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SUSTAINABLE ENERGY TRANSITION IN ASEAN

INSIGHTS & TRENDS 2023 - 2024

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Executive Summary

The report emphasizes the urgent need for the ASEAN region to shift to sustainable energy due to climate change risks and high carbon emissions. An estimated investment of 1.5-2.7% of GDP annually until 2050, totaling USD 29.4 trillion, is required.

Despite challenges, such as grid integration and infrastructure deficits, there are significant growth opportunities in renewable energy. Policy transparency, stakeholder coordination, and regulatory enhancements are crucial for a successful transition to a net-zero economy.

This detailed report, produced jointly by iDeals and EMIS, highlights the ASEAN region's journey towards sustainable energy. Given the region's vulnerability to climate change and significant carbon emissions—primarily from Vietnam, Indonesia, and Malaysia—a move towards sustainability is essential. This journey to a net-zero economy in the region means growing the renewable energy sector, with a focus on solar, wind, and hydropower projects. The shift requires substantial investment, with the region needing to invest 1.5-2.7% of its GDP annually until 2050 in the renewable energy sector to meet its Paris Agreement targets. The total investment for the energy transition in ASEAN is estimated to be USD 29.4 trillion by 2050.

The report also highlights the challenges faced by the region in this transition, such as grid integration, infrastructure deficits, financing issues, community opposition, and a coal-centric approach in certain countries. Despite these challenges, the region presents significant opportunities for growth and development in the renewable energy sector. Specifically, the analysis offers insights into Indonesia's electric power and renewable energy sectors, as well as the broader ASEAN region. It emphasizes the importance of policy transparency, stakeholder coordination, and enhanced regulatory frameworks for the successful transition to a net-zero economy.

Overview Of The ASEAN Region's Transition To A Net-Zero Economy

The ASEAN region, highly vulnerable to climate change and with high carbon emissions, needs to transition to a net-zero economy. This involves significant investment in renewable energy, aiming for 100% adoption by 2050 and a 35% increase in installed power capacity by 2025.

The ASEAN region is facing a compelling imperative to transition to a net-zero economy due to its vulnerability to the impacts of climate change. The imperative of transitioning to a net-zero emissions economy is particularly compelling for the ASEAN region. Southeast Asia is one of the most susceptible regions to the impacts of climate change, and the most vulnerable in the Asia region. The region has some of the world's highest carbon emission rates, notably driven by Indonesia and Malaysia, two of the globe's leading coal-producing nations. The imperative for Southeast Asia centers on the vital necessity of decarbonization efforts to halt carbon production and mitigate the pressing issue of climate change.

THE ASEAN REGION WILL NEED TO INVEST IN THE RENEWABLE ENERGY SECTOR ON AVERAGE 1.5-2.7% ANNUALLY OF ITS GDP UNTIL 2050 TO MEET ITS PARIS AGREEMENT TARGETS.

According to the Asian Development Bank, the ASEAN region will need to invest in the renewable energy sector on average 1.5-2.7% annually of its GDP until 2050 to meet its Paris Agreement targets. The ASEAN region has set a target to reduce its reliance on fossil fuels and shift toward cleaner energy sources, requiring a total investment of approximately US $159 billion in the power sector, with around 75% directed towards renewable energy initiatives from 2021 to 2030. Additionally, achieving the energy transition in ASEAN requires a total investment of USD 29.4 trillion by 2050, focusing on achieving 100% renewable energy adoption and limiting the maximum temperature increase to 1.5 degrees Celsius.

The transition to a net-zero economy in the ASEAN region involves aggressive expansion in the renewable energy sector, with a focus on solar, wind, and hydropower projects. However, there are challenges related to integrating renewables into the existing power grid, addressing pricing mechanisms, and resolving issues with technology and financing. The region has committed to raising the proportion of renewable energy in installed power capacity to 35% by 2025, and presently (2023), nine out of 10 governments have pledged to attain net-zero targets by 2050.

The renewable energy and electric power sectors play a crucial role in achieving sustainability goals, particularly in the context of transitioning to a net-zero economy. These sectors are essential for reducing carbon emissions, mitigating climate change, and promoting environmental sustainability. By increasing the adoption of renewable energy sources such as solar, wind, hydro, and geothermal power, countries can significantly reduce their reliance on fossil fuels, which are major contributors to greenhouse gas emissions.

