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GREEN ELECTRICITY

台灣綠電市場手冊

Guide to Taiwan Green Electricity Market

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台灣綠電市場手冊

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SCIENCE & TECHNOLOGY LAW INSTITUTE

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TAIWAN GREEN ELECTRICITY MARKET

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氣候治理下之能源轉型

全球減碳目標與協議

《巴黎協定》於2015年問世，象徵全球環境治理邁入新紀元，並將「控制溫升幅度」與「實踐淨零目標」列為首要方針。《巴黎協定》要求各國提交**國家自定貢獻**（Nationally Determined Contributions, NDCs），並建立五年盤點機制，推動政策逐步收緊。隨後的COP27與COP28會議進一步聚焦「逐步淘汰化石燃料」與「擴大再生能源布建」，要求各國2030年前達排放高峰、2050年前達淨零。主要經濟體相繼公布淨零時程並調整能源結構，強化再生能源占比與電力市場制度，以因應全球低碳競爭與監管要求。

隨著氣候治理制度化，企業面臨的減碳與揭露壓力同步升高。歐盟自2023年起實施「碳邊境調整機制」（Carbon Border Adjustment Mechanism, CBAM），要求進口品揭露碳排放並預計2027年起正式課徵碳稅，迫使製造業加速盤查供應鏈碳足跡。同時，科學基礎減量目標倡議（Science Based Targets initiative, SBTi）已成為國際主流，企業須明確說明如何透過使用再生能源達成範疇二（Scope 2）減排。國際財務報導準則基金會（IFRS Foundation）亦於2023年發布氣候揭露準則IFRS S2，要求揭露能源使用、排放與減緩行動，強化可查證的綠電使用紀錄。

鑑於環境轉型需求，能源配置的優化不再僅止於預算考量，更成為決定企業氣候韌性及強化市場競爭力的核心要素。綠電因具來源追溯性與減碳可驗證性，正由選擇項轉為合規必要，成為企業邁向淨零轉型及供應鏈重構的關鍵工具。

我國減碳策略

臺灣邁向2050淨零排放的減碳策略，是由行政院統籌推動，並以《氣候變遷因應法》為法律基礎，由國家發展委員會（國發會）與環境部氣候變遷署共同主責。該法於2023年公布施行，正式將「2050淨零排放」納入國家長期目標，並建立溫室氣體減量與氣候調適雙軌治理架構。

其後，國發會於2024年提出更具企圖心的中期減碳目標，將2030、2032及2035三階段目標分別設定為相較2005年減碳28%、32%及38%，以滾動修正方式強化我國國家自定貢獻（NDC），作為實現淨零的中期路徑。

政策層面則由國發會發布「臺灣總體減碳行動計畫」，作為全國淨零推動的核心藍圖，整合行政院各部會行動與資源，建構四大轉型願景（能源、產業、生活、社會）與六項支撐機制（科技研發、綠色金融、碳定價、法制調適、人才培育與社會參與），形成全國性減碳治理體系。依據該計畫，能源署、產發署、交通部、內政部、農業部及環境部等分別主責能源、製造、運輸、住商、農業與環境六大部門減碳行動計畫，並配合《氣候變遷因應法》建立盤查、管制及績效評估制度。

2022年國發會公布「十二項關鍵戰略」，涵蓋能源轉型、氫能與CCUS、低碳運輸、淨零建築、資源循環、綠生活與碳匯農業等重點方向；並於2025年，行政院再推動「減碳旗艦計畫」，由經濟部主導製造業與國營事業的深度節能及產業自主減量，藉此強化技術創新與產業參與。同時，資本市場與企業治理制度也同步轉型。自2026年度起，證交所將原有「公司治理評鑑」全面升級為「ESG評鑑」，將環境(E)、社會(S)、治理(G)三大構面納入考量，環境與社會指標權重大幅提升。新的評鑑機制要求企業揭露能源使用、水資源、廢棄物、循環經濟、生物多樣性、碳匯政策等具體資料，並對減碳與綠電使用行為給予具體評分。此外，透過「永續經濟活動認定參考指引」的制定與修訂，金管會為金融業與資本市場提供綠色、永續資金導向的標準分類，包括再生能源發電、綠電、節能減碳技術、循環經濟等，促使資金可導入支持綠電與低碳轉型。

國際供應鏈的去碳壓力與市場回應

企業將供應鏈碳中和視為新標準

在全球淨零轉型浪潮中，領先企業不僅強化自身營運減碳，更進一步將減碳要求延伸至供應鏈，形塑出「全供應鏈碳中和」的新標準。Apple、Microsoft等國際科技巨頭已公開要求其供應商須於特定時程內達成100%使用再生能源的目標，並視其進展作為採購與合作的重要依據。這一趨勢反映出綠電採購已脫離「企業社會責任」的自願範疇，轉而演變為跨國供應鏈協作與獲取國際訂單的標準配備。

與此同時，RE100、碳揭露計畫（Carbon Disclosure Project, CDP）等國際倡議亦持續強化其氣候資訊揭露與目標驗證標準，帶動越來越多企業自願加入再生能源採用承諾行列，推升綠電使用透明度與可信度。這些倡議對供應鏈企業產生強烈的外溢效果，即便未直接參與，也須因應其上游客戶或品牌方的減碳要求，逐步調整用電結構與能源來源。

除企業自律外，全球各國亦建立再生能源義務制度以驅動市場轉型。美國多州採行「再生能源配額制度」（Renewable Portfolio Standard, RPS），要求電力公司或用電大戶在一定期間內達成法定比例的再生能源使用；英國與歐盟則透過「再生能源義務制度」（Renewables Obligation, RO）及其證書交易機制，促使零售商與供應商達標。此類制度藉由法規約束與市場化機制並行，形成再生能源投資與採用的長期誘因。臺灣亦於《再生能源發展條例》第12條設置「用電大戶條款」，要求契約容量達5,000瓩以上之企業，須以自建、購電或購憑證方式使用一定比例的再生能源，逐步導入義務性採購概念。

這些制度的推動，使企業綠電採用同時受到「政策規範」與「供應鏈壓力」雙重驅動。綠電因此不僅是企業展現永續形象的手段，更成為維持國際競爭力、確保訂單穩定與符合法規要求的關鍵策略，標誌全球產業正從自願減碳走向制度化能源轉型的新階段。

企業以綠電作為範疇二的減碳主要手段

依據國際通用的碳盤查標準（如GHG Protocol），企業溫室氣體排放被劃分為三大範疇，其中範疇二（Scope 2）指的是來自購買電力、蒸汽、熱能與冷卻等間接能源的排放。隨著氣候資訊揭露規範日益嚴格，範疇二成為企業報告與減排目標中不可迴避的重點項目，特別是對製造業與高用電產業而言，其比重往往占總排放的一大部分。

由於市電多為化石燃料與再生能源的混合供電，企業若欲有效降低範疇二排放，必須透過改用具可追溯來源的再生能源來對應，從而推動企業從傳統市電轉向綠電採購。在此需求驅動下，全球綠電市場快速發展，企業採購工具與制度亦隨之多元化。

其中，以「再生能源憑證」（如台灣的T-REC）與「企業購售電契約」（Corporate Power Purchase Agreement, CPPA）為主的綠電採購機制，已在國際間成為企業實踐減碳與應對審查的標準做法。再生能源憑證透過憑證方式量化綠電使用，便於企業進行碳盤查與揭露；而CPPA則提供長期、穩定且具價格預期性的綠電來源，成為大型企業布局淨零的核心策略之一。

這些機制不僅提升企業對能源結構的掌握能力，也在無形中提升了企業對綠電市場制度設計與履約可信度的重視，促使各國政府更加積極建立透明、公正且可供企業採用的綠電制度環境。

2 台灣綠電供需現況

- 用電端綠電取得模式
- 綠電供給面
- 綠電需求面：企業綠電需求與採購現況
- 價格訊號與綠電交易

用電端綠電取得模式

直供

「直供」指再生能源發電業者自行設置電源線，直接與用戶聯結，並將所發電能供應給該用戶[1]。此模式的特徵在於電力傳輸不經台電電網，而是由發電業與用戶建立獨立的供電關係。由於跳過了電網輸配環節，直供在理論上可降低輸電過程的損耗與費用，並使用戶能直接掌握其使用的綠電來源。

然而，在實務操作上，直供須符合相關的線路設置規範與安全要求，並考量設置成本與距離限制，因此較常見於特定場域或大用電戶與鄰近再生能源電廠之間的合作模式。

轉供

「轉供」是指由台電透過電力網，把發電業者產生的電送到用電端的過程，這是《電業法》規定的基本機制[2]。若再生能源發電業把電接入台電的電網，就可以利用這個網路把電力供應給特定用戶，也就是所謂的「綠電轉供」，是目前再生能源交易的重要基礎。

在實際運作上，轉供大致可分成兩種情況。第一種是**再生能源發電業直接透過台電電網，把電賣給特定的用戶**；第二種則是由**再生能源售電業整合多個發電來源，再透過台電電網把電賣給不同的用戶**。台電在兩種情況下都負責提供電網傳輸與系統調度服務，並收取相應的費用。

此制度讓綠電能更有效率地被整合進電網，也能分散單一電廠發電不穩定的風險，讓企業或用戶能穩定取得附有來源憑證的再生能源電力，是我國綠電市場發展的重要環節。

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[1] 《電業法》第2條第25款：「直供：指再生能源發電業，設置電源線，直接聯結用戶，並供電予用戶。」

[2] 《電業法》第2條第26款：「轉供：指輸配電業，設置電力網，傳輸電能之行為。」

自發自用

在各種綠電取得方式中，「自發自用」是最直接、也最具自主性的使用模式。指的是用電者自行設置再生能源發電設備，所產生的電力可以不經電網，直接供自身使用，例如企業在廠房屋頂設置太陽能板，或學校於校舍設置光電系統，用以支應日常用電需求。

隨著政策鬆綁[3]，自用型發電設備也可將多餘電力售出，或委託再生能源售電業代為轉供他人，突破過去「自給自足」的限制，讓綠電在使用與交易上更具彈性。若用電者選擇將電力留供自用，也可選擇**「電證分離」**的方式，將對應的再生能源憑證單獨出售給其他企業，以創造額外收益。反之，若將電能與憑證一併售出，則視同將綠電完整移轉給他方。這種制度設計讓自發自用者可依自身需求與市場條件決定「電要不要拿出來賣」、「憑證是否保留自行使用」，兼顧能源自主與市場化運作，進一步提升綠電使用的靈活度與價值。

綠電供給面

臺灣發電概況

根據經濟部能源署資料統計[4]，國總發電量自2016年的2,641億度穩步上升，至2025年達2,889億度。從發電結構變化觀察，燃煤發電占比自2016年的45.9%降至2025年的35.4%；燃氣則由31.5%上升至47.8%，顯示其取代燃煤成為主要基載電源的趨勢。

此外，核能占比由12.0%減至1.1%，並於2026下降至0%，反映機組除役時程與設備運轉狀況的變化。近期經濟部已核定台電完成之核電廠現況評估報告，確認核一廠因設備老化及重要設施拆除等因素不具再運轉可行性；核二、三廠則初判具再運轉條件，並將依規定啟動自主安全檢查及研提再運轉計畫，相關程序仍須經核安會審查及社會溝通後方得進行。此一進展顯示未來核能在我國能源組合中的定位，將依照安全評估結果及政策程序逐步檢視。

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[3] 經濟部112年12月14日經授能字第11200342600號函。

[4] 經濟部能源署，發電概況，https://www.moeaea.gov.tw/ECW/populace/content/Content.aspx?menu_id=14437；經濟部能源署，能源統計，https://www.esist.org.tw/。（最後瀏覽日：2026/5/5）

再生能源占比則由2016年的4.8%提升至2025年的13.1%，呈現穩定成長。就再生能源發電量而言，總量由2016年的127億度增至2025年的378億度，成長逾一倍。以再生能源發電結構來看，慣常水力占比由2016年為51.5%，至2025年減少為14.5%；生質能及廢棄物占比由2016年為28.3%，至2025年減少為10.9%；太陽光電占比由2016年為8.7%，至2025年增加為42.2%；風力占比由2016年為11.4%，至2025年增加為32.3%。

發電量結構 Electricity Generation Mix

單位:億度(10^2 GWh)

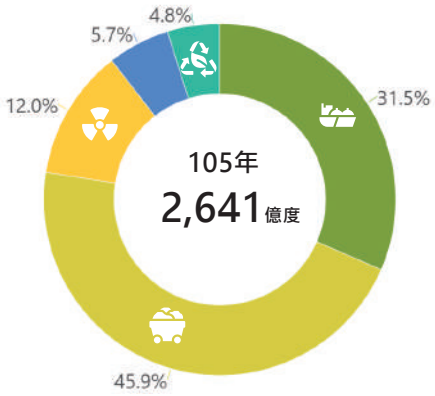
燃氣 LNG-Fired

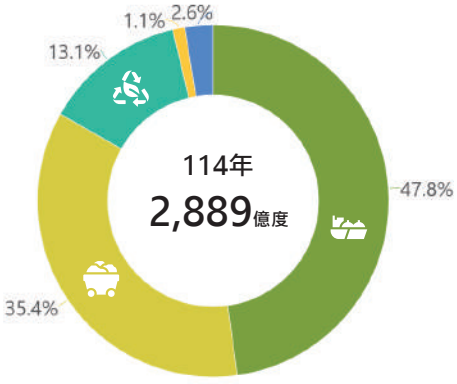
燃煤 Coal-Fired

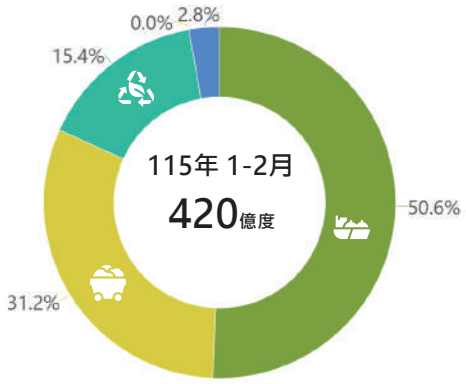
再生能源 Renewable Energy

核能 Nuclear

其他 Others

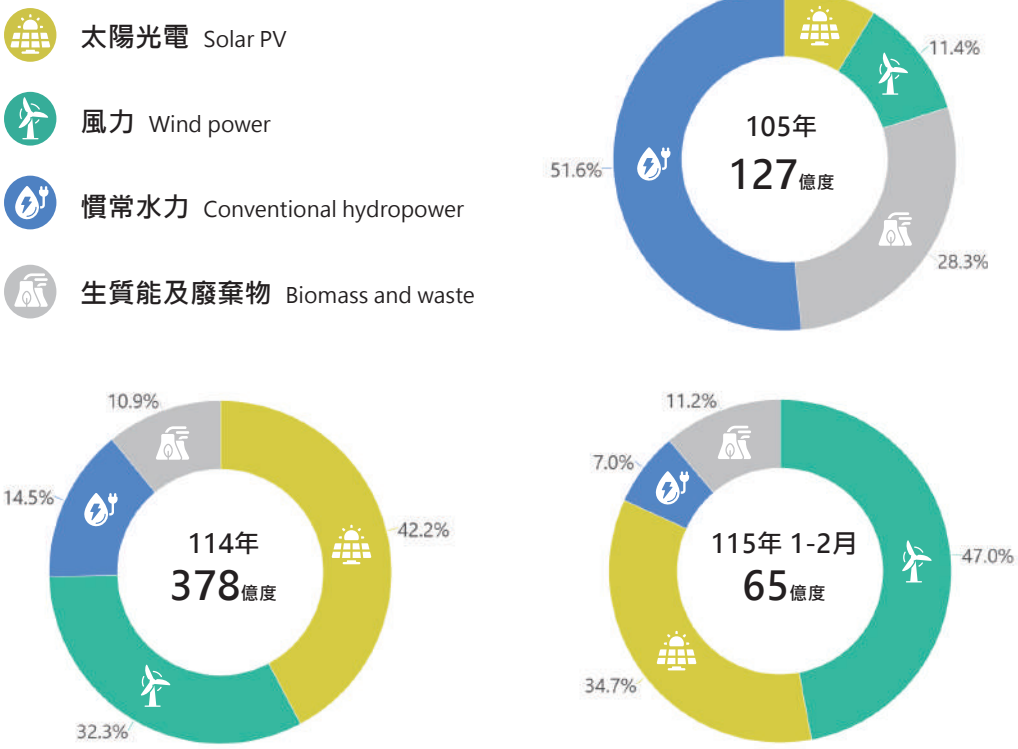






再生能源發電量結構 Renewable Energy Generation Mix

單位:億度(10^2 GWh)



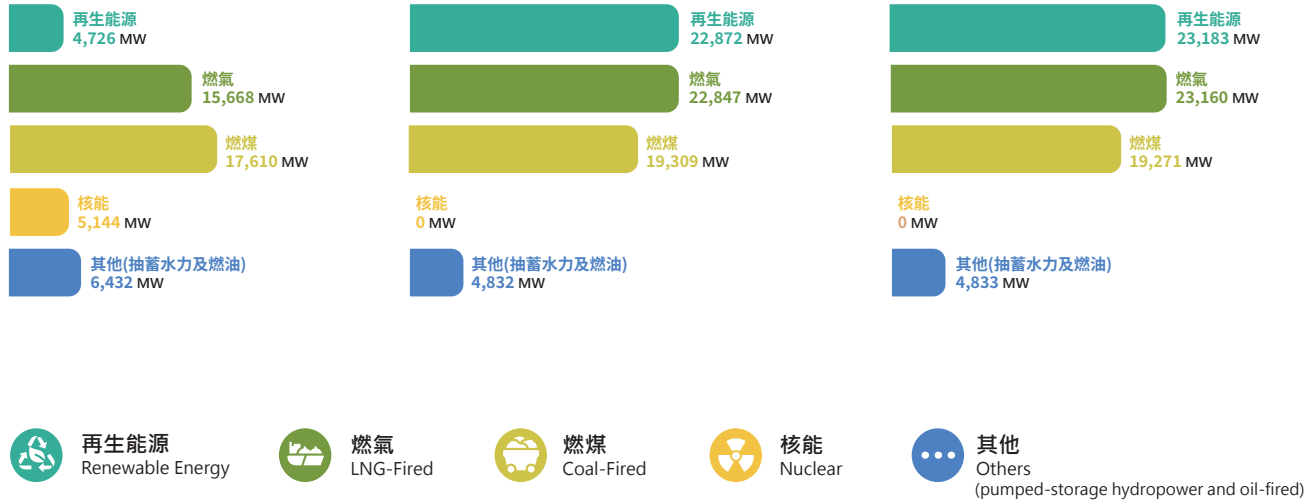
臺灣主要能源裝置容量

根據能源署統計資料顯示，近年來我國主要發電裝置容量變化，燃煤由105年為17.6百萬瓩，至114年增加為19.3百萬瓩；燃氣由105年為15.7百萬瓩，至114年增加為22.8百萬瓩；核能由105年為5.1百萬瓩，至114年降至0；再生能源由105年為4.7百萬瓩，至114年增加為22.9百萬瓩。

其中，再生能源發電裝置容量變化，再生能源發電總裝置容量由105年4.7百萬瓩，至114年為22.9百萬瓩。以再生能源發電裝置容量結構來看，慣常水力占比由105年為44.2%，至114年減少為9.3%；生質能及廢棄物占比由105年為15.0%，至114年減少為3.3%；太陽光電占比由105年為26.3%，至114年增加為67.7%；風力占比由105年為14.4%，至114年增加為19.7%。

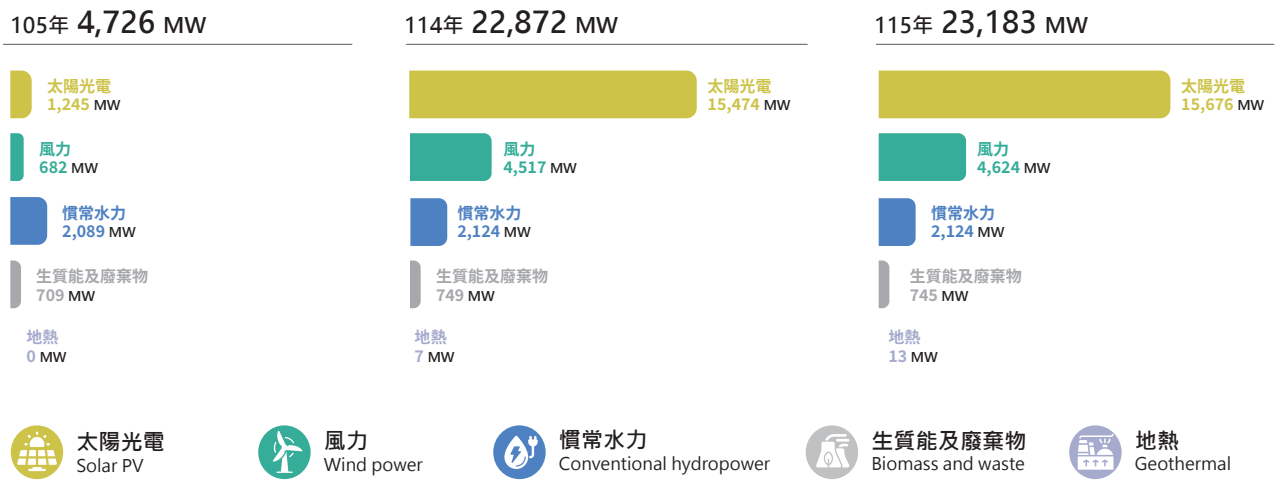
發電裝置容量 Installed Generation Capacity

單位:兆瓦(10^6 MW)



再生能源發電裝置容量 Renewable Energy Installed Capacity

單位:兆瓦(10^6 MW)



