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Regional Frameworks for Cross-Border Renewable Energy Certificates (RECs) Trading on Grid-to-Grid Transmission Lines: Gap Analysis vis-à-vis International Standards

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Highlights

- Demand for RECs in ASEAN is driven by voluntary clean energy goals of corporations, especially multi-national corporations, as well as decarbonisation goals of national governments. Most countries in ASEAN actively trade RECs domestically, largely through international RECs issuers and trading platforms.
- Policy and regulatory gaps prevent cross-border RECs transactions in ASEAN from being considered intra-market transactions. The main identified gaps are: i) Absence of shared Energy Sector Regulations, ii) Need for harmonisation and uniform Adoption of REC Standards, iii) Need of regional governance of best practices.
- RECs associated with cross-border trade on grid-to-grid lines in ASEAN are currently not recognised by international reporting frameworks such as RE100, undermining the value of such trade. The following approaches may be studied in more detail to determine whether they can address the gaps identified: 1) Harmonising RECs Standards, 2) Regulatory Alignment on Power Trade, and 3) Sub-Regional Markets.

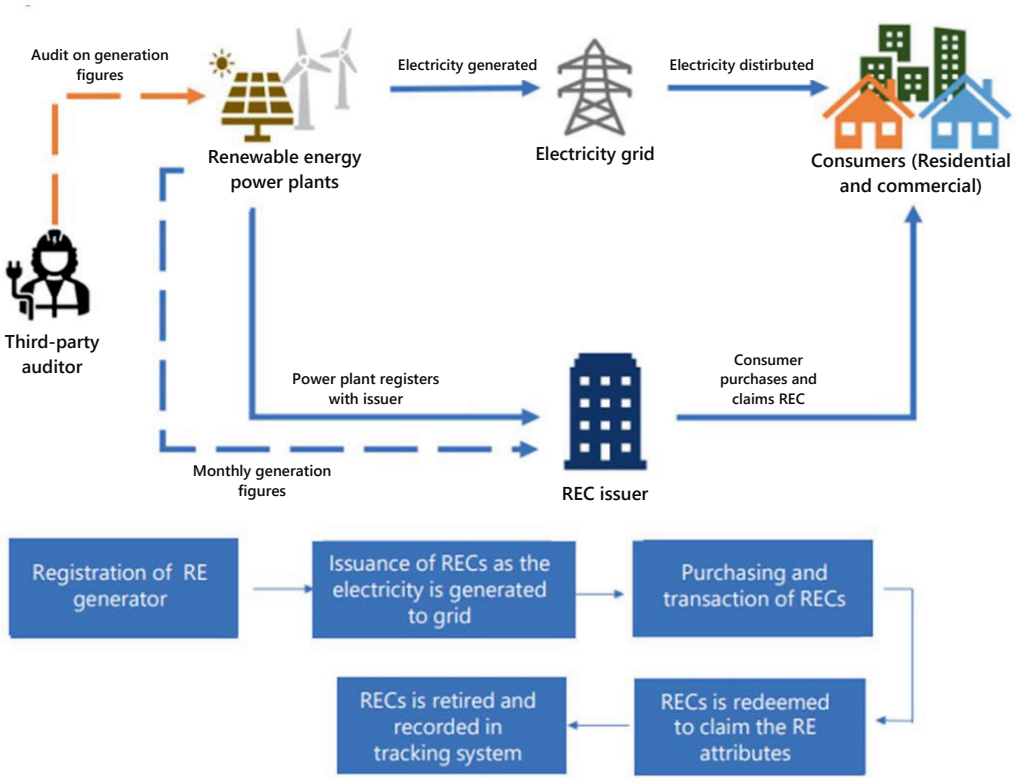
Overview of REC frameworks and its usage

A Renewable Energy Certificate (REC)[1] documents the renewable power attribute of one megawatt hour (MWh) of electricity from renewable sources separately from the physical electricity. A REC documents several attributes of the associated MWh of generation, such as location, time, generating entity, and fuel type used. Since each REC captures detailed attributes of the electricity generation, RECs allow electricity consumers (e.g., corporate buyers or utilities) to demonstrate evidence of clean energy delivery and, at the system level, avoid double-counting.

Figure 1 depicts how REC issuance relates to renewable energy generation sources and energy consumers. An independent third party oversees the verification of RECs transacted to ensure that RECs data and claims of renewable energy consumption by utilities and end-users are credible.