Furthermore, the development and expansion of renewable energy and electric power infrastructure are vital for enhancing energy security and resilience. By diversifying the energy mix and investing in clean energy technologies, countries can reduce their dependence on imported fossil fuels and create a more stable and sustainable energy supply.

Additionally, the renewable energy and electric power sectors contribute to economic growth and job creation. The transition to renewable energy sources and the development of related infrastructure create opportunities for investment, innovation, and employment in the green energy industry. This not only drives economic development but also fosters a more sustainable and inclusive economy.

Investment Required For The Transition

The transition to a net-zero economy in the ASEAN region requires a significant investment to achieve sustainable and resilient growth. According to the Asian Development Bank, the region will need to invest an average of 1.5-2.7% of its GDP annually in the renewable energy sector until 2050 to meet its Paris Agreement targets.

This ambitious goal encompasses a wide range of initiatives, including solar photovoltaic (PV) projects, hydroelectric power generation, various renewable energy sources for electricity production, national and international initiatives for transmission, distribution, storage, and network flexibility, biofuels, electric vehicle charging infrastructure, and more.

The estimated total investment required for the energy transition in ASEAN is projected to be USD 29.4 trillion by 2050, according to the International Renewable Energy Agency (IRENA). This investment is focused on achieving 100% renewable energy adoption and limiting the maximum temperature increase to 1.5 degrees Celsius.

The key areas of investment in the renewable energy and electric power sectors include solar PV, hydroelectric power generation, various renewable energy sources for electricity production, as well as national and international initiatives for transmission, distribution, storage for network flexibility, biofuels, and electric vehicle charging infrastructure.

THE ESTIMATED TOTAL INVESTMENT REQUIRED FOR THE ENERGY TRANSITION IN ASEAN IS PROJECTED TO BE USD 29.4 TRILLION BY 2050, ACCORDING TO THE (IRENA).

Policy Transparency And Stakeholders Coordination

Policy transparency and coordination among stakeholders are crucial for fostering a conducive environment for renewable energy projects. Clear and transparent policies provide certainty for investors and developers, reducing regulatory uncertainty and encouraging long-term investment. Additionally, coordination among stakeholders, including policymakers, regulators, and financial institutions, is essential for aligning efforts and resources towards sustainable growth in the renewable energy sector.

The significance of cooperation and proactive engagement among institutional investors, Multilateral Development Banks, various financial institutions, industry participants, and policymakers is highlighted in the ASEAN region. These collaborative endeavors play a vital role in identifying innovative financing alternatives and strategies tailored to support green energy and energy transition initiatives effectively. The emphasis on diverse cooperation and partnership efforts, with a special emphasis on collaborations that bridge developed and developing nations, underscores the importance of policy transparency and coordination among stakeholders.

Furthermore, the ASEAN region has recognized the importance of international and domestic policy support for sustainable growth. Policymakers, regulators, stock exchanges, rating agencies, and multilateral development banks are identified as key stakeholders that must take essential actions to enhance the efficiency and effectiveness of the financial and project ecosystem to guarantee the availability of funding for transition projects. Strong public policies that regulate and provide incentives for the proliferation of renewable energy are also crucial for achieving a successful transition to clean energy.

The policy transparency and coordination among stakeholders are essential for creating an enabling environment for renewable energy projects. The collaborative efforts and policy support are vital for driving sustainable growth and facilitating the transition to a net-zero economy in the ASEAN region.

Regulatory Frameworks And Their Role In Investment

IN THE ASEAN REGION, REGULATORY BARRIERS AND COMPLEX PROCESSES DISCOURAGE RENEWABLE ENERGY DEVELOPMENT.

Regulatory frameworks play a pivotal role in encouraging investment in renewable energy projects. Clear and stable regulatory frameworks provide a predictable environment for project development, enabling investors to plan and finance projects with confidence. These frameworks should streamline permitting processes, provide clear guidelines for project development, and ensure a stable and supportive environment for renewable energy initiatives.

In the ASEAN region, regulatory barriers, complex permitting processes, and a lack of clear guidelines for renewable energy project development have created hurdles that slow down project approvals and add uncertainty for investors, discouraging renewable energy development. The absence of a clear and stable regulatory framework for renewable energy development makes it hard for investors to plan and finance projects confidently. This uncertainty can deter both domestic and foreign investment in the sector.