台電躉購與自建綠電供應概況

台電長期以固定躉購費率收購再生能源發電業者所產電力，並統一併入電網供應用戶。然而，這些躉購綠電並未以獨立商品形式釋出，亦無法提供用戶可追溯的綠電來源或再生能源憑證（T-REC）。為擴大綠電供應通路，並協助不同規模的企業用戶取得綠電，台電近年推出「小額綠電」與「RE30低碳電力」兩項商品化機制，一方面強化用電端綠電取得的可及性，另一方面也回應企業對綠電可追溯性與碳揭露的實際需求。

1.躉購綠電總量與來源結構

根據台電公司資料，迄至2024年12月底止，躉售電能之再生能源發電系統計63,564件，合計裝置容量17.05GW，按再生能源別區分如下表：

再生能源別	收購件數	收購容量
太陽光電	63,322	1,330.3
風力	150	343.5
水力(含其他)	92	31.8
合計	63,564	1,705.6

資料來源：台電公司[5]

[5] 台電公司，購入電力概況，https://www.taipower.com.tw/2289/2363/2380/2385/10621/normalPost（最後瀏覽日：2026/5/5）。

2.台電自建綠電案場與發電現況

迄2025年12月底止，台電公司慣常水力發電裝置容量1.82 GW，累積發電量為4,685,304千度。自建太陽光電裝置容量 0.31 GW，累積發電量為402,468千度；自建置風力發電裝置容量 0.44 GW，累積發電量為958,057千度。

台電自有水力案場近五年發電量

年	2021	2022	2023	2024	2025
單位：度	2,713,204,615	4,845,599,177	3,334,488,352	3,535,786,063	4,685,304,964

台電自有光電案場近五年發電量

年	2021	2022	2023	2024	2025
單位：度	408,836,867	402,687,236	393,948,610	404,168,687	402,468,840

台電自有風電案場近五年發電量

年	2021	2022	2023	2024	2025
單位：度	761,574,377	1,072,201,098	872,087,161	946,979,033	958,057,613

台電自有水力、風電及光電案場近五年綠電供應占整體綠電的比重

年	2021	2022	2023	2024	2025
占比	22%	26%	17%	14%	16%

3.自建案場供應來源於小額綠電與RE30等商品化應用

(1) 小額綠電

2023年（民國112年）年底，台電首次推出「小額綠電銷售試辦計畫」，計畫釋出自建再生能源（主要為南鹽與彰濱光電案場）進入市場，透過經濟部標準檢驗局的「綠電媒合平台」以小包裝、多組合方式公開標售。該試辦方案設計了不同度數與年期的組合包，包含1萬度、5萬度等規格，並為確保公平，每個電號僅允許投標一件商品。

2024年11月13日，台電推出第二波小額綠電標售方案，總釋出量提升到2,000萬度，首次納入離岸一期風電，並推出更加多樣化的購買機制。商品設計上分為兩大主商品類型：

- **日間型**：鎖定上午7點至下午5點營業時段，以太陽光電為主。
- **全日型**：涵蓋全天用電，以白天光電搭配離岸風電供應。

每種主商品又細分出6種組合：1萬度、10萬度、20萬度 × 1年期與5年期的組合選擇，單一電號最多可購買20萬度商品。此外加入月定額制（允許得標者設定每月轉供上限）和冬季加購優惠（10–12月期間可額外獲取20%綠電）。

2025年底台灣電力公司推出「114 年小額綠電銷售計畫」，針對小額綠電銷售方式與商品設計進行調整。銷售機制由過去以競標方式分配，改採申購制，由用戶於申請期間填具申請文件向區營業處辦理購買。商品設計上，除延續既有1年期日間型與全日型商品外，另新增期間為2個月之選月型商品，並開放同一電號得同時申購1年型及選月型商品，以提升使用彈性。

2023-2024年小額綠電銷售成果一覽

年度 / 批次	投標企業數	得標企業數	成交電量	成交價格區間	商品特色	備註
2023年第一次	約50家	約47家	約159 萬度	4.9～6元/度	光電，1萬度 / 5萬度；1年、5年期	共360件商品
2023年第二次	約66家	約60家	約341萬度	4.9～6元 / 度	光電，新增10萬度組合	共193件商品
2023年合計	約116家	約107家	約500萬度	4.9～6元 / 度	光電為主	
2024年	71家	30+ 家	約900萬度	5.4～6.8 元 / 度	光電＋風電，日間型 /全日型；新增月定額、冬季加購、總公司代表投標	全日型占46%；熱門組合為20萬度 / 5年期與1萬度 / 1年期

資料來源：經濟部[6]、台電公司[7]，資策會科法所彙整

(2) RE30低碳電力

台電2025年6月推出的RE30低碳電力商品，主要目的是協助出口導向企業達成國際供應鏈的再生能源使用要求。其設計為「市電搭配補充綠電」的混合方案，用戶若已從民營售電業購買部分綠電，台電再補齊不足30%用電比例的綠電，讓企業能取得相應的再生能源憑證並降低碳排。RE30預計釋出台電自建案場5億度綠電，並搭配市電共計約16.6億度，將於2025年6月1日起至12月31日販售，7月1日起陸續轉供，其適用對象為經常契約容量達100瓩以上之（特）高壓用戶，且限於目前採轉供方式用電者。依台電公布之資訊，今年度自建案場供應的5億度綠電已全數售罄，顯示RE30商品具一定市場需求。台電亦表示將於2026年持續推動相關供應機制，協助更多企業銜接國際減碳與再生能源使用要求。

6 行政院能源及減碳辦公室112年第2次委員會議，我國綠電交易市場現況與展望， https://www.ey.gov.tw/oecr/D5847A4-CC2676B73/b2d617eb-0c26-47bb-b56d-bb6ba6108610（最後瀏覽日：2026/5/5）。

7 台電公司，台電小額綠電決標 71家企業買逾900萬度綠電 較去年增近5成， https://www.taipower.com.tw/2289/2323/2-324/60118/normalPost（最後瀏覽日：2026/5/5）。

用戶需以10萬度為單位約定年用電度數（含30%綠電），每年最低申購量為100萬度（含30萬度綠電），最高為1億度（含3000萬度綠電）。其中，綠電供應量上限為用戶約定用電量的30%，一旦達成即停止供應該商品。

在計價方面，RE30採市電與綠電分開計算。市電依尖離峰電價表收費，補充綠電則分為早鳥價6.1元/度（2025下半年）與一般價6.3元/度（2026 年）。加計5% 營業稅與電能轉供費後，實際價格約為6.7～6.9元/度。依照台電試算案例，若產業平均市電為4.27元、民營綠電為6元，則整體平均電價約落在4.86～4.88元/度。

RE30的綠電來源為台電自建的再生能源案場，包括風電、光電與水力，企業無法指定能源別或案場。台電會依實際轉供量，在每年6月及12月結束後60天內，將對應的再生能源憑證移轉至用戶帳號，確保購買者獲得合法的綠電憑證。

制度設計上，RE30具有一定彈性。用戶可在申請期間調整年約定需求度數，並可隨時申請終止，仍得於受理期間內重新申購。本方案不收取保證金，也不設違約罰則，若未達約定用電量僅是未用足額度，不會加收額外費用。

案場直售與企業購售電契約

具備規模經濟與技術能力的再生能源發電業者，可依據《電業法》規定，透過台電電網將自家案場所產生之綠電「轉供」予特定用戶，並與企業簽署企業購售電契約（Corporate Power Purchase Agreement, CPPA）。此模式多採長期契約形式，適用於用電量大、具備中長期減碳規劃的企業，雙方得以約定電價、供應期間與憑證取得方式，確保綠電來源與履約穩定性。

企業透過此模式可獲得具名來源的再生能源電力與T-REC，作為碳盤查、SBTi目標驗證與ESG揭露的重要依據，亦有助提升能源管理透明度與國際競爭力。案場直售不僅代表企業對淨零承諾的積極態度，也逐漸成為RE100倡議下的主流採購方式之一。

台灣離岸風電案場簽約狀況

案場	裝置容量 (MW)	契約併網年份	採購企業	採購量 (MW)	備註
海龍二號 B（完售）	232	2026	未具名半導體大廠	744	海龍2A已完工併網；2B風機已安裝完畢，待併網 / 商轉進度；海龍3號施工中
海龍三號（完售）	512	2026			海龍3號已啟動風機安裝，預計2026年推進併網
大彰化西南（完售）	337.1	2026	台積電	920	風機已全數安裝，預計2026年第3季全面商轉
大彰化西北（完售）	582.9	2026			
海峽一	300		N/A	N/A	向經濟部提出展延，然未獲同意，已遭撤銷行政契約，目前正處理履約保證金扣除必要罰金後，後續退款程序
澎湖一期（完售）	500	2028	中美晶及續興 聯電 遠傳 台哥大 聯發科 Google	不逾75 200 50 約100 50~100 50以下	
海鼎二號	600	2027	N/A	N/A	母公司科里歐撤資，開發進度具重大不確定性
海盛	495	2028	台智電	部分容量	
蔚藍海彰化	440	2028	台智電	部分容量	EDF提出終止行政契約 / 撤離台灣，後續擬重新招標
海峽二	300	2027	N/A	N/A	受海峽一期解約影響，後續開發具高度不確定性

資料來源：資策會科法所彙整

再生能源售電業發展概況

台灣再生能源售電業近年快速成長，已逐漸成為綠電交易的關鍵角色。隨著《電業法》放寬轉供機制與企業淨零壓力升高，售電業從單純的「電力供應商」轉型為能源服務平台。2024年憑證交易量已突破數十萬張，顯示綠電需求不再只是少數企業的選項，而是供應鏈競爭力的重要門檻。

市場發展的核心在於服務模式的轉變。過去單純的電力轉供，現已融入資料分析、智慧化管理與AI預測，使得用戶不僅能購得綠電，更能獲得完整的能源配置方案。平台化的運作，不僅提升交易透明度，也降低中小企業購買綠電的門檻。

與此同時，金融工具的導入正在重塑市場。長期購售電契約與信託制度的應用，讓企業在採購綠電時能確保履約穩定，進而將綠電視為一項長期承諾，而非單次交易。這種制度化保障，也強化綠電在國際碳揭露與供應鏈審查中的可信度。

放眼未來，售電業的角色將更趨多元。隨著市場逐步走向平台化與制度化，結合儲能、碳管理及跨境應用的趨勢已開始浮現。此類發展證實售電業已從末端的轉供職能，演進為跨足能源調度與服務的核心角色，成為當前電力市場體系得以健全運作的必要基石。如何在技術應用、交易制度與合作模式上持續深化，將是影響再生能源市場成熟度與穩定性的關鍵。

綠電需求面：企業綠電需求與採購現況

綠電需求端

台灣綠電需求端主要來自三股力量的推動。首先，加入RE100倡議之企業持續增加，全球成員中已有三十多家在台設有總部，並透過供應鏈要求帶動上下游加速採用可追溯綠電[8]。其次，用電大戶條款自2021年起對契約容量5,000 kW以上用戶課予義務，必須以自設再生能源、購電或憑證、設置儲能設備、代金等方式履行。環境部並於2026年起徵收碳費，一般費率每噸CO_2e 300元，進一步提升企業減碳壓力。

[8] RE100，2024台灣再生電力市場報告，https://www.there100.org/taiwan-renewable-electricity-market-briefing-advocacy-affordable-corporate-procurement（最後瀏覽日：2026/5/5）。

此外，越來越多未達大戶門檻的ESG導向企業，亦因應品牌方與國際揭露規範而投入綠電採購，透過小額綠電商品或轉供管道參與市場，形成更廣泛的需求群。

在用電結構上，台灣工業部門用電占比超過一半，為需求來源的核心；然而電網結構至2023年仍有近42.2%發電量來自燃煤，顯示企業端的減碳壓力相當沉重[9]。Reuters指出台灣科技業（半導體）淨零壓力與綠電缺口並存，例如台積電曾在2021年用掉全國約6.4%用電[10]，而綠電受資源、土地與規範限制，短期難以完全滿足快速成長的需求。安永（Ernst & Young, EY）統計顯示，2024年近12個月直轉供量約24.9億度，較2023年的17.3億度成長逾四成；並估2024年有約86億度自用設備綠電可望進入市場，有助緩解企業採購來源[11]。

政府對於未來需求亦有所估算。經濟部於2024年底指出，至2026年再生能源供給可達550億度[12]，足以支應當時企業用電需求，並搭配2026年20%、2030年30%的再生能源占比目標作為政策指引[13]。然而，實際供給能否完全滿足仍受限於併網進度、容量因子與交易機制成熟度。

企業綠電採購策略與挑戰

台灣目前尚未形成自由化的綠電交易市場，主要仍是透過合約方式進行，缺乏即時的價格媒合機制。因此，企業在採購時常面臨商品選擇有限、價格波動不確定、數量難以預估等問題，尤其大型離岸風電案場的綠電多已被特定大廠簽購完畢，中小型企業更難以取得穩定來源。

9 經濟部能源署，112年度全國電力資源供需報告。

10 Reuters, How Taiwan's green power deficit threatens tech industry's bid for net zero, https://www.reuters.com/sustainability/climate-energy/how-taiwans-green-power-deficit-threatens-tech-industrys-bid-net-zero-2024-06-04 (last visited: May. 5, 2026).

11 安永，借鑒歐洲，臺灣綠電交易市場將加速發展，https://www.ey.com/zh_tw/insights/energy-resources/learning-from-europe-taiwan-renewable-power-trading-market（最後瀏覽日：2026/5/5）。

12 經濟部，2026 年綠電供給達 550 億度 可滿足企業綠電需求，https://www.moea.gov.tw/Mns/populace/news/News.aspx?kind=1&menu_id=40&news_id=117810（最後瀏覽日：2026/5/5）。

13 經濟部，再生能源發電占比 2026年11月起可達20%，https://www.moea.gov.tw/MNS/populace/news/News.aspx?kind=1&menu_id=40&news_id=119230（最後瀏覽日：2026/5/5）。

另一方面，綠電採購的契約模式如CPPA，動輒十年以上，牽涉金額龐大且需長期履約，對企業財務規劃與風險控管要求甚高。許多中小型企業缺乏專業談判與能源管理經驗，再加上履約保證金與擔保條件的財務門檻，形成進入障礙，使得雖有需求卻不敢輕易承諾長期採購。PwC建議企業採購綠電應先盤點用電資料，明確設定目標（法規、供應鏈或碳邊境壓力），同時比較不同再生能源種類與自身用電特性的匹配度，並成立跨部門小組或引入外部顧問。合約談判須兼顧價格、年期、承諾量與風險條款，且應持續追蹤案場進度，確保採購落實[14]。

價格訊號與綠電交易

價格訊號現況與形成挑戰

台灣綠電交易雖已逐步發展，但價格訊號仍不明確。現階段交易價格多以長期議約決定，缺乏公開透明的行情與即時反映供需的市場機制，可謂「已有買賣行為，但尚未形成交易市場制度」。價格僵固與資訊不對稱，使得中小企業難以取得合理條件，也限制了價格發現與資源配置的效率。此外，部分案場因簽約過度或併網延宕，造成帳面需求與實際供給不符，使市場價格難以反映真實成本。

目前台灣綠電交易係以再生能源電能躉購制度（Feed-in Tariff, FIT）為主，加上日益增加之雙邊契約交易模式，尚未建立具撮合功能的自由化市場。企業採購綠電多透過企業購售電合約（CPPA）或再生能源售電業轉供等方式進行。台電則提供電網轉供服務並收取費用，支撐市場運作。

在制度設計上，我國原則採取電證合一，即電力與再生能源憑證必須同時移轉，以避免環境效益重複計算。例如在直供或轉供情境下，售電方須將與電量相符的憑證一併讓與購電方，確保「電隨證走」。但在自發自用案場中，則例外允許電證分離：發電者可自行使用電力，並將再生能源憑證單獨出售予其他企業。這項設計讓自用型案場能創造額外收益，也增加憑證市場的流通性。不過，目前規模有限、資訊透明度不足，對整體價格訊號的影響仍有限。

[14] PwC，2024全球與台灣暨再生能源市場，https://www.pwc.tw/zh/industries/new-energy/insights/power-utilities-renewables-markets.html（最後瀏覽日：2026/5/5）。

目前台灣綠電交易的基礎已建立，但價格形成仍仰賴議約與政策定錨（如台電小額綠電標售價格），尚未發揮市場化的價格發現功能。未來若能建立撮合平台、提升交易透明度，並讓電證市場化程度提高，例如參考英日等國際經驗，建立綠電之電能交易市場或交易平台，經由集中市場交易方式形成價格訊號，即可透過價格訊號真正引導再生能源投資與消費決策。

綠電商品與交易量價

目前台灣綠電商品主要透過多元管道進入市場，涵蓋再生能源憑證（T-REC）、企業購售電協議（CPPA）、再生能源售電業轉供、台電小額綠電，以及RE30低碳電力等機制，各有不同交易特性與市場規模。

1.再生能源憑證（T-REC）

我國T-REC交易模式可區分為「電證合一」與「電證分離」兩種。電證合一交易通常需經由台電電網進行轉供，並由售電業者與用戶簽訂CPPA，合約期間多介於3至20年，且具備時間匹配性（15分鐘區間與月度結算）。

相較之下，電證分離交易僅適用於自發自用型的再生能源發電設備，數量相對有限，且部分具社會公益性。此類憑證可透過經濟部標準檢驗局的競價平台或雙方私下議約進行，多為一次性購買，且不具時間匹配性。

2.企業購售電合約（CPPA）

CPPA屬於長期契約型商品，通常簽約10-20年，台灣近年交易量逐年攀升，已成為大型企業確保綠電來源的主要方式。PwC指出，2024年台灣市場（未含躉購電量）中，超過95%的交易量來自民營售電業的轉供與CPPA。

3.再生能源售電業者轉供

由民營售電業者整合不同案場，將綠電轉供至用戶。交易模式相對彈性，方便中小企業參與，但價格受限於業者掌握的資源與議價能力。

4.台電小額綠電

台電自2021年推出小額綠電銷售，採標售方式，2023-2024年成交價格區間約落在4.9–6.8元/度。成交電量由2023年約500萬度，增長至2024年約900萬度，顯示市場接受度提升。由於定價透明，常被市場視為參考價格，在實務上形成「定錨效果」。

5.電RE30低碳電力

台電已於2025年推出RE30低碳電力商品，並釋出5億度自建綠電與16.6億度市電組合，作為協助出口導向企業達成至少30%低碳用電比例，並同步提供對應的再生能源憑證。台電推出低碳電力商品目的在於回應國際供應鏈減碳需求，並為企業提供較低門檻的選擇。依台電2025年底公布之規劃，該年度5億度綠電已全數完銷，亦預計於2026年持續推出低碳電力商品，協助更多企業銜接國際需求。

制度與媒合機制

目前台灣的綠電交易尚未形成自由化市場，而是透過制度設計與官方或民間平台進行「媒合」與「輔助」。

1.經濟部標準檢驗局

經濟部標準檢驗局（Bureau of Standards, Metrology and Inspection, BSMI）設置再生能源憑證中心，負責憑證的核發、註銷與交易登錄，並提供綠電及再生能源憑證競價平台。然而，該平台性質並非真正的交易所，更接近登錄與媒合角色，價格發現功能有限。

2.綠電信託

金融機構逐步推動「綠電信託」機制，透過銀行信託專戶管理電費支付與履約條件，協助將長期CPPA的信用風險轉移，既保障開發商的收益，也降低企業進入長約的障礙，促進交易雙方達成合致。

綠電信託案例

金融機構	合作對象	特　　色
永豐銀行	阿波羅電力	● 12億度綠電轉供專案 ● 永豐銀行擔任主辦行，設專案信託帳戶管理金流，提升交易透明度與安全性
永豐銀行	天能綠電（雲豹能源）	● 首起「融資電廠→轉供」綠電信託 ● 以信託專戶專款專用，解中小型再生能源融資與金流風險、助轉供落地
永豐銀行	寶富電力（寶晶能源）	● 擴大信託管理範圍，宣稱以信託機制活絡綠電供需 ● 年預計轉供10.35億度
玉山銀行	麗升能源	建立「購電款先入信託專戶→依約撥付」流程，降低企業採購風險；並見合作落地案例
台北富邦銀行	天方能源	以信託管理金流與履約，作為中小企業採購綠電的安全機制
合作金庫銀行	怡和綠電超商	結合第三方查核之信託做法，主打提升交易透明度與價金安全

資料來源：資策會科法所彙整

綠電市場彈性分配試行計畫

綠電市場的彈性分配制度源自經濟部於2023年10月啟動的「綠電分配沙盒計畫」，由台電負責執行相關分配、結算與資訊系統操作。沙盒旨在協助多廠區企業改善綠電分配不易與配比僵化的問題，並在試辦期間累積制度運作經驗。基於沙盒成果與企業需求，台電於2025年推出「綠電市場彈性分配試行計畫」，作為沙盒的制度化延伸版本。

試行計畫明確由具資格之電源持有者或用電客戶擔任分配者，可依15分鐘時段調整綠電的分配方式，使綠電得以更貼近企業實際用電曲線進行配置。此制度突破既有以月度或固定比例進行媒合的限制，使綠電分配更即時、更具彈性。

再售業雖非分配者主體，但彈性分配制度提升了綠電供需組合的彈性，也使再售業能在更具變化性的分配結果下，協助企業整合不同案場的綠電來源、規劃時段化商品與多元採購方案。

3 綠電市場參與者

- 天能綠電
- 台汽電綠能
- 續興建構
- 寶富電力
- 大同智能
- 富威電力
- 星星電力
- 陽光伏特家
- 能元超商
- 瓦特先生
- 台灣智慧電能

擘劃資源、經營市場，**天能綠電**發展靈活型售電平台

以企業用電服務為核心，發展整合型綠電供應模式

天能綠電（Greenet）成立於2021年1月，並於同年8月取得再生能源售電業執照，為國內再生能源售電市場之主要參與者之一。公司以整合再生能源供應與用電需求為核心，透過電能收購、交易媒合與轉供執行等機制，串聯發電端與用電端，逐步由資源導向走向市場化經營。

