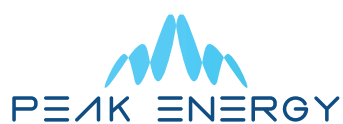




RENEWABLE ENERGY PROCUREMENT FOR INDUSTRIALS AND CORPORATES IN ASIA

STRATEGIES AND MARKET REALITIES IN 2025



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President of EuroCham Singapore, Jens Rübbert

Chair of the Sustainability Committee of EuroCham Singapore, Claire Langrée

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Co-Chair of the Sustainability Committee of EuroCham Singapore and CEO of Peak Energy, Gavin Adda

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MESSAGE

FROM THE PRESIDENT
OF EUROCHAM SINGAPORE,

JENS RÜBBERT

Singapore and the European Union are long-standing partners in trade, innovation, and environmental sustainability. Our shared objective is clear: build a climate-resilient future for today's generation, and for many generations to come. Achieving this requires change in how we work, trade, travel, and produce energy, and faster progress toward net-zero emissions. That progress depends on international collaboration among governments, companies, and communities.

This report is intended as practical guidance for EuroCham members, and for any company operating in ASEAN, on how to use renewable electricity efficiently, with a particular focus on solar. It summarises procurement pathways, maps market opportunities and constraints, and highlights the operational and regulatory considerations that determine success. The goal is simple: help decision-makers understand both the opportunities and the challenges so they can act with confidence.

The report is the product of EuroCham's Sustainability Committee. I would like to thank all committee members for their engagement and commitment, and to recognise in particular our Co-Chair Mr Gavin Adda, CEO of Peak Energy, whose leadership and technical expertise were instrumental in shaping this work.

Progress also depends on effective public-private cooperation. EuroCham maintains an ongoing dialogue with Singapore's key agencies, including the National Environment Agency (NEA), the Energy Market Authority (EMA), and the Ministry of Sustainability and the Environment (MSE). Together with our European networks, we aim to combine Singaporean and European excellence and innovation in renewable energy. It is encouraging to see solar adoption accelerating across the region as more companies integrate it into their operations.

We are confident that the Singapore-EU partnership will continue to grow, rooted in our shared ambition for a greener and more sustainable future. We hope this report serves as a useful, objective resource that helps companies in Singapore and across ASEAN plan, procure, and perform better, especially in deploying solar power, while contributing to a resilient, low-carbon economy.

MESSAGE

FROM THE CHAIR OF THE
SUSTAINABILITY COMMITTEE
OF EUROCHAM SINGAPORE,

CLAIRE LANGRÉE

With this report, we focus on corporate solar procurement one of the cornerstones of clean energy transition in Asia.

Solar power is an established technology supported by increasingly favourable regulatory environment and financing models. This supportive context allows companies of all sizes to implement actionable and bankable strategies that deliver measurable reductions in Scope 2 emissions in a region that accounts for over half of the Greenhouse gas emissions. Within a larger suite of maturing green energy solutions, these qualities make corporate solar procurement one of most practical clean power solutions that can be adopted today.

While other green power technologies and solutions —such as utility-scale wind, 24/7 hourly matching, large-scale power storage and green hydrogen - hold significant promise for the future, they remain constrained by technological, regulatory, and grid-related challenges across many Asian markets. These alternatives are generally at an early stage of development or are limited in availability due to fragmented policies and infrastructure barriers, which limits their current applicability for widespread corporate use.

By centering this guide on solar procurement, companies are empowered to act decisively now, leveraging proven, financially viable models that contribute to meaningful emissions reductions, as that are proven by developed projects.

Simultaneously, this report underscores the Eurocham's commitment to closely monitoring advancements in all clean power and clean energy solutions, ensuring that future updates incorporate emerging technologies as they gain viability and accessibility within the region's evolving sustainability landscape.

While enjoying your read, we trust that this guide will materialise your energy transition solutions and help actively contribute towards reduced greenhouse gas emissions, energy security and resource optimisation.

FOREWORD

NAVIGATING APAC'S ENERGY TRANSITION: FROM COMPLEXITY TO EXECUTION

**BY GAVIN ADDA,
CO-CHAIR OF THE SUSTAINABILITY COMMITTEE OF EUROCHAM SINGAPORE
AND CEO OF PEAK ENERGY**

In Asia-Pacific, renewable energy is no longer a long-term ambition, it's a near-term imperative. As temperatures soar across the world, Asia still accounts for 51% of the world's carbon emissions¹.

But the shift to renewables is now inevitable and gaining momentum. Asia accounts for over half of global renewable growth. Renewable electricity is the cheapest form of power in many markets and often the most accessible. Corporates are realising that it can be a major source of cost control as well as value creation.

In markets like Vietnam, Taiwan, and Thailand, we see regional champions and global multinationals alike embedding energy strategy into core business planning. Sustainability is no longer a Corporate Social Responsibility ("CSR") line item but a commercial differentiator and a boardroom concern. Fragmented regulations, legacy fossil dependencies, and rising energy volatility create major execution challenges for businesses.

The regulatory and market environment is evolving fast. From the EU's Carbon Border Adjustment Mechanism ("CBAM") to mandatory ESG disclosures across Asia, the pressure to act is intensifying. This creates both opportunity and risk. Companies that delay face rising costs and constrained access to credible clean energy. Those that move now can secure long-term price visibility, mitigate exposure, and reinforce their competitiveness.

But success requires a shift in mindset. Procurement decisions must align with operational realities, regulatory nuance, and internal ambition. There is no single template that fits all. That's why our team built this guide: to offer businesses, whatever their footprint in Asia, a pragmatic, market-informed overview of the renewable electricity options available.

This white paper draws on the team's experience developing over US\$ 10 Bn of renewable assets across the region. It reflects insights from decades of navigating the complexity of APAC markets and structuring clean energy solutions that work, technically, commercially, and politically.

We hope this resource helps you cut through complexity and accelerate your path from ambition to execution.

¹ How corporate Asia sits at the centre of the climate crisis | World Economic Forum, ESCAP PowerPoint Presentation

CONTRIBUTORS

We would like to extend our sincere appreciation to those who have contributed their time, expertise, and insights to this white paper.

Gavin Adda (CEO), **Sébastien Marlier** (Director of Strategy), and **Sérine Bendebiche** (APAC Marketing Manager) at Peak Energy led the drafting, analysis, and coordination of this document.

They were supported by Peak Energy regional collaborators and Singapore partners:

- **Éléonore Lazat**
(Granular Energy) contributed expertise on energy attribute tracking.
- **Suji Kang and Henry Eu**
(Asia Clean Energy Coalition) provided policy insights relevant to Asia.
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EXECUTIVE SUMMARY

RENEWABLE ELECTRICITY IN ASIA-PACIFIC: FROM AMBITION TO EXECUTION

Corporate demand for renewable electricity is rising fast across Asia-Pacific. Decarbonisation targets, electricity price volatility, and regulatory tightening, particularly from mechanisms like the EU's Carbon Border Adjustment Mechanism ("CBAM"), are transforming electricity sourcing into a strategic issue. For industrials, exporters, and regional conglomerates, clean electricity is no longer optional. It is becoming a **requirement for competitiveness, compliance, and long-term stability of supply**.

Yet translating sustainability goals into clean energy procurement remains difficult. Asia-Pacific is a fragmented region: Each market has its own regulations, pricing models, and commercial frameworks. Even where clean energy is available and cost-effective, **corporates often delay due to internal complexity or perceived risk**. Meanwhile, early movers, such as regional manufacturers in Thailand and multinationals operating in the Philippines, have already secured **long-term fixed-rate solar contracts (known as PPAs, or Power Purchase Agreements) at 10-30% below grid pricing**, strengthening both their financial position and reporting credibility.

This guide is designed to help corporates cut through complexity. It presents both the **strategic rationale** and the **practical procurement options** available across eight major APAC markets.

1. WHY CLEAN ELECTRICITY MAKES BUSINESS SENSE IN ASIA

Solar is the cheapest source of power in most Asian markets, with on-site solar now significantly cheaper than grid power for commercial and industrial companies across most of the region. We are also starting to see that solar system can be combined with batteries to provide corporates with cheap power at night.

For most companies, purchased electricity accounts for most Scope 2 emissions, making clean power one of the most visible and impactful levers for decarbonisation. Benefits include:

- **Heightened competitiveness, thanks to lower and more predictable electricity costs.**
- **Reduced exposure to carbon penalties and trade friction.**
- **Stronger ESG reporting and brand credibility.**

2. PROCUREMENT PATHWAYS AVAILABLE TODAY

While approaches vary, most corporates can pursue one or more of the following:

- **On-site solar:** Using PPAs or leases in practically every country in Asia
- **Off-site PPAs:** Notably Japan, Taiwan, South Korea, Singapore, the Philippines and Malaysia, covering a larger proportion of electricity, and like on-site solar ensuring long-term price visibility and traceable climate impact.
- **Utility Green Tariffs:** Primarily in Singapore, Malaysia, Taiwan. Simple to adopt, though limited in climate additionality.
- **Renewable Energy Certificates (RECs):** Tradable instruments that certify renewable electricity usage.
- **Solar-plus-storage hybrid systems:** Early stage, but emerging to cut peak charges and enhance resilience.

3. WHAT THIS GUIDE PROVIDES

Detailed market insights for eight key countries: Singapore, Malaysia, Indonesia, the Philippines, Thailand, Japan, South Korea, Taiwan, covering:

- Regulatory context
- Procurement structures
- Risk considerations and constraints

KEY MESSAGES:

- Clean electricity is **cost-effective and available now**. However, access is increasingly competitive.
- There is **no one-size-fits-all approach**. Strategies must be tailored by market and consumption profile.
- **Execution is the real constraint**. Not ambition, but internal alignment, contracting ability, and timing.

RENEWABLE ENERGY PROCUREMENT GLOSSARY

This glossary serves as a helpful resource for individuals beginning to explore solar energy. While it does not cover every possible term, it provides an accessible overview of many commonly used concepts in the field, supporting readers in building their foundational knowledge of solar technology and terminology.

1. CORE CONTRACT & PROCUREMENT MODELS

- **PPA (Power Purchase Agreement):** A long-term contract (10–25 years) to buy electricity directly from a generator at an agreed price.
- **Corporate PPA (cPPA):** PPAs signed directly between corporates and generators.
- **On-site PPA:** A renewable energy system, like rooftop solar, is installed at a company's site, providing clean electricity used directly on the premises.
- **Off-site PPA:** A contract where a company buys renewable electricity from a generator located away from its own site. The power is delivered to the company through the public electricity grid, helping the buyer use clean energy even if their facilities cannot host their own renewable systems.
 - **Physical off-site PPA:** Contract for renewable electricity with physical delivery to the buyer through the grid; Buyer receives both the power and associated Renewable Energy Certificates.
 - **Virtual off-site PPA (VPPA):** Financial contract for renewable generation without physical delivery; Buyer still gets Renewable Energy Certificate (RECs – see below).
- **Behind the Meter:** Generation connected to the customer's internal system, bypassing the public grid.

2. ENVIRONMENTAL INSTRUMENTS

- **REC (Renewable Energy Certificate):** Proof that 1 MWh of electricity was produced from renewable sources.
- **I-REC (International Renewable Energy Certificate):** A globally recognised certificate that proves 1 MWh of electricity was produced from renewable sources. I-RECs are issued and tracked under the International REC Standard, and they can be used in countries with or without their own domestic REC systems. Many countries have both I-REC and local REC markets, allowing buyers to choose the certification system that best fits their needs for verifying renewable energy use.
- **Additionality:** Ensuring a project adds new renewable capacity beyond what would exist otherwise.

3. FINANCIAL & RISK TERMS

- **CapEx vs. OpEx Models:** **CapEx:** Upfront investment; **OpEx:** Pay-as-you-go with no upfront capital.
- **Tariff Escalator:** Clause allowing price increases (e.g., inflation-linked) in long-term contracts.
- **Hedging:** A risk management strategy that uses various financial instruments or contractual mechanisms to protect against fluctuations in electricity prices. In renewable energy procurement, hedging can involve fixing prices through long-term agreements, using derivatives, or structuring contracts to minimize exposure to market volatility, helping buyers achieve greater budget certainty.
- **IRR (Internal Rate of Return):** Profitability measure for an investment.
- **Creditworthiness:** Electricity buyer's financial stability; Key to securing PPAs.

4. GRID & TECHNICAL CONCEPTS

- **Interconnection:** Physical connection of a project to the grid.
- **Load Profile:** Electricity usage pattern over time.
- **Peak Demand / Baseload:** Highest demand periods vs. minimum constant demand.
- **Hybrid Systems:** Combining renewables with storage or other sources.
- **Grid Curtailment:** Forcing a generator to reduce output due to grid constraints.
- **Dispatch Priority:** Order in which generators supply electricity.

5. POLICY & COMPLIANCE

- **Feed-in Tariff (FiT):** Guaranteed price paid for renewable electricity fed into the grid.
- **Feed-in Premium:** A policy that provides renewable energy producers with an extra payment added to the market price of electricity. Producers sell their power on the open market and receive the premium as an incentive, encouraging more renewable generation and greater market integration. The premium may be fixed or variable and is designed to help make renewable projects financially viable.
- **Net Metering:** Selling surplus on-site-generated power back to the grid for credit.
- **RPS (Renewable Portfolio Standard):** Regulatory requirement for a minimum share of renewables in generation.
- **CBAM (Carbon Border Adjustment Mechanism):** EU policy applying a carbon price to imports to prevent carbon leakage.

6. KEY INSTITUTIONS IN ASIA

- **Singapore:** EMA (Energy Market Authority), Ministry of Sustainability and the Environment.
- **Japan:** METI (Ministry of Economy, Trade & Industry), TEPCO.
- **South Korea:** KEPCO (Korea Electric Power Corp), MOEF (Ministry of Economy & Finance).
- **Thailand:** MOE (Ministry of Energy), EGAT (Electricity Generating Authority of Thailand).
- **Indonesia:** MOEMR (Ministry of Energy & Mineral Resources), PLN (Perusahaan Listrik Negara).
- **Philippines:** DOE (Department of Energy), NGCP (National Grid Corporation of the Philippines), ERC (Energy Regulatory Commission).
- **Taiwan:** MOEA (Ministry of Economic Affairs), Taipower.
- **Regional:** ASEAN Centre for Energy (ACE), ERIA (Economic Research Institute for ASEAN & East Asia).

7. ASIA MARKET REALITIES

- **Fuel Pass-Through Charge:** Tariff component reflecting fuel cost changes.
- **Cross-Border Power Trading:** Import/export of electricity between countries.
- **ASEAN Power Grid (APG):** Plan to integrate Southeast Asia's electricity networks.
- **State-Owned Utility Monopoly:** Common in Asia; single utility controls generation, transmission, and retail.
- **Deregulation:** Opening electricity markets to independent producers.

INTRODUCTION

Corporate energy strategies in Asia are at a crossroads: Companies must either secure clean electricity at predictable prices or face rising electricity costs, new trade barriers, and growing investor pressure.

Renewable electricity procurement is becoming a strategic priority for many corporates operating in Asia. Whether motivated by sustainability commitments, cost considerations, or energy security concerns, renewable energy is playing an increasingly central role in corporate energy procurement strategies in the region.

