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Indonesia's Forward Vector in Sustainability

Cracking the Growth Code through Modernity, Energy Security, and Energy Sustainability

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Acknowledgement

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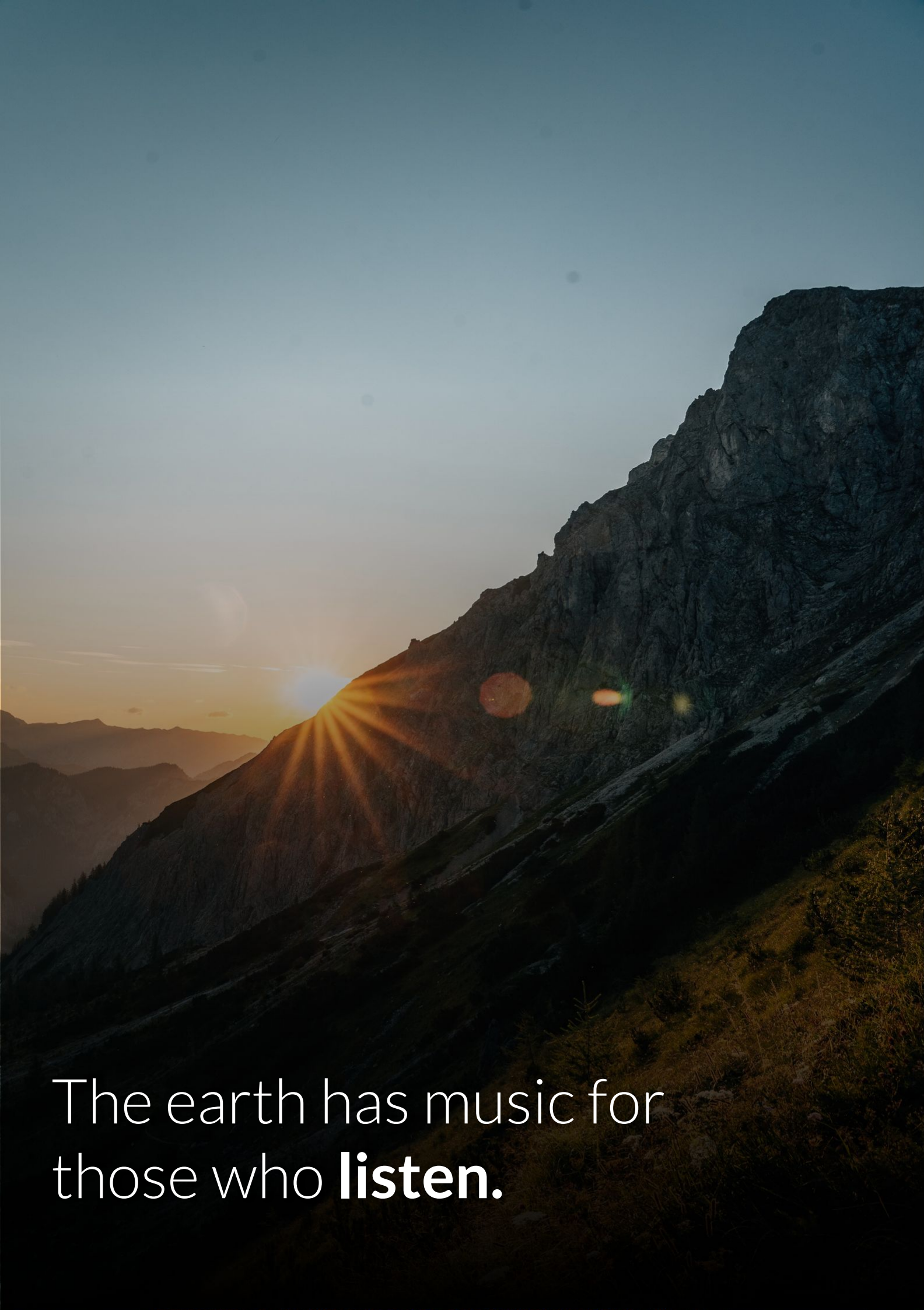
The earth has music for
those who **listen.**

Indonesia's Vector in Sustainability

Cracking the Growth Code

The world is facing a mounting climate crisis. Many communities are struggling with extreme weather events or enduring prolonged droughts. Regions are either plagued by scorching heat, or unpredictable weather patterns. Already strained, the ecosystems and infrastructure that support human life and biodiversity are increasingly vulnerable to the accelerating impacts of global warming. Thus, sustainability development and narratives become a paramount discussion and initiatives throughout the government, MNCs, and even to NGO and NPO.

Sustainability development and narratives of a nation can be accommodated by sustainability market resilience, availability, and robustness. There is no standard sustainability market yet. Sustainability can be defined as the long-term maintenance of a system according to environmental, economic, and social considerations (Crane et al., 2016). However, the sustainability market can be defined as the economic ecosystem where the exchange of goods and services occur with a sustainable mindset and designed to address environmental, social, and governance (ESG) challenges while promoting long-term ecological balance and societal well-being. Sustainability market will become a pervasive discourse in regard to the supply of government, business, and organization initiatives on sustainability.

However, a major hidden problem still present in the sustainability narratives and discourse. Net zero emission by 2060, COP 29 initiatives, and Just Energy Transition Partnership (JETP) still may not be familiar for most people. It is the three among numerous initiatives that the Indonesian government dreams of. The objective is very honorable. The initiative is intended to achieve the very dream of sustainable development of this country. Despite the honorable objectives and international level initiatives of sustainability, elitism can be sensed in the way the sustainability narrative has been narrated (Wirjawan, 2024). The sustainability narratives failed to resonate to the people in the villages of Vietnam, much less Nigeria, and much less villages in Papua.

The fact that elitism exists is very ironic with the distribution of people living in the developing countries. According to World Bank data in 2022, 84% of the world's total population resides in these nations, yet a significant portion of them lack access to basic needs like clean water, healthcare, education, and stable economic opportunities.

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While sustainability initiatives, discourse, and narrative are designed to address global and national challenges, they often remain inaccessible or irrelevant to the very people who are most affected by climate change and environmental degradation. These narratives are frequently crafted and implemented by elites in urban centers or developed nations, creating a disconnect with the realities of rural or marginalized communities in developing regions. Furthermore, the disconnection between sustainability initiatives with external stakeholders such as NGO, NPO, and environmental groups still become a paramount problem in Indonesia and most developing countries. The fact that they are seldom included in the discourses and initiatives framework may undermine the very significant contribution of these entities.

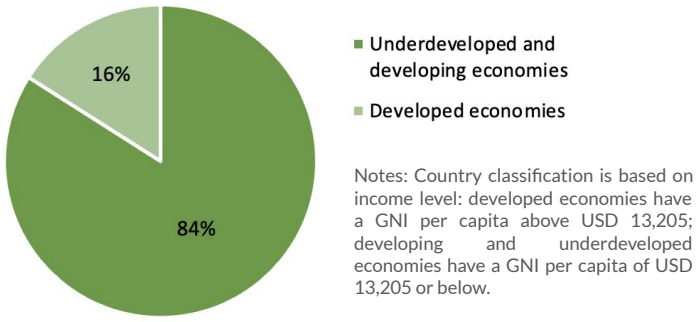

Figure 1. Population Ratio of Developed Economies Versus Developing and Underdeveloped Economies

How do we measure the Sustainability of Indonesia?

Indonesia, just like the other Southeast Asian countries, are pursuing Net Zero Emission and carbon neutrality (Siregar, 2024). However, one of the most popular and ambitious Southeast Asian countries' initiatives is achieving "modernity". It is often referred to as modernity because it modernized the energy value chain to become more electrified throughout the 21st century. Modernity can be achieved if and only if the electric consumption per kilowatt hours (kWh) per capita is reaching 6000. For context, energy usage is usually calculated in kWh, as one kWh is equivalent to powering a 100 watt light bulb for ten hours straight (David, 2024). By the time this report is published, only Singapore and Brunei have achieved modernity by electric consumption of 9702 kWh per capita and 9534 kWh per capita respectively (IMF, 2024; Global Economy, 2021; World Bank, 2021b). Indonesia, with a total of 1028 kWh per capita, still has a long way to go in achieving modernity. This will be further elaborated on this report.

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Sustainability can be measured through numerous methods as long as it is following the principles of economic, social, and environmental measures. However, it is important to notice the significance of energy and electrification in achieving the sustainability narratives. Focusing on electrification within the sustainability market is crucial as green technologies like solar PV, wind turbines, and hydropower directly contribute to increasing energy access and efficiency. These technologies not only support the transition to cleaner energy sources but also drive economic growth, improve living standards, and align with global efforts to achieve sustainable development. Furthermore, even though we agree that electrification can mean a lot of things, the essence of electrification is using the energy more efficiently. Thus, this report will measure sustainability based on per capita electrification and the significance of renewables in achieving the electrification.

