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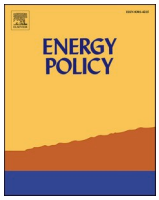

Contested transition? Exploring the politics and process of regional energy planning in Indonesia

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ABSTRACT

Transitioning to low carbon energy involves policies, institutions, and actors across different scales of governance. Indonesia's aspiration for a transition to low carbon energy is occurring in the dynamics of the re-scaling of environmental governance through decentralization processes. This article examines the interplays of actors at the national and provincial levels in negotiating energy futures as the energy planning processes unfold on the ground and identifies context specific factors that shape the outcomes. Further, it investigates how the regulatory framework and institutional arrangements for energy transition planning could not only generate obstacles for renewable energy transition but also open opportunities for actions. It is based on interviews with stakeholders at national and subnational levels, combined with the analysis of policy documents, studies, and relevant reports. The findings reveal emerging spaces for local actions amid constraining regulatory and institutional fields through the process of regional energy plan development. However, the ability of sub-national actors to seize these spaces is influenced by several factors, most notably political leadership, civil society engagement, political economic structure and power relations. These in-depth insights from Indonesia have wider implications for understanding the multi-scalar dynamics of energy transitions and provide useful policy recommendations for engaging subnational actors in the transition process.

1. Introduction

The world faces a climate emergency necessitating a rapid shift towards low carbon development (IPCC, 2021). Given the scale and speed required for this process, the International Energy Agency (IEA, 2021) has declared that there can be no fossil fuel energy projects if global temperature rise is to be kept below 2 °C. The need for a transition to low carbon energy is particularly pressing in Asia, which has the world's highest projected carbon emissions and where most of the world's proposed coal-fired power plants are planned to be built (Carbon brief, 2021).

Decisions regarding how to plan and pursue transitions to low carbon energy are politically embedded in multiple policy areas and a wide range of actors across different scales and spaces recent studies highlight local and regional transitions and their roles in supporting energy transition processes (Bulkeley and Castán-Broto, 2013; Wretling et al., 2018; Kuzemko, 2019; Hoppe and Miedema, 2020). However, the literature remains largely focused on the transition processes in Global North settings. Moreover, transition study has been criticized for its limited attention to the roles of politics, power, and interplays of actors at different scales as transition processes unfold (Meadowcroft, 2009; Pinker et al., 2020; Bridge and Gailing, 2020). Studies show that the pursuit of energy transitions involves the engagement of subnational governments in some countries (De Boer and Zuidema, 2016; Wretling et al., 2018), and that the level of acceptance and the attainment of energy transitions rely significantly on the participation quality of local citizens and other local stakeholders (Magnani and Osti, 2016; Smith, 2012; Seyfang et al.,). Nonetheless, limited analysis has been carried out to understand the interactions of actors across scales in planning energy transitions and the conditions that shape transition pathways, particularly in the Global South setting. To address this gap, this article investigates the interplays of actors on national and subnational levels in planning energy transitions in Indonesia, the biggest economy in Southeast Asia. This study examines how these actors negotiate the energy future as the energy planning processes unfold on the ground and explores how these negotiations in turn shape the transition trajectories. This article also identifies factors that contribute to the process and results of energy planning process and explores the ways in which

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regulatory frameworks and institutional arrangements for energy transition planning might not only generate obstacles for a renewable energy transition but also open up possibilities for actions.

Although Indonesia has been a climate change mitigation laggard, it has set a relatively ambitious commitment under the Paris Agreement for an unconditional greenhouse gas (GHG) emission reduction of 29% against the 'business-as-usual' scenario (BAU) baseline by 2030, and a commitment to increase this reduction to 41% if given international support (GoI, 2016; GoI, 2021). In the energy sector, the country commits to increase the percentage of renewable energy in total energy mix to at least 23% by 2025 and 31% by 2050 (Government Regulation 79/2014). Further, the state-owned electricity company, Perusahaan Listrik Negara (PLN), recently pledged to be carbon neutral by 2060 (Jong, 2021). Indonesia's aspiration for a transition to low carbon energy is occurring in the context of a deep decentralization process where the transfer of authority among different levels of government continuously changes. Thus, investigating the multi-scalar processes of planning energy transitions is crucial to generate a more nuanced understanding of regional energy transition challenges and to explore spaces for actions.

We argue that multi-scalar analysis of energy transition is key in understanding how different energy priorities and transition trajectories are negotiated across scales and in identifying factors that shape the transition outcomes. Instead of reifying different scales of governance and presenting them as determined and fixed, we recognize the fluidity of scale of governance and position it as a site of struggle (Bridge et al., 2013; Bridge and Gailing, 2020). Further, we highlight the importance of examining multi-scalar interaction and agency of actors in shaping energy transition pathways though regional energy planning. Such inquiry can uncover more situated perspectives at the subnational levels where 'new spaces of agency' emerge (Bolton and Foxon, 2013, 2195). It could also illuminate how local context and needs interface with national and global concerns and mandates, particularly related to climate change. Our study finds emerging spaces for local actions amid constraining regulatory and institutional fields through the process of regional energy plan development. Indeed, the planning process has become an arena in which Indonesia's energy futures are negotiated and contested.

This article is organized as follows. Section two describes the article's theoretical context for the article by situating it within the recent works on geographical political economy and decentralized governance in energy transition, followed by a brief description of the methodology. Section four lays out the broader context of energy planning and policy in Indonesia, and section five describes the findings followed by a discussion of the implications for the process and outcome of energy planning. The last section provides some conclusions and policy insights for engaging subnational governments and broader actors in energy transitions.

2. The geographies of energy transitions and re-scaling energy governance

The analysis of this paper is broadly informed by two bodies of literature: the geographies of energy transition and re-scaling energy governance. Previous studies have suggested the limits to socio-technical analysis informed by transition theory, particularly multi-level perspective (MLP) frameworks, as they tend to overlook the power relations and broader political economic situations that shape the process and outcomes of energy transition (Meadowcroft, 2009; Bridge et al., 2013; Seculova et al., 2017). In recent years, there has been a growing body of literature on 'geographic turn' of energy transition studies (Bridge et al., 2013; Bridge and Gailing, 2020). Departing from a focus on technological innovations in the change of socio-technological systems (e.g., Geels, 2004; Geels and Schot, 2007), scholars in this tradition conceptualize energy transitions as a geographical process that involves the reconfiguration of current patterns and scales of economic and social activity (Bridge et al., 2013; Calvert, 2016). Studying energy transitions from this perspective focuses on the ways in which drivers and outcomes of energy transitions are shaped by existing social relations and institutions that play out across space and scale (Bridge et al., 2013, 2018; Castán-Broto and Baker, 2018). This approach also emphasizes the importance of examining the transitions in the places they occur, highlighting spatial relations and interconnectedness of actors and changes at different scales (Kennedy, 2018; Power et al., 2016; Gailing et al., 2019). Others highlight the importance of tracing how the transitions emerge and are influenced by everyday practices of situated institutions and actors (Rutheford and Coutard, 2014; Pinker et al., 2020).