These strategies are no longer constraints to climate action but linked to competitiveness. Recent U.S. trade measures, including new “Trump tariffs” on Asian goods, along with mechanisms like the EU’s Carbon Border Adjustment Mechanism (“CBAM”), mean that energy sourcing now directly affects the cost and marketability of exports. Therefore, thinking “glocal” and integrating global competitiveness goals with local energy procurement strategies is becoming a key lever for defending market share in a reshaped global economy.

This shift in economic conditions is prompting many companies to formalise their intentions to move away from fossil fuels: in the year to May 2025, 75% of the 32 new members of RE100, a group of businesses committed to 100% renewable electricity, were headquartered in Asia². This shows the region is increasingly driving global decarbonisation commitments, not only through corporate pledges but also by virtue of its scale as the fastest-growing centre of energy demand worldwide.

Over the same period, RE100 companies have procured a greater share of their electricity from renewables in key Asian markets, notably in Japan (from 25% to 36%) or Vietnam (from 30% to 58%). New procurement schemes and regulatory frameworks (from direct PPA pilots to green certificate programs) are opening more practical pathways for corporates to access renewables, making it increasingly feasible to translate ambition into action. This trend is accelerating as electricity costs in some markets, such as Taiwan and South Korea, have risen sharply in the past two years, making renewables increasingly attractive as a hedge against volatility.

Yet renewable energy (RE) adoption in Asia remains below potential. Even among RE100 companies, renewables have the lowest penetration in Asia, at about 33% of companies’ overall procurement mix, below the global average of 42%³. One obstacle is awareness, with many companies still overestimating the costs and underestimating the benefits of renewable energy in the region; a perception shaped by the complex environment in which they operate, marked by fast-evolving energy markets, fragmented regional regulations, and the long history of fossil-fuel and coal dominated economies in Asia-Pacific.

“Thinking “glocal” and integrating global competitiveness goals with local energy procurement strategies is becoming a key lever for defending market share in a reshaped global economy.”

In practice, four major drivers are currently impacting the adoption of renewables in Asia, often in conflicting ways:

- **Ambitious sustainability agendas:** Many companies operating in Asia have made bold climate commitments over the past five years, driven by investor expectations, climate science, and regulatory signals. Some are members of global initiatives like RE100⁴; others are aligning with frameworks such as the EU’s Corporate Sustainability Reporting Directive (“CSRD”) or the Carbon Border Adjustment Mechanism (“CBAM”)⁵. With less than five years remaining until 2030⁶, an interim milestone for many corporate decarbonisation targets, pressure is growing on decision-makers to translate these ambitions into actions.
- **Heightened competition for supply:** Renewable energy is increasingly seen by industry leaders as a strategic asset, delivering cost stability, energy security, and progress toward sustainability goals. As demand for renewable electricity rises, particularly from large industrial users and fast-expanding data centres, competition for credible, high-impact renewable energy solutions are intensifying. In some markets, this rising competition is outpacing supply, driving up PPA prices and tightening access to high-quality projects or certificates. For corporates, early engagement is becoming a decisive factor in locking in favourable terms and avoiding being left with more expensive or less impactful options.

2 <https://www.there100.org/our-work/publications/2024-re100-annual-disclosure-report>

3 <https://www.there100.org/our-work/publications/2024-re100-annual-disclosure-report>

4 <https://www.there100.org>

5 https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

6 <https://www.un.org/en/climatechange/net-zero-coalition#:~:text=zero%20by%202050%2C2030,cent%20compared%20to%202010%20levels.>

- **Shifting boardroom priorities:** At the same time, global economic headwinds are reshaping internal priorities. In many boardrooms, sustainability agendas are under strain from cost pressures⁷, investor short-termism, and competing business demands. Some companies, including RE100 members, have begun revising or delaying targets in response to today's uncertain macroeconomic and geopolitical environment, with security of supply now an increasingly pressing buying consideration. The challenge for corporate leaders is to reconcile short-term cost discipline with long-term decarbonisation imperatives, particularly in energy-intensive sectors.
- **Fragmented and immature markets:** Local energy policy remains highly fragmented across Asia; procurement mechanisms vary widely in maturity and evolve rapidly. While some markets offer established Power Purchase Agreement ("PPA") structures or Renewable Energy Certificate ("REC") mechanisms, others are still in early stages of regulatory development. And although on-site solar is available basically everywhere, the situation is more complex for off-site projects. This patchwork landscape makes consistent renewable energy procurement across the region a challenge.

This report is designed to help companies overcome current difficulties and roadblocks, building a comprehensive report to take practical steps toward renewable energy adoption in Asia. It provides actionable guidance on how to source clean electricity across ten APAC countries. It is designed for energy, sustainability, and finance leaders who need clear, market specific answers on how to secure renewable electricity across Asia.

This report provides **three key components**:

- Section 1 outlines the urgency and **strategic importance** of renewable energy for businesses in the region.
- Section 2 details the **available procurement options** for renewable energy in multiple key markets.
- Section 3 explains the **specificities of each market in Asia Pacific**.

Finally, an Appendix presents case studies of companies that have successfully implemented renewable energy solutions in Asia.

Note: This report has been written in the third quarter of 2025 and reflects the situation prevailing at that time. Although many of the recommendations are likely to remain valid in the medium term, it is not the intention of this report to delve into future scenarios for energy market regulations, technology developments, or costs.



⁷ <https://hbr.org/2025/04/corporate-sustainability-is-in-crisis-what-should-companies-do-now>

SECTION 1: WHY PROCURE RENEWABLE ENERGY

While companies may procure renewable energy for a variety of reasons, the overarching outcome is often improved competitiveness. Renewable energy adoption can contribute to a competitive edge through three main channels:

- **Cost:** Reduces overall electricity expenses and shields companies from price volatility, improving their cost position relative to competitors
- **Sustainability:** Strengthens its positioning as a sustainability leader among key stakeholders (including customers, employees, suppliers, equity investors, lenders...)
- **Regulatory compliance:** Ensures companies meet evolving regulatory requirements, a critical factor for maintaining market access and safeguarding their license to export or operate in certain jurisdictions.

This section elaborates on each of these three drivers of competitiveness, highlighting how renewable energy procurement can serve as a strategic tool for businesses operating in Asia.

1.1 COST

Across Asia, companies that procure renewable energy can significantly reduce their electricity bills, making cost the single most powerful driver of adoption. Although most APAC countries do not subsidise renewable energy (RE), solar power and other renewables have become cost-competitive, achieving grid parity in the latter half of the past decade. On-site solar is now the lowest-cost electricity source in the region, with the Levelized Cost of Electricity ("LCOE") declining by an average of 17% per year from 2005 to 2024⁸. This reflects advancements in panel efficiency, lower module costs, expanded manufacturing scale, and more competitive engineering, procurement, and construction ("EPC") services.

"Renewables have become cost competitive, achieving grid parity in the latter half of the past decade."

Importantly, power purchase agreements ("PPAs") allow corporates to lock in fixed prices for 10-25 years. This creates two layers of value: immediate savings compared to current grid tariffs, and progressively greater savings as grid prices tend to rise with general inflation over time. While future construction cost declines are expected to be more moderate, module prices now account for less than 20% of total costs, compared with over 50% in 2010⁹, the value proposition for corporates remains strong. Even in markets where fossil fuels benefit from implicit subsidies, PPA-sourced on-site solar remains more affordable than grid electricity, with savings per kWh of up to 50% in Thailand and over 20% in Indonesia. In that situation, the benefits can extend even further; once the PPA term ends and ownership of the system transfers to the host, the installation continues to generate electricity at virtually no cost for the rest of its operating life.

Figure 1: Global solar LCOE and APAC grid electricity tariffs for industrial users

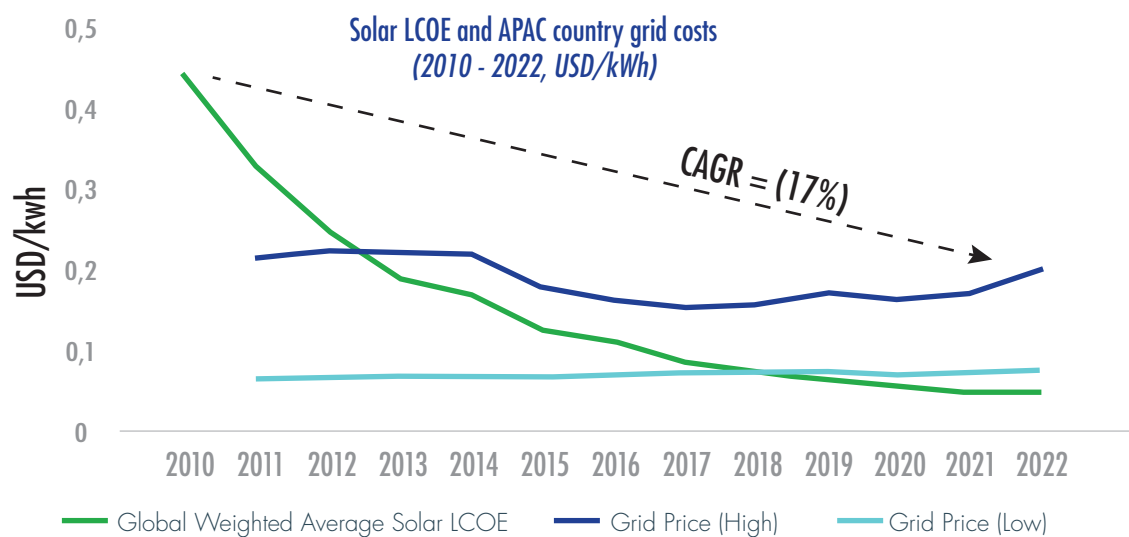


Figure 1 Wood Mackenzie Power Lens, 2025

8 https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jun/SDG7_Tracking_Progress_2022.pdf
 9 <https://www.irena.org/Publications/2024/Sep/Renewable-Power-Generation-Costs-in-2023>

“The long-term and fixed-price structure of many PPAs further allows corporate buyers to reduce cost uncertainty.”

Grid tariffs have been rising across the region due to structural constraints and rising demand, strengthening the case for solar. Examples are striking:

- **Japan:** Commercial tariffs grew by 4.6 % annually from 2013 to 2023, with further increases expected as utilities pass through fuel import costs.
- **South Korea:** Regulated industrial tariffs soared by about 50% between 2022 and 2024 (to 183 KRW or US\$ 0.13 per kWh).
- **Taiwan:** Though slower historically (0.7 % per year since 2013), industrial increase 15%-25% in 2024 alone.
- **Thailand:** Tariffs increased by 1.4 % per year over the past decade.

Even if grid tariffs do not rise as much as anticipated by leading energy experts (see table), RE PPAs with prices fixed at a pre-agreed level for 15-25 years can serve as a hedge against future price volatility.

For many corporates, this price stability is becoming increasingly relevant in a context of heightened uncertainty around geopolitical dynamics and trade flows. In particular, fixed PPA prices insulate buyers from surge in global commodity import prices, which would likely trigger further tariff increases in APAC's fossil-fuel dominated electricity grids.

Table 1: Grid Electricity Tariffs for industrial customers in select Asian markets, 2014-2034

COUNTRY	AVERAGE GRID TARIFF INFLATION, 2014-2024(1)	FORECAST GRID TARIFF INFLATION, 2024-2034(1)
Singapore (SGD)	2.2%	2.4%
Indonesia (IDR)	1.1%	6.8%
Japan (JPY)	2.5%	5.3%
Malaysia (MYR)	3.5%	3.5%
Philippines (PHP)	-1.2%(2)	2.3%
South Korea (KRW)	4.7%	3.2%
Taiwan (TWD)	3.9%	3.4%
Thailand (THB)	1.5%	2.8%

Source: Wood Mackenzie Power Lens, 2025

Note:

(1) Historical actuals are in nominal local currency. Forecasts are based on Wood Mackenzie analysis and are in nominal US\$ assuming a 2% US\$ inflation rate over 2024-2034

(2) The Philippines implemented the Competitive Selection Process (CSP) from 2016, requiring all distribution utilities to procure new generation supply through public bidding. This led to a wave of long-term fixed-price contracts, often 20–30% cheaper than previous bilateral deals, supported by new high-efficiency coal and renewable projects. As a result, average industrial tariffs declined in real US\$ terms over 2014–2024, making the –1.2% inflation rate unique among peer markets.

Off-site solar and hybrid solutions that include storage are also in cost competitiveness with the grid. While on-site solar remains the lowest-cost option, it typically supplies only 10-30% of a site's electricity needs. Off-site solar PPAs, which are increasingly permitted across Asia, can help bridge this gap at comparable prices.

Finally, the economics of solar-plus-storage (hybrid) projects are also improving. The sharp decline in battery prices in recent years - from around \$1,000 per kWh in 2010 to \$115 per kWh in 2023¹⁰ combined with the growing opportunity to arbitrage between off-peak and peak grid prices has made solar plus storage increasingly attractive. For instance, in Thailand, off-peak industrial tariffs can be

10 <https://about.bnef.com/blog/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/>

roughly 40 % lower than peak hour prices, while in Japan wholesale market prices often surge by over 200 % during evening peak hours (18:00–20:00) in summer.

By charging batteries when prices are low and discharging during these expensive peak periods, corporates can flatten their electricity costs and reduce exposure to price volatility. Consequently, companies looking to maximise savings are increasingly structuring PPAs that combine solar generation with battery storage, specifically designed to offset high night time tariffs and enhance overall cost efficiency.

“Fixed PPA prices insulate buyers from surges in global commodity import prices, which would likely trigger further tariff increases in APAC’s fossil-fuel dominated electricity grids.”

“(…) companies looking to maximize savings are increasingly structuring PPAs that combine solar generation with battery storage.”

1.2 SUSTAINABILITY

For corporates in APAC, renewable energy is the most effective tools for reducing CO2 emissions and meeting sustainability targets. Electricity grids across the region remain heavily carbon-intensive due to their continued reliance on fossil fuels for power generation. Replacing grid electricity with solar provides an immediate and quantifiable impact on emissions.

In markets with the highest grid carbon intensity, such as Indonesia or the Philippines, each megawatt (MW) of installed solar can avoid over 850 metric tons of CO₂ annually. Even in relatively lower carbon grids as Singapore, solar still displaces more than 400 metric tons each year.

Solar adoption therefore offers corporates a fast, measurable, and replicable pathway to lower carbon intensity.

Table 2: Grid emission factors and CO2 emission savings from solar in selected Asian markets

COUNTRY	CO2 EMISSION FROM COUNTRY ENERGY MIX (G/KWH)	NET CO2 EMISSION DISPLACED (G/KWH)	ANNUAL TONS OF CO2 AVOIDED FOR 1MW SYSTEM (CO2T/YEAR)
Singapore	388	344	447
Indonesia	761	717	933
Japan	500	456	593
Malaysia	659	615	800
Philippines	699	655	852
South Korea	480	436	567
Taiwan	484	440	572
Thailand	399	364	473

Source: Team analysis, based on various local sources, June 2025

Energy storage further amplifies these benefits by mitigating solar intermittency and enabling renewables to cover a greater share of corporates’ energy consumption. With storage costs continuing to fall, the combined emissions-reduction potential of solar-plus-storage systems become even more compelling.