Readers might react skeptically. Hasn't electrification through renewables steadily improved for decades? And didn't sustainability conferences like the Trans-Pacific Sustainability Dialogue, COP 29, JEP, and Paris Agreement address these problems? The answer is yes and no. Electrification initiatives through renewables by the Indonesian government such as Renewable Energy Certificates (REC), dedicated energy sources, and the Renewable Energy for Electrification Programme (REEP) has been implemented over decades. It is rather non-radical, reflecting the Indonesian government preference in slow but constant changes rather than instant-impact implementation.

Despite these initiatives, the answer to the question can also be no. As mentioned before, elitism of this discourse has brought disconnection between the elite and ordinary people living in the villages. Electrification and sustainability initiatives are also still far from the ideal compared to other countries in OECD. There are several sustainability and electrification myths that we need to address to understand the better panorama and landscape of Indonesia's current sustainability.

Myths to Clear Away

Electrification and sustainability are progressing rapidly in Indonesia

The myths stem within a strong assumption that significant strides in electrification and renewable energy adoption. The assumption did really happen, but only if you erase the word significant. For instance, the REEP initiative is based on the Indonesian government recognizing the potential of renewable energy and setting a target to reach a 23% share of renewable energy in the total energy mix by 2025. However, In 2023, the share of new and renewable energy in the energy mix reached 13.09%, a significant increase of 6.39% by 2015 (MEMR, 2017 & 2024). If 6.39% is a significant increase for eight years, the math doesn't work to achieve 10.91% in two years. Even the Indonesian Ministry of Energy and Mineral Resources (ESDM) has acknowledged that Indonesia is unlikely to meet its ambitious goal of achieving a 23% renewable energy mix by 2025 (Recessary, 2023)

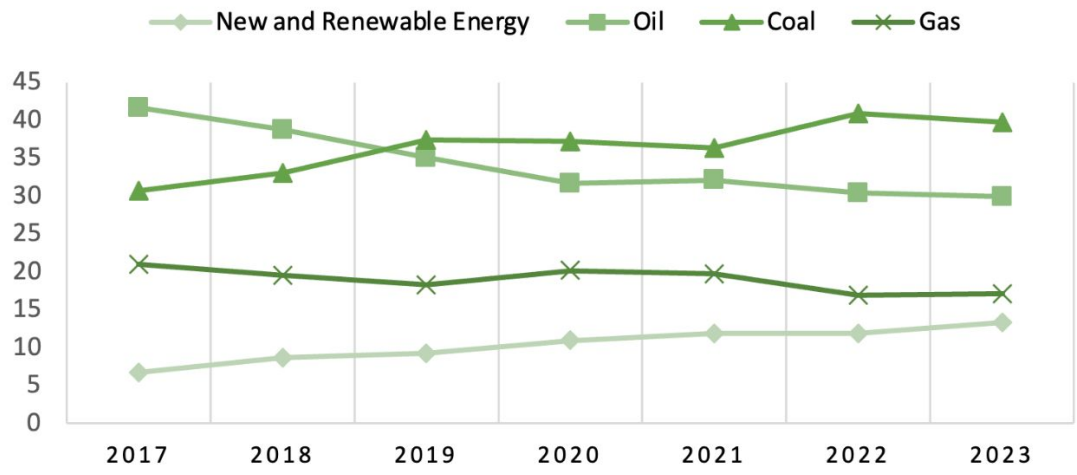


Figure 2. Indonesia Energy Mix by Major Type in %

Myths to Clear Away

Bottomline should be Stakeholder's Main Consideration for Sustainability Initiatives

Cash flow, final value of account, and balance sheets may really seem unfavorable for sustainable initiatives programs. In terms of bottom line, sustainable programs are very expensive, require long-term orientation, and even risky. However, then why entrepreneurs and business owners in the US and China spend so much money in R&D efforts on sustainability and green technology? Why do most companies in the developed countries invest in ESG, green technology, and sustainability programs for their business operation? The way of thinking in the west is not on the bottom line, but on the value of multiplication (Rasjid, 2024).

There can be two types of value of multiplication: valuation multiples and footprint multiplication. valuation multiples is the ability of investment to generate exponential growth in equity value overtime. The valuation of multiples for the renewable energy industry is four times bigger than the average coal industry multiplier. It means renewable energy investment can result in exponential growth when done right. Furthermore, footprint multiplication is also considered as a good investment for business to ensure social license to operate and reduce risk of potential sanction due to carbon footprint emission. For instance, a study case in China, Solar PV emits 1.35 kg/kWh of GHGs per unit of electricity produced in which significantly lower than coal power 4.81 kg/kWh and Solar PV demonstrates an ecological surplus with a per capita footprint of 0.0342 hm^2, while coal power shows a sustained ecological deficit with a growing per capita footprint of 0.6529 hm^2 (Luo et al., 2024). Furthermore, the energy generated from renewables is far much more efficient. The multiplier on lower footprints to achieve environmental and social sustainability and the multiplier of energy efficiency for economic sustainability is what have been the mindset of the west.

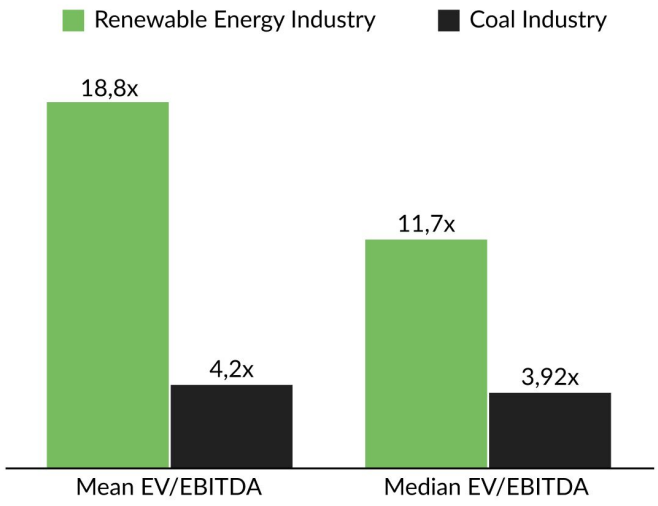


Figure 3. Valuation Multiples of Renewable Energy Industry and Coal Industry

Myths to Clear Away

Sustainable Growth Can Solve All Environmental Problems

This myth assumes that by growing economies and increasing wealth, societies can invest in cleaner technologies, improve living standards, and resolve environmental challenges. This myth is supported by the SDGs because SDG 8 promotes sustained economic growth, which is often interpreted as fostering consumption and production, while SDG 12 encourages more responsible practices, creating a framework where growth and sustainability appear to coexist harmoniously. However, it is important to understand that in the end, the only environmentally friendly way to tackle the burden on the resources is the wealthy people to reduce consumption, not to seek a creative solution to increase it (Hickel, 2015). Even though modernity is defined as an increase in consumption in electrification, modernity focuses on substituting the non-renewables consumption into electricity consumption. Thus, the decision to discuss modernity in this report is still justified.

Myths to Clear Away

Sustainability and electrification are equally accessible to everyone in Indonesia

Supporters of this myth might argue that Indonesia only charges 0.092 USD per kWh of electricity prices for households as of March 2023, significantly lower compared to Singapore that charges 0.231 USD per kWh (Wirjawan, 2024). Even if it is true, affordability is totally different from accessibility. Accessibility is about two things: (1) the economic perspective in which a household has the disposable income to purchase; and (2) the physical perspective, in which the infrastructure has been built to accommodate the consumption. In Indonesia, the physical perspective is far from ideal. Even on the very basic commodity, a study by the Institute for Essential Services Reform (IESR) in NTB and NTT provinces in 2019 found that electricity was not available 24 hours a day and was limited to electronic devices and low-power lighting (Simanjuntak & Hasjanah, 2023)

Even if 0,092 USD per kWh for electricity prices is considered cheap, it should be much cheaper to become the catalyst on energy sustainability and energy security. This will be further discussed throughout the research paper. The focus and objectives in lowering the prices and even giving incentives to households and industrials can help to boost energy mix by loosing up the prices of transitioning into a more sustainable source of energy and incentives new businesses to build their new project with sustainable energy accordingly at the very start.

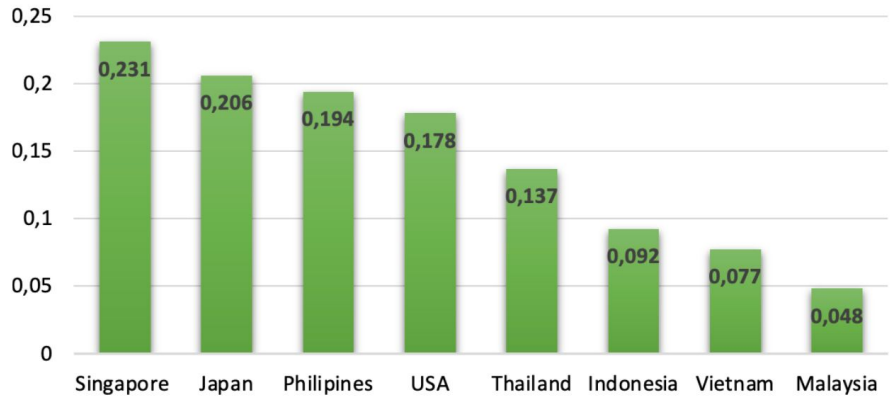


Figure 4. Electricity Prices for Households as of March 2023 (in USD per kWh)

Indonesia’s energy future will depend not just on transitioning to renewables, but on the efficiency of its **entire energy value chain** for security and sustainability.

