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Malaysia REC Market Assessment and Opportunities for Regional Integration

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Highlights

- **Malaysia is leading the way in REC development**: Driven by strong policy support for renewable energy (RE), abundant RE resources, and demand from multinational companies, Malaysia has a thriving REC market with both voluntary and bundled REC options.
- **Significant shift towards RE**: Malaysia's National Energy Transition Roadmap targets renewables making up 60%+ of the total primary energy supply by 2050, with solar energy playing a dominant role.
- **Decentralised electricity governance empowers states**: Sabah and Sarawak have gained autonomy in regulating their electricity sectors, including the development of REC markets, allowing for tailored approaches to RE development
- **Diverse stakeholders drive the REC market**: Utilities, IPPs, government agencies, brokers, corporations, and international organisations all play crucial roles in shaping Malaysia's REC market.
- **Regional integration presents opportunities and challenges**: Harmonizing REC markets across Peninsular Malaysia, Sabah, and Sarawak can create a larger, more efficient market and facilitate cross-border trade, but requires careful consideration of diverse regulatory frameworks and pricing mechanisms.

1. Introduction

Malaysia is emerging as a frontrunner in the development of a robust Renewable Energy Certificate (REC) market within the Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) region. While the current REC market in Malaysia primarily revolves around voluntary transactions, its progress surpasses that of its BIMP peers. This advancement is underpinned by a decade-long commitment to fostering renewable energy (RE) growth through supportive regulatory frameworks, resulting in an abundant supply of RE and, consequently, RECs. Furthermore, Malaysia has become a magnet for foreign investments from multinational companies, many of whom are committed members of RE100, driving demand within the REC market.

The groundwork for a thriving REC market has been laid over the past 4-5 years, with continuous adjustments and refinements to Malaysia's initial REC scheme. This policy brief delves into the insights gathered from extensive discussions with key stakeholders in Malaysia's REC market. It explores the potential for regional integration, leveraging Malaysia's experience to advance REC markets across the BIMP-EAGA region.

These valuable insights and findings are a direct outcome of the RECAP project, an initiative funded by the BIMP-Korea Cooperation Fund (BKCF) dedicated to promoting the conceptual regional REC framework across BIMP-EAGA countries.

2. Malaysia's Energy Priorities and Governance

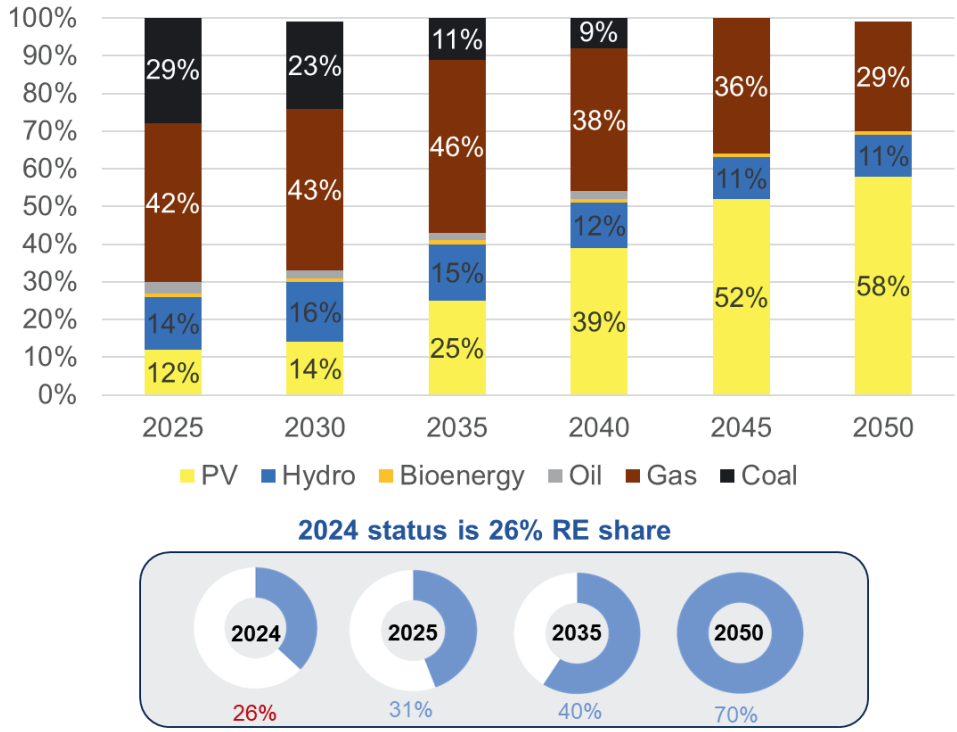
2.1. National Energy Transition Roadmap

In 2023, Malaysia's total primary energy supply (TPES) is 95 Mtoe (million tonnes of oil equivalent). The current energy mix is dominated by natural gas (42%), followed by coal (29%) and crude oil, petroleum products, and others (3%). Renewables, including bioenergy, solar, and hydropower, account for a relatively modest share of 26% (12% of solar and 14% of hydropower).

