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COAL TO CLEAN ENERGY POLICY

Towards a coherent policy framework for facilitating electricity transition in Indonesia

Achmed Shahram Edianto, PhD
Asia Electricity Policy Analyst

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Introduction and method

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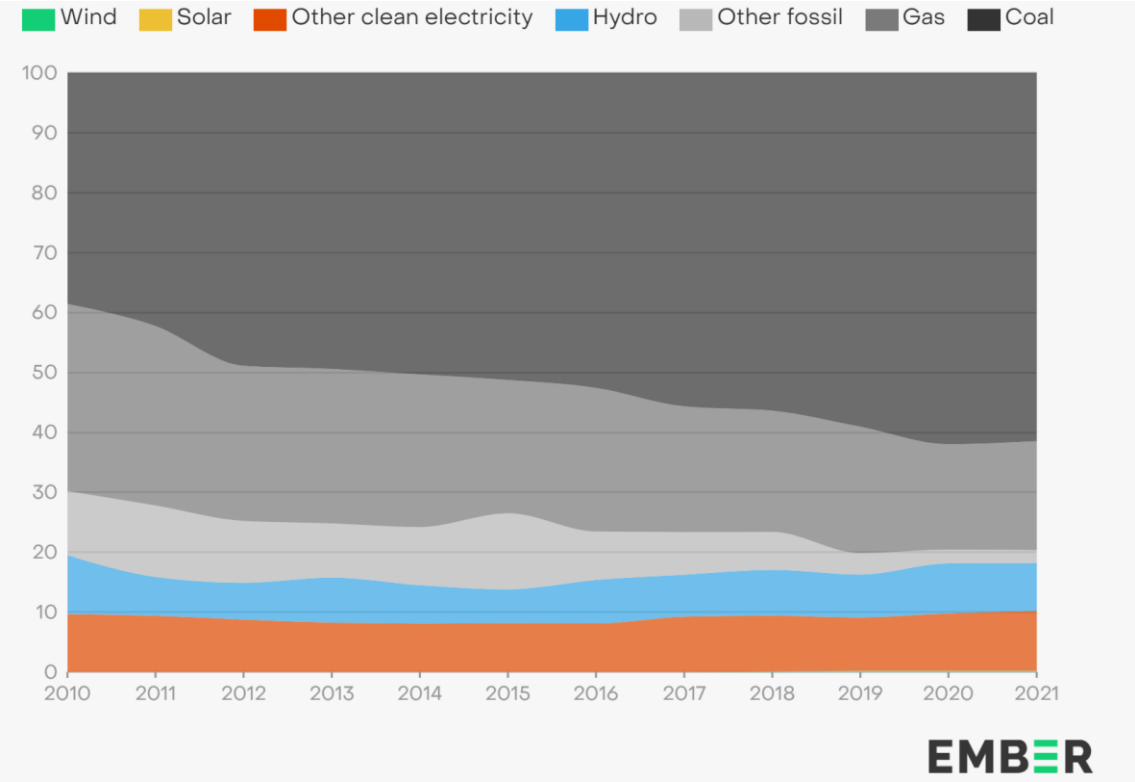
Indonesia's context

Figure 1. Indonesia electricity generation by fuel 2010-2021 (TWh)



Between 2015-2021:

- Renewables share increased from 14% to 18%
- Share of coal rose from 51% to 62%

These trends call into question the effectiveness of the existing policy framework.

Introduction and method

Objective and why

Objective

To analyse the efficacy of Indonesia's policy framework for steering the electricity transition process, with specific emphasis on identifying major gaps in this framework and ways to fill them.

Why this objective

The focus of the existing studies

- narrowly defined technical solutions (e.g., solar PV, geothermal, CCUS); or
- specific policy incentives and instruments for promoting renewable uptake, such as FiTs, reverse auction, and the removal of fossil fuel subsidies

These studies are deficient, as they fail to appreciate that:

- Electricity transition is much more than a technological substitution process
- It also requires 1) system reconfiguration; 2) socio-economic adaptation; and 3) change in people's mindsets and behavior.

