

MARKET SPOTLIGHT: CHINA



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Wednesday, 30 April 9:00-10:00 AM



**Renewable Energy
Markets™ Asia 2025**

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Commodity Insights

Market Spotlight: China

Understanding China's GEC and I-REC policies and markets

Rachel Tan/ Energy Transition
Associate Price Reporter

30 April 2025



Agenda

- Platts existing I-RECs and EACs coverage
- *Heards* and information collection
- China's EAC policy timeline
- I-REC vs GEC differences
- China I-RECs statistics and price ranges
- Comparison between I-RECs and GEC issuance figures and prices
- GEC trading volume and price ranges

Our existing I-REC assessments

| | Biomass | Hydro | Solar | Wind | Units | Timing |
|-----------------------------------|---------|-------|-------|------|---------------------------|---------------------------|
| India | | ✓ | ✓ | ✓ | INR/MWh, USD/MWh, Eur/MWh | 4:30 pm Malaysia close |
| Malaysia | ✓ | ✓ | ✓ | | USD/MWh | 4:30 pm Malaysia close |
| Vietnam | ✓ | ✓ | ✓ | ✓ | USD/MWh | 4:30 pm Malaysia close |
| Thailand | ✓ | ✓ | ✓ | | THB/MWh, USD/MWh | 4:30 pm Malaysia close |
| Singapore* (wef Jan 27) | | | ✓ | | SGD/MWh | 4:30 pm Singapore close |
| Brazil | ✓ | ✓ | ✓ | ✓ | BRL/MWh, USD/MWh, Eur/MWh | 3:30 pm Mexico City close |
| Chile | ✓ | ✓ | ✓ | ✓ | CLP/MWh, USD/MWh, Eur/MWh | 3:30 pm Mexico city close |
| Mexico | ✓ | ✓ | ✓ | ✓ | MXN/MWh, USD/MWh, Eur/MWh | 3:30 pm Mexico City close |
| Turkey | ✓ | ✓ | ✓ | ✓ | Eur/MWh, USD/MWh | 4:30 pm London close |
| Saudi Arabia* (wef Jan 27) | | | ✓ | | USD/MWh | 4:30 pm London close |