[1] also referred to as Renewable Energy Credits in some markets

Figure 1. Mechanism and Process of Issuance, Verification and Transfers of RECs



Source: Asia Pacific Energy Research Centre ("APERC").

The primary uses of RECs can be summarised as:

1. Purchase of RECs by utilities to comply with regulatory requirements on renewable energy targets: Renewable Portfolio Standards (RPS) or Renewable Portfolio Obligations (RPO). RECs purchased by utilities to meet RPS or RPO requirements are sometimes referred to as "compliance RECs". In ASEAN, only the Philippines has a formal RPS (ACE, 2024) and Indonesia is considering RPS in the draft of new and renewable energy law (ACE, 2024), as outlined in ACE's Philippines and Indonesia REC Market Assessments. However, other AMS also have targets for renewable energy generation or procurement. In the ASEAN context of state-owned utilities, these policy targets may have the same effect as formal RPS targets would for unbundled and privately owned entities. Similarly, in Singapore, the Energy Market Authority's renewable energy procurements could have the same effect.

2. Voluntary purchase of RECs by corporations to meet their self-stated (voluntary) renewable energy targets. This is a primary driver for RECs globally and in ASEAN. Utilities in several ASEAN member states (AMS) seek to respond to demand for RECs and renewable energy supply from their large corporate customers.
    a. Corporate accounting and disclosure protocols (such as GHGP) that include renewable electricity consumption as well as other environmental attributes and broader greenhouse gas emissions.
    b. "Ambition frameworks" set by international organisations like RE100 and the Science Based Targets initiative (SBTi) that offer guidance on procurement rules designed to add specific criteria to encourage corporations to deliver higher levels of impact through their renewable energy or REC procurement.

RECs can be transacted as either "bundled" with, or "unbundled" from, the underlying physical electricity. Under bundled transactions, buyers purchase both the electricity generated and the RECs associated with that electricity from designated resources, e.g., PPAs with specific power plants, self-consumption or net-metering schemes for rooftop solar generation, and bundled green tariffs offered by utilities (e.g., Malaysia, Thailand and Vietnam). Buyers may also purchase unbundled or "certificate-only" RECs, typically from a broker, trader, or market/exchange. In this case, the renewable attributes reflected in the RECs are purchased separately from the electricity purchased; buyers will seek to match the number of RECs purchased with the number of MWhs consumed.

Bundled and unbundled RECs transactions can take place as part of both domestic and cross-border power trade. However, bundled cross-border transactions are significantly more straightforward on generator-to-foreign grid lines than on grid-to-grid ties. Although it is more complex and currently, the case of ASEAN is not yet recognised by international voluntary reporting frameworks, except for within the EU and North America (USA and Canada), the bundled cross-border REC exhibits fundamental criteria desired by international-setting bodies and disclosure guidance.

Current Status of RECs in ASEAN

Active domestic RECs markets based on credible standards already exist in most AMS. Government participation in RECs markets has increased considerably in recent years. Thailand appointed EGAT as the designated Local Issuer while discussions on similar designations are advancing in several other nations, notably Malaysia, Lao PDR, and Indonesia. National RECs frameworks are also getting more robust. Singapore launched the new Singapore Standard (SS) 673: Code of Practice for Renewable Energy Certificates (RECs) in 2021.

All ASEAN Member States have engaged in RECs transactions (both issuance and redemptions) following the I-REC standard. An I-REC for electricity is an exchangeable Energy Attribute Certificate ("EAC") issued according to a set of rules approved and accredited by the International Tracking Standard Foundation ("I-TRACK"). I-RECs can be used for national energy reporting and end-user clean energy consumption claims, provided they are based on a generation source that is part of the same grid as the end-user – i.e., domestic power plants or foreign generators that are only connected to the same grid as the end-user (referred to here as a generator-to-foreign grid transaction).