Moreover, scholars highlight the need to pay attention to the processes of re-scaling in energy governance as this can shed light on "who is affected, who has the capacity for action and where the boundaries of responsibility lie" (Bridge et al., 2013, p. 338). Here, the notion of the scale at which energy systems are organized and governed is understood not as pre-given but as fluid and as a product of economic and political decisions (Bridge and Gailing, 2020; Bridge et al., 2013). Re-scaling environmental governance can facilitate the shifts in power over particular resources to different governance levels, allowing some actors to benefit while others are marginalized (Cohen and Bakker, 2014). Globally, the energy sector is usually scaled as a national issue to avoid the risk of domestic political impacts of a failure in supply (Bridge et al., 2013). This, in turn, brings several consequences such as systematically marginalizing the decentralized part of an energy system (e.g., distributed supply, end-use technology) in policy making and sidelining the local stakeholders, most notably local governments, from energy governance (Bridge et al., 2013). Further, scales are sites of struggle where broader questions of political economy are being worked out (Bridge and Gailing, 2020). For instance, Cumbers (2013) shows the influential role of decentralized and local forms of collective ownership of wind turbines and electricity distribution networks in shaping Denmark's decarbonization pathways. More recently, there is a growing recognition that decarbonization of energy system would involve increasingly decentralized approaches to energy production and consumption. This leads to more studies that investigate the roles of civil society in energy governance such as through community energy and prosumers, individuals or groups of consumers who both consume and produce electricity (e.g., Brown et al., 2020; Fathoni et al., 2021a; Magnani and Osti, 2016; Parag and Sovacool, 2016); highlight the importance of local government in energy decisions (De Boer and Zuidema, 2016; Hoppe and Miedema, 2020; Wu et al., 2018); and examine the evolution from a centralized to decentralized approach in the governance of energy systems (Baker et al., 2021).

Against this backdrop, this study seeks to enrich these literatures by adding an empirical contribution with the case study of Indonesia. There are some studies analyzing policies for transitioning to low carbon energy in Indonesia (e.g., Gunningham, 2013; Dutu, 2016; Kennedy, 2018; Maulidia et al., 2019; Setyowati, 2021). However, to our knowledge, no in-depth analysis exists that investigates the energy planning process and how it materializes on the ground. Examining the politics and process of energy planning is crucial as it is an instrumental process through which public policy directs energy transitions. Informed by the geographic turn and attention to re-scaling in energy governance, we argue that attending to multi-scalar interactions of actors at different scales of governance and to the dynamics of power relations can generate a more nuanced understanding of political and social struggles in negotiating the transition pathways and the context specific conditions that influence the processes as well as the resulting distributional outcomes. Our analysis also aims to challenge techno-managerial and apolitical approaches to understand energy planning processes.

3. Methods

This article is informed by empirical data collected from December

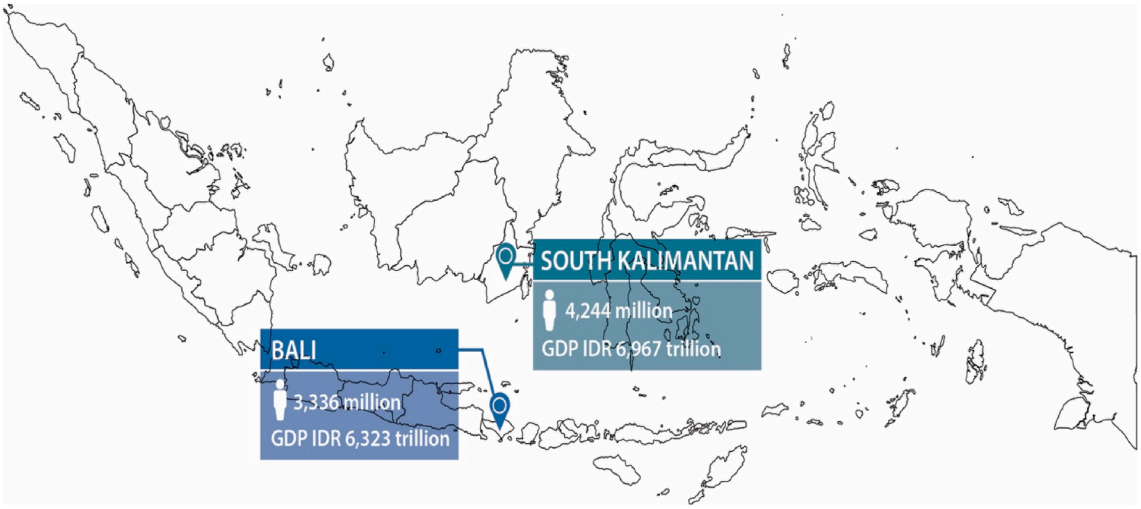

Fig. 1. Map of case studies[1] in Indonesia.

2020 through April 2021. Qualitative methods were chosen in response to calls for a 'human centric' approach in energy studies to better understand the dynamics of interactions and power relations among actors (Sovacool, 2018; Ryder,). We employed three methods: semi-structured interviews, document analysis, and case studies (see Appendix A for method diagram). The first author carried out online semi-structured interviews with actors involved in energy planning and policies at national and subnational levels in Indonesia using purposive sampling. Initial interviewees were identified using publicly available information concerning energy policy and planning stakeholders together with a network from a previous research project. Interviewees were then asked to identify other key stakeholders through a process of snowball sampling. A total of 27 interviewees participated in the interviews and included six national/subnational policy makers, two state owned enterprises, four renewable energy developers/private sectors, three international organizations, six civil society organizations and six research institutions (see Appendix B). Interview questions consisted of relevant thematic issues related to the interviewees' experiences and engagement in renewable energy planning and implementation. The interviews generally lasted around an hour.

Document analysis was also central in the analysis of this study. The first author reviewed policies and regulations (e.g., see Appendix C), as well as reports, media, and other articles on energy planning and energy transitions in Indonesia, with particular attention to the cases of Bali and South Kalimantan Province. Documents were mainly accessed through web searches, though some were shared or suggested by interviewees. The collected data sets were analysed using qualitative methods of content analysis and discourse analysis (Hajer and Versteg, 2006). The interview and document data was coded and analysed to identify emerging themes and key ideas particularly related to the process and politics of energy planning and to explore their connections, (in)consistencies, and contradictions (Tavory and Timmerman, 2014). Credibility, trustworthiness, and reliability of the data collected were ensured through triangulation, which included using secondary and primary data and relying on multiple interviewees to address similar questions.