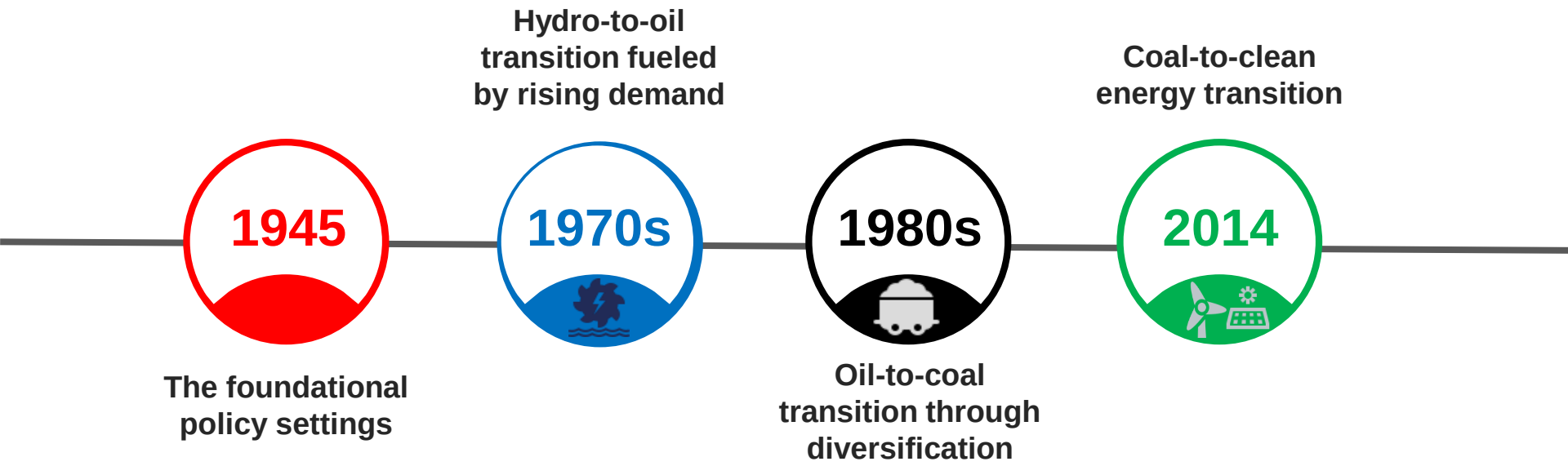
Method

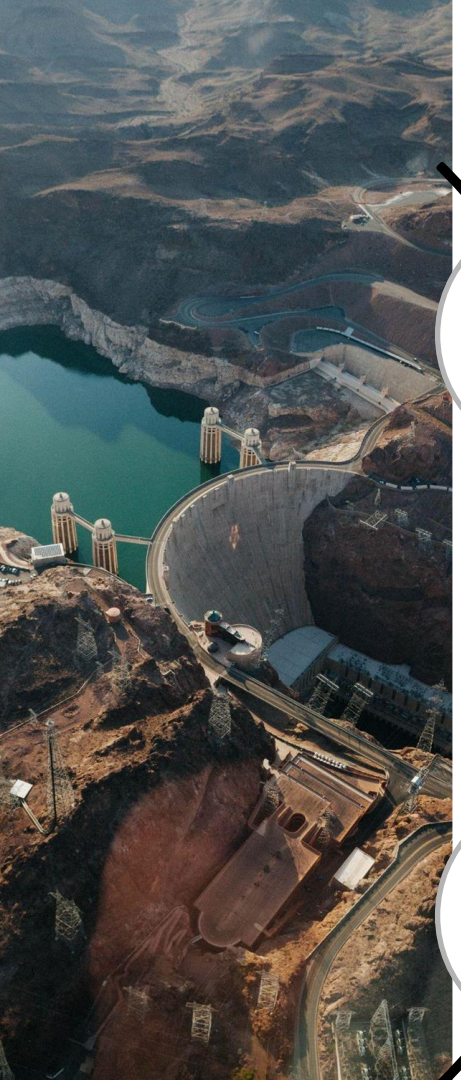
The analytical framework adopted in the study is informed by historical analysis and multi-level perspective framework.

Key findings

Indonesia's policy framework for facilitating electricity transition

Historical review





Efficacy of the policy framework

Key challenges Indonesia's electricity transition

TECHNOLOGY

Need for rapid development of clean electricity infrastructure

- Slow uptake of renewable energy that is insufficient to attain the country's climate target as stipulated in the most recent electricity plan (RUPTL 2021-2030)
- Large investment required for ramping up renewable deployment
- Unwillingness of private funds to participate in renewable projects, caused by some factors, such as difficulties involved in land acquisition and obtaining regulatory approvals, additional costs incurred by local content requirements, and renewable price distortions

SYSTEM

Unlocking electricity sector from its current fossil-intensive development pathway

