



THE ROLE OF MULTINATIONAL CORPORATIONS (MNCs) IN RENEWABLE PROJECTS IN INDONESIA

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Abstrak

Artikel ini membahas peran MNC dalam penerapan energi terbarukan di Indonesia. Isu yang mendesak terkait energi terbarukan di Indonesia adalah kebutuhan mendesak akan pendanaan yang lebih besar untuk mewujudkan program energi terbarukan guna mencapai target SDG. Banyak MNC yang berinvestasi di sektor energi terbarukan di Indonesia, seperti tenaga surya, angin, panas bumi, hidroelektrik, dan lainnya. Konsep SDG digunakan dalam penelitian ini dengan melihat aspek penerapan, pengaruhnya terhadap perekonomian, dan keterlibatan MNC dalam energi terbarukan di Indonesia. Penelitian ini bertujuan untuk mempercepat penerapan energi terbarukan di Indonesia dengan mendukung semua pemangku kepentingan dalam memfokuskan penerapan energi terbarukan untuk pertumbuhan ekonomi bersama.

Kata Kunci: Indonesia, MNC, Proyek Energi Terbarukan

Abstract

This article discusses the role of MNCs in the application of renewable energy in Indonesia. The pressing issue with renewable energy in Indonesia is the critical need for more funding to realize renewable energy programs to achieve SDG targets. Many MNCs invest in the renewable energy sector in Indonesia, such as solar, wind, geothermal, hydroelectric, and others. The SDGs concept is used in this research by looking at the application aspect, its effect on the economy, and MNC involvement in renewable energy in Indonesia. This research aims to accelerate the application of renewable energy in Indonesia by supporting all stakeholders in focusing on the application of renewable energy for shared economic growth.

Keywords: Indonesia, MNC, Renewable Energy Project

Introduction

In 2015, the UN General Assembly officially adopted the Sustainable Development Goals (SDGs) as the successor to the Millennium Development Goals (MDGs) to improve economic, environmental, and social conditions globally by 2030 (Fong & Roy, 2024). The SDG's goal, which discusses the application of renewable energy, is goal 7: "clean and affordable energy." This point is motivated by the lack of access to energy supplies, which can hamper human progress, and the implications of increasing the use of petroleum. This goal is to increase the role of renewable energy in the global energy mix and, at the same time, provide universal access to reliable and modern energy by 2030 (UNEP).

In Indonesia, the implementation of SDGs is coordinated by the Ministry of National Development Planning (National SDGs Secretariat Bappenas, n.d.). As a form of implementing the SDGs, the Indonesian government, through the Ministry of Energy and Mineral Resources (ESDM), is encouraging the energy transition towards renewable energy by encouraging the development of renewable energy that is not only clean but also affordable (Sutrisno, Nuraini, & Sari, 2022). This is in line with the target to achieve zero emissions by 2060. Indonesia also ratified the Paris Agreement in 2016. Members of this agreement agreed to limit climate increase to no more than 1.5 degrees Celsius above the pre-industrial era and the target to increase renewable energy in the energy mix to 23% in 2025 and 31% in 2050 (Badan Riset dan Inovasi Nasional, 2022).

Indonesia has a vast renewable energy potential, known in Indonesia as *Energi Baru dan Terbarukan* (EBT). According to the International Renewable Energy Agency (IRENA), the total potential for EBT in Indonesia is 3692GW, most of which is dominated by solar energy at 2898GW (IRENA, 2023). To achieve energy transition goals, Indonesia needs a commitment to encourage infrastructure development and also significant funds, which require cooperation between the private and international parties. According to Bappenas, it is estimated that Indonesia will need \$127 billion to achieve the 23% renewable energy mix target by 2025 (Pakpahan, 2023).

In terms of achieving the goals of the SDGs, companies certainly have a role by making the SDGs a guide for business activities. Multinational corporations (MNCs) can support the implementation of the SDGs with the resources they have by providing access to capital and technology and disseminating information (Eang, Clarke, & Ordonez-

Ponce, 2023). In the energy transition, MNCs play a role in building renewable energy infrastructure, such as solar and wind energy plants, by acting as investors, technology suppliers, and project developers (UN Environment Programme (UNEP), 2021).

This research aims to look at the role of Multinational Corporations (MNCs) and their influence in implementing renewable energy applications in Indonesia following goals 7, 8, 9, and 13 of the Sustainable Development Goals (SDGs). Based on the background and theory used, the research question arises, “What is the role of MNCs in the application of new renewable energy in Indonesia to achieve the SDGs targets?”

This research hypothesizes that MNCs play a role in the application of new renewable energy in Indonesia as investors and providers of infrastructure and technology.