Finally, two cases, Bali and South Kalimantan provinces, were selected to represent different political economic contexts that might shape the processes and results of energy planning (Fig. 1). Following the inductive and iterative analysis, the case studies are exploratory (Yin, 2014). In Bali, a globally known tourist destination, the local economy heavily relies on the tourism industry, agriculture, and fisheries, whereas in South Kalimantan, the local economy mostly depends on extractive industries (e.g., coal and other mineral resources) and oil palm plantations. South Kalimantan is the second largest coal producer in Indonesia with a total annual production around 172 million tons in 2017 (Government of South Kalimantan, 2020). In both provinces, the current energy mixes are still dominated by fossil fuels, particularly from coal. Considering Indonesia's target for transitioning to low carbon energy, both provinces need to explore pathways to achieve clean energy futures through the development of a Regional Energy Plan (RUED). While the RUED in South Kalimantan and Bali covers energy demands, electricity supply, transportation and industry, the scope of our discussion is limited to the electricity sector given most interviewees focused their insights on that sector. Further, we acknowledge that the regional energy planning is linked to broader regional development planning; however, our analysis focuses on the RUED development due to data and space limitations.

4. Broader context of planning for energy transition in Indonesia

In order to examine the multi-scalar dynamics of energy transitions, we need to understand the policies and institutional arrangements for energy planning and implementation in Indonesia (see Fig. 2). As is the case with many development processes in Indonesia, the materialization of the country's energy targets on the ground is largely in the hands of government agencies at national and subnational levels. State institutions play an important role in paving the way for renewable energy development by facilitating various processes such as issuing business permits and other relevant licenses and facilitating land acquisition.

Arguably, the most notable policy at the national level is the National Energy Policy (NEP) that stipulates a measurable target for increasing the share of new and renewable energy in the national energy mix to at least 23% by 2025 and 31% by 2050 (GoI, 2014). This is followed in 2017 by a detailed National Energy Plan (RUEN) aiming to detail the target to significantly increase the growth of renewable energy in the national energy mix and reduce fossil fuel consumptions. Although Indonesia has abundant renewable energy resources (Langer et al., 2021), coal will remain dominant up to 2025 with the projected share of 30% of total energy, although this will be slightly reduced to 25% in 2050 (MEMR, 2017). To ensure the achievement of energy transition targets at the subnational levels, the government has also mandated the provincial governments to develop and implement regional energy plans (RUED). As stipulated in its regulation, [2] the development of RUED in

[1] Data is based on BPS (2020).

[2] Presidential Regulation 1/2014 on Guidance for RUEN Development. It includes provisions on the participatory development of RUED.

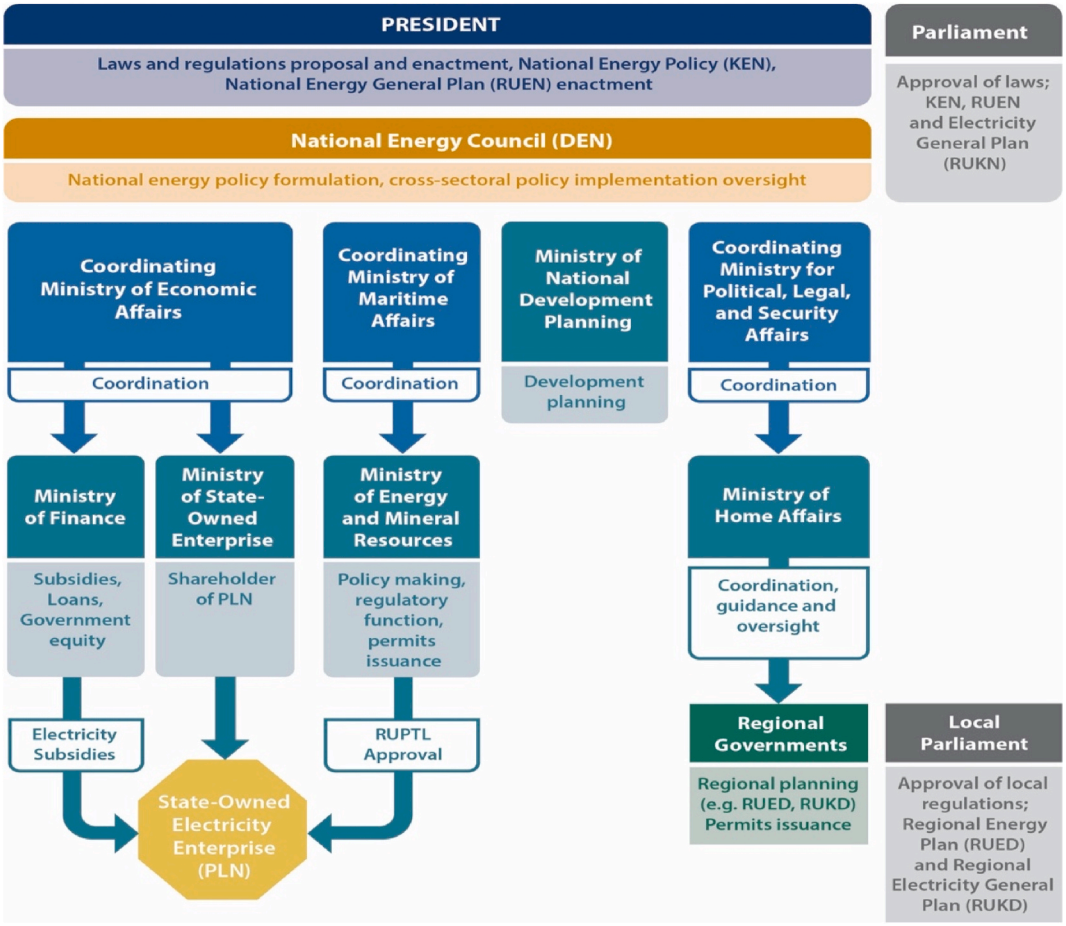

Fig. 2. Multi-scalar institutional arrangements related to energy planning in Indonesia[3].

the provincial level should be carried out through multistakeholder processes, involving stakeholders (e.g. government agencies, district governments, civil society groups, and universities). Thus, they could negotiate and shape their province energy futures. The agreed plan would then need to be formalized as a provincial regulation.

Indonesia's energy transition is occurring within the dynamic process of re-scaling of environmental governance through a decentralization process involving policies, institutions, and actors at multiple scales. After decades of centralized environmental governance, particularly during Suharto's administration (1965–1998), Indonesia underwent deep structural change with the enactment of decentralization policies that delegate some decision-making authorities to the provincial and district levels (McCarthy, 2004; Gellert, 2008). In the energy sector, decentralization has included transferring authority to district governments to issue permits for small-scale mining (below 15,000 ha) and concessions and licenses related to renewable energy projects (Setyowati, 2020). In the Electricity Law 30/2009, the provincial governments' authorities include issuing concessions and licenses for electricity generation between districts and municipalities within the province and setting the electricity price of Independent Power Producers (IPPs) whose licences are issued by the provincial government with the approval of the local parliament.[4] The enactment of decentralization policies led to rampant corruption and environmental degradation (Schütte and Syarif, 2020), and the law was revised in 2014 (Law 23/2014), transferring back significant authority for energy governance from the district to the provincial and national levels. With the issuance of Job Creation Law No. 11 of 2020 that shifts most of the authority for energy governance back to the national government agencies, the laws on regional autonomy law and energy will likely be revised.