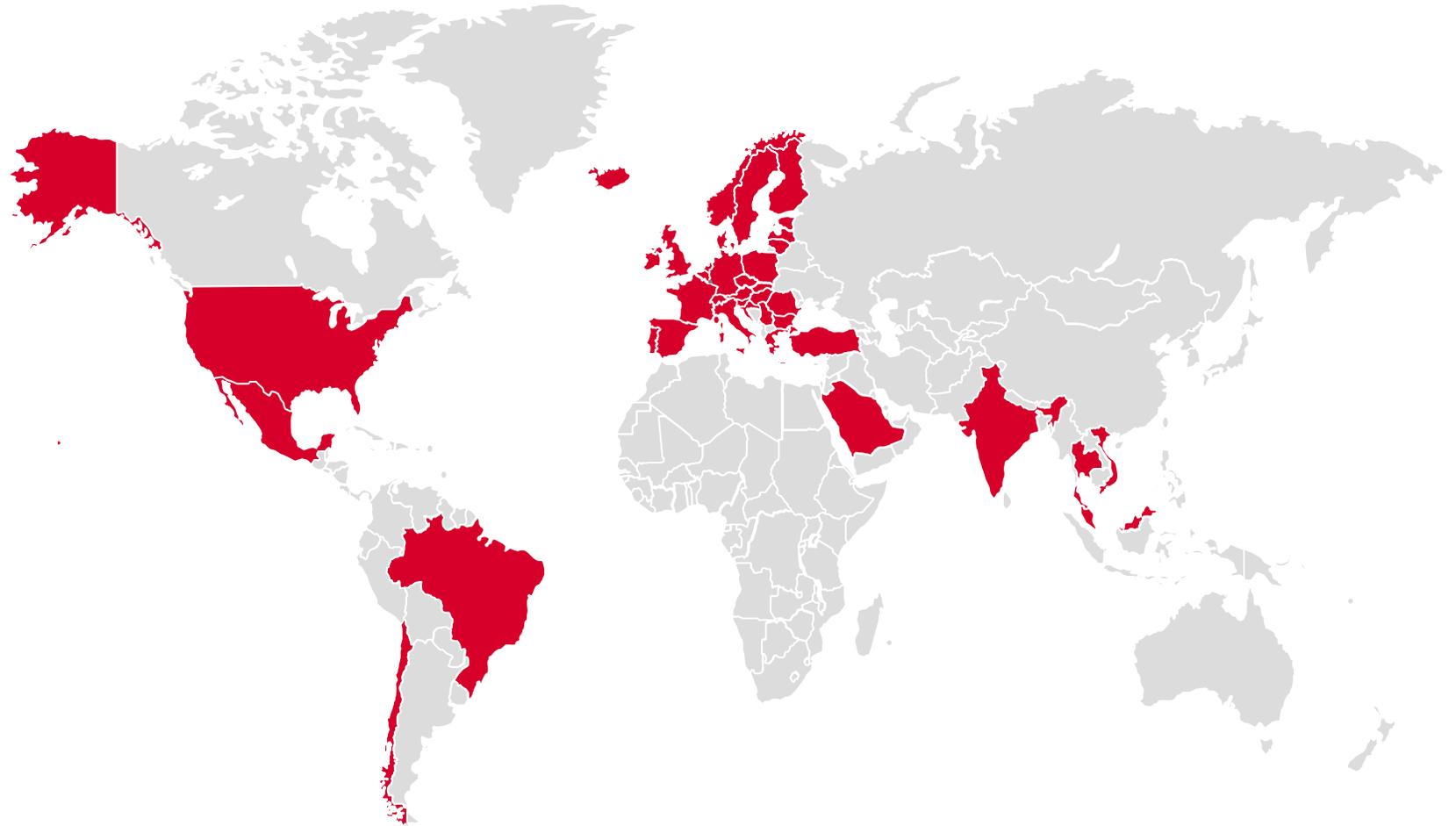
Platts' RECs Pricing Coverage

UK REGOs: Daily assessments for non-bio and biomass for current Compliance Period up to CP +2.

European GOs: Daily assessments for: Nordic Hydro (2025 to 2029), EU Wind, EU Biomass, EU Solar.

I-RECs: Daily assessments for: Brazil, Turkey, Chile, Mexico, Malaysia, Vietnam, Thailand, Singapore, Saudi Arabia and India.

US RECs and Emissions-Adjusted US RECs:
Weekly price assessments. EA RECs incorporating RESurety data.



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'Heards' Provide Granular Information in an Emerging Market

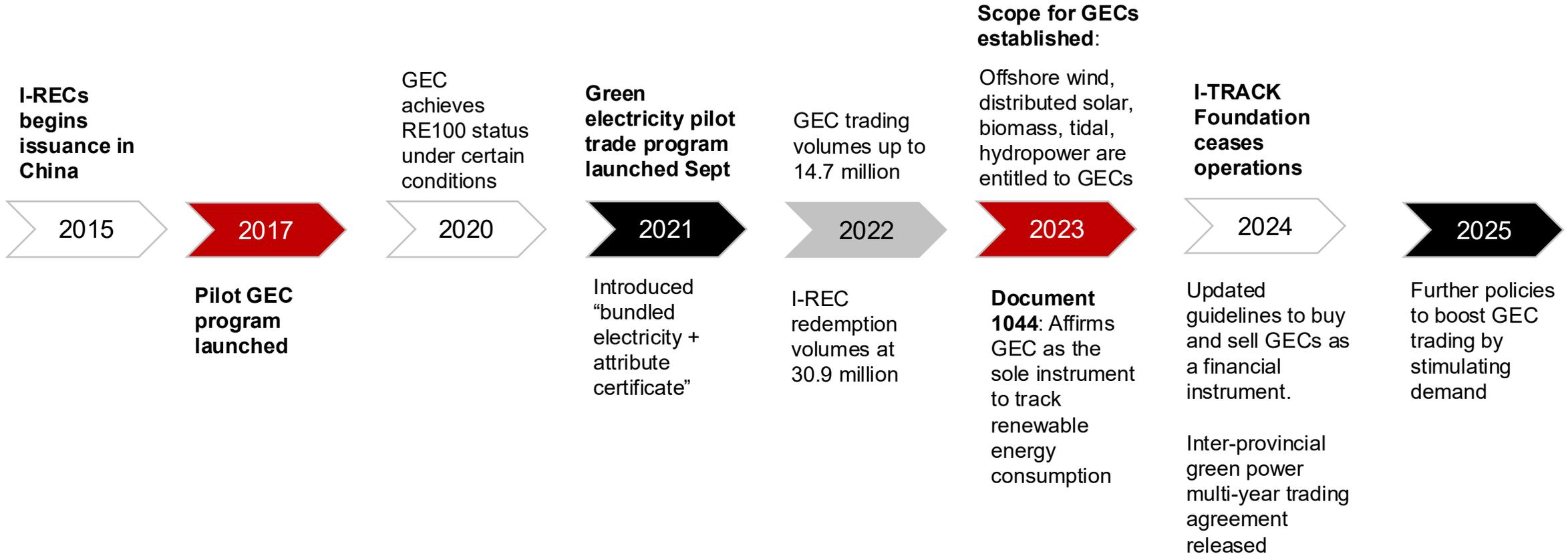
Platts Renewable Energy Certificates:
GEC China: Broker reports **Wind/Solar, 2026, Offer** at USD1.10/MWh for 200,000 MWh;