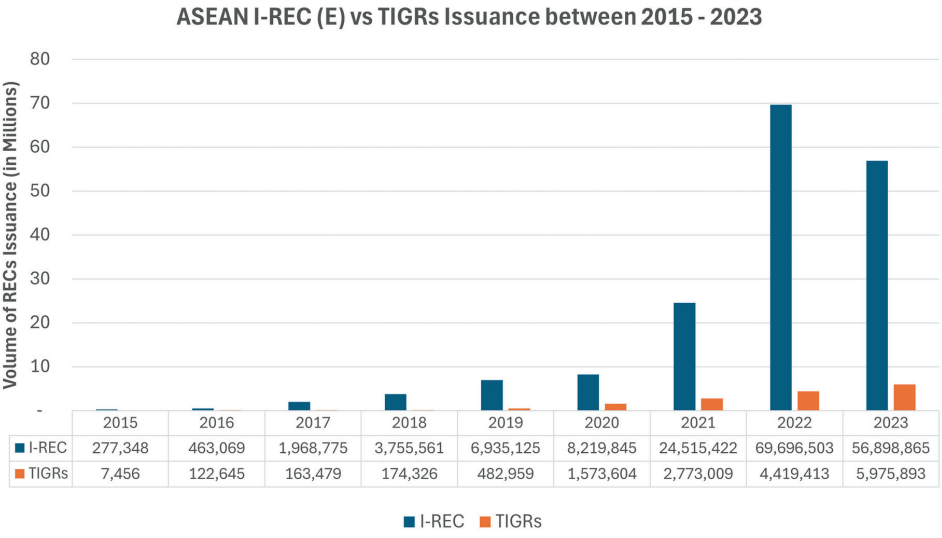
I-RECs can be issued by certified issuers, either local organisations like the EGAT and Singapore Power Group ("SPG") or international service providers like the Green Certificates Company ("GCC"). Evident, an entity accredited by I-TRACK to implement attribute tracking systems for I-RECs for electricity, maintains an Evident Registry to facilitate transactions. The Evident Registry provides a fully auditable chain of custody record to support the trading of EACs and verify claims by end-users.

Apart from this registry, many AMS also recognise the registry of Tradable Instruments for Global Renewables ("TIGRs"). The TIGRs registry is an online platform established by APX, a private company active in energy and environmental markets, where owners of renewable generation projects can generate, verify and sell RECs.

Aside from the aforementioned globally-recognised registries, Malaysia has also developed the Malaysia Green Attributes Tracking System ("mGATS"), its own platform for acquiring mRECs. While mGATS is the one-stop platform for buyers to purchase mRECs, the certificates are still hosted by the Evident registry (TNBX, n.d.)

The majority of RECs in ASEAN are issued under the I-REC standard. As shown in Figure 2, the volume of I-RECs issued has been about 10 times the volume of TIGRs issued between 2021 and 2023.

Figure 2. GROWTH IN RECS ISSUANCE IN ASEAN: 2015 - 2023



Source: SuSca Group

Table 1 summarises the state of RECs market features in each AMS. Domestic RECs markets are limited in Brunei, Cambodia, and Lao PDR.

Table 1. Summary of REC Market Features in ASEAN

	Market Type	RECs Certification and Tracking System	RECs Issuer	Trading Platform	Governance Body
Brunei Darussalam	Voluntary market with RECs	I-RECs	GCC	GCC	
Cambodia	Voluntary market with RECs	I-RECs, TIGR	GCC, APX	GCC and APX-based platforms	N/A
Indonesia	Voluntary market with RECs	I-RECs, TIGR	GCC, APX	GCC and PLN (APX-based platforms)	
Lao PDR	Voluntary market with RECs	I-RECs	GCC	GCC	N/A
Malaysia	Voluntary market with RECs	m-GATS, I-RECs, TIGR	GCC, APX	mGATS platform, GCC and APX-based platforms	PETRA (regulates GET pricing for mGATS platform only)
Myanmar	N/A	N/A	N/A	N/A	N/A
Philippines	Voluntary market with RECs	I-RECs, TIGR	GCC, APX	PREMS, GCC and APX-based platforms	Department of Energy
Singapore	Voluntary market with RECs	I-RECs, TIGR	GCC, APX, SPG	SPG-based platform	Energy market Authority
Thailand	Voluntary market with RECs	I-RECs, TIGR	GCC, APX, EGAT	EGAT, GCC and APX-based platforms	MoE and MoNRE (jointly)
Viet Nam	Voluntary market with RECs	I-RECs, TIGR	GCC, APX	GCC and APX-based platforms	N/A

Source: APERC, I-TRACK Foundation, TIGRs Registry.

The Need of International Recognition for Renewable Energy Trading

Robust REC frameworks and credible standards help ensure that RECs transactions are recognised by reporting bodies. National level entities in ASEAN that buy RECs are likely to be primarily concerned with their respective national level reporting bodies.