The discontinuation of the Feed-in Tariff (FiT) Policy for renewable energy projects and the lack of significant interest in new net metering schemes for rooftop solar have affected the growth of renewable energy in certain countries. Sudden policy changes can deter investment and project development. Despite targets for greater renewable energy participation in the power development plan, the lack of proper and adequate incentives can prevent sector investments.

International And Domestic Policy

International and domestic policy support, enhanced regulatory frameworks, and strong public policies are crucial for fostering sustainable growth and transitioning to a net-zero economy. The ASEAN region, China, Japan, and South Korea need to increase investments in clean energy technologies.

The ASEAN region's commitment to achieving a 23% renewable share of total primary energy supply and a 35% share of total installed capacity by 2025, along with international commitments like the Paris Agreement, underscore the importance of renewable energy in achieving sustainable development goals.

In the Vietnam Renewable Energy Sector, the total renewable energy capacity has shown significant growth, reaching 47,362 MW in 2024. This underscores the importance of policy support in driving the expansion of renewable energy infrastructure, which is essential for reducing carbon emissions and achieving net-zero targets.

Indonesia's Electricity Supply Business Plan for 2021-2030 (RUPTL 2021-2030) reflects the country's commitment to transitioning to a more sustainable energy mix. The plan outlines a shift towards renewable energy sources, with expectations to add 20.9 GW of renewable capacity by 2030. This demonstrates the impact of policy frameworks in driving investments in clean energy technologies.

The Indonesia Electric Power Sector Report highlights the government's initiatives to provide financial incentives for renewable energy projects. For instance, the government has offered soft loans from development banks and multilateral funds to support the development of renewable energy projects. These financial incentives are crucial in attracting investments and fostering sustainable growth in the energy sector.

International policy support, such as participation in agreements like the Paris Agreement, plays a pivotal role in driving collective efforts towards net-zero targets. The collaboration among ASEAN member states and their commitment to international agreements are essential for aligning domestic policies with global sustainability goals.

The Challenges & Opportunities In The ASEAN Region

1

Grid Integration Challenges

The highly fragmented grid in Indonesia and the existing electricity grid in the Philippines may not be designed to handle the intermittent nature of renewable energy sources, such as wind and solar. This variability poses challenges for grid operators and can require backup from conventional power sources.

2

Infrastructure Deficits

The lack of adequate power transmission networks in remote areas poses a significant challenge for renewable project deployment. Building transmission lines and infrastructure for smaller hydro plants can drive up costs, potentially making hydro generation less competitive.

3

Financing Challenges

Renewable energy projects often require substantial upfront investments, which can be challenging to secure, especially for smaller-scale projects. The lack of a supportive financing environment, including limited access to financing options and high interest rates, can deter potential investors and make project development financially unviable.

4

Community Opposition

Opposition from local communities can delay or even halt renewable energy projects, mainly if concerns about the environmental impact and social well-being are not adequately addressed. This can significantly impact the viability of projects.

5 **Technical Capacity Building**

Building technical expertise is essential for the effective planning, development, and operation of renewable energy projects. Government agencies, project developers, and other stakeholders must have the necessary skills and knowledge to navigate the complex world of renewable energy and ensure projects are executed successfully.

6 **Coal-Centric Approach**

Coal-Centric Approach: Indonesia's continued emphasis on coal in its energy mix sets it apart from global trends, where countries are transitioning to clean energy sources and aiming for carbon neutrality. This approach presents a challenge in aligning with global efforts to mitigate environmental impact.