聚焦用電分析與履約管理，強化企業端服務能力

天能綠電以企業用戶為主要服務對象，業務涵蓋再生能源轉供、T-REC申請、用電結構分析與綠電配置規劃，並延伸至長期購電合約之簽署與履約管理。其服務模式強調前端用電分析與後端履約執行之整合，協助企業在綠電比例、用電型態與導入時程之間進行配置優化。

轉供規模持續累積，形成市場交易基礎

在實際交易規模方面，天能綠電於2025年累計轉供綠電約4.15億度，顯示其在轉供執行與市場媒合上已具一定規模。透過持續累積交易量與客戶基礎，逐步建立其在企業綠電市場中的運作能力。

建構交易風險管理機制，支撐發電端合作

在發電端合作模式上，天能綠電透過金流安排與履約設計，降低交易過程中的不確定性。例如透過信託機制進行電費收付管理，以強化收款穩定性；並由售電業者承擔部分制度性義務（如備用容量責任），以簡化發電業者參與售電市場之負擔。相關安排有助於提升電廠參與綠電交易之意願與穩定性。

強化轉供效率與履約能力，縮短案場進入市場時程

在轉供執行方面，天能綠電具備一定之行政與流程整合能力，於發電業者文件齊備情況下，可於數月內完成轉供上線作業，縮短案場由發電至售電之時間落差，提升資產運轉效率。

延伸綠電應用與憑證服務，發展整合型解決方案

除電能交易外，天能綠電亦結合再生能源憑證管理與企業永續需求，提供憑證申請、碳盤查與綠電使用整合服務。透過電能與憑證之整合規劃，協助企業因應RE100等用電目標，並降低綠電導入過程中的制度與操作門檻。

資料來源

工商時報，《綠電交易告捷！雲豹能源售光電憑證排第一 登售電龍頭》

自由財經，《雲豹能源子公司與日月光簽約，20年供40億度綠電》

RECCESSARY，《雲豹能源進軍越南！找宏碁、發條橘子共組ESG聯盟，打算如何助台商淨零轉型？》

數位時代，《養蝦廢水也能變碳權？雲豹能源投資新創艾滴，瞄準東南亞「蝦電共生」大商機》

RECCESSARY，《雲豹能源獲利創新高，將推動天能綠電登興櫃、加速東南亞與日本業務》

MoneyDJ理財網，《天能綠電助攻產業淨零獲綠點高新綠電訂單》

串接多元電源與交易機制，**台汽電綠能**參與多層次市場

集團全資子公司，布局再生能源售電市場

台汽電綠能（TCC Green Energy）成立於2018年11月，為台灣汽電共生股份有限公司（台汽電）100%轉投資子公司，實收資本額新台幣1億500萬元。2019年10月，台汽電綠能取得全國第二張再生能源售電業執照，並於2020年10月開始正式轉供售電，積極參與國內綠電交易市場。

多元再生能源投資與綠電轉供服務

台汽電綠能專注於再生能源的投資開發、電力購售、顧問諮詢及電力能源整合性服務。其母公司台汽電集團近年積極投資開發太陽光電、陸域風電及地熱能等再生能源項目，並透過台汽電綠能進行綠電轉供，為企業客戶提供一貫化的整體服務，協助企業實現淨零排放目標。

綠電轉供量突破，攜手企業實踐永續願景

- **綠電轉供與企業合作：**截至2024年初，台汽電綠能累計轉供綠電量已突破5億度。2024年3月，開始轉供自有烏山頭水面光電案場的綠電予臺灣證券交易所，進一步擴大綠電版圖。
- **參與輔助服務市場：**台汽電綠能於2021年取得電力交易平台專業人員資格證明，正式進入輔助服務市場參與競價，成為國內首家以汽電共生機組資源直接參與補充備轉競價交易的業者。
- **再生能源開發與工程承攬：**母公司台汽電集團承攬國內大型太陽光電案場（台南鹽田150 MW）及離岸風力陸域輸變電EPC工程，並投資開發清水地熱電廠，該電廠已於2021年正式商轉，為國內再生能源發展再創重要里程碑。

從轉供實績到AI應用，打造綠電整合營運模式

- **發展多元電源與產業合作：**台汽電除本業汽電共生與燃氣發電外，亦投入再生能源發展，並參與大屯山地熱開發計畫，合作對象包含台電公司、倍速羅得（Baseload Power Taiwan）、GreenFire Energy 等，屬國內外聯合團隊。

- **導入AI優化轉供模型：**台汽電綠能在「再生能源購售電模型」中導入 AI 解析技術，透過智慧化演算進一步優化轉供模式。此舉不僅提升發電預測的精準度，亦能模擬用電負載以增進契合度，同時支援企業在購電成本分析與能源配置上的決策，使整體綠電交易更具效率與前瞻性。

資料來源

中時新聞網，《台汽電布局電力交易市場：透過子公司台汽電綠能代操，成國內首家以汽電共生機組資源直接參與補充備轉競價交易的業者》

自由財經，《大屯山地熱潛能占全國20% 台電率台汽電、國際團隊探勘研究》

今周刊，《台汽電提供整合性穩健服務 低碳能源與AI技術引領未來》

整合集團供應與交易機制，**續興建構**長期市場化綠電供應鏈

具備自有發電基礎的售電事業

續興股份有限公司成立於2021年4月19日，並於同年10月19日取得再生能源售電業執照，實收資本額新台幣1億元，為中美矽晶集團子公司。其擁有集團內自建太陽光電案場，亦積極拓展外部發電業與用電戶之合作，扮演集團參與綠電市場的實務操作窗口。

整合自有案場、外部供電與信託交易機制

續興以多元資源整合為基礎，除轉供中美矽晶集團旗下太陽光電案場之綠電外，亦與外部再生能源發電業者合作，提供企業端綠電購售契約（PPA）與再生能源憑證（T-REC）服務。公司同時參與綠電信託交易模式，結合金融機構協助企業端強化履約保障與財務透明度。

建構長期綠電供應鏈，服務科技與製造業客戶

2024年，續興與南亞科、福懋科、華邦電及滬妙等企業陸續簽訂綠電購售合約，合約期間長達10年、總電量達數億度，顯示其在大型製造業客戶端具備穩定供應與履約能力。此外，與永豐銀行簽署綠電信託契約，為金融整合型交易模式的實例之一。

由集團資源出發，逐步擴展交易與履約多角經營

續興憑藉中美矽晶集團的再生能源開發基礎，並隸屬於中美矽晶能源事業之「續升綠能」（續升綠能提供一站式能源服務），續興從集團內部轉供出發，逐步擴展至跨企業與跨產業的用電需求媒合。其業務型態涵蓋直接供應、合作轉供、長約合約與信託交易，展現穩健推進多角化售電模式的經營路徑，強化其在再生能源市場的可持續競爭力。

資料來源

自由財經，《中美晶子公司續興與南亞科、福懋科簽10年4億度綠電合約》
財訊，《中美晶旗下綠電子公司續興與永豐銀簽訂綠電信託》
經濟日報，《華邦電與中美晶子公司續興 簽署再生能源購售契》
經濟日報，《中美晶攜手綠電子公司續興，與滬妙簽署企業購電協議》

著眼交易結構與履約保障，寶富電力發展售電、信託與區域合作機制

聚焦交易彈性與契約多樣性，結合電力開發經驗

寶富電力（Pau Fu Energy）於2020年6月成立，並於2022年6月取得再生能源售電業執照，實收資本額新台幣2億元。寶富為寶晶能源集團之子公司，延伸自集團在太陽光電開發領域的經驗，定位為綠電轉供與客戶端服務平台，結合案場資源、交易操作與需求媒合能力。

提供多元契約與金流安排，強化交易穩定性

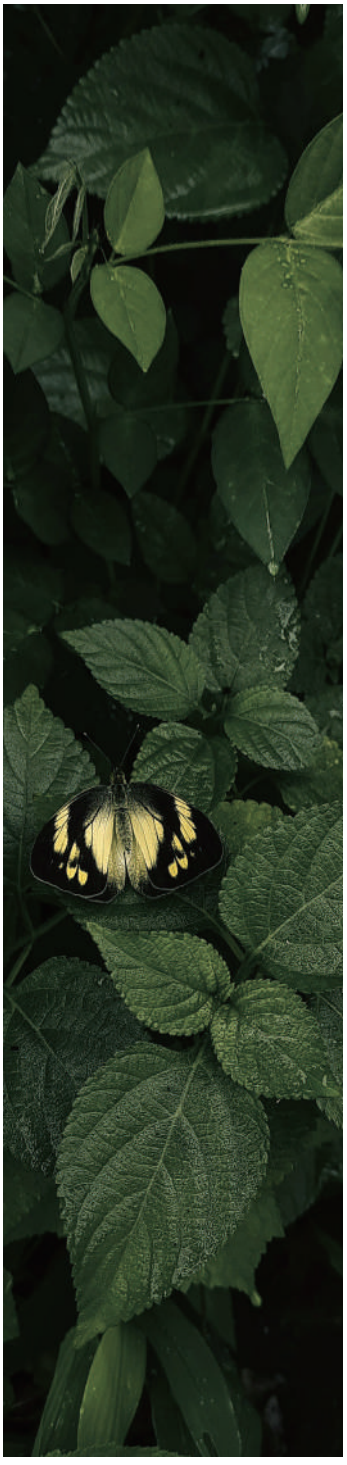
寶富電力依據企業用電條件設計契約架構，涵蓋長期CPPA、再生能源憑證（T-REC）服務，並與金融機構合作推動綠電信託機制，以強化交易過程中的金流管理與履約保障。其契約年限多落於5至20年間，並透過多對一供電與區域型媒合模式，提升供需配對彈性。

累積轉供實績與企業客戶基礎，形成穩定交易能力

在售電實績方面，寶富電力已服務逾20家企業用戶，並持續擴展至金融與科技製造業等用電大戶。整體轉供執行率達98%以上，客戶續約率為100%，顯示其在履約穩定性與客戶維繫方面具一定基礎。

大型長約落地，建立跨年期綠電供應結構

2024年，寶富電力與日月光子公司簽訂20年期綠電轉供合約，合計轉供量至少達35億度，為目前市場上具代表性之長期企業購電案例之一。透過長期契約安排，逐步建立穩定之綠電供應與需求連結。



結合自有電源與外購電力，建構供應彈性

在電源配置方面，寶富電力結合集團自有電廠與外購電力進行轉供，形成多元供電來源。隨著再生能源需求提升，公司亦逐步擴大在手轉供量體與長期供應規模，預計未來單年轉供量將持續成長。

延伸案場與農電共生經驗，支撐綠電供應來源多樣性

在電源開發基礎方面，集團已累積超過140MW自有案場、逾1GW太陽光電開發量體，並持續推動農電共生等多元案型，作為綠電供應來源之延伸。相關開發與運維經驗，有助於支撐售電業在電源取得與長期供應上的穩定性。

資料來源

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匯流新聞，《永豐與寶晶合作綠電信託 實現公民電廠願景》

科技新報，《轉供至少35億度綠電！寶晶子公司寶富電力與日月光子公司簽約》

知新聞，《光電專題3 | 魚電、蝦電、農電走出一片天　2025發展卡在這關》

結合工程與交易，
大同智能拓展多軌綠電交易與虛擬電廠應用

以光電建置為基礎，拓展轉供、媒合與虛擬電廠應用

大同智能（Tatung Forever Energy）為大同集團全資子公司，實收資本額新台幣60億元，具備再生能源發電業與售電業雙重執照，是集團新能源業務的核心平台。公司整合太陽光電建置、案場維運、綠電售電轉供、儲能系統開發與虛擬電廠（VPP）應用，建立一站式再生能源服務體系，支援企業永續轉型與用電彈性需求。

擴大發電與轉供量能，深化CPPA與信託合作

大同智能2026年在台灣擁有1,637座太陽能電廠，裝置容量達352 MWp，年發電量近4億度，並提供自建案場轉供與媒合服務。2024年與全球工業氣體公司Air Products子公司三福氣體簽署10年期太陽能購電合約（PPA），成為台灣綠電供應鏈中重要的長約履約業者。公司亦與永豐銀行合作推動綠電信託機制，提供大型用電戶財務穩定性與交易風險管理。

強化儲能工程能量，取得關鍵技術認證

大同智能承建多座儲能案場，包括桃園43.77 MW日前輔助服務案場，以及龍潭與冬山各60 MW的超高壓儲能系統。冬山案場為台灣首座導入週期性功率調變（FPPM）與增強型動態調頻（E-dReg）功能之案場，並取得IEC 62933-5-2與IEC 62443-3-3國際安全與資安認證，技術能量已獲高度肯定。2026年止，大同智能已擁有超過122 MWh的儲能資源，持續結合轉供與電力交易服務，建構虛擬電廠應用基礎。

開拓海外能源市場，擴展再生能源EPC服務

2024年，大同智能承接國合會委託之太平洋三國（帛琉、吐瓦魯、馬紹爾群島）太陽光電建置案，已完成首件工程，進入國際能源EPC市場。公司並積極評估拓展美國、日本與中東儲能與太陽能專案，結合國內工程經驗與跨區據點資源，推動國際營運規模化。

資料來源

經濟日報，《大同智能寒天練兵 多元布局強化優勢》

經濟日報，《大同智能取得海外光電標案 帛琉案場拚年底全面完工》

CTIMES，《大同智能與台電聯手布局減碳 啟用冬山超高壓變電所儲能系統》

RECCESSARY，《國際大廠綠電需求旺！大同智能與Air Product三福氣體簽10年太陽能PPA》

以信託與履約管理為支點，**富威電力**擴展綠電整合服務

集團資源整合，快速崛起

富威電力（Foxwell Power）成立於2019年，隸屬於正崴集團旗下的森崴能源，以6億元資本額投入再生能源市場，並於同年取得再生能源售電業執照。作為台灣最早進入綠電交易市場的業者之一，富威電力致力提供從綠電採購、儲能整合到節能服務的全方位解決方案。

售電不只是賣電，更是能源整合顧問

富威電力以再生能源售電為核心，並逐步拓展至多元服務領域，從綠電採購與 T-REC 履歷整合，到再生能源交易信託機制的創新設計，皆展現其市場前瞻性。同時，富威亦提供節能與 ESCO 深度診斷，並發展儲能整合解決方案，藉此滿足企業在能源使用上的多樣需求。「能源永續一站式方案」的定位，富威不僅是再生能源的供應者，更扮演企業邁向淨零轉型的策略顧問。

憑證交易量領先、企業客戶青睞

2024年富威電力再生能源憑證交易量位居全台第一，全年綠電訂單金額接近160億元。客戶涵蓋大型科技與金融企業，包括輝達（NVIDIA）與永豐銀行，顯示其在企業端建立穩定信任基礎。富威亦為最早導入「綠電交易信託」創新模式之售電業者之一，強化市場履約與財務透明度。

從單一售電走向多業整合，創造價值鏈

富威電力自綠電交易起步，逐步發展成為涵蓋售電、節能、儲能與碳權服務的多角化平台型業者。以售電業務為主體，富威累積轉供據點達369個，協助逾65家企業採購綠電，橫跨科技、金融、電信等產業，合約總量逾30億度、金額超過155億元，為國內綠電轉供規模領先者。憑藉其再生能源憑證交易量連續居冠，並為輝達在台唯一指定綠電供應商，展現高度履約能力與市場能見度。

▶ 儲能與節能布局

富威積極拓展儲能與節能業務，已建置5座儲能案場（總容量74.9 MW / 233.9 MWh），涵蓋案場選址、申請、施工至併網測試等全流程。節能方面已服務逾21處據點，推動深度節能改造，年節電逾97.5萬度、減碳487.7噸，並結合政府推動節能計畫導入設備汰換與能源效率改善。

▶ 碳權與認證服務

旗下子公司旭威認證提供企業碳盤查與碳匯開發等服務，協助客戶建構碳管理架構並強化ESG揭露能力，擴展再生能源以外的碳資產應用場域。

▶ 應對挑戰與未來布局

面對售電業競爭加劇、儲能電池價格波動與綠領人才不足等挑戰，富威以策略聯盟拓展供應鏈、推動產學合作吸引人才，並藉由上市提升資本市場知名度與招才吸力。未來將持續拓展異業合作模式，結合轉供、代操、顧問、憑證與碳權整合，打造具規模經濟與調節能力的綠電交易大平台。

資料來源

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RECCESSARY，《助企業找出「吃電怪獸」省下50%用電，富威電力推出ESCO深度節能方案》
RECCESSARY，《【圖解】富威電力掛牌上市！一文解析能源大平台策略，輝達首家綠電供應商強在哪？》
遠見雜誌，《輝達買綠電，為什麼首選這家才成立5年的公司？》
MoneyDJ理財網，《2024年再生能源憑證數 富威電力拿下總量第一

服務企業端用電需求，
星星電力結合轉供實務與智慧綠電系統應用

聚焦轉供操作、負載匹配與技術平台建構

星星電力（Star Exchange）成立於2020年8月，並於2021年8月取得再生能源售電業執照，實收資本額新台幣4,000萬元。為泓德能源全資子公司，承接其在綠電開發與智慧能源技術的基礎，星星電力專注於企業端用電服務，發展智慧化的電力交易與轉供架構，並透過AI資料分析與負載曲線匹配技術，提升綠電替代率與用電配置效率，強化資料應用與媒合效率，支援多樣化綠電採購需求，協助企業在電價波動環境下提升用電穩定性與風險管理能力。

大型企業合作落地，多對多轉供規模擴大

截至2024年底，星星電力綠電轉供累計合約度數已超過161億度，合作企業容量逾156MW，轉供據點超過2,084個，累計憑證張數達9萬9,392張。轉供實績涵蓋半導體、金融、電信、製造等產業，合作客戶包括聯發科、日月光、國泰集團、玉山銀行、中國信託、永豐銀行、台灣大哥大、台灣資生堂與台北101等。近期並攜手太陽能模組製造商茂迪合作，預計自2025年下半年起轉供茂迪產出之綠電，供應企業用戶，該批綠電約占星星電力外購量15%。

結合顧問、憑證、轉供與視覺化管理功能

星星電力提供企業用電戶整合型綠電解決方案，涵蓋採購諮詢、轉供操作、T-REC　憑證處理與用電數據管理等服務。公司自主研發TITAN智慧綠電系統，支援用電視覺化、負載分析與排程模擬功能。2024年起，進一步推出「綠電星智匯」與「綠電星平方」兩大平台，整合AI技術強化發電預測、金流管理與減碳成效追蹤，優化企業用電排程與綠電配置效率，提升整體綠電替代率與調度精準度。

深化平台應用，拓展案場與海外據點

相較於台灣市場以企業綠電零售與轉供服務為核心，泓德能源於海外市場則聚焦容量資源與儲能資產布局，採取差異化策略推進電力批發與調度能力建構。

▶ 拓展海外儲能據點，強化國際市場布局

泓德能源積極布局海外市場，已與日本東急不動產合作，在群馬縣開發19.7 MW / 60.18MWh特高壓儲能案場，並獲得東京都補助，預計2028年營運。澳洲方面，透過與ZEN Energy合資設立的ZEBRE公司，取得南澳Solar River案場開發許可，案場規模達210 MW光電與256 MW儲能，並已通過外資審查，總體開發目標達1.4 GW，進一步強化其在高波動電力市場下之容量配置與跨區調度能力。

▶ 推動漁電共生產業化發展，結合綠電與智慧養殖應用

泓德能源透過子公司星源漁業於台南七股建置日運漁電共生案場，2023年養殖面積達57公頃，年產漁獲超過10萬台斤，產出烏魚子約2.7萬片，創造當地經濟產值逾千萬元。該案場導入AI水質監測、自動化投料與養殖控制技術，使烏魚子結卵率達70%，高於一般水準。集團目前正推動漁電共生管理面積擴大規劃，目標規模達300公頃，展現其在再生能源應用與多元再生能源應用場景布局上的營運能力。

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MoneyDJ，《〈泓德專訪上〉走向綠電民營化 扮演智慧電力公司關鍵要角》；《〈泓德專訪下〉以TITAN平台發展VPP切往國際電力市場》

聯合新聞網，《星星電力與台灣大共同成立綠能平台 投資光電與儲能案場》

工商時報，《擴大綠電布局 富邦金與星星電力簽約導入439萬度綠電》

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經濟日報，《泓德能源 獲東京都政府儲能補助金》

星星電力攜手茂迪 下半年綠電轉供企業用戶

聯合新聞網，《澳洲執政黨連任 泓德能源南澳案場獲准開發許可》

以多對多媒合為核心，**陽光伏特家**串連分散電源與企業需求

早期投入綠電市場，專注需求媒合與轉供操作

陽光伏特家（Sunnyfounder Inc.）成立於2015年11月，並於2019年9月取得再生能源售電業執照，是台灣第一家通過電業法規定取得許可的再生能源售電業者。公司實收資本額為新台幣2,000萬元，長期深耕再生能源市場轉供業務，致力於打造開放且彈性的綠電交易模式。

建立多元電力來源與用戶配對機制

陽光伏特家強調媒合多樣化的綠電供應與用電需求，透過多對多配對與標準化交易流程，協助企業快速取得綠電與憑證，並降低綠電採購進入門檻。公司整合分散式小型發電案場，亦針對中小企業、供應鏈用電戶設計具彈性的採購機制。

累積轉供用戶超過百家，主打中型與新進需求者

2024年，陽光伏特家協助多家製造與服務業用戶，包括歐萊德、昇陽半導體等企業，落實RE100與供應鏈減碳目標。公司亦與北富銀合作，推動5年期綠電團購機制，協助6家企業採購1,700萬度綠電，展現中型團購與分散供應整合能力。隔年，陽光伏特家與全球PCB領導廠燿華電子簽署7,000萬度綠電採購協議，為其高精密製程導入穩定的再生能源，成為PCB產業低碳轉型的重要範例。2025年止，陽光伏特家累計綠電轉供量突破3億度。轉供據點超過1,300處，涵蓋科技、製造、金融與電信等多元場域，並首創「大中小企業綠電採購平台」，從每年上千萬度的大型用電戶到每月百度的小額方案，皆可透過標準化機制參與綠電交易，降低企業進入門檻，打造製造業邁向淨零的可行解方。