The country's energy transition takes place amid incomplete electrification and partial liberalization, in which the state-owned electricity company, Perusahaan Listrik Negara (PLN) plays a dominant role. Despite numerous efforts to restructure the electricity sector, it remains centralized and controlled by PLN. PLN monopoly is touted to be the manifestation of a principle in Indonesia's Constitution, found particularly in Article 33, namely that all vital utilities must be controlled by the state. During the first wave of decentralization in the late 1990s, the government attempted to liberalize the electricity sector through stipulating the Electricity Law No 2 of 2002 that allowed significant involvement of private sectors. Due to strong resistance from various actors, however, the Supreme Court annulled the law for violating the Constitution (Maulidia et al., 2019). The current Electricity Law 30/2009 maintains PLN's dominant position in electricity generation, transmission, and distribution. PLN and its subsidiaries still retain control of most of the electricity generation in the country (some 77%), with the rest coming from private power utilities (PPUs) and IPPs (IRENA, 2017). The recalcitrance of PLN's dominant position and its hesitance to wean away from coal often creates policy blockages at the national level for decarbonizing the energy system.

In terms of an electricity plan, a national electricity plan (RUKN) provides overall guidance for electricity generation, transmission, and distribution. Yet, the monopoly of the state-owned electricity company and centralized planning for electricity generation are at odds with the intended energy planning process. The energy planning process requires

[3] Modified and updated from Maulidia et al. (2019) and Schmidt et al. (2013). See Appendix D for further description of institutions' roles.

[4] No governor has utilized the authority to set up energy price that is higher than the price set up by PLN due to perception of high political risks.

broader stakeholder engagement at national and provincial levels, opening space for subnational actors to co-shape the transition trajectories. PLN is meant to translate the RUKN into PLN's annual electricity generation plan (RUPTL),[5] including electricity demand projection and a power generation plan that needs to be approved by the government. On paper, this RUPTL must be aligned with both the national and subnational energy plans. In actuality, however, this alignment might not be the case; hence, the power generation plan often becomes a point of contention and negotiation in the subnational energy planning processes, as elaborated in the next section.

5. Research findings

5.1. Regional energy planning in Bali Province

Bali's energy sources for electricity, industry, and transportation are still dominated by fossil fuels (95.6% with coal accounting for 19.6%), and natural gas (4.3%). The rest (0.4%) comes from the renewables, especially solar, wind, and microhydro. As in other areas in Indonesia, the ongoing struggle for Bali is balancing the objectives of energy security, energy access, and the transition to renewables. The development of RUED was an avenue where local stakeholders could discuss the strategies to balance these objectives and negotiate their region's energy future.

In Bali, the RUED development was carried out in a participatory manner engaging local stakeholders through extensive public consultation meetings in 2018 and 2019. The stakeholders engaged in the process included government agencies, PLN, private sectors, universities, and NGOs. The governor of Bali's strong political leadership was a crucial driving force for a more participatory approach to planning. One interviewee suggested that before the governor took office in 2018, the initial plan was to follow the national energy plan recommendation for Bali with a lower target for renewable energy transition (Government officer #3, January 7, 2021). However, the initial draft was changed to align with the governor's ambitious vision of a clean energy future to pursue 100% renewable energy by 2050.

Scholars posit the importance of civil society role to promote the agenda for a just and equitable transition (Smith, 2012; Van der Schoor and Scholtens, 2015). In Bali, flourishing civil society organizations and thriving citizen-led renewable energy initiatives have forged a more conducive environment for developing pathways towards a cleaner energy future. These civil society organizations have actively advocated for decarbonizing Bali's energy system and participated actively during the negotiation processes in the RUED development.

During the consultation meetings, a key point of contention was the mismatch between the Government of Bali's ambition supported by local stakeholders, to phase out coal by 2050 and the PLN's electricity plan for Bali that projects an expansion of electricity transmission from Java's coal power plants from 400 MW to 1400 MW by 2050 (PLN, 2020). Currently, one third of Bali's electricity sources comes from coal power plants on Java Island (Fig. 3). For the provincial government representatives, sourcing electricity from Bali itself was necessary to achieve provincial energy independence because relying on the Java grid can put the island into a volatile condition due to regular blackouts. Further, the transmission cable is located in the earthquake-prone Ring of Fire. However, PLN representatives contended that increasing transmission from Java to Bali was not only an economically efficient solution to fulfil Bali's rising energy demand but also a quick fix to address power oversupply in Java.[6] During the meetings, national policy makers and PLN emphasized that Bali needed to conform to national energy regulations, plans, and power generation contracts (government officer #3, January 7, 2021; researcher #4, 06/01). For example, when the provincial government proposed to switch the coal power plant in North Bali into gas by 2025, PLN opposed it as the IPP contract would last until 2040. Indeed, cancelling committed power generation contracts with IPPs could impose contractual penalties that PLN sought to avoid (state owned enterprise #2, January 26, 2021).

In the end, the provincial government along with local stakeholders and PLN reached compromises that resulted in the RUED document with significantly limited ambition for moving away from fossil fuel energy sources. The RUED document establishes the province's target of 11.15% of renewable energy by 2025 and 20.10% by 2050 utilizing various renewable energy sources such as solar, bioenergy, and hydropower (Government of Bali, 2020). Nonetheless, the provincial government and local actors managed to negotiate replacing coal with natural gas, which they considered a better option than coal. Natural gas will therefore account for 34.85% by 2050 (Fig. 3). Further, they also retained the vision of Bali's energy independence, security, and sustainability in the RUED document by optimally utilizing local renewable sources.

Despite the province's modest ambitions to pursue a cleaner energy future, most interviewees in Bali demonstrated a substantial level of awareness of the planning process and policy outcomes. Interviewees suggested that the planning process had created a space for public debates on Bali's energy future and had increased stakeholders' awareness of the need for and opportunities to rapidly transition to low carbon energy (government officer #3, January 07, 2021; NGO #3 December 04, 2021; Researcher #4, January 06, 2021).