Platts Energy Attribute Certificates: China
GEC: Trader reports **wind/solar 2025 offer** range at Yuan4.50-6.00/MWh ;

Platts Renewable Energy Certificates: China
I-REC: Trader reports **wind/solar 2024 trade** at \$0.30/MWh for 2,300 MWh ;

Platts Renewable Energy Certificates: China
GEC: Trader reports **Wind/Solar 2024 bid at Yuan0.85/MWh** for 3,870,000 MWh [Delivery time: 21 Mar.; Geographical requirements: outside Guangdong province; Exchange platform: Guangzhou Power Exchange Centre]

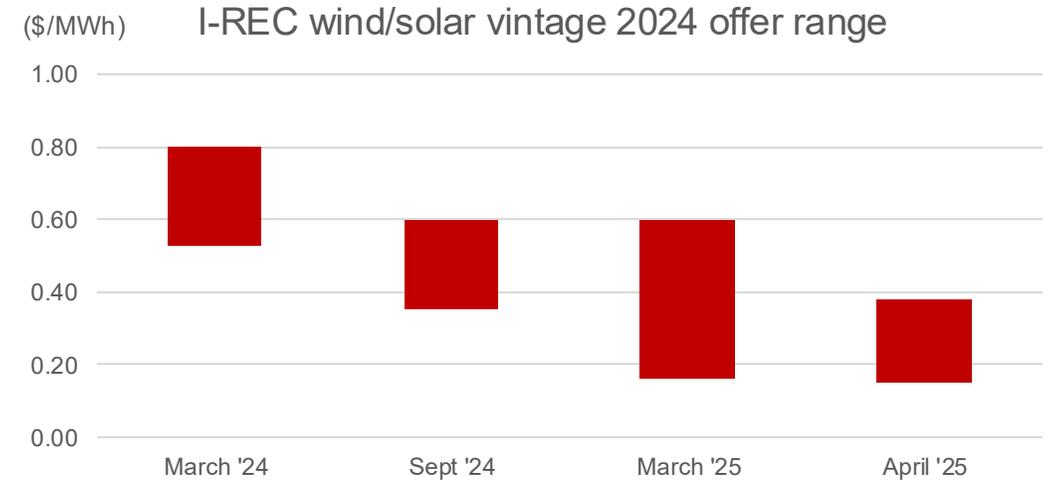
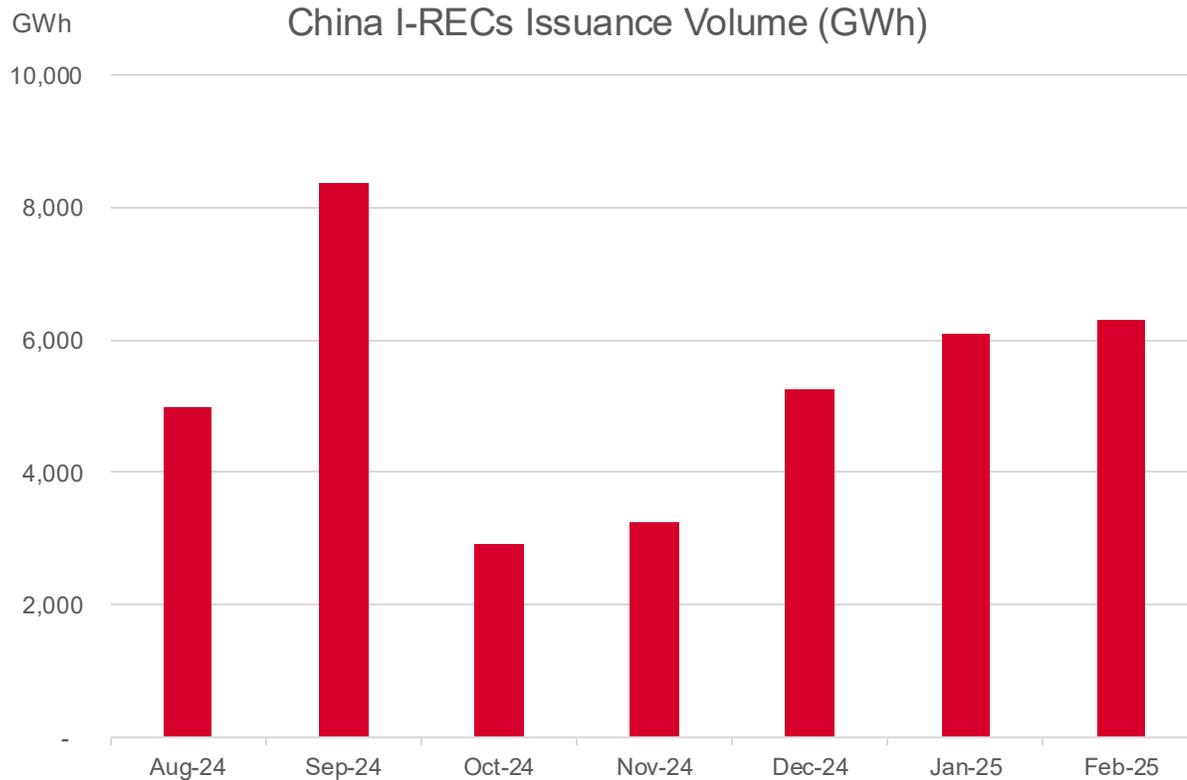
The NEA has established and promoted the domestic GECs system in past years, regulations are still developing