Beyond emissions reductions, renewable energy adoption supports broader corporate sustainability agendas. Investors, regulators, and consumers now expect greater transparency and accountability in decarbonisation efforts. Integrating on-site solar or procuring clean power through structured PPA agreements allows companies to accelerate net-zero timelines, improve brand equity, and strengthen relationships with local stakeholders.

“In Indonesia or the Philippines, each megawatt (MW) of installed solar can avoid over 850 metric tons of CO₂ annually.”

1.3 REGULATORY COMPLIANCE

Renewable energy can help companies ensure they comply with regulations, notably under the EU's Carbon Border Adjustment Mechanism ("CBAM"). Designed to equalize carbon costs between EU producers and imports, CBAM requires emissions reporting during its transitional phase (2023-2025), and, from 2026*, obliges importers to purchase certificates reflecting the carbon intensity of their goods. Although CBAM details and timeline of application is still under review by institutions, preliminary reports show this measure will directly impact carbon-intensive exports such as steel, aluminium, and cement, and, increasingly, downstream products.

For instance, automotive supply chains are particularly exposed; early estimates suggested the price of an average car imported from Asia into the EU could increase by US\$ 230–690, driven by the embedded emissions of the steel and aluminium used in vehicle production. This creates a new cost layer for exporters, where CBAM-covered goods already account for billions of dollars in annual EU shipments. In Japan, CBAM-covered exports represented about US\$ 2.1 billion in 2023, while South Korea shipped roughly US\$ 4.9 billion worth of steel and aluminium to Europe.

Existing reports based on the current CBAM proposal underline how financial stakes could be significant. Analysts estimate that CBAM liabilities could reach US\$ 24.5 billion by 2035, representing over 25%¹¹ of the value of impacted imports. For steel alone, which constitutes roughly 75% of total CBAM costs¹², the effective levy could climb to 20-35% by 2030–2035.

As the European Commission considers extending CBAM to finished goods such as cars and machinery, pressure to decarbonize entire supply chains will intensify. Exporters, especially in automotive, steel, and electronics, are accelerating investment in low-carbon technologies. Examples include POSCO and Hyundai Steel shifting to electric-arc furnaces (EAFs) and piloting hydrogen-based ironmaking, and Nippon Steel developing "green steel" aligned with Japan's forthcoming GX-ETS carbon-pricing scheme.

That said, deep process decarbonization can take years and require significant capital. By contrast, switching to lower-carbon electricity via corporate PPAs is an immediate, cost-effective first step for companies seeking deployable solutions.

CBAM is only one of several emerging carbon policies. Canada, Japan, and Australia are introducing carbon pricing, tighter emissions reporting, and climate-due-diligence rules. Companies that delay risk higher compliance costs and supply-chain disruption. Those that integrate renewable energy into operations and sourcing now will be better positioned for resilience, regulatory alignment, and credible climate leadership.

**All information in this paragraph may be updated as the CBAM regulation and its coverage are currently under review by EU institutions.*

CBAM in Asia: The Numbers

- US\$ 44 billion: Value of CBAM-covered goods exported from Asia to the EU in 2023.
- US\$24.5 billion: Estimate of CBAM liabilities by 2035.
- 20–35 %: Effective levy projected on high-emission steel by 2030-35 (≈ 75 % of total CBAM costs).
- US\$ 220-660: Additional cost per car exported to the EU, due to embedded carbon in steel and aluminum.
- Key exporters: South Korea (~\$4.8 billion), Japan (~\$1.88 billion), plus significant flows from China, Vietnam, and India.
- Carbon price trajectory: EU ETS projected at \$99–154/tCO₂ by 2030.

¹¹ EU Carbon Border Adjustment Mechanism to raise \$80B per year by 2040 | S&P Global 20240318_Final-CBAM-Assessment-Report-final.pdf Impact-of-CBAM.pdf

¹² Winners and losers of the EU carbon border adjustment mechanism. An intra-EU issue? - ScienceDirect

SECTION 2: HOW TO PROCURE RENEWABLE ENERGY

This section provides concrete guidance for embarking on a renewable energy procurement journey. It first details the main procurement options available, comparing their key features and benefits. It then offers step-by-step recommendations on how to select the right counterparty.

2.1 AVAILABLE OPTIONS

Renewable Energy procurement options can be characterised along a set of key dimensions: generation technology, location, type of contract, and counterparty. Corporate procurement of renewable electricity in Asia typically falls into four main categories, depending on market structure, regulatory maturity, and corporate energy profile.

1. **On-site solar:** Usually delivered through zero-CapEx PPAs or leases, and available across almost all Asian markets.
2. **Off-site PPAs:** Including physical and virtual models; accessible in liberalized markets such as Japan, Taiwan, the Philippines, and South Korea.
3. **RECs and Utility Green Tariffs:** Used where direct procurement is not feasible, offering flexibility but often with low additionality.
4. **Hybrid solar-plus-storage models:** Emerging as strategic tools to reduce peak costs and support 24/7 clean energy goals.

Each option comes with specific contractual, technical, and regulatory considerations. The following sections provide a breakdown of how each mechanism works in practice, with a focus on commercial feasibility, benefits, and limitations.

The following section provides further detail on the procurement structures corporates are adopting.

OPTION 1: ON-SITE SOLAR PV

On-site solar photovoltaic (PV) systems enable companies to generate renewable electricity **directly at their facilities**, typically on rooftops, but also on carports, nearby land, or even water (floating solar). These systems, usually installed **“behind-the-meter”**, reduce grid reliance and help manage energy costs while enhancing sustainability performance. Companies can adopt on-site solar through:

- **PPA model:** An energy provider develops, finances, and operates the system; the company only pays for the electricity generated. This model requires **zero upfront capital** from the company and no expertise in operating and maintaining solar systems. Companies can keep focusing on their core business and operations, with the energy provider incentivised to maximise the yield of the solar systems and ensure they perform optimally throughout the contract period. **This PPA model is the standard approach on a global basis.**
- **CapEx model:** The company **pays upfront** and owns, operates and manages the system from day 1. The challenge has been that solar systems can require significant upfront investments, adding significant roadblock to companies in their first sustainability steps; a non-negligible characteristic in the current economic trends affecting most industrial and retail segments. In addition, **most companies lack the commercial, technical and operational experience to design, construct and operate solar systems**, outsourcing them to cheap installers which can lack experience, exposing them to a non-performing system on the long run.

On-site solar is typically the cheapest form of power globally. This is because the customer does not need to pay for power transmission, distribution, retail and other costs. Most rooftops can only provide 20-30% of a company's electricity needs. However, it is **usually the first step major companies tend to take** as it is the easiest and fastest way to start their sustainability journey.

OPTION 2: OFF-SITE PPAS (SOLAR OR WIND)

Off-site PPAs allow companies to buy electricity from renewable energy projects (solar or wind) located elsewhere (on any available land or, for solar, rooftop) and connected to the grid. These can be:

- **Physical PPAs:** In this model, electricity from a renewable project is **fed into the national grid and accounted against the buyer's consumption**, effectively covering part of their electricity demand. The buyer typically pays the generator a fixed price for the power, along with any applicable wheeling or grid usage charges. The associated RECs are transferred to the buyer, enabling sustainability claims that are compliant with frameworks like RE100.

- **Virtual PPAs (vPPAs):** These are financial contracts **focused on purchasing renewable credits or environmental attributes** rather than the physical delivery of electricity. The generator sells the electricity into the wholesale market, and the buyer receives or settles the difference between the market price and the PPA price. The buyer still receives the RECs, which allows them to claim the environmental benefits of the renewable power. Crucially, these deals require a willing intermediary (often a retailer or utility), which can be difficult to secure in some Asian markets.

Compared with on-site generation, off-site renewable energy solutions provide companies with access to renewables at a much larger scale. However, they are **typically more expensive**, as projects need to cover third party costs such as wheeling, grid usage charges, and electricity retail margins. They also involve longer lead times, due to permitting and grid connection requirements, and greater legal complexity, including **land access and multi party contractual arrangements**. Off-site PPA markets are active in countries such as Japan, Singapore, Philippines, South Korea, Malaysia, and Taiwan, with other countries, including Thailand and Vietnam, increasingly opening to them.

OPTION 3: RENEWABLE ENERGY CERTIFICATES (RECS)

RECs are **tradable certificates** representing 1MWh of electricity generated from a certified renewable source. They allow companies to **claim renewable energy use without sourcing it** directly and are often the fastest and most flexible option. There are various types of RECs in Asia, including internationally recognised I-RECs and national schemes such as T-RECs (Taiwan), Green Energy Certificates (South Korea), and others.

REC prices can vary widely depending on country of origin, certificate type, and supply-demand dynamics. In Asia, unbundled REC prices typically range from US\$1-10 per MWh, but notably, markets such as Japan, Singapore, and South Korea often command much higher prices due to limited supply and heightened demand for local certificates. These elevated costs are expected to rise further as more renewable supply becomes locked into long-term PPAs, leaving fewer unbundled certificates available. Premiums also apply to country-specific or project-specific certificates.

Utility Green Tariffs, available in markets like Thailand, South Korea, Malaysia, and Taiwan, provide another way for corporates to purchase electricity bundled with RECs through local utilities. In deregulated markets like Singapore and Taiwan, companies can also select licensed electricity retailers offering renewable energy bundles (typically with RECs). These options are quick and easy to implement but often come with a cost premium and little visibility into the actual project impact.

RECs in general have broader limitations:

- **Compliance:** RE100 compliance requires RECs to originate from the same market or a connected region as electricity consumption.
- **Low additionality:** RECs may not support new project development, particularly if sourced from existing assets.
- **Cost:** RECs represent an extra cost on top of electricity purchases, which can be significant especially if supply is constrained (like in Singapore, where local RECs traded at >50US\$/MWh in the first part of 2025).

In summary, while RECs remain a useful stopgap for corporates lacking access to PPAs, their rising costs, limited additionality, and credibility concerns mean sustainability leaders treat them as a temporary or complementary tool, rather than a long term solution.



OPTION 4: ADDING BATTERY ENERGY STORAGE SYSTEMS (“BESS”)

Battery Energy Storage Systems (“BESS”) are becoming an essential tool for corporates looking to **lower energy cost and maximise emission reductions**. Stand-alone batteries enable corporates to leverage extremely low, sometimes even negative, wholesale electricity prices during daytime hours, when solar generation is at its peak, by charging at minimal cost. When paired with a solar PPA, BESS helps companies **reduce reliance on expensive grid power during evening peak hours**. In fact, the rapid decline in battery costs has made solar plus BESS solutions increasingly competitive with traditional evening power sources across many Asian markets.

Importantly, solar plus BESS PPAs also **enhance decarbonisation efforts** by increasing the share of renewables in overall electricity consumption. By storing excess generation from renewable energy systems and shifting it to periods with lower renewable output (for instance at night), BESS effectively extends the availability of renewable energy. This is particularly useful for companies pursuing **24/7 Carbon Free Energy (“CFE”) strategies**, which aim to match renewable generation to consumption on an hourly basis rather than just annually (See Box 2, p. 20).

With the corporate-facing **BESS market remaining relatively new** in many Asian countries, business models, contract types, and procurement pathways are rapidly evolving. That said, long-term PPAs combining both solar and BESS are increasingly included in developers’ offerings and are poised to become a mainstream solution for corporates.

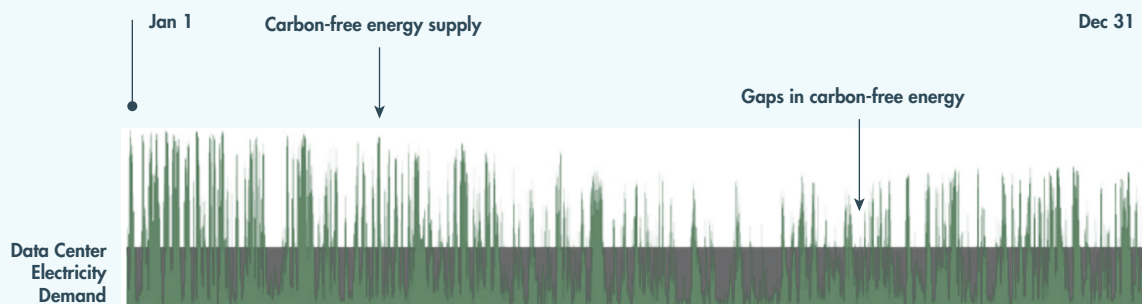
Table 3: Summary of Renewable Energy Procurement Options for Corporates in Asia

OPTION	SAVINGS	SPEED	ADDITIONALITY	SUSTAINABILITY	TYPICAL USE CASE
On-site Solar PPA	High	Medium	High	High	Sites with usable roof/land
RECs (incl. Green Tariffs)	No	Fast	Low	Variable	Quick wins; lack of alternatives
Off-site Solar PPA	Medium to high	Slow	High	High	Large loads; long-term buyers
Off-site Wind PPA	No savings to Medium	Slow	High	High	Very large loads (but few actual cases in Asia)
BESS	Depends on use	Medium	N/A	Depends on use	Peak load or intermittency management

Box 2: 24/7 CFE

In recent years, momentum behind 24/7 carbon-free energy (CFE) has surged, as companies seek to achieve a higher-level of credible, impactful climate action. While traditional clean energy procurement focuses on annual volumes, often ignoring when clean energy is consumed, 24/7 CFE implies sourcing clean power for every hour of use. In other words, companies targeting 24/7 CFE must match every hour of electricity consumption with carbon-free generation. This approach helps highlight gaps in clean energy availability and sends clear signals for investment in storage, flexible demand, and diverse renewables. The eventual objective is to enable greater emissions reductions, promote innovation, and strengthen the grid by aligning clean energy generation with real-time demand.

Hourly carbon-free energy performance at an example data centre¹³



Although the shift toward 24/7 CFE emerged in the US and Europe, it is expanding fast across Asia. AirTrunk, an APAC data centre company, is a founding member of the 24/7 CFE Coalition. In Japan Tokyo Metro is supplied with hourly matched energy by JERA Cross, a leading utility, using an hourly matching tool developed by Granular Energy.

A range of policy and regulatory developments suggest that 24/7 CFE is likely to increasingly become the norm. The Taiwan-Renewable Energy Certificate (T-RECs) system is already capable of 15-minute tracking, and ready to support hourly EACs. In Australia, the Future Made in Australia Act, adopted in November 2024, established REGOs, a new type of time-stamped renewable energy certificates. International corporate standard and accounting frameworks are also pushing toward 24/7 CFE. Most significantly, the Greenhouse Gas Protocol's revised Scope 2 guidance, expected in 2026, is leaning towards hourly matching methodologies. The Climate Group is also urging members to join their 24/7 CFE Coalition.

In short, 24/7 CFE is increasingly likely to be driving corporate renewable energy procurement in coming years, and early movers can ensure they are ready for this evolution. Companies could explore 24/7 ecosystem initiatives such as the 24/7 CFE Coalition and EnergyTag. For example, Peak Energy is expanding its Japan portfolio to 59 MW, with select sites co-locating storage to support time-shifted PPAs. Interested companies could also refer to public case studies (e.g., Google) and materials from market providers (e.g., Granular Energy) on building systems to manage and report the increased data requirements of 24/7 CFE.