從早期倡議到平台實踐，持續降低綠電採購門檻

陽光伏特家早期以「全民電廠」概念推動能源參與，轉型後聚焦綠電交易平台開發與用戶端資料分析應用。相較於大型案場導向的業者，其服務重心放在分散型資源整合、多對多匹配與中小企業綠電使用者培育，逐步建立靈活的綠電流通網路。

資料來源

RECCESSARY，《從全民電廠到綠電交易！陽光伏特家如何靠精準分析用電收服百家客戶？》

經濟日報，《中小企業ESG永續轉型最大拼圖 / 陽光伏特家 扮綠電橋梁》

RECCESSARY，《綠電團購新模式！陽光伏特家攜北富銀，助6家企業5年採購1700萬度綠電》

結合綠電交易與聚合代操，**能元超商**發展平台型電力服務模式

聚焦電力交易應用與企業採購整合服務

能元超商（Energy Helper TCC Corporation）成立於2022年8月，並於同年10月取得再生能源售電業執照，實收資本額新台幣1億元。公司為台泥企業團100%持股之子公司，定位為集團在電力交易與能源管理領域的實務操作平台，結合台泥於再生能源、儲能及國際碳金融等業務的整體布局。

涵蓋綠電轉供、平台營運與聚合代操

能元超商採用多角化經營策略，除了提供基本的綠電採購與T-REC服務外，亦投入電力交易平台代操、企業用電配置顧問與聚合型轉供機制。其平台結合發電與儲能資產管理功能，強化客戶在參與電力市場時的靈活性與應變能力。

導入跨國品牌與多樣用電端需求，打造交易實績基礎

公司成立初期即完成與宏碁、迪卡儂等企業之綠電供應合作案，並進一步服務其台灣在地供應鏈，顯示其多元合與交易調度能力。目前平台以中長期供應穩定性為基礎，結合集團儲能資產，逐步擴大交易量與轉供規模。

打造從儲能產品到交易平台的完整能源系統

▶ 結合儲能設備、統包建置與平台交易，深化營運垂直整合

台泥企業團整合旗下能源事業體，包括能元超商、台泥儲能與台泥綠能，布局從創能、儲能至電力交易的完整鏈條。能元超商參與台電電力交易平台所有運轉項目，包括調頻備轉（s-Reg、d-Reg、E-dReg）、即時備轉與補充備轉，顯示其實際交易能力。母集團台泥建置全台最大100MW

（311MWh）E-dReg儲能系統並已完成併網，另開發自主設計的EnergyArk UHPC儲能櫃，具備防火、防爆、注水滅火與模組化配置等功能，並於2024年能源週及CES展公開亮相，成為國內唯一具備混凝土與金屬雙儲能櫃能力的業者。

▶ 推動充儲一體應用與國際化商模，擴展多元服務場域

台泥儲能與台灣福斯汽車合作，在14個充電站導入EnergyArk儲能系統，落實「尖峰放量、離峰儲電」應用，預計每站每年可協助減排逾40噸CO_2。該案亦結合能元超商參與台電電力輔助服務，展現集團整合效益。為拓展海外市場，台泥規劃在南歐設置70座儲能櫃，由旗下義大利子公司NHOA營運，以充電站場域為切入點，複製充儲應用與商業模式進軍歐洲儲能市場。

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經濟日報，《台泥搶攻儲能、低碳水泥玩哪招？四大關鍵布局讓「泥娃娃變身綠巨人」》

中央社，《台泥儲能與福斯宣布充儲合作 充電站年減40噸CO2排放》

經濟日報，《台泥最新年報 水泥之外兩岸及歐洲減碳增綠都有新突破》

瓦特先生以屋頂型友善綠電為核心，結合母公司資產與資料平台，拓展企業綠電採購與多元能源解方

聚焦屋頂型資產基礎與分散式能源經營

瓦特先生（Mr. Watt）成立於2018年，並於2019年底取得再生能源售電業執照，為台灣綠電自由交易初期之市場參與者之一。公司隸屬睿禾體系，承接集團屋頂型太陽光電資產作為主要綠電來源，結合發電端開發與售電端交易服務，形成發售電分工之整合架構。

截至2025年底，母公司睿禾金碳（原睿禾控股）累計建置屋頂型太陽光電容量達160MWp，預估年發電量約2億度綠電。睿禾體系強調低環境衝擊之屋頂型分散式能源模式，並導入ISO 27001資訊安全管理系統（2025年取得認證），將綠電資產管理與數據治理納入長期經營架構。

完成多項市場「第一」，建立綠電中盤商交易基礎

瓦特先生定位為綠電「中盤商」，承接發電端綠電並透過台電電網轉供企業用戶，提供電力與憑證合一之綠電採購服務。

2020年5月完成台灣「第一度」綠電交易，將綠電轉供予大江生醫與元太科技。同年10月完成首宗「商辦大樓綠電轉供案」，供應台灣萊雅於台北101辦公室使用，並協助其於2021年第一季達成100%使用綠電。依2026年公開資料，瓦特先生在未來20年已確保超過30億度綠電訂單，反映在2023年底第二、三型屋頂型電廠開放銷售後之市場擴張成果。

結合預測系統與RE100支援，強化企業綠電配置能力

瓦特先生結合集團子公司春禾科技技術能量，導入綠電管理平台「RE100 Tracker」，整合發電預測、負載分析與轉供追蹤機制，協助企業即時掌握購電與用電結構。

透過數位化管理與轉供優化，提升綠電配比效率，並支援企業規劃RE100達標路徑與中長期能源轉型策略。

打造發電×交易×技術整合架構，擴展多元能源應用

▶ 結合發電資產與交易服務，形成垂直整合模式

睿禾體系自2019年起推動發電端與售電端分工，旗下盛禾能源負責電廠開發管理，瓦特先生負責市場交易與企業用電端服務。2020年引入包括日本SB Energy（軟銀集團旗下）、全球人壽、中國人壽與永豐創投等投資人，共同投入屋頂型光電開發平台，預計三年內開發100MW容量，強化資產擴張與融資能力。

▶ 延伸氫能與ESG方案，擴大能源服務場域

2025年起，瓦特先生與美國Amogy合作評估「氨轉氫能發電」應用可能性，探索再生能源間歇性下之補位方案，強化企業能源配置彈性。

同時推動「E+S永續方案」，結合綠電採購與在地農業及社會行動設計，形成能源減碳與社會價值並行之服務模式，逐步擴大綠能生態系合作範圍。

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CRS天下，《第一度綠電、第一個商辦綠電　最年輕的綠電中盤商瓦特先生　被K到滿頭包也要讓你可以買綠電｜逆轉氣候危機的U20》

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統購分銷離岸風電，**台灣智慧電能**促成企業取得大規模綠電

泛官股背景成立，打造離岸風電綠電採購新模式

台灣智慧電能（Taiwan Smart Electricity & Energy Co., Ltd.）成立於2024年，由多家官股事業與民間企業共同出資設立，為目前市場中少數以離岸風電為核心供應來源的售電業者。台智電的成立目的在於降低企業採購離岸風電的門檻，協助其因應國際供應鏈對再生能源與低碳用電的重大要求。相較於一般以太陽光電為主的售電模式，台智電聚焦於大型風場電力的整合與供應，在國內綠電市場中具有獨特性與代表性。

統購離岸風電、拆分供應企業，提供更具彈性的綠電方案

台智電以「統購＋分銷」為主要經營模式，先與離岸風電開發商簽署大規模CPPA，取得穩定且具規模的綠電來源，再將其拆分為適合不同企業需求的合約或供電量，以降低企業直接與大型風場簽約時面臨的財務規模、信評要求與契約期限等障礙。

台智電提供的綠電產品型態相對彈性，包括中期契約、小量採購配置，以及配套性的 T-REC 憑證，可支援出口導向企業在短期內快速提升再生能源使用比例。

從轉供實績到AI應用，打造綠電整合營運模式

- **簽署大型離岸風場購售電協議：**台智電已與多家國內外風場開發商（含歐洲跨國能源集團）完成合作，確保風電來源具備長期穩定性。
- **擴大分銷能力：**透過拆分供電量與彈性調配機制，使原本僅限大型企業端的離岸風電採購，得以延伸至更廣泛的企業群體。
- **支援供應鏈綠電需求：**離岸風電供應對RE100、碳足跡管理與供應鏈減碳要求具高度貢獻，是目前企業取得高品質綠電的重要來源之一。

協助企業降低採購門檻、滿足國際減碳要求

- **降低採購障礙：**協助無國際信評或用電規模不足的企業取得離岸風電，減輕其因長期契約與大型案場門檻所承受的壓力。
- **契約與採購彈性：**相較於傳統 20–25 年的大型 CPPA，台智電提供中期契約與較小採購量，符合多數企業的能源規劃需求。
- **支持 ESG 與供應鏈永續性：**企業可藉由採購離岸風電，強化符合 RE100、淨零排放與供應鏈審查等永續標準。

逐步建構離岸風電交易平台角色，強化國內綠電供應結構

台智電的營運模式使其成為離岸風電供應端與企業用電端之間的重要橋梁。一方面協助風場建立穩定的承購基礎，有利於專案融資與後續開發；另一方面則使企業能以較低門檻、較高彈性進入離岸風電市場，在目前以光電為主的市場供給結構中，提供另一關鍵的綠電來源，提升綠電類型的多樣化。

2025年直轉供再生能源憑證總量前10大再售業					
售電業公司名稱	太陽能	水力	風力	總憑證張數	排名
天能綠電	184,541	0	0	184,541	1
富威電力	119,450	0	31,540	150,990	2
台汽電綠能	43,762	26,610	62,375	132,747	3
續興	87,984	0	0	87,984	4
陽光伏特家電力	70,690	1,559	0	72,249	5
星星電力	64,069	0	0	64,069	6
艾涅爾電力	51,059	0	0	51,059	7
大自然電業	49,329	175	0	49,504	8
寶富電力	43,886	0	0	43,886	9
能元超商	2,852	0	35,531	38,383	10
合計	717,622	28,344	129,446	875,412	-

歷史直轉供再生能源憑證總量前10大再售業					
售電業公司名稱	太陽能	水力	風力	總憑證張數	排名
台汽電綠能	103,979	79,002	575,440	785,421	1
富威電力	336,698	0	219,462	556,160	2
天能綠電	412,800	0	0	0	3
星星電力	186,187	0	0	186,187	4
陽光伏特家電力	168,452	1,983	0	170,435	5
續興	134,821	0	0	134,821	6
花蓮綠能	0	128,241	0	128,241	7
能元超商	6,604	0	95,060	101,664	8
博耀電力	79,177	0	0	79,177	9
大自然電業	73,749	316	0	74,065	10
合計	1,502,467	209,542	889,962	2,601,971	-

資料來源：POXA ENERGY

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3 Green Electricity Market Participants

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1 Background and Drivers of the Green Electricity Market

- Energy Transition under Climate Governance
- Decarbonization Pressure from Global Supply Chains and Market Responses

Energy Transition under Climate Governance

Global Decarbonization Targets and Agreements

With the adoption of the Paris Agreement in 2015, global climate governance has entered a new phase centered on temperature control and net-zero emissions. The Agreement requires each country to submit **Nationally Determined Contributions (NDCs)** and establishes a five-year ratchet mechanism to progressively tighten climate policies. Subsequent COP27 and COP28 conferences further emphasized the phase-down of fossil fuels and the scale-up of renewable energy deployment, calling on countries to peak emissions by 2030 and achieve net-zero by 2050. Major economies have since announced net-zero timelines, adjusted energy structures, increased the share of renewables and strengthened electricity market frameworks to respond to global competition for decarbonization and regulatory pressures.

As climate governance becomes increasingly institutionalized, companies are faced with mounting pressure to reduce emissions and enhance disclosure. The European Union implemented the Carbon Border Adjustment Mechanism (CBAM) in 2023, demanding the disclosure of embedded carbon emissions for imported goods and planning to formally levy carbon taxes from 2027 onward. This has compelled manufacturers to accelerate carbon footprint assessments across their supply chains. Meanwhile, the Science Based Targets initiative (SBTi) has become a global mainstream standard, requiring companies to clearly demonstrate how they achieve Scope 2 emissions reductions through the use of renewable energy. In addition, the IFRS Foundation issued IFRS S2 Climate-related Disclosures in 2023, mandating the disclosure of energy use, emissions, and mitigation actions and requiring the enhancement of verifiable records of green electricity consumption.

Against this backdrop, energy structure is no longer merely a cost consideration but a core indicator of corporate climate resilience and market access. Due to its traceability and verifiable decarbonization attributes, green electricity is transitioning from an optional choice to a compliance necessity and has become a key instrument for corporate transformation towards net-zero and supply chain restructuring.

Taiwan's Carbon Reduction Strategy

Taiwan's strategy for achieving net-zero emissions by 2050 is driven and coordinated by the Executive Yuan and grounded in the Climate Change Response Act, with responsibility assumed jointly by the National Development Council and the Climate Change Administration of the Ministry of Environment. Promulgated and implemented in 2023, the Climate Change Response Act formally incorporates "net-zero emissions by 2050" as a national long-term goal and establishes a dual-track governance framework for greenhouse gas mitigation and climate adaptation.

Subsequently, the National Development Council proposed more ambitious medium-term targets in 2024, setting three milestones to reduce emissions by 28%, 32%, and 38% for 2030, 2032, and 2035 respectively, from 2005 levels. These rolling adjustments strengthen Taiwan's Nationally Determined Contributions (NDCs) and provide a medium-term pathway toward net-zero.

At the policy level, the National Development Council issued the "Taiwan's Comprehensive Carbon Reduction Action Plan" as the national blueprint for the drive towards net-zero. The plan integrates actions and resources across ministries under the Executive Yuan and establishes a national governance system for carbon reductions by articulating the vision of four major transitions (energy, industry, lifestyle, and society) and constructing six major innovation mechanisms (technology R&D, green finance, carbon pricing, regulatory adaptation, talent development, and social participation). Under this framework, the Energy Administration and Industrial Development Administration of the Ministry of Economic Affairs, along with the Ministries of Transportation and Communications, the Ministry of the Interior, the Ministry of Agriculture, and the Ministry of Environment, are respectively responsible for carbon reduction action plans across six major sectors: energy, manufacturing, transportation, residential and commercial segments, agriculture, and environment. These efforts are synchronized by greenhouse gas inventory, control and management, and performance review systems established under the Climate Change Response Act.

In 2022, the National Development Council announced the 12 Key Strategies, covering priority areas such as energy transition, hydrogen and carbon capture, utilization and storage (CCUS), carbon free electric vehicles, net-zero buildings, resource recycling and zero waste, green lifestyle and carbon sinks.

In 2025, the Executive Yuan further launched the Flagship Carbon Reduction Program, orchestrated by the Ministry of Economic Affairs to promote extensive efforts in energy savings and voluntary carbon reductions by manufacturers and state-owned enterprises in order to strengthen technological innovation and industrial participation.

Meanwhile, capital markets and corporate governance frameworks are also undergoing transformation. Starting in 2026, the Taiwan Stock Exchange will fully upgrade its Corporate Governance Evaluation into ESG Evaluation by significantly increasing the weighting of environmental (E) and social (S) indicators.

The new evaluation mechanism requires companies to disclose detailed information on energy use, water resources, waste management, circular economy practices, biodiversity, and carbon sink policies and scores will be assigned to efforts in carbon reduction and use of green electricity. Furthermore, the Financial Supervisory Commission provides the financial industry and the capital markets with standardized taxonomies for green and sustainable finance by formulating and revising the Reference Guidelines for the Recognition of Sustainable Economic Activities, covering renewable energy generation, green electricity, energy-saving and carbon reduction technologies, and the circular economy so that capital can be directed to support green electricity and low-carbon transition.

Decarbonization Pressure from Global Supply Chains and Market Responses

Supply chain carbon neutrality viewed by companies as the new standard

A new norm for carbon neutrality across the supply chain is taking shape amid the global transition towards net-zero as leading companies are not only stepping up in-house operations in carbon reduction but also requiring their supply chains to cut down carbon emissions. International technology powerhouses such as Apple and Microsoft have publicly asked their suppliers to achieve 100% renewable energy usage within specified timelines and have made progress toward these targets a key criterion for procurement and

collaboration. This trend signals that green electricity is no longer a voluntary adoption by a few companies, but rather a threshold requirement for participation in multinational partnerships and access to orders.

In the meantime, international initiatives such as RE100 and the Carbon Disclosure Project (CDP) continue to strengthen standards for climate information disclosure and target verification, encourage a growing number of companies to voluntarily commit to the use of renewable energy and enhances the transparency and credibility of green electricity usage. These initiatives create significant spillover effects across companies in supply chains. Even companies not directly involved must respond to the requests from customers or brand owners for carbon reduction by gradually adjusting the mix of electricity consumption and energy sources.

In addition to industry self-regulation, governments worldwide have also established renewable energy obligation schemes to drive market transformation. Many U.S. states implement the Renewable Portfolio Standard (RPS) that requires utilities or large electricity consumers to achieve a statutory percentage of renewable energy usage within specified periods. Meanwhile, the United Kingdom and the European Union employ Renewables Obligation (RO) schemes and the trading mechanism for certificates to ensure compliance by retailers and suppliers. These systems combine regulatory mandates with market mechanisms to create long-term incentives for renewable energy investment and adoption. Taiwan has similarly introduced a provision regarding energy-heavy industries under Article 12 of the Renewable Energy Development Act to require companies with a contracted capacity exceeding 5,000 kW to adopt a certain proportion of renewable energy via construction of generation facilities or purchase of electricity or certificates. The goal is to gradually establish the concept of obligatory procurement. The implementation of these systems drives the corporate adoption of green electricity with a dual force of regulatory requirements and supply chain pressure. Green electricity has thus become not only a tool for companies to showcase an image for sustainability but also a key strategy to maintain international competitiveness, secure stable orders, and ensure regulatory compliance. This marks a new era for global industries to shift from voluntary emissions reduction toward an institutionalized phase of energy transition.

Use of green electricity as the primary means for corporates to reduce Scope 2 emissions

According to internationally recognized greenhouse gas inventory standards (such as the GHG Protocol), corporate greenhouse gas emissions are categorized into three scopes. Scope 2 refers to indirect emissions arising from the purchase of energy such as electricity and steam for heating and cooling. As climate-related information disclosure requirements are increasingly stringent, Scope 2 has become an unavoidable focus in corporate reporting and targets for emissions reduction. This is particularly the case for manufacturing and electricity-intensive industries, where Scope 2 emissions often account for a substantial share of total emissions.

Because grid electricity is typically supplied through a mix of fossil fuels and renewable energy, companies seeking to effectively reduce Scope 2 emissions must adopt renewables with traceable origins. This necessity has driven enterprises away from the purchase of conventional grid electricity and toward the sourcing of green electricity. In response to this demand, the global green electricity market has expanded rapidly, accompanied by a growing diversity of corporate procurement instruments and institutional arrangements.

Among these, procurement mechanisms centered on renewable energy certificates (such as T-REC in Taiwan) and corporate power purchase agreements (CPPAs) have become an international standard practice for companies to reduce carbon emissions and respond to regulatory scrutiny. Renewable energy certificates enable enterprises to quantify green electricity usage in a manner conducive to carbon inventory and disclosure. On the other hand, CPPAs provide long-term, stable, and price-predictable sources of green electricity and have become one of the core strategies for large corporations in pursuit of net-zero.

For companies, these mechanisms not only enhance visibility and control over the mix of energy consumption but also elevate the emphasis on the design of green electricity markets/systems and the reliability of contract performance. This, in turn, incentivizes governments to establish transparent, fair, and enterprise-ready institutional environments for green electricity markets.

2 Supply and Demand of Green Electricity in Taiwan

- Ways for Users to Access Green Electricity
- Supply of Green Electricity
- Green Electricity Demand: Corporate Demand and Procurement Status
- Price Signals and Green Electricity Trading

Ways for Users to Access Green Electricity

Direct supply from renewable energy producers

Direct supply refers to the electricity directly from renewable energy producers via transmission lines they have constructed and connected with users[1]. This arrangement allows an independent supply relationship between the generator and the user and electricity supply bypasses the grid network owned by Taipower. In theory, direct supply can reduce transmission losses and related costs because it avoids the grid transmission and distribution process. Users can also directly control the source of the green electricity they consume.

In practice, however, direct supply must comply with relevant technical and safety requirements regarding line installations and take into account the deployment costs and distance limitations. As a result, this model is usually seen at specific sites or partnerships between large electricity users and adjacent renewable energy plants.

Wheeling

Wheeling refers to the process by which Taipower transmits electricity generated by power producers to end users through the power grid, as prescribed under the Electricity Act as the basic mechanism[2]. Renewable energy producers can supply electricity to specific users by feeding electricity to Taipower's grid network. Green electricity wheeling is currently the primary foundation of renewable energy trading in Taiwan.

In practice, wheeling generally takes two forms: **(1) Renewable energy producers sell electricity to specific users through the Taipower grid**; and **(2) Renewable energy retailers aggregate electricity generated from multiple sources and then supply it to various users through the Taipower grid.** In both cases, Taipower provides grid transmission and dispatch services and charges corresponding fees.

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[1] Paragraph 25 of Article 2 of the Electricity Act: "Direct Supply" refers to the situation in which a renewable energy-based electricity-generating enterprise installs power lines connecting directly to users and thereby supplying power.

[2] Paragraph 26 of Article 2 of the Electricity Act: "Wheeling" refers to the situation in which an electricity transmission and distribution enterprise installs one or more power grids to transmit and distribute electricity.

This framework enables more efficient integration of green electricity into the power grids and mitigates the risks associated with intermittent generation from individual power plants. It allows companies or end-users to obtain renewable electricity accompanied with certificates of origin in a stable manner and serves as an integral element of the development of Taiwan's green electricity market.

