EnergyTag

TAIWAN POWER SECTOR AND POLICY LANDSCAPE FOR ROUND-THE-CLOCK CLEAN POWER

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The views expressed in this report, along with any errors or omissions, remain the sole responsibility of the authors and do not necessarily reflect the positions of the organizations acknowledged above.

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Clean energy procurement is entering a new phase. As renewable penetration grows, the question is no longer simply how much clean energy a company buys, but whether that energy was actually available when consumption occurred. Most corporate procurement has not kept pace with this shift: annual matching frameworks allow a company to claim "100% renewable" while running on coal or gas during evening peaks. Hourly matching is designed to close that gap by ensuring that for every hour of the day, a buyer's consumption corresponds to renewable generation at that same moment. This gave rise to a new norm of corporate renewable procurement. Round-The-Clock (RTC) renewable procurement means structuring a buyer's clean energy supply so that renewable generation is available and dispatchable across all hours of the day. This method encourages corporations to employ diverse clean technologies to match their loads and achieve deep decarbonisation.

Taiwan's electricity system was built around physical renewable delivery and sub-hourly metering. These are infrastructures that most markets are still working toward. Taiwan Renewable Energy Certificates are issued against delivered generation, and 15-minute smart meters are already standard. Yet despite this granular foundation, T-REC issuance is aggregated to monthly volumes, and corporate procurement still defaults to annual matching. Annual matching not only disfavours Taiwan in comparison with other markets on paper, it obscures the growing mismatch between when Taiwan's solar and wind generate and when demand peaks, masking the need for storage and demand flexibility.

This report assesses how Taiwan can build hourly matching practice and RTC procurement pathways on top of its already hourly-ready infrastructure and sets out the market reforms needed to give Energy Storage Systems (ESS) a larger role and make round-the-clock procurement accessible to corporate consumers.

RTC is beneficial for both the grid and corporate procurement.

Since the retirement of nuclear power, reliance on LNG rose by 3.8%. The government is planning to add 36 GW of gas-fired power plants to accommodate the projected increase in electricity demand from data centers. This means that Taiwan is managing a fossil-dependent grid with a growing duck curve, harming Taipower's financial health. Taipower has accumulated 422.9 billion NTD (USD 13 billion) in debt, as the electricity tariff is priced consistently below the fuel cost.

Transition Zero modelling demonstrates that achieving an 80% hourly matched renewable portfolio for 5% of total electricity demand generates approximately US$1 billion per year in system fuel savings through the direct displacement of gas and coal generation. For corporates, behind-the-meter (BTM) battery storage is becoming more economically viable with the growing time-of-use (ToU) tariff price spread between evening peak and midday trough, and declining battery cost.

Taiwan corporate procurement, grounded in physical delivery, enables sub-hourly matched procurement today.

The vast majority of T-REC issuance is bundled with delivered electricity. With the availability of 15-minute metering and accessibility of interval data against matched renewable supply, consumers can already conduct the practice of hourly matching by EnergyTag Configuration 3. Small-to-Medium Enterprises (SME) consumers can now access RTC products at competitive prices through small-scale green power auctions conducted by Taipower. At 6 NTD/kWh, SME can purchase renewable electricity round-the-clock supplied by Taipower's solar-wind portfolio.

Taiwan needs to create more avenues to market to enable ESS to play a larger role in grid flexibility.

Currently, ancillary market saturation limits the use of ESS capacity. Over 1800 MW ESS capacity is participating in the ancillary market against Taipower's demand of 1300 MW. Since the second quarter of 2025, the bidding capacity price on the market has crashed to zero due to overcapacity. With declining rates and slow uptake of the solar-plus-storage FiT program, the government should consider opening up more avenues for ESS to participate in the market, including through storage-backed PPAs, enabling storage T-RECs, and installing a real-time spot market.

Flexibility allocation scheme, a reform enabling aggregating loads across consumers, allows for sub-hourly T-REC issuance and portfolio firming through retailer allocation.

The current two-step matching process of T-REC has stopped T-REC from moving to 15-minute matching, due to the unmatched electricity at each interval. Flexibility allocation, by allowing aggregated load across offtakers, returns to the strict 15-minute matching. One application for RTC is to combine various loads across consumers and build a firm portfolio under one retailer. In the future, flexibility allocation can be a foundation for real-time price discovery, giving Taiwan more time-based market signals for storage and flexibility investment.

The report identifies concrete reforms that make RTC more accessible to corporate consumers and release more supply of hourly matched clean electricity:

Horizon	Corporations: options to do RTC procurement	Government/policymakers: actions to enable RTC procurement
Short term	Simple hourly matching can be done by layering T-RECs on hourly electricity usage data on Taipower's portal	Promote and broaden participation in the Flexibility Allocation Pilot.
	Large corporate consumers: For more sophisticated matching, corporates could conduct hourly matching via EnergyTag Configuration 3 by procuring renewables through a wheeled/direct-supplied PPA and layer 15 minutes of data from Taipower onto T-RECs.	
	SMEs: Buy RTC/daytime products in the small-scale green-power auction and match your own 15-minute generation and consumption data from the Taipower portal and app.	Begin defining what "hourly-matched" means in Taiwan's context: matching boundary and granularity. (15-minute vs hourly)
Medium term	Large corporate consumers: Procure firm or storage-backed/ hybrid PPAs that time-shift midday surplus into evening load.	Adopt EnergyTag Configuration 1 on Flexible Allocation scheme: Build a 15-minute-matched T-REC tier on BSMI's registry using pilot matched-volume data
	SMEs: Use the retailer-allocation mode for portfolio-based firming: SMEs access RTC by pooling diverse offtakers	Enable T-RECs for storage: Reform T-RECs to recognise time-shifted generation from ESS, with anti-double-counting and loss-attribution rules. Enable storage-backed PPA products.
Long term	Trade and hedge renewable supply on the green spot market. Use price arbitrage to deploy ESS and optimise round-the-clock procurement.	Launch the dedicated green-energy spot market to provide real-time, time-based price signals. Mandate that large buyers procure a set share of power from the free market to support price discovery and liquidity, countering reliance on the low regulated tariff.

The reforms are achievable in stages. In the near term, corporations can already conduct hourly matching using 15-minutes data on Taipower portal or EnergyTag configuration 3. In the medium term, flexibility allocation and a 15-minute T-REC tier on BSMI's registry can enable portfolio-based firming and broader market participation.

In the long term, a real-time spot market would unlock price discovery, give storage the market signals it needs, and allow RTC procurement becoming a norm.

執行摘要

執行摘要

綠電採購正進入新階段。隨著再生能源滲透率提升，問題已不再只是企業購買了多少綠電，而是這些能源是否在用電當下確實可用。目前大多數企業採購尚未跟上這一轉變：年度匹配框架允許企業宣稱「100%再生能源」，卻可能在夜間尖峰時段依賴燃煤或天然氣發電。小時級匹配的設計正是為了填補這一缺口，確保一天中每個小時，買方的用電量都對應同一時刻的再生能源發電量。這催生了企業再生能源採購的新規範——全天候（RTC）再生能源採購，意即構建買方的綠電供應結構，使再生能源發電在全天所有小時均可調度。此方式鼓勵企業採用多元化的綠電，以匹配其用電負載並實現深度去碳化。

台灣的電力系統建立在實體再生能源輸配與次小時計量的基礎上——這是大多數市場仍在努力追求的基礎設施。台灣再生能源憑證（T-REC）依實際輸配發電量核發，15分鐘智慧電表已是標準配備。然而儘管具備如此細緻的基礎，T-REC的核發仍以月度電量彙總，企業採購也依然沿用年度匹配。年度匹配不僅使台灣在與其他市場的書面比較中處於劣勢，更掩蓋了台灣太陽能與風能發電時段與需求尖峰之間日益擴大的落差，從而掩蓋了對儲能與需求彈性的迫切需求。

本報告評估台灣如何在其已具備小時級就緒的基礎設施之上，建立小時級匹配實務與全天候採購路徑，並提出所需的市場改革方向，以賦予儲能系統（ESS）更重要的角色，並讓企業消費者能夠實際取得全天候採購產品。

全天候採購對電網與企業採購均有裨益。自核電退役以來，液化天然氣（LNG）依賴度上升了3.8%。政府計畫新增36 GW的燃氣電廠，以因應資料中心帶動的電力需求增長。這意味著台灣正以化石燃料依賴的電網應對日益加劇的「鴨子曲線」問題，損害台電的財務健康。台電已累積4,229億新台幣（約130億美元）的債務，原因在於電價長期低於燃料成本。Transition Zero的模型試算顯示，若5%的總用電量實現80%小時匹配的再生能源組合，每年可透過直接替代燃氣與燃煤發電，為系統節省約10億美元的燃料費用。對企業而言，隨著峰谷時間電價（ToU）價差擴大及電池成本持續下降，表後（BTM）電池儲能的經濟可行性正日益提升。

台灣企業採購以實體輸配為基礎，今日即可實現次小時級匹配採購。絕大多數T-REC核發均與實際輸配電力捆綁。透過15分鐘計量的可用性及區間數據與再生能源供應的對應可及性，消費者現已可依EnergyTag配置三（Configuration 3）實踐小時級匹配。中小企業消費者現可透過台電舉辦的小規模綠電競標，以具競爭力的價格取得全天候產品。以每度6元新台幣的價格，中小企業即可購買由台電太陽能與風能組合供應的全天候再生電力。

台灣需要開拓更多市場管道，使儲能系統在電網彈性中發揮更大作用。目前，輔助服務市場趨於飽和，限制了儲能容量的運用。超過1,800 MW的儲能容量參與輔助服務市場，而台電的需求僅約1,300 MW。自2025年第二季起，市場競標容量價格已因供過於求而跌至零。面對收益下滑及太陽能加儲能躉購費率（FiT）方案進展遲緩的現況，政府應考慮為儲能系統開拓更多參與市場的管道，包括儲能支援的購售電合約（PPA）、啟用儲能T-REC，以及建立即時現貨市場。

彈性分配機制是一項允許跨消費者彙總負載的改革，可實現次小時級T-REC核發，並透過零售商分配進行組合穩定供電。目前T-REC的兩步驟匹配流程，因每個區間存在未匹配電量，阻礙了T-REC邁向15分鐘級匹配。彈性分配透過允許跨用電方彙總負載，回歸嚴格的15分鐘匹配。全天候採購的應用之一，即是將不同消費者的各類負載整合，在單一零售商下建立穩定供電組合。未來，彈性分配可作為即時價格發現的基礎，為台灣提供更多基於時間的市場信號，進而引導儲能與彈性資源的投資。

本報告提出具體改革建議，使得企業消費者更易取得全天候採購，並釋放更多小時級匹配綠電的供給：

時程	企業：全天候採購選項	政府：賦能行動
短期	簡易小時級匹配：將T-REC疊加至台電入口網站上的每小時用電數據，即可實現小時級匹配。	推廣並擴大彈性分配試點計畫的參與。
	大型企業用戶：如需更精細的匹配，可依EnergyTag配置三實施小時級匹配——以輸電 / 直供PPA採購再生能源，並將台電提供的15分鐘數據疊加至T-REC。	
	中小企業：在小規模綠電競標中購買全天候 / 日間產品，並從台電入口網站及應用程式比對自身的15分鐘發電與用電數據。	開始定義台灣脈絡下「小時級匹配」的具體內涵：匹配邊界與顆粒度 (15分鐘 vs. 小時)
中期	大型企業用戶：採購具備儲能支援或混合型PPA，將午間剩餘電力跨時段轉移至夜間負載。	於彈性分配機制下採用EnergyTag配置一：利用試點匹配量數據，在BSMI登記系統上建立15分鐘匹配的T-REC層級。
	中小企業：採用零售商分配模式進行組合式穩定供電——中小企業透過彙集多元用電方，取得全天候產品。	啟用儲能T-REC：修訂T-REC制度，認可儲能系統的跨時段發電，並訂定防止重複計算及損耗歸屬規則。 開放儲能支援PPA產品。
長期	在綠電現貨市場上交易與避險再生能源供給，利用價格套利部署儲能、優化全天候採購。	建立專屬綠能現貨市場，提供即時、基於時間的價格信號。 強制要求大型買方從自由市場採購一定比例電力，以支持價格發現與市場流動性，抑制對低管制電價的過度依賴。
		現貨市場建立後，隨著電力以15分鐘為基礎在市場上結算，T-REC即可轉型為15分鐘匹配機制。

改革可分階段實現。短期內，企業已可透過台電的15分鐘用電數據或EnergyTag第三配置進行逐時匹配。中期而言，建立基於彈性分配機制15分鐘T-REC分級，將能實現組合式穩定供電並擴大市場參與。