7 **Geothermal Challenges**

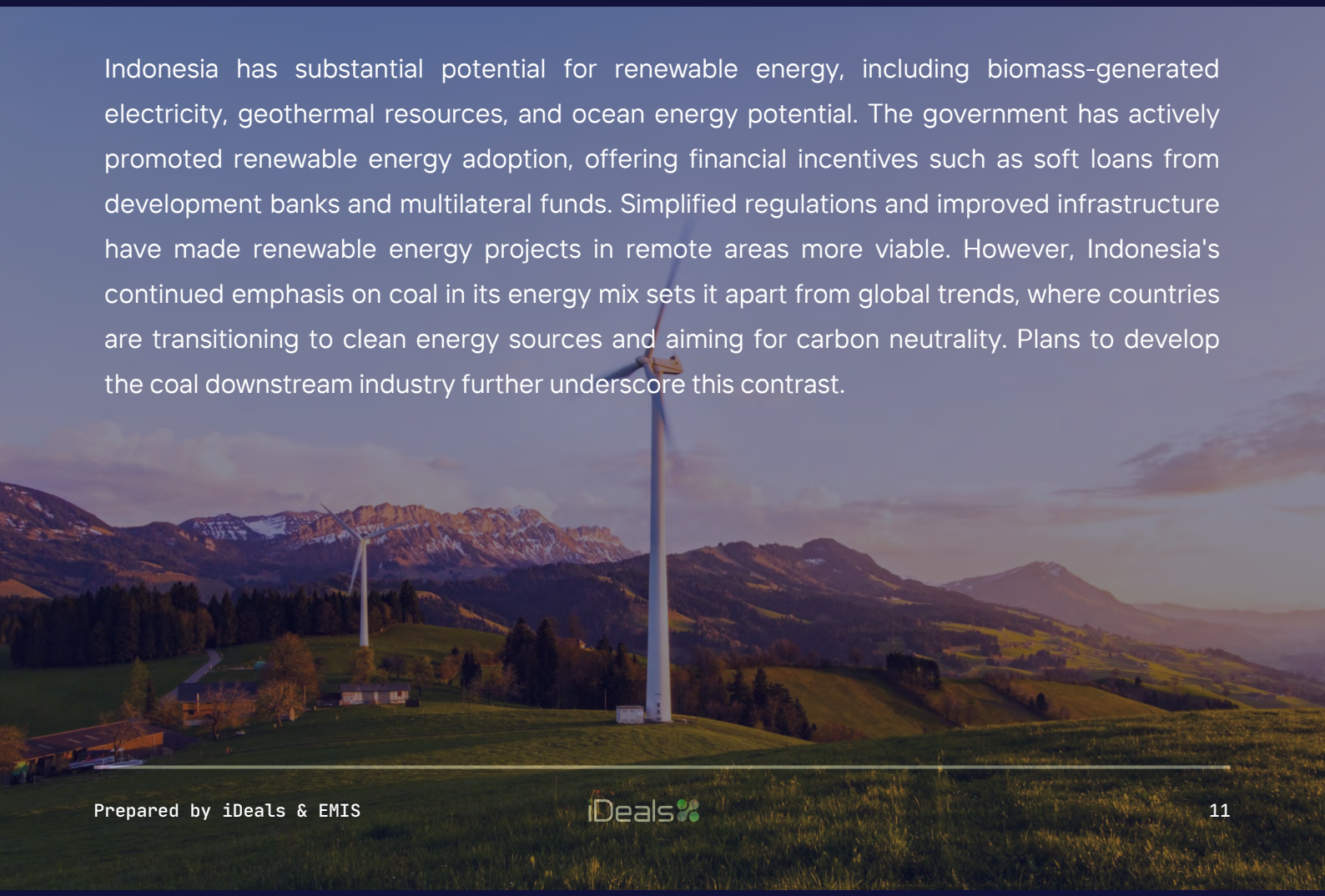
While Indonesia possesses ample geothermal reserves, the associated exploration, land clearing, and drilling costs, along with uncertainties in energy production estimates, present obstacles. Geothermal projects often involve remote, infrastructure-deficient locations, adding complexity and risk.

In conclusion, these challenges highlight the complex landscape of transitioning to a net-zero economy and the development of renewable energy in the ASEAN region. Addressing these challenges will be crucial for achieving sustainable and resilient growth in the region.

Sector-Specific Insights In Indonesia And The Broader ASEAN Region

The electric power sector in Indonesia plays a crucial role in driving economic development and meeting the energy needs of the country. As of 2022, the power generation mix in Indonesia is dominated by coal, accounting for 50% of total installed capacity and over 60% of power generation. Gas-powered plants make up 28% of capacity, while renewable energy sources contribute 15%. The reliance on relatively inexpensive coal and gas fuels has enabled Indonesia to offer affordable electricity rates, benefiting the industrial sector by reducing operating costs. The state-owned enterprise PLN controls the generation and transmission of electric power to 99% of the population, highlighting its significant role in the sector.

Indonesia has substantial potential for renewable energy, including biomass-generated electricity, geothermal resources, and ocean energy potential. The government has actively promoted renewable energy adoption, offering financial incentives such as soft loans from development banks and multilateral funds. Simplified regulations and improved infrastructure have made renewable energy projects in remote areas more viable. However, Indonesia's continued emphasis on coal in its energy mix sets it apart from global trends, where countries are transitioning to clean energy sources and aiming for carbon neutrality. Plans to develop the coal downstream industry further underscore this contrast.



