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FORTHCOMING IN THE SPECIAL ISSUE: APPROACHING CLIMATE COMPLEXITIES IN THE SOUTH: GLOBAL CLIMATE ACTION AND ITS EFFECTS

The reorientation process of the Indonesian energy sector towards international climate pledges: a policy trajectory analysis

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ABSTRACT

To achieve Indonesia's Nationally Determined Contribution (NDC), its government has operationalised the Paris Agreement's ratification through several climate–energy policies. This article investigates the extent to which these policies have reoriented the energy sector towards achieving the NDC targets. Policy trajectory analysis was chosen to unravel the why, how, and what of relevant energy policy documents. The findings suggest that first, the Ministry of National Development Planning, the Ministry of Environment and Forestry, and the Ministry of Energy and Mineral Resources are the central institutions in framing and implementing climate–energy policies. Second, variation in the temporal attribute between documents signals the presence of an intricate web of significant energy policies, which explains the difficulty in synchronising efforts towards meeting the NDC targets. Third, the energy policy trajectory still overlooks renewable energy, which may substantially compromise the nation's efforts to fulfil its international climate commitments.

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Energy policy; energy governance; nationally determined contribution; Indonesia; energy trilemma; policy trajectory analysis

1. Introduction

Following the Paris Agreement, Indonesia's Nationally Determined Contribution (NDC) framework outlines two primary scenarios, CM1 and CM2, for greenhouse gas (GHG) emission reductions. CM1 targets a 29 per cent unconditional reduction, whereas CM2 targets increasing this reduction to 41 per cent, conditional on international support (Republic of Indonesia 2016). The energy sector is expected to contribute substantially to these reductions, yet remains dominated by coal, oil, and gas, with renewable energy deployment lagging stated ambitions (Kementerian Energi dan Sumber Daya Mineral 2018; Purnomo Yusgiantoro Center (PYC) 2019b). Similarly to the energy sector, the National Electricity Company has contributed to the continued reliance on coal because of the lower production costs incurred (Handayani, Filatova, and Krozer 2019; Setyowati 2020). This tension between climate commitments and a fossil-heavy energy system raises questions about how far recent policy developments have actually reoriented the sector towards decarbonisation.

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Studies on Indonesia's climate policy in energy transition have tended to focus on techno-economic pathways, sector-specific barriers, and investment challenges, or on the political economy of the coal, energy justice, and land-use sectors (Budiman and Smits 2020; Kennedy 2018; Setyowati 2021; Siagian et al. 2017; Silaen et al. 2020; Veldhuis and Reinders 2015; von Lüpke 2022). While these studies provide important insights into potential transition scenarios and constraints, they pay less attention to how the sequence and content of national energy and climate policy documents collectively shape the space for change. Thus, it remains necessary to understand Indonesia's climate–energy governance as a policy trajectory that links international pledges, national development planning, and sectoral energy policies over time (see Baptista et al. 2022; Fragkos et al. 2021).

By exploring the historical context of energy policymaking and current climate commitments, we aim to provide insights into how Indonesia's NDC has influenced the transformation of its climate–energy policies (also see Dubash 2021). The following sections will discuss the methods used in this study, discuss the results, and conclude with a summary of the findings and the implications for future energy policy development.

2. Analysing the climate–energy policy trajectory in post-nationally determined contribution governance: a literature review

2.1. Post-Nationally determined contribution to national climate–energy governance

Climate–energy governance in the post-NDC era involves coordinating a diverse set of actors, institutions, and policy instruments across multiple scales, under conditions of contested interests and political uncertainty (Marquardt 2017). Climate governance involves various actors, policy processes, and policies, as well as financial flows (see Jernnäs 2024; Sapiains et al. 2021). National climate institutions mediate between domestic development priorities and international expectations, resulting in different governance "models", depending on the salience of climate politics and the political polarisation level (Castro, Kammerer, and Michaelowa 2024; Dubash 2021).

Many emerging economies face an "energy trilemma"; that is, they must try to balance energy security and affordability with environmental sustainability, even as they are expected to update NDCs with increasingly higher ambition (Gunningham 2013; Setyowati 2020; Suharsono et al. 2019). In practice, this trilemma is shaped by the historical reliance on fossil fuels, the political power of incumbent industries, and the uneven access to finance and technology, especially in Global South countries, such as Brazil, China, Fiji, India, Indonesia, Mexico, Russia, and South Africa (Downie and Williams 2018; Lefèvre, Wills, and Hourcade 2018; Michalena, Kouloumpis, and Hills 2018; Mohan and Wehnert 2019; Mukhia, Shen, and Xiaolong 2024; Vishwanathan et al. 2023; von Lüpke and Well 2020).

2.2. Incorporating policy trajectory within climate–energy governance

Policy trajectory analysis offers an analytical lens for examining how policies emerge, evolve, and interact over time, rather than treating them as static instruments (Ball 1993; Horschig and Thrän 2017). It distinguishes between policy as text, discourse, and ideology, emphasising how documents are drafted, negotiated, and interpreted in different institutional arenas (Ball 1993; Gale 1999; Lockwood et al. 2017). Ball (1993) conceptualises policies as "textual interventions into practice", underscoring their active role in shaping outcomes.

As texts, policies are revised and reinterpreted through legislative processes, bureaucratic negotiations, and stakeholder engagement, accumulating institutional momentum and sometimes drifting away from their original intentions (Ball 1993; Gale 1999). As discourse, policies reflect and shape prevailing narratives about development, energy security, and climate responsibility, defining who is heard, whose interests are represented, and which options are rendered thinkable (Lockwood et al. 2017; Röser et al. 2020).