長期來看，即時現貨市場的建立將釋放價格發現機制，為儲能提供所需的市場信號，並使全天候採購成為常態。

TERMINOLOGY

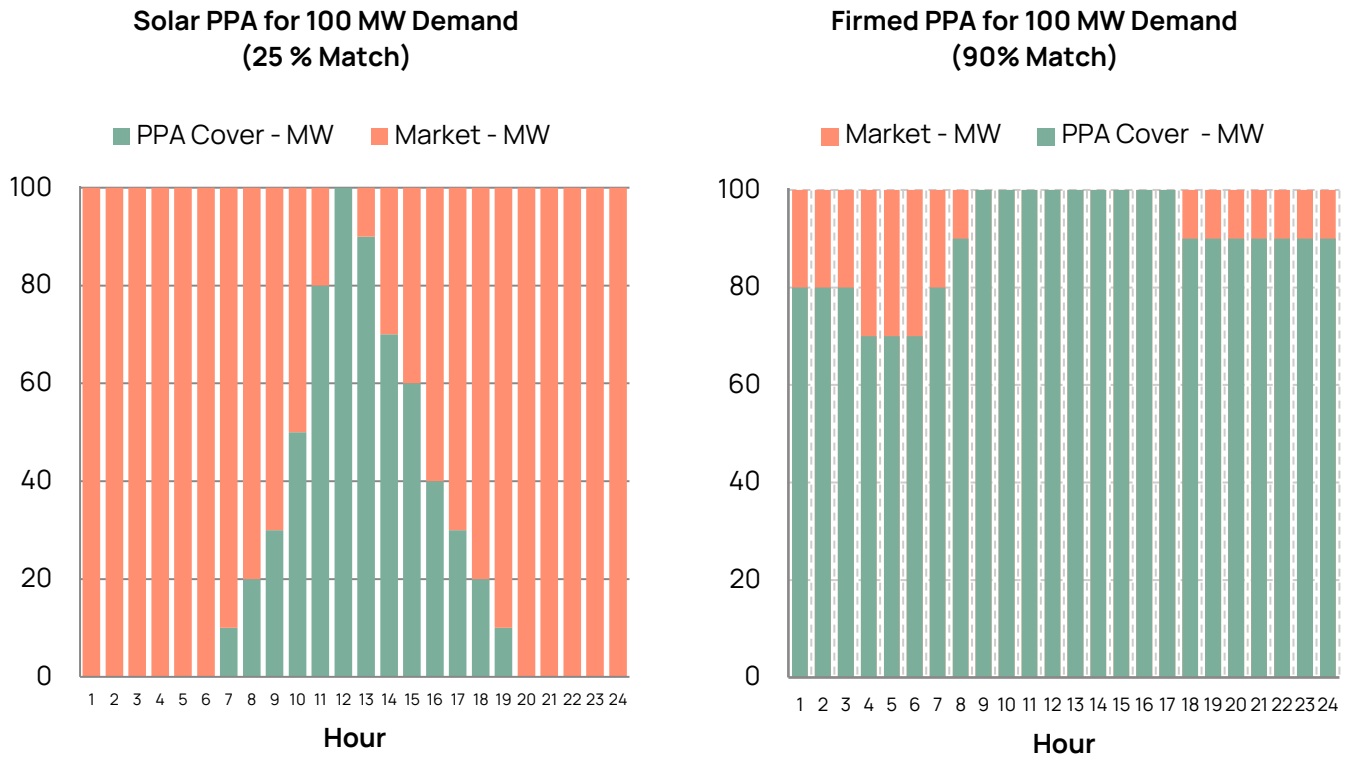


Fig 1. Illustrative graph for RTC procurement

HOURLY MATCHING

Hourly matching refers to the accounting method that requires renewable generation to be matched to consumption within the same hour rather than averaged across a full year. Under annual matching, a buyer can claim to use 100% clean power if the total volume of renewable energy procured over a year equals its total consumption, regardless of when each was produced or drawn. This allows a midday solar surplus to offset an evening demand that was met by the fossil-heavy grid. Hourly matching closes that gap by making the timing of generation visible and thus incentivises flexibility and storage investment.

ROUND-THE-CLOCK (RTC) RENEWABLE PROCUREMENT

The shift toward hourly matching creates a direct financial incentive for firms to pursue **Round-the-clock (RTC)** renewable procurement. RTC renewable procurement means structuring a buyer's clean energy supply so that renewable generation is available and dispatchable across all hours of the day. This is typically achieved through a combination of complementary technology, such as combining solar and batteries, solar and wind etc. RTC procurement targets temporal alignment between clean supply and consumption, but does not require every single hour to be matched with low carbon electricity.

01.

ELECTRICITY MARKET OVERVIEW

1.1. MARKET STRUCTURE

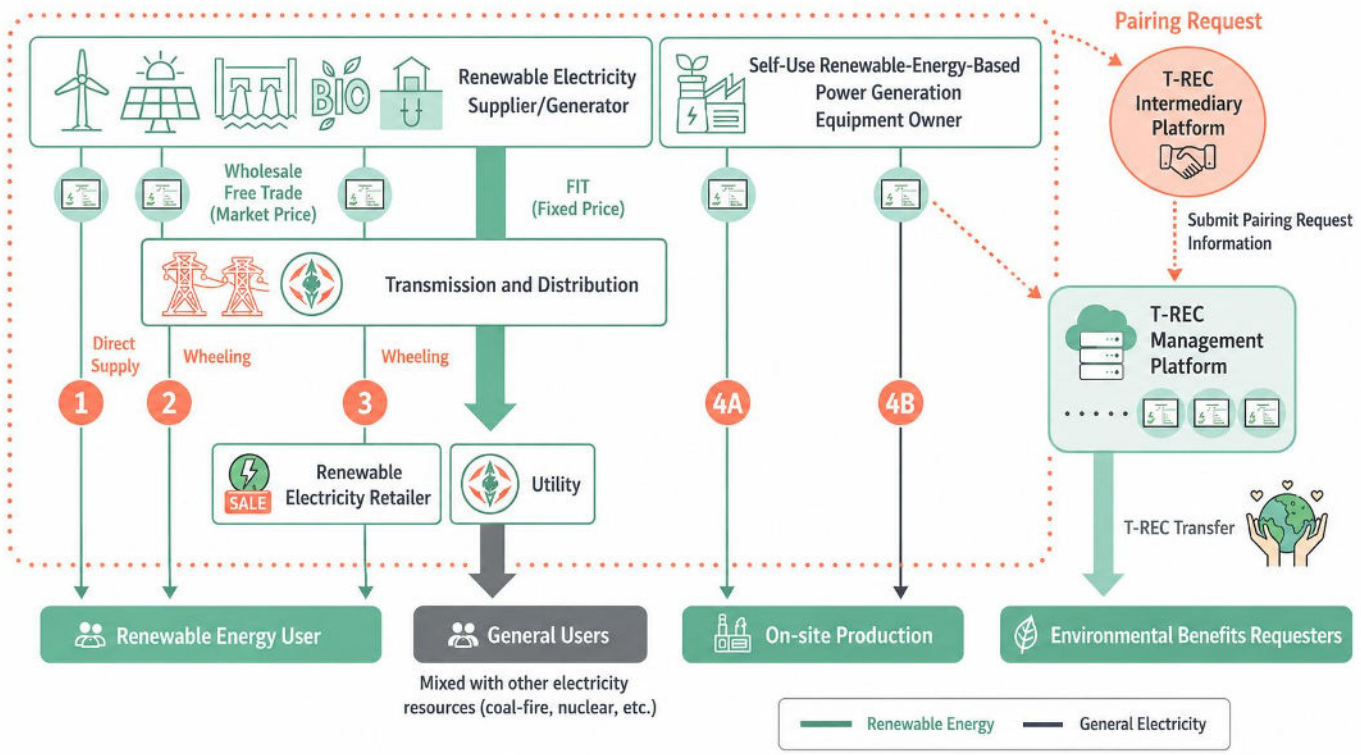


Fig 1.1. Current Taiwan power market structure

Industry experts classify Taiwan's power sector as a partially liberalised system. Taiwan Power Company (Taipower), as a single state-owned utility, continues to manage generation, transmission, distribution, and the bulk of retail supply. The government deliberately carved out a market-based segment for renewable energy. The government opened competition first in green power, while the conventional fossil fleet remains under Taipower's effective monopoly.

Since the Renewable Energy Development Act of 2009, the feed-in tariff (FiT) has been the foundation of Taiwan's renewable market. Taipower must procure all electricity generated from eligible renewable energy generation facilities under 20-year power purchase agreements at fixed FiT rates. The 2017 amendment to the Electricity Act activated electricity liberalisation, and opened four procurement routes for renewable power alongside FiT (Fig 1.1):

1. On-site generation: Involves investing in renewable capacity at the consumer's premises. T-RECs are self-claimed and retired by the consumer.
2. Direct offsite PPAs: Consumers contract directly with CFE generators, with power delivered through dedicated lines or wheeling. Generation and consumption are tracked, and T-RECs are issued and retired in real time.
3. Unbundled T-REC purchase: Consumers buy T-RECs separately from their electricity, usually from entities with surplus generation. Transactions occur bilaterally or on the official T-REC market. This accounts for marginal amount of T-RECs on the market
4. Through retailers: Licensed retailers buy CFE with bundled T-RECs and sell it to consumers, handling all tracking and matching on their behalf.[1]

Between 2023 and 2025, Taiwan further expanded the reform to promote market flexibility. These updates introduced retailer-to-retailer renewable trading, formalized the participation of energy storage operators and demand-response aggregators, and enabled partial-offtake PPAs.

Taiwan is liberalising market participation and trading while stepping back from the structural unbundling of Taipower. The May 2025 Electricity Act amendment cancelled the unbundling, which would have separated Taipower into generation, grid, and retail companies, and retained it as a vertically integrated entity subject to internal accounting separation rather than corporate separation.

1. The transmission and distribution network and the conventional generation remained with Taipower.

1.2. TIME-BASED MARKET SIGNAL

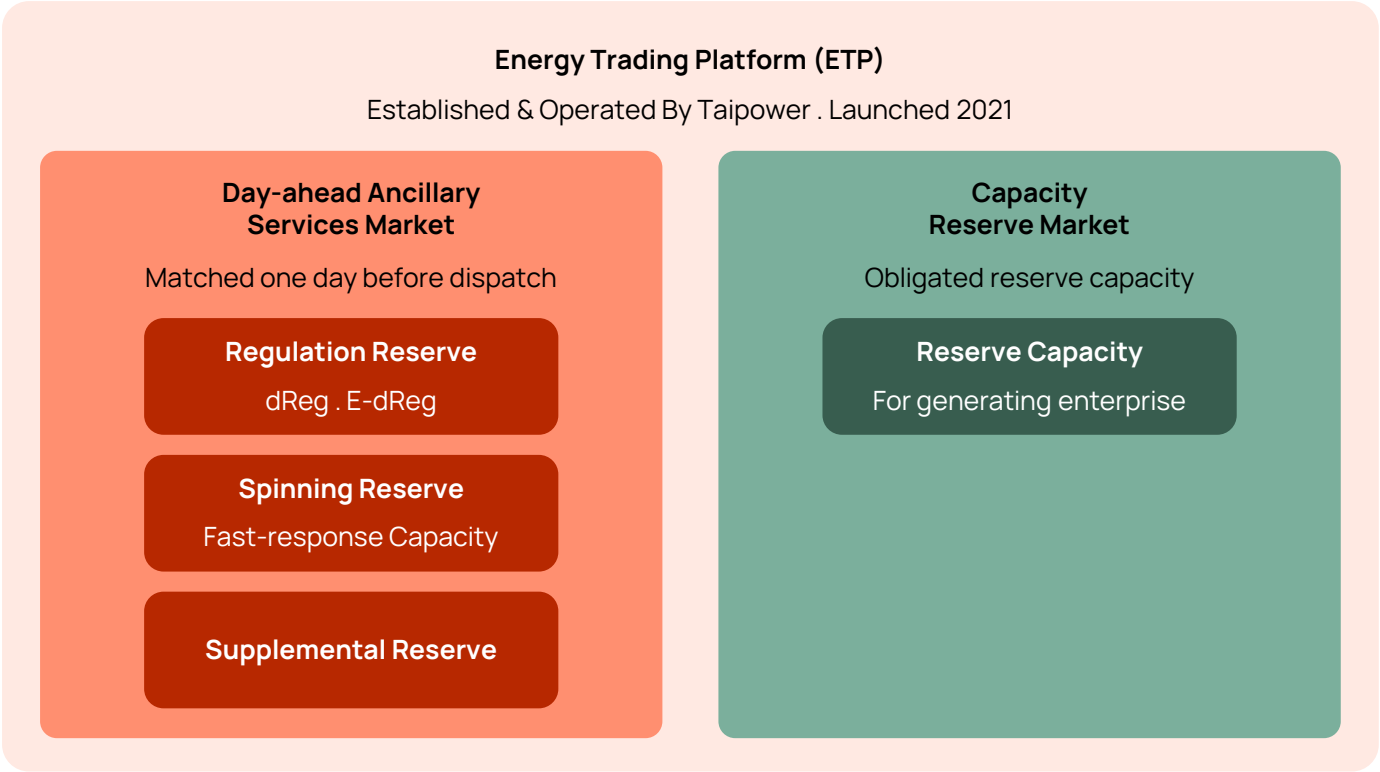


Fig 1.2. Structure Of The Energy Trading Platform (ETP)

Taiwan has no wholesale energy spot market, and therefore no day-ahead or real-time market for energy (kWh) in the sense understood in liberalised power systems. Taipower launched its Energy Trading Platform (ETP) in 2021 for system services and reserve capacity. Taipower establishes and operates the platform, divided into two markets: a Day-Ahead Ancillary Services Market covering frequency regulation, spinning reserve, and supplemental reserve; and a Capacity Reserve Market for procuring obligated reserve power capacity.

Taiwan's primary time-based market signal is conveyed through Taipower's time-of-use (ToU) tariff, which differentiates the price of electricity across peak, mid-peak, off-peak, and Saturday mid-peak blocks. The TOU structure gives industrial and commercial users a financial incentive to shift load away from the evening peak and towards midday trough.