Literature Review

This research analyses previous research related to the role of MNCs, renewable energy, renewable energy applications, government partners in realizing renewable energy, and government targets on Goal-7 SDGs as an example of Langer, Quist, & Blok (2021) regarding renewable energy's contribution to Indonesia's electricity system. Lubis (2007) article explains that the potential for renewable energy in Indonesia, including bioethanol, biodiesel, solar power, geothermal power, micro-hydro, wind power, and waste power, is quite significant. However, Indonesia must develop several government policies to accelerate the transition from fossil to renewable energy. Meanwhile, Adrian et al. (2023) explain the policies the Indonesian government has adopted to implement renewable energy by looking at renewable energy applications implemented by other countries and comparing them with Indonesia. Adrian focuses more on the investment sector to facilitate the implementation of renewable energy.

Budiarto & Surjosatyo (2021) discuss the Indonesian government's efforts to achieve renewable energy targets in 2025 and 2050. This research provides recommendations so that renewable energy applications in Indonesia can be quickly realized, including prioritizing renewable energy issues and stopping energy subsidies. Fossil, and providing support to investors through domestic banks. Discussions regarding the role of investment in implementing renewable energy in Indonesia are also discussed in other journals, such as Febriananingsih (2019), which discusses specifically the governance of renewable energy in the electricity sector. Kalpikajati & Hermawan (2022)

article also highlights the issue of inadequate renewable energy investment in Indonesia. This issue means several previous studies regarding investment in the renewable energy sector in Indonesia have been carried out. However, there are no specifics regarding the role of MNCs in the application of renewable energy in Indonesia.

Erdiwansyah et al. (2022) discuss policies and laws for applying renewable energy in Indonesia. Indonesia must provide legal guarantees to investors in developing renewable energy and other policies to support renewable energy applications. Meanwhile, Marquardt (2014) research is more critical of the need for more communication between the Central government and Regional governments regarding the more aggressive application of new renewable energy carried out by the Central government. Only research Csomós (2014) discusses MNCs in renewable energy applications. For example, ExxonMobil, Chevron, BP, and Royal Dutch Shell have invested, although only around 1-2% of the total investment has been made.

Pickl (2019) also mentioned Royal Dutch Shell, ExxonMobil, Total, Chevron, BP, Petrobras, Eni, and Equinor, and only five, namely Royal Dutch Shell, Total, BP, Eni, and Equinor, have invested significant amounts in the renewable energy sector. Research by Patala et al. (2021) discusses MNCs that have shifted to investing in the new and renewable energy sector.

The existing research primarily focuses on the role of multinational corporations (MNCs) interested in investing in Indonesia's new renewable energy sector. However, there is still a need to define their specific role in the country's application of renewable energy. Some articles only mention the necessity of foreign investors to achieve renewable energy targets in Indonesia or call for further research on the technological requirements for implementing renewable energy. This comprehensive research aims to clarify the role of MNCs in driving Indonesia's progress towards its sustainable development goals (SDGs) through the application of new renewable energy. The findings of this research have significant implications for policymakers and industry professionals as it offers a roadmap for utilizing the resources and expertise of MNCs to expedite Indonesia's journey toward its SDG targets.

Theoretical Framework

This research uses the concept of Goal 7 of the SDGs, “Clean and Affordable Energy,” Goal 8, “Decent Work and Economic Growth,” Goal 9 of the SDGs, “Industry, Innovation and Infrastructure,” and Goal 13 SDGs, “Tackling Climate Change,” as a concept that explains the government’s efforts to apply renewable energy and the role of MNCs in it. Sustainable Development Goals (SDGs) are a collection of 17 agendas approved by 193 UN members to overcome social issues in five areas: people, planet, prosperity, peace, and partnership by 2030. SDGs aim to improve the welfare of people and the planet by addressing various social issues such as poverty, sanitation, clean energy, and climate change. Implementation of the SDGs involves the role of government, non-profit organizations, and also the business sector (National Geographic, n.d.).

The SDG’s Goal 7 is “Clean and Affordable Energy”. This Goal will ensure universal access to modern, reliable, affordable energy by 2030. The target is because the availability of modern, reliable, and affordable energy is essential for inclusive economic development. Among the other goals of this SDG are setting a target by 2030 to increase renewable energy in the global energy mix, improve infrastructure and technology in energy services, specifically in developing countries, increase international cooperation in terms of clean energy, and support investment in clean energy infrastructure, and carry out improvements in energy efficiency have doubled at the international level (National SDGs Secretariat Bappenas, 2017).