Planning for a phased renewable energy adoption

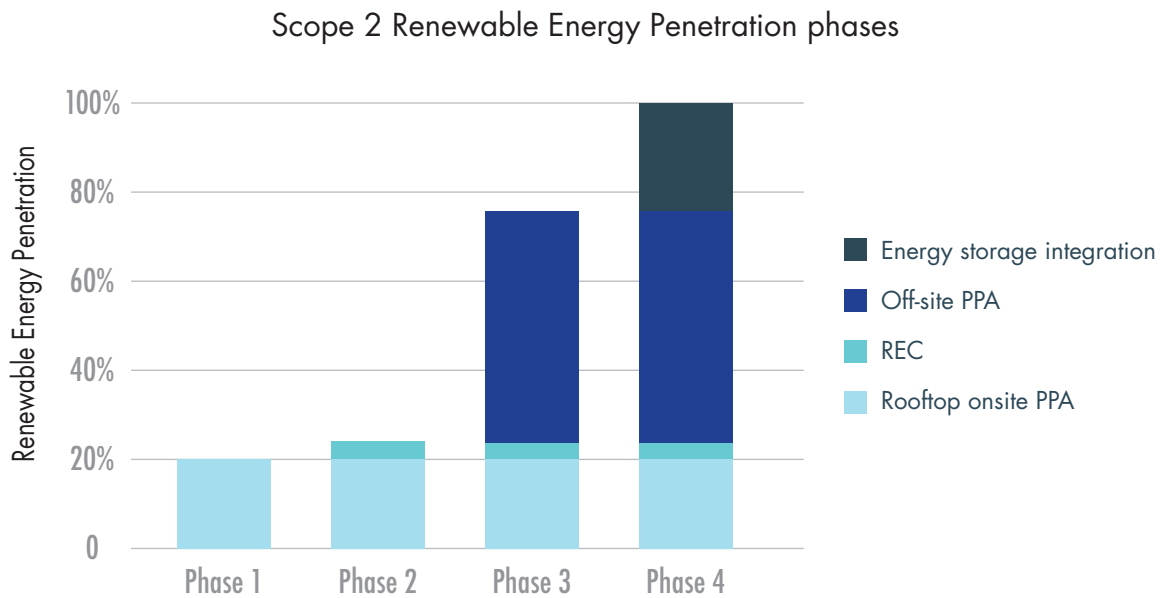
For most corporates, transitioning to 100% renewable electricity is best approached as a step by step journey rather than a single leap. Companies often begin with on-site solar to capture immediate cost savings and gain visible progress toward their sustainability targets. They then layer in Renewable Energy Certificates (RECs) for broader footprint coverage.

As market access and experience grow, many corporates progress to off-site PPAs, which provide long term price stability and deliver greater additionality by directly supporting new project development. Battery storage systems can be added to improve load matching, reduce dependence on the grid during peak hours and support 24/7 Carbon-Free Energy goals.

This phased approach enables a practical and scalable pathway to full decarbonisation, allowing companies to balance speed, cost, and operational realities while steadily increasing their share of renewable energy.

¹³ <https://www.gstatic.com/gumdrop/sustainability/247-carbon-free-energy.pdf>

Figure 2: Indicative phasing of renewable energy adoption journey for corporates in Asia



To extend impact beyond their own operations, some corporates then replicate this model across their supply chain, working with key suppliers to deploy on-site solar, adopt renewable PPAs, or purchase credible RECs. This approach not only accelerates decarbonisation across value chains but also directly addresses Scope 3 emissions (see Box 3).

Box 3: Scope 3 Emissions and Supplier Engagement

For companies that successfully reduce Scope 2 emissions with RE procurement, the next challenge is usually Scope 3 or value chain emissions, which can represent over 90% of their total footprint. RE solutions offer significant potential here as well, particularly for Scope 3.1 emissions, which stem from purchased goods and services and often represent one of the largest categories in a company's carbon footprint. Indeed, for most companies most of those Scope 3.1 emissions are those associated with the electricity consumption of their suppliers.

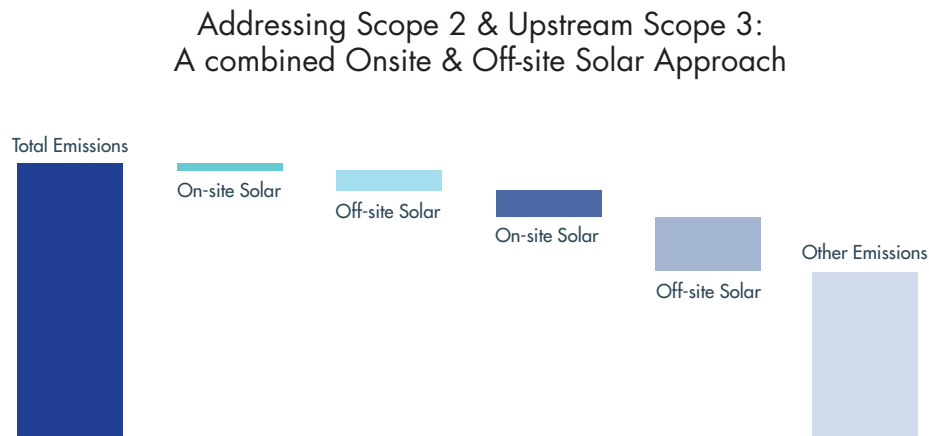
What can be done? Sustainability leaders are encouraging suppliers to adopt renewables, incentivising them in a variety of ways. These include:

- Many companies are helping to aggregate suppliers' requirements and support procurement deals or renewable energy programs.
- Sharing tools and resources to help suppliers evaluate their energy usage and explore renewable options.
- Integrating renewable energy expectations into supplier codes of conduct or sourcing policies.
- Differentiating supplier evaluation or contract renewal criteria based on emissions transparency and progress.

To accelerate deployment, some companies are also partnering with a renewable energy developer across their supply chain, sometimes even co-investing in renewables projects to fully align their own financial incentives with decarbonisation objectives.

Companies that succeed in decarbonising their supply chains in this way can boost their cost competitiveness, while demonstrating readiness for regulations like CSRD and CBAM, and enhancing their market positioning with sustainability-conscious customers and investors. However, there are notable challenges. A key difficulty lies in emissions attribution and quantifying what share of a supplier's emissions can be credibly linked to the purchasing company. Many firms also face gaps in data availability or supplier engagement capacity. To overcome these hurdles, some corporates are prioritizing action with strategic or high-emission suppliers, relying on industry averages or spend-based estimates when primary data is not available, and focusing first on engagement and capability-building rather than enforcement.

Figure 3: Indicative impact of scope 2 and supply chain decarbonisation through renewable energy for Asian corporates



2.2 TIPS FOR CORPORATE PROCUREMENT JOURNEY

For many corporates, renewable energy procurement is a first-of-its-kind exercise. Below is a step-by-step approach designed for companies with little or no prior experience in solar or wind procurement.

These tips focus primarily on PPA pathways (on-site or off-site), which are the most widely used by corporates. Some of them nonetheless also apply in the context of RECs procurement or for companies opting for a self-investment/CAPEX model.

STEP 1: ON-SITE SOLAR - DEFINE HIGH-LEVEL NEEDS AND REQUIREMENTS

On-site solar is typically the most cost-effective and fastest-to-implement solution. Begin by mapping what is physically and contractually possible for your company:

- **Understand your energy baseline and current input:**
 - How much electricity do you consume per month (kWh)?
 - What do you currently pay for this power per kWh?
 - Do you have seasonal or daily load variations or periods of zero load (e.g., factory shutdowns)?
 - Do you face challenges such as grid instability, blackout, etc.?
 - At this stage, it is important to bring a project team together:
 - › **Technical:** Usually led by Engineering or Facilities Management staff.
 - › **Financial:** A team to estimate savings, approve payment terms and credit support mechanisms. This is often overlooked but it is critical to bring them into the process early.
 - › **Legal:** Given the long tenor of PPAs, it is important to engage this department early. They will need to review the contract and understand the risk-sharing mechanisms.
- **Identify available space:**
 - How much rooftop or ground area do you control?
 - Can you add a carport or solar canopy?
 - Can your rooftop sustain additional weight from a solar PV system? (Sometimes more construction is required.)

- **Clarify contract conditions:**

- What PPA term are you comfortable with? Longer tenors (typically 20–25 years) usually offer the lowest rates, but they must align with the ownership horizon of your building.
- If your site is leased, what approvals are needed from landlords? Are they willing to sign off on rooftop projects?
- What is the pricing structure? Fixed per MWh (with or without escalation) or tracking a price/market index (with or without floor/ceiling)?
- What is the currency used? Local currency in most cases, but US\$ can be considered in some markets to be protected against currency volatility or depreciation. It usually also means cheaper PPA pricing.

- **Decide on whether the Renewable Energy Certificates (RECs) are important:**

- Are RECs critical for your sustainability reporting?
- If not, you may secure a better PPA price by leaving the RECs with the developer.

Output of Step 1:

A clear understanding of what's feasible on-site, what you want from a contract (term, REC strategy, operational flexibility), and the kind of counterpart you need.

STEP 2: PLAN FOR OFF-SITE PROCUREMENT - SCALE YOUR RENEWABLE MIX

On-site projects typically cover only 10–30 % of a site's electricity needs. To reach deeper decarbonisation, you'll likely need off-site solutions (solar or wind).

- **Select the right model:**

- **Physical PPAs** are where renewable credits are bundled with power, injected into the grid and credited directly to you. There can be significant complexity around structuring these contracts as you generally need a retailer to sit between the developer and customer. Some retailers require significant margins to provide the service.
- **Virtual PPAs** (often called Contracts for Difference) are financial contracts where you receive the renewable credits but not energy. These tend to be easier to structure and represent most power contracts globally.
- Both are generally available across the region though some countries are working through regulations.

- **Define your target:**

- Are you aiming to decarbonise a fixed % of national power consumption?
- Given that the alternative is to buy RECs from existing projects, it's important to be clear on the value of "additionality", e.g. your contract causes new renewable capacity to be developed.
- What are your alternatives in terms of sourcing power and how flexible is your existing retailer?
- When would you like the power / RECs to be delivered? It can take several years for new projects to be developed (though many developers have existing development portfolios available).

- **Set contract terms:**

- Like on-site, longer tenors (20–25 years) usually provide the lowest prices, but often off-site contracts can be shorter.
- Often the PPA is signed with a legal entity, not a physical building, and so there can be more flexibility if you move location.

Output of Step 2:

A high-level off-site procurement plan: What scale of renewable energy you need, in which markets, and under what contract conditions.



STEP 3: SELECT VENDOR - RUN A COMPETITIVE TENDER (RFP)

With requirements defined, companies can move to vendor selection. Whether for an on-site or off-site project, companies must ensure they engage with a counterpart they are comfortable with, whose interests are aligned and who has significant relevant experience. The goal is not just to get a low price but to find a partner who can deliver a project that works for the next 15–25 years.

Customers need to focus on the experience and credentials of the individuals in the vendor's team – as much as ensuring the vendor has sufficient funding to develop, construct and operate the infrastructure project. Many large, renowned brands lack in-house capabilities which are critical to delivering the projects. The strength of the team is often more important than the credentials of the company.

Look for:

- Teams with a proven track record delivering projects of similar size.
- Companies with financial strength to fund construction.
- Ideally, a partner with the agility to deliver both on-site and off-site solutions across multiple jurisdictions simultaneously, offering a bundled approach tailored to your needs.

Key selection criteria should include:

- **Financial Strength:** Counterpart bankability is critical. For on-site projects, you should look for developers that can fund the entire CapEx without needing 3rd party equity or bank debt. Otherwise, you can experience delays of 1-2 years. For off-site projects, developers need to be able to fund their portion of the construction equity and have good experience working with reputable banks to structure the debt. This really speaks to a particular team's experience. It is also important to understand the investor's profile. Is this an EPC company that plans to build the project (cheap) and then sell to someone else? Is this a professional infrastructure investor? Experienced, well funded developers can often absorb regulatory changes or cost shocks that smaller players cannot.
- **Technical Expertise:** High-quality technical execution can significantly impact both savings and reliability. This can be assessed based on a team's track record in system design, output quality, health and safety (HSE) compliance, and long-term operational performance. Often developers do not conduct the construction or engineering themselves but outsource to local contractors. Does the team have experience managing the local nuances and are they also able to bring global best practices to ensure the system operates at maximum capacity and safety over the contractual period?
- **Reputation and ESG Alignment:** Poor governance or community opposition can derail projects. It can pose reputational and operational risks to the buyer, especially in high-visibility or long-duration projects. Evaluating a vendor's broader reputation, including community engagement, land use practices, and compliance with ESG and regulatory standards can help minimize risks.
- **Multi-market experience:** If you operate in several countries, a vendor with proven ability to deliver across multiple APAC markets can save you time and complexity by offering a single, harmonized approach.
- **Development capability:** Does your vendor have the in-house teams to navigate permits, interconnection, and community engagement? This can be the difference between achieving Commercial Operating Date (COD) on time vs. years of delays.

Tip: To be effective, a Request for Proposals (RFP) should allow corporates to assess qualified vendors according to their most critical factors. A strong tender process further ensures alignment on price, performance, and sustainability. The best partners will proactively offer flexible solutions, such as integrating battery storage, structuring multi-site portfolios, or tailoring REC strategies to your reporting needs.

STEP 4: NEGOTIATE, SIGN, AND IMPLEMENT - FROM PAPER TO POWER

Once a preferred vendor is selected, move carefully through contracting and execution.

During contracting, there are multiple clauses which may be unfamiliar to most corporate legal teams, but tend to be intuitive. Examples include:

- For on-site, vendors will need access to your facility to construct and maintain the system safely.
- Termination fees (from customer) allow vendors to recoup a major investment and potential losses if there is a break in contract.
- Customers usually look to align on performance expectations and request vendors to support if systems perform below.
- Infrastructure projects are not viable without debt (at some point). Contracts need to be bankable to receive debt which requires several clauses, e.g. bank guarantees, payment terms, step-in rights, force majeure and change-in-law alignment.
- Definition of REC ownership and process for sustainability reporting

Engaging legal and technical advisors early can help to reduce risk and clarify obligations.