Looking ahead to 2050, the National Energy Transition Roadmap (NETR) [1] outlines a significant shift towards RE sources. The targeted TPES for 2050 is 102 Mtoe, with renewables comprising 60%+ of the total. This represents a substantial increase from the current 26%. The projected energy mix for 2050 shows natural gas still playing a vital role at 29%, while coal is expected to be phased out by 2050.

The NETR also highlights the pivotal role of solar energy in driving the transition as reflected by Figure 1. The installed capacity of solar power is projected to grow at a compound annual growth rate (CAGR) of 14% between 2025 and 2050. By 2050, solar power is expected to dominate the energy mix, contributing 58% of the total installed capacity of 97 GW. Other renewable sources, such as hydropower and bioenergy, are also expected to contribute, but to a lesser extent.

Figure 1. NETR's Projection on Installed Capacity
(Figure is generated by ACE based on NETR data)



2.2. Electricity Market Governance and Autonomy

The institution leading the power sector governance in Malaysia is the Ministry of Energy Transition and Water Transformation (PETRA), whose responsibility lies in setting the energy sector's overall policymaking and regulation direction. The Energy Commission of Malaysia (Suruhanjaya Tenaga) is an independent regulatory body for the Peninsular and formerly Sabah power sector.

The Energy Commission fulfils the functions of power sector regulation and enforcement of electricity supply infrastructure rules [2]. The Malaysian electricity industry has evolved from the vertically integrated model with the government-owned power utility Tenaga National Berhad (TNB) at the forefront to the Single Buyer model.

Sarawak is accorded the autonomy to govern its electricity sector, especially when the application of the Electricity Supply Act was deferred effective from 1 September 1990 for Sarawak [3].

Thus, the landscape of the power sector in Sarawak is relatively different from that of Peninsular Malaysia in terms of actors and regulations. In Sarawak, the Ministry of Utility and Telecommunication of Sarawak (MUT) oversees the electricity sector regulation and advises the policy direction for the power system [4].

The Electricity (Amendment) Ordinance 2023, The Electricity Rules 1999, and The Electricity (State Grid Code) Rules 2003 are the regulatory framework that governs and ensures the effective operation of the electricity sector in Sarawak. The reinforcement of The Electricity (Amendment) Ordinance 2023 reasserted Sarawak's commitment to undertaking the path of the clean energy transition with an emphasis on renewable energy sources [5].

Sarawak Energy Berhad, as the vertically integrated power utility, is taking the central role on the generation, transmission, and distribution side of the electricity market in Sarawak.

The government of Sarawak wholly owns Sarawak Energy Berhad, and the utility operates under the authority of MUT and the Ministry of Energy and Environmental Sustainability of Sarawak (MEESty). MEESty takes the coordination and monitoring role in the environment and energy-related programmes and activities [6], including Sarawak's power export activities [7] exemplified by the Sarawak – West Kalimantan interconnection led by Sarawak Energy.

The transfer of electricity governance autonomy from the Peninsular to Sabah represents a significant shift in energy regulation within Malaysia. This devolution of power, rooted in Article 95c of the Federal Constitution, has enabled Sabah to establish its own regulatory framework and institutions to oversee the electricity sector.

Previously, Sabah operated under the purview of federal laws and regulatory authorities, including the Energy Commission Act 2001 and the Energy Commission of Malaysia. However, with the devolution of power, Sabah gained the authority to enact its own legislation and establish independent regulatory bodies.

This transition is evident in the establishment of the Energy Commission of Sabah (ECoS) in 2023 under the Energy Commission of Sabah Enactment 2023. ECoS is now responsible for regulating the electricity supply in Sabah, including the development of renewable energy resources and the implementation of the REC market.

