Business transformation in Indonesia's energy sector: Dealing with decarbonization and minimal stranded assets post-Paris Agreement

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Introduction

Indonesia has committed to reducing 31.89% of emissions with a conditional target[1] of up to 43.2% reductions by 2030 under the enhanced nationally determined contribution (NDC) which represents climate action plans of countries as part of the Paris Climate Agreement. The government also set a target to achieve net-zero emissions by no later than 2060. Based on the emission projection, the energy sector will be the main contributor to greenhouse gas (GHG) emissions in 2030 (Table 1). In response, the government has focused on developing clean energy sources as stipulated in Government Regulation No. 79/2014 on National Energy Policy. The government also expects to achieve 23% new renewable energy in the national energy mix by 2025 and a 1% reduction in energy intensity per year, as mandated in Presidential Regulation No. 22/2017.

Table 1. Projected Business as Usual (BAU) and emission reduction from each sector

Sector	GHG Emission Level 2010* (MTon CO_2-eq)	GHG Emission Level 2030 MTon CO_2-eq			GHG Emission Reduction MTon CO_2-eq		GHG Emission Reduction % of BAU		Annual Average Growth BAU (2010-2030)	Average Growth 2000-2012
		BAU	CM1	CM2	CM1	CM2	CM1	CM2		
Energy	453.2	1,669	1,311	1,223	358	446	12.5	15.5	6.7%	4.5%
Waste	88	296	256	253	40	43.5	1.4	1.5	6.3%	4.0%
Industrial Processes and Product Use (IPPU)**	36	69.6	63	61	7	9	0.2	0.3	3.4%	0.1%
Agriculture	110.5	119.66	110	108	10	12	0.3	0.4	0.4%	1.3%
Forestry and Other Land Uses (FOLU)***	647	714	214	-15	500	729	17.4	25.4	0.5%	2.7%
Total	**1,334**	**2,869**	**1,953**	**1,632**	**915**	**1,240**	**31.89**	**43.2**	**3.9%**	**3.2%**

Note: CM1: Counter Measure 1 (unconditional mitigation scenario), countries implementation ability based on their own capabilities and resources
CM2: Counter Measure 2 (conditional mitigation scenario), attached conditions to the implementation of some measures

* Including fugitive

** Emissions related to industrial processes and products use GHGs, such as refrigerators, foams or aerosol cans

[1] A more ambitious target, but requires international financial and technical support

*** Including emissions from estate and timber plantations
Source: Republic of Indonesia's Enhanced NDC (2022)

Although decarbonization efforts to phase out fossil fuels sign the government's commitment, the climate target would be a political statement without a clear trajectory. Considering the coal-fired power plant (CFPP) project pipeline, the capacity of CFPPs will be around 61 GW by 2030 (Global Energy Monitor, 2023). This shows that coal will still dominate the energy mix, contradicting the government's expectations. Meanwhile, Cui et al. (2022) estimate around 9.2 GW of CFPPs should retire to achieve the 2030 NDC target, and more capacities will be required for early retirement to meet the net zero emission goal.

In contrast, Indonesia has abundant coal, contributing to the growing economy for decades. Unfortunately, high reliance on coal would deter sustainable energy transitions. It should be noted that energy transitions may threaten incumbent energy companies because they are potentially suffering from stranded assets (Firdaus & Mori, 2023). In this case, Indonesian coal mining companies are no exception; thus, how they respond to such a risk remains critical to surviving and moving toward a decarbonized world.

Decarbonization and coal market dynamics

The Paris Agreement sent a powerful signal to include climate change in the decision-making process. In this regard, the need to mitigate climate change becomes a new challenge for businesses, requiring them to transform and change their business model. This is because businesses, notably, have been recognized as major players in contributing emissions. Still, they can address climate change as their actions may shape more effective climate policies.