However, many corporate renewable energy buyers in ASEAN are multinational companies that follow international reporting frameworks, also members of RE100. It is imperative for such buyers that the RECs they purchase be recognised internationally. Also, some ASEAN countries have ambitious renewable energy targets and seek to demonstrate leadership on this issue at a global scale. Their utilities and domestic entities will likely follow the more stringent international reporting frameworks.

The following international reporting frameworks are considered benchmarks for RECs reporting standards:

i. **GHG Protocol for Scope 2 Accounting**
GHG Protocol was launched as a partnership between non-governmental organisations (NGOs) and businesses to standardise methods for GHG accounting. It publishes guidance on how companies can measure emissions from their electricity usage as well as a suite of tools for calculating emissions and benefits of climate change mitigation projects. The Scope 2 Guidance aims to standardise the approach to measuring emissions from the direct purchase or acquisition of electricity, steam, heat, and cooling by corporations. Corporations follow GHG Protocol's guidance on how they use RECs for clean energy claims, both for internal accounting and public reporting.

ii. **CDP**
CDP is a non-profit charity organisation, formerly known as the Carbon Disclosure Project, that runs a global disclosure system for investors, companies, and governments on their environmental impact, including clean energy use. Over 23,000 organisations report their emissions impact annually through CDP. Corporations and governments that report their emissions and clean energy claims and use RECs to claim clean energy usage must adhere to CDP's standards and guidelines.

iii. **RE100**
RE100 is a global corporate renewable energy initiative led by the Climate Group in partnership with CDP. RE100 aims to get major global multinational corporations, particularly those with annual electricity consumption exceeding 100 GWh, to commit to achieving 100% renewable electricity by 2050. To achieve this target, corporations must match their electricity usage across their global footprint with electricity generated from renewable sources, either through direct consumption or purchase of RECs. RE100 publishes and updates its Technical Criteria to ensure that corporate procurement of renewable energy and RECs drive impact. These may include criteria such as the percentage of a corporate's renewable energy consumption that must be sourced from power plants that are less than 15 years old, or the market boundaries within which corporates must match their energy consumption with renewable energy procurement.

iv. **SBTi**
SBTi is a corporate climate action organisation that develops standards, tools and guidance for corporates to set GHG emissions reduction targets that align with the emissions reductions needed to reach net-zero emissions by 2050 and limit global warming to 1.5oC above pre-industrial levels. As a result, SBTi's guidance and standards become more stringent over time as timelines to achieve the level of emissions reductions needed to limit climate impact become more urgent.

It is, therefore, necessary to implement more stringent and robust regional frameworks for RECs to align with international reporting frameworks in ASEAN. Corporations with a significant footprint in ASEAN increasingly make business decisions – e.g., on where to site a new plant or data centre – by partly factoring in, among other criteria, whether they can procure sufficient renewable energy or associated RECs to offset their electricity consumption. There are initiatives led by donors and corporates to develop robust RECs markets in ASEAN.

The demand for renewable energy by corporations and national governments can facilitate the development of renewable energy in ASEAN and, if harnessed, also the growth of regional cross-border interconnections and power trade. Grid-to-grid interconnections can help absorb higher levels of variable renewable energy generation within energy systems and also link areas of higher demand with areas of higher renewable energy resources. However, this requires greater clarity regarding cross-border power trade and associated RECs markets.

RECs and Cross-Border Power Trade

Although most ASEAN countries follow common systems for RECs issuance, certification and trading – as shown in Table 1 – this applies only to domestic transactions or generator-to-foreign grid transactions. Even if all ASEAN countries adopt common frameworks for RECs issuances that follow guidance and standards issued by GHG Protocol, CDP, RE100, SBTi, it is not currently sufficient for international recognition of bundled cross-border RECs transactions. One key aspect of the technical criteria and guidance issued by the international reporting frameworks is geographic, which defines the market boundaries within which RECs purchases and clean energy consumption claims can be made.

International reporting frameworks consider renewable energy consumption claims more credible if a corporation's REC purchases are generated in the same market as its energy consumption. This is largely a function of the reliability of information since there can be some loss of transparency when EACs move between grid systems. In addition, procurement of RECs outside the market where a corporation's energy consumption is located can "crowd out" financing and market access for local electricity producers because there is less demand for the RECs their projects generate. The increasingly stringent criteria of RE100 and SBTi, which emphasise the value of the impact of corporate renewable energy procurement, highlight this as an aspect to be avoided.