The devolution of power has also led to the enactment of Sabah-specific legislation, such as the Electricity Supply Enactment 2024 and the Sabah Renewable Energy Enactment 2024. These enactments provide the legal framework for ECoS to regulate the electricity sector and promote RE development in Sabah.

2.3. Green Energy Programmes

Malaysia is committed to promoting RE and has implemented various green programs to achieve its goals. These programs focus on incentivising RE generation, simplifying consumer access, and creating a supportive market framework.

Key initiatives include the Feed-in Tariff (FIT) program (2011), which provides a fixed tariff for RE producers, and the Large-Scale Solar (LSS) program (2016), which promotes large-scale solar installations. Additionally, the Net Energy Metering (NEM) scheme (2016) allows consumers to generate their own solar power, while the Self-Consumption (SelCo) guidelines (2017) simplify the installation process for personal use.

Moreover, the programs rolled out in in the past 6-8 years, have laid the groundwork for a robust REC market in Malaysia.

The New Enhanced Dispatch Arrangement (NEDA) (2017) ensures that RE producers, including those participating in the FIT and LSS programs, can effectively sell their electricity to the grid, creating a reliable source of RE for REC generation. The Green Electricity Tariff (GET) (2021) allows consumers to directly support RE generation by purchasing green electricity bundled with RECs, driving demand within the REC market.

The Corporate Green Power Program (CGPP) (2022) further incentivises the use of RECs by enabling corporations to meet their sustainability targets through virtual power purchase agreements linked to RECs. The introduction of Cross-Border Electricity Sales (CBES) (2023) has the potential to expand the REC market by facilitating the trade of RECs across borders, while the upcoming Corporate Renewable Energy Supply Scheme (CRESS) (2024) is expected to further stimulate the REC market by increasing market participation and competition.

3. Malaysia's REC Market

3.1. Peninsular

The development of the REC market in Peninsular Malaysia is evident in the evolution of the GET program and the establishment of the Malaysia Green Attribute Trading System (mGATS) [8]. The m-REC mechanism (denominated I-REC(E)) in Peninsular Malaysia offers both bundled (GET) and unbundled REC options to cater to different consumer preferences.

Early Stages (2020-2021): TNBX, a subsidiary of Tenaga Nasional Berhad (TNB), spearheaded the REC initiative in 2020 by introducing an unbundled REC mechanism. This allowed consumers to purchase RECs separately from their electricity consumption, laying the foundation for a voluntary REC market. In 2021, the GET program was launched, offering consumers the option to purchase green electricity bundled with RECs directly through their electricity bills. This simplified consumer access to RECs and promoted the growth of the REC market.

Expansion and Refinement (2022-2023): The GET program gained significant traction, with the initial quota of 4,000 MWh fully subscribed in the first half of 2023. To further enhance the REC market, the mGATS was developed as a platform for REC registration, issuance, and redemption. mGATS provided a centralised system for tracking RECs and ensuring transparency in the REC market. Continuous development and collaboration with various parties led to the refinement of the REC framework and the introduction of new REC products.

Maturity and Increased Accessibility (2024): The GET program continued to expand in 2024, with an annual green energy quota of 6,600 GWh. The program incorporated features such as Imbalance Cost-Pass Through (ICPT) exemptions for GET subscribers and prioritised the use of solar RECs. mGATS evolved into a comprehensive trading platform with auction features, facilitating the commercial trading of RECs and increasing market accessibility. The launch of mGATS in 2024 opened the REC market to a wider range of participants, including non-TNB customers and public distribution licensees.

3.2. Sarawak

Sarawak's journey towards a robust REC market began in 2019 with the registration of its Batang Ai hydropower plant on the TIGR registry. Recognising the evolving needs of market players, Sarawak Energy registered its Murum hydropower plant on the I-REC registry in 2022. This strategic move aimed to cater to the increasing demand for I-REC certified RECs in the region and internationally. This registration allowed them to tap into a broader market and cater to buyers who prefer I-REC certified RECs, which are often recognised in international markets and sustainability reporting frameworks.

Sarawak's substantial hydropower capacity, with plants like Batang Ai, Bakun, and Murum, positions it as a significant player in the REC market. The combined potential of these plants to generate RECs annually is estimated to be around 30 million. This highlights Sarawak's potential to become a major REC exporter in the region, supporting the growth of RE both domestically and across borders. Sarawak Energy actively promotes the origin and quality of its RECs, emphasising the sustainability and low environmental impact of its hydropower projects. This includes showcasing sustainability certifications from the International Hydropower Association (IHA) and highlighting the contribution of these projects to sustainable development goals.