EAC market in China: GECs and I-RECs comparison

| | GECs | I-RECs |
|------------------------------------|---|----------------------------------|
| Issuing authority | China National Energy Administration | I-TRACK Foundation |
| Technology supported | All technologies, except hydropower plants built before 2023 | All technologies accepted |
| Trading restrictions | Can only be traded once | Can be traded several times |
| International Certification | RE100, CDP | RE100, CDP, SBTi |
| Transactions | State and/or regional power exchange platforms and GEC platform | Traded OTC |
| RPS compliant | Yes | No |
| Vintages | All vintages still available (two-year validity) | Vintage 2024 as the last vintage |

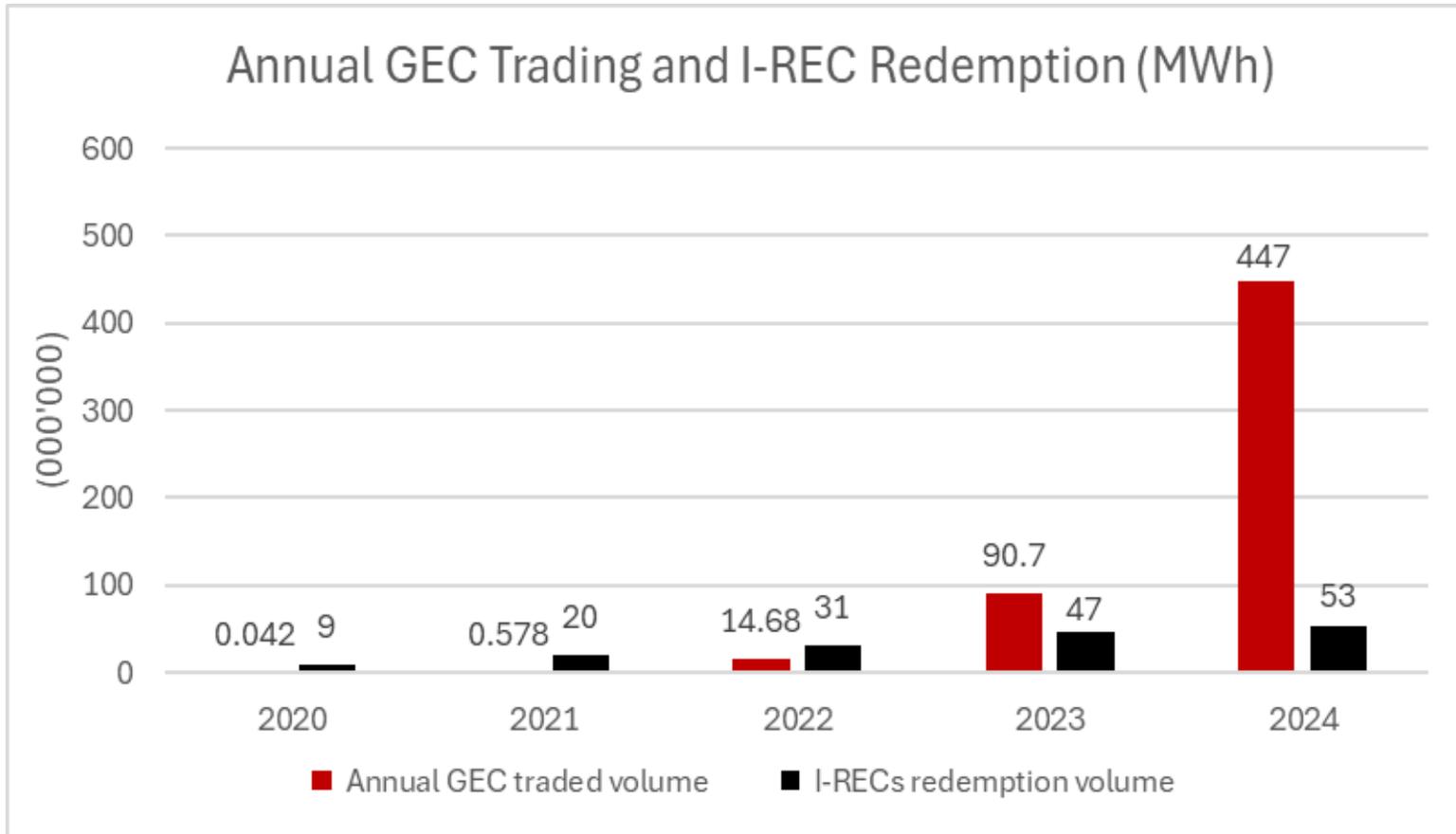
I-RECs issuance in 2024 down 33% from 2023, due to local policy changes