The Reality: Indonesia Energy Security

According to Khatib et al. (n.d.) in their research with the United Nations Development Programme, Energy Security is defined as a continuous source of energy at a reasonable price, in sufficient quantities and is available to everyone. Concerns of energy security have far moved on from just issues regarding oil into more multifaceted issues with discovery of power sources and business models in regards to it. Thus as the world readies itself to ensure energy security, how is Indonesia?

The truth about Indonesia's energy security is that Indonesia is falling behind, even compared to their ASEAN contemporaries. Dipping our feet on World Energy Council Trilemma Index (2023) which is based on energy security, environmental sustainability and energy equity, Indonesia is ranked in the 58th place, losing out to nations such as Malaysia and Brunei who ranks 35 and 45 respectively. Looking through the data, despite Indonesia's advantage in the category of energy security in solitary, they are in one way or another hugely advantageous or are more well balanced in environmental sustainability and energy equity. This implies that despite Indonesia's energy supply and its variations, in the process Indonesia still lacks in the access of energy as well as the negative externalities of the energy generation. This, actually, relates to Indonesia's progress within the 3 pillars of sustainability. The first pillar is the environmental pillar.

As will be explained in greater detail later, Indonesia's effort to sustain the environment has been quite rocky. Spanning from 2000 to 2022, Indonesia's greenhouse gas(GHG) per capita has increased by 99% and is increasing with more than half of it coming from coal. This, too, is paired by the trends of the construction of coal power plants despite efforts of reduction in 2023 (Santika, 2023) shows that Indonesia is still struggling to create an environmentally friendly energy generation but also in transitioning the nation into greener pastures in general. Another aspect to the 3 pillars of sustainability is in regards to the social pillar, a pillar that is based on people's welfare. As seen in Indonesia's low energy equity, it implies that energy is not accessible. This could mean that electricity is not well distributed, energy and fuel is expensive and many more factors that relate to people's welfare. This is paired with issues such as the existence of 140 rural areas not being electrified and constant misgivings regarding fuel prices. The significant implication of this is that there is still much to do for Indonesia to achieve greater welfare to fulfill in the social pillar especially for energy. The last scope of this framework is the economic scope. From the economic scope, especially in focus of Indonesia's resource management.

The Reality: Indonesia Energy Security

Despite the common myth that Indonesia has great feats in electrification and sustainable energy, implying a mix in energy sources, this could not be farther from the truth. While this is not to say that there have been no improvements, non-renewable energies such as coal and oil are still by a long shot the main source of energy. There were efforts in taking steps to transition. Take for instance the development of B30 and B35 biofuel, a significant project due to Indonesia's NRE being greatly contributed from NRE and is proven to increase biofuel usage by 2.3% in a mere 3 years, or electrification effort of public facilities. However, a report from the Institute for Essential Service Reform (2023) shows that the progress is little for the transition to renewable resources and Indonesia is still reliant on non-renewable energy. The report even exclaims that it is actually declining by almost 1%. Similar conclusion was reached when looking through the Ministry of Energy and Mineral Resources in their reports which shows a not so significant increase in NRE as an energy source with only an increase of 6.39% in relation to Indonesia's current goal. This shows the greater implication of Indonesia's energy security: not only is Indonesia far from its target, it is actually straying away.

Indonesia Agility

Maybe it's Time for the Government to Fiddle the Figures

`The country's energy mix of renewables and non renewables used in power generation can explain the country's energy agility. Energy agility can be defined as the ability of an energy system, organization, or economy in a certain country to adapt and respond quickly and effectively to changes in energy demands, technologies, resources, or market conditions. Benchmarking the agility and initiatives in other South East Asia countries might be plausible for Indonesia.

Indonesia's energy mix, with its slow but growing shift toward renewables amidst heavy reliance on non-renewables, reflects limited energy agility, highlighting the country's challenges in swiftly adapting to sustainable energy transitions while maintaining energy security. With a total of 18% renewable energy, Indonesia's agility can be said to be limited compared to other countries like Vietnam. Singapore is a special case, 95% of the total power generation is from non-renewable energy. Singapore used mainly natural gas, which was also mostly bought from Indonesia. They are starting to consider buying from the US because fracking has been so efficient, so effective, and very cost effective (Wirjawan, 2024). The exception in SEA also can be seen from Laos and Cambodia. Thanks to the help from China, which has been building massive capabilities in hydropower. The way forward is that Indonesia needs to achieve the renewables bandwagon.

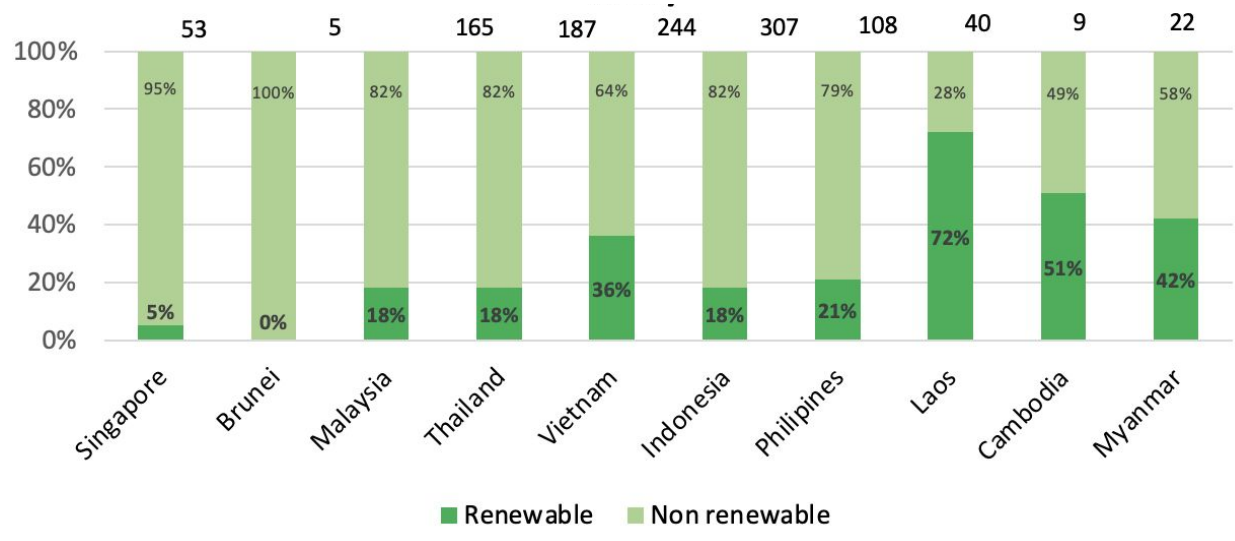


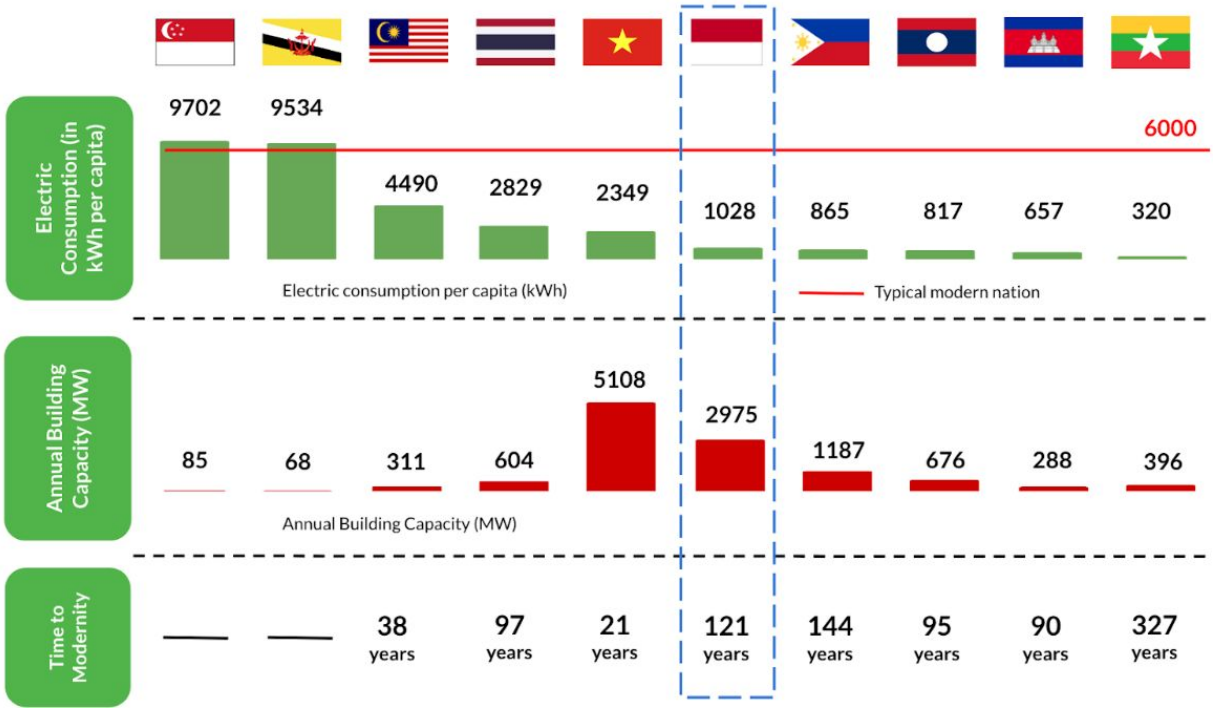
Figure 5. Power Generation Capabilities across SEA (in billion kWh)