Goal 8 of the SDGs is “Decent Work and Economic Growth”. The purpose of Goal 8 is to encourage inclusive and sustainable economic growth, provide decent work, and provide productive and comprehensive employment opportunities. This Goal is achieved by diversifying and increasing technological innovation, especially in sectors with high-added value. This Goal aims to increase efficiency in global resource production and consumption and implement The 10-Year Framework of Programs on Sustainable Consumption and Production to eliminate the link between economic growth and environmental damage. Among other targets of this Goal are ending modern slavery, child labour, and trafficking and protecting labour rights (National SDGs Secretariat Bappenas, n.d.).

Goal 9 of the SDGs is “Industry, Innovation and Infrastructure”. The main objective of this Goal is to build resilient infrastructure, encourage innovation, and promote

sustainable industrialization. Economic development, social development, and efforts to fight climate change must be connected to the role of technology and investment in infrastructure and sustainable industrial development. Inclusive and renewable industrialization, when combined with infrastructure and innovation, can drive competitive economic forces that create jobs. Among the efforts to achieve these goals are investing in the infrastructure sector (irrigation, energy, information and communication technology, and transportation), increasing mobile broadband access, reducing carbon emissions, supporting technological development, and supporting infrastructure development in developing countries (United Nation (UN), n.d.).

Goal 13 of the SDGs is “Tackling Climate Change” to fight change and its impacts immediately. This Goal is because climate change impacts everyone and is a global problem (SDGs Dashboard Lampung University). The targets intended to achieve this Goal are integrating mitigation efforts into national policies, increasing education and awareness regarding climate change, increasing human and institutional capabilities in adaptation, mitigation, impact reduction, and early warning in terms of climate change, implementing the United Nations Framework Convention on Climate Change for handling mitigation actions in developing countries by mobilizing USD100 billion per year from 2020 and continuing to capitalize the Green Climate Fund so that it can be fully operationalized, and increasing capacity in climate change handling planning and management in developing countries. Countries classified as least developed countries and small island countries still have developing country status (UN Environment Programme (UNEP), n.d.).

Table 1. Theoretical Framework of SDGs Concepts

No	SDGs Goals Concept	The role of MNCs
1	Goal 7: Clean and Affordable Energy	MNCs act as providers of infrastructure and technology and also as investors in the clean energy sector to support the availability of clean energy.
2	Goal 8: Decent Work and Economic Growth	MNCs act as drivers of economic growth by becoming investors and providers of labour in the renewable energy sector and eliminating the lousy image between economic growth and environmental damage.
3	Goal 9: Industry, Innovation and Infrastructure	MNCs play a role as drivers of industrialization through their role as investors in renewable energy infrastructure. The presence of MNCs helps encourage competition and economic growth while also encouraging technological innovation.
4	Goal 13: Tackling Climate Change	MNCs play a role in the transition from non-renewable energy to renewable energy by providing infrastructure for renewable energy.

Methods

This research uses qualitative methods as an analysis method. According to Kumar (2011), qualitative research aims to describe the object of analysis in the form of phenomena, situations, events, or problems. The analytical method in qualitative research aims to provide results that show variations in the research object without quantification. With this, qualitative research collects and analyses existing data through ordinal or nominal measurements.

Meanwhile, Creswell (2009) explains that qualitative research is a method that emphasizes individual meaning, is inductive, and emphasizes the complexity of a situation. In the qualitative method, the research process is carried out by the researcher interpreting the data that has been collected and then looking for the meaning of the data that has been collected with his interpretation. Therefore, the results of the analysis using this research method have a flexible structure. Among the information retrieval methods in qualitative methods are ethnography, grounded theory, phenomenological research, narrative studies, and case studies.

For this research, the authors used a literature study that analyzed previous research regarding renewable energy, investors, MNCs, and infrastructure in Indonesia. This research also used secondary data from journal articles, official websites, and news websites.

Result and Discussion

Renewable Energy Project in Indonesia

Based on PLN's RUPTL (Electricity Supply Business Plan) 2021-2030, the National Electricity Company (PLN) has put in place a plan to increase the share of EBT generation by 51.6% of total electricity generation. Of that figure, 56.3% of the development of EBT generators is managed by the private sector. The most significant portion is the development of Solar Power Plants (PLTS), with 63.7% of the development managed by the private sector. The private sector will manage 54.4% of the on-grid PLTS development. It is planned to add 10.6 GW of EBT generators in 2025. PLN's 2021-2030 RUPTL plan is used as a basis for achieving net zero by 2060 and to achieve the target of

increasing the EBT mix in the national mix by 23% starting in 2025 (State Electricity Company (PLN), 2021).

Starting with a target of 23% EBT in the national energy mix in 2025, efforts to increase the portion of EBT in the national energy mix will continue. By the end of 2030, the target for the EBT mix is to reach more than 24%. This project will be continued by reducing the fuel mix after 2025 and limiting supply to 3T (Disadvantaged, Frontier, and Outermost) areas. The coal mix is targeted to decrease after 2026 (State Electricity Company (PLN), 2021).