In terms of renewable energy capacity, Indonesia contributes 12.2% of ASEAN's total capacity, with significant potential for biomass-generated electricity, geothermal resources, and ocean energy. The country's transition away from coal will be supported by a coalition of industrialized nations, with USD 20 billion of public and private finance. Indonesia has installed 12.5 GW of renewable energy capacity as of 2022, with renewable energy accounting for 15% of the country's power capacity mix, with hydro accounting for over half of the renewable capacity. However, Indonesia falls significantly behind other Asian countries in terms of solar and wind deployment.

In the broader ASEAN region, the renewable energy sector is experiencing significant growth, with renewables constituting 35% of power capacity by 2025. The region has seen a surge in renewable energy projects, with a substantial pipeline of potential projects in solar, wind, hydro, and ocean or tidal energy resources. The sustained growth of hydropower highlights the region's utilization of its vast water resources for clean energy generation. Additionally, solar power is the segment that witnessed the strongest growth, adding 21.8 GW of new capacity from 2018 to 2022, expanding at a CAGR of 52.9%.

Government initiatives, such as feed-in tariffs, renewable energy targets, tax incentives, and power purchase agreements, have been vital instruments in attracting investments to the renewable energy sector. Some countries, such as the Philippines and Indonesia, have opened up their renewable energy sector to full foreign ownership to attract overseas capital. However, challenges in grid integration, technology-specific challenges, and a coal-centric approach in Indonesia pose significant hurdles for the renewable energy sector in the region.

While Indonesia and the broader ASEAN region have made significant strides in promoting renewable energy adoption and increasing renewable energy capacity, there are challenges and opportunities that need to be addressed to achieve a sustainable and diversified energy mix.

Key Statistics, Industry Trends And Company Profile

The key statistics, industry trends, and company profiles in the electric power and renewable energy sectors in Indonesia and the broader ASEAN region are essential for understanding the market dynamics and investment opportunities.

In the Indonesia Electric Power Sector, key statistics include the total installed power capacity, which has shown consistent growth from 65.0 GW in 2018 to 81.2 GW in 2022. The sector's reliance on coal is evident, with coal power installed capacity increasing from 31,587.2 MW in 2018 to 40,650.0 MW in 2022. Additionally, natural gas and hydro installed capacities have also shown growth over the years.

In the ASEAN Renewable Energy Sector, the electric power generation capacity has increased from 48,573 MW in 2018 to 77,737 MW in 2022. The total renewable energy capacity has also shown significant growth, reaching 45,326 MW in 2022. Hydropower capacity has been a significant contributor to renewable energy capacity, showing consistent growth over the years.

48,573 MW | **77,737 MW**

2018 | 2022

Electric power generation capacity in the ASEAN Renewable energy sector

45.326 MW

2022

Total renewable energy capacity in the ASEAN Renewable energy sector

Industry trends in the ASEAN region indicate a surge in renewable energy projects, with a substantial pipeline of potential projects in solar, wind, hydro, and ocean or tidal energy resources. The region has seen a significant increase in the pipeline of wind projects, with a growing emphasis on solar and wind power in the capacity mix. The sustained growth of hydropower highlights the region's utilization of its vast water resources for clean energy generation. Solar power is another segment that has witnessed strong growth, adding 21.8 GW of new capacity from 2018 to 2022.

The EMIS Insights reports provide detailed company profiles of leading sector companies in the electric power and renewable energy sectors. These profiles are compiled by locally-based analysts and offer comprehensive insights into the market positions, operations, and contributions of these companies.

In the Indonesia Electric Power Sector, the company profiles cover key players such as PT Perusahaan Listrik Negara (PLN), which holds a dominant position in the sector, controlling over 60% of the nation's total installed capacity and being responsible for more than half of the power generation. The profile delves into PLN's ownership of distribution and transmission systems within Indonesia and its authority to fast-track power projects, including those utilizing renewable energy sources, through private investment.

In the ASEAN Renewable Energy Sector, the company profiles feature leading developers and operators of renewable energy projects across ASEAN countries. For example, in Vietnam, the profiles may include companies such as the Vietnam Electricity Corporation (EVN), the Viet Nam Urban And Industrial Zone Development Investment Corporation (IDICO), and the Petrovietnam Power Corporation (PV Power), which are major developers of hydroelectric power projects.