Self-consumption

Self-consumption represents the most direct and independent option among all the methods of accessing green electricity. Electricity users install their own renewable energy generation facilities, and the electricity produced is consumed on-site without feeding into the grid. Typical examples include companies who deploy solar panels on factory rooftops or schools that build photovoltaic systems on campus to meet daily electricity demand.

As a result of regulatory relaxation[3] , generation facilities for self-consumption are now permitted to sell surplus electricity or authorize renewable energy retailers to wheel excess power to third parties. This removal of the former limitation of "self-generation for self-sufficiency" introduces greater flexibility in both use and trading of green electricity. If users choose to retain the electricity for self-consumption, they may opt for unbundling of electricity and certificates by selling the renewable energy certificates separately to other companies to generate additional revenues. Conversely, when electricity and certificates are sold together, the green electricity is deemed to have been fully transferred to the receiving party.

This scheme allows users who own generation capacities for self-consumption to determine, based on their own needs and prevailing market conditions, whether to sell the electricity they generate and whether to retain the associated certificates. This balancing act between energy autonomy and market-oriented operations further enhances the flexibility and value of green electricity transactions.

[3] The Ministry of Economic Affairs' Official Letter MOEA-Authorization-Energy No.11200342600 dated December 14, 2023.

Supply of Green Electricity

Overview of electricity generation in Taiwan

According to statistics from the Energy Administration of the Ministry of Economic Affairs[4], the total electricity generation in Taiwan has increased steadily from 264.1 billion kWh in 2016 to 288.89 billion kWh in 2025. An examination of changes in the generation mix shows that the share of coal-fired power declined from 45.9% in 2016 to 35.4% in 2025. The rise in the share of natural gas-fired power from 31.5% to 47.8% indicates that natural gas is replacing coal as the primary source of baseload electricity.

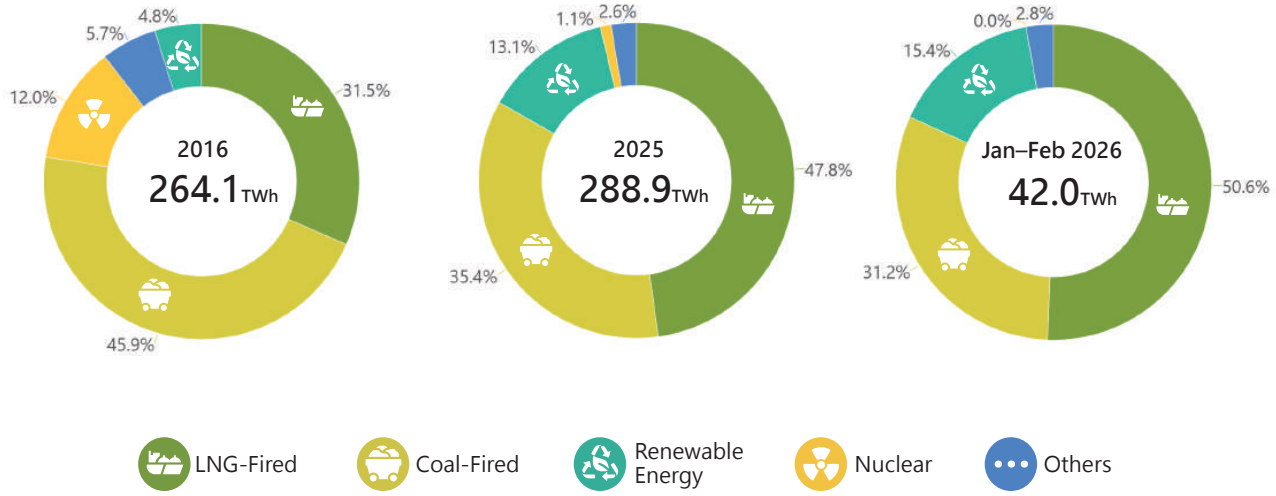
Meanwhile, the share of nuclear power decreased from 12.0% to 1.1%, reflecting the scheduled decommissioning of reactors and changes in equipment operating conditions, before falling to 0% in 2026. The Ministry of Economic Affairs[4] has recently approved Taipower's assessment report on nuclear power plants and confirmed that Chinshan Nuclear Power Plant (NPP 1) is no longer viable for restart due to equipment aging and the dismantling of critical facilities. In contrast, Kuosheng (NPP 2) and Maanshan (NPP 3) plants were preliminarily assessed as meeting the conditions for potential restart. In accordance with regulatory requirements, these plants will proceed with self-inspections for safety and the preparation of restart plans. Relevant procedures may only go ahead after the review by the Nuclear Safety Commission and the communication with the public. This development indicates that the future role of nuclear energy in Taiwan's energy mix will be reassessed progressively based on safety evaluation outcomes and policy procedures.

The share of renewable energy increased steadily from 4.8% in 2016 to 13.1% in 2025, with the total output more than doubled from 12.7 billion kWh to 37.8 billion kWh during the period. In terms of the composition of renewable generation, the share of conventional hydropower declined from 51.5% in 2016 to 14.5% in 2025, while biomass and waste-to-energy fell from 28.3% to 10.9% over the same period. In contrast, solar photovoltaic power increased from 8.7% in 2016 to 42.2% in 2025, and wind power rose from 11.4% to 32.3% during the period.

[4] Overview of Electricity Generation by the Energy Administration of the Ministry of Economic Affairs · https://www.moeaea.gov.tw/ECW/populace/content/Content.aspx?menu_id=14437 (last visited: May 5, 2025).

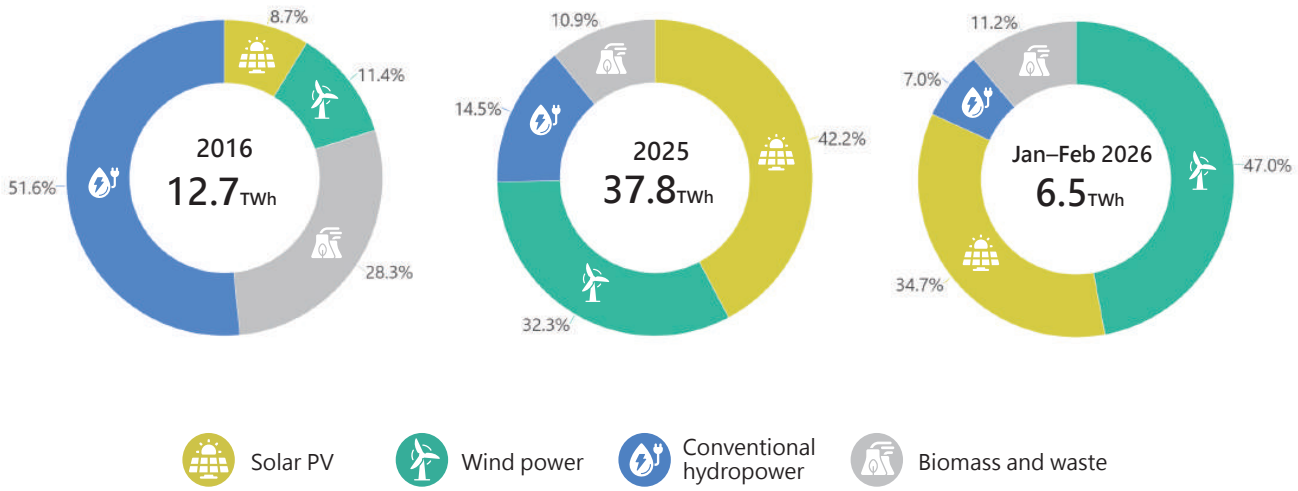
Electricity Generation Mix

Unit: TWh



Renewable Energy Generation Mix

Unit: TWh



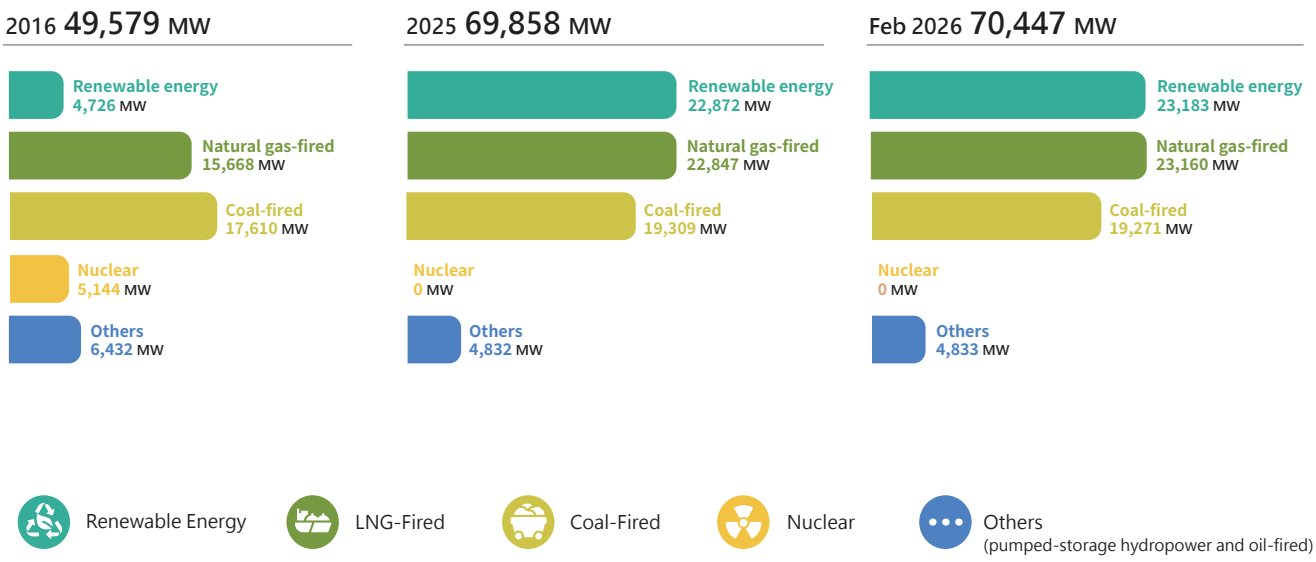
Installed capacities of major energy sources in Taiwan

According to statistics from the Energy Administration, changes in Taiwan's installed generation capacity in recent years are as follows: Coal-fired capacity increased from 17.6 GW in 2016 to 19.3 GW in 2025 and natural gas–fired capacity grew from 15.7 GW to 22.8 GW during the same period. Nuclear capacity declined from 5.1 GW in 2016 to zero GW in 2025 whereas renewable energy capacity expanded from 4.7 GW to 22.9 GW over the same period.

The total installed renewable capacity increased from 4.7 GW in 2016 to 22.9 GW in 2025. Regarding the mix of generation capacities, the share of conventional hydropower dropped from 44.2% in 2016 to 9.3% in 2025 and that of biomass and waste-to-energy declined from 15.0% to 3.3% during the same period. In contrast, solar photovoltaic capacity grew from 26.3% in 2016 to 67.7% in 2025 and wind power capacity rose from 14.4% to 19.7% over the same period.

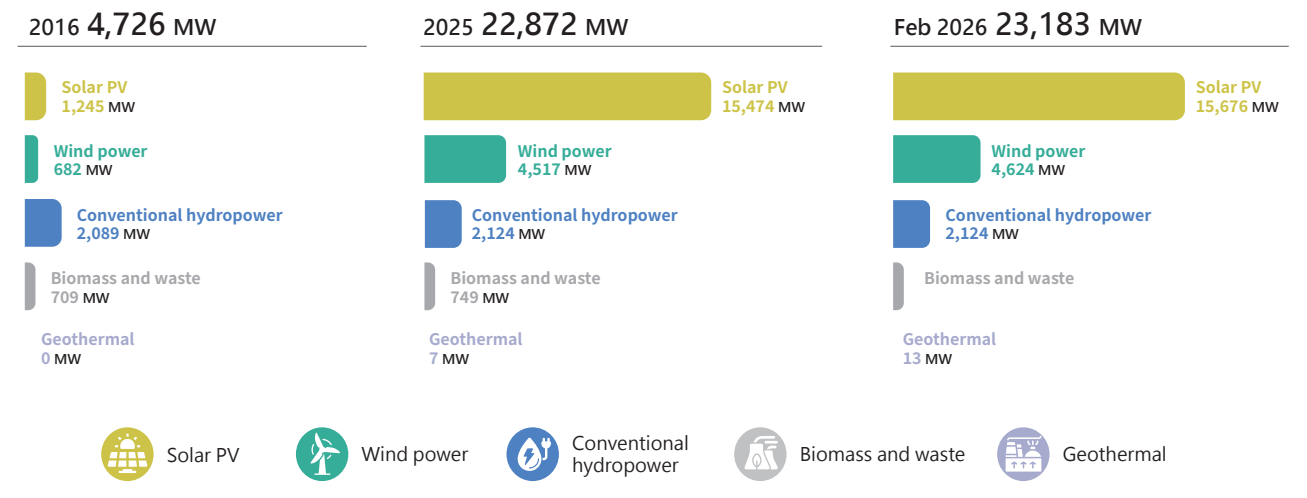
Installed Generation Capacity

Unit: MW



Renewable Energy Installed Capacity

Unit: MW



Overview of Taipower's feed-in tariff schemes and supply from its own green electricity capacity

Taipower has long been purchasing electricity from renewable energy producers under the feed-in tariff (FIT) scheme and integrating such electricity into the power grid for supply to users. However, electricity procured through the FIT mechanism has not been released as a standalone product, nor has it been able to provide users with traceable green electricity sources or renewable energy certificates (T-RECs).

To broaden the supply channels of green electricity and assist corporate users of varying sizes in accessing green electricity, Taipower has in recent years introduced two products: Small-Scale Green Energy Sales Program and "RE30 Low-Carbon Power". These initiatives enhance the users' accessibility to green electricity and meet the corporate needs for traceability and carbon disclosure in terms of green electricity usage.

1. Total volume and sources of green electricity purchased under FIT schemes

Data from Taipower suggests that a total of 63,564 renewable energy generation systems with an aggregate capacity of 17.05 GW was selling electricity under the FIT scheme as of the end of December 2024. The breakdown by renewable energy type is shown in the table below.

Renewable energy type	No. of purchases	Corresponding capacity
Solar photovoltaics	63,322	1,330.3
Wind	150	343.5
Hydro and others	92	31.8
Total	63,564	1,705.6

Source: Taiwan Power Company[5]

[5] Overview of Taipower's purchase of electricity: https://www.taipower.com.tw/2289/2363/2380/2385/10621/normalPost (last visited: May 5, 2025).

2. Current status of Taipower's own green electricity sites and outputs (regularly updated by Taipower; pending update to the latest data)

As of the end of November 2025, Taipower's installed capacity for conventional hydropower totaled 1.82 GW, with cumulative electricity generation reaching 4,685,304 thousand kWh. Its installed capacity for solar photovoltaics stood at 0.31 GW, with cumulative generation of 402,468 thousand kWh. Its Installed capacity for wind power amounted to 0.44 GW, with cumulative generation of 958,057 thousand kWh as of the end of April in 2025.

Electricity Generated from Taipower's Hydropower Sites in 2021-2025

Year	2021	2022	2023	2024	2025
Unit: kWh	2,713,204,615	4,845,599,177	3,334,488,352	3,535,786,063	4,685,304,964

Electricity Generated from Taipower's Solar Photovoltaic Sites in 2021-2025

Year	2021	2022	2023	2024	2025
Unit: kWh	408,836,867	402,687,236	393,948,610	404,168,687	402,468,840

Electricity Generated from Taipower's Wind Power Sites in 2021-2025

Year	2021	2022	2023	2024	2025
Unit: kWh	761,574,377	1,072,201,098	872,087,161	946,979,033	958,057,613

Generation from Taipower's Hydropower, Wind and Solar Photovoltaic Sites in Total Mix of Green Electricity Supply in 2021-2025

Year	2021	2022	2023	2024	2025
Percentage	22%	26%	17%	14%	16%

3. Commercialization of electricity from Taipower's own sites: Small-Scale Green Energy Sales Program and RE30 Low Carbon Power

(1) Small-Scale Green Energy Sales Program

At the end of 2023, Taipower launched its pilot program of Small-Scale Green Energy Sales. Under this program, electricity generated from Taipower's own renewable energy projects (primarily Tainan Salt Field Solar PV Farm and Changbin Solar PV Farm) was released to the market. Auctions of small and modular bundles were conducted openly through the Green Electricity Matching Market operated by the Bureau of Standards, Metrology and Inspection (BSMI), Ministry of Economic Affairs. The pilot program offered packages of varying electricity volumes and contract years, including specifications such as 10,000 kWh and 50,000 kWh. To ensure fairness, each electricity account could only bid for one product.

On November 13, 2024, Taipower offered the second auction of Small-Scale Green Power Sales by increasing the total electricity released to the market to 20 million kWh. This round marked the first inclusion of electricity from the Offshore Wind Farm Project - Phase I and provided a greater variety of purchasing mechanisms. The products were structured into two main categories:

- **Daytime Type:** Targeting business hours from 7:00 am to 5:00 pm, primarily supplied by solar photovoltaics.
- **All-Day Type:** Covering full-day electricity demand, supplied by a combination of daytime solar photovoltaics and offshore wind power.

Each main category was further divided into six package combinations: 10,000 kWh, 100,000 kWh, and 200,000 kWh, each available for 1-year and 5-year contract terms. A single electricity account could purchase up to 200,000 kWh in total. Additional features included a monthly cap mechanism (allowing successful bidders to set a monthly wheeling limit) and a winter promotional offer (additional 20% green electricity from October to December).

By the end of 2025, Taipower launched the "2025 Small-Scale Green Power Sales Program," introducing adjustments to both the sales mechanism and product design. The allocation method shifted from the previous auction-based approach to a subscription system, under which users submit application

documents and complete purchases through local service offices during the application period.

In terms of product design, in addition to maintaining the existing 1-year Daytime Type and All-Day Type products, a new Select-Month Type product with a 2-month duration was introduced. Furthermore, a single electricity account is allowed to subscribe to both 1-year and Select-Month products simultaneously, enhancing flexibility of use.

Results of Small-Scale Green Power Sales Program in 2023-2024

Year/ Round	No. of corporate bidders	No. of bid winners	Electricity volume sold	Transaction price range	Product features	Comment
2023/ Round 1	About 50	About 47	c. 1.59 million kWh	NT$4.9-6 per kWh	Solar PV: 10,000/50,000 kWh for one or five years	360 products in total
2023/ Round 2	About 66	About 60	c. 3.41 million kWh	NT$4.9-6 per kWh	Solar PV, a new package of 100,000 kWh	193 products in total
2023 Total	About 116	About 107	c. 5 million kWh	NT$4.9-6 per kWh	Primarily solar PV	
2024	71	30+	c. 9 million kWh	NT$5.4-6.8 per kWh	Solar PV + wind; Daytime Type / All-Day Type; new features includedthe monthly cap, winter top-up, voting by representatives from headquarters	All-Day Type accounted for 46%. Popular packages were 200,000 kWh for a term of five years and 10,000 kWh for a term of one year.

Source: Ministry of Economic Affairs[6], Taiwan Power Company[7] and Science & Technology Law Institute (STIL) of Institute for Information Industry

[6] Current Status and Prospects of Green Electricity Market in Taiwan from the Second Meeting of Committee Members in 2023, Office of Energy and Carbon Reduction under the Executive Yuan: https://www.ey.gov.tw/oecr/D5847A4CC2676B73/b2d617eb-0c26-47bb-b56d-bb6ba6108610 (last visited: May 5, 2025).

[7] Taiwan Power Company: 71 Bidders Purchase Over 9 Million kWh of Green Electricity from Small-Scale Green Power Sales Program Sells, Up Nearly 50% from Last Year. https://www.taipower.com.tw/2289/2323/2324/60118/normalPost (last visited: May 5, 2025).

(2) RE30 Low-Carbon Power

In June 2025, Taipower launched RE30 Low-Carbon Power, a product primarily aiming to assist export-oriented enterprises in meeting the requirements from international supply chains for use of renewable energy. The product was designed with a hybrid supply of electricity supplemented with green electricity. If users had purchased some green electricity from private power suppliers, Taipower would make up for the difference so that green electricity accounts for 30% of the consumption mix. This allows corporate users to obtain the corresponding renewable energy certificates and reduce carbon emissions.

Taipower released 500 million kWh of green electricity generated from its own sites for RE30 Low-Carbon Power, in conjunction with approximately 1.66 billion kWh of grid electricity. The product was available for sale from June 1 to December 31, 2025, with wheeling services commencing progressively from July 1. Eligible users included (extra) high-voltage customers with a contracted capacity of 100 kW or above but were limited to those currently on wheeled electricity supply arrangements. According to information published by Taipower, the 500 million kWh of green electricity from its own sites was completely sold out for the current year, indicating strong market demand for RE30 offerings. Taipower has also stated that it will continue to promote relevant supply mechanisms in 2026 to help more companies align with international requirements for carbon reduction and use of renewable energy.

Users are required to commit to annual electricity consumption in units of 100,000 kWh (including the 30% green electricity component). The annual purchase is for a minimum of 1 million kWh (including 300,000 kWh of green electricity) and for a maximum of 100 million kWh (including 30 million kWh of green electricity). The green electricity supply is capped at 30% of the user's contracted electricity volume, and supply under the product ceases once this threshold is reached.

In terms of pricing, the RE30 program applies separate pricing for grid electricity and green electricity. Grid electricity is charged according to peak and off-peak tariff schedules, while supplemental green electricity is priced at an early-bird rate of NT$6.1 per kWh (for the second half of 2025) and a standard rate of NT$6.3 per kWh (for 2026). After adding the 5% value-added tax and wheeling

service fees, the effective price is approximately NT$6.7–6.9 per kWh. Based on Taipower's illustrative calculations and assuming an average grid electricity price of NT$4.27 per kWh and privately sourced green electricity (民營綠電) at NT$6.0 per kWh, the overall blended electricity price would be approximately NT$4.86–4.88 per kWh.