1.3. CORPORATE RENEWABLE DEMAND

Corporate demand for renewable electricity in Taiwan is large and growing from both compliance and voluntary markets.

a) Compliance Market:

2019 amendment to the Renewable Energy Development Act (REDA) introduced the Large User Renewable Obligation, requiring electricity users with contracted capacity above 5,000 kW to deploy renewable energy equivalent to 10% of contracted capacity within a five-year compliance period. The user must choose to either install a certain capacity of renewable generation equipment, or install a certain capacity of energy storage equipment, or purchase a certain volume of renewable electricity and Taiwan Renewable Energy Certificates (T-RECs). 43.6% of large users had installed renewable generation, and 52% had purchased renewable electricity and certificates, but only 4.4% had installed storage.

b) Voluntary Market:

39 companies are part of the global RE100 initiative, heavily concentrated in the technology and electronics manufacturing sector. Among them, Taiwan Semiconductor Manufacturing Co. (TSMC) is the largest electricity consumer, with its share of Taiwan's total electricity consumption expected to triple from 8.4% in 2023 to 23.7% by 2030, according to S&P ratings. [2]

2. Taipei Times (2025), "TSMC should lead green power transition: report" https://www.taipeitimes.com/News/taiwan/archives/2025/04/11/2003834993

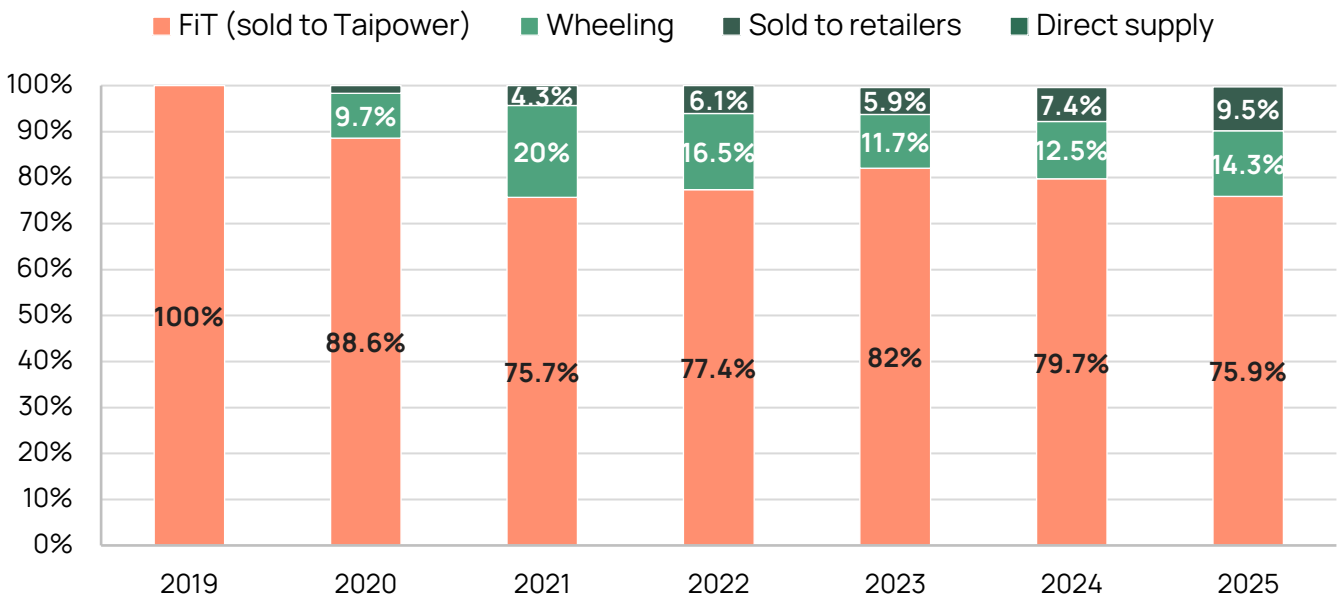


Fig 1.3. Renewable power generation by sales channel (2019–2025)[3]

The majority of corporations procure via wheeling (i.e., PPA) and via retailers. Direct supply is rare. The top 20 companies by wheeling volume are dominated by the electronics industry, with 13 companies. While FiT now plays a less dominant role in the renewable power market, it still accounts for roughly 75.9% of total renewable output in 2025. (Fig 1.3)

1.4. STORAGE PARTICIPATION

Energy storage has scaled rapidly in Taiwan through a series of policies without a real-time energy market. As of the end of March 2026, operators have successfully integrated 2223.3 MW of resources into the grid, against the 1000 MW target of 2025.[4] Taiwan's storage participates in the market through three pathways: Taipower ancillary services market (1.872 GW)[5], solar-plus-storage FiT (0.198 GW)[6], and the Large-User obligation (0.1 GW).[7]

1.4.1. ANCILLARY SERVICES

A majority of grid-scale storage in Taiwan earns its revenue inside the ancillary-services market.

Dynamic Regulation (dReg):

dReg was the early driver of storage adoption: batteries provide short and fast bursts of energy to stabilise grid frequency. Only grid-connected storage of more than 5 MW / 12.5 MWh may bid.

Enhancement dynamic Regulation (E-dReg):

E-dReg bundles an energy-shifting function onto the regulation service. This market requires storage systems of 2-4 hours duration to shift generation across time periods.

3. Ministry of Economic Affairs Energy Administration (2026), Monthly Renewable Energy Generation Statistics. https://ea01.moeaea.gov.tw/a0303/02/newest/monthly/?tab=再生能源
4. Taiwan Power Company, Distributed Energy Resources Integration Dashboard. https://service.taipower.com.tw/smartgrid/DERIntegration/Index
5. Ibid: refers to capacity that has passed Taipower's inspection and are actively trading on the market
6. Reccessary (2025), "Behind-the-Meter Storage Opportunity,"https://www.reccessary.com/zh-tw/insight/poxa-behind-the-meter-storage-opportunity
7. Energy Omni (2023), 儲能需求長期向上趨勢已定，法規和政策將與儲能產業發展相輔相成https://www.energy-omni.com/product/detail/AT003011?categoryId=927ZX88Uu1wj3WZ8

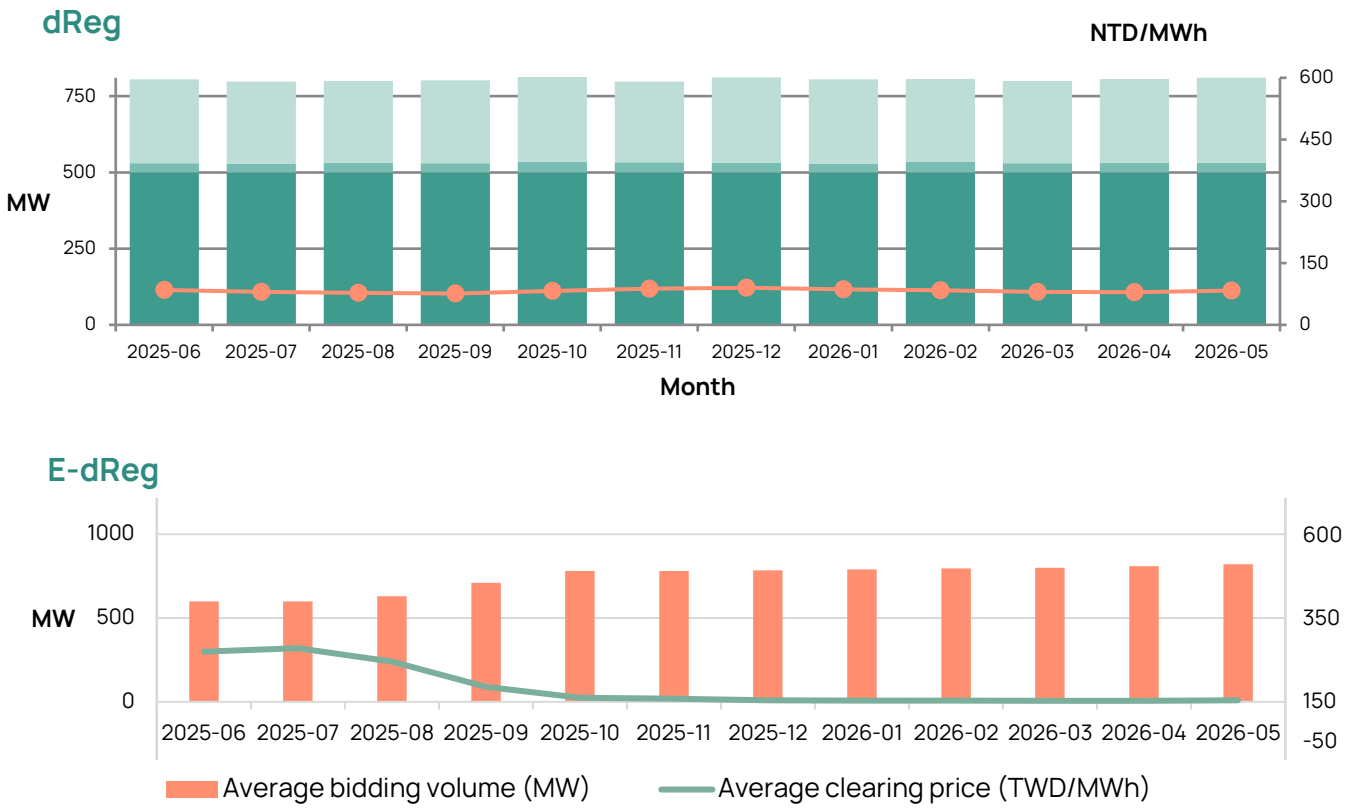


Fig 1.4. Monthly average prices on d-Reg and e-dReg (TWD/MW)

Registered capacity applications on the platform exceeded 2,730 MW by the end of March 2026. However, since Taipower's procurement through dReg and E-dReg was capped at 500 MW each, this has resulted in a price collapse. From late 2025, both dReg and e-dReg clearing prices had fallen to NT$0/MWh. In addition, intraday prices remain flat as Taipower procures a constant capacity at all hours from the ancillary market as an attempt at simplification, failing to reflect the real-time need for grid services. As a result, despite a large and growing body of flexible capacity existing physically, the ancillary market offers a saturated venue for monetisation.

1.4.2. SOLAR-PLUS-STORAGE FEED-IN-TARIFF

The Ministry of Economic Affairs (MOEA) introduced the solar-plus-storage feed-in-tariff. To receive the FiT, batteries store the electricity generated by daytime solar power in the energy storage system, and then discharge the electricity to the grid during the Taipower-designated nighttime periods.[8] The FiT consists of two components:

- Battery capacity rate: rate paid per unit of storage capacity, which is set by competitive bidding, with the lowest bidder winning.[9]
- Electricity rate: rate paid to discharged volume priced at 125% of the original feed-in tariff rate applicable to solar photovoltaic projects.[10]

The Solar-plus-storage FiT route had a 2025 target of 500 MW but sits at only ~198 MW, dragged down by the slow permitting process for solar farms. In addition, the FiT rate has been on a steady decline. The winning tariff rate for the first phase of 2022 was 9.59 NTD/kWh, and by October 2025, the winning tariff rates had decreased to 6.66 NTD/kWh.[11]

9. ibid
10. Ibid
11. The Reporter (2026) "Billion-Sun Siting Controversy and Grid Energy Storage Policy." https://www.twreporter.org/a/billion-sun-siting-controversy-and-grid-energy-storage-policy

1.4.3. STORAGE IN LARGE USER RENEWABLE OBLIGATION

The Large User Obligation, requiring 10% of renewable procurement for industrial users >5000 kW, may be fulfilled by installing storage instead of renewables. In practice, it is the smallest of the three channels, with under 0.1 GW of market space, and has been the least used because stored energy could be applied only to self-consumption.

Incentive adjustments tying bill deductions to discharge timing and grid-dispatch participation have been introduced to revive it, but it remains marginal relative to the ancillary-services and solar-plus-storage tracks.

02.

WHY RTC MATTERS IN TAIWAN

2.1. ROLE OF ROUND-THE-CLOCK RENEWABLES FOR ENERGY SECURITY

From 2025 onwards, Taiwan expects overall electricity demand to grow by 2.5% annually, driven largely by the heavy industrial sector and surging AI data center deployments.[12] 4.32 million kWh of electricity will be consumed in the next 5 years by AI data centers and semi-conductors manufacturers.[13]

In response, Taiwan's Ministry of Economic Affairs (MOEA) is actively adding new gas-fired power plants to ensure the grid can handle demand expansions. An additional 26 GW of LNG-powered generation fleets will be added to the grid by 2035.[14]