- Excess supply capacity backed by PPAs with take-or-pay clauses, leaving limited scope for renewable energy
- Electricity subsidies that affect PLN's capacity to fund necessary network augmentation to manage intermittency
- Role of PLN: concern that PLN may disadvantage renewable projects
- Governance complexity that makes a major reorientation of industry development difficult to attain

LANDSCAPE

Socio-economic adaptation for a clean electricity future

- A strong coal-electricity nexus, especially considering the recent volatility and uncertainty in the export markets
- Through this nexus, reduced coal generation would affect deeply entrenched coal-related interests that are often connected to (locally concentrated) jobs, regional development, and desire to ensure energy security

Conclusions and policy implications

Conclusion

- Despite ambitious climate commitment of Indonesia → **the steps (measures) needed** to align the **ambitions** with **actual outcomes**
- The current framework → essentially characterised by **sporadic incentives**, **ad-hoc initiatives**, and **inchoate programs** for promoting renewable projects.
- Developing a **coherent and effective** policy framework is therefore critical to expedite the country's electricity transition.
- Need to first recognise **the substantial complexity** associated with electricity transition
- A **coherent policy framework** should not be reducible to a technology roadmap and blueprint, it should be built upon a couple of scenario analyses, where several possible transition pathways are analysed.
- The policy framework needs to **evolve** → reflect **changing socio-economic and political** landscapes that significantly affect the case for electricity transition.

Policy implications

01

A shared vision for a clean electricity future

02

Reflexive governance through learning-by-implementation

03

Fairness and equity

04

Closer international cooperation

05

A bottom-line thinking

06

Institutional frameworks

Policy implications

01

A shared vision for a clean electricity future

02

Reflexive governance through learning-by-implementation

03

Fairness and equity

- A shared vision for a clean electricity future is needed to develop a coherent policy framework for guiding the transition of the Indonesian electricity system
- This vision needs to be informed by an **understanding of electricity's transformative** potential in the **developing country context**
- Needs the **involvement of all relevant stakeholders** – governments (national, provincial, local), regulators, energy producers and consumers, local and external investors, NGOs, and community groups
- To facilitate this process → the Indonesian government may consider undertaking **comprehensive studies** that appraise **technical, economic, socio-political and geo-strategic impacts** of various options for meeting the electricity needs of the country

Policy implications

01

A shared vision for a clean electricity future

02

Reflexive governance through learning-by-implementation

03

Fairness and equity

- **A learning-based reflexive process** is likely to be more suitable for governing the electricity transition.
- **Linear governance process** → requires policymakers to first define the problem precisely and then identify and implement the most effective solutions to it.
- Given the **substantial complexity** involved in electricity transition, it is very difficult to fully understand it before any solutions can be identified, making the linear process less effective (M. Yang et al., 2022).
- **The reflexive process** → focuses on iteration through 'mulling over, evaluating, recapturing experiences, and re-orienting on actions' (Sol et al., 2018).
- **Through learning-by-implementation**, a better understanding of issues affecting the transition progress and their solutions can be developed, thereby assisting with a better governance of the transition process.

Policy implications

01

A shared vision for a clean electricity future

02

Reflexive governance through learning-by-implementation

03

Fairness and equity

- Impact from transition → for example, isolated coal-dependent communities, decline of the coal industry caused by reduced coal generation would adversely affect economic development and jobs, putting pressure on policymakers to guarantee a 'just transition' (Sartor, 2018)
- The job losses in coal-dependent communities can be somewhat offset by new jobs created in low-carbon technology industries (IRENA, 2020; NRDC, 2017, 2015) → Not all
- **The impact on local growth and jobs** could spread to other interconnected economic activities, putting pressure on the social contexts → poverty, and a rural-urban divide.
- **The transition policy framework** → guided by the need to adopt an inclusive and equitable approach to electricity transition.
- **Specific policy objectives and measures** should be evaluated in terms of their net social benefits, by internalising the costs and benefits of social externalities.
- **Transparent provisions** should also be made to develop compensatory schemes → for the vulnerable and disadvantaged groups that may be adversely impacted by electricity transition.

Policy implications

- The demand for financial support and knowledge-sharing will increase dramatically.
- **Closer and genuine international collaboration**, across all levels of governance, business and civil society will be needed.
- This will ensure Indonesia has **access to the technology, skills, knowledge, and finances** needed to clean up its electricity sector, while also ensuring sufficient electricity supply at affordable prices to satisfy the developmental aspirations of the country.
- **Effective regional institutions** (e.g., multilateral development agencies) are critical in facilitating international cooperation through, for example, the provision of technical and financial assistance, as well as the creation of platforms and mechanisms (Muyi Yang et al., 2022).