Applied to climate–energy governance, this perspective highlights how NDCs operate both as pledges and as negotiation devices, embedded in pre-existing planning systems and sectoral policy ensembles (Holz et al. 2023; Jernnäs 2024). Therefore, tracing policy trajectories can clarify how national frameworks for low-carbon transitions are assembled, how they incorporate renewable energy, and where gaps emerge between formal commitments and implementation practices (Setyowati and Quist 2022; Dubash 2021).

In this study, we use policy trajectory analysis to examine the "why", "how", and "what" of Indonesia's post-NDC climate–energy policies and their implications for renewable energy. These components can be examined through the lens of this analysis to highlight the historical evolution of NDC outcomes, particularly in the case of Indonesia, which is the focus of this study (see Figure 1). However, this analysis has limitations in investigating the link between policy, and its implementation and impact.

3. Methodology

We use a qualitative design combining in-depth interviews and desk-based document analysis. We conducted 37 semi-structured interviews in 2020–2022 with officials from relevant ministries and agencies, state-owned and private energy companies, civil society organisations, international partners, and experts, selected through snowball sampling to capture key perspectives on climate–energy policy (see Table 1). We coded interview data using content analysis, complemented with reports and statistics on the Indonesian energy sector. We conducted a policy trajectory analysis to a set of national climate and energy documents to trace how the "why", "how", and "what" of climate–energy policies have evolved around the NDC and subsequent commitments (Figure 2; Table 2). We selected this approach to identify the red threads connecting those policies, and, in particular, to uncover how a climate–energy policy is produced and how the governmental agency interprets it (Gale 1999), before it enters a political sphere in which other policies have been passed and have been effective ever since. We performed this analysis to better understand the process and substance of policies before they are implemented and have an impact. We also developed a climate–energy governance model to further analyse the practices and effects of these policies (Suroso et al. 2023).

4. Indonesian climate–energy policies: a temporal perspective for context

The trajectory of climate–energy policies is based on the presidential terms of the Widodo administration (2014–2024), given that the first NDC commitment was made in his first term (2014–2019).

4.1. Widodo's first-term administration (2014–2019)

During Widodo's first term (2014–2019), Indonesia submitted its Intended NDC and its first NDC, ratified the Paris Agreement, and developed a set of sectoral and cross-sectoral instruments to operationalise its commitments. The Ministry of Energy and Mineral Resources led the preparation of the

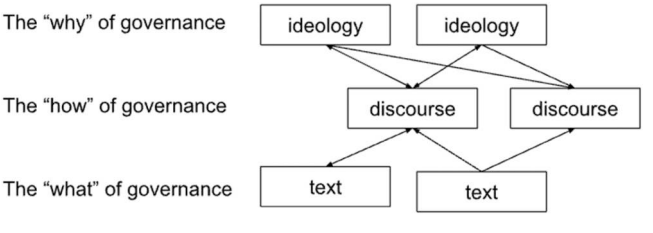

Figure 1. Conceptual framework of the policy trajectory in climate–energy governance (adapted from Al Faruq 2019).

Table 1. List of key informants.

Date	Respondent	Affiliation	Gender
2020	KI-01	Ministry of National Development Planning	Man
	KI-02	Ministry of Environment and Forestry	Woman
	KI-03	Ministry of Environment and Forestry	Man
	KI-04	Ministry of Environment and Forestry	Woman
	KI-05	Ministry of Energy and Mineral Resources	Man
	KI-06	Ministry of Energy and Mineral Resources	Man
	KI-07	Ministry of Finance	Man
	KI-08	Ministry of Finance	Man
	KI-09	Environmental Fund Management Agency (BPDLH)	Man
	KI-10	Hong Kong and Shanghai Banking Corporation (HSBC)	Man
	KI-11	Royal Norwegian Embassy in Indonesia	Man
	KI-12	Royal Norwegian Embassy in Indonesia	Woman
	KI-13	Civil society	Woman
	KI-14	Civil society	Man
	KI-15	Civil society	Man
	KI-16	Civil society	Woman
	KI-17	Civil society	Man
	KI-18	Civil society	Man
	KI-19	Civil society	Man
2021	KI-20	Civil society	Man
	KI-21	Presidential Chief of Staff Office	Man
	KI-22	Kemitraan (Partnership for Governance Reform)	Man
	KI-23	Ministry of Energy and Mineral Resources	Man
	KI-24	Ministry of National Development Planning	Man
	KI-25	Ministry of Foreign Affairs	Man
	KI-26	Global Green Growth Institute	Woman
	KI-27	Ministry of Finance	Man
	KI-28	National Electricity Company (PLN)	Woman
	KI-29	Geothermal power plant company	Man
2022	KI-30	Coordinating Ministry of Maritime Affairs and Investment	Man
	KI-31	Geothermal power plant company	Man
	KI-32	Coal company	Man
	KI-33	Coal company	Man
	KI-34	Indonesian Solar Energy Association (AESI)	Man
	KI-35	National Energy Council (DEN)	Man
	KI-36	National Research and Innovation Agency (BRIN)	Woman
	KI-37	Oil and gas company	Man

Table 2. Indonesian climate–energy policies analysed in this study.