The green electricity supplied under RE30 comes from Taipower's own renewable energy projects, including wind, solar, and hydropower. Users are not permitted to designate specific energy types or project sites. Based on actual wheeled electricity volumes, Taipower will transfer the corresponding renewable energy certificates to users' accounts within 60 days after the end of June and December each year, ensuring that purchasers receive legally recognized green electricity certificates.

The RE30 program incorporates a certain degree of flexibility in its design. Users may adjust annual contracted electricity volumes during the application period and apply for termination at any time, with the option to reapply for purchase within the acceptance period. The program does not require a security deposit, nor does it impose breach penalties. Failure to fully utilize the contracted electricity volume simply results in unused capacity and no additional charges.

Direct purchase from project sites and corporate power purchase agreements (CPPAs)

Renewable energy producers with economies of scale and technical capabilities may, in accordance with the Electricity Act, "wheel" the green electricity generated at their own project sites through Taipower's grid for delivery to designated users, and enter into corporate power purchase agreements (CPPAs) with those users. This model typically adopts long-term contractual arrangements and is suitable for enterprises with large electricity demand and medium/long-term plans for carbon reduction. Both parties may agree on electricity pricing, supply duration, and certificate acquisition methods, to ensure the sourcing of green electricity and stability of contract performance.

Through this mechanism, enterprises can obtain renewable electricity with identifiable sources as well as Taiwan Renewable Energy Certificates (T-RECs), which serve as an important basis for carbon inventory, SBTi target validation, and ESG disclosure. This model also enhances transparency in energy management and strengthens international competitiveness. Direct purchase from project sites not only demonstrates the proactive commitment of enterprises to net-zero goals, but also gradually becomes one of the mainstream procurement approaches under the RE100 initiative.

Table 1 Contracting Status of Taiwan Offshore Wind Power Projects in 2025

Site	Installed capacity (MW)	Contract year for grid connection	Buyer	Purchased volume(MW)	Note
Hai Long Offshore Wind Farm Project No. 2B(sold out)	232	2026	Unnamed leading semiconductor company	744	Hai Long 2A has been completed and connected to the grid; wind turbine installation for Hai Long 2B has been completed, with grid connection and commercial operation progress pending; Hai Long 3 is currently under construction.
Hai Long Offshore Wind Farm Project No. 3(sold out)	512	2026			Hai Long 3 has commenced wind turbine installation and is expected to proceed with grid connection in 2026.
Greater Changhua Southwest (sold out)	337.1	2026	Taiwan Semiconductor Manufacturing Company Limited	920	All wind turbines have been installed, and full commercial operation is expected in Q3 2026.
Greater Changhua Northwest (sold out)	582.9	2026			
Strait (WPD) Offshore Phase 1	300		N/A	N/A	Application to MOEA for extension denied. Administrative contract rescinded. Refund procedures ongoing after penalties taken from performance bond.
Fengmiao Phase 1 (sold out)	500	2028	Sino-American Silicon Products Inc. and Sustainable Energy Solution Co., Ltd.	≤75	
			United Microelectronics Corp.	200	
			FarEasTone Telecommunications Co., Ltd.	50	
			Taiwan Mobile Co., Ltd.	c. 100	
			MediaTek Inc.	50~100	
			Google	>50	

Source: Science & Technology Law Institute (STIL) of Institute for Information Industry

Site	Installed capacity (MW)	Contract year for grid connection	Buyer	Purchased volume(MW)	Note
Haiding 2	600	2027	N/A	N/A	Its parent company, Corio, has withdrawn its investment, creating significant uncertainty over the project' s development progress.
Formosa 4	495	2028	Taiwan Smart Electricity & Energy Co., Ltd.	Certain capacity	
Wei Lan Hai Chang Hua	440	2028	Taiwan Smart Electricity & Energy Co., Ltd.	Certain capacity	EDF has requested termination of the administrative contract and plans to withdraw from Taiwan; the project is expected to be re-tendered subsequently.
Strait (WPD) Offshore Phase 2	300	2027	N/A	N/A	Affected by the termination of the Formosa Strait Phase 1 contract, the subsequent development remains highly uncertain.

Source: Science & Technology Law Institute (STIL) of Institute for Information Industry

Development overview of renewable energy retailers

In recent years, Taiwan's renewable energy retail sector has grown rapidly and has increasingly become a key player in green electricity transactions. Given the liberalization of wheeling mechanisms under the Electricity Act and rising pressure on enterprises to achieve net-zero emissions, electricity retailers have evolved from simple "power suppliers" into integrated energy service platforms. In 2024, the trading volume of renewable energy certificates exceeded several hundred thousand certificates, indicating that demand for green electricity is no longer an option for a small number of enterprises but has become a critical threshold for supply chain competitiveness.

At the core of market development is the transformation of service models. The once straightforward electricity wheeling is now integrated into data analytics, intelligent management, and AI-based predictions.

As a result, users are able not only to procure green electricity but also to obtain comprehensive energy portfolio solutions. Platform-based operations have enhanced transaction transparency and reduced the barriers for small and medium-sized enterprises to access green electricity. At the same time, the introduction of financial instruments is reshaping the market. The utilization of long-term power purchase agreements and trust mechanisms enables enterprises to ensure contract performance stability for procurement of green electricity and to treat green electricity sourcing as a long-term commitment rather than a one-off transaction. Such institutional safeguards further strengthen the credibility of green electricity in international carbon disclosure and supply chain audits.

Looking ahead, electricity retailers will play a more varied role. As the market moves toward greater platformization and institutionalization, trends are beginning to emerge regarding the integration of energy storage, carbon management, and cross-border use cases. These developments suggest that electricity retailing is no longer merely about power wheeling, but has become an indispensable component of the energy market. Continued advancement in technological applications, transaction frameworks, and collaboration models will be key determinants of the maturity and stability of the renewable energy market.

Green Electricity Demand: Corporate Demand and Procurement Status

Green electricity demand

The demand in Taiwan's green electricity market is driven primarily by three major forces. First, the number of companies joining the RE100 initiative continues to grow. More than thirty global RE100 members have established headquarters in Taiwan and their supply chain requirements are accelerating the adoption of traceable green electricity among upstream and downstream partners[8]. Second, the regulatory provision has imposed obligations since 2021 on energy-heavy Industries with a contracted capacity exceeding 5,000 kW.

[8] RE100: 2024 Report on Renewable Energy Market in Taiwan, https://www.there100.org/taiwan-renewable-electricity-market-briefing-advocacy-affordable-corporate-procurement (last visited: May 5, 2025).

Such obligations must be fulfilled by the installation of renewable energy facilities, the purchase of renewable energy or certificates, deployment of energy storage equipment, or monetary contributions. In addition, the Ministry of Environment will levy a carbon fee starting in 2026, with a general rate of NT$300 per ton of CO_2e, further increasing pressure on enterprises to reduce carbon emissions. Moreover, a growing number of ESG-oriented companies beneath the threshold for large electricity users are also procuring green electricity in response to brand owners' requirements and international disclosure standards. These firms participate in the Small-Scale Green Power Sales Program or the wheeling mechanisms and forming a broader and more diversified demand base.

In terms of electricity consumption mix, the industrial sector accounts for more than half of total electricity use in Taiwan and remains the core source of green electricity demand. However, nearly 42.2% of grid electricity as of 2023 still came from coal-fired plants, indicating significant pressure on companies to reduce carbon[9]. Reuters has noted that Taiwan's technology (semiconductors) industry faces the dual dilemma of net-zero pressures and a green electricity supply gap. For example, TSMC alone consumed approximately 6.4% of the total electricity in Taiwan in 2021[10]. Given constraints related to resources, land availability, and regulatory frameworks, green electricity supply is unlikely to fully meet the rapidly growing demand in the short term. According to Ernst & Young (EY), the supply via direct wheeling during the most recent 12 months in 2024 reached approximately 2.49 billion kWh, representing an increase of more than 40% from 1.73 billion kWh in 2023. EY estimated that around 8.6 billion kWh of green electricity from self-generation-for-self-consumption facilities would enter the market in 2024, to help to alleviate the constraints on corporate procurement sources[11].

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[9] 2023 Report on Supply and Demand of Electricity Resources in Taiwan by the Energy Administration under the Ministry of Economic Affairs.

[10] Reuters, How Taiwan's Green Power Deficit Threatens Tech Industry's Bid for Net Zero: https://www.reuters.com/sustainability/climate-energy/how-taiwans-green-power-deficit-threatens-tech-industrys-bid-net-zero-2024-06-04 (last visited: May 5, 2025).

[11] "Learning from Europe: Renewable Power Trading Sets to Accelerate in Taiwan" by Ernst & Young: https://www.ey.com/zh_tw/insights/energy-resources/learning-from-europe-taiwan-renewable-power-trading-market (last visited: May 5, 2025).

The government has also provided projections for future demand and supply. At the end of 2024, the Ministry of Economic Affairs stated that renewable energy supply could reach 55 billion kWh by 2026[12], sufficient to meet the corporate demand at that time and aligned with policy targets of a 20% renewable energy share by 2026 and 30% by 2030[13]. Nevertheless, whether actual supply can fully satisfy demand will still depend on factors such as grid connection progress, capacity factors, and the maturity of transaction mechanisms.

Strategies and challenges for corporate purchases of green electricity

At present, the green electricity market is not yet fully liberalized in Taiwan. Transactions are still predominantly conducted through contracts and there are no real-time price-matching mechanisms. As a result, companies often face procurement challenges such as limited product options, price volatility and uncertainty, and difficulty in forecasting volumes. In particular, green electricity from large offshore wind farms has largely been fully contracted by major corporations, making it even more difficult for small and medium-sized enterprises (SMEs) to access stable supply sources.

In addition, procurement models such as CPPAs typically involve contract terms exceeding ten years, substantial financial commitments, and long-term performance obligations. These arrangements place high demands on corporate financial planning and risk management. Many SMEs lack the professional negotiation capabilities and energy management experience and the financial thresholds associated with performance bonds and collateral requirements constitute the barriers to entry. This results in hesitance to commit to long-term procurement despite the demand. PwC recommends that companies should first conduct a comprehensive review of their electricity consumption data and clearly define procurement objectives (driven by regulatory compliance, supply chain requirements, or carbon border pressures). Firms

[12] Ministry of Economic Affairs: Green Electricity Supply Reaches 5.5 Billion kWh in 2026 to Satisfy Corporate Demand: https://www.moea.gov.tw/Mns/populace/news/News.aspx?kind=1&menu_id=40&news_id=117810 (last visited: May 5, 2025).

[13] Ministry of Economic Affairs: Share of Renewable Energy Reaches 20% Starting in November 2026: https://www.moea.gov.tw/MNS/populace/news/News.aspx?kind=1&menu_id=40&news_id=119230 (last visited: May 5, 2025).

should also compare different types of renewable energy against their own electricity consumption patterns, establish cross-functional teams or engage external consultants. Contract negotiations must balance considerations such as pricing, contract years, committed volumes, and risk clauses. It is also necessary to continue monitoring of project site progress to ensure procurement commitments[14].

Price Signals and Green Electricity Trading

Current status and challenges in forming of price signals

Although green electricity trading in Taiwan has been gradually developing, price signals remain unclear. At present, transaction prices are largely determined through long-term contract negotiations, in the absence of a transparent and publicly available price references or a market mechanism reflective of supply and demand in real time. In other words, trading activities exist, but a fully functioning market system is yet to take shape. Price rigidity and information asymmetry make it difficult for small and medium-sized enterprises (SMEs) to obtain reasonable contract terms and place limitations on price discovery and resource allocation efficiency. Furthermore, over-contracting or grid connection delays with certain projects result in discrepancies between contracted demand and actual supply and prevent market prices from reflecting true costs.

Currently, green electricity transactions in Taiwan are still largely tied to the renewable energy feed-in tariff (FIT) mechanism, supplemented by a growing number of bilateral contracts. A liberalized market with matching functions is yet to be established. Corporate procurement of green electricity is mainly conducted through CPPAs or via wheeling arrangements facilitated by renewable energy retailers. Taipower provides grid wheeling services and charges associated fees, forming the backbone of market operations.

[14] 2024 Report on Global and Taiwan Renewable Energy Markets by PwC: https://www.pwc.tw/zh/industries/new-energy/insights/power-utilities-renewables-markets.html (last visited: May 5, 2025).

The system design in Taiwan adopts the principle of bundled RECs. In other words, electricity and renewable energy certificates must be transferred together to avoid double counting of environmental benefits. For example, in direct supply or wheeling scenarios, the seller is required to transfer renewable energy certificates corresponding to the electricity volume to the purchaser, so that electricity and certificates move in tandem. However, an exception is made for self-consumption renewable energy generation where unbundling of electricity and certificates is permitted. Electricity producers may consume the electricity themselves while selling the renewable energy certificates separately to other companies. This design allows self-consumption project sites to generate additional revenue and enhances liquidity in the certificate market. Nevertheless, due to limited scale and insufficient information transparency, its impact on overall price signals remains modest.

Whilst the basic infrastructure for green electricity trading in Taiwan has been established, price formation still relies on contract negotiations and policy anchoring (e.g., Taipower's auction prices for small-scale green energy sales). Market-based price discovery function is yet to be formed. If a matching platform can be established in the future, it will enhance transaction transparency and boost the market for both electricity and certificates. Lessons can be drawn from the United Kingdom and Japan in the creation of green electricity markets or trading platforms. Price signals formed in a centralized market for trading can truly direct the decision-making in investment and consumption of renewable energy.

Green electricity products, trading volumes and prices

At present, green electricity products in Taiwan enter the market through multiple channels, including Taiwan Renewable Energy Certificates (T-REC), corporate power purchase agreements (CPPAs), wheeling services provided by renewable energy retailers, Taipower's Small-Scale Green Power Sales Program, and RE30 Low-Carbon Power offerings. Each mechanism exhibits distinct trading characteristics and market scale.

a. Taiwan Renewable Energy Certificates (T-REC)

T-REC transactions in Taiwan can be categorized into two models: bundled (power and certificates together) and unbundled (separation of power and certificates). Bundled transactions typically require wheeling through Taipower's grid network and are conducted via CPPAs between retailers and users.

Contract durations generally range from 3 to 20 years, with temporal matching requirements (15-minute intervals and monthly settlements).

In contrast, unbundling of electricity and certificates is only applicable to self-generation-for-self-consumption renewable energy facilities. Volumes are relatively small, and some projects are pro-bono in nature. These certificates may be traded via the competitive bidding platform operated by the Bureau of Standards, Metrology and Inspection (BSMI) under the Ministry of Economic Affairs, or through private bilateral negotiations. Such transactions are usually one-off purchases and do not require temporal matching.

b. Corporate power purchase agreements (CPPAs)

CPPAs are long-term contractual products, typically spanning 10 to 20 years. The steadily increasing transaction volumes in Taiwan during recent years have made CPPAs the primary mechanism for large enterprises to ensure sources of green electricity. According to PwC, more than 95% of green electricity transaction volumes in Taiwan (excluding FIT-based purchases) in 2024 came from wheeling services and CPPAs provided by private renewable energy retailers.

c. Wheeling by renewable energy retailers

Private renewable energy retailers aggregate green electricity from multiple project sites and wheel it to end users. The model is relatively flexible and facilitates participation by SMEs. However, pricing is constrained by the resources available to retailers and their bargaining power.

d. Taipower's Small-Scale Green Energy Sales Program

In 2021, Taipower launched its Small-Scale Green Energy Sales Program through an auction mechanism. In 2023–2024, transaction prices fell in the range of NT$4.9-NT$6.8 per kWh. Transaction volumes increased from approximately 5 million kWh in 2023 to c. 9 million kWh in 2024, indicating growing market acceptance. Due to its transparent pricing, this product is often regarded as a market reference and has, in practice, created an "anchoring effect" on prices.

e. Taipower's RE30 Low-Carbon Power Program

In 2025, Taipower unveiled its RE30 low-carbon power product by releasing a combination of 500 million

kWh of green electricity from its own project sites and 1.66 billion kWh of grid electricity. This product is designed to help export-oriented enterprises to achieve at least a 30% share of low-carbon electricity in consumption mix and to obtain corresponding renewable energy certificates. Taipower launched low-carbon power offerings to respond to international supply chain requirements for carbon reduction and to offer companies procurement options with a lower entry barrier. According to Taipower's plans published at the end of 2025, the 500 million kWh of green electricity allocated for that year was fully sold out. Taipower also intends to continue offering low-carbon power products in 2026 to support more enterprises in meeting international requirements.

Systems and matching mechanisms

At present, green electricity trading in Taiwan has yet to evolve into a fully liberalized market. Instead, transactions are facilitated through institutional arrangements and government-run or private-sector platforms that provide "matching" and "support" functions.

a. Bureau of Standards, Metrology and Inspection (BSMI) under Ministry of Economic Affairs

The Bureau of Standards, Metrology and Inspection (BSMI) under Ministry of Economic Affairs has established National Renewable Energy Certification Center, which is responsible for the issuance, cancellation, and registration of certificates as well as the operation of a bidding platform for green electricity and renewable energy certificates. However, this platform does not function as a true exchange. Rather, it serves mainly as a registration and matchmaking mechanism and plays a limited role for price discovery.

b. Green electricity trusts

Financial institutions have been gradually introducing a green electricity trust mechanism by managing electricity fee payments and contract performance conditions through dedicated trust accounts. This structure helps transfer the credit risk associated with long-term CPPAs, safeguards the revenue streams for developers, reduces the barriers for corporates to enter into long-term contracts and facilitates deal-making between buyers and sellers.

List of Green Electricity Trusts

Financial institution	Partner	Characteristics
Bank SinoPac	Apollo Power Co., Ltd.	• Wheeling of 1.2 billion kWh of green electricity. • Bank SinoPac as the lead bank set up the trust account to manage money flows and enhances transaction transparency and security.
Bank SinoPac	Greenet Co., Ltd. (J & V Energy Technology Co., Ltd.)	• First green electricity trust transformed from financing of the power plant to financing of wheeling. • Funds in the trust account earmarked to mitigate financing and cashflow risks associated with small-and-medium renewable energy projects so as to ensure deployment of wheeling.
Bank SinoPac	Pau Fu Energy Corp. (Ina Energy Corporation)	• Extended scope of management by the trust mechanism in order to energize the supply and demand of green electricity. • Wheeling of 1.035 billion kWh each year expected.
E.SUN Ban	Leadsun Greentech Corporation	Establishment of the process so that the funds for electricity purchase are credited in the trust account first before disbursements according to contracts. The purpose is to reduce corporate procurement risks and ensure successful cooperation.
Fubon Bank	Teamphon Energy Co., Ltd.	The trust manages cash flows and contract performance and serves as a safeguard for small-and-medium enterprises in purchase of green electricity. cooperation.
Taiwan Cooperative Bank	YIHO Green Energy Transformation Co., Ltd.	Emphasis of enhanced transaction transparency and security of funds by working with third-party auditors.

Source: Science & Technology Law Institute (STIL) of Institute for Information Industry

Pilot programs for flexible allocations in the green electricity market

The flexible allocation mechanism in the green electricity market originated from the "Green Power Allocation Sandbox Program" launched by the Ministry of Economic Affairs in October 2023, with Taipower responsible for allocations, settlements, and information system operations. The sandbox was designed to help multi-site enterprises address challenges related to the difficulty in the distribution of green electricity and the inflexibility of dispatching ratios. Hands-on experience was accumulated during the pilot phase. Building on the sandbox outcomes and in response to corporate demand, Taipower introduced "Pilot Program for Flexible Allocations in the Green Electricity Market" in 2025 as an institutionalized extension of the sandbox initiative.

This pilot program specified that qualified power source owners or electricity customers may act as allocators and adjust the dispatch of green electricity on a 15-minute interval basis, in order to better align green electricity allocations with the actual electricity consumption profiles of enterprises. This mechanism breaks away from the traditional constraints of monthly or fixed-ratio matching and enhances the timeliness and flexibility of green electricity dispatching.

Although renewable energy retailers are not designated as allocators, the flexible allocation framework enhances the adaptability of supply–demand combinations. It also allows retailers to support enterprises by integrating green electricity from multiple project sites, designing time-segmented products, and developing a diversity of procurement strategies under more dynamic allocation outcomes.

3 Green Electricity Market Participants

- Greenet Energy
- TCC Green Energy
- Sustainable Energy Solutions
- Pau Fu Energy
- Tatung Forever Energy
- Foxwell Power
- Star Trade
- Sunnyfounder
- Energy Helper
- Mr. Watt
- Taiwan Smart Electricity

Strategic Resource Planning and Market Development: Greenet Energy Creates Flexible Retail Platform

Developing an integrated green electricity supply model centered on corporate electricity services

Greenet Energy was established in January 2021 and obtained its renewable energy retail license in August of the same year, making it one of the major participants in the domestic renewable energy retail market. The company focuses on integrating renewable energy supply with electricity demand. Through mechanisms such as power acquisition, transaction matching, and wheeling execution, it connects power generation with power consumption, gradually transitioning from a resource-oriented operation to a market-driven business.

Focusing on power consumption analysis and contract performance management to strengthen corporate service capabilities

Greenet Energy primarily serves corporate clients. Its business scope covers renewable energy wheeling, T-REC (Taiwan Renewable Energy Certificate) applications, power consumption structure analysis, and green electricity allocation planning, extending to the signing and performance management of long-term power purchase agreements (PPAs). Its service model emphasizes the integration of front-end power consumption analysis and back-end contract performance execution, helping enterprises optimize their configurations across green electricity ratios, consumption patterns, and implementation timelines.

Continuously accumulating wheeling scale to build a foundation for market trading

In terms of actual trading scale, Greenet Energy achieved a cumulative green electricity wheeling volume of approximately 415 million kWh in 2025, demonstrating that it has reached a solid scale in wheeling execution and market matching. By continuously accumulating trading volume and growing its customer base, the company is gradually establishing strong operational capabilities in the corporate green electricity market.