The plan for developing EBT generators based on data from the 2021-2030 PLN RUPTL, along with the national energy mix projection plan for 2021-2030, is as follows:

Table 2. The Planning of Renewable Energy Project in 2021-2030

No	Types of power plant	Capacity	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
1	Geothermal Power Plant (PLTP)	MW	136	108	190	141	870	290	123	450	240	808	3355
2	Hydroelectric Power Plant (PLTA)	MW	400	53	132	87	2478	327	456	1611	1778	1950	9272
3	Microhydro Power Plant (PLTM)	MW	144	154	277	289	189	43	-	2	13	6	1118
4	Solar Power Plant (PLTS)	MW	60	287	1308	624	1631	127	149	165	172	157	4680
5	Wind Power Plant PLTB	MW	-	2	33	337	155	70	-	-	-	-	597
6	PLT Biomassa	MW	12	43	88	191	221	20	-	15	-	-	590
7	PLT EBT Base	MW	-	-	-	-	-	100	265	215	280	150	1010

8	PLT EBT Peaker	MW	-	-	-	-	-	-	-	-	-	300	300
Total		MW	752	648	2028	1670	5544	978	991	2458	2484	3370	20923

Source: State Electricity Company (PLN) 2021

Currently, as of 2022, based on data from the Ministry of Energy and Mineral Resources (ESDM) of RI (2023), the installed generating capacity has reached 12,542.5 Megawatts, dominated by PLTA (Hydroelectric Power Plants) of 6,688.7 Megawatts. The capacity of the EBT PLT experienced a constant increase of 2719.3 megawatts from 2018 to 2022, with an initial capacity of 9823.2 megawatts in 2018.

The following are details of the installed renewable energy capacity from 2018-2022:

Table 3. Electricity Generation Capacity from Renewable Energy in 2018-2022

	2018	2019	2020	2021	2022
PLT Air	5791,4 MW	5995,7 MW	6140,6 MW	6601,8 MW	6688,7 MW
PLT Panas Bumi	1948,3 MW	2130,7 MW	2130,7 MW	2286,1 MW	2342,6 MW
PLT Bioenergi	1874,8 MW	2098,3 MW	2253,2 MW	2284,0 MW	3086,6 MW
PLT Surya	65,2 MW	150,6 MW	172,9 MW	204,7 MW	270,3 MW
PLT Bayu	143,5 MW	154,3 MW	154,3 MW	154,3 MW	154,3 MW
Total	9823,2 MW	10529,6 MW	10851,7 MW	11530,9 MW	12542,5 MW

Source: Ministry of Energy and Mineral (ESDM) of RI, 2023

Renewable Energy Investment in Indonesia

Based on the explanation of the Director General of New Renewable Energy and Energy Conservation RUPTL (Electricity Supply Business Plan) 2021-2030, Indonesia will generate a total investment of US\$55.18 billion. This condition is detailed with the most significant investment taken by a Water Power Plant (PLTA) amounting to USD26.63 billion, Geothermal Power Plant worth USD17.35 billion, a Renewable energy Power Plant worth USD5.49 billion, a large-scale Solar Power Plant worth USD3.2 billion, Solar Power Plant Roof worth USD3 billion, Bioenergy Power Plant worth USD2.2 billion, Wind Power Plant worth USD1.03 billion, and Peaker Power Plant worth 0.28 billion (Humas EBTKE, 2022). Efforts to encourage investment in the renewable energy sector continue to be made. Indonesia seeks to provide fiscal and non-fiscal incentives, namely

tax allowances for investors, exemption from import duties for machinery, equipment, raw materials, and goods for production needs, and tax holidays (Umah, 2021).

The government has also issued *Presidential Regulation Number 112 of 2022* concerning accelerating the development of new renewable energy for electricity supply as a new regulation to support the development of renewable energy (Zahira & Fadillah, 2022). The government is also preparing a *Draft Law on New Energy and Renewable Clean Energy* to support renewable energy users (Syaharani, 2023).

Based on data from the Humas EBTKE (2022), Sector Performance Achievements, and 2023 Targets from the Ministry of Energy and Mineral Resources (ESDM), the investment in the renewable energy sector in 2022 will amount to USD 1.6 billion. The number does not match the target set for 2022 about USD4 billion. The constant amount of NRE investment from 2017-2022 is still lower than the investment obtained in the non-renewable sector, namely the mineral and coal and oil and natural gas sectors (Ministry of Energy and Mineral Resources (ESDM) of RI, 2023).