Indonesia Agility

Maybe it's Time for the Government to Fiddle the Figures

One of the most important variables in measuring energy agility is the changes in market demand. The changes in market demand can be easily measured by the total consumption of electricity compared to Indonesia's energy initiatives in achieving modernity. The concept of modernity, as mentioned on how to measure sustainability, will be an instrumental concept to understand current agility of Indonesia in the energy sector and measuring the performance of sustainability in Indonesia simultaneously. Refreshing back to the concept of modernity, modernity can be achieved if and only if the electric consumption per kWh per capita is reaching 6000. The gap between modernity initiatives and current consumption will reflect the changes in market demand.

From the graph alone, Indonesia is far from achieving the sustainable we all dreamt of. Indonesia's current electricity consumption of 1,028 kWh per capita, compared to the 6,000 kWh per capita required to achieve modernity, highlights a pressing need for enhanced energy agility. This massive gap implies a significant increase in market demand, necessitating the rapid expansion of energy infrastructure, improved efficiency in energy usage, and diversification of energy sources. Even though, in South East Asia, only Singapore and Brunei have achieved modernity, Indonesia needs to learn from institutional voids to business opportunities to boost the electricity consumption per capita to 6000. Below graph is processed by the writer with Gita Wirjawan Paradox of Sustainability paper as the main references.

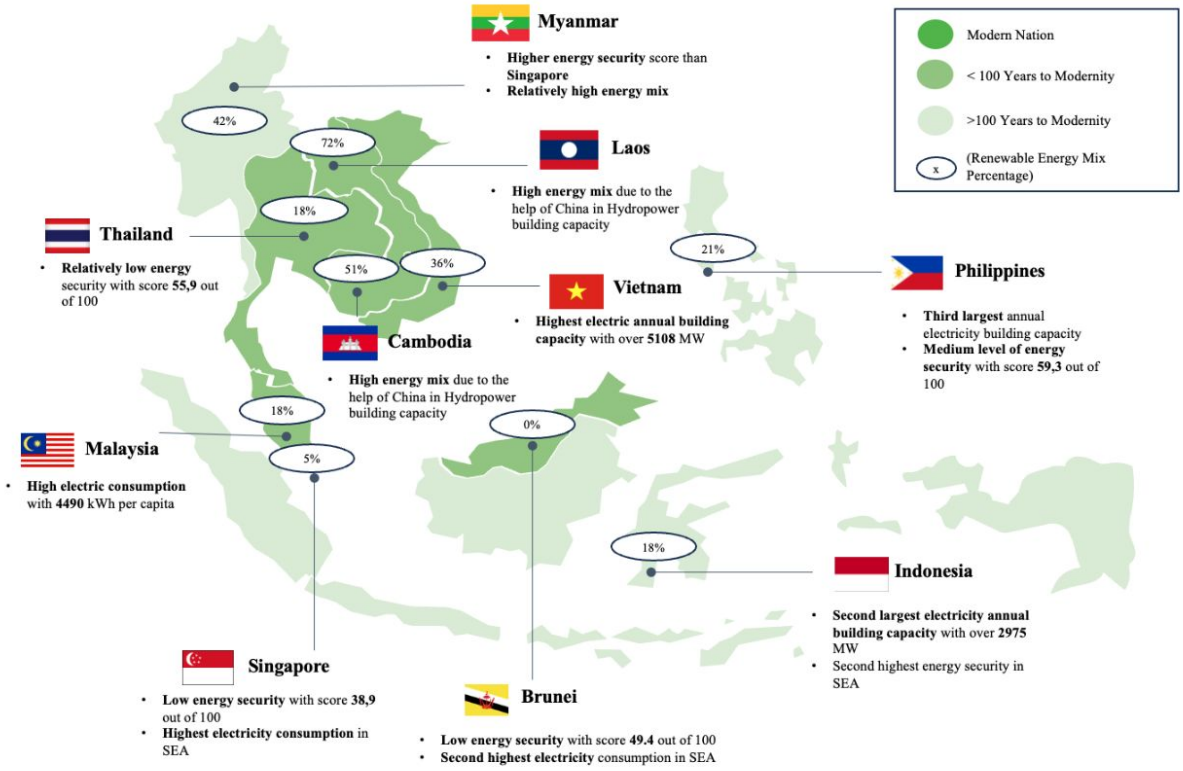


Indonesia Agility

Maybe it's Time for the Government to Fiddle the Figures

Do we want to wait for 121 years? Indonesia will be 200 years old by the time Indonesia achieves modernity and we don't have the time for that. Compared to countries like Vietnam and Malaysia that require 21 years and 38 years respectively, it is a significant proof of the incompetence of Indonesia in achieving the sustainable narratives by 2030 or even the golden age of Indonesia by 2045. Achieving this demand sustainably will require accelerating the transition of renewable energy, reducing dependency on non-renewables, and increasing technological breakthroughs to meet modernity. Energy agility then becomes crucial to balance market demand, resource availability, and environmental sustainability while ensuring equitable energy access across the nation. Without a more aggressive transition toward cleaner energy sources and efficient energy utilization, Indonesia's current trajectory falls short of supporting the sustainability narratives central to its national and global commitments. Maybe it's time for the government to fiddle with the figures on renewables energy mix.

Summarizing energy security, agility, and national modernity a map can be constructed to better understand the landscape in which Indonesians need to understand. This map will serve as a summary of the current state of energy in Indonesia compared to other Southeast Asian countries.



The Cost to Modernity

Sustainability is often integrated with modernity. “Modernity” itself is defined as a state for which something is modern; in this sense it can also be defined as something of difference in context of the past (Shilliam, 2010). With modernity being actuated to many things, energy is no exception. Now, compared to decades to centuries ago, a variety of innovation and methods of harnessing energy in the modern world have greatly increased. Yet, with this being said, this opportunity is not distributed equally; there are nations with greater energy technology (Shieh & Chang, 2021); even in neighboring countries such as Indonesia, Singapore and Malaysia, energy generation looks very different. If we take a look at some countries' energy usage, we can see an imbalance which begs the question: how can we define high energy modernity?

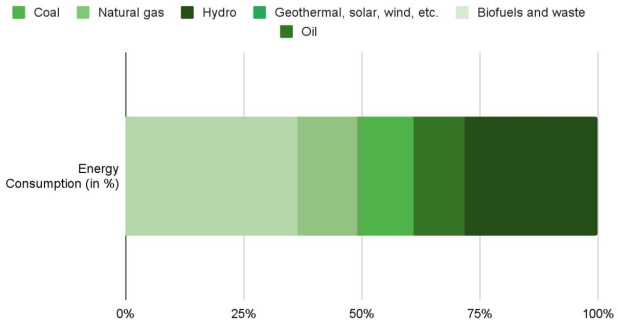


Figure 6. Indonesia Energy Consumption (2022)

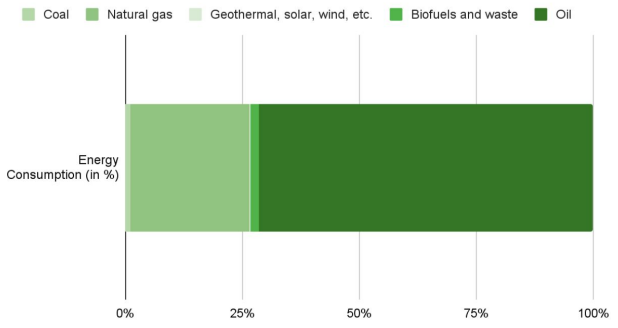


Figure 7. Singapore Energy Consumption (2022)

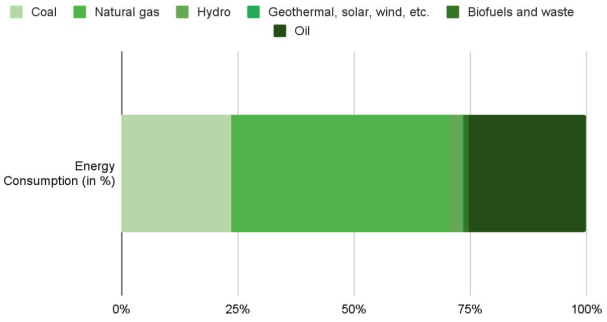


Figure 8. Malaysia Energy Consumption (2022)

According to King (2024), the high energy modernity can be characterized by a few things: High energy intensity at a low cost, high quality of energy, improved quality of life and a sustainable source of energy; something identified within IEA’s energy trilemma.