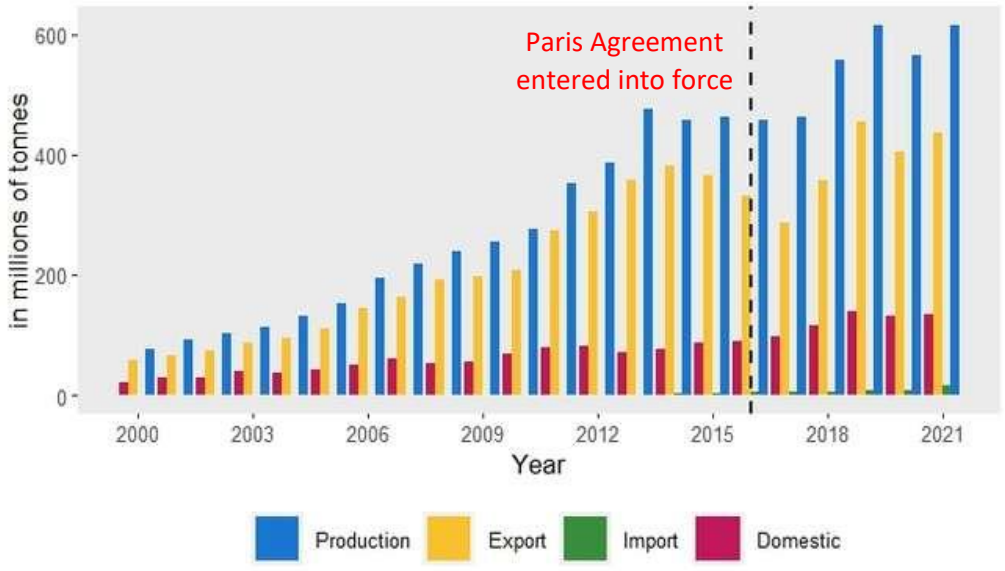

Figure 1. Indonesian Coal Production, Export-Import, and Domestic Sales, 2000-2021
Source: MEMR (2021)

Like global oil and gas companies, Indonesian coal mining companies are also affected by the energy transition. They are encouraged to adapt and make a systemic change. Nevertheless, they have enjoyed coal sector growth; hence, changes in their business model that align with the energy transition may not happen drastically. As depicted in Figure 1, coal production and export increased dramatically from 2000 to 2013, indicating the rapid growth of global coal demand, regardless of environmental concerns post the Kyoto Protocol in 1997. The production kept growing post-Paris Agreement in 2015, although exports slightly decreased mainly due to unexpectedly low economic growth in China (the major importer), abundant supply of shale oil (an unconventional oil, similar to petroleum, produced from oil shale rock fragments) and gas in the USA and Canada, and climate change awareness in more developed countries from 2014 to 2016. The coal market was buoyant from the end of 2016 to the middle of 2018 but worsened, affected by the US-China trade war.

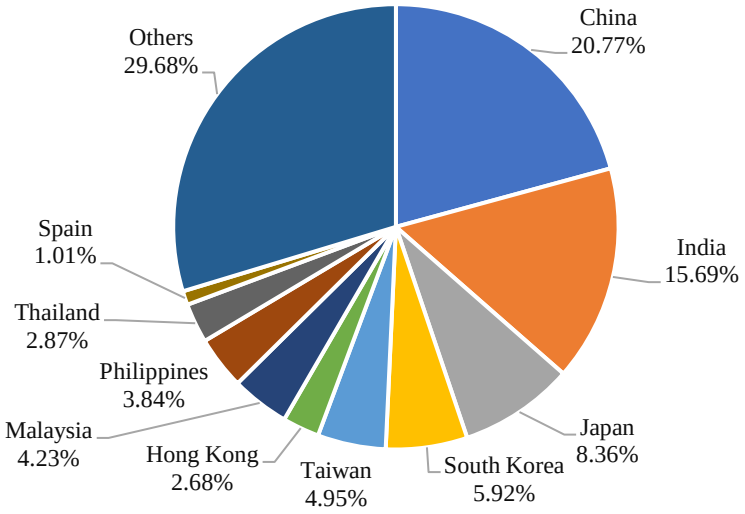

Figure 2. Major Export Destinations for Indonesian Coal, 2006-2021
Source: MEMR (2021)

The global coal demand was dynamic, but the rapid economic growth in several emerging Asian countries, such as India, Malaysia, the Phillippines and Vietnam, boosted Indonesia's coal demand (Figure 2). This offset a decline in demand from European countries prioritizing renewable energy and gas as an alternative to coal. Regardless, coal mining companies kept ramping up their production with the pressure of decarbonization.