- Total issuance for 2024 at 53.8 TWh, hydro I-RECs leading issuance figures
- YOY decline in issuances for all technologies
- Interest for I-RECs still lingers despite China's new EAC policy implementation.
- Supply is depleting, prices are relatively stable at \$0.30/MWh

Source: I-TRACK Foundation, S&P Global Commodity Insights

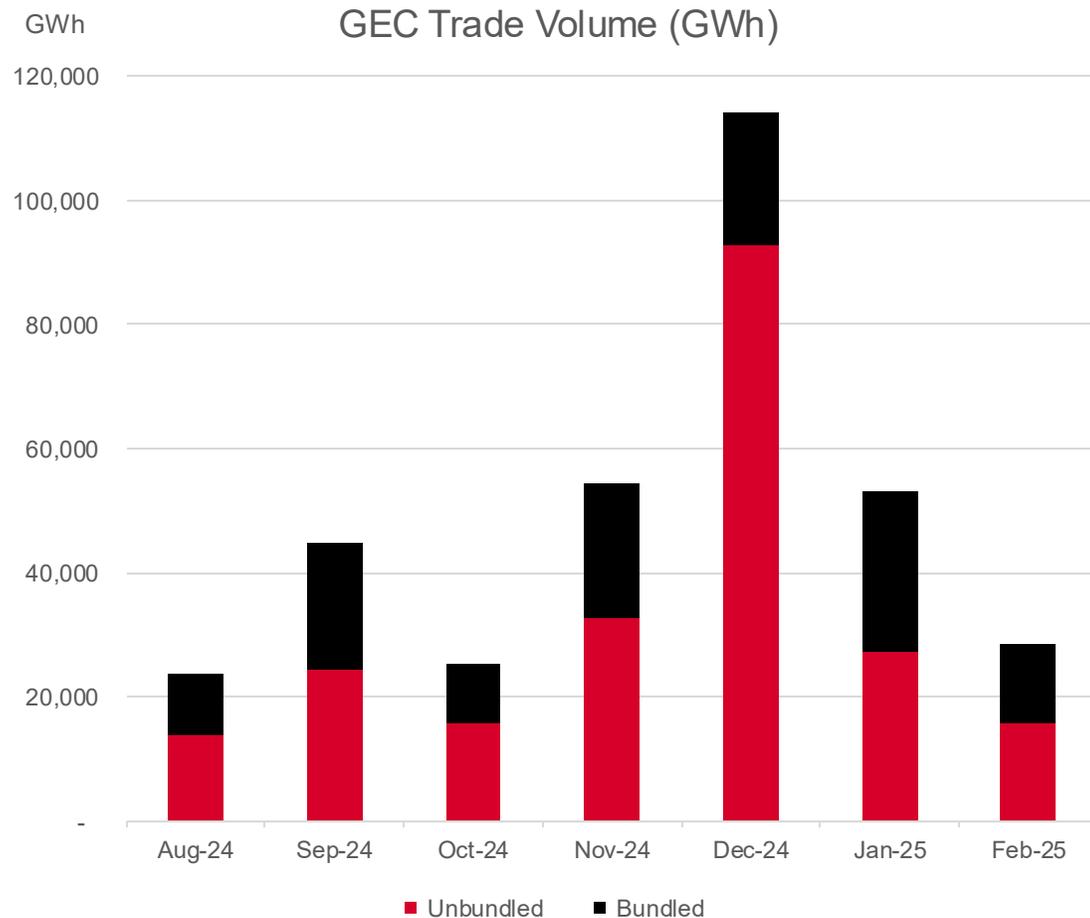
Transition towards GECs: 2024 sees a 419% YOY increase in traded volume



