides a foundation for domestic fiscal incentives, it is evident that international investment remains crucial for sustaining blended financing (E.S, June 5, 2024).

The establishment of the JETP demonstrates that the current funding platform is not yet optimal. JETP offers US$20 billion in financing, with half provided as loans, making these incentives comparable to those offered by general commercial funding rather than being uniquely advantageous.

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## Conclusion

In light of the preceding discussion, five key factors have emerged as potential drivers behind the issuance of procedural policies concerning the early retirement of CFPPs in Indonesia: intertwined institutions, risk avoidance, a lack of public awareness about clean energy transition policies, deliberate momentum creation through initiatives like JETP and the G20 Summit, and differing priorities among stakeholders, where development often conflicts with climate commitments.

Under Howlett's (2014) climate policy framework, PR 112/2022 can be seen as a policy with negative procedural norms in terms of authority and organisation. This regulation, particularly regarding the criteria for CFPP early retirement, tends to focus on risk avoidance and lacks a clear framework, thereby stalling the retirement of plants like Cirebon-1, Pelabuhan Ratu, and Suralaya. The absence of a

comprehensive roadmap has hindered the timely execution of these retirements, illustrating the policy's limitations in achieving its intended climate goals.

Indonesia's dual reliance on coal for economic growth and the desire to attract green finance investors has resulted in a "makeshift" policy approach to CFPP retirement. This tension is evident in the incomplete and sectorally fragmented roadmap, which has led to administrative delays and uncertainty. These issues are further exacerbated by MoF Regulation 103/2023, which hinges on the roadmap for effective domestic fiscal subsidies, yet suffers from poor stakeholder coordination and transparency.

The implications of this situation are profound for the energy transition process. The challenges in funding, coordinating CFPP retirements, and managing long-term assets underscore the need for Indonesia to shift towards more substantive and coordinated policies. This shift requires significant investment in renewable energy, the reduction of coal dependence, and enhanced cross-sector collaboration to overcome the institutional and procedural hurdles currently impeding progress.

The study's limitations, including the geographic focus on specific CFPPs and the reliance on available financial data, may have influenced the findings. Future research could expand to other regions and explore alternative financing models, providing a broader perspective on the feasibility of CFPP early retirement. Additionally, more detailed studies on stakeholder coordination and policy transparency could offer insights into overcoming the identified challenges, contributing to a more effective energy transition strategy in Indonesia.

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