Policies	Bill
First Biennial Update Report 2015	-
First Nationally Determined Contribution 2016	-
Second Biennial Update Report 2018	-
Medium-Term National Development Plan 2015–2019	Presidential Regulation 2/2015
Medium-Term National Development Plan 2020–2024	Presidential Regulation 18/2020
National Energy Policy 2014	Government Regulation 79/2014
National Energy General Plan 2017	Presidential Regulation 22/2017
National Electricity General Plan 2019–2038	Ministerial Decree of Energy and Mineral Resources 143/2019
Electricity Supply Business Plan 2019–2038	Ministerial Decree of Energy and Mineral Resources 39/2019
Second Nationally Determined Contribution 2025	-
Implementation of Carbon Economic Value	Presidential Regulation 98/2021
Acceleration of Renewable Energy Development for Electricity Supply	Presidential Regulation 112/2022
Acceleration of Battery Electric Vehicle for Road Transportation Program	Presidential Regulation 55/2019
New Renewable Energy	New Renewable Energy Bill (draft)
National Action Plan on Greenhouse Gases Emission Reduction	Presidential Regulation 61/2011

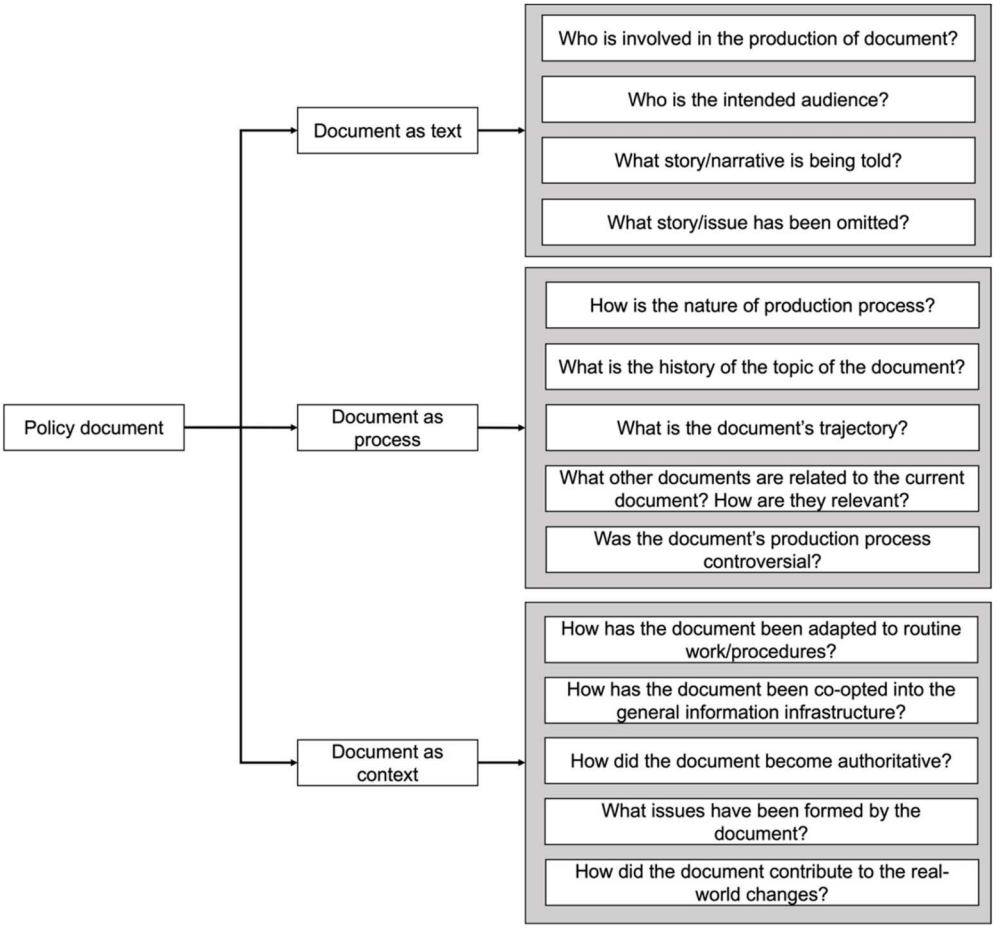

Figure 2. Indicators of policy trajectory analysis (adapted from Al Faruq 2019; Gale 1999; Power et al. 2004).

First and Second Biennial Update Reports of 2015 and 2018, respectively, and coordinated the development of measurement, reporting, and verification systems, including the National Registry System, to track mitigation actions and support needs across sectors (KI-02 and KI-04).

In parallel, the energy sector followed its own planning trajectory. The National Energy Policy 2014 and the National Energy General Plan 2017 established long-term directions on energy sovereignty, energy mix targets, and infrastructure (KI-14, andKI-35), while the National Electricity General Plan and the Electricity Supply Business Plan translated these into strategies for power sector investment and operation. However, the provincial-level implementation lagged, given the slow adoption of the Provincial Energy General Plan in only two provinces as of 2019 (Setiawan and Fitra 2019). In the power sector, the focus on coal-based generation persisted in the Electricity Supply Business Plan, even as the NDC commitments were formalised (KI-28).

In summary, the NDC pledge was submitted in 2016 under the first Widodo administration. The Ministry of Environment and Forestry leads the NDC operationalisation, which includes passing several bills that encompass mitigation efforts, including those in the energy sector.

4.2. Widodo's second-term administration (2019–2024)

In Widodo's second term (2019–2024), Indonesia updated its NDC and submitted its Long-Term Strategy for Low Carbon and Climate Resilience 2050, framing a pathway towards net zero emissions

by 2060 (KI-28, KI-34, and KI-35). The second NDC maintained the overall emission reduction targets but refined the adaptation components and linked mitigation to evolving domestic policy frameworks. In preparation for the G20 presidential forum in 2022, the government announced the draft of the National Energy Grand Strategy (KI-23), and the Net Zero Emission by 2060 target. These measures signalled an intention to align energy policy with low-carbon development. Conversely, the National Electricity Company's Electricity Supply Business Plan stated that coal power plants are expected to maintain dominance in the energy generation mix until 2030.

Overall, the second term reinforced the complexity of Indonesia's climate–energy policy web with more instruments and commitments added, but institutional fragmentation and path-dependent reliance on coal persisted, complicating efforts to steer the energy sector towards NDC-consistent trajectories.

5. Results: Indonesian energy policy trajectory after the international climate pledges

In this section, we discuss the results from the analysis of Indonesian energy policies as texts, processes, and contexts.