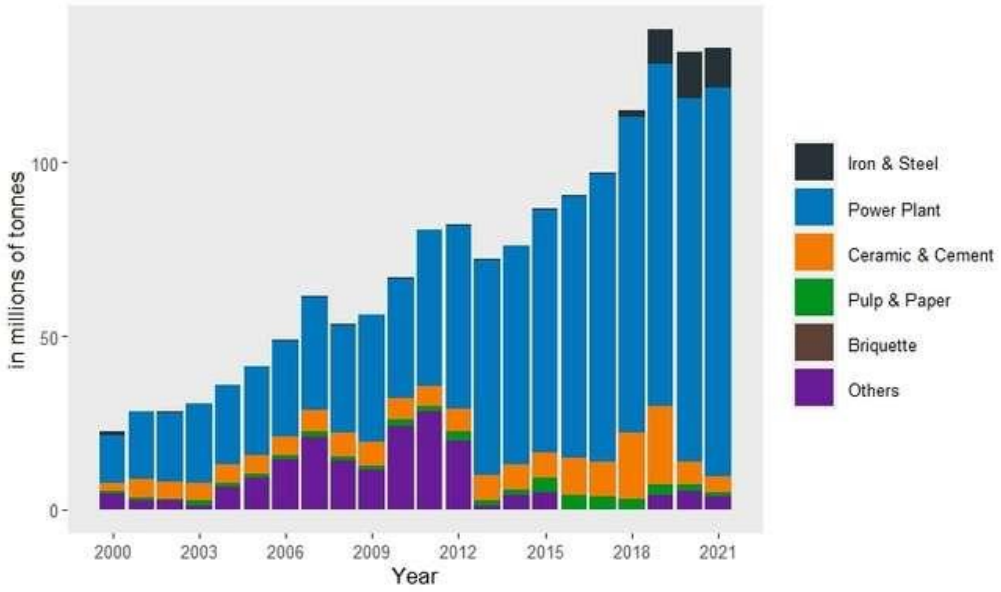

Figure 3. Domestic Coal Sales, 2000-2021
Source: MEMR (2021)

Furthermore, the government introduced the Domestic Market Obligation (DMO) policy to increase domestic coal consumption. In this regard, coal mining companies are required to allocate their coal production for domestic purposes. The policy also instructed the coal industry to develop coal-added value to widen the domestic coal market. However, the coal price offered by the government was less competitive than the global market price. Figure 3 shows domestic coal consumption improved, driven by the power generation sector aligning with the 35 GW program. Increased CFPPs benefit coal mining companies as the contract lifetime is long, securing their coal demand, although the rise of renewable energy threatens CFPPs.

Dealing with decarbonization and stranded asset risk

Following the coal industry dynamics, the government amended Law No. 4/2009 and introduced significant changes regarding how mining companies operate in the country. This amendment is stipulated in Law No. 3/2020, which includes changes in mining areas determination, mineral and coal mining authority, licensing of mining businesses, and divestment obligations. Also, this law regulates the continuation of operations under the Coal Contract of Work (CCoW), Coal Mining Concession, and other issues related to business security and good mining practices (e.g., post-mining obligations for restoration and reclamation). In this case, the government argues that the amendment improves national coal mining governance, favouring national interests─including domestic market prioritization and environmental aspects.

Regarding decarbonization, companies engaged in a single business (coal mining) simply comply with public interests. They implemented pollution control and energy consumption efficiency strategies, increased fuel bioenergy (B20 and B30) for operation, and used environmentally

friendly materials and energy as well as solar panels for electricity generation (internal use), showing their awareness of the environment.

On the other hand, companies with various business lines mainly focus on value creation while maintaining the existing value of their business. They utilized their internal capabilities to create new value to enhance their competitive advantage. The strategies include business diversification (non-coal mining: e.g., nickel[2], power generation[3], and mining services), coal upgrading initiatives (coal gasification and liquefaction[4], development of advanced coal power plant technologies), renewable energy development, and adoption of ESG/ GRI standards[5]. These strategies are mainly applied to coal mining companies with large market capitalization and well-established for a long-time. Several companies have committed to divesting their coal assets and rebranding them to be green companies (Kontan, 2021; Katadata, 2022).

Furthermore, since export is the primary coal market, coal mining companies manage the coal industry dynamics by adjusting internal capabilities, such as taking efficient and low-cost actions following how the market moves. Besides, securing sales through a long-term contract and identifying opportunities for market expansion supported by improved infrastructure are performed to maintain revenue streams. The initiative to enhance coal value by lowering carbon content through coal upgrading programs would benefit future energy, mainly for industrial sectors. Moreover, potential stranded asset risk would be minimal by developing the downstream coal industry and clean coal technologies. In relation to this, not only companies but also the government will receive benefits from such initiatives.

Although coal mining companies have changed their business model, reflected in their strategies, and started to include renewable energy development, the coal pathway in the energy sector remains to stay in the next few years. In this case, coal mining companies are still optimistic about coal in the future with a different paradigm.