Based on research from IESR in the Indonesia Energy Transition Outlook 2024, the investment requirement to achieve the net-zero emissions target by 2060 is around USD 30-40 billion per year. Therefore, improvements in regulatory certainty, transparency, credibility, and environmental, and social protection are still needed to increase funding potential. Among the potential sources of financial funding that can be sought are green sukuk, bilateral and multilateral support, carbon markets, and carbon taxes (IESR, 2024).

At the G20 Leaders Summit on November 15, 2022, Indonesia, together with member countries of the International Partners Group (IPG), chaired by the United States and Japan and whose members include Canada, Denmark, the European Union, Germany, France, Norway, Italy, and the United Kingdom, launched Just Energy Transition Partnership (JETP) to mobilize USD20 billion to support the decarbonization of the energy sector. These funds were obtained through several schemes involving the private and public sectors, grants, investments, soft credit, guarantees, and loans at market interest rates (Just Energy Transition Partnership (JETP) 2023). Apart from members of the International Partners Group (IPG), JETP's initial funding also came from the Glasgow Financial Alliance for Net Zero (GFANZ), which is a collection of international financial institutions, namely Citibank, HSBC, Standard Chartered, Deutsche Bank, Bank

of America, Macquarie and MUFG. IPG and GFANZ committed to disbursing financing of at least USD10 billion for JETP.

According to the Comprehensive Investment and Policy Plan (CIPP) issued by the JETP Indonesia Secretariat, the potential funding from IPG is USD11.5 billion disbursed, the majority of which is in the form of concessional loans of USD6.94 billion, guarantees of USD2 billion, loans non-concession of USD1.59 billion, equity investment of USD384.5 million, other mechanisms of USD345.3 million, and grants of USD292.3 million. Currently, CIPP still needs to release details for funding from GFANZ (Ahdiat, 2023). CIPP sets three targets for on-grid development:

1. The emission level of the on-grid electricity sector is targeted at a total of 250 MT CO₂ in 2030,
2. the renewable energy generation mix will reach the level of 44% in 2030, and
3. achieve net-zero emissions in the electricity sector by 2020.

For this reason, the needs required for developing the on-grid electricity sector require an investment of at least USD97.1 billion in 2023-2030 and USD580.3 billion in 2023-2050, which does not include the costs of assessments and interventions related to a just transition. The initial funding of USD20 billion is expected to be a catalyst to cover around one-fifth of the total investment required to achieve the JETP target in 2030. CIPP has approved around 1000 projects based on five investment areas (IFA) in Indonesia (Just Energy Transition Partnership (JETP), 2023).

With several commitments from various parties to invest, Indonesia is optimistic that it will continue to carry out the EBT program to achieve the SDGs targets. The five investment areas (Investment Focus Area), along with the types of projects and costs required, are:

Table 4. IFA Investment

No	Project	Budget/Cost Production
1	Development of 14,000 km of electricity distribution and transmission network by 2030	USD19,7 billion
2	Carrying out coal flexibility retrofitting and early retirement of coal PLTUs (Electric Steam Power Plant) and managed phase-out	USD2,4 billion
3	Accelerate dispatchable renewable energy by increasing capacity by 16.1 GW by 2030	USD49,2 billion
4	Accelerate variable renewable energy (VRE) by increasing capacity to 40.4 GW by 2030	USD25,7 billion
5	Developing a renewable energy supply chain	TBD
Total		USD97 billion

Source: JETP Indonesia Secretariat, 2023

Of the 1000 projects that have been agreed upon, 400 projects have been included in the priority category with a total minimum investment requirement of USD 66.9 billion. Among the priority projects, 50 projects are included in the top priority category (Just Energy Transition Partnership (JETP), 2023).

The Role of MNC in Renewable Energy

Multinational companies are funders, partners, product and service providers, community capacity developers, and innovators in sustainable development. In the energy transition, MNCs play a role in building renewable energy infrastructure, such as solar and wind energy plants, by acting as investors, technology suppliers, and project developers (UN Environment Programme (UNEP), 2021).

The following is a list of multinational companies, along with their investment projects and roles in building renewable energy-generating infrastructure in Indonesia:

Table 5. MNC involved on Renewable Infrastructure in Indonesia

Sector	Company	Power Plant	Role	Capacity	Investment	Status
Solar	Masdar	Floating Solar Power Plant (PLTS) in Cirata, West Java, Indonesia	Project developer and Ownership	145 MW	USD145 million	Done
	Jinkosolar SunGrow		Technology Supplier			
	DNV		Lender's Technical Adviser			
	Masdar	Floating Solar Power Plant (PLTS) in Cirata, West Java, Indonesia (Phase II)	Developer	500 MW		Approved
	Canadian Solar	PLTS Atap (Rooftop Solar Power Plant) Bali	Module provider for solar panel	226 kWp		Done
	Vena Energy	PLTS Likupang	Owner	21 MWp	USD29,2 million	Done
	ACWA Power	Floating Solar Power Plant (PLTS) Singkarak	Project Developer	77 MWp		Planned
		PLTS Saguling		92 MWp		
Geothermal	1. Ormat International	PLTP (Thermal Power Plant) Sarulla	Joint Ownership under Sarulla	330 MW	USD1.7 billion	Done