During construction, key priorities include:

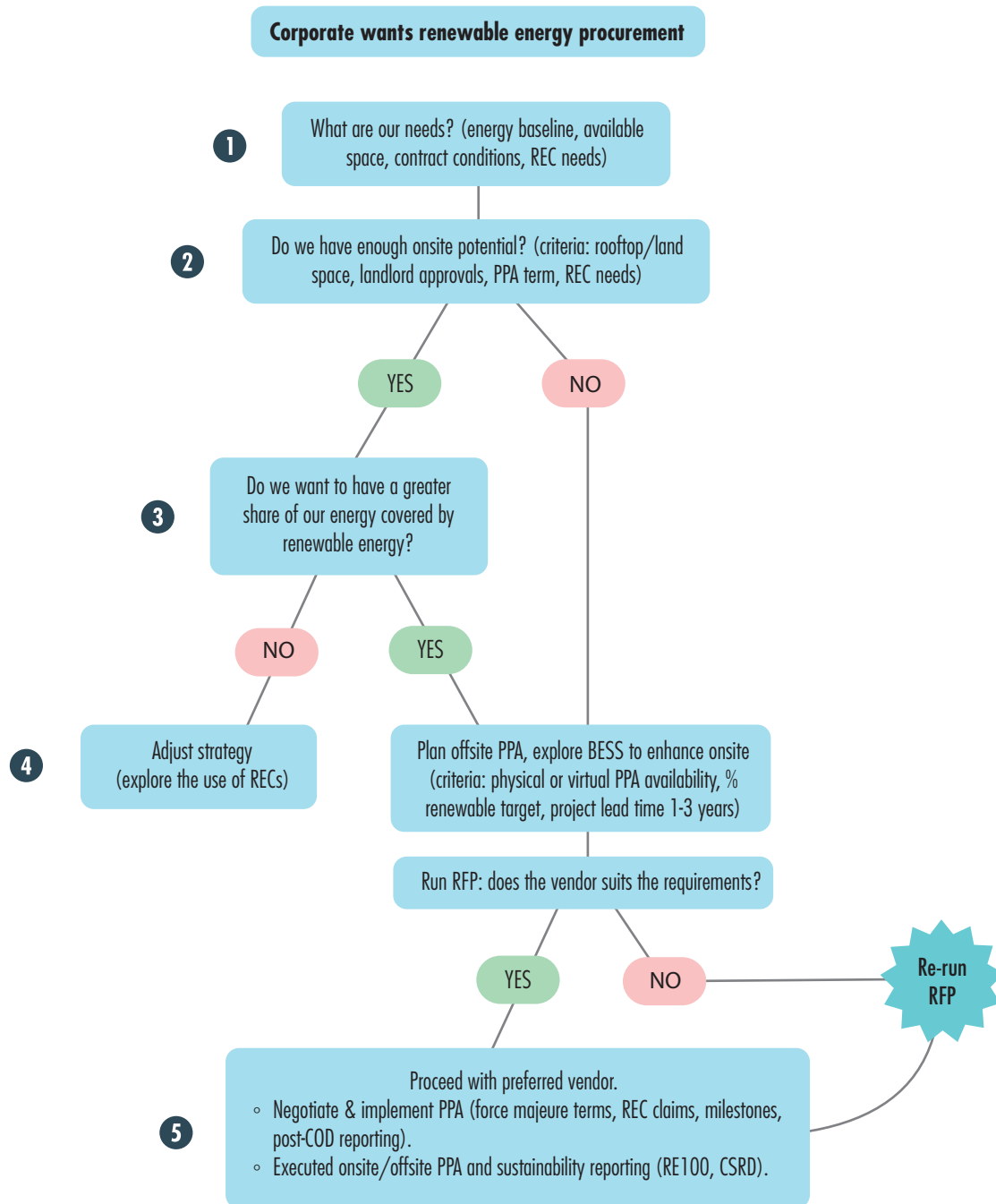
- **Delivery alignment:** This is particularly relevant for on-site projects. The facilities team needs to provide access, space for construction materials and align on schedules.
- **Internal coordination:** Bring procurement, finance, legal, and sustainability teams into the process early. Internal misalignment is one of the biggest causes of delay.
- **Post COD operations:** A good partner will provide online dashboards and periodic reports that simplify sustainability disclosures for RE100, CSRD, or other frameworks.

Why this matters: A poorly negotiated or managed contract can erase the cost and sustainability benefits of your renewable energy investment. Choosing an experienced partner, with institutional backing and a track record of delivering across Asia, significantly reduces this risk.

While these four steps provide some high-level practical guidance, many other resources are available for companies turning renewable energy strategy into action:

- Freely available resources include template PPAs, including by the Solar Energy Industries Association or the Vietnam Energy Partnership Group, with support from Germany's GIZ [here](#).
- US-based Clean Energy Buyers Association (CEBA) also provides templates, as well as trainings and additional resources (accessible mostly to its members).
- Many specialist companies provide corporate buyers of RE with advisory services and end-to-end procurement solutions.

Figure 4: Step-by-step procurement journey - Energy procurement decision tree



SECTION 3: COUNTRY-SPECIFIC CONSIDERATIONS

While corporate buyers face many common steps in procuring renewable energy, implementation can vary significantly by country. National regulations shape what procurement options are available; for instance, whether off-site PPAs are permitted or if utilities provide credible green tariff programs.

At the same time, renewable energy prices differ widely depending on resource availability, subsidy regimes, and market competition. Finally, the maturity of local providers, both in terms of technical capability and project execution, can significantly influence delivery timelines and risk profiles.

The below market profiles aim to help decision-makers quickly compare opportunities and constraints across jurisdictions and develop strategies that reflect these local realities.

The following countries are included: Singapore, Indonesia, Philippines, Malaysia, Thailand, Japan, South Korea and Taiwan.

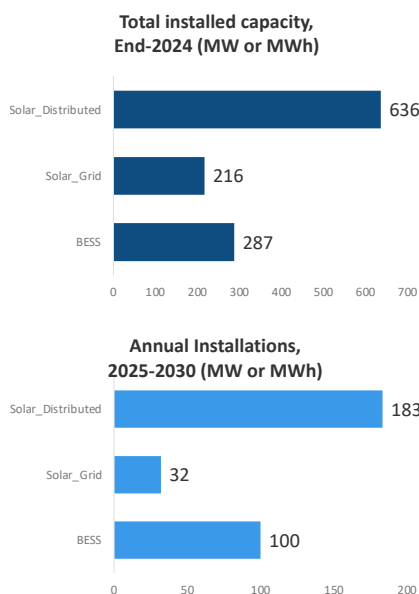
All charts in this section are sourced from Wood Mackenzie Power Lens, 2025. Case studies to illustrate those findings can be found in the Appendix.



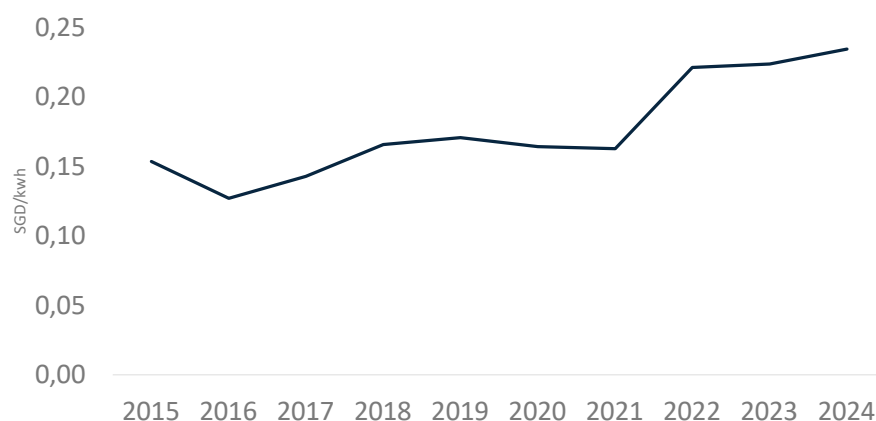


SINGAPORE

One of the most expensive power tariffs in Asia (and expectation of future price escalation) means energy strategy is a critical component for many industrials. Favourable regulatory environment is counter-balanced by extremely scarce land. RECs offer short-term alternatives (at high cost), while large electricity import projects could offer renewable solutions in the longer term, but at high cost.



Singapore Industrial Electricity Tariffs in SGD/kwh (2015–2024)



- » Limited scope for additional off-site projects.
- » Customers need to move fast to secure capacity.

- » Large data centre and semicon manufacturing demand expected to push power prices up.
- » Many customers looking to lock in fixed-rate PPAs at current levels before further escalation.

Solar PPAs (on-site/ off-site)	<ul style="list-style-type: none"> » Contracts typically last 15–25 years with fixed pricing, about 20–50% cheaper than grid electricity. » Off-site PPAs cost more because they involve roof rental and landlords often retain part of the energy or RECs. » Under National Energy Market of Singapore (NEMS) rules, on-site systems can sell excess solar at approx. 70–75% of the retail tariff - a major boost for project bankability. » Project timelines are 3–6 months, covering permits, rooftop assessments, and often complex landlord approvals. » One of the main challenges: aligning landlord–tenant interests (long leases, access rights, sharing savings and RECs) is frequent. » There are no feed-in tariffs; all terms, prices, and risks are negotiated directly with developers.
RECs markets	<ul style="list-style-type: none"> » RECs in Singapore are issued under I-REC and TIGR standards. » Prices are very high (SGD 35–60/MWh) and among the highest in Asia (vs. <SGD 5/MWh in oversupplied markets like Vietnam or India). » Most RECs come from older rooftop systems, offering limited additionality (they don't directly fund new projects). » This raises credibility risks for companies relying solely on them. » Many buyers now prefer RECs from new projects or regional imports to strengthen their climate impact. » Despite their cost, RECs remain essential for companies without access to on-site or off-site solar.
BESS	<ul style="list-style-type: none"> » The first large-scale battery storage system (Sembcorp, 285 MWh) is now operational, but adoption by private companies remains very limited. » Two main barriers: high upfront cost (often with long payback periods) and lack of space to install containerized batteries. » Unlike in deregulated markets, companies in Singapore currently have few ways to monetise battery assets (e.g. no time-of-use pricing or trading mechanisms): no commercial projects using batteries for electricity arbitrage to date. Current market structures do not reward storing energy during low-price periods and discharging during peaks. » The government is piloting demand aggregation and virtual power plant models to improve viability. For now, batteries are mainly strategic assets for large sites or data centres, not a mainstream corporate solution.
Wind PPAs	<ul style="list-style-type: none"> » No development due to space constraints and low wind speeds (avg. 2 m/s). » No projects operational or planned at scale.
Incentives	<ul style="list-style-type: none"> » Under NEMS rules set by the Energy Market Authority, excess solar generation can be exported to the grid, with payments of about 70–75% of the retail tariff for small consumers and of wholesale rates for larger ones. » EFS–Green: Government-backed loans with up to 70% risk-share, supporting projects like renewables, energy efficiency, and low-carbon tech. Loan sizes can reach SGD 50 million. » Other support includes SolarNova (public sector solar deployment) and the Energy Efficiency Grant for SMEs, covering up to 70% of qualifying energy-saving equipment costs. » Loan amounts can reach up to SGD 50 million depending on the company profile and project scope.
<p>Key takeaways: On-site solar PPAs remain the most cost-effective option where space is available. Off-site PPAs are possible but often more complex and expensive. RECs are widely used but costly and offer low additionality. Batteries are being trialled at utility scale but remain early-stage for corporates. Wind is not viable. Decarbonisation in Singapore requires careful mix of on-site efforts, credible RECs, and long-term planning for regional imports or system-level storage.</p>	

Box 5: Singapore's planned renewable energy imports

Renewable electricity procurement across Asia is gaining momentum, though regulatory complexity remains a key hurdle, particularly for Singapore-based corporates relying on regional sourcing. With limited domestic renewable potential, Singapore aims to import low-carbon electricity by 2035 from neighbouring markets such as Indonesia and Malaysia. The Asia Clean Energy Coalition ("ACEC"), a coalition of renewable energy buyers, sellers, and investors, is closely tracking these developments to support scalable and credible clean energy procurement.

In Indonesia's Riau Islands, over 3.4GW of solar conditional licenses and approvals have been awarded from the Singapore government, positioning the Indonesia as a key contributor to Singapore's clean electricity goals. The solar-export-linked islands lie just 30 to 160 km from Singapore by sea route, highlighting the strategic relevance of cross-border supply. However, offtake negotiations and final investment decisions (FID) remain constrained by uncertainty over how such imports will be recognised under global corporate disclosure standards, including RE100 and the GHG Protocol Scope 2 Guidance.

To bridge this gap, ACEC advocates a phased "start-small, scale-up" approach through pilot projects between Singapore and neighbouring markets to test cross-border renewable-energy certification and verification mechanisms. These pilots are intended to inform a unified regional framework aligned with RE100, the GHG Protocol, and ASEAN Power Grid (APG) objectives. Project developers and consortiums are targeting 2027 for initial commercial operations, making timely policy clarity a critical enabler for investment and financing decisions.

In Malaysia, the Energy Exchange Mechanism (ENEGEM) is a government-led pilot enabling third-party access and electricity exports. Johor, just across the border, includes Special Economic Zones (SEZs) supported by both governments, and is expected to host green data centres and solar farms that can supply power to Singapore. While promising, ENEGEM remains a one-year trial, and low uptake limits its effectiveness as a benchmark. Its viability will depend on extending the trial to multiple years to encourage broader corporate participation as a decarbonisation pathway.

The successful rollout of Malaysia's Regulatory Period 4 (RP4), effective July 2025, will be pivotal in strengthening market transparency and credibility. RP4 introduces unbundled electricity tariffs (energy, capacity, network, retail), a new Automatic Fuel Adjustment (AFA) replacing ICPT, and an expanded Time-of-Use (TOU) regime for users with smart meters. Together, these reforms can lay the foundation for an enhanced ENEGEM phase and a more integrated ASEAN clean power market.

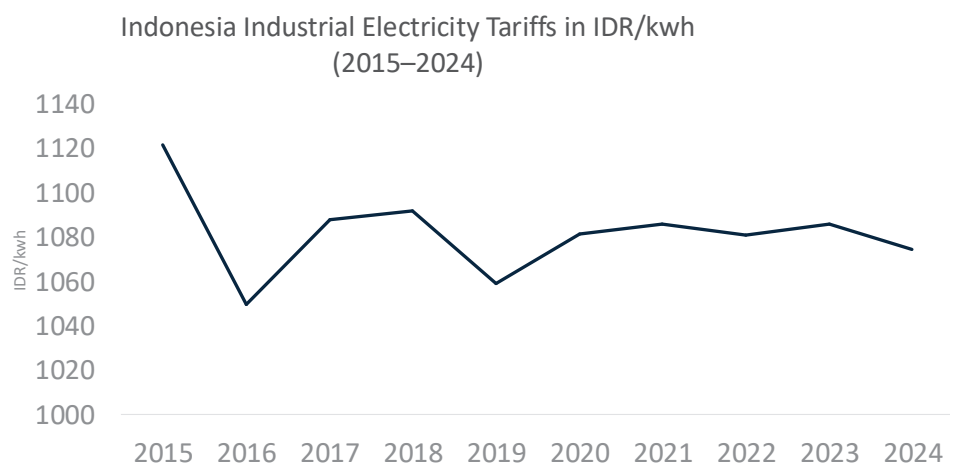
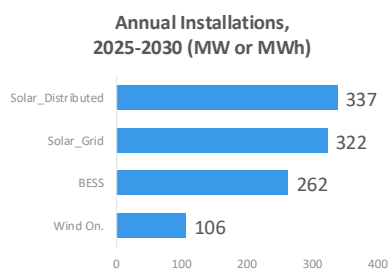
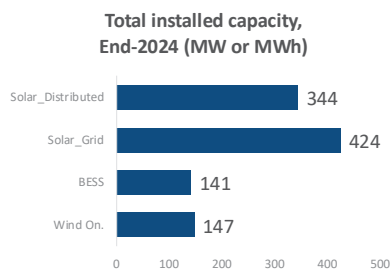
Building cross-border electricity trade will require both policy alignment and market credibility across participating countries. In support of this, ACEC has submitted a letter to the Climate Group calling for clearer guidance under RE100 and the GHG Protocol on how such renewable electricity can be credibly recognised. As these standards evolve, Singapore-based corporates will need to stay closely aligned with regional developments to ensure their procurement strategies remain robust, scalable, and consistent with global best practices.