The Bali government has also implemented regulations to facilitate energy transitions, such as the Governor Regulation on Bali Clean Energy (Pergub 45/2019) and Electricity Vehicle (Pergub 48/2019), which include provisions to incentivize people to adopt renewable technologies. Among the technology options, the local government representatives and civil society activists considered solar PV as a 'quick win' for Bali's energy transition because it could easily be rolled out at the household level. Indeed, existing regulations are relatively more conducive for solar PV than other technologies (government officer #3, January 07, 2021; NGO #4; Fathoni et al., 2021b). In 2019, the national government introduced regulations on a Rooftop Photovoltaic Solar System and feed-in tariffs for exporting power into the PLN's grid.[7] This policy covers a scheme by which the residential, governmental, commercial, and industrial customers could offset their electricity from the national grid with solar PV (Setyawati, 2020). Another provincial regulation has also been stipulated that mandates the use of solar PV in government and commercial buildings (with more than 500 m^2 area) and provides land and building tax reductions and financial incentives for solar PV adoption. Such regulations may stimulate the emergence of prosumers that could transform the traditional electricity sector by opening localized energy markets and encouraging the policy makers to look beyond the centralized solutions (Parag and Sovacool, 2016; Kubli et al., 2018).

To navigate through regulatory and institutional constraints, the local governments have established novel forms of cooperation for renewable energy projects. As the district governments no longer have fiscal discretionary authority for renewable infrastructure establishment and maintenance, some districts have established locally owned enterprises (LOE/BUMD) through which they can legally set aside budget and directly collaborate with domestic private sectors for renewable energy initiatives. On the village level, since 2015, the village governments have received fiscal transfers from the national government ranging

[5] While the provincial governments are required to develop provincial electricity plan (RUKD), to date only one province has developed it.

[6] Java-Madura grid currently suffers oversupply by 30–40 percent due to recent establishment of large coal power plants. Source: https://ekbis.sindonews.com/read/184168/34/pln-oversupply-pembangkit-listrik-pengamat-beberkan-penyebabnya-1601651404.

[7] MEMR Regulation 12/2019 and MEMR 13/2019 on RPVSS. For an installation below 500 kVa, no permit is required. However, for an installation above 500 kVa, a permit is required from the provincial and/or central government.

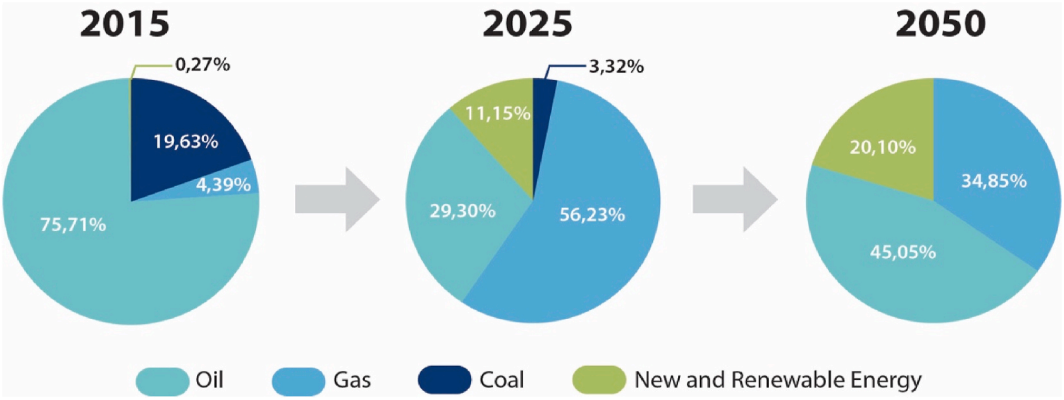

Fig. 3. Energy transition projection in the provincial energy plan in Bali.

around USD 42,000–70,000 per village to support community driven developments (Watts et al., 2019). Some village governments in Bali have utilized the funds for establishing renewable power initiatives (e.g., Wangsa and Tayana, 2019). However, long term effectiveness of these initiatives remains to be seen. The subnational government representatives have also strategically invoked different policies and regulations when negotiating with provincial authorities in constructing renewable energy futures. This process is akin to the notion of 'forum shopping' where certain actors have the capacity "… to select the arena of law, custom and convention that will favour to their objectives" (Ribot and Peluso, 2003, p.157). For instance, government interviewees referred to a Ministry of Home Affairs regulation to legitimize the local government's discretion to allocate a budget for maintaining renewable energy infrastructure, even though the regional autonomy law provides limited space for such allocations.[8]

The results also reveal the multiple positionalities[9] of different actors involved in the RUED development. For instance, the local officers of PLN sometimes act as intermediaries to facilitate negotiations between the provincial government and PLN. A representative of a state-owned enterprise suggested that the local officers often needed to navigate the tensions between the provincial government and the state-owned company by playing a dual role as a company representative and a resident of Bali:

> PLN still believes that Bali's electricity needs to be supplied from Java, and we plan to establish more transmission infrastructure from Java to Bali to fulfil the province's energy demand projection. But as a Balinese … I think if Bali highly depends on Java to supply its electricity, it might be rather risky if there is a transmission problem between Java and Bali. It was great that the governor of Bali has been very keen to ensure Bali's energy security and independence. I tried to convey this message to PLN in Jakarta that Bali could help us in achieving the renewable energy target (interview #1, January 18, 2021).

The local officers of the state-owned electricity company often have a better understanding of local needs and issues and play a bridging role in the planning process.

At the grassroot level, we find multiple instances of citizens' adoption of renewable technologies at the household and community levels. While the data regarding the number of households with installed solar PV in Bali is unavailable, a study recorded the installation of solar rooftops that connected to the PLN grid as having reached 470 kWp by mid-2019, particularly in the eastern part of Bali (Core and Greenpeace, 2019). Driven by a growing discontent with the existing centralized and on-grid energy system, the civil society activists in Bali have called for the adoption of more inclusive and locally based energy system. An interviewee argued that installing solar PV was also an act of resistance against the restrictive regulatory frameworks for renewable energy:

> The state-owned company should have been pleased that we can easily access energy [through installing solar rooftop], but it might endanger its core business. This is our act of resistance to counter such strict regulations. The hardest challenge [of the energy transition] is not about technological availability, it's not about the lack of skill, but it's about the persistent view that prioritizes centralized and on grid business models (private sector #3 December 9, 2020).

To overcome limited financial options for households and small businesses to install solar PV, some local cooperatives have provided soft loans for their members to adopt renewable technologies, particularly solar PV, in their own homes or small businesses.

The provincial economic dependence on tourism industries has provided, to some degree, a more conducive environment for the push toward a renewable energy transition. A recent study finds growing numbers of domestic and international travelers seeking to visit ecotourism sites and stay in eco-friendly facilities in Bali (Krummeck et al., 2020). Some interviewees noted a growing interest among hotels and tourism industries to adopt renewable energy technologies. This situation, combined with more thriving citizen initiatives and engagement in energy transitions and political leadership, provides more enabling conditions for pursuing a more ambitious target for low carbon energy transitions.