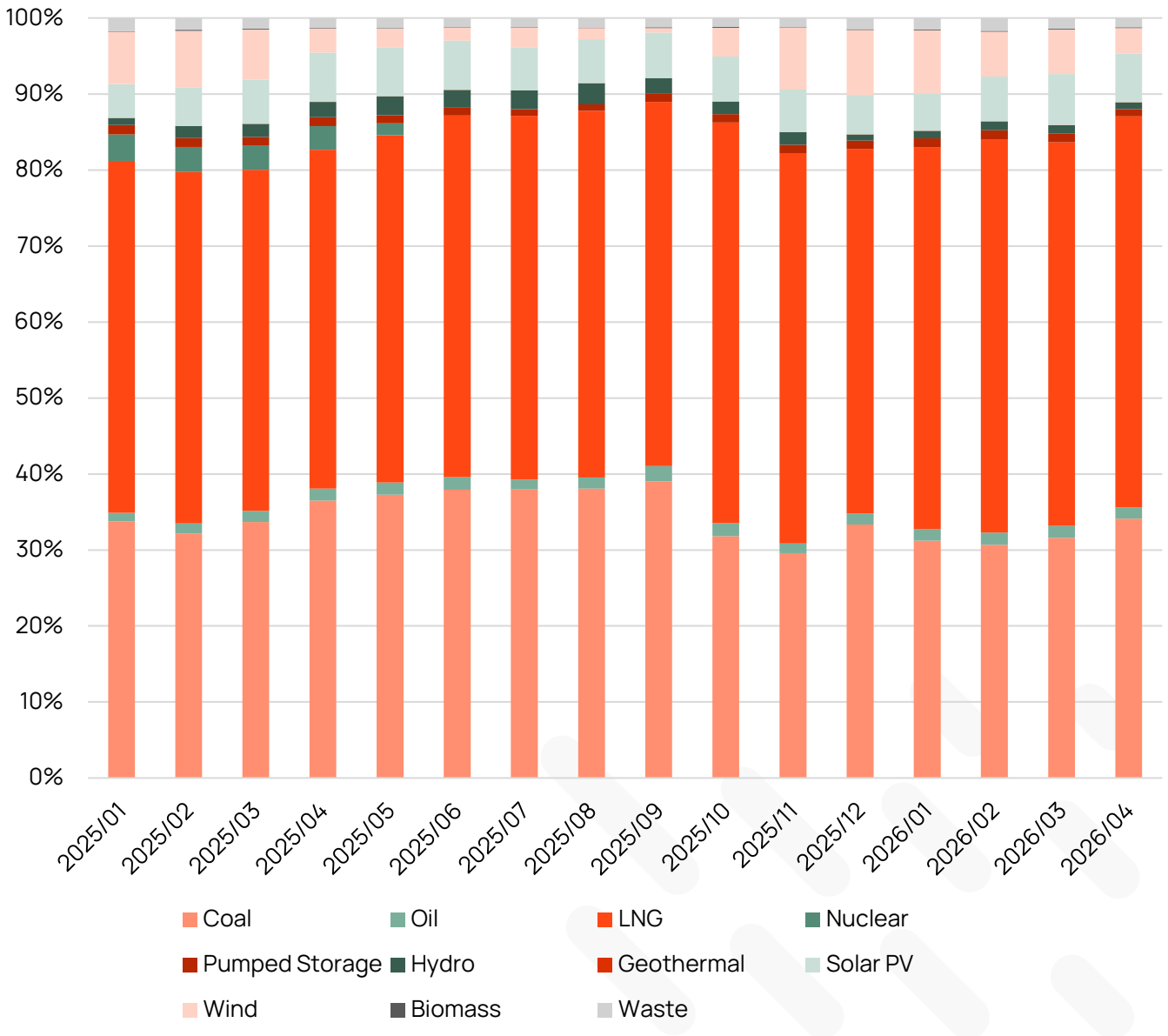


Fig 2.1. Taiwan electricity generation by fuel type (2025 - April 2026)[15]

12. Ministry of Economic Affairs (2026), Electricity Demand Forecast News Release. https://www.moea.gov.tw/Mns/populace/news/News.aspx?kind=1&menu_id=40&news_id=123066https://www.moea.gov.tw/Mns/populace/news/News.aspx?kind=1&menu_id=40&news_id=123066
13. Earth Journalism Network (2025), "Powering AI: How Much Electricity Will Taiwan Need to Fuel Its AI Ambitions?" https://earthjournalism.net/stories/powering-ai-how-much-electricity-will-taiwan-need-to-fuel-its-ai-ambitions
14. Ibid 12
15. Ministry of Economic Affairs Energy Administration, Monthly Electricity Generation Statistics. https://ea01.moeaea.gov.tw/a0303/02/en/newest/monthly/?tab=Electricity

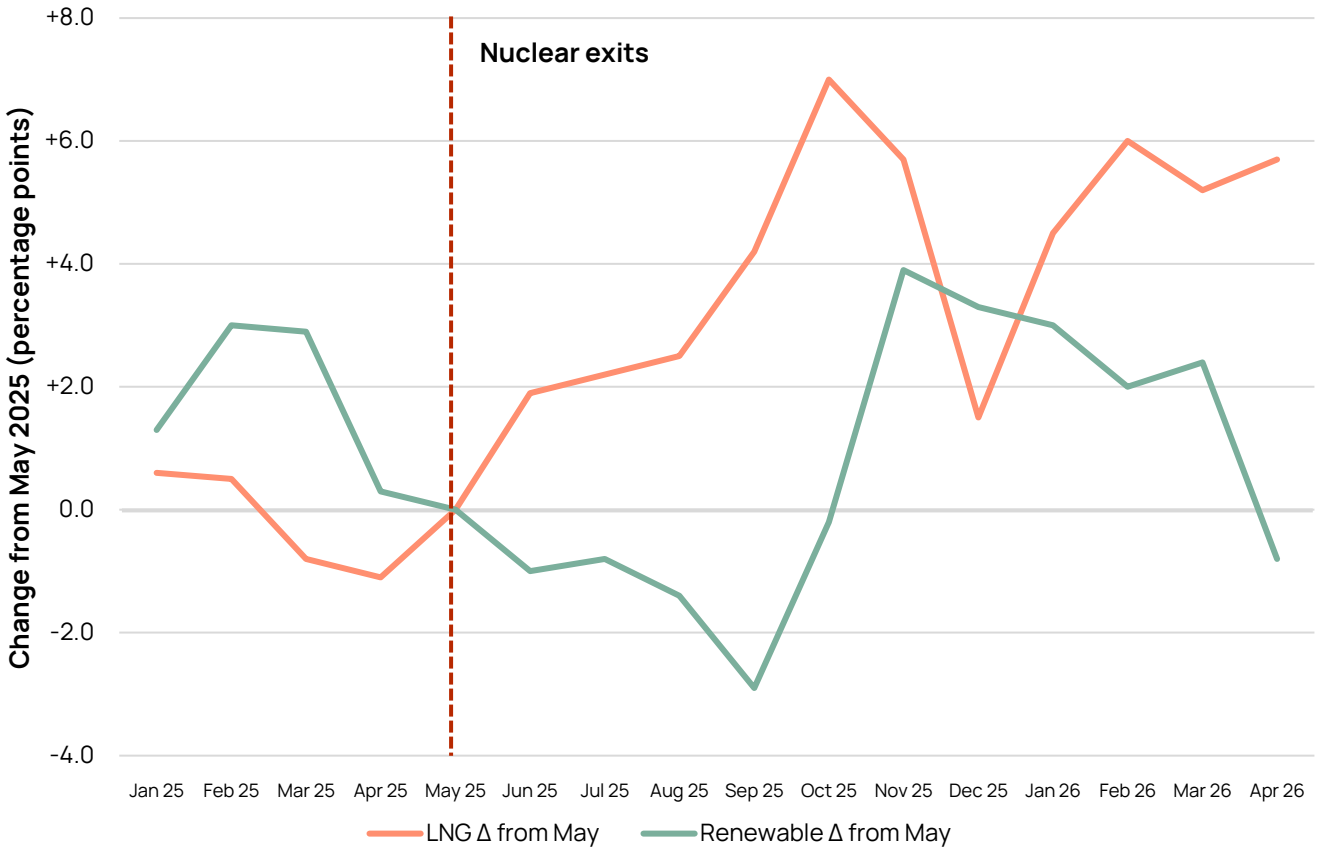


Fig 2.2. % change in LNG and renewable generation before and after the closure of nuclear[16]

Since the closure of its last nuclear plant in May 2025, Taiwan's grid has become more LNG dependent. On average, LNG accounts for 45.9% of the total electricity generation in the first quarter of 2025, compared to 49.7% since May 2025. (Fig 2.2) Renewables account for around 10–17% of total generation, well short of Taiwan's 20% renewable target for 2025.

Renewable penetration also demonstrates seasonal patterns. Wind peaks in winter (Nov–Jan: 8–10%) and nearly vanishes in summer (Jun–Sep: 0.6–2.5%). The closure of the nuclear plant has created a deterioration of energy security for Taiwan as the island grew more dependent on LNG, which is 99% imported.[17]

16. Ibid 13

17. Ministry of Economic Affairs Energy Administration, Energy Security Overview. https://www.moeaea.gov.tw/ECW/english/content/Content.aspx?menu_id=8677

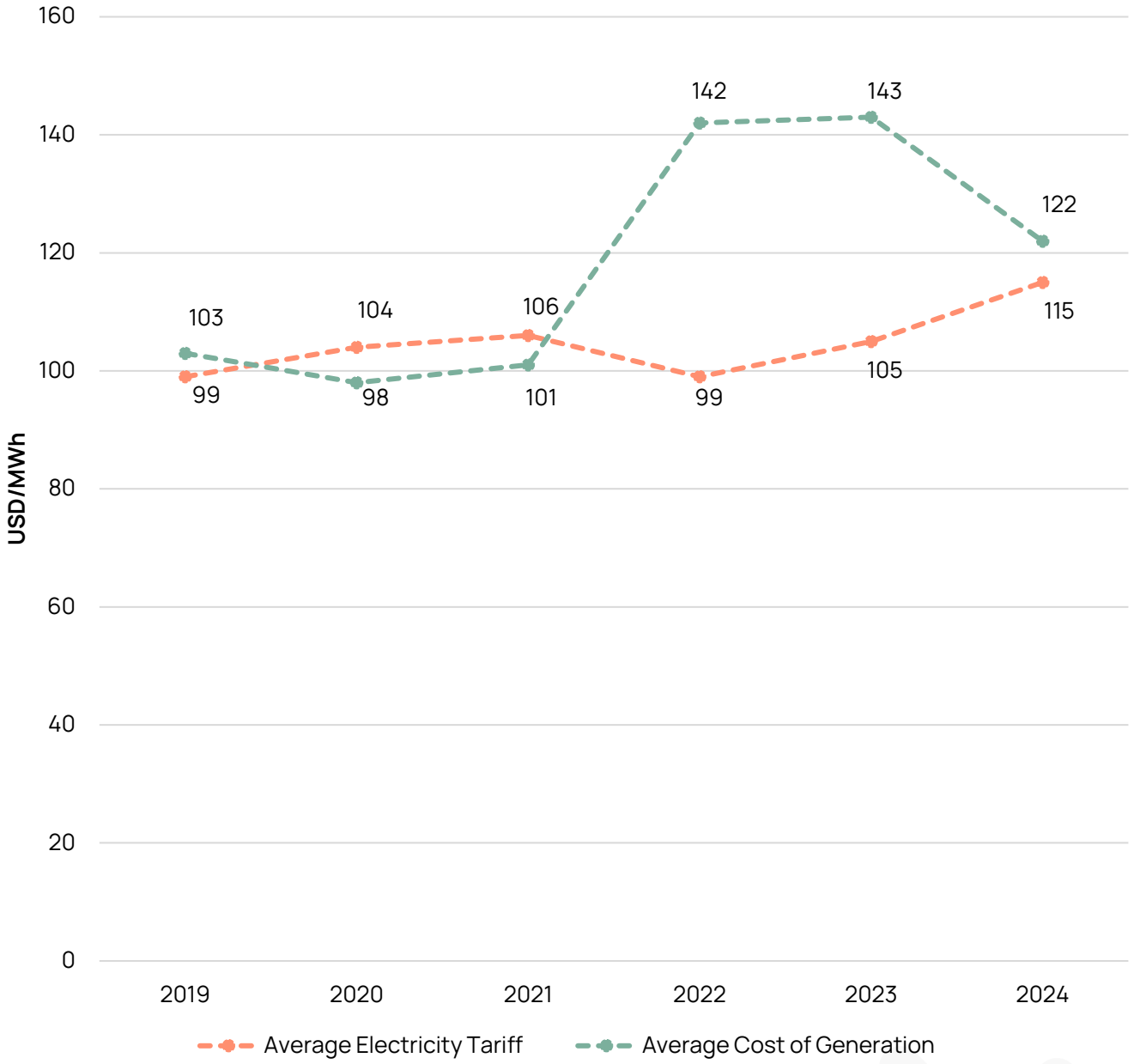


Fig 2.3. Taipower's historical electricity tariff and generation cost (USD/MWh)[18]

Fossil fuel dependence is exacerbating Taipower's debt and limiting its access to finance. Historically, the government has kept the regulated tariff low to support industrial growth. Since 2021, the government has consistently priced the electricity tariff below the cost of supply. Fig (2.3) Taipower has since accumulated 422.9 billion NTD (USD 13 billion) in debt.[19]

Over 80% of its generation is still fossil-fired. Therefore, banks and insurers covered by Dow Jones Sustainability Index (DJSI) decarbonisation policies are signalling they will not roll over Taipower debt at maturity.[20] Accelerating renewable integration is crucial to Taipower's financial health by lowering the cost of electricity for Taipower and aligning with green financial requirements.