INDONESIA

Firmly regulated electricity market, with the national utility, PLN, dominating power generation, and holding a monopoly in transmission, distribution and retail. Options for corporate procurement of RE are therefore limited. End-user power prices are amongst the lowest in the region and are well under PLN’s actual production cost.

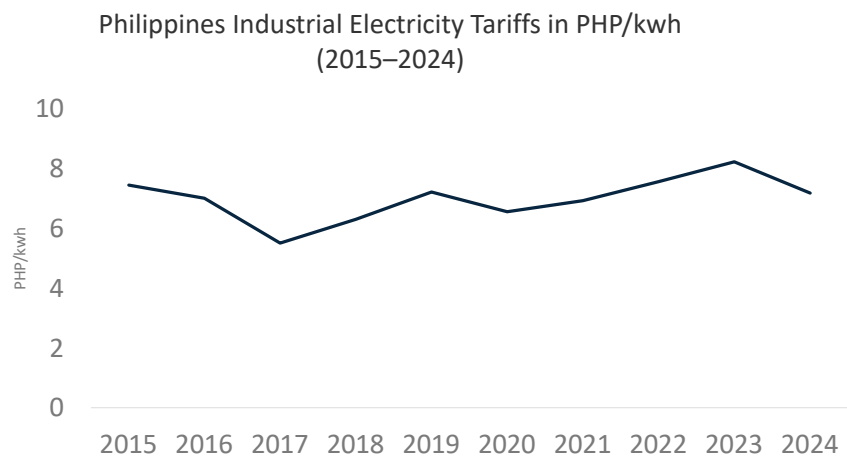
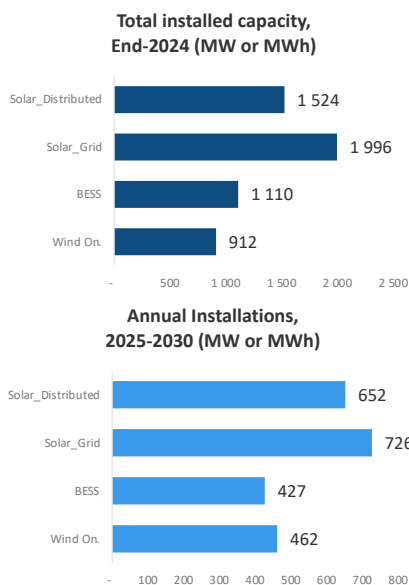


Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » Only on-site solar is available for corporates, usually via Operating Lease Agreements (OLAs) that mirror PPAs. Off-site PPAs are not permitted as PLN holds a sales monopoly. » Pricing: Three main models are used: <ul style="list-style-type: none"> › 1. Grid tracking: a fixed 20–30% discount on PLN tariffs. These tend to be historic deals and are very difficult to find currently – given the already-low PLN tariffs. › 2. Grid tracking with a floor adds a minimum tariff to protect developers. › 3. Fixed flat tariffs: offering long term price certainty. To meet minimum return requirements, this often involves customers paying more for renewable energy in the short-term. » These options balance immediate savings for corporates with revenue stability for developers. » Market: Dominated by local providers; some foreign players (e.g., Engie) have exited due to market complexity. » Regulation: A proposed Renewable Energy Bill could eventually allow companies to buy power directly from independent producers via PLN’s grid. New 2024 rules limit rooftop solar capacity on each grid area to maintain system stability.
RECs markets	<ul style="list-style-type: none"> » PLN’s TIGR Certificates: Since 2020, state utility PLN sells 1 MWh renewable certificates via the APX TIGR registry, mainly from geothermal and hydro plants. Prices started around IDR 35,000 (~US\$2.5/MWh), and by 2024, corporates had bought ≈11 TWh worth of these certificates. » I-RECs: A voluntary I-REC market has existed since 2018, managed by the Green Certificate Company. Supply remains limited as only a few Indonesian projects are registered for I-REC issuance. » Green Energy as a Service (GEAS): PLN now offers corporates a green tariff, allocating output from its renewable plants (geothermal, hydro, etc.) directly to buyers, bundled with RECs. This provides a turnkey way to source renewables for those unable to install on-site solar, though pricing and conditions are set by PLN.
BESS	<ul style="list-style-type: none"> » While some pilot utility-scale battery exists, there are currently no easily accessible BESS options for corporates in Indonesia. The behind the meter storage market is still nascent, with no standard offers from PLN or third party providers for commercial battery services. » Regulatory support is lacking, there are no clear rules for using batteries in ancillary services or reducing demand charges, leaving companies with little incentive or ability to deploy large scale storage. For now, BESS remains at pilot stage, though adoption is expected to grow as grid reliability challenges and renewable integration needs increase.
Wind PPAs	<ul style="list-style-type: none"> » Corporates in Indonesia currently can’t buy wind power directly. All electricity from wind farms must be sold to the state utility PLN, which is the only entity allowed to buy and distribute power. » The country’s wind capacity is very small (around 150 MW nationwide). A few large projects, like the Sidrap and Jenep-onto wind farms in Sulawesi, are operating or being built, but their output goes entirely to PLN. For now, companies that want wind power are limited to buying certificates (RECs) linked to these projects or waiting for future green programs that may open access.
Incentives-	<ul style="list-style-type: none"> » Main incentive: Tax holidays: Up to 100% corporate income tax relief for 5–20 years, depending on project size. These incentives mainly target developers but can indirectly make PPAs cheaper for corporates. » There are no direct subsidies or premium tariffs for corporate renewable buyers; projects still depend on PLN agreements and regulatory approvals.
<p>Key takeaways:</p> <p>On-site solar is the most effective, affordable and readily available option. There are also some opportunities for REC purchases and a recently introduced the Green Energy as a Service (GEAS) initiative with PLN, but supply is relatively constrained. Companies should stay tuned with regulatory updates as a gradual loosening of rules around RECs and off-site PPA market can be expected in the medium term.</p>	

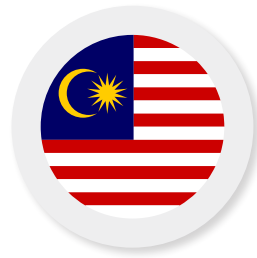


PHILIPPINES

One of the most favourable regulatory environments for renewables in Southeast Asia, with the government doubling down on incentives and regulatory easing in recent years. Combined with strong solar (and wind) potential, this creates many pathways for corporates procurement of RE.

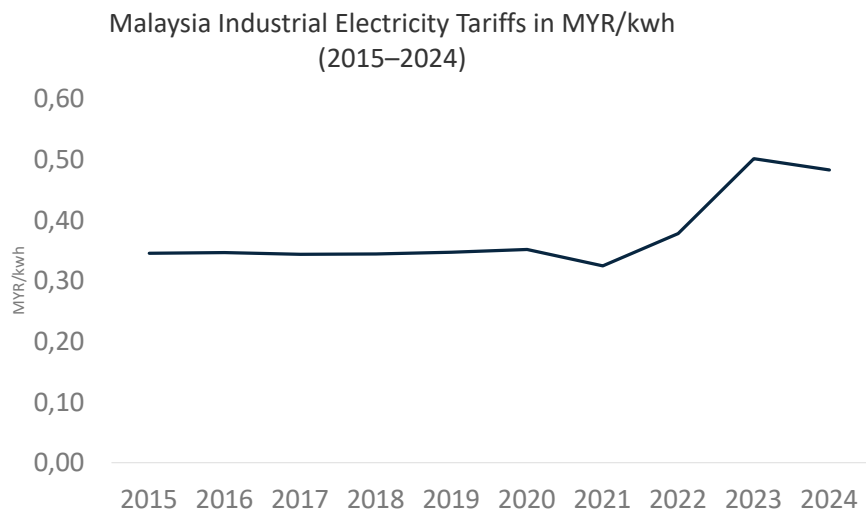
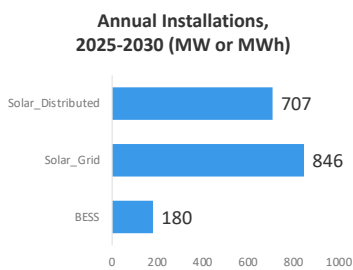
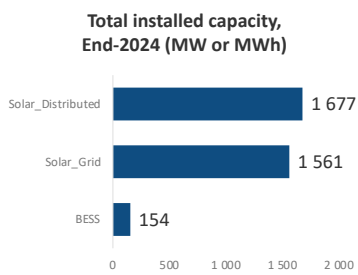


Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » Companies can use all types of PPAs: on-site solar (rooftop), off-site solar through licensed renewable energy suppliers, or utility backed programs like the Green Energy Option (“GEOP”). The GEOP allows eligible businesses to sign a PPA directly with a renewable energy producer (solar, hydro, etc.) while using the public grid for delivery, instead of buying only from their local utility. » Eligibility: “Contestable Customers” (≥500 kW peak demand) can freely choose their supplier under retail open access; those ≥100 kW can join GEOP to contract directly with renewable producers. These programs are expanding, with thresholds set to gradually drop to 100 kW for all. » Pricing: PPAs typically provide 10–40 % discounts on grid electricity, with fixed rates for 10–25 years (no escalation), helping businesses hedge against volatile tariffs. » For smaller sites: Rooftop systems up to 100 kW can join net metering, earning bill credits for excess power at the utility’s generation cost (lower than the retail price). » Key considerations: Some programs (like GEOP) require sourcing 100 % renewable power, and green certificates (RECs) from these contracts usually go to the utility, i.e. companies need extra steps if they want to claim renewable use for reporting.
RECs markets	<p>The Philippines strengthened its Renewable Portfolio Standard (RPS) in 2023, requiring electricity suppliers to increase their renewable share to 35% by 2030. To track this, Renewable Energy Certificates (RECs) are issued for each MWh of green power.</p> <ul style="list-style-type: none"> » REC ownership: Under current rules, RECs from programs like net metering and GEOP automatically go to the utility, not the corporate buyer. This means companies signing these contracts cannot directly claim “100 % renewable” use unless they buy additional certificates. » REC market: In late 2024, the government launched the Renewable Energy Market (REM), a trading platform where utilities, generators, and large users can buy and sell RECs. This allows companies to purchase RECs to cover their consumption and make credible sustainability claims. » International RECs: Some plants issue I-RECs (internationally recognised), but volumes are limited.
BESS	<ul style="list-style-type: none"> » Large scale projects: Several hundred MWh of batteries are now operating, mainly for grid support (frequency regulation and reserve power). » Hybrid projects: The government is preparing a special auction for solar/wind paired with batteries, ensuring new projects can deliver power more reliably. Batteries paired with renewables keep priority dispatch status, meaning their energy must be accepted by the grid before fossil sources. » For corporates: Behind the meter batteries for factories or malls are still rare, with no dedicated incentives. They can help reduce peak demand charges or store excess solar for evening use but are at an early stage.
Wind PPAs	<ul style="list-style-type: none"> » Onshore wind: The Philippines has around 400–450 MW of onshore wind, mainly built under an old feed in tariff program. In 2023, the Green Energy Auction awarded 1.46 GW of new onshore wind capacity, which will more than triple installed capacity in the coming years. » Offshore wind: The country has huge potential (approx. 178 GW). By April 2024, the government had issued 92 offshore wind study licenses totalling over 65 GW. A roadmap targets up to 21 GW of offshore wind by 2040. » Corporate access: At this stage, corporates can’t directly contract wind power; output is sold to utilities. In the future, corporate PPAs could emerge as projects mature.
Incentives	<ul style="list-style-type: none"> » Tax holidays: Up to 7 years of income tax exemption, followed by a reduced 10% corporate tax rate (vs. 25%). » Accelerated depreciation: Projects can recover investments faster with double depreciation rates if they waive tax holidays. » VAT zero rating: Renewable power sales are exempt from VAT, improving returns. » Cash incentives: For renewables replacing diesel in off grid areas. » Tax exemption on carbon credits.
<p>Key takeaways:</p> <p>On-site solar remains the quickest and most cost-effective route to green energy, delivering 10–40% savings compared with grid rates. Large energy users can access retail open access and GEOP PPAs, while smaller corporates rely on net metering; however, REC ownership rules often require separate certificate purchases to claim renewable use. Onshore wind is expanding, and offshore wind, with 65 GW in the pipeline and foreign developers entering, could be transformative. Batteries are increasingly central to ensuring reliability, with auctions planned for integrated renewables-plus-storage projects. Combined with tax breaks, VAT exemptions, and 100% foreign ownership, these factors make the Philippines one of Southeast Asia’s most attractive renewable markets.</p>	

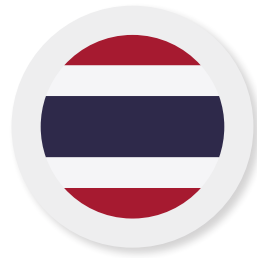


MALAYSIA

Relatively new solar market for corporates with growing range of available RE procurement options and players, but regulations are complex and in flux.