5.2. *Regional energy planning in South Kalimantan Province*

In South Kalimantan, most energy sources (for electricity, transportation, and industry) come from fossil fuels (92.3% with coal accounting for 9.8% of total energy), and the rest comes from natural gas (1.3%) and renewable energy (6.3%) which come from biomass, solar, and hydropower (Fig. 4). In the electricity sector, the power demand reaches around 2.6 TWh/year and is expected to double in the next decade (Riva and Vestarchi, 2019). Moreover, the province is currently the second largest producer of coal in Indonesia after East Kalimantan Province. Against this backdrop, the processes to develop the regional energy plan could aid the province in exploring pathways for transitioning away from coal.

Our study reveals that the process of RUED development that took place in 2019 was rather one-sided, involving only the relevant government agencies and PLN, and was mostly carried out by a team of consultants. While the provincial government representatives indicated the willingness to set a more ambitious target for renewable energy, the consultants proposed a more 'achievable' target considering the availability of renewable energy sources and their technological feasibility.

[8] Ministry of Home Affairs regulation 50/2020.

[9] Positionality is understood as how "personal values, views, and location in time and space influence how one understands the world" (Warf, 2010, p.2258).

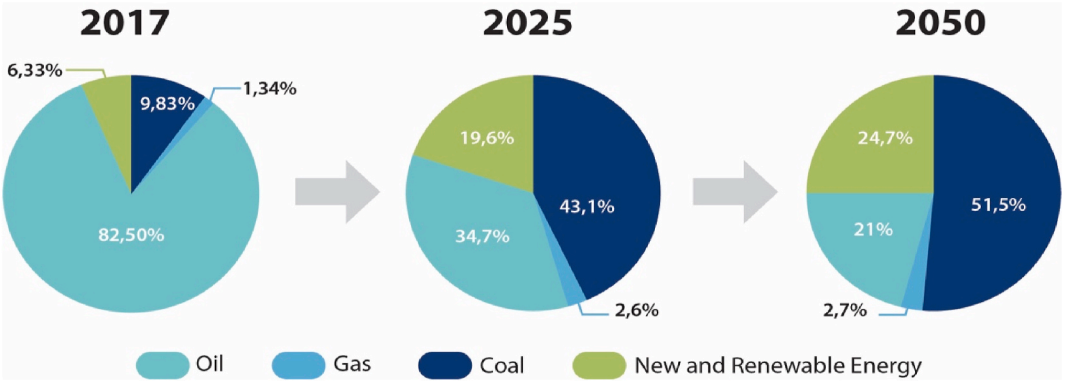

Fig. 4. Energy transition projection in the provincial energy plan in South Kalimantan.

However, such a projection does not consider the possibility of technological advancements that could make them more accessible and cheaper. Consideration was also given to retain coal in the province's energy future due to coal's contribution to national revenues and the province's economic dependency on it. As a researcher elaborated:

> The national target [for renewable energy mix] is too ambitious, and now there is a discussion to adjust the target. Like other regions outside Java, South Kalimantan highly depends on fossil fuel. To replace it with renewable energy will require a good assessment on the availability of renewable energy sources … we also need to see financial and technological feasibility, so the projection for 2050 is based on such an assumption (interview #6 January 27, 2021).

Despite the South Kalimantan's RUED target to increase the share of new and renewable energy to 24.7% by 2050, it also projects the share of coal to be 51.5% by the same year (GoSK, 2020). The province still prioritizes coal extraction and investments in coal and natural gas power plants. Furthermore, most interviewees in South Kalimantan suggested they had limited knowledge of the process, except for a handful of government representatives who oversaw the RUED development process.

Our analysis shows a disjuncture between the province's renewable energy target and the realities on the ground. Despite some public discussions on renewable infrastructure initiatives in the province, these initiatives have not materialized to date. Further, the provincial government has not issued subsequent regulations to facilitate the RUED implementation. Therefore, the energy transition plan might only be aspirational rather than a backbone for the province to decarbonize its energy system.

The lack of local actions and the projection of increased reliance on coal for electricity can be attributed to the province's significant reliance on coal mining for the regional development, which accounts for approximately 19–26% of the province's GDP in the last five years (IESR, 2019). Coal mining concessions cover approximately a 33% share of the province's area (1.2 million ha) for which 789 coal mining permits have been stipulated to date (Mulyana, 2021). While exploration for coal reserves began in the 1980s, the industry did not take off until a decade later, particularly after implementation of decentralization policies in the post-Suharto era (Fünfgeld, 2019).[10] This led to the proliferation of mining permit issuance by the local governments. In South Kalimantan, the coal production grew exponentially from 27.7 million tons in 2000 to 150 million tons in 2019 (Kalteng, 2020). This situation, intersected with favourable market conditions and the rising demand for coal, particularly from China, India, and South Korea, has contributed to the rise of coal production in Indonesia (Fünfgeld, 2019). As a result, by 2019, Indonesia had become the world's fourth largest coal producer and the biggest coal exporter, accounting for almost one-third of the global coal market (IEA, 2020).

Therefore, it is not surprising that some interviewees perceived the coal extraction in South Kalimantan as the lifeblood of both provincial and national economic growth. Such a perception was clearly articulated by a government officer who argues that instead of phasing out coal, Indonesia needs to prioritize the adoption of more efficient technology for coal power plants:

> Honestly, coal has been the backbone of our national economy. We have coal, it is plentiful and a cheap energy source … I think the most important thing is improving the technology for coal power plants, adopting the ones that are more environmentally friendly and emit less CO_2. But if we are asked to completely shift away from coal, that will be difficult. It is a given fact that our country is blessed with plentiful [coal] resources for us to utilize (interview #2 February, 03, 2021).

There has also been an uneven playing field for renewable energy sources due to the persistent perception among policy makers that coal is a cheaper source of electricity. This is despite the fact that coal power plants and industries continue to receive substantial government support in term of loans, tax exemptions, and price supports, such as the coal price cap policy that keeps the electricity tariff constantly low (Briddle et al., 2018; Setyowati, 2020; IESR, 2019).[11]

Moreover, political leadership to pursue a cleaner energy future in South Kalimantan is lacking. This study finds a strong connection between the extractive industries, especially coal, and local politics in which many local politicians, bureaucrats, and parliaments are involved in one way or another in these industries and utilize their political power to sustain them. This finding confirms previous studies that reveal the deeply entrenched patron-client networks that dominate coal business in Indonesia (Greenpeace Indonesia, 2018; Fünfgeld, 2016, 2019; Ordonez et al., 2021). Many of those who can secure these lucrative contracts have strong political connections with influential politicians and bureaucrats. In South Kalimantan, a recent report suggests an intricate network of coal business involving the bureaucrats and politicians on the provincial and national levels (Apriando, 2021). Consequently, the coal interests and industries continue to shape the energy decisions of the province. Our data also shows a lack of initiatives and

[10] In the early phase of decentralization, the government issued Mining Law 4/2009) stipulating that the central government was responsible for large scale mining permit issuance (up to 50,000 ha) while the district and municipality governments were responsible for small scale mining permit issuance (up to 15,000 ha). However, the Regional Autonomy Law 23/2014 has shifted all authorities for energy governance, including mining, from district authorities to the provincial and central governments.