04

Closer international cooperation

05

A bottom-line thinking

06

Institutional frameworks

Policy implications

- A rapid transition towards a clean electricity future in the next two or three decades is needed, coal generation needs to fall substantially in the 2020s, to mitigate the worse impacts of climate change (Ember, 2022).
- **The transition policy framework** → recognise the need to reconcile the dichotomy of the usually prolonged electricity transition process and the present need to achieve a rapid transition to help save the world from the climate crisis.
- **A bottom-line thinking** can help achieve such a reconciliation by **recognising the times and efforts** that coal-related interests may take to adapt themselves → setting up clear deadlines for peaking and phasing down coal generation

04

Closer international cooperation

05

A bottom-line thinking

06

Institutional frameworks

Policy implications

- The National Energy Council (DEN) → the apex body of energy policy formulation and decision-making in Indonesia.
- **DEN should act as the focal point** for the articulation of interests regarding electricity transition → could broadly define the boundaries for developing a shared vision for a clean electricity future in Indonesia and act as guides for designing key elements of the National Energy Policy (NEP) that will translate this vision into actions.
- **The NEP should include long-term targets** for guiding the transition towards a clean electricity future, priority areas for actions to attain the targets, and guiding principles for the design of policy measures.
- The DEN may also **consider establishing a taskforce**, responsible for overseeing the electricity transition process, periodically reviewing the NEP, and advising the DEN on the need for revisiting specific elements of the NEP, to better reflect the changing contexts.
- The **MEMR** could provide **technical support** to the taskforce and could also act as the Secretariat for coordinating the activities of the taskforce.

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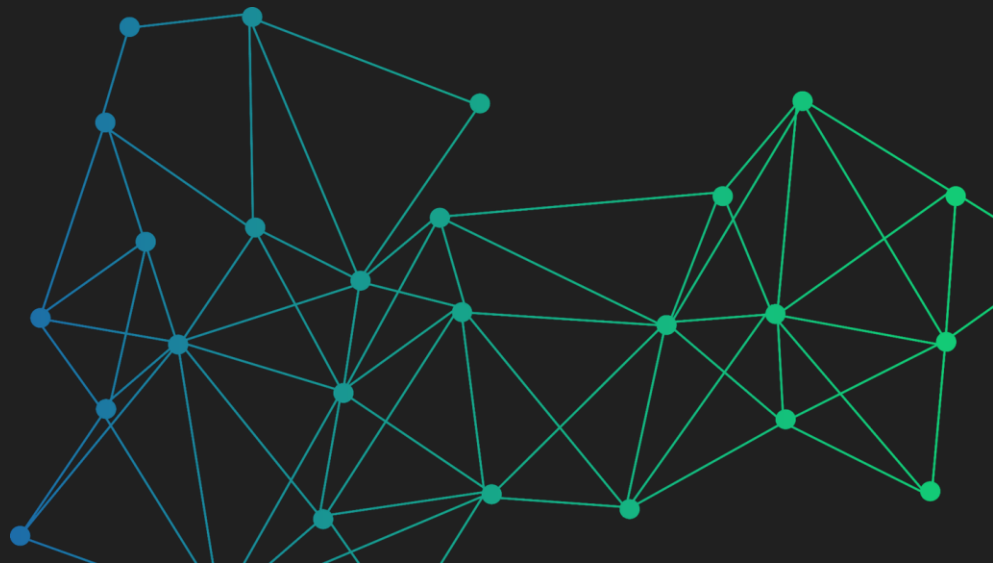
Thank you

Contact
muyi@ember-climate.org
achmed@ember-climate.org
aditya@ember-climate.org

More information about EMBER:
ember-climate.org



EXTRAs

Methods

The overview

Objective: To analyse the efficacy of Indonesia's policy framework for steering the electricity transition process

Research question

Whether the existing policy framework can facilitate changes in these areas in a coherent manner and provide a satisfactory responses to the consequences and trade-offs.