5.1. Indonesian energy policies as text

The key informants (KI-02 to KI06, KI-23, KI-25, and KI-28) revealed that the main actors in producing energy policies in Indonesia, particularly those related to the NDC, are the Ministry of Environment and Forestry, the Ministry of Energy and Mineral Resources, and the National Energy Council. The Ministry of Environment and Forestry led the writing of the NDC and of the First and Second Biennial Update Reports. The contributors to the Second Biennial Update Report exceeded those to the first report. These documents were intended for the United Nations Framework Convention on Climate Change (UNFCCC), international audiences, and the relevant ministries whose sectors have pledged to contribute to the NDC. The Ministry of Energy and Mineral Resources and the National Energy Board formulate the major policies in the energy sector, such as the National Energy Policy 2014, the National Energy General Plan 2017, and the National Electricity General Plan 2019–2038 (KI-14, KI-28, and KI-35). However, there needs to be a key regulation update in the Indonesian energy sector, as one key informant stated:

> Since there have been many dynamics in the energy sector, including the submission of the Third Nationally Determined Contribution, National Energy Policy (2014) is set to be updated soon; hopefully, it will be effective next year. We will also prepare a more detailed plan to achieve the target. (KI-35)

The Ministry of Energy and Mineral Resources has also issued Ministerial Regulations and Ministerial Decrees to regulate the energy sector. Further, in the electricity sector, the National Electricity General Plan 2019–2038 was developed for the National Electricity Company and other Power Plant Procurement Business Permit holders. Apart from these policies, the Medium-Term National Development Plan was prepared by the Ministry of National Development Planning under the direction of the President to synchronise the sectoral operationalisation of the President-elect's visions under relevant ministries and offices (KI-01 and KI-24). From the legislative body, the Commission IX of the House of Representatives is also involved in energy policymaking, specifically, in formulating the New Renewable Energy Bill draft currently (KI-16).

The evolving narratives in the NDC and the First and Second Biennial Update Reports can be considered progress in terms of the overall commitment and the methodological framework. The First Biennial Update Report provided details on the GHG inventory progress, but not on the land-use, land-use change, and forestry (LULUCF) sector. Subsequently, by submitting the NDC, the Government of Indonesia confirmed its commitment to plan and reduce emissions; the NDC highlights that the LULUCF sector is the highest contributor to carbon emissions. The significant progress

from both documents was reported in the Second Biennial Update Report, which reported that several proposed mitigation actions in critical sectors have progressed (Republic of Indonesia 2018).

In the trajectory consisting of the National Energy Policy 2014 and the National Energy General Plan 2017, the documents note the aim to bring about energy sovereignty and energy resiliency (KI-14 and KI-35). The central policies of the National Energy Policy 2014 include ensuring adequate energy supply to meet the national demand, prioritising energy development priorities (i.e. energy mix shares), using national energy resources, and developing national energy storage. As the National Energy General Plan 2017 is derived from the National Energy Policy 2014, the latter supports implementation of energy policies through the former and multisectoral policies to achieve the targets set in the National Energy Policy 2014 (KI-14 and KI-35).

Interestingly, the National Energy General Plan 2017 states that energy resources are an export commodity and a national development tool to achieve independent, sustainable energy resource management, aiming to meet the national demand, achieve energy efficiency, enhance economic development, control climate change effects, and preserve the environment (KI-14 and KI-35). The document also includes indicative energy development programs at the provincial level, implying that this Plan acts as the aggregator of the Provincial Energy General Plan, although it is not explicitly stated.

The following policy trajectory includes the policies in the power generation sector as a part of the energy sector. The National Electricity General Plan 2019 is derived from the National Energy General Plan 2017 and is the foundation for implementing electricity generation policies that will ensure adequate availability and good quality at a reasonable price. This document directs two domains: electricity supply and technology, and environmental protection. The Electricity Supply Business Plan 2019–2038 is the current effective business plan of the National Electricity Company that directs this company's electricity provision and distribution. The targets are specific to the power generation sector, yet, the document presents renewable energy share targets similar to those in National Energy General Plan 2017. Although each Electricity Supply Business Plan lasts for ten years, it can be updated annually, which reveals it is demand-oriented.

The Medium-Term National Development Plan 2020–2024 distinguishes itself from other policy trajectories, as it covers all the public sectors managed by the government and delegates the related activities to relevant ministries and offices. Substantially, this Plan should have covered the operationalisation of international commitments, such as the NDC (KI-01 and KI-24). However, the Intended NDC was submitted before this Plan was enacted. As the Indonesian NDC was updated in 2022, the gap years from the first version were used to calculate GHG emissions and the following consolidation. The Medium-Term National Development Plan 2020–2024 focuses on strengthening the pillars of sustainable development by emphasising low-carbon development and limiting Indonesia's dependency on fossil fuels and coal. Although it acknowledges the prospect of using renewable energy to increase electricity access, it also contradicts that by mentioning that the focus will be on increasing the use of coal, gas and electricity to meet the energy demand. Unlike the earlier energy policies, this vital document highlights the energy trilemma in Indonesia that demands international understanding for the continued use of coal and oil, apart from renewable energy, which is an emerging sector (Gunningham 2013; Setyowati 2020).

This broad picture of the Indonesian energy policy trajectory shows that the narratives are being collectively improved towards renewable energy use. These narratives also concern the effects of the climate crisis perpetuated by the business-as-usual scenario strongly associated with coal power plants. Thus, an energy transition narrative emerges in the Indonesian energy policy trajectory (see Gale 1999). Several initiatives towards energy transition in Indonesia manifest not only as key policies, including Presidential Regulation 98/2021, Presidential Regulation 112/2022, and Presidential Regulation 55/2019, but also as the newly launched Just Energy Transition Partnership.