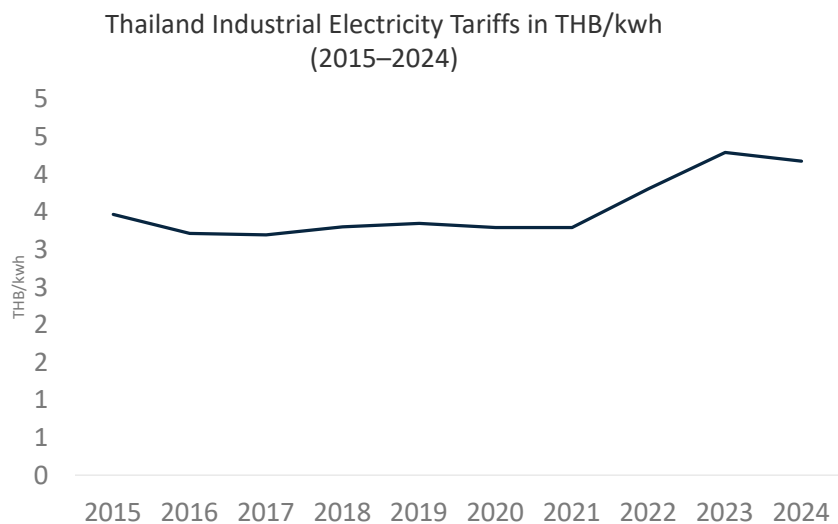
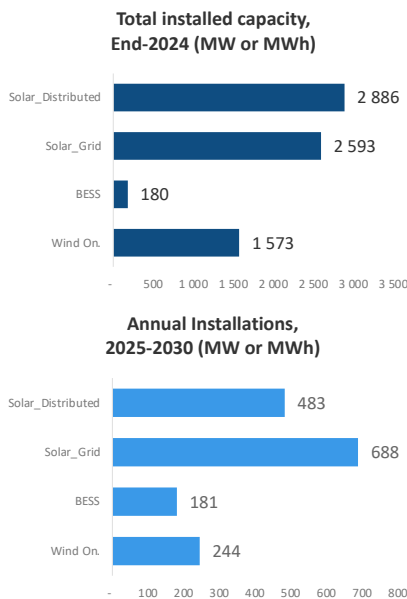


Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » All types of PPAs are available: on-site, virtual off-site via the Corporate Green Power Programme (CGPP), and physical off-site through the upcoming Corporate Renewable Energy Supply Scheme (CRESS). » Off-site projects require a local partner (Malaysian law requires at least 51% local ownership for CRESS developers). » Pricing: PPAs are typically 20–30% cheaper than grid power; either at a fixed price or at a discount to the TNB utility tariff (grid-tracking). » These options allow corporates to lock in lower long-term rates or benefit from a consistent discount compared to grid electricity.
RECs markets	<ul style="list-style-type: none"> » IRECs dominate, followed by TIGRs (Tradable Instruments for Global Renewables) (APX) » Green Electricity Tariff (GET): Offered by TNB, lets companies bundle green power with RECs for a premium. » This makes REC-backed green power more affordable for corporates that can't sign PPAs.
BESS	<ul style="list-style-type: none"> » Storage is emerging, mainly paired with solar PPAs under CRESS. » Projects that add batteries can qualify as "firm" suppliers, reducing grid charges (from 45 sen to 25 sen/kWh) and improving reliability. » This is attracting interest from developers and corporates aiming for 24/7 renewable coverage, but adoption is still early-stage.
Wind PPAs	<ul style="list-style-type: none"> » Limited viable wind resource (on average 2 m/s). » No utility-scale projects exist, so corporate procurement is focused on solar and RECs.
Incentives	<ul style="list-style-type: none"> » Green Investment Tax Allowance (GITA): Deduction of up to 100% of CapEx for green tech projects. » Green Income Tax Exemption (GITE): Tax exemption on profits from qualifying green energy activities. » Both are available until 2026, benefiting self-owned solar projects and renewable developers.
<p>Key takeaways:</p> <p>On-site solar is well established in Malaysia and represents an easy starting point. RECs (via GET or I-REC) are also well available and provide a simple alternative for corporates, even if at a cost premium. Malaysia introduced a flexible off-site PPA framework with competitive pricing, but these off-site projects need to be owned in part by local companies. Solar-plus-storage is growing as grid rules reward "firm" energy, while wind remains unviable. Combined with green tax incentives, these tools place Malaysia among the more attractive Southeast Asian markets for corporate decarbonisation.</p>	



THAILAND

Relatively large market that is just starting to expand renewable options for corporates (though on-site is well-established). Off-site virtual PPAs are expected in the near term, but regulatory complexity remains a concern.

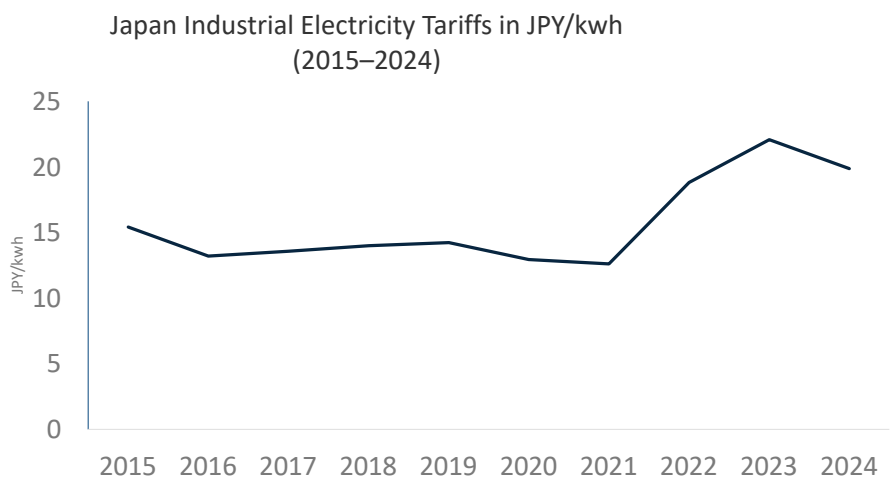
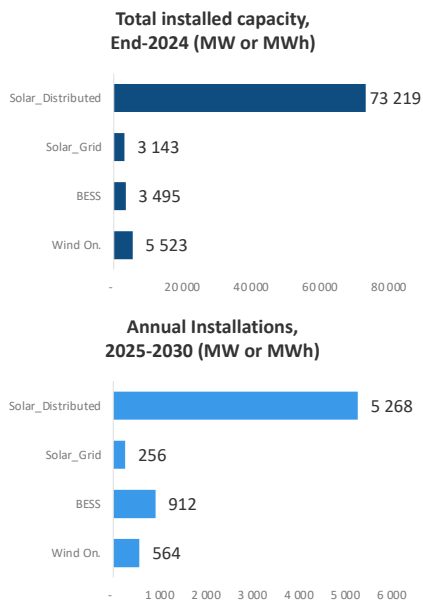


Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » On-site PPAs are widely available in Thailand. They typically feature flexible tenors of 15–25 years and are common among large commercial and industrial (C&I) users. » Pricing: Corporate PPAs are typically fixed price, often at 10–50 % below prevailing grid tariffs depending on the contract length, system size, and location. » Virtual/off site PPAs under the new “Direct PPA model” are preparing for pilot phase (2 GW cap), initially targeting large power users such as data centres. This model will allow corporates to buy renewable electricity directly from producers through the public grid, bypassing the utility monopoly. » Outlook: The pilot is restricted in scope for now, and the timeline and modalities for full rollout are still being finalised (expected after 2025). Once fully implemented, this model will unlock virtual and off site PPAs at scale for corporates. <p>Note: There are indications that physical off-site PPA might not be allowed under future regulation currently being drafted, which could impact procurement options for corporates and industrials.</p>
RECs markets	<ul style="list-style-type: none"> » International RECs (I-RECs): Widely traded in Thailand, with the bulk coming from biomass and hydro projects. Recent issuance reached over 1 TWh for biomass (Jan–Oct 2024), compared to approx. 0.2 TWh for solar and 0.04 TWh for wind. Prices are relatively low (approx. \$0.5–1.5/MWh), making them a cost effective tool for corporates to claim renewable electricity use. » Local T VER credits: Managed by the Thailand Greenhouse Gas Management Organization (TGO). These voluntary carbon credits are popular among Thai companies to demonstrate local contributions to emissions reduction. » Utility Green Tariff (UGT): Launched in 2025, allowing large customers to buy certified green electricity directly from state utilities (EGAT, PEA, MEA). Phase 1 offers 2,000 GWh/year from hydro, and Phase 2 (planned for 2025–26) will expand to solar, wind, and storage, with 10 year contracts.
BESS	<ul style="list-style-type: none"> » Market trend: The government has supported nearly 1 GW of solar plus storage projects in recent procurements, helping to drive costs down – although much of the capacity still needs to be constructed.
Wind PPAs	<ul style="list-style-type: none"> » Current options: There are no direct corporate wind PPAs in Thailand today. Existing wind farms sell their output to state utilities. » Indirect access: Corporates can purchase wind I-RECs to claim renewable use, though volumes remain very limited (approx. 0.04 TWh issued Jan–Oct 2024). » Future developments: The Direct PPA model will allow corporate wind PPAs once fully implemented, and the expanded Green Tariff will also include wind in its next phase.
Incentives	<ul style="list-style-type: none"> » Joint Crediting Mechanism (JCM) is a Japan-led initiative that provides financial support to Thai companies for the adoption of advanced low-carbon technologies, thereby accelerating decarbonisation efforts and assisting Thailand in achieving its greenhouse gas reduction targets. This initiative is intricate and uncommon, typically reserved for specialised projects.
<p>Key Takeaways:</p> <p>On-site solar PPAs are accessible and cost effective options, offering up to 50% savings compared with grid rates. Green instruments such as I-RECs and the Thailand Voluntary Emission Reduction Program (T VER) provide a quick way to claim renewable use, though they come at a premium and offer limited additionality. Battery storage is becoming increasingly viable for industrial users, supporting peak load management and improving the utilization of on-site solar. Offshore wind PPAs are expected to grow under the Direct PPA model, but timelines and availability remain uncertain. A pragmatic strategy combines on-site PPAs for immediate savings, certificates for rapid coverage, and off-site PPAs for long term scaling toward corporate decarbonisation goals.</p>	



JAPAN

Deregulated regulatory environment, with significant Government subsidy-driven capacity but very new on-site and off-site PPA markets. Recently revised energy plan is pushing for higher renewable penetration but growth is hindered by land constraints, rising grid curtailment and complex regulations.

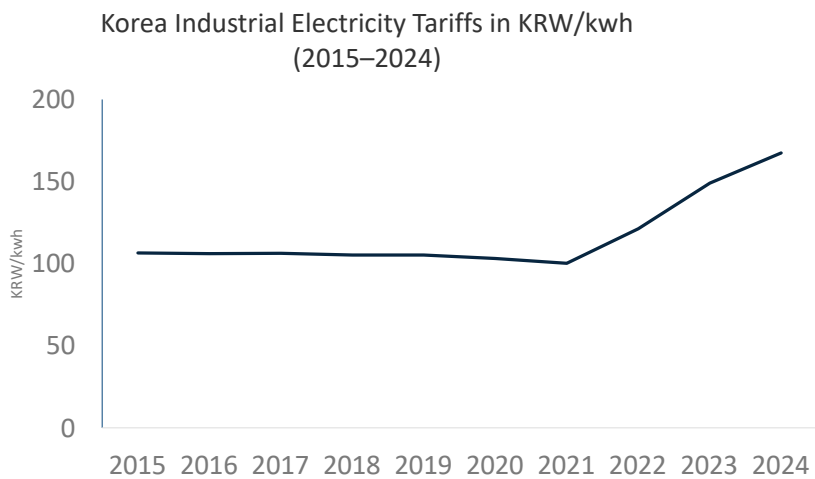
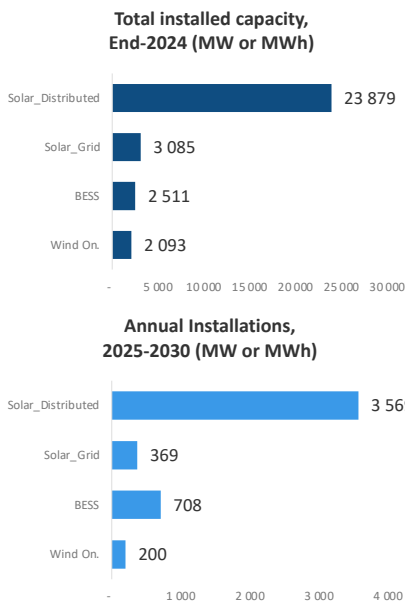


Solar PPAs (on-site/ off-site)	<ul style="list-style-type: none"> » All PPA types are available in Japan. Contract lengths are typically 20–25 years. » On-site PPAs: A growing market and can offer 10–40% discount against grid costs. » Off-site PPAs (physical or virtual): Theoretically physical PPAs could provide discount compared to grid prices but in practice retailers have been very reluctant to engage. Virtual PPAs are most contracts and usually require a premium against the wholesale spot market. » Market evolution: The Feed in Premium (FiP) scheme introduced in 2022 lets developers sell to corporates at market prices while still receiving a government premium, making corporate PPAs more attractive and cheaper. » Corporate adoption: Large companies like Google have already signed virtual PPAs in Japan (e.g., 60 MW of new solar capacity in 2024) to secure long term renewable supply.
RECs markets	<ul style="list-style-type: none"> » Non Fossil Certificates (NFCs): The most widely used renewable certificates, traded on the JEPX platform. Recent prices are around 0.4 US\$/kWh ($\approx 0.5$ ¥/kWh) after a 2023 price adjustment and are often bundled into green electricity plans by utilities or sold directly to companies. » Green Energy Certificates (GECs) and J Credits exist but are less commonly used for corporate procurement. » International I-RECs (available since 2022) are gaining ground among corporates that need globally recognised certificates. » Companies often combine NFCs with PPAs or green retail contracts to meet RE100 or voluntary carbon goals at low cost.
BESS	<ul style="list-style-type: none"> » Both large scale grid batteries and co located batteries with solar projects are growing in Japan. » Given the high cost of power at night, some developers now offer solar-plus-battery “time shifted PPAs”, where stored solar power can be used to limit peak pricing. This also has the potential to improve grid reliability, and raises the share of renewable energy used during non sunlight hours.
Wind PPAs	<ul style="list-style-type: none"> » Wind energy development has slowed considerably as most attractive sites have been already constructed. » They range from small, shared deals (<5 MW) to large commitments (50 MW+).
Incentives	<ul style="list-style-type: none"> » Feed in-Premium (FiP): Provides developers with a premium on top of market electricity prices for 20 years. The FiP can be directly transferred to virtual PPA off takers, helping to eliminate uncertainty around the JPEX price curve. In certain regions in the country, FiP projects also benefit from improved curtailment priority: since FIT projects are curtailed first, FiP can offer greater operational reliability. » Capital subsidies: National and local programs cover up to 30% of costs for on-site solar and battery projects. Example: Grants from METI or Tokyo Metropolitan Government for largescale BESS or solar plus-battery installations. » Impact on corporates: These incentives significantly reduce project costs, making PPA pricing more competitive than standard grid rates.
<p>Key takeaways:</p> <p>On-site solar is the simplest and most cost effective entry point for renewable procurement in Japan. Land constraints means that off-site solar while a growing market is likely to quickly hit maximum capacity. This is driving customers to move quickly to secure renewable capacity at attractive pricing. The expectation is for renewable and fossil power prices to accelerate sharply in near future with rapid growth in data centres. Integrating batteries into PPAs could provide better cost control and higher renewable utilisation, this is a business model that is being piloted by multiple players currently. Generous government incentives, including FiP premiums and 50% CapEx subsidies, further strengthen project economics, making renewable PPAs financially attractive even compared with grid power. The market for RECs and other Green Energy Certificates is active, but complex and fragmented across multiple schemes.</p>	

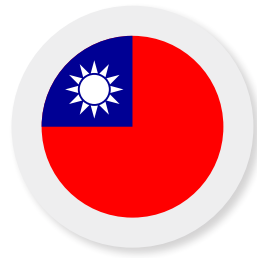


SOUTH KOREA

Complex market with KEPCO dominating most generation and all the transmission and distribution. On-site and off-site PPAs are opening in the last few years, driven by fast-rising end-user tariffs.