	2. PT Medco Power Indonesia 3. Itochu 4. INPEX 5. Kyushu Electric Power		Operations (SOL) with Kyushu Electric Power owning 25%, Itochu owning 25%, PT Medco 18.99%, INPEX 18.25%, and Ormat 12.75%.			
	1. PT Pertamina Geothermal Energy 2. Hyundai Engineering and Construction 3. Ormat 4. Toshiba 5. Halliburton 6. Thermochem		Joint Operation (PT Pertamina Geothermal Energy) and Operation Contract (Hyundai, Ormat, Toshiba, Halliburton, and Thermochem)			Done
	1. Asian Development Bank (ADB) 2. Japan Bank for International Cooperation (JBIC) 3. Bank of Tokyo-Mitsubishi UFJ Ltd 4. ING Bank NV 5. Mizuho Bank Ltd 6. National Australia Bank 7. Societal		Loan		USD1,17 billion	Done

	8. Sumitomo Mitsui Banking Corporation					
	1. Star Energy	PLTP Gunung Salak	Ownership (Star Energy (68,31%),	370 MW		Done
	2. AC Energy	PLTP Derajat	AC Energy (19,3%),	240 MW		Done
	3. EGCO		EGCO (11,89%)).			
	1. Star Energy	PLTP Wayang Windu	Joint Operation contract	287 MW		Done
	2. PT Pertamina Geothermal Energy					
	KS Orka Renewables	PLTP Sorik Marapi	Ownership	90 MW		Done
	1. PT Supreme Energy	PLTP Muara Laboh Phase 1	Ownership under PT Supreme Energy Muara Laboh (SEML)	85 MW	USD580 million	Done
	2. Sumitomo Corp	PLTP Muara Laboh Unit-2	Developer	75 MW	USD400 million	Planned
	3. INPEX					
	1. PT Supreme Energy	PLTP Rantau Dedap phase-1	Ownership under PT Supreme Energy Rantau Dedap	91,2 MW	USD700 million	Done
	2. ENGIE					
	3. Marubeni Corporation					
	4. Tohoku Electric Power					
	1. PT Rekayasa Industri		Engineering, Procurement and Construction Contractor			
	2. Fuji Electric					
Water	PT Vale Indonesia	PLTA (Hydro Electric Power Plant), Larona	Developer and Ownership	165 MW		Completed
		PLTA Balambano	Developer and Ownership	110 MW		Completed
		PLTA Karebbe	Developer and Ownership	90 MW		Completed

	1. PT Kayan Hydro Energy 2. Sumitomo Corporation 3. Power China	PLTA Kayan Cascade	Joint development	9000 MW	USD17,8 billion	Approved
Wind	1. Total Eren 2. Adaro Power 3. PLN	PLTB Tanah Laut	Project Developer	70 MW	USD153 million	Approved
	1. Vena Energy 2. Siemens	PLTB Tolo-I	Project Developer (Vena Energy) and Wind Turbine supplier (Siemens)	60 MW	USD160,7 million	Done
	Vena Energy	PLTB Tolo-II	Project Developer	72 MW		Planned
	UPC Renewables	PLTB Sidrap	Project Developer	75 MW	USD150 million	Done
	Gamesa		Wind Turbine Supplier			
	UPC Renewables	PLTB Ciemas	Project Developer	150 MW	Rp 3,3 trillion	On Progress

Source: Results of data processing from several sources

Based on the explanation above, several MNCs have played a role in investment, developer projects, and technology suppliers. Most MNCs act as investors and owners of several renewable energy power plants in Indonesia. In terms of providing technology and infrastructure, several MNCs have taken part in the renewable energy sector. In the wind power sector, Gamesa and Siemens companies provide propellers for Sidrap PLTB (Darmanto, 2023) and Tolo-I PLTB (CNBC Indonesia, 2019; Simorangkir, 2017). For solar power, several MNCs act as module providers for solar panels, such as Canadian Solar as a module provider for PLTS (Solar Power Plants) Rooftop Bali Power Generation Unit (Andi & Handoyo, 2020), and Jinkosolar and Sungrow as technology providers for PLTS floating Cirata, West Java, Indonesia (ANTARA News, 2023; Bhambhani, 2023).