To further enhance the REC market in Sarawak, Sarawak Energy collaborated with Bursa Malaysia to launch a REC auction on the Bursa Carbon Exchange (BCX) platform in June 2024. This initiative aimed to provide a transparent and efficient marketplace for REC trading, attracting a diverse range of buyers, including local traders and financial institutions. The first auction successfully traded 268,800 RECs, demonstrating the growing demand for RECs in Malaysia and the potential for Sarawak to become a key REC supplier in the region.

3.3. Sabah

Sabah has a clear vision for RE development, aiming to harness its abundant resources to drive sustainable economic growth and reduce carbon emissions.

The Sabah Energy Roadmap and Masterplan 2040 outlines ambitious targets, including achieving over 50% RE capacity and over 30% RE energy by 2035. Sabah possesses significant RE potential, particularly in solar PV, large hydro, and ocean thermal energy conversion (OTEC). The state plans to leverage these resources to meet its growing energy demand while contributing to national low-carbon targets.

To facilitate RE development and consumer participation, Sabah is establishing a REC market. The plan involves allocating a portion of RECs to RE developers to enhance tariff competitiveness and encourage further RE investments. The remaining RECs will be utilised for bundled tariff programs (GET) and to fund future RE development initiatives under the ECoS. RE developers will have the flexibility to auction RECs in an unbundled market, potentially including cross-border markets, or offer them to utilities for bundled REC programs. This approach aims to provide consumer choice and align with national REC frameworks while ensuring the achievement of local and national low-carbon emission targets.

Sabah's REC market is expected to evolve over time, with ongoing studies and policy development to optimise its implementation. The state aims to create a REC market that supports local consumers in participating in voluntary schemes like RE100 while contributing to the overall growth of the RE sector in Malaysia.

4. Key Stakeholders in Malaysia's REC Market

4.1. Government Agencies

Ministry of Energy Transition and Water Transformation (PETRA): Responsible for setting the overall policy direction for the energy sector, including RE and RECs.

Energy Commission (Suruhanjaya Tenaga): Provides regulatory oversight for the electricity sector in Peninsular Malaysia, including licensing, rate-setting, and ensuring compliance with relevant regulations.

Ministry of Utilities (Sarawak): Oversees the power sector in Sarawak, including RE development and REC market implementation.

Ministry of Energy and Environmental Sustainability (Sarawak): Spearhead the policymaking efforts to transform the region towards net zero carbon by 2050.

Energy Commission of Sabah (ECoS): Regulates the electricity supply in Sabah, including renewable energy development and REC market implementation.

4.2. Market Actors

Utilities:

- **TNB:** The vertically integrated utility in Peninsular Malaysia, responsible for electricity generation, transmission, and distribution. TNBX, its innovation arm, manages the utility's REC program, including mGATS and GET.
- **Sarawak Energy Berhad:** The primary electricity provider in Sarawak, actively involved in REC issuance and market development.
- **Sabah Electricity Sdn. Bhd (SESB):** The main electricity provider in Sabah, with potential for increased involvement in the REC market as it develops.

Independent Power Producers (IPPs): Generate renewable electricity and can sell RECs to consumers or through various market mechanisms.

Brokers and Traders: Facilitate REC transactions between buyers and sellers, providing market liquidity and price discovery.

Buyers:

- **Multinational Corporations:** Often driven by sustainability targets and reporting requirements, such as RE100, SBTi, CDP, etc.
- **Local Companies:** Increasingly recognising the benefits of RECs for meeting ESG goals and reducing carbon footprint.
- **Domestic Consumers:** Motivated by factors such as the GET and the potential for financial savings.

4.3. International Organisations

I-REC Standard Foundation: Provides the globally recognised I-REC standard for REC certification, ensuring quality and credibility.

TIGR Registry: An alternative REC registry used by some market players in Malaysia.

RE100: A global initiative encouraging companies to commit to 100% renewable electricity, driving demand for RECs.

Science Based Targets initiative (SBTi): Provides guidance and standards for companies to set science-based emissions reduction targets, often involving the use of RECs.

5. Challenges of REC Market Harmonisation and Implementation

Diverse Regulatory Frameworks: Malaysia's states (Peninsular Malaysia, Sabah, and Sarawak) have distinct energy regulatory structures, aligning REC market governance and implementation can be complex. Determining whether to adopt a unified national approach or allow for regional variations requires careful consideration of the advantages and disadvantages of each option.