As the world gets evermore complex, high energy intensity is needed in order to keep up with international demand for commodities. High energy intensity communities tend to be more catering to more complex yet optimal operations capable of bettering the lives of many and lighting up industries creating an environment where people would worry less about basic commodities and reach self actualisation. This marks the importance of high energy intensity. So, how about Indonesia?

Counter the Pessimist

Why is the narrative of “always become the fossil fuel era” wrong?

By the time you are reading this section, you might become very pessimistic about Indonesia's performance and commitment to the renewable energy mix. Even some of the most famous figures in the world clearly stated that the world will always become the fossil fuel era period. So should we keep trying to achieve modernity, keep up the figures of renewables energy mix, and trying to invest in renewables sectors to achieve sustainability?

Despite the cost and the time, the concept of modernity does really come to light. As Nick Eyre, a researcher from the University of Oxford, once stated “If we had to replace all our current energy use with renewables, I would be very pessimistic. But if we can replace half of our current energy use with energy efficiency and the other half with renewables, then it looks a lot easier”. But what Nick Eyre is actually trying to say? How can Indonesia and businesses can learn from this?

Let's take a look at the value chain of energy. The value chain of energy can be divided into four parts: primary, secondary, final, and useful energy. Primary energy is the original energy that is used to produce power. It can be a piece of coal, a wind that moves a turbine, or the kinetic energy produced by waves. That primary energy then is converted into secondary energy, which is going to make it transportable. The secondary energy is the energy that goes into the grid, or the refined gasoline, or the petrol that goes to the local petrol station. When the energy gets to the user, that is called the final energy. However, when the user actually uses the energy, it is called the useful energy.

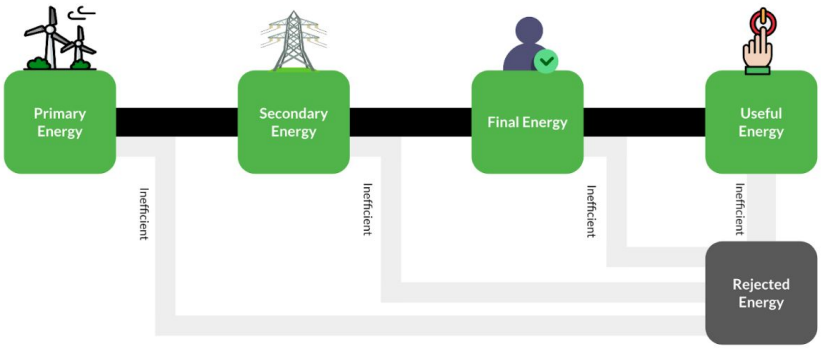
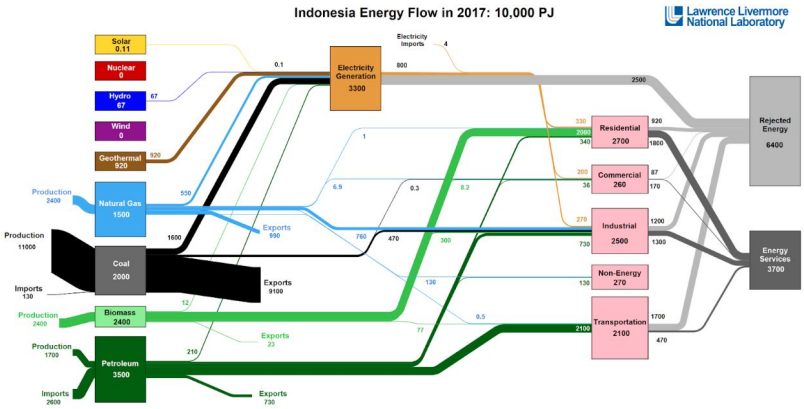


Figure 9. Energy Value Chain

Every stage of the energy value chain is inefficient and some portions of the energy generated, transported, or used is actually wasted. The wasted energy can be called as rejected energy (which can also be said to be the 5th type of energy). One of the most prominent research to take a closer look at rejected energy is the Sankey Diagram developed by Lawrence Livermore National Laboratory. The Sankey Diagram explains the energy value chain flow and can be seen on the graphs below (using Indonesia 2017’s Sankey Diagram as a case study).

Counter the Pessimist

Why is the narrative of “always become the fossil fuel era” wrong?



Around ⅔ of the energy we produce ends up wasted. Why is so much energy wasted? For instance, when coal or other primary energy is used to move a steam turbine, around 65% of the heat generated is lost to the environment. This also shows how primary non-renewables energy like the fossil fuel based appliances and engines are inefficient. In a completely working car, the energy used by fossil fuel energy generation is only about 20%, the 80% is completely wasted whether as thermal losses from the engine or to power other parts of the car system. Furthermore, non-renewables energy plants also come at a maintenance time and that wastes a lot of energy. The problem is getting even worse when we push the electricity grid to the limit, which is a phenomenon called peak demand. When we actually reach or exceed the peak demand, utilities companies start to turn on older and less efficient plants to keep up with the demand.

The good news is that research has shown that renewable energy generators like solar panels, wind turbines, and hydropower plants don't need to burn anything to produce electricity, which reduces wasted energy. Renewable energy is far more efficient. When a fossil fuel is burnt to generate heat to drive the turbine that generates electricity, a wind turbine skips the first two processes (burnt primary energy and generates heat) and goes straight to the turbine which generates electricity. Furthermore, if we substitute fossil fuels with electricity, meaning that we also substitute all the machines we rely on today that burn gas or petrol to work, we would now have to use electricity instead (and then make the energy used much more efficient). This means it is not mission impossible to achieve modernity as long as Indonesia creates a totality strategy for a better transition of energy.

But does transitioning to electricity also benefit market actors like businesses or will it only benefit the government to achieve modernity and sustainability? In 2021, Nick Eyre found that businesses need 40% less final energy than the current status quo. Then it means that the switch to renewables involves a switch to electricity which helps energy efficiency. This actually integrates and creates the system that achieving modernity and sustainability through renewable energy and electricity is not a mission impossible (Eyre, 2023).

A nation can develop greater energy potential by effectively involving, managing, and collaborating stakeholders in the aims of **national objectives.**

Indonesia's Forward Vector

Plausible Solutions to Achieve Modernity, Energy Security, and Energy Sustainability

Transforming Perceptions

Knowing is merely half the battle. This sentiment rings true in the transition to become more sustainable. In order to transition into a more sustainable energy, just increasing energy supply is not enough. Rather, the demand for sustainable energy must be able to match. This is revealed in the study by Hartono et al. as mentioned prior showing that although the energy initiatives have been somewhat effective, bottleneck still persists especially in rural areas. Accessibility, in this case, is not merely infrastructure but rather a wider umbrella of things that prevents people from accessing energy initiatives. One thing that was noted by Hartono et al. was the importance of education.

Sustainable energy initiatives in rural areas is not necessarily an uncommon thing in Indonesia's more rural & especially more impoverished areas. As such the government just operated 6 newly made solar powered power plants in the 3T region (regions that are of lesser quality in terms of infrastructure and human development in Indonesia). However, this being said, it remains a challenge for the government to fully socialize these changes to the people.

Public perception and public socialization

In a study conducted by Viendyasari et al. (2022), some things are revealed regarding public perception of renewable energy . Firstly, public perception of renewable energy is correlated with status, educational attainment and how exposed an individual is to digital media. Secondly, a sizable number of people still view renewable energy as a more expensive option in Indonesia, however once people actually experience what renewable energy is like they tend to take further initiatives to utilize renewable energy; participation is also supported by a research done by Loy et al. (2024). Finally, most effective socialization for this sample happens via social media with collaborative actions between public, private and community engagements which is then supported by word of mouth.

From this and a variety of other resources, we can conclude some key pointers that mark a successful public education of Renewable energy. Largely, the key pointers are very contextual due to the nature of NRE knowledge being non-equitous. At its risk, non-alignment of these communication methods could at best be a simple waste of money or at worst an unswallowable and insensitive message. Therefore, a thorough analysis must be done in order to transform this perception.