In the Hydro sector, Voith Hydro plays a role by providing technology for several hydroelectric power plants (Hydro Power Plants) in Indonesia, such as providing

propellers for the Watermelon Hydroelectric Power Plant, the Karai Hydroelectric Power Plant, and the Pusaka Hydroelectric Power Plant (VOITH, n.d.) and also Andritz Hydro which is also working together with PLN to develop hydropower infrastructure in Indonesia Indonesia (Enzenhofer & Ronaldo, 2023).

Effects of the Energy Transition on the Indonesian Economy

Based on PLN's 2021-2030 RUPTL (Electricity Supply Business Plan) regarding the scenario for Indonesia's economic growth in the 2021-2030 period, which is calculated using two scenarios, optimistic and moderate. In the optimistic scenario, Indonesia will experience an increase of 5.07% in 2021, while in the moderate scenario, the increase in the Indonesian economy in the same year will be 4.71%. Each scenario projects that the increase in the Indonesian economy will continue from 2021-2025 to its highest point, around 5.25% in 2025, and decrease by 0.03% in the next three years to 5.23% in 2029 and continue in 2030 (State Electricity Company (PLN), 2021).

The energy transition scenario that has been prepared is estimated to create up to 5.1 million people in the energy sector in 2030. This decision will result in the loss of 1.94 million jobs in the fossil fuel sector. On the other hand, there will be an increase in jobs in the renewable energy sector, namely 0.74 million in 2030 and 1.07 million in 2050. Biodiesel will dominate the number of job vacancies in the renewable energy sector with 510,000 jobs, namely 69% of jobs in the renewable energy sector. Job vacancies in the solar energy sector will increase by 177,000 in 2030 and 595,000 in 2050. In 2050, solar energy will dominate employment in the renewable energy sector. This condition will create 6.8 million jobs in 2050, with fossil fuels still dominating (IRENA, 2023).

A report from the International Renewable Energy Agency (IRENA) highlights the economic benefits of renewable energy-based power plants, which are cheaper than the cost of energy production. IRENA states that due to this cost advantage, renewable energy-based power plants can produce up to 800 gigawatts (GW) more than coal currently produces. This project aims to save up to USD32 billion annually and reduce carbon dioxide emissions by 3 Giga Tons (Umah 2021a). Clean energy has added around USD320 billion to the world economy, contributing significantly to global GDP growth. The growth of the renewable energy industry drove Indonesia's economic growth in 2021, with Indonesia's economic growth reaching 3.69% in 2021. Indonesia's real GDP has

exceeded pre-pandemic levels, and Indonesia has entered the upper middle class (Coordinating Ministry For Economic Affairs RI, 2023).

The regulation of the Minister of Energy and Mineral Resources Number 49 of 2018 concerning the Use of Rooftop Solar Power Generation Systems by PLN Consumers offers a practical solution for consumers to save on electricity costs. This regulation allows households to install Rooftop PLTS that are connected to the State Electricity Company (PLN)'s grid, enabling them to pay their electricity bills through the 'export-import' of electricity. The amount of money that can be saved depends on the power capacity generated and the overall electricity usage, highlighting the potential for significant financial savings.

Government policies play a pivotal role in promoting renewable energy and shaping the national energy mix. The policy, as outlined by the Regulation of the Minister of Energy and Mineral Resources Number 49 of 2018, is a clear demonstration of the government's commitment to increasing the contribution of EBT in the national energy mix, accelerating the use of solar energy, encouraging solar panel businesses and industries, and reducing greenhouse gas emissions (KOMINFO, 2019). These points are integral components of how renewable energy contributes to economic development, providing a clear roadmap for the future of energy and instilling confidence in the audience about the direction of energy development.