Implications for Korean investment in the Indonesian energy sector

Although Korea made the coal phase-out declaration in 2018, its investment is still recorded in coal financing, mostly in CFPPs (CFPP Jawa 9 and 10). Besides, several operating CFPPs are managed and financed by Korean institutions, such as KEPCO, the Export-Import Bank of Korea, and the Korea Development Bank. To this, Korean financial institutions' exposure to CFPPs and related corporations increased in 2021 (Kim et al., 2021). Moreover, Korean companies, such as Samtan Co Ltd.[6], investing in the coal mining and power generation sectors, will be exposed to

[2] In response to a growing demand for battery and electric vehicles (long-term investment) through acquisition and set up a new subsidiary.
[3] Most coal mining companies own CFPPs, and some promote renewable energy.
[4] This business was pioneered by Bukit Asam and PT Pertamina (state owned enterprises engaged in the energy sector) (e.g., Dimethyl Ether (DME)).
[5] A set of reporting standards to show the transparency of economic, social, and environment responsibilities. In 2021, more companies published sustainability reports.
[6] Or ST International Corporation, a company engaged in energy development and has investment in coal mining (e.g., Samindo Resources, Kideco Jaya Agung) and mining services (e.g., Sims Jaya Kaltim and Trasindo Murni Perkasa)

energy transition risk. The exposure will be substantial when CFPPs are terminated earlier to achieve climate goals.

The transformation in the coal mining sector through the commitment made by companies to emission reductions with green business practices may provide opportunities for new investment. This is related to the expansion of coal mining companies in renewable energy and nickel in response to the growing demand for battery and electric vehicles.

Concluding remark

Considering the climate commitment, decarbonization in the energy sector has become one of the prioritized climate actions. Although the main target is the power sector, early retirement of CFPPs will negatively affect coal mining companies as such a sector is the primary market of coal demand. In response, Indonesian coal mining companies have gradually transformed to deal with decarbonization, although they are still optimistic about the coal market. In addition, the companies are concerned about developing clean coal technologies, indicating their awareness of public demands regarding decoalization to achieve a clean energy system in Indonesia. Also, while waiting for the feasibility of advanced clean technologies to anticipate changes in the future energy landscape, coal mining companies first adapted and reconfigured their internal processes to comply with the requirements to reduce emissions and diversify their business.

References

Articles, Reports, and News

Coal mining companies' annual and sustainability reports, 2015-2021.

Cui, R.Y., Tumiwa, F., Zhao, A., Arinaldo, D., Wiranegara, R., Cui, D., Dahl, C., Myllyvitra, L., Squire, C., Simamora, P., & Hultman, N.E., (2022). Financing Indonesia's coal phase-out: A just and accelerated retirement pathway to net-zero.

Firdaus, N., & Mori, A. (2023). Stranded assets and sustainable energy transition: A systematic and critical review of incumbents' response. Energy for Sustainable Development, 73, 76–86. https://doi.org/10.1016/j.esd.2023.01.014

Global Coal Plant Tracker, Global Energy Monitor, January 2023 release. Retrieved from https://globalenergymonitor.org/

Katadata. (2022). Indika Energy akan Tinggalkan Bisnis Batu Bara Demi Target Emisi 2050. Accessed from https://katadata.co.id/happyfajrian/berita/6306d64f215b8/indika-energy-akan-tinggalkan-bisnis-batu-bara-demi-target-emisi-2050

Kim, T. H., Lee, D. Y., Kwon, J. H., & Lee, J. O. (2021). Coal Finance in Korea: Changes in 2021 and Next Steps. *White Paper on Korea's Coal Finance*. Korea Sustainability Investing Forum (KoSIF) and Won-young Yanyi.

Kontan. (2021). Transformasi Bisnis TBS Energi (TOBA): Dari Batubara ke EBT hingga Motor Listrik. Accessed from https://insight.kontan.co.id/news/transformasi-bisnis-tbs-energi-toba-dari-batubara-ke-ebt-hingga-motor-listrik?payment=success

Ministry of Energy and Mineral Resources of Indonesia [MEMR]. (2021). *Handbook of Energy & Economic Statistics of Indonesia 2021*. Ministry of Energy and Mineral Resources Republic of Indonesia. https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi

Republic of Indonesia. (2022). Enhanced Nationally Determined Contribution Republic of Indonesia. Retrieved from https://unfccc.int/sites/default/files/NDC/2022-09/23.09.2022_Enhanced%20NDC%20Indonesia.pdf