Indonesia's Forward Vector

Plausible Solutions to Achieve Modernity, Energy Security, and Energy Sustainability

Amping up the ante on the education sector

Amping up the ante in the education sector can also greatly assist sustainability initiatives. Currently there are multiple ways that tertiary institutions are helping sustainability efforts. For example, things such as modification of curriculums, execution of mandatory community service along with changing of faculty and university and values towards a more sustainable outlook are few of the many ways the education sector, especially the tertiary sector, have helped transition energy in Indonesia. Some primary and secondary schools have also started to implement teachings of sustainability to teach them young.

However despite these inferences, there is always room to intensify their impact. As such, efforts for energy transition in tertiary education are not always grand. A lot of them are actually community or organization based and for the most part forms the issue of scalability. Same thing goes to the mandatory community service where for the most part sponsors are needed to scale their impact. Yet, their impacts are true. As such, an upcoming community service team has a goal of socializing nuclear energy in the western side of Indonesia. Student groups have become a hotbed for impact and thus could be more better utilized to create a smoother energy transition.

A study by Farida, Iqbal and Iswahyudi (2024) also shows that the study of sustainability is still relatively new and is still mainly centered around governance despite their growth. As a result, there may be a lack of increased knowledge in topics such as biodiversity and many more themes. As a result, this can create a condition of stagnation in knowledge and its knowledge transfer which hinders effort to cover the broad groups of sustainability.

Hence, this matter creates an opportunity for both the public and private sector to chime in and help the education sector. These help may not always have to be in terms of funding but could also be in terms of guidance. Thus, further attention should be given to the education sector both in terms of its institutions as well as the members in them.

Understandably, communicating and creating initiatives for the energy transition is difficult. For this, 180DC UGM can help by:

- Developing your customer persona
- Assessing potential impact of communication strategy
- Enhancing your communication strategy to reach better effectiveness
- Helping you create fitting assessment matrix for your strategies

Robust Formal Institutions and Political Culture

The term “circular economy” has been a phrase that has been thrown around more often than not in recent years. This is of course for a reason; our planet is facing a climate crisis and something needs to be done. Thus, a focus should be emphasized on the common good and for the common good.

When it comes to a circular economy, it is important to understand the status quo: linear economy. Linear economy is an economic process where things are produced and things that are not used become waste and are promptly thrown away hence the alternate name for this economic process being the “take-make-waste” economy (Ellen McArthur Foundation, 2023). Although this has been going on for the longest time, attention is shifting into the consequences of this wasteful process. With environmental concerns in mind, a new economic process is concocted namely the circular economy. It aims to reduce waste by reuses in a variety of other ways and processes and ensures that wastes are safe when wasted.

For a circular economy to happen, a solid pillar is needed namely from formal institutions such as the government. To create a sustainable initiative, the importance of the government cannot be overstated. As such, referring to previous study by Viendyasari, it was a key note that government and collaboration plays a huge part in transitioning energy. The same sentiment is shared by Perciun, Șavga and Iordachi (2023) in their study about the practice for circular economy as the government holds the responsibility as they are the creator and enabler of the circular economy framework for the nation.

With this being in mind, a change in mindset is desperately needed. One fundamental mindset that must be changed is regarding gratification. According to the cultural factor (n.d.), Indonesia’s long term orientation is at an index of 29 out of 100. This implies that Indonesia for the most part prefers short term than long term gratification. Where this hinders sustainability initiatives is the fact that transitioning is not necessarily quick.

For the most part, circularity may require more research and more process adding up to processes of anything in relation with a payback not as immediate as one of linear economy. Equally, the consequence of a linear economy is not immediate but rather gradual. A combination of these 2 factors makes circular economy difficult for those who prefer short term gratification.

Another thing to keep in mind is regarding political willingness. To create an energy transition is to create a political environment that fits it. For this, political willingness is required. Political willingness is defined as a “demonstrated credible intent of a political actor”. It is essentially where a political actor takes the time and effort to achieve a set of objectives and undertake its cost (Kukutschka, 2014).

Robust Formal Institutions and Political Culture

Political willingness is important in any initiative not just limited to sustainability. Yet, as seen with many criticisms for Indonesia's sustainability initiatives, many critics have questioned the legitimacy of the Indonesian government's political willingness. All government effort is a pie chart; that is, every cost and effort increase on 1 activity will reduce the other. To put it into perspective, the US$ ~1B is a value that has both been taken and has been taken from by other initiatives. With this, it should be emphasized more now that greater initiatives for sustainability are possible. However, the government must be willing to act on it.

The nature of political and formal institutions is the start of sustainable development environmentally and economically. A solution for all this is, to put it bluntly, to change how to think. Prioritize the long term consequences of everything and have the willingness to execute to redirect Indonesia's forward vector in the right path

However, in execution, this is way more complex than as said. Governance is always a balancing act between many issues. Unless urgent, the government could not give 100% on one certain initiative which creates many business opportunities.

To this aspect, here is how 180DC UGM can help you:

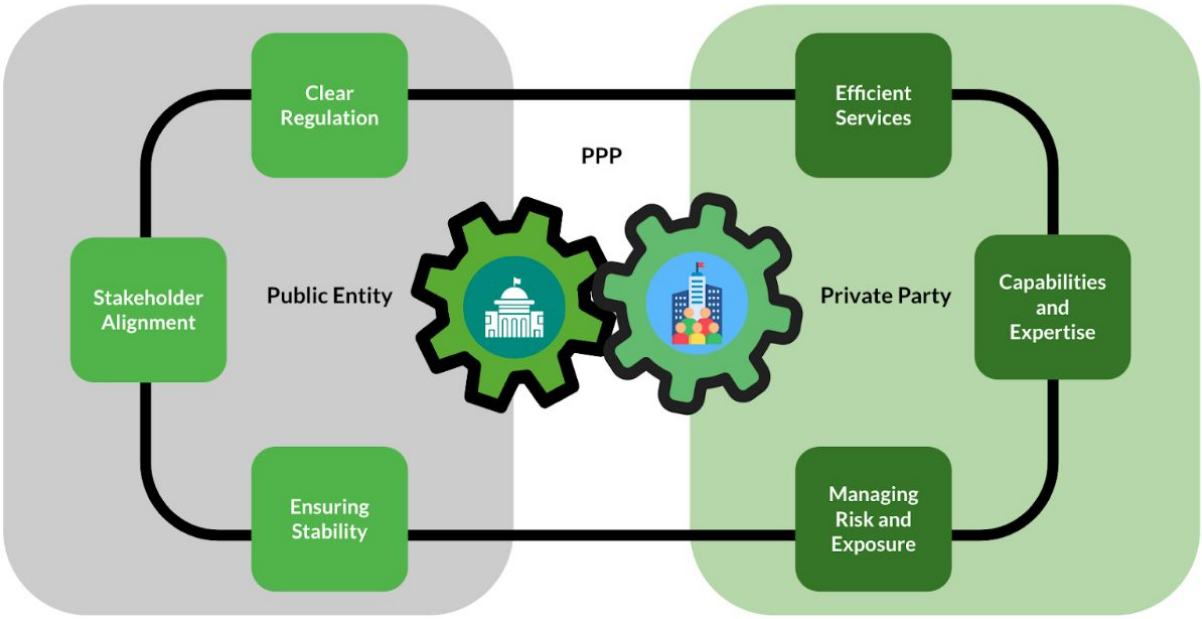
- Create analysis as well as pitch decks that could attract both public and private entities (Ini project scope gw pas Mankaya)
- Mapping possible collaborators for your project and its phases
- Enhancing and fitting your business model in regulatory aspects

Public-Private Partnerships (PPP) Opportunities in Attaining Sustainability

Investing in sustainability initiatives, green technology, and renewable energy is inherently capital-intensive, large-scale, and long-term. Achieving sustainability and modernity requires the government to allocate substantial resources to build energy infrastructure. However, with limited funds, the government must find sustainable solutions to ensure these investments continue to grow over time. Thus, sets of solutions emerged to test its effectiveness to achieve national objectives.