Although overall, the narratives of these policies converge in specific directions and particularly favour renewable energy, several significant issues have been omitted during document production. We find that although the legal documents we analyse in this study are meant to be generic and

encompassing, sometimes there are differences between the policy text and its accompanying academic text, which can generate different interpretations (see Ball 1993; Gale 1999). The academic transcript of the New Renewable Energy Bill draft expresses intentions to address the climate crisis; however, these intentions lie outside the policy draft. Since this bill is still under deliberation, the newly enacted Presidential Regulation 112/2022 acts as the main legal document to ensure further development of the renewable energy sector. As some key informants stated:

> When the government [of Indonesia] sets a new target, the process of formulating the target is often not transparent. Many academic manuscripts (of the regulation) differ from the policy text. (KI-16)

> A bottom-up approach was not incorporated into the formulation of the NZE (Net Zero Emission) target by 2060 and thus is not science-based. (KI-14 and KI-35)

Another issue with the National Energy Policy 2014 is that it did not set a target for reducing GHG emissions, although Presidential Regulation 61/2011 on the National Action Plan on GHG emission reduction was issued in 2011. In the electricity sector, the absence of other Electricity Supply Business Plans from other Power Plant Procurement Business Permit holders signifies the central position of the National Electricity Company in managing the country's electricity transmission and distribution system (Handayani, Filatova, and Krozer 2019; Setyowati 2021). The stated intention to continue using coal until 2030 for generating electricity also implies the presence of a coal lobby backing the business-as-usual scenario. Considering the high cost of the energy transition (see Marquardt 2017), one could argue that this situation also suggests the lack of roles set in the regulations for the proponents of renewable energy development, whether in the private or public sector, particularly as regards funding mechanisms, research and development, or other possible roles. Further, the feed-in tariff mechanism for electricity from renewable sources has been removed from the broader energy policy framework without an immediate substitute, which will be explained further in the next section.

5.2. Positioning the legal documents as processes

The production and circulation processes of international climate commitments and national energy policies are differentiated into three types. The production of the First and Second Biennial Update Reports followed the previously pledged commitments to the UNFCCC in the First National Communication in 1999 and the Second National Communication in 2010 (Republic of Indonesia 2015). The NDC was also submitted to UNFCCC after the twenty-first session of the Conference of the Parties (COP21). However, the national energy policies were drafted and enacted under the direction of the superior predecessor Acts and policies. The Energy Act 2007 motivated the enactment of the National Energy Policy 2014 and the National Energy General Plan 2017, but this policy is also hierarchically higher than this plan. For the power sector, the Electricity Act 2009 drives the enactment of the National Electricity General Plans, whereby the National Electricity General Plan 2008–2027 was updated to match the current electricity sector, and thus led to the currently effective National Electricity General Plan 2019–2038. While the National Electricity General Plan 2019–2038 mandates the production of the Electricity Supply Business Plan, it is not explicitly mentioned in the Electricity Act 2009. At present, the National Electricity Company produces the only accessible Electricity Supply Business Plan – although 15 other companies are obliged to produce this plan, by scale, they only manage much smaller distribution areas (Widyaningsih 2019). Likewise, the Medium-Term National Development Plan 2020–2024 continued the previous Widodo administration's agenda in the Medium-Term National Development Plan 2015–2019. Both plans were drafted by the Ministry of National Development Planning, in consultation with the President and subnational governments.

The latest energy policymaking also includes the New Renewable Energy Bill draft, Presidential Regulation 98/2021, and Presidential Regulation 112/2022, all of which contribute to the start of

the renewable energy regime in Indonesia. However, the regulation type arguably also implies the complexity of the policymaking process. For example, an Act will be highly scrutinised during its drafting process since the House of Representatives, as the legislative body, will deliberate on it. In contrast, this process is arguably alleviated for a Government Regulation or a Presidential Regulation, given that the drafting for these is managed solely by the Executive Office of the President. Furthermore, ministries in Indonesia can also issue either Ministerial Regulations or Ministerial Decrees, which can be drafted and issued in-house.

The circulation process of Indonesian energy policies also uses international forums to signify the nation's position on the current climate crisis. As the Paris Agreement has binding power on its parties, operationalising this international pledge is obligatory and its provisions are included in all Indonesian energy policies. Around the time when the G20 Forum was held in late 2022, Indonesia also introduced its updated NDC, its Long-Term Strategy for Low Carbon and Climate Resilience 2050, and the Net Zero Emission by 2060 target, arguably solidifying the energy transition pathway.

Figure 3 illustrates the intertwining relationship between Indonesian climate-related and energy policies. The First and Second Biennial Update Reports detail the commitment progress biannually, including the National Greenhouse Gases Inventory and appropriate mitigation actions – the latter report reveals that there has been significant progress since the former. The NDC continues the commitment to the CM1 and CM2 scenarios. In another trajectory, the National Energy Policy 2014 does not comply with NDC. However, the National Energy General Plan 2017, as its derivative, explicitly mentions the consideration of the NDC, particularly the CM1 and CM2 scenarios, and recognises the roles of renewable energy development, energy conservation, and energy efficiency in meeting the national energy demand. The National Electricity General Plan 2019–2038 and the Electricity Supply Business Plan of the National Electricity Company both do not mention the NDC, but the former elaborates on how the electricity sector contributes to achieving the targets set by the National Energy General Plan 2017. The energy trilemma is implicitly reflected in the 2017 Plan. Although coal and crude oil shares are modelled to decrease up to 2050, the primary energy supply from those two is shown to consistently increase. From this scenario, the annual utilisation of both fossil fuels is capped at a certain number to comply with the NDC, as the National Energy General Plan 2017 projects that in 2025, coal production will be 119.8 Mtoe. Moreover, all documents state that the energy and electricity sectors comply with the requirement that the share of renewable energy will be 23 per cent in 2025, and this share will increase to 31.2 per cent by 2050. This finding shows the connection between all the documents investigated in this study, although