Multi-level perspective (MLP)

- Niche technologies
- Electricity system
- Socio-economic landscape

Expected output

- Provide new perspectives on understanding the existing policy framework for promoting electricity transition in Indonesia
- Provide key policy recommendations that could be applied to Indonesia or any various developing countries aiming to enhance the electricity transition

Analytical framework

Multi-level perspective (MLP)

Niche Technologies

- Landscape pressures (e.g., public concern about climate change challenge) create 'windows of opportunities' for niche innovations on renewable technologies to take place and often accompanied by policy measures to protect or insulate the innovations from the selection pressures in the dominant, fossil fuels-based electricity system (Schot, 1998). For example:
  - R&D support to improve the techno-economic performance of renewable technologies
  - Incentives (e.g., feed-in tariffs, and tax benefits) for promoting the uptake of renewable technologies

Electricity system

- As renewable technologies become mature and start to diffuse rapidly, a need for reconfiguring the whole electricity system, encompassing all its constitutive elements:
  - Network infrastructure
  - Market rules
  - Consumer practices

Socio-economic landscape

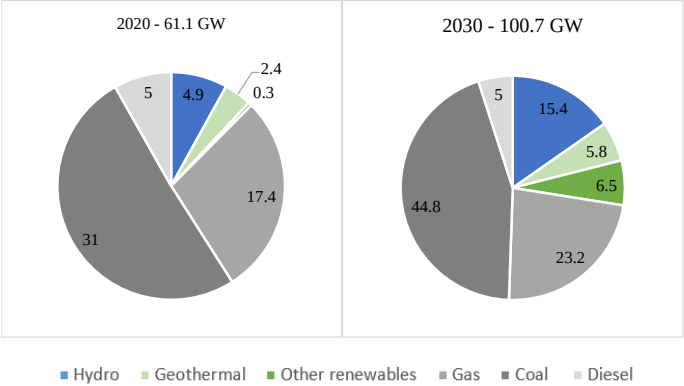
- The electricity system is deeply enmeshed into a wider socio-economic landscape, making its transition an inherently political process. In this process, various actors, such as utility companies, private investors, consumers, national bureaucracy, local authorities, and NGOs, seek to shape the scope, direction, and depth of the transition in accord of their own interests

Key challenges

01

Need for rapid development of clean electricity infrastructure

Figure 3. Renewable energy share in RUPTL 2021-2030



Source: World Bank, 2021

- The Indonesian electricity sector is currently **dominated by fossil fuels**: 80% in 2021, more than 60% from coal
- Indonesia's most recent electricity development plan (RUPTL 2021-2030) → **The greenest RUPTL**, however, renewable energy currently occupies a **marginal proportion** of total installed capacity (Fig 3)
- **Achieving the 2025** renewable capacity target → USD 7-10 billion per year, 2021-2025 (IESR, 2019; KEARNEY, 2021)
- The need for financial resources in Indonesia gets outstretched when the high cost of augmenting grid infrastructure → **archipelagic country**
- **The lack of private interest** is caused by some factors → the difficulty involved in **land acquisition** and obtaining **regulatory approvals** (Ordonez et al., 2022), additional costs incurred by **local content requirements** in the backdrop of small local manufacturing base, mainly focused on assembling imported components for solar and wind technologies (OECD, 2021), and **renewable price distortions** (World Bank, 2021)

Key challenges

02

Unlocking electricity sector from its current fossil-intensive development pathway

- **Excess supply capacity** → PLN is likely to have reserve margins (40-60% for the Java-Bali grid, and 30-56% for the Sumatera grid) that are much higher than the optimal levels over the next ten years (Hamdi, 2021), implying limited scope for the uptake of renewable generation.

- **Electricity subsidies** → Even with subsidies and financial support, PLN has still found it difficult to earn an adequate return on its assets. In fact, revenues generated by PLN have often been insufficient for financing necessary system maintenance and expansion, resulting in inadequate and unreliable electricity supply.

- **Role of PLN** → The current structure of the Indonesian electricity industry is a kind of monopsony. Under this structure, PLN – a combined national generation and network utility – has the responsibility for electricity generation, transmission, and distribution, as well as system operation and planning.

- **Governance complexity** → Indonesia's complex arrangements for governing the electricity sector pose a major challenge to coordination and coherence between various authorities across the three levels of government (national, provincial, and local (regency/city)), rendering a major re-orientation of sector development an extremely challenging task

Key challenges

03

Socio-economic adaptation for a clean electricity future

- Volatility and uncertainty in the export markets → Indonesia's coal industry has started to pin its **hope on the expansion of the domestic market** for securing its future demand (Harrington, 2017) → The introduction of the **Domestic Market Obligation (DMO)**, whereby coal producers are required to sell a certain amount of coal to PLN at lower-than-market rates (World Bank, 2021)

- Coal-electricity nexus = the transition towards clean electricity would inevitably **affect deeply entrenched coal-related interests** → inviting opposition to its progress.

- Facilitating the transition would therefore require **restructuring the political economy** revolving around coal mining, transport, and use to adapt the associated interests for a clean electricity future.