[11] This price of electricity from coal power plants might increase with the recent stipulation of carbon tax (Law 7/2021 on Harmonization of Tax Regulation).

support by district governments in the province for an energy transition. This situation has heightened the difficulties of pursuing a cleaner energy future and implementing the regional energy plan.

Amid the inhospitable regulations for the renewables and a strong coal lobby, only a handful of renewable energy power plants operate in the province, and some renewable plants are non-operational (GoSK, 2020). A government interviewee argued that the revision of the regional autonomy law[12] and other regulations has further constricted the provincial government's ability to support renewable energy development. The regulation on government budgeting, for instance, has limited the ability of district and provincial governments to finance the establishment and maintenance of renewable energy infrastructure.[13] The continuous change of regulatory frameworks also results in regulatory uncertainties, hence increasing the time and resources needed by local stakeholders to understand the implications of new regulations and to comply with them (Setyowati, 2020).

Our study also finds the absence of citizen engagement in the energy planning development due to one-sided nature of the process, which limited public push for an ambitious transition pathway. There are, however, emerging local anti-coal mining groups, which actively campaign to stop the coal extraction. The most prominent group is led by a local branch of WALHI, a national environmental NGO, actively advocating to end coal mining in the province and for broader environmental issues. However, organizing the 'end coal' movement can be perilous; Indonesia is experiencing democratic regression marked by a heightened repressive environment and dwindling space for civil societies to express their opinions, let alone opposition, toward the industries. Many people have been attacked or threatened for expressing concerns on the coal mining impacts on the environment and local livelihood, as an NGO representative posited:

> We encounter significant challenges and risks here for campaigning the coal phase out; we have extraordinarily high degrees of agrarian conflicts due to extractive industries, such as mining and oil palm plantations. You can imagine, over 50% of the area in the province has been allocated to mining and oil plantation concessions, which excludes forest plantations (interview #6, April 28, 2021).

Such a situation adds to the layer of difficulties and risks for civil society and the broader public to demand a more ambitious goal for transitioning to low carbon energy.

6. Discussion

In this paper, we have illustrated the multi-scalar interactions of actors in negotiating, contesting, and reaching compromises in the process of developing regional energy plans. There are four key insights as follow:

6.1. Multi-scalar view of energy transitions in the dynamics of re-scaling energy governance

Instead of viewing energy transition processes from 'the top' (i.e., at the national level), this study adopts a multi-scalar analysis that reveals how different energy transition priorities and perspectives are negotiated, changed, and sometimes subverted, influenced not only by scale at which they are generated but also by the interaction between scales and between different actors operating in specific scales and across scales. Through this approach, we contest "a tendency to treat decentralized actors as remote, unpredictable and capricious, especially when they 'fail' to behave in accordance with the preferred models of national decision-making processes" (Bridge et al., 2013, p. 338). Examining the interplays of actors engaged in the processes of change at different scales enables us to illuminate layered outcomes and interaction between structural determination and context specific factors (Murdoch and Marsden, 1995).

As described, Indonesia's energy transition is implemented in the dynamics of re-scaling energy governance where there have been continuous changes of regulatory frameworks. Such dynamic regulatory fields have often become a source of discouragement and uncertainty, which require the stakeholders to remain informed about the latest developments and to anticipate the future changes. Further, despite the decentralization policies that devolve significant authority to local governments including in environmental governance, institutional arrangement and regulatory framework in the electricity sector remain relatively centralized and retain the dominant role of the central government and PLN in paving the transition pathways. This has become a point of tension and contestation in the RUED development. The local stakeholders often need to carefully navigate this tension by pushing forward their agenda for energy transitions yet remaining within the boundaries set in the national regulatory frameworks and institutional arrangements. This is evident in the Bali case wherein the local stakeholders' aspiration towards a clean energy future was ratcheted down in response to the opposition from the state utility that held decision making power for an electricity generation plan. Instead, the local stakeholders negotiated a middle ground pathway through weaning away from coal but retaining the natural gas in the energy projection in 2050.

6.2. Emerging local actions and agencies amid constraining regulatory and institutional environment

Our multi-scalar analysis reveals emerging spaces where new possibilities for local actions are found amid Indonesia's constraining institutional and regulatory fields. Such spaces are often constructed through the everyday negotiation of regulatory and normative processes. In this study, the everyday negotiation has been observed in the process of developing regional energy plans. Indeed, the planning process has been a 'site of struggle' (Bridge and Gailing, 2020), in which the energy transition is negotiated and contested. The process has provided a breakthrough to overcome the policy and institutional barriers at the national levels and unlock possibilities for local actors to shape the transition trajectories.

In Bali, local actors have managed to manoeuvre within the limits of regulatory and institutional fields through some strategies, such as negotiating the province's energy futures during the RUED development processes and actively carrying out some experimentations in terms of policy and local actions. These experimentations do not necessarily involve grand initiatives but rather the ongoing and everyday processes of trial and error. For instance, given the national regulations that provide space for broader actors' participation in solar PV adoption and relatively fewer institutional barriers if the installation occurs at the household level and at small-scale capacity, the Government of Bali has developed policies that incentivize solar rooftop installation in government and commercial buildings as well as households. Governments at district and local levels have also established LOEs to legally enable them to allocate budget and collaborate with private sectors for renewable infrastructure development. Further, we find multiple positionalities of actors operate across scales in navigating the tension in energy transitions. For example, the local state electricity company officers in Bali have played dual performative roles. On the one hand, they represented the company's agenda at the subnational levels. On the other hand, they helped facilitate the negotiations for decarbonizing Bali's energy system. Indeed, state agency is not an entity with a singular aspiration but it is constituted by everyday mundane actions of actors with a variety of interests (Nightingale and Ojha, 2011).

At the grassroot levels, we observe mushrooming local initiatives such as renewable cooperatives and solar PV adoption at the household

[12] Regional Autonomy Law 23/2014 that took into effect in 2017.

[13] Ministry of Home Affairs Regulation (Permendagri) 90/2019 on the categories of government budget for subnational governments.

levels. As an interviewee pointed out, such initiatives could 'subvert' the domination of the state electricity company as a sole provider of electricity and contribute to local aspiration for pursuing a cleaner energy future. In contrast, local actions are relatively minimal in South Kalimantan for reasons that will be elaborated in the following sections.