Conclusion

In conclusion, the ASEAN region is facing significant challenges in transitioning to a net-zero emissions economy. Despite earnest endeavors by various stakeholders, the pathway to achieving this goal is riddled with economic, financial, and social obstacles. The region's heavy reliance on coal and gas fuels, which account for a substantial portion of energy usage, poses a significant barrier to achieving net-zero targets.

To foster sustainable growth and achieve net-zero targets in the ASEAN region, it is imperative to provide substantial international and domestic policy support, accompanied by the enhancement of regulatory frameworks. Additionally, there is an urgent imperative to significantly boost investments in the energy sector and allocate a larger share of capital to clean energy technologies. Achieving the investment levels needed to attain sustainable development goals would facilitate a transformation in the energy landscape, building upon key elements essential for achieving net-zero emissions by 2050. These elements encompass the widespread adoption of renewable energy sources, advancements in energy efficiency, electrification of various applications, and the implementation of low-emission fuels, including modern bioenergy, hydrogen-based fuels, and Carbon Capture, Utilization, and Storage (CCUS).

Enhanced power system connectivity across the ASEAN region is also of paramount importance. While some initiatives are currently in progress, it is now imperative to expand and scale up these efforts. Dealing with overarching concerns such as establishing effective financial market frameworks for renewable energy and transition investments, as well as effectively managing coal power, will be crucial in achieving the region's net-zero targets.

Achieving a net-zero emissions economy in the ASEAN region requires a comprehensive and collaborative approach, encompassing policy support, investment in clean energy technologies, and the adoption of low-emission fuels. These efforts are essential for securing a sustainable future, mitigating vulnerabilities to climate change, and fostering economic growth in the region.

Source:
1. EMIS Insights - ASEAN Transitioning to Net Zero Economy.pdf
2. EMIS Insights - Indonesia Electric Power Sector Report 2023-2024.pdf
3. EMIS Insights - Vietnam Renewable Energy Sector Report 2023-2024.pdf
4. EMIS Insights - ASEAN Renewable Energy Sector Report 2023-2024.pdf

EMIS Insights and EMIS

EMIS Insights

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iDeals Virtual Data Room

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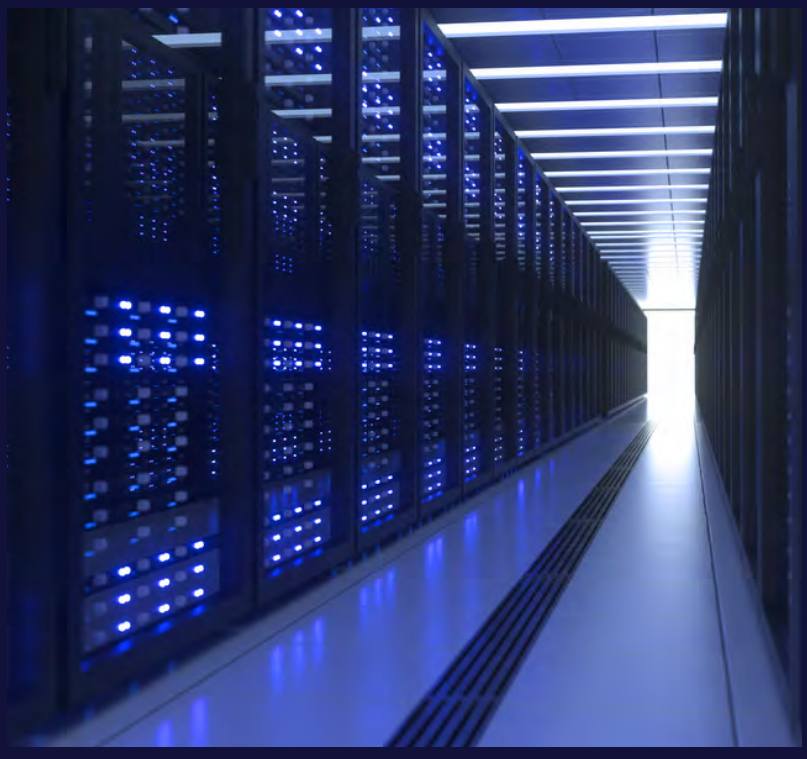

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