18. Transition Zero (2025), 24/7 CFE Report — Taiwan (English edition). https://blog.transitionzero.org/hubfs/Analysis/CFE%20Reports/TransitionZero%20-%2024-7%20CFE%20Report%20-%20Taiwan%20(English).pdf
19. Taipei Times (2025), TSMC should lead green power transition: report https://www.taipeitimes.com/News/taiwan/archives/2025/04/11/2003834993
20. https://www.cw.com.tw/article/5134614

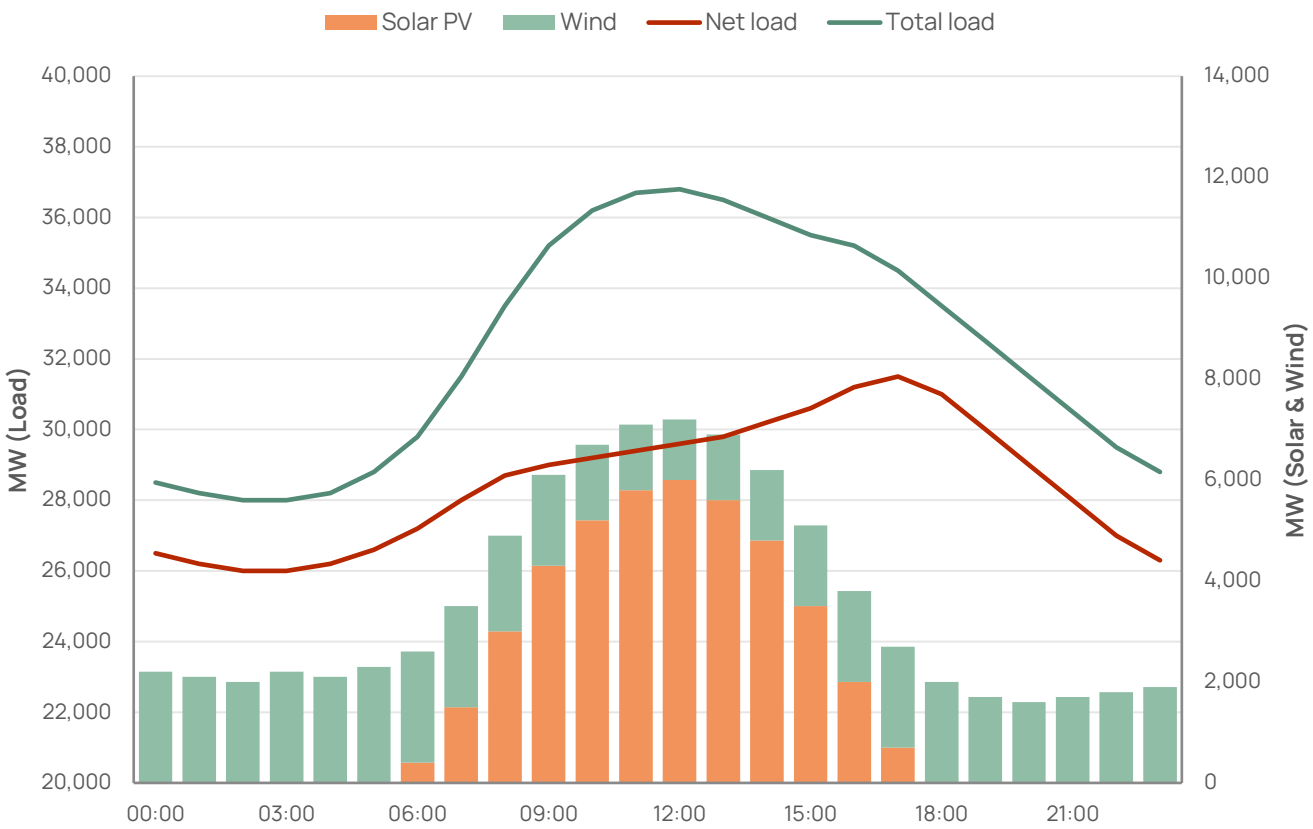


Fig 2.4. Average net load by hour in Taiwan[21]

With growing renewable penetration, the duck curve arises as midday oversupply of solar is pushed onto the grid when demand is lowest, while the steep evening ramp must still be met by fossil generation after the sun sets. (Fig 2.4) Seasonal and daily variability of solar and wind means total annual clean generation can look adequate on paper, even as large portions of demand remain fossil-backed.

Hourly matched renewables will provide energy security benefits by displacing fossil fuels and correct the incentive by valuing clean power for when it is delivered, hence incentivising firm renewables and storage that more effectively displace fossil fuels even when renewable output is low.

Transition Zero modelling demonstrates that achieving an 80% hourly matched electricity generates approximately US$1 billion per year in system fuel savings through the direct displacement of gas and coal generation. By matching clean supply to demand on an hourly basis, increasing hourly matched renewables displaces the gas-fired generation that would otherwise run during the evening peak.

21. Taiwan Power Company, Daily Load Curve Data, extracted 2–11 June 2026. https://www.taipower.com.tw/2289/2363/2367/2368/10264/normalPost

2.2. ROLE OF RTC IN CORPORATE PROCUREMENT

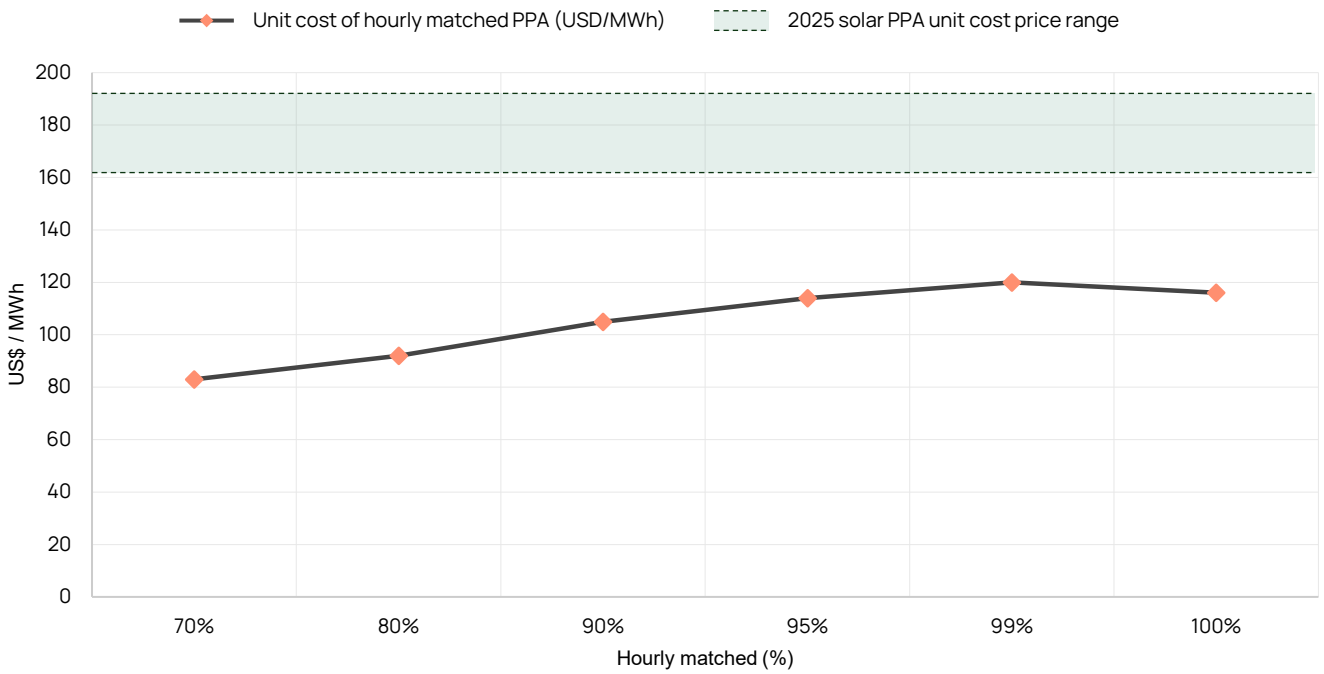


Fig 2.5. Unit cost of hourly matched PPA compared to Solar PPA.

According to the TransitionZero modelling, adopting 80% hourly matching makes economic sense without employing storage and is achievable using a blend of solar, onshore wind, and geothermal.

The unit costs for securing 80% matched PPAs are around 2.7NTD/kWh (around 92 USD/MWh). It is roughly half the range of single-technology solar corporate PPA prices reported by BloombergNEF. (Fig 2.5)

Fig 2.6. Time of Use tariff (2018-2024)[22]

22. Taiwan Power Company, Time-of-Use Tariff Schedule. https://www.taipower.com.tw/2289/2290/46940/46945/normalPost

The role of energy storage systems (ESS) in achieving RTC is also growing. As a single entity's load profile cannot absorb the natural shape of variable generation, fixed-volume CPPAs leave the offtaker with unmet RE demand in some intervals, even while wasting surplus in others. Time-shifting renewable generation at an hour of surplus into the buyer's evening load could lower the cost of clean electricity.

The economic case for behind-the-meter (BTM) ESS is becoming stronger as equipment cost falls and the price spread of ToU has nearly reached the ESS discharge cost.

Average global ESS prices fell by 45% in 2025.[23] Taipower's calculation gives an ESS discharge cost of about 7.1 NTD/kWh.[24] By late 2024, the peak-to-off-peak electricity price spread for industrial users had reached 6.86 NTD/kWh in the summer months. (Fig 2.6) Plus a cost saving from load-reduction of 2.47 NTD/kWh,[25] lifts the combined per-cycle value above 9 NTD/kWh, ahead of the breakeven cost.

2.3. INTERNATIONAL COMPLIANCE DRIVERS

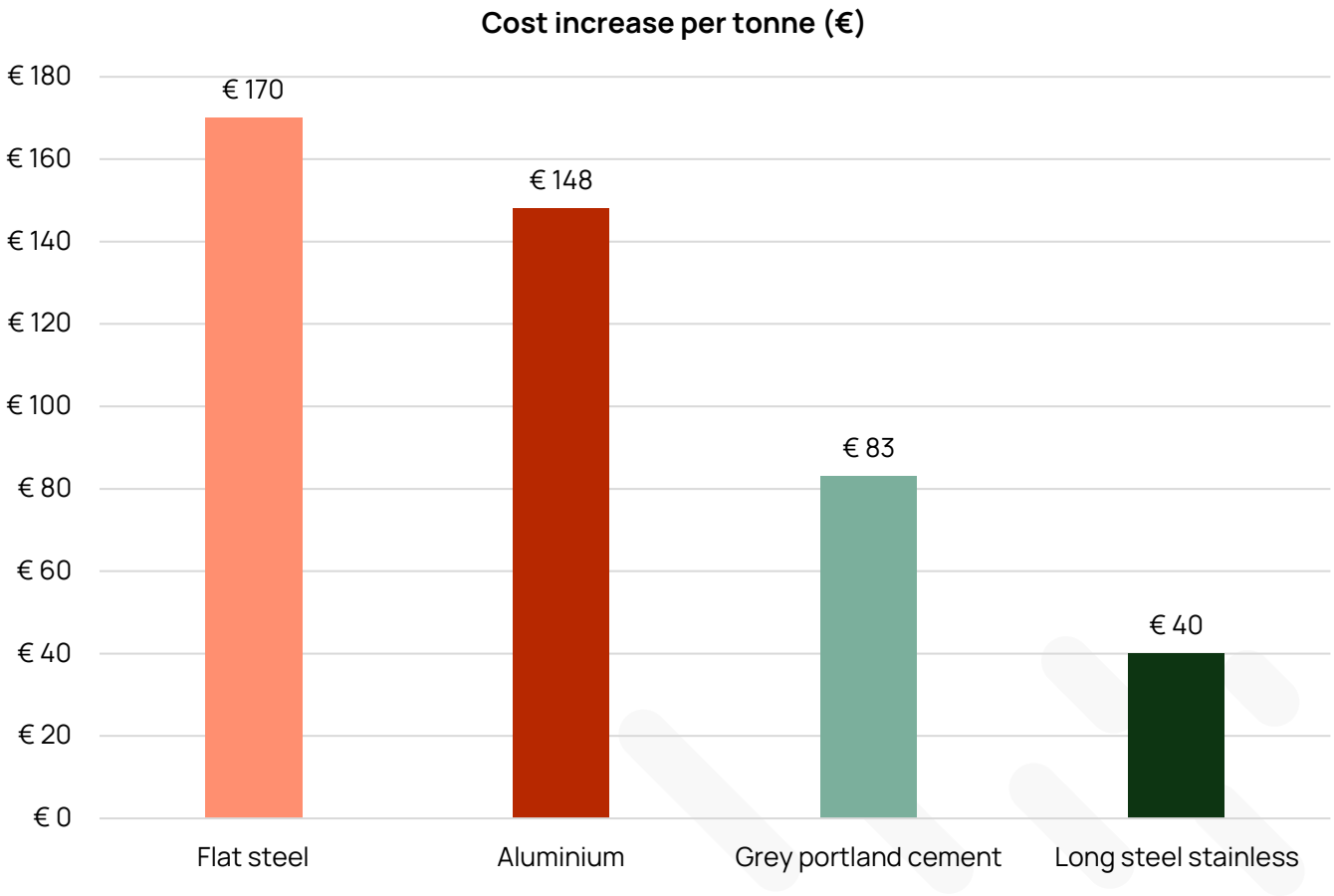
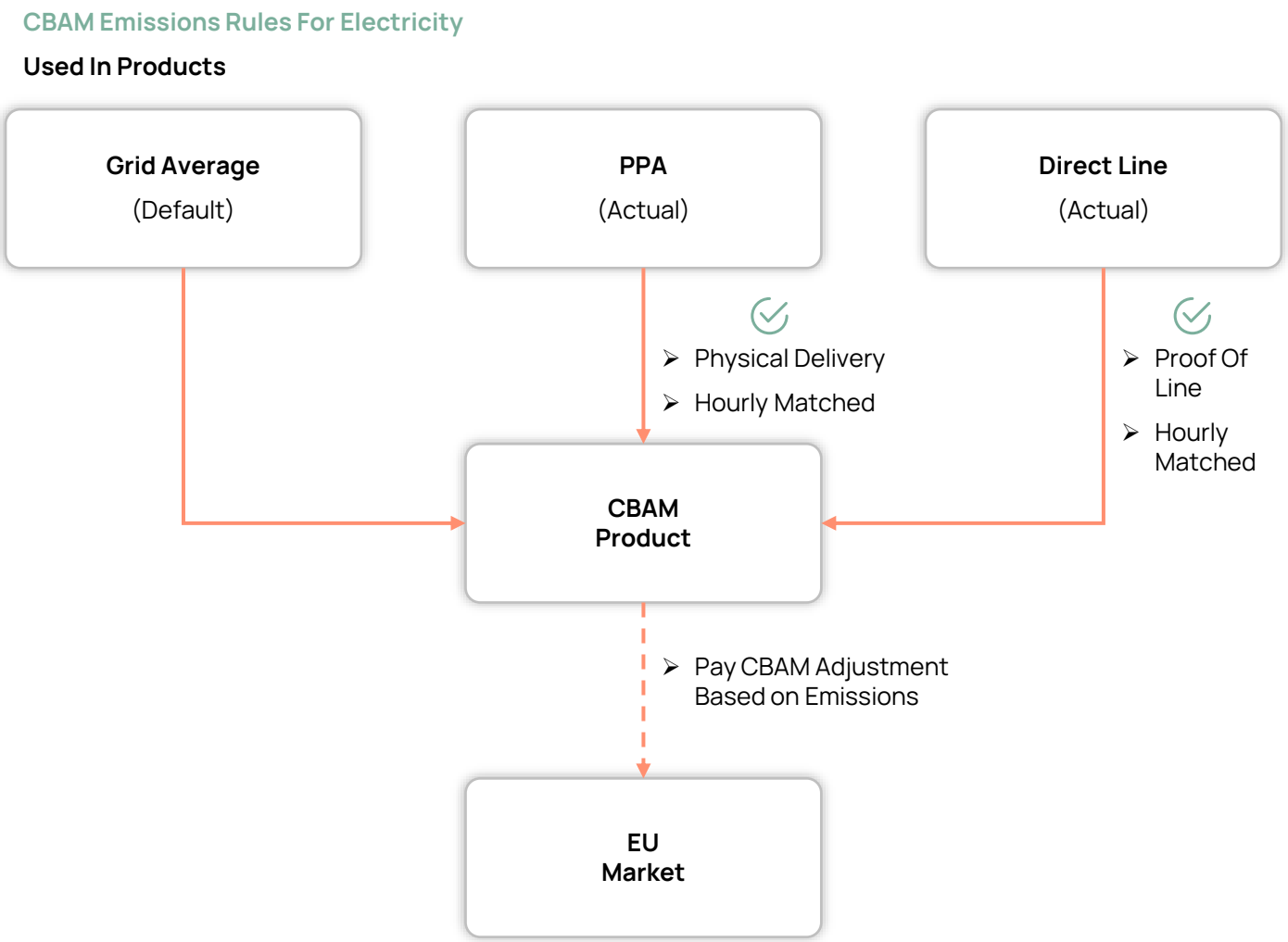