The guidance issued by international reporting frameworks considers the locations of energy consumption and RECs generation to be within the same market if they share a common legal or energy market jurisdiction. At present, only the European Single Market or the United States and parts of Canada are considered to be a single market regional spanning national boundary. However, these definitions of single market boundaries by international reporting entities have some flexibility and can reflect changes in regulatory regimes or market conditions. For example, the 2024 update to the RE100 Technical Criteria redefined the single market area in Europe – with respect to RECs – to exclude Bulgaria, Cyprus, Malta, Poland, Romania, Serbia, Ireland and the UK. Only European countries that meet all three of the following criteria are considered in the single market for renewable electricity: (i) part of the European Union (EU) single market; (ii) member of the Association of Issuing Bodies; and (iii) have a grid connection to a country meeting both criteria (i) and (ii). This market definition is stricter than defined by EU legislation. By comparison, an earlier version of the RE100 technical criteria indicated that an entity that did not have access to renewable energy or reliably tracked RECs in a country where it has electricity demand could seek to source RECs from the nearest reliable tracking system that is physically interconnected to the demand market.

Therefore, under current international reporting standards, large-scale buyers of RECs and renewable energy supply – whether utilities or corporates – in ASEAN can only procure RECs from domestic supply or via cross-border generator-to-foreign grid transactions for their clean energy claims to adhere to international reporting standards. Without internationally recognised regional RECs frameworks, it will be significantly more challenging to harness corporate demand for renewable energy supply as a driver for the advancement of regional power interconnectors and cross-border trade

Policy and Regulatory Gaps Preventing International Recognition

As noted earlier, RE100 and other international reporting benchmarks do not recognise cross-border transfer of RECs associated with grid-to-grid power trade except for US-Canada and a subset of the EU. These two jurisdictions are considered a single market for electricity trade; hence, all transactions within these markets are considered intra-market transactions, including those for cross-border RECs transfers. RE100 conducted public technical consultations in 2022 to evaluate proposed changes to the RE100 technical criteria, including accepting physical cross-market procurement of renewable electricity under certain conditions (outside US-Canada and the EU); however, RE100 chose not to implement this revision since "it found that no credible cross-border procurement options currently exist and that introducing strict criteria now would potentially limit development of such options."

On top of the need for physical interconnection itself, the following policy and regulatory gaps prevent cross-border RECs transactions in ASEAN (and all other markets besides US-Canada and the EU) from being considered intra-market transactions.

- **Absence of shared energy sector regulations**

  The EU countries share common legislation and regulations governing electricity markets. Physically interconnected countries in the EU are effectively part of a single governing framework; hence, there is minimal risk of loss of transparency with cross-border transfer of EACs. Similarly, the US and Canadian power grids are highly integrated: each Canadian province along the US-Canada border is interconnected with at least one neighbouring US state or market. The North American Electric Reliability Corporation (NERC) has jurisdiction over both countries to establish reliability standards and monitoring and assessing the performance of grid operators, utilities, and power generators. It is not anticipated that AMS will move towards comparable levels of legislative and regulatory alignment within the foreseeable future.

- **Need for harmonisation and uniform adoption of REC Standards**

  As was mentioned, only countries that are member of the Association of Issuing Bodies are considered part of the European single market area for renewable electricity. This ensures that REC issuances across all countries in that market follow a common standard, in addition to the overall levels of legislative and regulatory harmonisation within the EU market.

  In ASEAN, transactions are conducted under the I-REC or TIGRs standards. However, these are commonly used standards developed by individual organisations. Some ASEAN countries also have increasingly robust national frameworks. Discrepancies between national standards may also create barriers to international acceptance of regional frameworks.

- **Need for regional governance of best practices**

  In the EU, a regional governance body supports the participation of national-level market participants (buyers, sellers, issuers) in the regional REC market. This has contributed to greater market harmonisation and stability. A similar body is necessary in ASEAN to ensure that national-level market participants, particularly state-owned enterprises, compete and engage with other private actors on an even footing.

- **Need to ensure data transparency and reliability**

  There are a lot of data that are required to be acknowledged in order to determine the environmental attributes of RECs. As laid out by the European Association of Issuing Bodies (AIB), the shared data include the annual generated and consumed energy, the mix of energy in the grid, and the grid emissions factors. A transparent and secure mechanism to collect and share the relevant data (data-sharing) would be practical in supporting the growth of RECs market in ASEAN, as renewable energy trading become between the countries continue to become more common. The shared data should also be reliable across AMS so that international reporting frameworks could consider inter-market REC transactions within ASEAN.

