

STRATEGIC ENERGY POLICY PATHWAYS TO 2045

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On 17 August 2025 Indonesia will celebrate its 80th independence. And ten years ago the London-based consultancy the Price Waterhouse predicted that in 2045 the world economy will significantly change. China will be the biggest one, followed by India, the US, and Indonesia based on the purchasing power parity perspective. Nowadays, Indonesians often think of the year of 2045 as the golden year (tahun emas), which is only less than two decades from now. Now the pressing question is what should be done in order to realize that prediction in term of energy policy?

Under President Prabowo Subianto's leadership, now in his second year since taking office in October 2024, Indonesia's economy appears to be on a positive trajectory. According to data from the Statistics of Indonesia, exports from January to May 2025 reached USD 112.03 billion, a significant increase from USD 93.26 billion during the same period in 2024. While it is still early to fully evaluate the performance of the administration, this growth grants promising future.

Years back, Indonesia was one of the oil-producing country. However, its oil reserves have steadily declined, and the country now relies more on imports. It is true that energy from fossil fuels such as coal, oil, and natural gas are still dominant globally, but they are finite and environmentally damaging. This reality underscores the urgency of shifting energy dependency from fossil fuels to renewable energy sources.

THE SHIFT TOWARD RENEWABLE ENERGY

The global community, including the United Nations, has raised concerns about using food crops like corn, sugarcane, soybeans, and palm oil for energy, especially during times of food scarcity. In this regards, Indonesia should avoid using food-based biofuels and instead focusing on sustainable alternatives such as solar, wind, hydro, geothermal, and biomass energy.

In 2025, Indonesia updated its National Power Supply Plan (RUPTL) 2025–2034, setting ambitious goals to increase renewable energy's share to 35% of the national energy mix by 2034, up from the current 12%. Of the projected 71 GW of new installed capacity, 70% will come from renewable sources, signalling a major policy shift.

Indonesia is the world's second-largest producer of geothermal energy, after the United States. The Kamojang geothermal field in West Java, established in 1978, and the Sarulla geothermal plant in North Tapanuli, Sumatra, are notable examples. The RUPTL includes plans to add 5 GW of new geothermal capacity by 2034.

With abundant geothermal potentials, Indonesia should continue to invest in this clean and reliable energy source by streamlining regulations, attracting more investment, and upgrading local expertise.

There is no doubt that solar energy is increasingly used in Indonesia, particularly for street lighting and residential areas. The Cirata Floating Solar





Power Plant, launched in 2023, is the Southeast Asia's largest floating solar project and a flagship example of Indonesia's solar potential and the government plans to add 17 GW of solar capacity by 2034.

While solar panels offer various benefits, they require regular maintenance and depend heavily on consistent sunlight. Expanding rooftop solar programs and improving grid integration can enhance solar roles across the archipelago.

Wind energy presents another opportunity, though it faces serious challenges due to Indonesia's inconsistent wind patterns. Former President B.J. Habibie once noted that Indonesia's wind conditions were unstable (angin-anginan). Despite this condition, certain localized wind projects in suitable regions could still contribute to the energy mix, with 6 GW of wind capacity targeted by 2034.

Meanwhile hydropower remains a valuable renewable resource. The Asahan River in North Sumatra, for example, empowers the PT Inalum aluminum plant. The RUPTL outlines plans for 16 GW of new hydropower capacity, making it the second-largest renewable contributor after solar in future.

In this regard community involvement in identifying and developing potential river sites is essential to ensure sustainable and inclusive hydro projects.

Indonesia has also significant potential in biomass energy, including the use of wood pellets. Biomass can be a viable alternative, especially in rural areas, as long as it does not threaten food production or lead to deforestation. The government plans to add 6 GW of biomass capacity by 2034.

Another option is to utilize nuclear power for energy. But it has certain serious drawbacks. As a result, nuclear option is a controversial one. It is true, that countries like the United States and Japan have successfully developed and enhanced the role of nuclear power for energy. Therefore both countries can extract energy from one kilogram of uranium-235 to produce approximately 80 trillion joules of energy. Although Indonesia currently has no nuclear power plants, the government has began preliminary studies in initiating possible international cooperation for nuclear development post-2040.

Investing in nuclear studies and safety protocols will ensure the readiness of Indonesia to utilize nuclear power for energy in future.

In this regard, relevant policies, transparencies and international cooperation of the State-owned enterprises such as Pertamina and PLN can play a critical role in shaping Indonesia's energy transition in future. However, Government regulations must be carefully formulated to encourage innovation, ensure environmental protection, and avoid social disruption.

Despite those ambitious targets, PLN has historically underperformed, achieving only 0.6 GW of renewable energy capacity per year, far below the 2.1 GW annual target. Addressing regulatory bottlenecks, financing gaps, and infrastructure limitations is profoundly essential.

Economic incentives can motivate individuals and businesses to adopt renewable energy solutions. International cooperation certainly important, but Indonesia must prioritize national interests, environmental sustainability, and the well-being of communities near the sites of the energy projects.





A VISION FOR 2045

If Indonesia maintains its commitment to renewable energy and sustainable development, it can not only become the world's fourth-largest

economy by 2045 but also serve as a global model for responsible energy player. Balancing energy security, economic growth, and environmental stewardship is essential for building a resilient and prosperous future.

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