Constructing a transaction risk management mechanism to support cooperation on the power generation side

Regarding the cooperation model on the power generation side, Greenet Energy reduces uncertainties during the transaction process through cash flow arrangements and contract performance designs. For example, it utilizes a trust mechanism for electricity fee payment and receipt management to enhance collection stability. Furthermore, as an electricity retailer, it assumes certain institutional obligations (such as reserve margin responsibilities) to simplify the burden on power generators participating in the retail market. These arrangements help increase power plants' willingness and stability in participating in green electricity trading.

Enhancing wheeling efficiency and contract performance capabilities to shorten the time-to-market for power projects

In terms of wheeling execution, Greenet Energy possesses solid administrative and process integration capabilities. When power generators have all necessary documents prepared, the company can complete the wheeling launch operations within a few months. This shortens the time gap between power generation and electricity sales, thereby improving asset operational efficiency.

Extending green electricity applications and certificate services to develop integrated solutions

In addition to power trading, Greenet Energy combines T-REC management with corporate sustainability needs to provide integrated services for certificate applications, carbon footprint verification, and green electricity usage. Through the integrated planning of power and certificates, the company helps enterprises meet electricity consumption goals such as RE100 and lowers the institutional and operational thresholds during the green electricity adoption process.

Source:

- **Commercial Times:** Triumph in Green Electricity Trading! J&V Energy Technology Ranks No. 1 Seller of Solar Energy Certificates.
- **Liberty Times:** J&V Energy Technology's Subsidiary Signs 20-Year Contract with ASE Technology for Supply of Four Billion kWh of Green Electricity.
- **RECCESSARY:** J&V Energy Technology's Goes to Vietnam! How Will the ESG Alliance with Acer and ClockWork Orange Help Taiwanese Companies Towards Net Zero?
- **BusinessNext:** Wastewater from Shrimp Farming Becomes Carbon Credits? J&V Energy Technology Invests in the Startup Company "ID Water" for Aquaculture Solar Business Opportunities in Southeast Asia.
- **RECCESSARY:** J&V Energy Technology Reports Record-High Profits, Plans to Bring Greenet Energy to the Emerging Stock Market and Accelerates Business in Southeast Asia and Japan
- **MoneyDJ:** Greenet Energy Helps Industry Players to Achieve Net Zero and Receives Orders from Jabil Green Points

Connecting a Diversity of Diverse Power Sources to Trading Mechanisms: TCC Green Energy Participates in Multi-Level Markets

Taiwan Cogeneration Corporation's 100% owned subsidiary enters renewable energy retail market

TCC Green Energy, established in November 2018 with a paid-in capital of NT$105 million is a wholly owned subsidiary of Taiwan Cogeneration Corporation. In October 2019, TCC Green Energy obtained the second renewable energy retail license in Taiwan and in October 2020 formally launched wheeling services as an active player of the domestic green electricity trading market.

A diversity of renewable energy investments and offering of green electricity wheeling services

TCC Green Energy focuses on renewable energy investment and development, electricity retailing, consulting services, and integrated power and energy solutions. Its parent company, Taiwan Cogeneration Corporation, has been proactively investing in and developing solar PV, onshore wind, and geothermal energy projects during recent years. Meanwhile, TCC Green Energy provides wheeling of green electricity. The offering of the end-to-end services to corporate clients assists in their achievement of net-zero emission goals.

Record-high wheeled volumes of green electricity and collaboration with corporates toward sustainability vision

- **Green electricity wheeling and corporate partnerships:**
  As of early 2024, TCC Green Energy's cumulative wheeled volume of green electricity exceeded 500 million kWh. In March 2024, the company expanded its footprint in the market by beginning to wheel green electricity generated from Wushantou Floating Solar Project Site to the Taiwan Stock Exchange.
- **Participation in the ancillary services market:**
  In 2021, TCC Green Energy obtained professional certification for participation in the electricity trading platform and formally entered the ancillary services market. It is the first operator in Taiwan backed with

cogeneration resources in the bidding market for supplementary reserve capacities.

- **Renewable energy development and EPC projects:**

  The parent company Taiwan Cogeneration Cooperation has undertaken major domestic renewable energy projects, including Tainan Salt Field Solar PV Farm (150 MW) and onshore transmission EPC works for offshore wind projects. The group has also invested in the development of Cingshuei Geothermal Power Plant, which commenced commercial operation in 2021, marking another significant milestone in Taiwan's renewable energy development.

From wheeling to AI use cases: Building an integrated business model for green electricity

- **Development of diversified power sources and industrial partnerships:**

  In addition to its core business in cogeneration and gas-fired power generation, Taiwan Cogeneration Corporation is also investing in renewable energy development and participating in the Datun Mountain geothermal development project. Its partners include Taipower, Baseload Power Taiwan, GreenFire Energy, and other domestic and international collaborators.

- **Introducing AI to optimize wheeling models:**

  TCC Green Energy has incorporated AI analytical technologies into its renewable energy purchase and retail business by using intelligent algorithms to further optimize wheeling models. This approach not only improves the accuracy of generation forecasting, but also simulates electricity loading to enhance matching efficiency. In addition, it supports corporate decision-making in power procurement cost analysis and energy portfolio planning, making overall green electricity transactions more efficient and forward-looking.

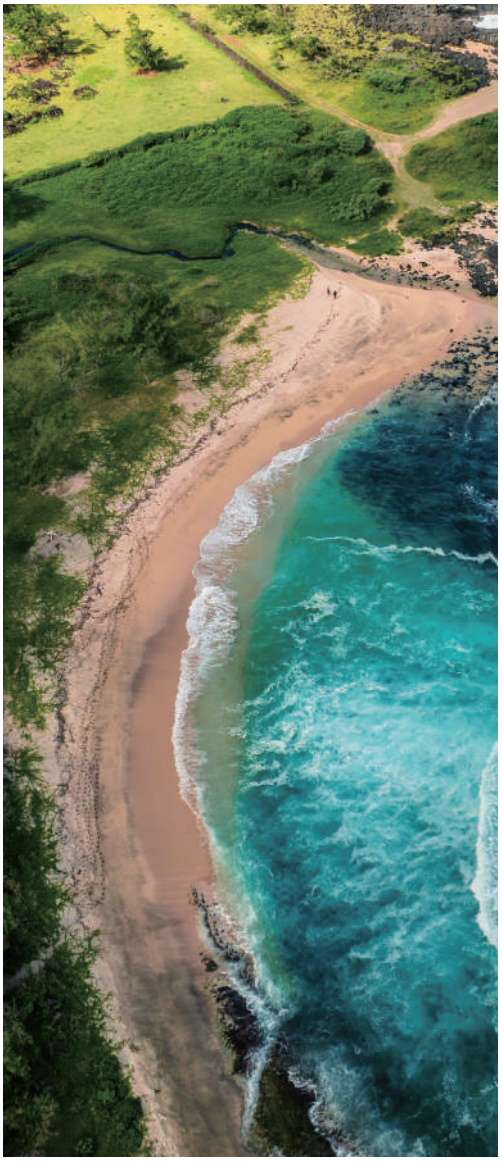
Source:

- **ChinaTimes:** Taiwan Cogeneration Corporation Enters the Electricity Trading Market. Its Subsidiary TCC Green Energy Becomes the First Operator in Taiwan Backed with Cogeneration Resources in the Bidding Market for Supplementary Reserve Capacities.
- **Liberty Times:** Datun Mountain Holds 20% of Geothermal Potential in Taiwan. Taipower, Taiwan Cogeneration Corporation and International Exploration Team Join Forces in Exploration Efforts.
- **Business Today:** Taiwan Cogeneration Corporation Provides Reliable Integrated Services Supported with Forward-Looking AI Technology for Low-Carbon Energy.

Integration of Group Supply and Trading Mechanisms: Sustainable Energy Solutions (SES) Constructs a Long-Term, Market-Oriented Green Electricity Supply Chain

An electricity retailer with in-house generation assets

Sustainable Energy Solutions (SES) was established on April 19, 2021, and obtained a renewable energy retail license on October 19 of the same year. With paid-in capital of NTD 100 million, the company is a subsidiary of the Sino-American Silicon Products Group (SAS Group). It owns in-house solar PV projects within the group, actively expands cooperation with other power generation companies and electricity users and serves as the group's business interface with the green electricity market.



Integrating in-house project sites, external power supply, and trust-based trading mechanism

SES is an integrator of a diversity of generation resources. In addition to wheeling of green electricity from solar projects within the SAS Group, SES offers PPA (power purchase agreement) and T-REC (Taiwan Renewable Energy Certificate) services to corporate clients by partnering with external renewable energy generation companies. The company is also involved in structuring of green power trust transactions by working with financial institutions to enhance performance guarantees and financial transparency for corporate buyers.

Establishing a long-term green electricity supply chains for corporate clients in technology and manufacturing sectors

In 2024, SES entered into green electricity retail agreements with companies including Nanya Technology, Formosa Advance Technologies Co. Ltd. (FATC), Winbond Electronics, and Fengmiao Offshore Wind Farm, with contract terms of up to 10 years and total volumes reaching hundreds of millions of kWh. These agreements demonstrate the company's capabilities in reliable supply and contract performance for large manufacturing clients. Meanwhile, SES signed a green power trust agreement with Bank SinoPac, as a practical example of the finance-integrated trading model.

Gradual business diversification in trading and contract performance with support of group resources

Leveraging the SAS Group's foundation in renewable energy development, and operating under the group's energy business arm "Xusheng Green Energy" (a provider of one-stop energy services), SES started off with internal electricity wheeling within the group. It has since progressively expanded into electricity demand matching across different companies and industries. With a business scope covering direct supply, cooperative wheeling, long-term contracts, and trust-based transactions, SES demonstrates a steady trajectory toward advancing a diversified electricity retail model, thereby strengthening its sustainable competitiveness in the renewable energy market.

Source:

- **Liberty Times:** SAS Group's Subsidiary Sustainable Energy Solutions (SES) Signs 10-Year Contracts with Nanya Technology and Formosa Advance Technologies for Supply of 400 Million kWh of Green Electricity.
- **Wealth Magazine:** SAS Group's Subsidiary Sustainable Energy Solutions (SES) Signs Green Electricity Trust Contract with Bank SinoPac.
- **Economic Daily:** SAS Group's Subsidiary Sustainable Energy Solutions (SES) Inks Renewable Energy Retail Contract with Winbond Electronics.
- **Economic Daily:** SAS Group and Its Subsidiary Sustainable Energy Solutions (SES) Enters into Power Purchase Agreement with Fengmiao Offshore Wind Farm.

Focusing on Transaction Structures andPerformance Assurance: Pau Fu Energy Develops Electricity Retail, Trusts, and Regional Cooperation Models

Focusing on Transaction Flexibility and Contract Variety, Leveraging Power Development Experience

Established in June 2020 and obtaining its renewable energy electricity retail license in June 2022, Pau Fu Energy has a paid-in capital of NT$200 million. As a subsidiary of the INA Energy Group, Pau Fu Energy leverages the group's experience in solar PV development. It positions itself as a green electricity wheeling and customer service platform, integrating project resources, transaction execution, and demand matching capabilities.

Offering Diverse Contracts and Cash Flow Arrangements to Enhance Transaction Stability

Pau Fu Energy designs contract frameworks based on corporate electricity consumption conditions, covering long-term Corporate Power Purchase Agreements (CPPAs) and Taiwan Renewable Energy Certificate (T-REC) services. It also collaborates with financial institutions to promote green electricity trust mechanisms to strengthen cash flow management and contract performance guarantees during the transaction process. Its contract durations mostly range from 5 to 20 years. Furthermore, it enhances supply and demand matching flexibility through many-to-one power supply and regional matching models.

Accumulating Wheeling Track Records and Corporate Customer Base to Build Stable Trading Capabilities

In terms of electricity sales track records, Pau Fu Energy has served over 20 corporate clients and continues to expand its reach to major electricity consumers in the financial and technology manufacturing sectors. Its overall wheeling execution rate has reached over 98%, and its customer renewal rate is 100%, indicating a solid foundation in contract performance stability and customer retention.

Securing Large-Scale Long-Term Contracts to Establish a Multi-Year Green Electricity Supply Structure

In 2024, Pau Fu Energy signed a 20-year green electricity wheeling agreement with a subsidiary of the ASE Group, with an estimated total wheeling volume of at least 3.5 billion kWh. This makes it one of the most representative cases of long-term corporate power purchasing in the current market. Through long-term contract arrangements, it is progressively establishing a stable link between green electricity supply and demand.

Combining Owned Power Sources with Purchased Electricity to Build Supply Flexibility

Regarding power allocation, Pau Fu Energy combines the group's self-owned power plants and externally purchased electricity for wheeling, creating diversified power supply sources. As the demand for renewable energy rises, the company is also progressively expanding its on-hand wheeling volume and long-term supply scale, with expectations of continuous growth in its annual wheeling volume in the future.

Extending Project and Agrivoltaic Experiences to Support the Diversity of Green Electricity Supply Sources

Regarding its foundation in power development, the group has accumulated over 140 MW of self-owned project sites and over 1 GW of solar PV development volume. It continues to promote diverse project types, such as agrivoltaics, as an extension of its green electricity supply sources. The related development, operations, and maintenance (O&M) experiences help support the electricity retail business's stability in power acquisition and long-term supply.

Source:

- **Business Today:** INA Energy and Topco Technologies Sign a Five-Year Green Electricity Sale and Purchase Agreement.
- **CNEWS:** Bank SinoPac and INA Energy Collaborate in Green Electricity Trusts to Achieve the Vision for Power Plants of Citizens.
- **TechNews:** Wheeling of at Least 3.5 Billion kWh of Green Electricity! INA Energy's Subsidiary Pau Fu Energy Inks Contract with ASE Group's Subsidiary.
- **Knews:** Special Report on Photovoltaics: Part 3 | Agrivoltaic, Aquavoltaics and Shrimp Agriculture Solar: Building Momentum Against Bottlenecks in 2025.

Integrating Engineering and Trading: Tatung Forever Energy Expands Multi-Track Green Power Trading and Virtual Power Plant Applications

Building on solar PV installations and expanding into electricity wheeling, matching and virtual power plant use cases

Tatung Forever Energy, with a paid-in capital of NT$6 billion, is a wholly owned subsidiary of the Tatung Group. The company has two licenses (one for renewable energy generation and the other for electricity retailing) and serves as the Group's core platform for new energy businesses. Tatung Forever Energy integrates solar PV deployment, plant operations and maintenance (O&M), green power retailing and wheeling services, energy storage system (ESS) development, and virtual power plant (VPP) use cases to establish a one-stop renewable energy service ecosystem that supports corporate transition to sustainability and flexibility in electricity consumption needs.

Expanding generation and wheeling capacities and deepening collaborations via CPPAs and trusts

Tatung Forever Energy holds 1,637 solar power plants across Taiwan, with a total installed capacity of 352 MWp and annual generation of nearly 400 million kWh. The company provides power wheeling and matching services by offering electricity from its own plants. In 2024, the signing of a 10-year solar power purchase agreement (PPA) with San Fu Chemical, a subsidiary of the global industrial gas company Air Products made Tatung Forever Energy the most important long-term contract performer across the green electricity supply chain in Taiwan. The company also works with Bank SinoPac to promote green power trust mechanisms, in order to enhance the financial stability and provide transaction risk management for large electricity users.

Strengthening energy storage engineering capabilities and acquiring key technical certifications

Tatung Forever Energy has undertaken multiple energy storage projects, including a 43.77 MW day-ahead

ancillary services project in Taoyuan, as well as two extra-high-voltage energy storage systems of 60 MW each in Longtan and Dongshan. The Dongshan project is the first one in Taiwan that incorporates the Function of Periodic Power Modulation (FPPM) and Enhanced Dynamic Regulation (E-dReg) and has obtained international safety and cybersecurity certifications, including IEC 62933-5-2 and IEC 62443-3-3. Given its highly acclaimed technical capabilities and with the ownership of more than 122 MWh of energy storage resources, the company continues to integrate power wheeling and electricity trading services to lay a foundation for virtual power plant use cases.

Expanding overseas energy markets and extending renewable energy EPC services

In 2024, Tatung Forever Energy was commissioned by International Cooperation and Development Fund (TaiwanICDF) to undertake solar installation projects in three countries in the Pacific Ocean, namely Palau, Tuvalu and Marshall Islands. The first project was completed, marking its entry into the international energy EPC market. The company is also actively evaluating expansion into energy storage and solar projects in the United States, Japan, and the Middle East. By leveraging its domestic engineering experience and regional operational footholds, Tatung Forever Energy is scaling up its international presence.

Source:

- **Economic Daily:** Tatung Forever Energy Strengthens its Advantages at All Fronts during the Downturn.
- **Economic Daily:** Tatung Forever Energy Wins Overseas Solar PV Contracts and Aims to Complete Palau Project by Year-End.
- **CTIMES:** Tatung Forever Energy and Taipower Join Forces on Carbon Reduction and Bring Online the Energy Storage Project for Dongshan Extra-High-Voltage Substation.
- **RECCESSARY:** Strong Demand from International Heavyweights for Green Power: Tatung Forever Energy and Air Products'

Anchored on Trusts and Contract Performance Management, Foxwell Power Expands Integrated Green Power Services

Rapid rise thanks to group resource integration

Foxwell Power was established in 2019 under Shinfox Energy, a member of the Foxlink Group. With paid-in capital of NT$600 million, the company entered the renewable energy market and obtained a renewable energy retail license in the same year. As one of the earliest entrants into the green power trading market in Taiwan, Foxwell Power is committed to delivering comprehensive solutions spanning green power procurement, energy storage integration, and energy efficiency services.

Power retailing as energy integration consulting

With renewable energy retailing as its core business, Foxwell Power has been steadily expanded into a diversity of service areas. Its forward-looking offerings range from green power procurement, T-REC portfolio integration to an innovative design of the trusts mechanism for renewable energy trading. Foxwell Power also provides in-depth energy efficiency diagnostics as an ESCO (energy/emerging service company) and develops integrated energy storage solutions to address increasingly diverse energy needs of enterprises. Positioned itself as a one-stop provider of sustainable energy solutions, Foxwell Power is not merely a renewable energy supplier but a strategic advisor supporting corporate transitions toward net-zero emissions.

Market-leading certificates trading volume and strong corporate client base

In 2024, Foxwell Power ranked first nationwide in terms of renewable energy certificates (RECs) trading volume, with the total value of green electricity orders approaching NT$16 billion for the year. Its clientele includes major technology companies and financial institutions such as NVIDIA and Bank SinoPac, a testimony of the company's solid foundation of trust among corporate customers. Foxwell Power was also one of the earliest electricity retailers that introduces the innovative model of "green power trading trusts", to enhance contract performance assurance and financial transparency in the market.

From no-frills electricity retailing to multi-sector integration and creation of a value chain

Foxwell Power started as a green electricity trader and gradually evolved into a diversified platform operator covering electricity retailing, energy efficiency, energy storage, and carbon asset services. Centered on its electricity retail business, Foxwell Power has established 369 wheeling sites and assisted more than 65 enterprises across the technology, finance, and telecommunications sectors in procuring green electricity. As the leader in Taiwan in terms of scale of green electricity wheeling, the company's cumulative contract volume exceeds 3 billion kWh and total contract value surpasses NT$15.5 billion. With consecutive years of the highest trading volume of renewable energy certificates (RECs) and its designation as NVIDIA's sole green power supplier in Taiwan, Foxwell Power demonstrates strong execution capability and high market visibility.

▶ Energy storage and energy efficiency deployment

Foxwell Power is actively expanding its energy storage and energy efficiency businesses. To date, it has completed five energy storage projects with a combined capacity of 74.9 MW / 233.9 MWh, covering the full project lifecycle from site selection and permitting to construction, grid-connection and testing. In terms of energy efficiency, Foxwell has served over 21 sites and implemented deep retrofits that deliver electricity savings exceeding 975,000 kWh and carbon reductions of 487.7 metric tons per annum. These efforts are further aligned with government-led energy efficiency programs through equipment replacement and performance enhancement initiatives.

▶ Carbon credits and certification services

Its subsidiary, Settway Energy Technology, provides services including corporate carbon inventories, carbon verification, and carbon sink development to assist clients in building robust carbon management frameworks and strengthening ESG disclosure capabilities. These services are the extended use cases of carbon assets beyond renewable electricity.

Shrimp aquaculture solar projects as the innovation to broaden the diversity of green electricity resources and underpin the potential for product integration

▶ Challenges and go-forward strategies

In response to intensifying competition in the electricity retail market, volatility in battery prices for energy storage, and shortages of green-collar talent, Foxwell Power is expanding its supply chain through strategic alliances, promote industry–academia cooperation to attract talent, and enhance capital market visibility and attractiveness to talents via public listing. Looking ahead, the company plans to further develop cross-industry collaboration models and integrate electricity wheeling, contracting of outsourced operations, consulting, discretionary trading, and carbon credit services to build a major green power trading platform with economies of scale and system-balancing capabilities.

Source:

- **Liberty Times:** Bank SinoPac and Foxwell Power Sign Agreement Today to Introduce Green Power Trading Trusts.
- **RECCESSARY:** Helping Companies Save 50% Electricity Consumption by Identifying "Power-Hungry Monsters": Foxwell Power Launches In-Deep ESCO Energy-Saving Solutions.
- **RECCESSARY:** (Photo) Foxwell Power Goes Public: A Visual Guide to Its Energy Platform Strategy and Why NVIDIA Chose It.
- **Global Views Monthly:** Why Did NVIDIA Choose a Five-Year-Old Company as Its Green Power Supplier?
- **MoneyDJ:** Foxwell Power Tops Renewable Energy Certificate Volume in 2024

Serving Corporate Demand for Electricity: Star Exchange Integrates Wheeling Operations with Intelligent Green Power Systems

Focus on electricity wheeling operations and technology platform development

Star Exchange was established in August 2020 and obtained its renewable energy retail license in August 2021, with a paid-in capital of NTD 40 million. A wholly owned subsidiary of HD Renewable Energy (HDRE), Star Exchange builds on its parent company's strengths in green power development and smart energy technologies. Star Exchange focuses on services catering to corporate demand for electricity, develop intelligent power trading and wheeling frameworks, and leverage platform technologies to enhance data utilization and matching efficiency and support a variety of needs for green power procurement.