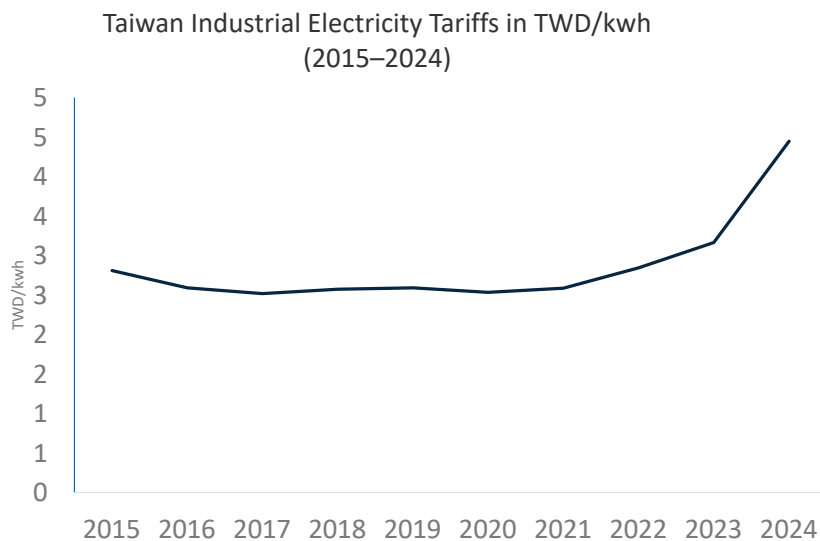
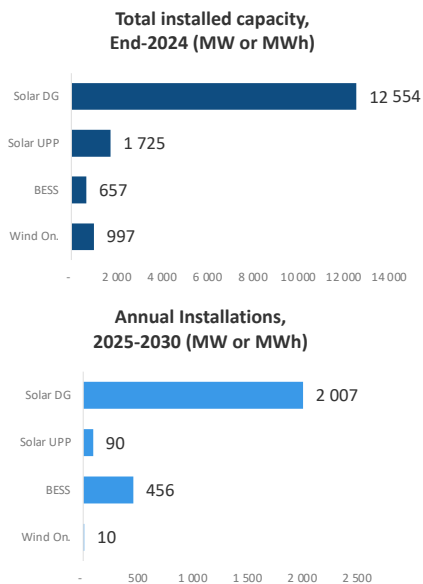


Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » All forms of PPAs available (on-site, virtual off-site, physical off-site), with contract terms typically 20 year fixed tenor. The corporate PPA market is still young but growing quickly. » Pricing: <ul style="list-style-type: none"> › 1. On-site PPAs: Around 5–15% cheaper than grid tariffs (industrial tariff ≈ 183 KRW/kWh). › 2. Off-site PPAs: Often structured through renewable retailers to deliver power to corporate buyers. » Regulatory framework: Since 2021, companies with demand ≥ 300 kW can sign PPAs under the K RE100 program. Examples: <ul style="list-style-type: none"> › 1. Amore Pacific signed Korea's first direct solar PPA in 2022 (20 years, 5 MW). › 2. Samyang Foods signed a 20-year on-site solar PPA in 2025 (1MW). › 3. SK Specialty signed a 20 year off-site solar PPA (50 MW) to cover long term needs. › 4. Amazon signed a 60 MW solar PPA in 2023 for its Korean operations.
RECs markets	<ul style="list-style-type: none"> » K RECs (domestic certificates): Issued by the Korea Energy Agency; very expensive at roughly 80 KRW/kWh (≈ 5.4 US¢/kWh). » Green Premium program: KEPCO sells bundled renewable power with RECs at a flat premium of 10 KRW/kWh (≈ 0.7 US¢), making it far more cost effective. In 2024, approx. 98% of corporate renewable procurement in Korea was through this program. » I-RECs: Approved in April 2025, enabling Korean renewable projects (especially rooftop and behind the meter) to issue globally recognised RECs, however this option remains a very recent evolution, making its implementation still uncertain. » Usage by corporates: Many companies combine Green Premium purchases for quick RE100 claims with unbundled RECs or I-RECs for flexibility and reporting compliance.
BESS	<ul style="list-style-type: none"> » Current status: Korea has deployed ≈ 4.1 GW / 10.1 GWh of batteries by 2022, one of the highest global capacities. » For corporates: On the long term, behind the meter batteries help store excess solar, reduce peak grid charges, and provide backup during outages. Time of use tariffs and high peak demand costs make storage attractive for industrial sites. » Government push: <ul style="list-style-type: none"> › 1. BESS previously earned high REC multipliers (up to 5x) under the RPS, which drove massive deployment. › 2. While these bonuses were reduced in 2020, new programs support grid connected and corporate owned batteries, including pilots for ancillary services and demand response participation.
Wind PPAs	<ul style="list-style-type: none"> » Corporate wind PPAs are allowed but rare. Most corporates source wind indirectly by buying RECs or through KEPCO's Green Premium (which includes wind in its mix). In 2022, Amorepacific signed Korea's first Virtual PPA for wind (17 year, 3 MW share of a 20 MW project in Jeju). » Pipeline: <ul style="list-style-type: none"> › 1. Onshore wind: Limited growth due to land constraints and slow permitting. › 2. Offshore wind: The government plans tens of GW, with the first PPA auction for 1.25 GW held in 2025 (20 year fixed contracts). » Outlook: Large corporate wind PPAs are expected to grow in the early 2030s as offshore projects reach commercial operation.
Incentives	<ul style="list-style-type: none"> » Renewable Portfolio Standard (RPS): Requires large generators to meet 15% renewable share by 2026 (2024 target: 13.5%). Utilities that fail, face penalties up to 150% of the REC price. While this drives new capacity, corporate buyers don't directly benefit (it incentivizes supply, not corporate procurement). » Corporate support: <ul style="list-style-type: none"> › 1. The K RE100 program gives companies formal access to PPAs, Green Premium, and other renewable sourcing tools. › 2. Some low interest loans and targeted subsidies exist for installing renewable systems (mostly for SMEs or strategic sectors). » Planned reforms: In 2024, the government announced plans to simplify PPA approvals and explore corporate participation in renewable auctions, changes that could reduce costs for corporates over time.
<p>Key takeaways:</p> <p>On-site solar PPAs represent the easiest first step for corporates, delivering cost savings and direct emissions reductions. Off-site PPAs are growing rapidly but corporates are competing with retailers to procure large quantities. Green Premium supply and RECs provide a way to bridge the gap, enabling immediate renewable coverage while waiting for new projects to come online. However, K-RECs are relatively expensive, and the I-RECs market is still in its early stage, with considerable uncertainty regarding its successful implementation. A blended approach combining on-site generation, off-site PPAs, RECs for short term needs offers the most effective path to achieving RE100 goals. Ongoing regulatory reforms and upcoming PPA auctions could further improve the affordability and accessibility of corporate procurement in the coming years.</p>	



TAIWAN

Mature market which is transitioning from government subsidy framework to corporate PPAs. Rapid increase in grid power is pushing corporates to implement on-site and off-site solar PPAs but limited land availability is a constraint.



Solar PPAs (on-site/off-site)	<ul style="list-style-type: none"> » All forms of solar on-site and off-site (virtual and physical) PPAs are available, Contract terms: Typically, 10–25 years, with most projects offered by local developers. » Pricing: <ul style="list-style-type: none"> › 1. On-site PPAs: Around NT\$3–5/kWh. › 2. Off-site PPAs: Around NT\$4–6/kWh, higher because of roof rental or grid wheeling fees and the developer's need to match/beat the Feed in Tariff ("FiT"). These rates are competitive with grid tariffs for industrial users (≈ NT\$3.8–4.3/kWh). » Off-shore wind PPAs: around NTD\$5/kwh » Regulatory rules: <ul style="list-style-type: none"> › 1. Large industrial users (>5 MW contracted load) must source 10% of their power from renewables by 2025, by installing on-site solar, signing PPAs, or buying certificates. › 2. New commercial buildings over 1,000 m² must include solar installations (at least 1 kW per 20 m²). <p>For most companies, on-site solar PPAs are the cheapest and fastest way to cut costs and emissions, especially with rising grid tariffs.</p>
RECs	<ul style="list-style-type: none"> » Dominant system: Taiwan Renewable Energy Certificates (T RECs) are the main instrument. International I-RECs exist but are issued in very small volumes and rarely used. » Market dynamics: Corporate demand for green energy more than doubled between 2022 and 2023, but supply has lagged. Large buyers dominate e.g., TSMC initially bought 98% of all T RECs and still holds 66%, leaving small and mid sized corporates struggling to secure volumes. » Pricing: <ul style="list-style-type: none"> › 1. Unbundled T RECs: Typically, NT\$3–5/kWh (NT\$3,000–5,000 per MWh). › 2. Bundled energy + RECs: Auctions have cleared around NT\$5–6+/kWh. » Limitations: No secondary market as TREC can only be transferred once: once a T REC is transferred to a corporate, it must be retired. This makes small or medium transactions difficult to execute. » Bottom line: With insufficient TREC supply and premium costs, often higher than purchasing green energy directly, off-takers will find that buying clean energy from energy retailers and renewable providers is the fastest and most practical route.
BESS	<ul style="list-style-type: none"> » Main use case: Peak shaving - charging batteries when power is cheap (NT\$2–3/kWh) and discharging during peak hours (NT\$9–10/kWh), avoiding the highest tariffs. » Tariff reforms: <ul style="list-style-type: none"> › 1. In 2025, Taipower widened the gap between off peak (NT\$2.61) and peak (NT\$10.20) rates for industrial users, improving storage economics. › 2. Government estimates the cost of stored energy at NT\$7.1/kWh; with peak rates now above this, storage becomes profitable. » Large manufacturers (e.g. semiconductors, steel, petrochemicals) are increasing installation of storage systems to cut peak demand charges. Adding storage to solar lets companies use more of their own renewable energy, avoid expensive peak tariffs, and improve resilience against grid issues.
(Off-site) Wind PPAs	<ul style="list-style-type: none"> » Offshore wind as the main source: Taiwan is an offshore wind leader in Asia, with projects in the hundreds of MW (TSMC, 920 MW offshore wind PPA, Google, 495 MW offshore wind PPA). » Challenges for smaller corporates: <ul style="list-style-type: none"> › 1. Projects are very large; minimum PPA blocks are often too big for mid sized buyers. › 2. Onshore wind opportunities are limited (land and permitting constraints). › 3. Shared/offtake aggregation models are emerging but still rare. » Outlook: As more offshore capacity comes online (Taiwan targets 5.6 GW by 2025 and more after), corporates may get new entry points but PPAs are feasible mostly for very large power users (due to credit rating issue).
Financial incentives	<ul style="list-style-type: none"> » Feed in Tariffs (FiT): Introduced in 2010 with 20 year guarantees, sparked a rooftop solar boom. 2024 FiT: ≈ NT\$5.7/kWh for small rooftops; ≈ NT\$3.7/kWh for ground-mounted projects. Many corporates rent out rooftops to developers who use FiTs for revenue. » Subsidies: From 2025–2028, government will pay up to NT\$300,000 per small rooftop solar project (≈ NT\$3,000/kW). » Utility green power sales: Taipower runs green auctions: In 2024, 71 companies bought >9 GWh of green electricity at NT\$5.4–6.8/kWh for 1–5 year contracts. Products include daytime-only or 24 hour supply, in 10–200 MWh blocks, making them accessible for SMEs.

Key takeaways:

On-site solar PPAs are the fastest growing sector, provide strong value, locking in power at NT\$3–5/kWh, cheaper than current grid rates, while reducing exposure to future tariff hikes. For large users needing bulk renewable energy, off-site solar and offshore wind PPAs are essential. Many companies are combining on-site solar, RECs or green power for immediate coverage, and off-site PPAs for scale. Acting early is critical, as rising demand is tightening the Taiwanese market and land is a major constraint. The best deals are likely secured by the early movers.



APPENDIX: CASE STUDIES

CASE STUDY 1

Location	Singapore
Industry	Chemical manufacturing
Project type	Rooftop solar PV system, with virtual off-site PPA (20 years)
Key insight	By procuring renewable electricity from an off-site rooftop solar PV system, this off taker could increase its load coverage ratio in Singapore beyond the constraints of its own roof whilst saving on electricity bills.

CONTEXT

To deliver on its ambitious decarbonisation targets, a leading European industrial chemical manufacturer wanted to increase the share of renewable electricity consumption of its Singapore operations. After fully solarising its own premises, it needed alternative options to further increase its load coverage ratio.

APPROACH

The company collaborated with a local solar player to contract off-site virtual PPAs from Singapore-based rooftop solar systems. The developer installed a solar PV system, with a capacity of around 1 MWp, on the roof of another company. This system's excess electricity generation is injected into the Singapore grid, with the chemical manufacturer purchasing all associated Renewable Energy Credits (RECs) directly through a 20-year virtual PPA (using a contract for difference, with a significantly lower strike price than grid tariffs of 18 US cents per kWh).

OUTCOME

Through this set-up the company managed to achieve the following goals:

- Increase its overall share of solar energy use beyond the capacity of its own roof.
- Reduce its Scope 2 emissions, thereby progressing towards its sustainability targets.
- Lower its Operating Expenses (OpEx), thereby improving the cost-competitiveness of its Singapore operations
- Shield itself from future electricity price swings, by fixing the price of its electricity purchase for 20 years.

CASE STUDY 2: LEVERAGING PERFORMANCE-BASED INCENTIVES TO DRIVE SCOPE 3 EMISSIONS REDUCTION

Location	Multiple countries in Southeast Asia
Industry	Apparel manufacturing
Project type	Scope 3.1 supply chain decarbonisation, with on-site solar PPAs on suppliers' premises
Key insight	Using simple on-site PPAs and well-structured incentives to onboard suppliers, a leading apparel manufacturer managed to significantly reduce its scope 3.1 emissions at low cost.

CONTEXT

A leading international apparel company was making slow progress on decarbonisation as a significant share of its emissions came from electricity consumption by its upstream suppliers.

APPROACH

Instead of relying on punitive measures for non-compliance, the company designed a structured incentive system to encourage supplier ownership of environmental and operational improvements. Suppliers are scored on four operational dimensions, including sustainability, with higher-ranked ones securing preferred consideration in procurement decisions. This offers a clear commercial incentive for suppliers to explore renewable energy, as it improves their score both on cost and sustainability.

In addition to sourcing preference, selected suppliers receive capacity-building support, including leadership engagement, technical training, and guidance on implementing best practices in areas such as energy efficiency, waste reduction, and lean operations. These initiatives aim to foster long-term, self-sustaining improvements that align suppliers more closely with the company's climate and operational goals.

OUTCOME

Through this incentive approach, the company managed to accelerate renewable energy adoption among many suppliers and achieve faster progress on its Scope 3 targets. More broadly, by embedding environmental performance into its sourcing model, the company is advancing its decarbonisation objectives, while strengthening supply chain resilience and transparency.

ABOUT



WHO WE ARE

EuroCham is an independent non-profit organisation governed by members representing the common interest of the European business community in promoting bilateral trade, services and investments between Europe and Singapore and the region.

WHAT WE DO

EuroCham represents the voice of the European business community in Singapore. We provide our members with a forum for advocacy, networking and information sharing within the European, and Singaporean business communities and government circles.

OUR NETWORK

EuroCham offers you access to an extensive networking pool, including bilateral National Business Groups, the Singaporean government, the local business community, the diplomatic circle, and key partners across ASEAN.

We host a wide range of events such as closed-door discussions with the Singapore government, prestigious gala dinners, and flagship events like the Europe Business Summit and the Sustainability Awards Gala Dinner. These events are attended by both the local and European business communities, the diplomatic circle, and key partners across ASEAN. Additionally, our year-round panel discussions with expert speakers provide opportunities to connect with business partners from various industries.

We invite you to participate, enhancing your company's corporate visibility.



OUR COMMITTEES

Our committees offer a unified European platform to exchange information, discuss common business challenges, and launch coordinated initiatives. Through our 12 committees, we conduct advocacy work and publish position papers to present our recommendations.



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WINE & SPIRITS



European Chamber of Commerce (Singapore)
138 Robinson Road, #11-04 Oxley Tower
Singapore 068906

W: www.eurocham.org.sg
T: +65 6836 6681