Fig 2.7. CBAM Induced Cost Increase Per Tonne (Euro) Under Business-as-usual Scenario

Taiwan Will Face An Estimated Net Cost Of 215 Million Euros From The Carbon Border Adjustment Mechanism (CBAM).[26] Taiwan Currently Collects Carbon Fees Priced At 300 NTD/Tonne (~8.33 Euro), Which Is One-tenth Of The Price Of An EU Carbon Permit (~60-90 Euro).

As the Taiwan industry runs on a carbon-intensive grid, exporters are heavily exposed to CBAM-induced cost increases. (Fig 2.7)

23. Ember, Global Electricity Review 2026. https://ember-energy.org/latest-insights/global-electricity-review-2026/
24. Central News Agency (2024), "Taiwan Electric Power intends to push the electricity price of energy storage time after the factory table, and the sharp off-peak price difference is 4 times."https://www.cna.com.tw/news/afe/202409140024.aspx assumes storage installation costs of around NT$12.5 million per MWh, a 10-year lifespan, and 20% charge/discharge losses,
25. Ibid 6
26. Sandbag CBAM Simulator, business-as-usual scenario. https://sandbag.be/cbam-simulator/



Sources. EnergyTag based on European Commission – CBAM Implementing Acts

Fig 2.8. CBAM Emission Rules for Electricity

CBAM regulation requires hourly matching for both direct and indirect emissions. Two conditions must be met together (Fig. 2 .8):

- Physical delivery: a verifiable grid connection or proven electricity flow between the production facility and the generation source, not a certificate purchase
- Hourly matching: proven via smart-metering data that generation and consumption volumes did not exceed each other within the same one-hour measurement period.

If companies fail to submit or verify hourly-matching data, the national grid average emission factor (or a more unfavorable default) is applied. Since all PPAs are physically delivered in Taiwan and the majority of T-RECs are bundled with PPAs, Taiwanese companies are benefiting from the CBAM cost reduction if they procure electricity through a PPA. RTC will play a role in further reducing the CBAM cost by reducing the hours in which the corporations rely on Taiwan's carbon-intensive grid.

Disclosure standards are tightening to mandate hourly matching. The GHG Protocol's proposed Scope 2 revisions would, for the first time, introduce hourly and geographic matching into the market-based method. It would require that renewable certificates be matched to the hour and grid region in which electricity is actually consumed, rather than netted annually. Hourly matching would apply to voluntary clean energy claims by organisations above a large consumption threshold. The credibility of a corporate clean-power claim is shifting from how much was bought over a year to whether it was delivered in the right hour and place.

Semiconductors and electronics face supply-chain-driven pressure to decarbonise. TSMC and Taiwan's electronics exporters are not yet directly liable under CBAM, but they face mounting Scope 2 pressure from downstream customers and from TSMC's own RE100 commitment to 100% renewable electricity by 2040. Indirect emissions are also a question for future CBAM scope expansion that could increase the cost of exporting to the EU if semiconductors continue to rely on the carbon-intensive grid.

03.

TAIWAN'S READINESS FOR RTC PROCUREMENT

3.1. DATA GRANULARITY AND ACCESSIBILITY

15-minute matching is enabled by Taiwan's advanced metering infrastructure (AMI). Taipower completed the installation of smart meters for all 24,624 high-voltage users, covering the commercial and industrial consumers. Roughly 4.1 million meters are installed by the end of 2025 against a target of 6 million by 2030[27]. This metering granularity allowed 15-minute simultaneous matching of renewable generation to load.

Each consumer can access their own interval data at 15-minute, hourly, daily, and monthly resolution through Taipower's high-voltage user service portal, the Taiwan Power app, allowing buyers to view their consumption profile against matched renewable supply at the same temporal resolution[28]. Accessible interval data provides the foundational data layer on which more granular, hourly-matched clean-power accounting can be built.

3.2. ASSESSMENT OF THE ESS MARKET

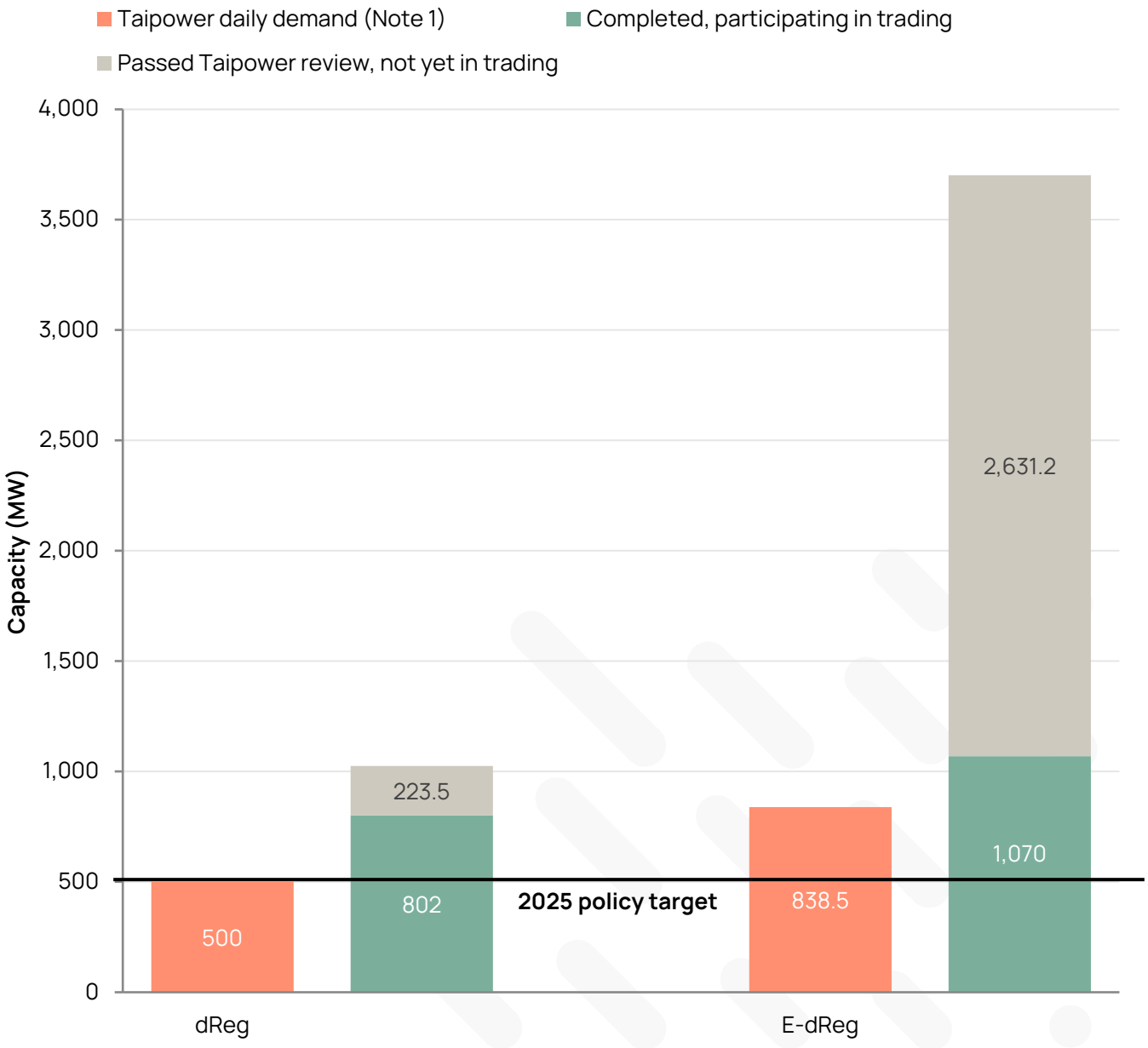


Fig 3.1. Oversupply of ESS capacity in the dReg and E-dReg market

27. TechNews (2026), "Taipower AMI 2030," https://technews.tw/2026/04/07/taipower-ami-2030/.
28. Taiwan Power Company, High-Voltage User Portal. https://www.taipower.com.tw/2289/2290/2321/3731/normalPost

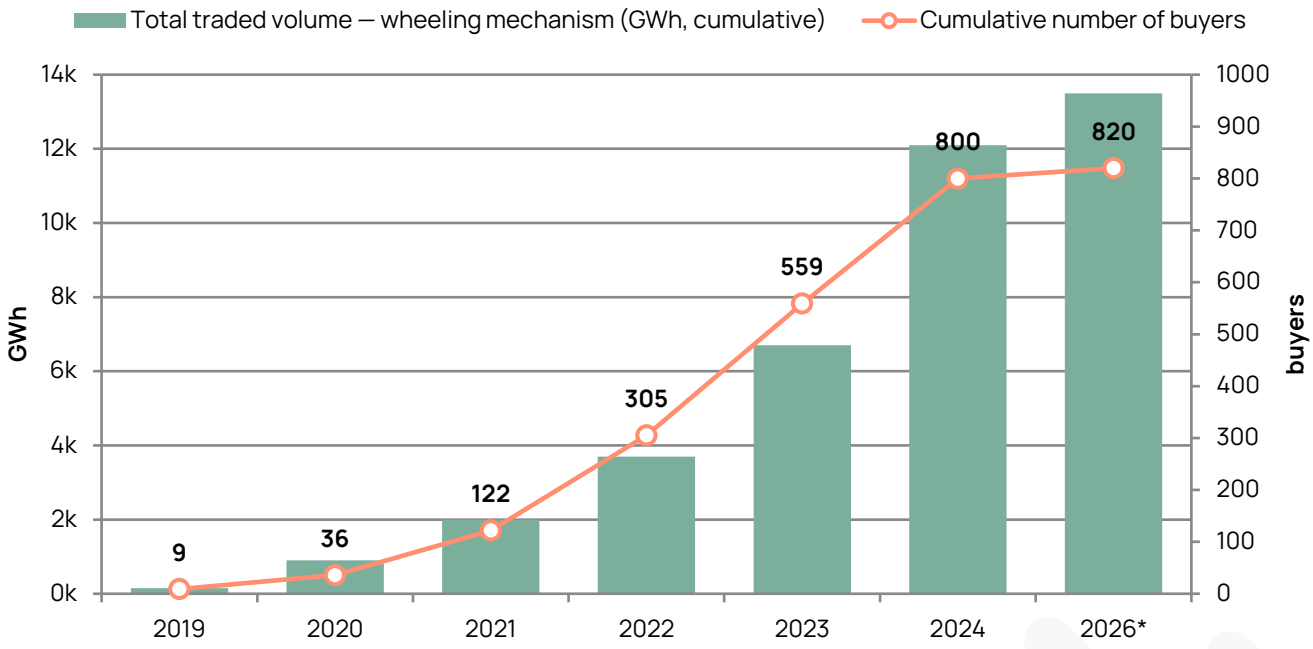
In Taiwan, the market faces significant overcapacity of ESS in the ancillary market, which is a common occurrence across different markets. (Fig 3.1)Other avenues to market are not getting enough traction. There is insufficient incentive created, either through the price spread of ToU or government subsidies, to compensate for the long payback horizon for investing in BTM-ESS. While some behind-the-meter storage projects show a 5-7 year payback period, this relies heavily on a combination of TOU tariffs and government financial incentives.

There is uncertainty regarding these incentives, as the government has not guaranteed their long-term existence, and they could be removed at any time. Slow uptake of the solar-plus-storage FiT hinders the policy goals for grid flexibility and reduces peak demand pressure.

Boosting ESS will need to move beyond capacity goals and focus on opening up markets for ESS to play a larger role in grid flexibility.