Balancing Unification and Flexibility: A unified national REC framework offers benefits such as streamlined processes, consistent information, and increased market confidence. However, it's essential to balance this with the flexibility needed for individual regions to gain experience and knowledge in REC market development. The framework should accommodate specific regional needs and regulatory differences while maintaining overall cohesion.

Choosing the Right Issuer: Deciding whether to have a single national REC issuer or separate regional issuers is a key consideration. While a single issuer can streamline processes and enhance market confidence, state-level issuers may offer greater flexibility and local control. If transitioning from a global or centralised issuer to a national or state-level issuer, ensuring a smooth handover of responsibilities and data access is crucial. Training the local issuer and establishing clear governance structures are essential steps in this process.

Ensuring Inter-State Collaboration: Effective communication and coordination between regions are crucial for successful REC market harmonisation. Regular meetings and dialogues can help align views and policies, while allowing for state-specific addendums to address unique circumstances or policy variations.

Addressing REC Pricing Sensitivity: REC pricing can be influenced by various factors, including fuel type, project location, and additional features like carbon offsetting. Regular discussions and a shared understanding of pricing drivers among states are necessary to avoid market distortions and ensure fair pricing.

Adapting to Emerging Compliance Mechanisms: New compliance mechanisms, such as carbon border taxes and financial disclosure requirements, are influencing REC demand. Staying informed about these developments and adapting REC market frameworks to align with these mechanisms will be crucial for market success.

6. Adopting Global and Regional REC Market Best Practices to Malaysia's Context

Drawing inspiration from global best practices, particularly the EU's experience with cross-border REC trade, Malaysia can implement several strategies to enhance its REC market and facilitate regional integration:

Establishing a "Single Market" Approach:

- While replicating the EU's fully integrated single market might be challenging due to varying regulations in Sabah, Sarawak, and Peninsular Malaysia, striving for harmonisation and inter-state collaboration can create a more unified market.
- This can be achieved through a robust national REC framework, a unified issuer, and consistent standards for RECs across regions.
- Regular meetings and dialogues between states can ensure alignment on REC policies and facilitate the development of state-specific addendums to address unique circumstances.

Enabling Cross-Border REC Recognition:

To gain acceptance from international reporting frameworks like RE100 for cross-border REC transactions, Malaysia should prioritise:

- *Tracking physical electrons:* Implement robust systems for verifying and tracing the flow of renewable electricity across borders, potentially through data-sharing infrastructure and standardised protocols.
- *Uniform REC system:* Encourage the use of a single, internationally recognised REC system (like I-REC) for REC settlements across regions.
- *Consistent grid mix and emissions factor calculations:* Ensure consistent methodologies for calculating grid mix and emissions factors between regions engaged in cross-border electricity trade.

Leveraging Regional Working Groups:

- Actively participate in regional initiatives, such as the I-TRACK Standard Foundation's Regional Working Group for Southeast Asia, to define national REC border policies and align cross-border transactions with international best practices.
- Collaborate with other ASEAN countries to develop MOUs that outline REC border preferences and facilitate the recognition of cross-border REC transactions by international frameworks.

Maintaining Market Diversity and Open Access:

- Allow continued space in the market for traders and brokers to ensure liquidity and optionality for buyers.
- Provide guidance or a "cheat sheet" to ensure fair practices among market participants if market rules become necessary.
- Facilitate increased harmonisation and dialogue among marketplaces to enhance transparency and efficiency.

7. Opportunities for Regional REC Integration

Expanding Market Access: Integrating REC markets across Peninsular Malaysia, Sabah, and Sarawak can create a larger and more liquid market, benefiting both buyers and sellers. This can lead to greater competition, improved price discovery, and increased market efficiency.

Facilitating Cross-Border Trade: Regional integration can pave the way for cross-border REC trade with neighbouring countries, opening up new markets for Malaysian RECs and supporting RE development across the region.

Strengthening ASEAN's Position in Global REC Market: A unified regional REC market can strengthen ASEAN's collective bargaining power in the global REC market, enabling better negotiation of terms and access to international buyers. Under the Malaysia's ASEAN chairmanship next year, such efforts could be solidified more through regular dialogues, joint initiatives, and the formation of an ASEAN Association of Issuing Bodies.

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