Materializing partnerships with large corporates and expanding multi-to-multi electricity wheeling scale

As of the end of 2024, Star Exchange's cumulative volume of wheeled green electricity exceeded 16.1 billion kWh and the contracted capacity surpassed 156 MW. The company operates more than 2,084 power wheeling sites and has issued a cumulative total of 99,392 renewable energy certificates. Its power wheeling track record spans industries including semiconductors, finance, telecommunications, and manufacturing. Key clients include MediaTek, ASE Group, Cathay Group, E.SUN Bank, CTBC Bank, Bank SinoPac, Taiwan Mobile, Shiseido Taiwan, and Taipei 101, etc. More recently, Star Exchange has partnered with the solar module manufacturer Motech and is scheduled to begin wheeling the green electricity generated with Motech modules to corporate customers in the second half of 2025. This supply accounts for approximately 15% of Star Exchange's externally sourced green power.

Integrating consulting, certification, wheeling and visualization management functions

Star Exchange provides enterprise customers with integrated green power solutions, covering procurement consulting, wheeling operations, T-REC certificate processing, and electricity usage data management. The company has developed the TITAN Smart Green Power System, which supports

electricity consumption visualization, load analysis, and scheduling simulation. In 2024, Star Exchange further launched two major platforms—Green Power Star Hub and Green Power Star Square by integrating AI technologies to enhance generation forecasting, cash flow management, and carbon reduction performance tracking. These platforms have enabled green power wheeling rates exceeding 90%.

Deepening platform applications and expanding project sites and overseas footprints

▶ Expanding overseas energy storage sites and strengthening international market presence

HD Renewable Energy (HDRE) is actively extending its international footprint. In partnership with TOKYO LIVABLE Inc. in Japan, the company is developing a 19.7 MW / 60.18 MWh extra-high-voltage energy storage project in Gunma Prefecture. This project has secured subsidies from the Tokyo Metropolitan Government and is scheduled to commence operations in 2028. In Australia, HDRE has established a joint venture, ZEBRE, with ZEN Energy. The venture has obtained the development permit for the Solar River project in South Australia, encompassing 210 MW of solar PV and 256 MW of energy storage. As this project has passed the foreign investment review for the target to develop a total of 1.4 GW in capacity, it has enhanced the group's international energy service capabilities and platform scalability.

▶ Promoting the industrialization of aquavoltaics and integrating green power with smart aquaculture

Through its subsidiary Star Aquaculture, HDRE has developed Riyun Fishery–Solar Symbiosis Project in Qigu District, Tainan. By 2023, the aquaculture area had reached 57 hectares, produced over 100,000 catties of aquatic products per annum (including approximately 27,000 mullet roe sliced pieces) and created a local economic value exceeding NT$ 10 million. The project incorporates AI-based water quality monitoring, automated feeding, and aquaculture control systems, achieving a mullet spawning rate of 70%, above industry averages. The group is currently scaling up its managed area for aquavoltaics to a target of 300 hectares, in order to showcase a diversified business model that integrates the use of renewable energy and aquaculture technologies.

Source:

- **MoneyDJ:** Interview with HD Renewable Energy (Part 1): Playing a Pivotal Role as Smart Power Company in Privatization of Green Electricity; Interview with HD Renewable Energy (Part 2): Development of VPPs on TITAN Platform to Enter the International Power Market.
- **United Daily:** Star Exchange and Taiwan Mobile Jointly Establish Green Energy Platform for Investments in Solar and Energy Storage Projects.
- **Commercial Times:** Expanding Green Power Deployment: Fubon Financial Holdings Signs Agreement with Star Exchange to Introduce 4.39 Million kWh of Green Electricity.
- **Knews:** Special Report on Photovoltaics: Part 3 | Agrivoltaic, Aquavoltaics and Shrimp Agriculture Solar: Building Momentum Against Bottlenecks in 2025.
- **Economic Daily:** HD Renewable Energy Receives Energy Storage Subsidies from Tokyo Metropolitan Government.
- Star Exchange Works with Motech to Wheel Green Electricity to Corporate Users in the Second Half of the Year.
- **United Daily:** Ruling Party Re-Elected in Australia; HD Renewable Energy's South Australian Project Approved for Development.

Centered on Many-to-Many Matching, Sunnyfounder Connects Distributed Power Sources with Corporate Demand

Early Bird in the Green Power Market, with a Focus on Demand Matching and Power Wheeling Operations

Sunnyfounder Inc. was established in November 2015 and obtained its renewable energy retail license in September 2019, the first license of its kind in Taiwan issued in accordance with the Electricity Act. With a paid-in capital of NT$20 million, the company has long been dedicated to power wheeling operations in the renewable energy market and aiming to build an open and flexible green power trading model.

Establishing a matching mechanism of a diversity of electricity sources for users

Sunnyfounder Inc. emphasizes the matching of diversified green power supply to meet demand through many-to-many pairing and standardized transaction processes. This approach enables enterprises to quickly procure green electricity and renewable energy certificates and lowers the entry barriers to purchase of green power. The company aggregates distributed small-scale generation projects and designs flexible procurement mechanisms tailored to SMEs and electricity users in the supply chain.

Wheeling electricity to over 100 users to date, with a focus on mid-sized customers and new market entrants

In 2024, Sunnyfounder assisted multiple manufacturers and companies in the service sector, including O'right and Phoenix Silicon International Corporation (PSI), in meeting RE100 commitments and supply-chain goals for carbon reduction. The company also partnered with Taipei Fubon Bank to launch a five-year group procurement program for green electricity and helped six companies to purchase 17 million kWh of green electricity in total. This initiative demonstrated Sunnyfounder's capability in organizing mid-sized group purchases and integrating distributed supply. In the following year, Sunnyfounder signed a 70 million kWh green power supply agreement with Unitech, a global leader in the

PCB industry for the sourcing of stable renewable energy going to its high-precision manufacturing processes and setting a key example of low-carbon transition in the PCB sector. To date, Sunnyfounder's cumulative wheeled volume of green electricity exceeds 300 million kWh and it has over 1,300 wheeling sites, serving technology, manufacturing, financial and telecommunication sectors. The company also pioneered a green electricity procurement platform for large companies and SMEs by offering packages ranging from tens of millions of kWh p.a. for mega users to small monthly plans of just hundreds of kWh. The standardized mechanism for green electricity transactions lowers the entry barriers for enterprises and provides a practical pathway for manufacturers toward net-zero emissions.

From early advocacy to platform-based implementation to continue lowering procurement barriers

In its early days, Sunnyfounder promoted the concept of "citizen power plants" for the public's involvement in energy issues. Following its business transformation, the company shifted its focus to green power trading platform development and user-side data analytics. Compared with developers oriented toward large-scale projects, Sunnyfounder emphasizes its service as an integrator of distributed resources, enabling many-to-many matching, cultivating SME green power users, and gradually building a flexible distribution network for green power.

Source:

- **RECCESSARY:** From Citizen Power Plants to Green Power Trading: How Sunnyfounder Won Over Hundreds of Clients Through Precise Power Analysis.
- **Economic Daily:** The Missing Piece of SMEs' Transition to ESG/Sustainability: Sunnyfounder as a Green Power Bridge.
- **RECCESSARY:** A New Paradigm for Group Green Power Procurement! Sunnyfounder and Taipei Fubon Bank Help Six Companies Purchase 17 Million kWh Over Five Years.

Integrating Green Power Trading with Aggregation and Discretionary Trading: Energy Helper Develops a Platform-Based Power Service Model

Focus on power trading applications and integrated corporate procurement services

Energy Helper TCC Corporation was established in August 2022 and obtained its renewable energy retail license in October of the same year, with a paid-in capital of NT$100 million. The company is a wholly owned subsidiary of the Taiwan Cement Corporation (TCC) Group and serves as the group's operational platform for power trading and energy management by leveraging TCC's broader footprint in renewable energy, energy storage, and international carbon finance.

Green electricity wheeling, platform operations, aggregation and discretionary trading

Energy Helper adopts a business diversification strategy. In addition to providing the essential services for green power procurement and T-RECs, the company also offers discretionary trading services on electricity trading platforms, consultation to corporates in terms of electricity usage allocations and aggregated wheeling mechanisms. Its platform integrates asset management functions for electricity generation and energy storage and enhances customer flexibility and responsiveness when in participating in electricity markets.

Building a track record by serving multinational brands and meeting demand from a diversity of electricity users

Shortly after its establishment, Energy Helper completed green power supply partnerships with companies such as Acer and Decathlon, and further extended services to their local supply chains in Taiwan. This demonstrates the company's capabilities in multi-party matching and transactions coordination. Currently, the platform is anchored in medium- to long-term supply stability and leverages the group's energy storage assets to gradually expand transaction volumes and power wheeling scale.

Building a complete energy system from storage products to trading platforms

▶ Deepening vertical integration by combining energy storage equipment, EPC delivery, and platform-based trading

The TCC Group integrates its energy subsidiaries—including Energy Helper, New HOrizons Ahead, and TCC Green Energy—to build a complete value chain spanning power generation, energy storage, and electricity trading. Energy Helper participates in all operational segments of Taipower's electricity trading platform, including regulation reserve (s-Reg, d-Reg, E-dReg), real-time reserve, and supplemental reserve services, demonstrating its trading and dispatch capabilities. The parent company, Taiwan Cement Corporation (TCC), has deployed and grid-connected its E-dReg energy storage system, the largest in Taiwan with a capacity of 100 MW (311 MWh). TCC has also developed its proprietary EnergyArk UHPC energy storage container, featuring fire resistance, explosion protection, water-based fire suppression, and modular configuration. The EnergyArk system was unveiled at Energy Week and CES 2024, making TCC the only domestic company capable of producing both concrete-based and metal-based energy storage containers.

▶ Advancing charging-and-storage integration, international business models and variety of service sites

New Horizons Ahead has partnered with Volkswagen Taiwan to deploy EnergyArk systems at 14 EV charging stations to store energy off-peak and discharge at peak. Each site is expected to reduce carbon emissions by more than 40 metric tons of CO_2 p.a. These projects are also integrated with Energy Helper's participation in Taipower's ancillary services market and can showcase the group's synergies. To expand overseas operations, TCC plans to deploy 70 energy storage units across Southern Europe, operated by its Italian subsidiary NHOA. The purpose is to make inroads into the European energy storage market by focusing on EV charging stations and replicating the business model of charging-and-storage integration.

Source:

- **Central News Agency:** Energy Helper, a Member of TCC Group, Sells Green Electricity to Acer by Supplying Tens of Millions of kWh Annually.
- **Wealth Magazine:** Two Major Breakthroughs in TCC's New Energy Strategy! Taiwan's Largest 100 MW Storage System Connected to Grids. EnergyArk UHPC Storage Debuts.
- **Economic Daily:** What Is TCC Up to in Energy Storage and Low-Carbon Cement? Four Key Strategies Behind Its Transformation from a Muddy Doll to a Green Giant.
- **Central News Agency:** New HOrizons Ahead and Volkswagen Announce Charging-and-Storage Partnership, Cutting 40 Tons of CO2 per Station Annually.
- **Economic Daily:** TCC's Latest Annual Report: New Breakthroughs in Carbon Reductions and Green Energy in Taiwan, China, and Europe.

Centered on Eco-friendly Rooftop Green Power: Mr. Watt Integrates Parent Company's Assetsand Data Platform to Expand Corporate Green Power Procurement and Diversified Energy Solutions

Focusing on Rooftop Asset Foundation and Distributed Energy Operations

Mr. Watt was established in 2018 and obtained its renewable energy retail license at the end of 2019, making it one of the early market participants during the initial phase of green electricity liberalization in Taiwan. The company is part of the TREA Group, leveraging the group's rooftop solar photovoltaic assets as its primary source of green electricity. By combining power generation development with electricity retail trading services, it forms an integrated framework with a clear division of labor between generation and retail.

As of the end of 2025, its parent company TREA Carbon-Gold (formerly TREA Holding) has achieved a cumulative installed capacity of 160 MWp in rooftop solar photovoltaics, with an estimated annual generation of approximately 200 million kWh of green electricity. The TREA system emphasizes a low-environmental-impact, rooftop-based distributed energy model and has introduced the ISO 27001 information security management system (certified in 2025), integrating green electricity asset management and data governance into its long-term operational framework.

Achieving Multiple Market "Firsts" to Establish the Trading Foundation of a Green Electricity Wholesaler

TMr. Watt positions itself as a green electricity "wholesaler," off-taking green electricity from the generation side and wheeling it to corporate users through Taipower's grid, providing green electricity procurement services that bundle electricity and certificates.

In May 2020, it completed Taiwan's "first kWh" green electricity transaction, wheeling green electricity to TCI Co., Ltd. and E Ink Holdings. In October of the same year, it completed the first "green electricity wheeling case for a commercial office building," supplying L'Oréal Taiwan's office in Taipei 101 and assisting it in achieving 100% green electricity usage in the first quarter of 2021. According to public data in 2026, Mr. Watt has secured orders for over 3 billion kWh of green electricity over the next 20 years, reflecting its market expansion achievements following the opening of sales for Type II and Type III rooftop power plants at the end of 2023.

Combining Forecasting Systems with RE100 Support to Strengthen Corporate Green Electricity Allocation Capabilities

Mr. Watt combines the technical capabilities of the group's subsidiary Chunhe Technology to introduce the green electricity management platform "RE100 Tracker." This platform integrates generation forecasting, load analysis, and wheeling tracking mechanisms, helping enterprises grasp their electricity procurement and consumption structure in real time.

Through digitalized management and wheeling optimization, it enhances the efficiency of green electricity allocation and supports enterprises in planning their RE100 target pathways and mid-to-long-term energy transition strategies.

Building an Integrated Framework of Generation × Trading × Technology to Expand Diverse Energy Applications

▶ Combining generation assets with trading services to form a vertically integrated model

Since 2019, the TREA system has promoted a division of labor between the generation and retail sides. Its subsidiary Shenghe Energy is responsible for power plant development and management, while Mr. Watt oversees market trading and corporate electricity end-user services. In 2020, it brought in investors including Japan's SB Energy (under the SoftBank Group), TransGlobe Life Insurance, China Life Insurance (Taiwan), and SinoPac Venture Capital to jointly invest in a rooftop PV development platform. With a target to develop 100 MW of capacity within three years, this move strengthened its asset expansion and financing capabilities.

▶ Extending hydrogen energy and ESG solutions to expand energy service areas

Starting in 2025, Mr. Watt has partnered with the US-based Amogy to evaluate the application potential of "ammonia-to-hydrogen power generation," exploring complementary solutions for the intermittency of renewable energy and enhancing corporate energy allocation flexibility.

Simultaneously, it is promoting the "E+S Sustainability Solution," which combines green electricity procurement with local agriculture and social action design to form a service model that balances energy carbon reduction with social value, gradually expanding the cooperation scope of the green energy ecosystem.

Source:

- **Environmental Information Center:** [2020 Green Electricity Battle] Major Breakthrough: Mr. Watt Completes Taiwan's First Green Electricity Transaction for a Newly Built Power Plant.
- **CSR@Commonwealth:** The First kWh of Green Electricity, the First Commercial Green Electricity: The Youngest Green Electricity Wholesaler, Mr. Watt, Ensures You Can Buy Green Electricity Even Through Thick and Thin | U20 Reversing the Climate Crisis.
- **Economic Daily News:** Mr. Watt Upgrades Green Electricity Cooperation, Launching Green Energy Ecosystem.
- **Economic Daily News:** TREA Carbon-Gold Deepens Rooftop PV Presence, Accumulating 160 MW Track Record.

Bulk Purchase and Distribution of Offshore Wind Power: Taiwan Smart Electricity & Energy Helps Corporates to Access Large-Scale Green Power

A quasi–state-owned establishment creates a new model for offshore wind power procurement

Taiwan Smart Electricity & Energy Co., Ltd. was founded in 2024 with investments from state-owned enterprises and private-sector companies. It is one of the few electricity retailers in Taiwan currently with offshore wind power as its core supply source. Taiwan Smart Electricity & Energy was established to lower the barriers for corporate procurement of offshore wind power and help companies meet crucial requirements from international supply chains for renewable energy and low-carbon electricity. In contrast with most retailers that focus primarily on solar PV, Taiwan Smart Electricity & Energy is unique and representative in the green power market in Taiwan because it specializes in aggregating and supplying electricity from large-scale offshore wind farms.

Aggregating and redistribution of offshore wind power to supply to corporates and provide flexible green power packages

Taiwan Smart Electricity & Energy operates on a "bulk purchase + redistribution" model. The company first signs large-scale corporate power purchase agreements (CPPAs) with offshore wind developers to secure stable, high-volume green power supply and then subdivides this capacity into contracts or supply blocks tailored to different corporate needs. This reduces barriers that companies face in relation to financial scale, credit rating requirements, and long contract tenors when signing contracts directly with large wind farms.

The green power offerings from Taiwan Smart Electricity & Energy are relatively flexible, including mid-term contracts, small procurement volumes, and bundled T-REC certificates. These products enable export-oriented enterprises to rapidly increase their share of renewable energy consumption within a short timeframe.

Progress in offshore wind power wheeling and gradual expansion of supply volumes

- Signing of CPPAs with large-scale offshore wind farms: Taiwan Smart Electricity & Energy has finalized cooperation agreements with multiple domestic and international offshore wind developers, including European multinational energy groups, to ensure long-term supply stability.

- Expansion of redistribution and marketing capability: Subdivision of supply capacities and enabling of flexible allocations make offshore wind procurement, once accessible only to large corporations, now available to a broader range of enterprises.

- Support the supply chain demand for green power: Offshore wind power makes a significant contribution to RE100 commitments, carbon footprint management, and supply-chain carbon reduction. It is one of the most important sources of high-quality green power for enterprises today.

Lowering procurement barriers for corporates and meeting international requirements for carbon reduction

- Reduced entry barriers: The easing of burden associated with long-term contracts and large project thresholds aims to assist companies without international credit ratings or with insufficient electricity demand to access offshore wind power.

- Flexible purchase contracts: In contrast with traditional 20–25 year CPPAs, Taiwan Smart Electricity & Energy offers mid-term contracts and smaller purchase volumes that better align with energy planning needs of most companies.

- Support for ESG and supply-chain sustainability: Procurement of offshore wind power helps enterprises strengthen compliance with sustainability standards such as RE100, net-zero targets, and global supply-chain audits.

Gradually building the platform's role in offshore wind power trading and strengthening the green electricity supply structure in Taiwan

Taiwan Smart Electricity & Energy operates as an essential bridge between offshore wind suppliers and corporate electricity users. On the supply side, it helps wind farms establish stable offtakes, which supports project financing and future development. On the demand side, it enables enterprises to enter the offshore wind market with lower thresholds and greater flexibility. In a market currently dominated by solar PV supply, this model introduces another vital source of renewable energy and enhances the diversity of green power supply structure.

2025 Top Ten Resellers Measured by No. of TRECs Associated with Direct Supply and Wheeling

Renewable energy retailer	Solar PV	Hydro	Wind	Total No. of TRECs	Rank
Greenet Co., Ltd.	184,541	0	0	184,541	1
Foxwell Power Co., Ltd.	119,450	0	31,540	150,990	2
TCC Green Energy Corporation	43,762	26,610	62,375	132,747	3
Sustainable Energy Solution Co., Ltd.	87,984	0	0	87,984	4
Sunnyfounder	70,690	1,559	0	72,249	5
Star Trade Co., Ltd.	64,069	0	0	64,069	6
Anneal Energy	51,059	0	0	51,059	7
Natural Power Company Ltd.	49,329	175	0	49,504	8
Pau Fu Energy Corp.	43,886	0	0	43,886	9
Energy Helper TCC Corporation	2,852	0	35,531	38,383	10
Total	717,622	28,344	129,446	875,412	-

Source：POXA ENERGY

Top Ten Resellers to Date Measured by No. of TRECs Associated with Direct Supply and Wheeling					
Renewable energy retailer	Solar PV	Hydro	Wind	Total No. of TRECs	Rank
TCC Green Energy Corporation	103,979	79,002	575,440	785,421	3
Foxwell Power Co., Ltd.	336,698	0	219,462	556,160	4
Greenet Co., Ltd.	412,800	0	0	0	5
Star Trade Co., Ltd.	186,187	0	0	186,187	6
Sunnyfounder	168,452	1,983	0	170,435	7
Sustainable Energy Solution Co., Ltd.	134,821	0	0	134,821	8
Hualien Green Energy	0	128,241	0	128,241	9
Energy Helper TCC Corporation	6,604	0	95,060	101,664	10
Bo Yao Power Co., Ltd.	79,177	0	0	79,177	-
Natural Power Company Ltd.	73,749	316	0	74,065	
Total	1,502,467	209,542	889,962	2,601,971	

Source：POXA ENERGY

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近年，本所持續投入台灣再生能源市場及綠電交易制度研究，參與經濟部再生能源相關研究計畫，就綠電交易、儲能配套、再生能源市場制度及新興能源發展議題提供政策研析與決策支援；同時亦為在台企業提供綠電交易制度專業顧問服務，協助企業分析綠電採購路徑、制度限制及履約風險，提出具體可行之調適建議與政策溝通方向。

我們相信，能源轉型從來不只是技術或價格的問題，更是制度理解、市場判讀與長期規劃能力的競賽。科技法律研究所將持續透過研究分析、政策觀察與市場資訊整合，協助各界在快速變動的綠電市場中，看見制度脈絡，掌握轉型先機。

專業團隊 Professional team

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GUIDE TO TAIWAN GREEN ELECTRICITY MARKET

台灣綠電市場手冊

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