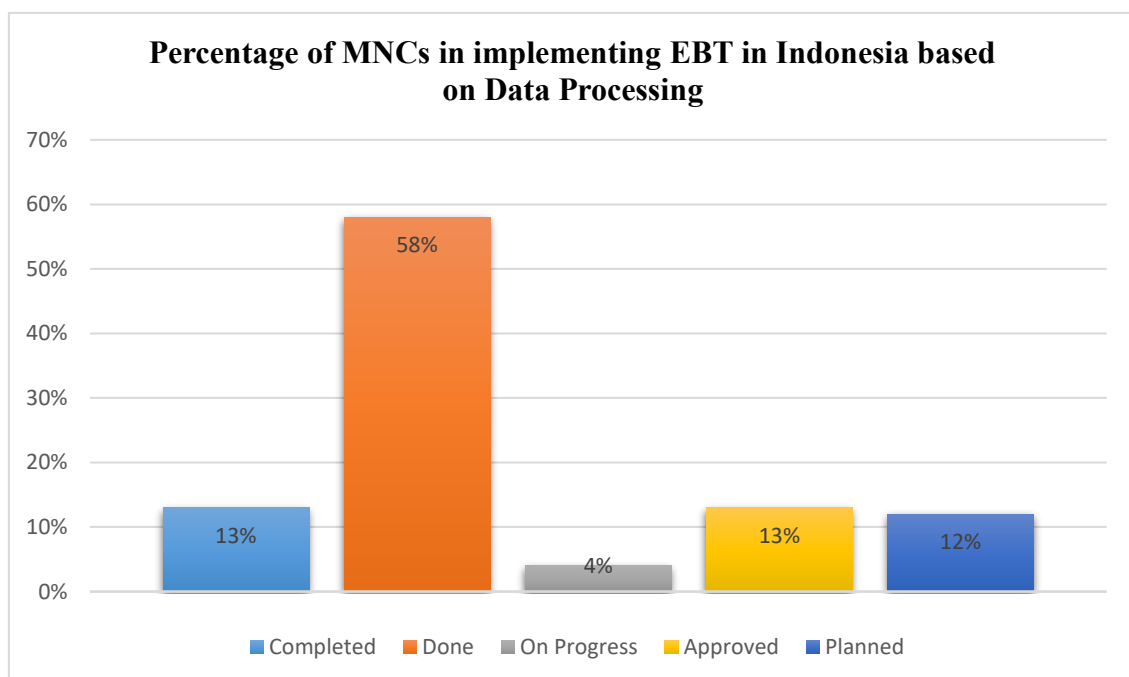
Result

Multinational companies have played a role in implementing renewable energy in Indonesia as investors, project developers, and technology suppliers. The existence of multinational companies in implementing renewable energy is encouraged by government policies, including PLN's policy to provide 56.3% of renewable energy development by the private sector and incentivize renewable energy investors. This policy is due to the government's need for investors to accelerate Indonesia's energy transition to achieve net zero by 2060. In implementing SDGs in Indonesia, multinational companies act as investors and providers of clean energy infrastructure either as project developers or as technology suppliers to achieve energy clean (UN Environment Programme (UNEP), 2021). For example, UPC Renewables, an international company,

is developing the Sidrap PLTB for USD 150 million (Darmanto, 2023). However, the Spanish company Gamesa uses the propeller technology supply (Simorangkir, 2017).

Three critical points from the results of this research are regarding the role of MNCs in the application of EBT in Indonesia to achieve SDGs targets: infrastructure providers and technology suppliers because Indonesia is not yet ready to create technology to accelerate the energy transition process from fossil to EBT, and as project developers. Meanwhile, SDGs Goal-8 regarding helping economic growth will be a suggestion for further research related to the role of MNCs in EBT in Indonesia.

Figure 1. Percentage of MNCs implementing EBT in Indonesia based on Data Processing



Based on the graph above, the role of MNCs in the implementation of renewable energy projects in Indonesia is significant and promising. Approximately 13 percent of the projects have been completed, with 58 percent successfully implemented. Another 4 percent are in the development stage, which has been approved by both the Indonesian government and MNCs. The remaining 12 percent are in the planning stage. This data underscores the substantial role of MNCs in the implementation of renewable energy projects in Indonesia. Looking at the graph, it's clear that Indonesia is on track to achieve its renewable energy target of 26 percent by 2025, with even more potential for growth in the future.

Conclusion

Indonesia has committed to carrying out an energy transition to implement the Sustainable Development Goals (SDGs). The government has set a target to increase the mix of renewable energy in the national mix by 23% in 2025 and 31% in 2050 and achieve net-zero carbon emissions by 2060. Indonesia needs investment to encourage the energy transition. PLN, in the 2021-2030 RUPTL, has targeted increasing the portion of renewable energy generators to 51.6% of total electricity generation, where the private sector will manage 56.3% of the development of EBT generators. With this policy and providing incentives to investors, multinational companies are encouraged to play a role in the energy transition. The company has entered into the construction of renewable energy as an investor, project developer, and technology supplier. In implementing the SDGs, multinational companies play a role as infrastructure and technology providers to encourage the achievement of clean energy. The presence of multinational companies as investors will help bring in new jobs in the renewable energy sector by encouraging industrialization and innovation to increase efficiency in the production and consumption of resources, as well as encouraging economic growth by helping to cut carbon emissions through providing renewable energy sources to replace non-renewable sources as energy sources. This work aligns with the implementation of SDGs goals 7, 8, 9, and 13.

Suggestions for further research on renewable energy projects and multinational corporations (MNCs) in International Relations (IR) Studies could focus on how these projects influence a country's foreign policy in addressing environmental challenges. While renewable energy has the positive effect of reducing greenhouse gas emissions, it also presents negative impacts on the environment. For example, floating solar energy systems can harm underwater ecosystems, and land acquisition for such projects may lead to ecological disruption. Additionally, there are concerns about the unpredictability of climate change impacts and the high costs associated with these renewable initiatives.

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