Public-Private Partnerships (PPP) has been popular among the government and business owners because of its effectiveness in undergoing such a large-scale project. Public-Private Partnerships is a long-term contract between the government (public) entity and private party for providing a public asset or service in which the private parties bear a significant risk and management responsibility and remuneration is linked to performance (World Bank, 2025). The significant risks mentioned include cost overruns, technical defects, and the failure to meet the quality standard for private parties and agreed-upon usage fees may not be supported by demand for public entities (Investopedia, 2024). This partnership is deemed effective because both private and public resources, capital, and innovation are combined with public incentives to complete the project on time and within the budget. The below figure explaining responsibilities of each parties in PPP:

PPP Parties Responsibility and Dynamics



PPP Opportunities in Attaining Sustainability

PPP would obviously help Indonesia as a nation to achieve modernity and sustainability due to several reasons. Firstly, PPPs can accelerate sustainability, modernity, and renewable energy infrastructure. Sharing booths, financial risk and capabilities from private and public entities, it can reduce the burden on public budgets and increase the quality of the infrastructure in accelerating sustainability and modernity. This can also be achieved by incorporating ESG compliance into long-term contracts and project designs, ensuring that sustainability is evaluated not only by its means but also by its outcomes. Secondly, to increase the energy mix of Indonesia, the government should not only give incentives to renewable investment but also collaborate with private entities to accelerate the investment. It is true that it would be very beneficial for the government to also give incentives for newly built businesses to invest in renewable energies before they even incurred the capital expenditure, but the government should also sponsor and attract private investment in the first place. Lastly, to ensure PPP strategies are far from elitist narratives, PPP could also help to develop the urban and rural areas in terms of its electrification and renewable energy generation. Since the current Indonesia energy infrastructure is limited and inaccessible, PPP projects could help to cater more undeveloped areas to increase their energy infrastructure evenly.

Risk and Challenges of PPPs in Indonesia

Despite the merits of PPP, Indonesia and most developing countries may face great difficulties in making sure PPPs projects are going well. The public entity in a typical developing economy such as Indonesia has some sort of structural challenges at the rate the interest between talent and power is very questionable (Wirjawan, 2024). This misalignment stems from issues such as political patronage, lack of merit-based appointments, and an inefficient bureaucracy, which can hinder effective governance and the optimal utilization of skilled individuals. These conditions are usually called institutional voids. Institutional voids can be defined as the gaps that exist in specific markets that serve as a roadblock to the ideal interactions and transactions of buyer and sellers. For an effective PPP, it requires a serendipity between the nation's leaders, the public entity, the private parties, and with the people.

PPP Opportunities in Attaining Sustainability

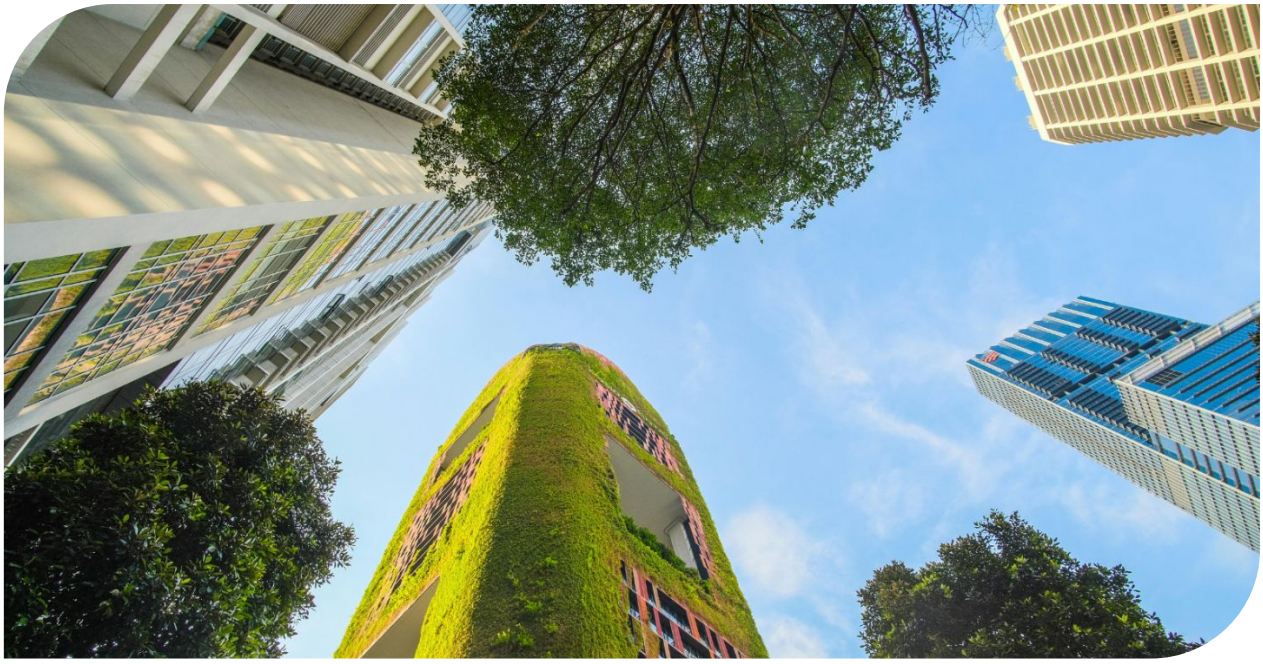
In typical developing economies, serendipity is unlikely to happen. Due to challenges like conflicting interests, weak institutional frameworks, and a lack of trust among stakeholders, serendipity to maximize a broad range of stakeholder value is far from the ideal. Then, what's the perfect example of serendipity that could create such radical changes? The serendipity between Lee Kwan Yue and its private parties and people is something that Indonesia needs to learn. His visionary governance created an environment where the government, private sector, and citizens worked cohesively toward national progress. This alignment was achieved through strong institutional frameworks, a merit-based system, and a clear commitment to public welfare and economic growth. Indonesia could learn from this model by fostering trust, strengthening institutions, and ensuring all stakeholders share a unified vision for development.

Furthermore, if PPPs projects are capital intensive and to achieve national goals it requires numerous PPPs, the money liquidity factor comes into place. The developing economies money liquidity is not ideal. Especially in the status quo, countries like Indonesia still have underdeveloped banks, limited access to financial markets, and regulatory inefficiencies that can restrict the flow of money and create liquidity shortages. This hasn't taken into account economic risk such as external shock, uncontrolled inflation, and currency volatility. Taking into account this exposure and risk, governments robustness of formal institutions is very vital. The current government now needs to fight against the pre-existing mediocrity.

The inequality of the world's money liquidity can help to explain this phenomenon. When it comes to money liquidity in terms of trillions of dollars, around 60 trillion dollars are being managed by 17 transnational investments. This may sound like a good signal, but if most of the money supply is controlled by transnational corporations and investment, it will not practically favour the government especially in the developing economies. One of the main characteristics of transnational corporations and investment is they need to recycle their capital every seven years or ten years at maximum. When it comes to the government plan and project design, it usually takes more than 10 years. Thus, this recycle of capital does not reconcile with the government's large-scale project for 10, 20, or even 30 years. It reflects the need for more private parties.

PPP Opportunities in Attaining Sustainability

The institutional voids, government pre-existing mediocrity, and limited money liquidity in Indonesia may not sound good, but it actually opens up numerous vulnerable and subsequent opportunities for private parties and entrepreneurs. Institutional voids have become many entrepreneurs opportunities to build their business with. When the government fails to implement technology innovation, it means that it requires an active participation from the private parties to do the job. This has been the major principle in entrepreneurship in emerging economies, in which opportunities are open from institutional voids and pre-existing mediocrity. But before taking the opportunities into discussion, the private side has to take a view in a totally different way. The private parties need to restructure its pre-existing philosophical nuance to see better development in developing economies through PPPs. Thus, to challenge pre-existing challenges, there also needs to be a change in the pre-existing philosophy of doing business to better navigate PPPs.



What can 180DC UGM do for your business?

- Define PPPs opportunities for your business in various industries.
- Helping with assessing and designing partnership potentials and strategies
- Enhance your business risk management in partnerships potentials and strategies
- Performing a specific institutions-based view analysis to identify opportunities for your business
- Performing specific analysis to identify sustainability initiatives and potentials

The totality strategy of Indonesia: How NGO and NPO will be the catalyst?

There needs to be an effectives check and balances mechanism in Indonesia's sustainability initiatives and strategies. Business, big projects, and governments are prone to act not within the interest of major stakeholders, causing further agency problems that can result in inefficiency and ineffectiveness of strategy implementation. An effective check and balance can be described as the set of mechanisms that successfully distribute and limit power among different branches or entities within the relationships of the government, private parties, and individuals. To achieve this, the role of NGO, NPO, and communities is crucial. The totality of strategy of Indonesia is paramount, meaning all relevant parties need not only investment, partnerships, managerial changes, and cultural changes, but also an effective check and balance for further evaluation and retrospect.

NGO, NPO, and communities that are independent, mission-driven, and usually advocate particular issues can be the catalyst in achieving the sustainability objectives and narratives more effectively. In Indonesia, The total number of NGOs in Indonesia is estimated to be between 7,000 to 8,000, with approximately 500 considered "environmental NGOs" that mainly address environmental problems (Nomura, 2007). This number is phenomenal, which can unveil the potential of advocacy and a better check and balances toward both the public entity and private sectors. There are several reasons on why check and balances could occur (the reasons is also derived from previous solutions and recommendations):

1. **Hold Government Accountable**

   NGO, NPO, and communities are vital in helding the government accountable for their sustainability commitments, initiatives, and short and long term strategies. This can be done through advocacy and coalitions. Especially within the presence of SDGs, the most important added value is in terms of the role that it invites NGOs, NPOs, and communities to create new coalitions for advocacy and accountability (Hege & Demailly, n/d). Skepticism might say that coalitions have existed before. Yes it is true, however the presence of SDGs and sustainability narratives allow for much broader collaboration beyond activity sectors. For instance, formal coalitions and even informal networks to strengthen the cross-sectoral collaboration can lead to common accountability activities such as joint position papers and criticism and comments regarding government and national sustainability implementation process. The perfect implementation of this is countries like Germany and France, whereas they include NGOs in sustainability development plan discourse and a high level political forum.