Potential Approaches to Addressing Gaps

RE100 has indicated that it will continue to study cross-market transactions of EACs. Therefore, it is important for stakeholders in renewable energy development and energy transition in ASEAN to engage RE100 and other reporting frameworks to identify a pathway towards recognising cross-border transactions of RECs. The following approaches may be studied in more detail to determine whether they can address the gaps identified.

1. **Harmonising RECs Standards:** Many AMS already follow I-REC and TIGRs standards but only some countries have a governance body overseeing the RECs marketplace and actors. The introduction of more stringent requirements and regulations at the national level in some AMS will create differences between RECs issued in different countries, making cross-border trade in RECs more challenging. Through those challenges, a regional REC market framework is needed to harmonise varying national standards, to comply with international REC frameworks, and to ensure transparency and efficiency of the market mechanism within the REC transactions. The established REC market should be aligned with international standards and best practices to facilitate cross-border transactions and attract foreign investments. Establishing an ASEAN entity similar to the Association of Issuing Bodies that helps to harmonise standards across the region would make ensure that transparency is not lost during cross-border transfer of RECs. A regional entity would also coordinate the ongoing national efforts towards the development of REC market, while also opening up to opportunities for collaboration inside ASEAN.

2. **Regulatory Alignment on Power Trade:** Aligning regulations pertaining to power trade may help the ASEAN region, or sub-regions within ASEAN, to function more like a single market area. Alignment on power trade data requirements and sharing, technical standards regarding interconnection of renewable energy generators, and dispute resolution mechanisms and principles would make cross-border power and RECs trade on grid-to-grid lines more like intra-market transactions. Additionally, ensuring the clarity of environmental attributes ownership is as important in exchanging power. PPAs of cross-border electricity trade should clearly define the ownership to acknowledge the environmental attributes of the generated and consumed energy, taking into account the grid emissions and other related metrics.

3. **Sub-Regional Markets:** Updates to the RE100 technical criteria have redefined the European single market area with respect to renewable electricity to include or exclude various countries, depending on changing definitions or alignment with established criteria. Under the current definition, the European single market area for renewable electricity is a sub-set of the countries that are part of the interconnected European grid. Therefore, it would likely be feasible and may be prudent to begin with a sub-region within ASEAN for recognition by international reporting entities as a single market area for renewable electricity. Some AMS already have physical interconnections, established power trading, and increasingly robust frameworks for power sector regulations and RECs governance (e.g., Malaysia and Singapore, possibly Thailand). Others, like Thailand and Lao PDR or Vietnam and Cambodia, have closely integrated grids. Establishing sub-regions within ASEAN as an internationally recognized single market area for the purpose of renewable electricity and RECs would help to establish cross-border RECs trading and facilitate eventual integration across ASEAN.

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References

[1] Asia Pacific Energy Research Centre, "Renewable Energy Certificates (RECs) in Six APEC Southeast Asia Economies." July 2023. Web: https://aperc.or.jp/file/2023/7/19/Renewable_Energy_Certificates-RECs-in_Six_APEC_Southeast_Asia_Economies.pdf

[2] The International Tracking Standard Foundation, I-REC for Electricity. Web: https://www.trackingstandard.org/product-code/electricity/. Accessed September 2024.

[3] The International Tracking Standard Foundation, 2024 I-REC(e) Market Statistics – January. Web: Ministry of Economy Malaysia, National Energy Transition Roadmap. 2023. Accessed: Oct. 21, 2024. Available: https://www.ekonomi.gov.my/sites/default/files/2023-09/National%20Energy%20Transition%20Roadmap_0.pdf . Accessed September 2024.

[4] Tradable Instruments for Global Renewables, Public Reports. Web: https://tigrsregistry.apx.com/ng/Report/getdto_view_Report_PublicProjectsAll. Accessed September 2024.

[5] Science Based Targets Initiative, How It Works. Web: https://sciencebasedtargets.org/how-it-works. Accessed September 2024.

[6] World Resources Institute, Initiatives – Science Based Targets initiative (SBTi). Web: https://www.wri.org/initiatives/science-based-targets. Accessed September 2024.

[7] RE100, "RE100 Technical Criteria." December 2022.

[8] RE100, Updated RE100 requirements for 100% renewable electricity. Web: https://www.climateimpact.com/news-insights/insights/Updated-RE100-criteria-for-100-renewable-electricity/. Last updated December 2023.

[9] RE100, "Results of public consultation on proposed changes to the RE100 technical criteria." October 2022.

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