3.3. PROCUREMENT PATHWAYS FOR RTC RENEWABLE

3.3.1. POWER PURCHASE AGREEMENT (PPAs)



* 2026 partial data to March. Source: Bureau of Standards, Metrology and Inspection, MOEA (as of 20 May 2026).

Fig 3.2. Total traded volume of renewable electricity through wheeling in Taiwan (2020–2024)[29]

For corporate buyers with sufficient scale, bilateral CPPAs remain the principal route to renewable procurement, executed either as direct supply or through wheeling across Taipower's grid with a generator-to-user linkage. Corporate renewable procurement via PPA in wheeling has grown rapidly. Approximately 13.2 TWh of renewable energy has been traded via wheeling by the end of May 2026, with annual volume reaching 5.4 TWh in 2025, up more than 90% year-on-year. In total, 817 corporate buyers purchased renewables via CPPA wheeling as of May 2026.

PPAs in Taiwan are already hourly matched. Since all PPAs are physically delivered through the grid and settled on a 15-minute basis,

The standard product is a single-technology, fixed-volume contract, and this shapes the central limitation for round-the-clock supply. A fixed-volume solar or wind contract delivers against the natural generation profile of the resource, not the buyer's load curve, so a single offtaker's consumption cannot absorb the shape of the supply: the buyer is left with unmet demand in some intervals while paying for surplus in others. No standardised firm or 24/7 PPA product yet exists in Taiwan. Hybrid PPA or storage-backed PPA structures are not yet available in the market.

29. PwC, (2023), 2023 Taiwan CPPA Market Report, https://www.pwc.tw/en/publications/taiwan-re-market-updates/taiwan-cppa-market-report.html

Firm procurement is still possible with the use of less variable clean generation, such as geothermal. In April 2025, Google signed Taiwan's first corporate PPA for geothermal energy with Baseload Capital, with initial projects adding 10 MW and expected to be online around 2029.[30] Google has paired the geothermal contract with a separate solar development pipeline to support its goal of operating on 24/7 carbon-free energy by 2030. Because geothermal is an always-on resource available across all hours, it functions as a firm complement to variable solar and wind.

While this remains a rare firm physical supply arrangement rather than a standardised contract structure, it could become a viable pathway to scale RTC availability. According to the Transition Zero modelling, a standalone geothermal PPA priced around NT$4.1/kWh is cheaper than solar CPPA prices that range in 2024-2025 (NT$5.1 - 6.0/kWh).[31] Geothermals, where geologically available, are a low-cost path to firming a renewable portfolio in Taiwan.

3.3.2. RTC PRODUCTS IN SMALL-SCALE GREEN POWER AUCTION

Taipower launched its small-scale green power auction in October 2023, specifically to provide procurement channels for companies that lack the scale to negotiate bilateral CPPAs. The programme offers contracts of 10,000, 100,000, and 200,000 kWh across one- or five-year terms.

The small-scale green power auction provides a daytime-only option matched to solar generation between 7 am and 5 pm at NT$5.8/kWh, and an all-day option matched to combined solar and wind at NT$6.0/kWh.[32] The green electricity is sourced exclusively from Taipower's own self-built renewable facilities, with successful bidders able to claim the associated renewable energy for carbon accounting and ESG reporting purposes.

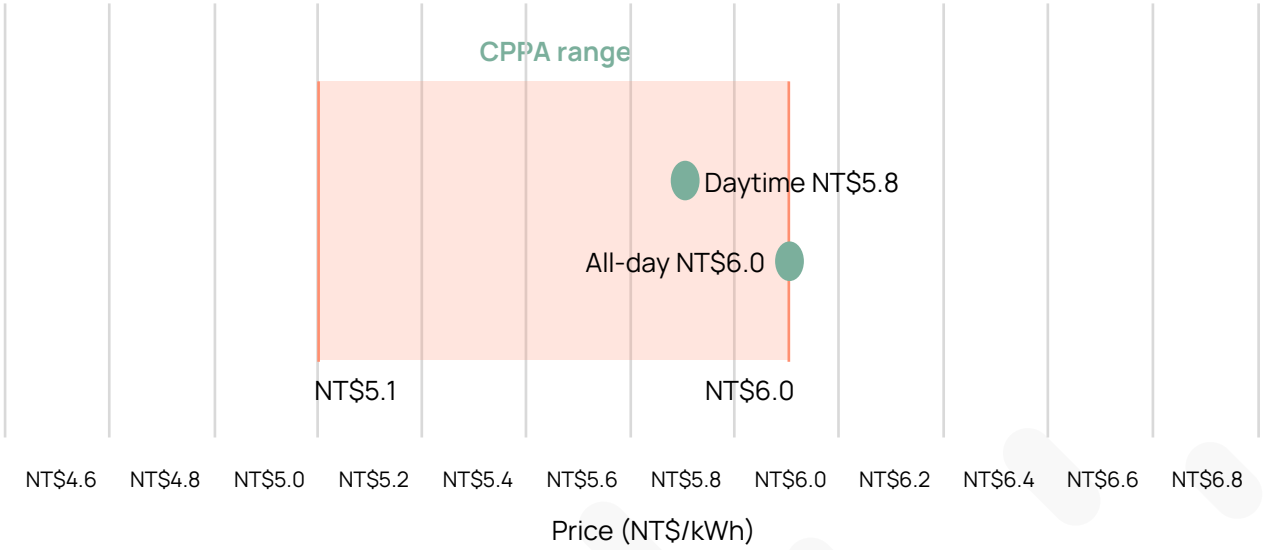


Fig 3.3. Price comparison between Taipower's small-scale green power price range and solar PPA

Comparing with the PPA market, using the BloombergNEF data on 2024–2025 solar PPA prices range (NT$5.1 - 6.0/kWh), Taipower's daytime product (NT$5.8/kWh) and all-day product (NT$6.0/kWh) sit roughly at a parity of what corporate buyers would pay for a negotiated CPPA.

In 2024, this product accounted for 46% of the total sales in the small-scale green power auction, demonstrating the demand for and the price competitiveness of RTC products.[33]

30. PR Newswire, (2025), "Major Step for Geothermal Energy in Asia — Baseload Capital and Google," https://www.prnewswire.com/news-releases/major-step-for-geothermal-energy-in-asia---baseload-capital-and-google-forge-corporate-ppa-302428525.html
31. BloombergNEF, 2024–2025 Taiwan Solar PPA Price Data. https://www.linkedin.com/posts/yuhan-hung_taiwan-cleanpower-renewables-share-7404450299090051072-yKRr/
32. Taiwan Power Company, Small-Scale Green Power Auction. https://www.taipower.com.tw/2289/2406/2420/59621/66029/66032/normalPost
33. Ministry of Economic Affairs, Green Power Auction News Release. https://www.moea.gov.tw/Mns/populace/news/News.aspx?kind=1&menu_id=40&news_id=121608

3.3.3. SOLAR-PLUS-STORAGE WHEELING

Taipower's 2025 wheeling contract formally recognises solar-plus-storage as a wheeling category,[34] but the underlying auction framework constrains what storage can do for a corporate buyer.

Under the Energy Administration's solar-plus-storage auction rules, a winning project sells its battery-discharged energy to the utility under the FiT regime.[35] The solar-plus-storage wheeling contract's option therefore applies only to the un-stored portion of output. As the battery-shifted energy remains committed to the utility under dispatch, the battery itself is not yet a freely dispatchable instrument for shifting clean energy into a buyer's evening peak.

3.4. THE DESIGN OF TAIWAN RENEWABLE ENERGY CERTIFICATE (T-REC)

The T-REC is an environmental attribute certificate system managed by the Bureau of Standards and Metrology Institute (BSMI)'s T-REC centre, which covers 5 procurement options: on-site generation, direct offsite PPAs, unbundled T-REC purchase, wheeling, and through licensed retailers. In 2025, the total generation volume of T-REC reached 14 million MWh. Currently, 97.8% of T-RECs are bundled and only 2.2% unbundled, which gives T-RECs strong physical delivery credibility but also limits their flexibility. Reforming T-REC will provide the data granularity needed for hourly matching.

Taiwan's wheeling system was built on a 15-minute simultaneous matching principle, dictated by two things:

- The Electricity-Certificate Unity principle: certificates and physical electricity must move together, which requires that generation and consumption are physically simultaneous.
- The pre-existing 15-minute industrial ToU metering infrastructure. Taiwan had already deployed the smart meter needed to achieve granularity.

When Step 1 (15-min matching per contract) went live, two problems emerged.

- First, fixed-volume PPA contracts produced large unmatched residuals in each interval: the offtaker had unmet RE demand on its books, and the generator had surplus electrons it had to sell to Taipower at FiT by law.
- Second, a single legal entity's load profile could not absorb the natural shape of variable generation, producing predictable mismatches.

The matching process of T-REC, therefore, is designed with a Step 2 to rescue unmatched volume from Step 1, by sliding it to a different interval within the same ToU block, and so improve matching rates for the buyer's annual claim. Taipower's own settlement system already uses the four ToU blocks (peak / mid-peak / off-peak / Saturday mid-peak) for normal billing, so re-using those blocks for the unmatched volume.

- **Step 1:** 15-minute interval matching per contract already achieves granular temporal alignment.
- **Step 2:** Monthly balancing reallocates unmatched generation within the same ToU block.

Step 2 diluted the time-value signal, because residual matching within a ToU block treats all 15-minute intervals in that block as equivalent. A midday solar electron matched in Step 2 to an evening load was no longer being matched at the actual hour of generation. In effect, the system pays as Taipower will need to purchase the residual energy at FiT and in diminished temporal signal for the convenience of treating intervals within a price block as interchangeable.

Despite Taiwan's wheeling system matching at 15 minutes, the T-REC carries only a monthly volume. The 15-minute interval is dictated by the metering granularity already in place. The temporal information from the wheeling layer is not lost in T-REC but aggregated before being stamped onto the certificate. Monthly claims are the sum of all matched intervals: strict sub-hourly matching improves accuracy but creates inefficiencies when excess generation or deficits cannot be reallocated in real time.

The government has since rolled out reforms to tackle the residual generation by adopting the flexibility allocation program and separating certificates and electricity.

34. Taipower, 電能轉供契約 114.9.1 版, Note 2 to Art. 2 and Arts. 13(4), 15(3)–(4).
35. Energy Administration, 太陽光電發電設備結合儲能系統競標及容量分配作業要點, Point 13 (https://law.moea.gov.tw/LawContent.aspx?id=GL001762);

3.5. THE REFORMS: THE FLEXIBILITY ALLOCATION PROGRAMME

3.5.1. DESIGN AND SCOPE

Taipower formally announced the Green Power Market Flexibility Allocation Pilot Programme on 1 September 2025, with operations running from 1 October 2025 to 30 September 2026. The programme is implemented under Taipower's wheeling regime and the Electricity Trading Operating Rules. The core principle is to hand green-power dispatch rights to enterprises and retailers to reduce the unmatched residuals by returning to strict 15-minute matching. The programme is positioned as a transitional instrument toward a market trading platform. According to Taipower, the 15-minute matching reform is intended "to connect with the future green power market trading model."

The programme establishes two participation modes: [36]

- Single-entity allocation[37] confers allocation rights on a single legal-entity offtaker, which may redistribute wheeled renewable generation across its own meter accounts within the 15-minute intervals. '
- Retailer allocation[38] gives allocation rights on a licensed renewable retailer, which aggregates offtakers from multiple legal entities into a single user group and distributes generator output across that group at 15-minute intervals.

Eligibility is constrained. Generators participating under feed-in tariff contracts with Taipower are excluded unless those contracts are formally terminated. Generators in commissioning trial-run periods may participate only with explicit authorisation from the electricity regulator. Self-use generation facilities may contribute only output from formally registered commercial units. Each consumption meter may participate in either general wheeling or one flexibility allocation plan, but not in multiple plans simultaneously. In contrast, generators face no restriction: a single generation asset may set wheeling ratios that distribute output across general wheeling and multiple flexibility allocation plans.

3.5.2. OPERATIONAL DESIGN

Participants pay monthly data-provision and verification fees set under Taipower's Information Service Fee Standards.