The totality strategy of Indonesia: How NGO and NPO will be the catalyst?

In Indonesia, there are several good examples that could turn the spirits up for more NGOs to participate in advocating government's accountability. Several examples such as but not limited to Greenpeace Indonesia and Central of Economic and Law Studies (CELIOS) in Bali have made significant progress in holding the government accountable. White papers, agitative infographics in social media, and public discourse are being held to increase pressure for the government to be held accountable. Through social media, website, and internet utilization, these advocacy is not only reachable by academics, but also to ordinary people due to its simplicity but detailed writings.

2. **Private Sector Engagement**

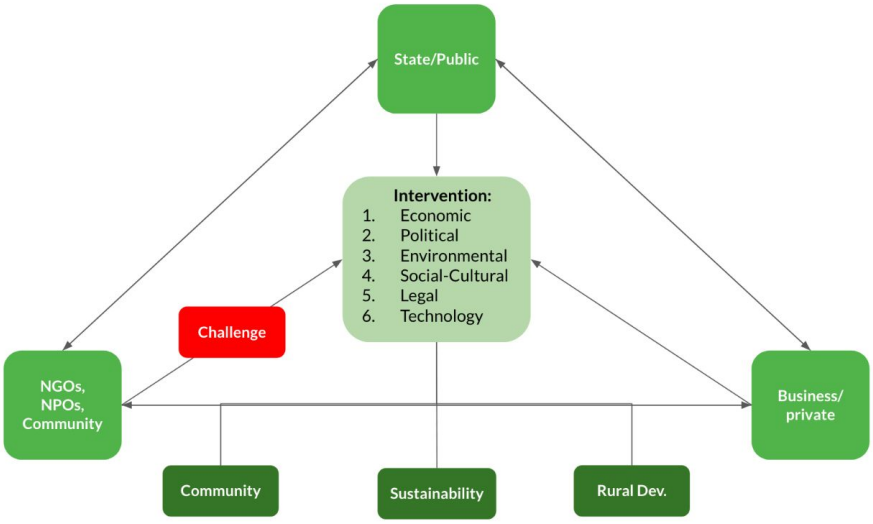
   NGOs, NPOs, and communities can act as "critical friends" toward the private sector such as businesses. "Critical friends" refers to individuals or organizations that provide constructive feedback and hold others accountable while maintaining a collaborative and supportive relationship. In the context of NGOs, NPOs, and communities acting as critical friends to businesses, it means they critically evaluate and challenge business practices, particularly on ethical, social, and environmental issues, while working together to encourage improvements and positive outcomes. However, the roles of NGOs can also be further elaborated. For instance, NGOs play an essential role in promoting awareness and generating public demand for sustainable consumption and production, while also monitoring voluntary commitments to determine whether private sector participation is genuine or simply superficial, without real transformation of business models.

3. **Increasing Public Awareness and Education**

   NGOs recognize their significant role in raising public awareness about the SDGs (Spitz, Kamphof, van Ewijk 2015). They can share updates on government progress and enhance the transparency of policy processes. One of the main objectives of raising awareness to the public is mainly because of two things: minimizing the elitism paradigm in sustainability narratives and empowering citizens to act more sustainable. This is deemed effectives because the objectives can turn one way or another. As far as PPPs are being implemented, the role of NGOs here is worth exploring since NGOs can have the capacity in increasing the demand on sustainable markets to end customers, businesses, and even the government. For instance, if the society's demand for sustainable materials and development keeps increasing, it can increase the capacity of NGOs, NPOs, and communities in pressuring the government to take up their accountability role on sustainability.

The totality strategy of Indonesia: How NGO and NPO will be the catalyst?

Overall, the writer of this report develop the framework on the interrelationship between NPOs, NGOs, Community, with the state (public) and businesses (private) on how they could provide an effective check and balances for the nation:



The role of NGOs, NPOs, and communities may be significant, but challenges also exist in their roles. Six important challenges to the role of NGOs, NPOs, and communities noted by Hege and Demailly include:

1. NGOs are increasingly mobilized at the national level. It is reasonable to say that NGO mobilization tends to favor development-focused organizations and those engaged in international issues with familiarity with the UN system, rather than those operating at the national level, and even less so those working locally.
2. There is a great need to clarify what is expected from NGOs in terms of implementing SDGs and other sustainability initiatives at the national level and the local level.
3. NGO, NPO, and community involvement still depends on how they perceive the political credibility of sustainability locally, nationally, and internationally.
4. The mobilization of NGO, NPO, and communities is heavily relies on their financial capabilities
5. For many NGOs, integration and universality are meaningful but fragile concepts, as global challenges are often addressed in isolation, making these principles the core strength of the SDGs and a key driver for NGO mobilization.
6. A significant SDG knowledge gap exists between international, national, and local levels, requiring efforts from the UN, governments, and NGOs to bridge it through targeted communication, as seen in Germany, where specialized organizations have successfully mobilized others.

The totality strategy of Indonesia: How NGO and NPO will be the catalyst?

Despite the challenges and opportunities, Indonesia needs the totality of strategy to achieve sustainability, modernity, and net zero emission, and other things that you can name of. Investment is crucial, institutions stability is paramount, and partnerships can help to realize these initiatives, but the role of NGOs, NPOs, and communities can serve as a catalyst and a check-and-balance mechanism for both public entities and private sector initiatives. It is mainly because the main objectives of these stakeholders are actually the same: bottom line, net zero, and sustainability.

Indonesia's Forward Vector

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What can 180DC UGM do for your business?

1. Helps NGOS, NPOs, and communities deliverables strategies to enhance their presence locally and nationally
2. Helping NGOs, NPOs, and communities in clarifying their business model, business process, and current strategies to combine and implement SDGs and sustainability values
3. Enhance your business sustainability implementation strategies through creative norms in education, investment, and partnerships
4. Multiply strategic impact for not only the NGOs, NPOs, and communities themselves, but also for their respective industries
5. Amplify strategies for NGOs, NPOs, and communities by developing, measuring, and communicating the impact of sustainability initiatives

Indonesia's Forward Vector

Our energy choices define the world we leave behind.

Data, statistics, and inference on Indonesia's current performance in energy management may not be appetizing. However, these obstacles should not overshadow the nation's greatest aspiration—to achieve both modernity and sustainability. Indonesia's journey toward sustainable energy management is undeniably complex and requires a multi-dimensional approach. It involves not only the refinement of current strategies but also a long-term commitment to innovation, policy reform, and technological advancement.

"Our energy choices define the world we leave behind" is not only inference on how we use our energy on a daily basis, but also a message on how people should keep their energy on optimism and positivity for a more sustainable future. It is time to shift our paradigm from defeatism to optimism. Achieving a sustainable energy future for Indonesia will require a shift in mindset, alongside robust policy frameworks that align economic development with environmental preservation. While the road ahead may be arduous, it is vital to recognize that the pursuit of sustainability is not just a choice, but an imperative for future generations. This journey, though demanding, represents an opportunity and hope to propel Indonesia toward a future that embraces both progress and environmental stewardship.

A sustainable future demands a **national vision,** where energy, resources, and policy are crafted not for today, but for the well-being of generations to come.

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Relevance of SDGs covered in the research paper	
Focused Material Issues	**Details/Topics**
Promoting the importance of education for sustainable future	*Promoting climate change and issues as the basis of the research paper* • "The earth has music for those who listen" reflects the need for change • Extreme weather, enduring prolonged droughts, and other climate crisis affects our community *Highlighting current landscape, challenges, and benchmark of clean and renewables energy in Indonesia and Southeast Asia (SEA)* • Indonesia's energy mix, energy security, and infrastructure to achieve modernity need to be increased • The cost to modernity and sustainability is very expensive, thus it requires total commitment *Constructing the totality strategy of Indonesia in achieving sustainability* • The need for more investment in education sector to shift perception from defeatism to optimism • Embracing collaboration and check and balances mechanism between network of stakeholders *Promoting sustainable societies and nations as the ultimate goal of the research paper* • "A sustainable future demands a national vision, where energy, resources, and policy are crafted not for today, but for the well-being of generations to come"
Contributing to clean energy potential research	
Contributing to energy industry research and potential innovations	
Promoting stable and sustainable societies	
Utilizing climate action issue and principles for problem-solving	
Collaboration to gain communal needs and greater objectives	

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