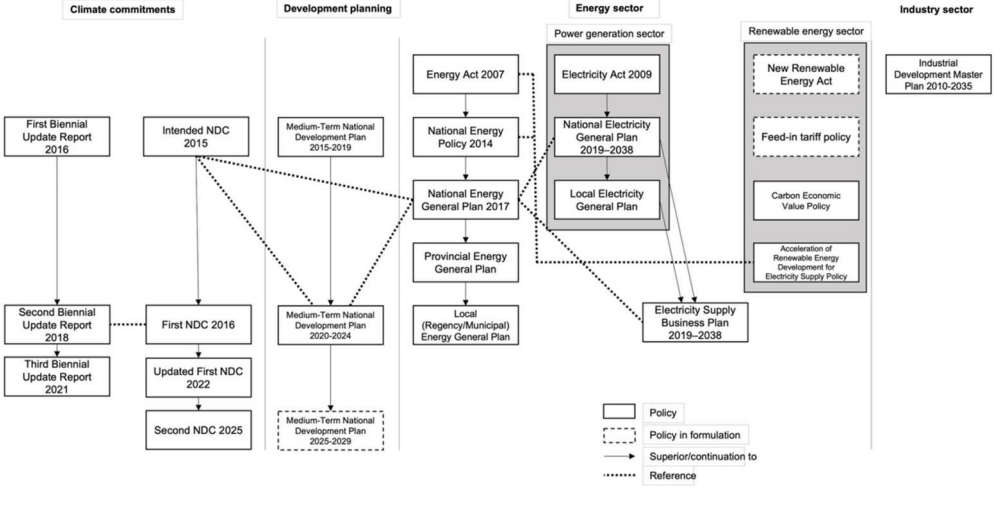

Figure 3. Trajectories of Indonesian climate–energy policies.

there are several differences in the layers of this relationship. Another prominent difference is that the National Energy General Plan 2017 and the National Electricity General Plan 2019–2038 are designated to be hierarchical, enabling subnational governments to produce their versions of those documents, namely, the Provincial Energy General Plan and the Provincial Electricity General Plan. While it is unclear whether the relationship should be a vertical aggregation or a contextual translation, it is also unclear to what extent the National Energy General Plan should be referred to in creating the Provincial Energy General Plan (Widyaningsih 2019). Further, only the Acceleration of Renewable Energy Development for Electricity Supply Policy is connected to the energy policy trajectory as it refers to both the Energy Act 2007 and the National Energy Policy 2014. However, although the National Industry Development Master Plan (RIPIN) 2010–2035 acts as the sectoral framework for industry development, it is not referenced in the Acceleration of Renewable Energy Development for Electricity Supply Policy. This situation opens the possibilities of future policy trajectories, including synchronisation between the renewable energy sector and the industry sector (see Figure 3).

Such differences might be considered controversial in producing a document. Another controversy is that there was a negotiation after the technocratic process for establishing the NDC, particularly the analysis and modelling regarding the target. This process was required because the target in the NDC was increased from that of the National Action Plan for Greenhouse Gases Emission Reduction set in 2011 and is thus ambitious. There is also a edebatable clause that although the CM2 scenario calls for up to 41 per cent reduction of GHG emissions, the modelling in the document indicates only 38 per cent reduction, which is considered insufficient to meet the commitment in the NDC (Tacconi 2018). Some key informants asserted:

> During the formulation (of National Energy Policy), the assumptions used are obsolete since the baseline year is around 2010, meaning that the calculation is the underestimation of current reality. (KI-14 and KI-35)

Thus, the assumptions in the NDC drafting are compromised since those in the National Energy Policy 2014 are considered obsolete. Meanwhile, the National Energy General Plan should have been passed in 2015, but owing to political factors, the draft was rewritten and enacted late in 2017. The political will to navigate the electricity sector is also dominated by the Ministry of Energy and Mineral Resources, as the enactment of the Electricity Supply Business Plan is in the ministry's domain. This Plan is criticised for the lack of transparency and public participation in developing it because of its status as the company's business plan.

In addition, the analysis of the regulations published by the Ministry of Energy and Mineral Resources shows that the energy policy trajectory still demonstrates solid support for fossil fuel development. For example, the pricing and feed-in tariff policies for renewables are frequently amended and do not offer an attractive price to renewable energy developers, as the trajectory of the feed-in tariff policy has not yet been established (see Figure 4). On the national level, the publication of the Carbon Economic Value Policy was timely, particularly emphasised by its declaration at the COP26 in 2021 after being in the drafting stage for years. This situation may reflect the political will of the Government of Indonesia to contribute significantly to mitigating the current climate crisis.

5.3. How the energy policies are operationalised

International climate commitments, such as NDC 2016, the First Biennial Update Report of 2015, and the Second Biennial Update Report of 2018, have become the basis of many climate-related development policies. The NDC submission should follow the first policy that emphasised the previous targets that were pledged in 2015. The last two documents are the National Greenhouse Gases Inventory and proposed mitigation measures in pertinent sectors. However, climate commitment became one of many sectoral policies in the Medium-Term National Development Plans for 2015–2019 and 2020–2024. The Medium-Term National Development Plan is then referred to as the guideline for drafting the Medium-Term Local Development Plan by the subnational governments. The