- The data-provision fee comprises a one-time programme design fee of NT$6,000 at first application, plus a machine-processing fee of NT$0.20 per energy data record, subject to a floor of NT$2,000 (or under 10,000 records) and a ceiling of NT$100,000 (above 500,000 records).
- The verification fee is tiered by total meter account count:
    - ≤100 accounts: NT$100,000
    - 101–300 accounts: NT$100,000 plus NT$600 per account above 100
    - 301–1,000 accounts: NT$220,000 plus NT$400 per account above 300
    - >1,000 accounts: NT$500,000

36. Taipower, 綠電市場彈性分配試行計畫 [Green Power Market Flexibility Allocation Pilot Programme], issued 1 September 2025
37. 單一法人分配
38. 售電業分配

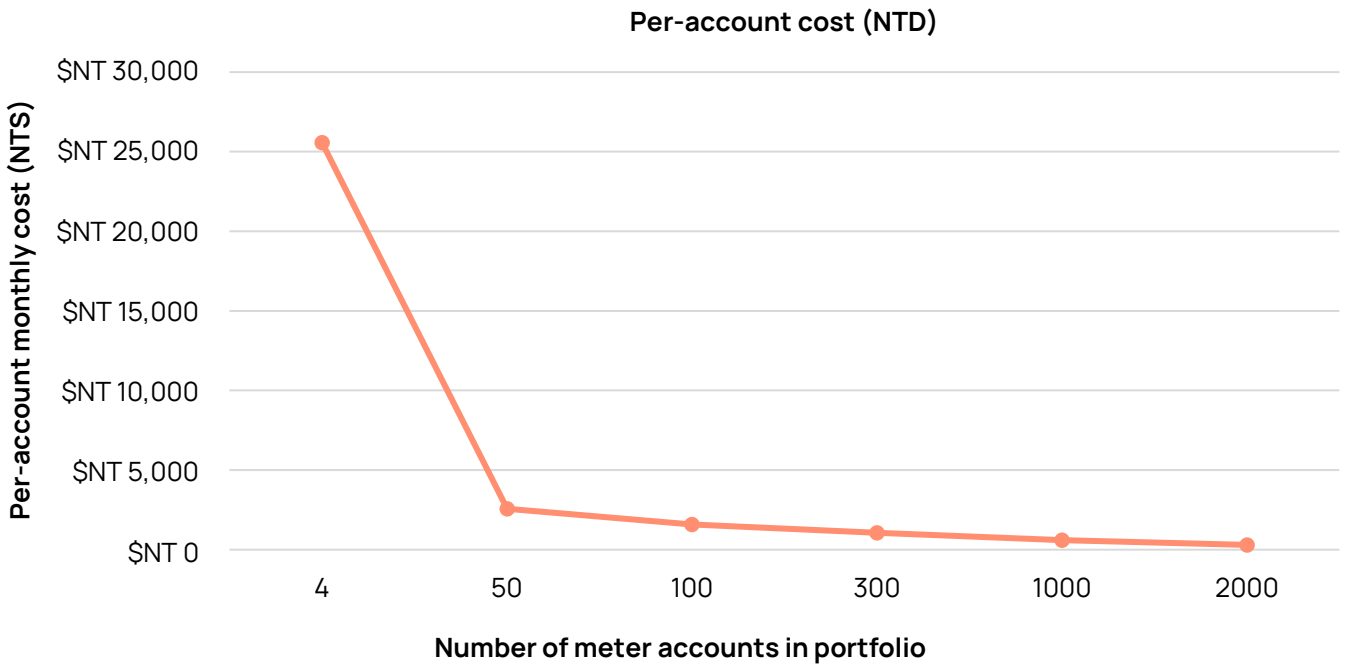


Fig 3.4. Monthly participation fees per account by portfolio size

The fee schedule produces strong economies of scale. Per-account costs declined from approximately NT$25,600 for a four-meter participant to NT$300 for a two-thousand-meter retailer-aggregator. The structure thereby channels participation toward the retailer-allocation mode, consistent with the programme's stated design intent of using licensed retailers as aggregators of diverse offtakers.

The direct single-entity participation is economical primarily for the largest corporate consumers. Small-to mid-sized offtakers seeking granular procurement must access the programme through a licensed retailer.

3.5.2. PRICE DISCOVERY

Fig 3.5. Intraday price settlement of Flexibility Allocation Scheme in December 2025

Intra-day clearing patterns in December 2025 show cleared volumes peaking at midday with mildly suppressed prices, prices rising to test a NT$6/kWh ceiling in evening hours, and no clearing during overnight periods. The price signal effectively reflects the abundance of midday solar generation. (Fig 3.5)

3.5.3. OVERALL ASSESSMENT

The programme manufactures a time-value signal for renewable electricity without a spot market pricing. The allocation rights are themselves the instrument of flexibility. By letting retailers redistribute generation across diverse load shapes within each interval, flexibility is rewarded through the matching rate it unlocks. And because volumes clear interval-by-interval, genuine price discovery emerges. This incentivises shifting consumption toward hours of renewable abundance, directly raises the share of procurement that is recognised, and reduces cost.

3.6. THE REFORM: ELECTRICITY-CERTIFICATE SEPARATION

3.6.1. DESIGN AND SCOPE

On 9 April 2026, the MOEA pre-announced a partial amendment to the Renewable Energy Certificate Implementation Regulations.[39]

Under the existing rule, only owners of self-use generation facilities may transfer unused or unclaimed certificates to a third party. The amendment to Article 7 extends this right to generators that have not signed a power purchase agreement with Taipower (ie, FiT), allowing the certificates corresponding to their residual electricity to be obtained and transferred to other users. The objective is to increase supply-side flexibility and expand the circulating volume of T-RECs.

The reform addresses the same structural inefficiency as Flexibility Allocation mechanisms. Without a transfer route, the environmental attributes for surplus renewable generations from PPAs are defaulted back to Taipower. By creating a certificate pathway for this residual generation, the amendment releases renewable volume locked under feed-in-tariff contracts.

3.6.2. IMPACT ON RENEWABLE SUPPLY

Because it permits a greater degree of unbundled T-RECs in the market, it raises the importance of temporal matching as the safeguard of claim integrity. As certificates circulate more freely and independently of physical delivery, hourly matching becomes the mechanism that distinguishes a genuine clean-power claim from a volumetric certificate purchase.

Hourly matched or sub-hourly matched T-REC will allow the expansion of renewable supply while continuing to provide a robust temporal verification to make the environmental attribute impactful.

39. Official pre-announcement, 9 April 2026, ref. 經授標字第11553000460號 — National Association of Small & Medium Enterprises posting linking the official MOEA documents: https://www.nasme.org.tw/en/board/policy/810

04.

BRIDGING THE GAP

With its existing data and physical infrastructure for sub-hourly matching, Taiwan can unlock around-the-clock clean power procurement. It can achieve this by expanding procurement pathways, layering sub-hourly T-RECs onto Flexible Allocation Schemes, and increasing the supply of T-REC-backed renewables.

4.1. BUILDING CERTIFICATION INFRASTRUCTURE ON FLEXIBILITY ALLOCATION SCHEMES

Taipower's Flexibility Allocation scheme resolves the residual generation problem created by 15-minute matching. This removes the necessity of Step 2 ToU dilution in the current setup of T-REC. With more unbundled T-RECs existing in the market.

The route forward to a 15-minute matched T-REC could be built on the participants of the Flexibility Allocation Scheme. For example, adding a 15-minute matched certificate tier to BSMI's existing registry using the 15-minute matched-volume data already flowing from the pilot. This is the EnergyTag "Configuration 1" approach: time-stamped issuance integrated into the existing certificate registry.

Because Taiwan already matches at 15 minutes, it could go finer than the hourly EnergyTag standard. Taiwan should decide on a definition of what "hourly-matched" means in its context: the matching boundary, the granularity (15-minute versus hourly), and the treatment of residual mix. A data-governance framework with third-party verifier access and audit trails will be needed to prevent double-counting as more unbundled certificates arise.

4.2. ENABLE STORAGE T-RECS TO RECOGNISE TIME-SHIFTED GENERATION FROM ESS

Overcapacity in the ancillary market has made ESS assets sit idle in the grid. To provide an additional revenue stream, the certificate regime should recognise time-shifted renewable generation from storage as eligible for matching. T-RECs are currently limited to direct renewable generation. Output discharged from a battery that was charged with renewables does not count, even though it is the most direct solution to the ramp.

Recognising stored renewable output requires explicit anti-double-counting rules governing charge and discharge: the same MWh must not be claimed once at the point of charging and again at discharge, and charge/discharge losses must be attributed. EnergyTag storage GC already provides an accounting framework.

4.3. ENABLING FIRM AND STORAGE-BACKED PPA PRODUCTS

Currently, all solar-plus-storage investments are tied under Taipower's FiT, where corporations are unable to benefit from the time-shifted generation under the solar-plus-storage wheeling arrangement. Taiwan should enable storage-backed or hybrid PPA to address the problem of growing duck curves. Under such a structure, the midday PPA surplus that today is dumped to Taipower is instead time-shifted by storage into the buyer's evening load, where it can be claimed against evening consumption.

4.4. PORTFOLIO-BASED FIRMING THROUGH LOAD AGGREGATION

For SMEs, they could access RTC through portfolio-based firming through the retailer-allocation mode of the Flexibility Allocation Scheme. Because a single entity's load cannot absorb variable supply, aggregating diverse offtakers and a blend of solar, onshore wind, and geothermal across a retailer's portfolio raises match rates structurally. The Flexibility Allocation Scheme's fee structure, which favours large aggregators, creates a barrier for SME to participate. Portfolio firming can be an accessible route for these SME.

An example is Peninsula Clean Energy, a California community choice aggregator serving roughly 310,000 customers, which demonstrates portfolio matching at scale.[40] By pooling diverse demand and procuring across a blend of resources, it targets 99% hourly-matched renewable electricity. Its open-source MATCH model found that matching demand to clean supply 99% of the time struck the best balance of cost-competitiveness, portfolio risk, and emissions reduction.

40. ClimateBreak, "Improving on 100% Renewable Portfolio Standards through Hourly Matching with Jan Pepper of Peninsula Clean Energy." https://climatebreak.org/improving-on-100-renewable-portfolio-standards-through-hourly-matching-with-jan-pepper-of-peninsula-clean-energy/

4.5. CREATING A SPOT MARKET FOR MORE TIME-BASED SIGNALS

The spot market will reflect real-time demand and supply dynamics on the grid and incentivise ESS uptake by creating opportunities for price arbitrage. Once the spot market is launched, 15-minute matched T-RECs are enabled as no enabled as electricity are settled on a 15-minute basis and second step matching can be removed.

Taiwan is planning to create a real-time spot market exclusively for green energy trading in late 2026 to 2027.[41] As this market will exist in parallel with the low-regulated industrial electricity tariff, the government should encourage buyers to participate in the market instead of relying on the regulated tariff. To support green energy prices discovery and market liquidity, the government could mandate that large buyers procure a specific percentage of their power from the free market.

4.6. HOW CAN CORPORATIONS PERFORM HOURLY MATCHING TODAY?

While Taiwanese corporations cannot yet make an hourly matching claim purely based on T-RECs because the T-REC still carries only a monthly volume, they can conduct hourly matching EnergyTag Configuration 3.

The practical route is to procure renewable power through a wheeled/direct supplied PPA, or purchase the RTC or daytime products in a small-scale green power auction for SMEs so that generation is physically delivered against the buyer's load. Taiwan's wheeling system already matches generation to consumption at 15-minute resolution, and because every high-voltage user can access its own interval consumption data through Taipower's portal and the Taiwan Power app, the buyer can line up its 15-minute generation and consumption data to conduct 15-minute matching.

Participating in the Flexibility Allocation Pilot strengthens this further: it returns dispatch rights to the buyer or retailer and matches strictly at 15 minutes, producing auditable matched-volume records rather than a self-assembled estimate.

41. Digitimes, (2026), "Taiwan Spot Market 2027 Launch," https://www.digitimes.com/news/a20260514PD206/taiwan-spot-market-market-2027-launch.html

Table 1. Summary of actions to enable RTC procurement

Horizon	Corporations: options to do RTC procurement	Government/policymakers: actions to enable RTC procurement
Short term	Simple hourly matching can be done by layering T-RECs on hourly electricity usage data on Taipower's portal	Promote and broaden participation in the Flexibility Allocation Pilot.
	Large corporate consumers: For more sophisticated matching, corporates could conduct hourly matching via EnergyTag Configuration 3 by procuring renewables through a wheeled/direct-supplied PPA and layer 15 minutes of data from Taipower onto T-RECs.	
	SMEs: Buy RTC/daytime products in the small-scale green-power auction and match your own 15-minute generation and consumption data from the Taipower portal and app.	Begin defining what "hourly-matched" means in Taiwan's context: matching boundary and granularity. (15-minute vs hourly)
Medium term	Large corporate consumers: Procure firm or storage-backed/ hybrid PPAs that time-shift midday surplus into evening load.	Adopt EnergyTag Configuration 1 on Flexible Allocation scheme: Build a 15-minute-matched T-REC tier on BSMI's registry using pilot matched-volume data
	SMEs: Use the retailer-allocation mode for portfolio-based firming: SMEs access RTC by pooling diverse offtakers	Enable T-RECs for storage: Reform T-RECs to recognise time-shifted generation from ESS, with anti-double-counting and loss-attribution rules. Enable storage-backed PPA products.
Long term	Trade and hedge renewable supply on the green spot market. Use price arbitrage to deploy ESS and optimise round-the-clock procurement.	Launch the dedicated green-energy spot market to provide real-time, time-based price signals. Mandate that large buyers procure a set share of power from the free market to support price discovery and liquidity, countering reliance on the low regulated tariff.
		Once the spot market is built, T-RECs can be turned into 15-minute matching as electricity is settled on a 15-minutes basis on the market.

4.7. CONCLUDING REMARKS

The trajectory for Taiwan is clear. The Flexibility Allocation Pilot, the electricity-certificate separation reform, and Taiwan's planned green energy spot market collectively signal a policy direction that is converging toward the global standards: hourly granularity as the baseline for credible clean energy claims. The question is how efficiently it can close the gap between its current infrastructure and the market design that RTC procurement requires.

Three dynamics will shape that transition. First, demand-side pressure will intensify. As CBAM costs become real for Taiwanese exporters in 2026 and beyond, and as the GHG Protocol's Scope 2 revisions translate into procurement requirements for multinational supply chains, the commercial case for hourly matching will sharpen considerably. Companies that move early, by procuring through physically delivered PPAs and layering 15-minute interval data, will accumulate the operational experience for hourly matching.

Second, the storage market's overcapacity problem contains its own solution. Over 1,800 MW of ESS capacity is currently underutilised. Enabling storage T-RECs, permitting storage-backed PPAs, and establishing a real-time spot market would redirect this capacity toward the time-shifting function the grid actually needs.

Third, the design choices made now will determine how well Taiwan's RTC market scales. The Flexibility Allocation Pilot's fee structure, which favours large aggregators, risks concentrating participation among a small number of retailers and large corporates, leaving SMEs dependent on Taipower's green power auctions as their primary RTC pathway. Resolving this will determine whether RTC becomes a mainstream procurement norm or remains a premium product accessible only to the largest buyers.

The priority now is building the market structures that allow the foundations to do what they were always capable of doing.