6.3. Citizen engagement and political leaderships are key to facilitate a greater ambition for energy transitions

The findings illustrate the importance of public participation in the decision-making processes to pursue a more ambitious targets for energy transitions. As described, the engagement of civil society can push forward pathways for a clean energy future (Magnani and Osti, 2016; Pesch et al., 2019). Indeed, citizens have increasingly also sought new forms of engagement to influence their energy future (Seyfang et al., 2014). In Bali, the participatory process of energy planning has served not only as a planning sphere but also as a process for raising broader stakeholders' awareness of the energy transitions. The civil societies in Bali have taken on local actions to advocate a rapid energy transition and to adopt renewable energy technologies. By contrast, in South Kalimantan Province, the engagements of civil societies, private sectors, and other local actors are limited in the energy planning, and a limited degree of local actions to pursue energy transitions is noted. The civil society actors in South Kalimantan are also in a more disadvantaged position against powerful coal networks and lobbies.

Furthermore, political leadership with a clear vision for a transition to renewable energy can play a crucial role in enabling the subnational actors to pursue a more ambitious renewable target. As evidenced in Bali, the current governor's leadership and commitment to a cleaner energy future played a significant role in facilitating and motivating the local actors in negotiating an ambitious target for revolutionizing the province's energy system toward renewables. The finding resonates previous studies highlighting the important role of leadership in influencing the energy system transformation either through a top-down, usually formal leadership or a bottom up, emergent informal approach involving networks of leaders or change agents (Xavier et al., 2017). In contrast, due to the lack of political leadership to pursue a clean energy future in South Kalimantan, the RUED development process was rather one-sided, and served merely as an administrative checklist to comply with the national regulation and has not materialized into local policies and actions. While the Government of Bali has creatively explored different regulatory options to legitimize the local actions for renewable energy transitions, the South Kalimantan government has remained rather fixated on the constraints imposed by the regional autonomy law for renewable infrastructure development.

6.4. Existing power structure and relations continue to shape regional energy planning outcomes

The result of provincial energy planning processes must be understood in the country's broader political economic situation in which there is an ongoing tension between fulfilling the commitment to reduce carbon emission under the Paris Agreement and 'business as usual' economic development. The latter often trumps the former, hence exacerbating the challenges for rapid transition to low carbon energy. This tension is evident in the case of South Kalimantan where the local economy has been highly reliant on extractive industries, particularly coal and oil palm plantations. Compounding this problem is the intermingling of the coal industries with local politics and the mutual dependence between the subnational governments and coal industries as they provide local fiscal revenues (Ordonez et al., 2021). The result is a regional energy plan that priorities the powerful stakeholders' energy system preference to sustain coal as the key source for regional development. In contrast, as Bali's economy highly relies on tourism industries, the island benefits from growing demands of tourists seeking ecotourism facilities and more thriving citizen initiatives and public discourses on green lifestyles. While this situation has created a more enabling environment for generating local actions for transition to low carbon energy, the local stakeholders need to scale down their ambition for a rapid energy transition to accommodate the state utilities' power generation plan.

To conclude, it could be argued that identifying the factors that shape the energy planning process is a key initial condition to the elaboration and operationalization of plans to decarbonize the energy system. Moreover, the insights from multi-scalar analysis of energy transition planning are pivotal in understanding the mechanisms through which energy futures are prioritized by different actors and thus how they might be enrolled into transition trajectories towards more equitable and sustainable energy, and in identifying emerging space for local actions.

7. Conclusions and policy implications

Indonesia's energy transition policy and governance are highly complex and dynamic. However, the dominant analysis remains largely focused on a system of national energy service and electricity provision that seems monolithic. The dynamic nature of the country's energy transition is seen when multi-scalar analysis is applied to examine the process of energy planning in the context of re-scaling energy governance (Bridge and Gailing, 2020; Brown et al., 2020). By deploying such an approach, this paper generates a more nuanced understanding of the political struggles as the transition process unfolds, identifies context specific factors that could stimulate or hamper local actions and illustrates new spaces for actions that emerge from the regional energy planning processes.

Our study shows that energy planning processes are not neutral technical exercises but constitute political processes involving multi-scalar interplays of actors at the national and subnational levels in which the energy futures are negotiated and where subnational actors attempt to claim space and assert their roles in energy transitions. We have described how the regional energy process can provide an avenue to overcome the policy blockages at the national level and stimulate local actions for energy transition. However, the ability of subnational actors to influence the transition trajectories has been shaped by some factors that include political leadership, civil society, and broader stakeholders' engagement in the process, as well as political economic structures and power relations.

While this study is based in Indonesia, the findings and policy implications might resonate with other developing countries pursuing transitions to low carbon energy. Considering the speed and scale needed to reach net zero emissions and the potential social implications, engaging actors across different scales of governance is paramount. This research reaffirms the importance of multilevel governance approaches in energy transitions that provide spaces for subnational actors in regional energy planning and encourages local actions to pursue a transition to low carbon energy (Boer and Zuidema, 2016; Kuzemko, 2019; Dobravec et al., 2021). Indeed, realizing energy transition ambitions cannot be achieved only via a national government's top down but it should be supported by active participation of all levels of government. However, without a set of responsibilities for sustainability or political support, local governments have insufficient incentive to act.

Therefore, national governments need to create effective regulatory frameworks to drive local actions and provide broader space for public participation, and to reform electricity markets to encourage the engagement of private energy companies, local communities, and other stakeholders to ensure inclusive and just energy transitions. In Indonesia, the reform of regional autonomy laws and relevant regulations is needed to provide subnational governments with clear and meaningful authorities in energy governance. However, reform should be accompanied by clear accountability mechanisms and improved technical and financial capacities. Further, some regulatory strategies can implemented to reform the electricity market and encourage citizen

and private sector participations such as: unbundling of a monopoly power provider's control over generation, retail, and distribution; sequencing policy instruments in a clear and organized manner; providing mechanisms to incentivize investment in renewable energy; and facilitating market entry by independent power producers and providing clear incentives to encourage citizens' adoption of renewable energy technologies.

While this study finds the importance of political leadership to be a driving force for regional energy transitions, it is important to note that one cannot solely rely on this factor as any change of administrative leadership can prompt a shift of priorities and policies, as has been demonstrated in previous studies (Kennedy, 2018; Setyowati, 2020). Therefore, national policies and regulations to enable rapid transitions to low carbon energy remain critical because some issues are better addressed at the national level. The national government's role remains key in designing and implementing an overarching climate policy and regulatory framework and in institutionalizing long-term commitment towards low carbon energy transition, thus creating certainty in regulatory environment that is central for energy transitions.

CRediT authorship contribution statement

Abidah B. Setyowati: Conceptualization, research design, data collection, data analysis, Writing – original draft, Writing – review & editing. **Jaco Quist:** grant acquisition, research design, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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