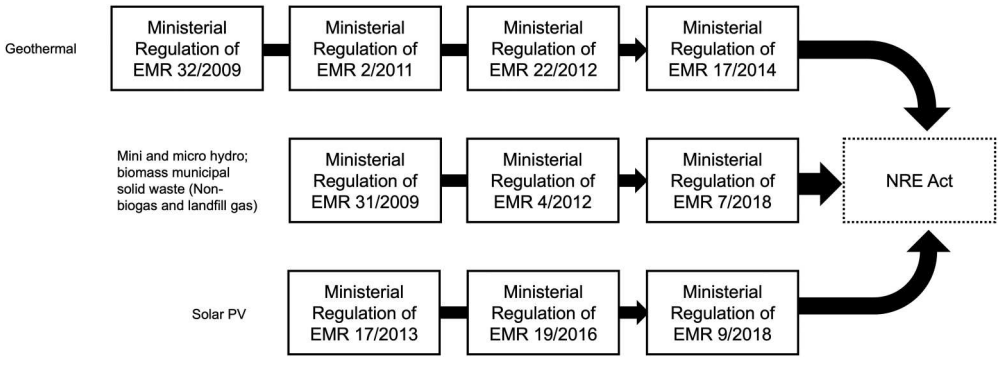

Figure 4. Feed-in tariff policy trajectory. Source: Suroso et al. (2022).

National Energy Policy 2014 is the trailblazer in that it sets the path towards subsequent policies in the energy sector, such as the National Energy General Plan of 2017, the National Electricity General Plan of 2019–2038, and the Electricity Supply Business Plan. Further, the National Energy General Plan and the National Electricity General Plan should both be hierarchically derived into the Local Energy General Plan and the Local Electricity General Plan, following the governmental system in Indonesia. The Electricity Supply Business Plan considers the National Energy General Plan, the National Electricity General Plan, and the local potential in a bottom-up approach. Nevertheless, the renewable energy sector still needs a strong commitment from the government to create a solid policy trajectory, as the Renewable Energy Bill has not yet been enacted, nor has a feed-in tariff policy been established. Thus, the operationalisation is still siloed through sectoral interests.

In the energy sector, these silos also colour the assimilation of policy documents into the general information infrastructure. Mainstreaming the National Energy General Plan to the provincial government is also problematic. The National Energy Council itself also acts as the Technical Supervisor of the Provincial Energy General Plan drafting process. The National Electricity General Plan is operationalised by the Provincial Electricity General Plan whereby Power Plant Procurement Business Permit holders refer to the National Electricity General Plan and the Local Electricity General Plan in drafting their Electricity Supply Business Plan. As one of the Power Plant Procurement Business Permit holders, the National Electricity Company must report on its Plan implementation to the Minister of Energy and Mineral Resources through the General Director of Electricity every four months. According to one key informant:

> It is not clear whether National Energy General Plan acts as the aggregator of Local Energy General Plan or it is translated from National Energy General Plan, although personally, I prefer the latter. As an institution, we also help the Ministry of Energy and Mineral Resources to mainstream Local Energy General Plan to the provincial government. (KI-15)

The silos regarding the Indonesian law hierarchy still persist (see Figure 3). NDC 2016, the First Biennial Update Report 2015, and the Second Biennial Update Report 2018 follow Law 16/2016 on the Paris Agreement's Ratification to the UNFCCC. The National Energy Policy 2014 is the second highest document in the hierarchy as it manifests as Government Regulation 79/2014. The Medium-Term National Development Plans of 2015–2019 and 2020–2024, and the National Energy General Plan 2017, are all on the same level as the documents are in the form of a Presidential Regulation. However, the electricity sector is under the authority of the Ministry of Energy and Mineral Resources. The National Electricity General Plan 2019–2038 has been stipulated through the Ministerial Decree of Energy and Mineral Resources 143/2019. The Electricity Supply Business Plan, as reserved for every Power Plant Procurement Business Permit holder, also manifests as a Ministerial Decree. However, one key informant interviewed in this study suggested that the National Energy Policy and the National Energy General Plan should be drafted as national bills rather than

governmental regulations. This power will arguably give the documents the legitimacy to transcend the energy sector's political sphere (see Ball 1993).

The climate commitments signify the Government of Indonesia's effort to reduce GHG emissions and shift towards a low-carbon economy. Yet, although NDC 2016 primarily emphasises the LULUCF sector, especially considering COP21's proximity to the 2015 haze crisis, the document downplays the palm oil industry's involvement in causing this crisis (Al Faruq 2019). Moreover, the First and Second Biennial Update Reports both focus on reducing GHG emissions and even shed light on the energy and transportation sectors. The documents also provide data on the financial, technological, and capacity needs of, and the support received by, the Government of Indonesia for its activities to mitigate climate change. The First Biennial Update Report also recognises the need to strengthen subnational governments to contribute to the National Greenhouse Gases Inventory and Measurement, Reporting and Verification system. Further, the Second Biennial Update Report also lists the policies of the energy sector and other sectors related to mitigation efforts that have been enacted. In addition to addressing climate change mitigation, all energy policies in this study still reflect the energy trilemma (see Gunningham 2013). Indeed, the National Energy Policy 2014 increased the renewable energy target set for 2050. Thus, the National Energy General Plan 2017 seeks to accelerate the construction of renewable energy power plants, increase biofuel availability, improve energy efficiency and conservation, and develop renewable energy-supporting industries. However, coal and crude oil remain dominant in the primary energy mix until 2025. The current investment in renewable energy by the power generation sector is limited, reaching only USD 1.36 billion or 68 per cent of the target (IESR 2021). In addition to the COVID-19 pandemic effects, the rapid changes of procurement policies for independent power producers comprise one factor, among others, that make the investment climate in Indonesia unattractive (Halimanjaya and Maulidia 2014; IESR 2019; Setyowati 2021; Shalati and Simanjuntak 2019; Suharsono et al. 2019). This policy trajectory is also based on the perspective that renewable energy should be developed in areas not covered by the National Electricity Company's electricity grid. This approach results in persistent energy injustice and inequalities in community-based renewable energy development in Indonesia, as noted in several studies (Fathoni, Setyowati, and Prest 2021; Setyowati 2021).

Our analysis shows that, according to the contribution of each policy, in general, the existing policies are aligned to the same trajectory set by the NDC, especially in reducing GHG emissions. However, the renewable energy policy trajectory needs to be strengthened. Although the National Energy Policy 2014 was enacted before the NDC, this document implicitly supports NDC targets by increasing renewable energy utilisation. The NDC, along with the First and Second Biennial Update Reports of 2015 and 2018, respectively, explicitly contributes to institutionalising emission reductions at the national level in a more detailed context. The Medium-Term National Development Plan supports the NDC commitments as a national development plan but mainly targets the energy sector. The National Electricity General Plan 2019–2038 illustrates the government focus on the power generation sector in climate change mitigation and adaptation, culminating in the Electricity Supply Business Plan as the business plan, particularly for the National Electricity Company, to manage power generation, transmission, and distribution. This policy trajectory analysis does not include other lower-level policies indirectly related to emission reduction efforts, such as the Geothermal Law, the New Mineral Resources Law, and more technical regulations. However, some interesting information on those laws might emerge in further, more detailed studies.

6. Conclusion

In this study, we examine the influence and impact of Indonesia's NDCs on its climate–energy policies, with a specific focus on its energy sector. This study adopts a unique approach by analysing Indonesia's climate–energy policies through the lenses of policy texts, processes, and contexts, thereby viewing them as regulation, discourse, and ideology (see Ball 1993; Gale 1999; Lockwood

et al. 2017). Al Faruq (2019) used this approach to analyse Indonesia's forest policies – which illustrates the complexities within Indonesian climate policy trajectories.

This study further exemplifies the uniqueness of Indonesia in terms of climate–energy policies. Analysing the energy policy as a text shows that, despite the international commitment to reduce GHG emissions, Indonesia's energy policy documents are still heavily influenced by discourses centred on meeting its energy demand. This situation is worrying, considering that the energy sector will be the highest contributor to GHG emissions in 2030 (Republic of Indonesia 2016). Despite the availability of many options for energy transition to other renewable sources in Indonesia, as stated in the National Energy Policy 2014, the continued reliance on coal is reflected in the NDC and other policy documents extending to 2050. These energy policies appear fragmented and shortsighted, as the Electricity Act does not explicitly address the provision of an Electricity Supply Business Plan by electricity companies, despite being part of the same sectoral policy trajectory (Widyaningsih 2019). This analysis of the energy policy processes reveals that the energy trilemma in Indonesia is a political arena in which politically exposed persons, from among renewable energy proponents as well as opponents, have varying interests within the sector and development agenda and thus ensure fragmented policymaking (Gunningham 2013; Suroso et al. 2022; also see Holz et al. 2023; Jernnäs 2024; Mukhia, Shen, and Xiaolong 2024). To reconcile the contest between fossil fuels and renewable energy, a stronger commitment from the highest levels of governance is needed to ensure long-term effects (see Röser et al. 2020; Setyowati and Quist 2022). On analysing these policy documents as contexts, it becomes evident that each document's binding power varies, indicating a weak commitment to achieving the NDC and a just energy transition program. Although significant energy and power generation policies are complementary and align with broader climate commitments, such as the NDC and the Biennial Update Reports, differences in the temporal frameworks of these documents could hinder collective progress (see Heggelund 2021; Jänicke 2017). Strategic planning documents, such as the Medium-Term National Development Plan, reflect the government's political will to address various issues, including those in the energy sector. However, this political will is challenged by the complexities of addressing both the energy trilemma and energy injustice in Indonesia, particularly concerning the development of the renewable energy sector and relevant policies (Jernnäs 2024).

In conclusion, while the NDC targets are being gradually integrated into various policies, some key policies still do not explicitly reference them, confirming the difficulty in synchronising them with subnational policies (Holz et al. 2023; Waisman et al. 2019). Instead, there is a more frequent mention of GHG reduction, indicating that the NDC has not fully reoriented Indonesia's climate and energy policies. Policymakers need to explicitly reference the NDC targets in future climate-related policies to ensure that these commitments are met (see Jernnäs 2024). These findings reveal the complexities surrounding energy policies related to climate targets in Indonesia. One finding of this study is that overlapping policies are produced by each ministry and agency. Hence, to achieve the NDC and other climate–energy targets, Indonesia needs to integrate and align all climate and energy-related policies as a unified strategy for government action.

Nevertheless, this study has several limitations, which future studies can address. For instance, future studies should examine hierarchically structured regulations, such as the National Energy General Plan – Local Energy General Plans and National Electricity General Plan – Local Electricity General Plans to deepen current understanding of Indonesia's decentralised governance and energy policy network (see Jörgensen, Jogesh, and Mishra 2015). Further, this study does not explore the effects of Indonesia's energy policy trajectory on private and public stakeholders, and hence, further analysis can be conducted to determine whether there is a collective yet substantial effort to decrease GHG emissions. As this limitation also relates to whether these policies have triggered investments for climate mitigation and climate adaptation – ascertaining which is beyond the scope of this study – this research avenue should also be explored. Doing so would enable a comprehensive tracing of the policy trajectory and of the exercise of governmental power in shaping the energy landscape.

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Author contributions

CRediT: **Niken Prilandita:** Conceptualization, Data curation, Supervision, Validation, Writing – original draft, Writing – review & editing; **Dhimas Bayu Anindito:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing; **Aliyah Alfianda Dwicahyani Chandra Bhuana:** Visualization, Writing – review & editing; **Zahara Sitta Iskandar:** Formal analysis, Methodology, Visualization; **Djoko Santoso Abi Suroso:** Funding acquisition, Supervision; **Pradono Pradono:** Supervision, Validation.

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