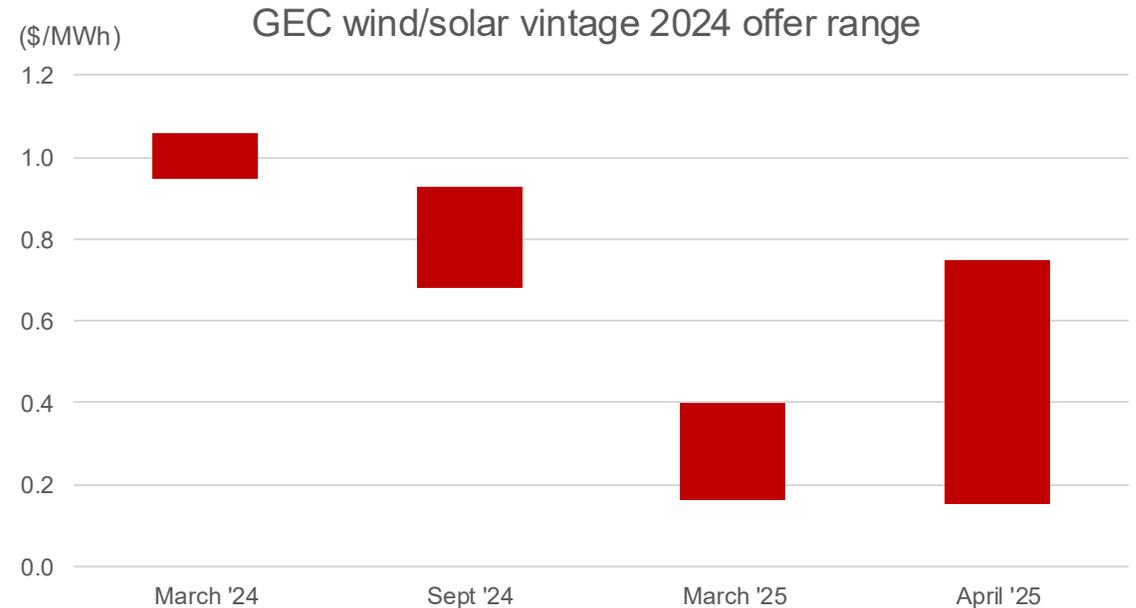
- In 2024, GEC trading volumes were at 447 million, while I-RECs redemptions were at 53 million.
- A total of 4.7 billion GECs were issued in 2024. 183 million GECs were issued in 2023.
- I-RECs redemption in Q4 totaled to 11TWh, despite a 6TWh decline across technologies, lowering annual growth.
- Preference in wind/solar technologies were seen for both certificates.

Source: NEA and I-TRACK Foundation

China's GEC trading reaches 447 TWh in 2024, offer range narrows as policies push corporates to purchase GECs



Source: NEA



Average offer levels for GECs

- International traders: \$0.50 - 0.70/MWh
- Local traders: \$0.31 - 0.42/MWh

Contact us:

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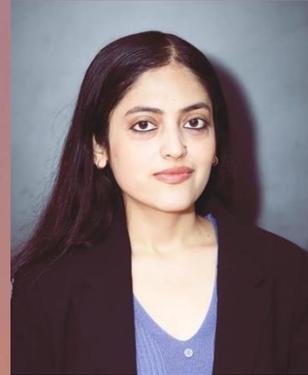
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Spotlight on China

REM Asia 2025

China RE Procurement Options

China RE Procurement Options

Typically cost saving solutions

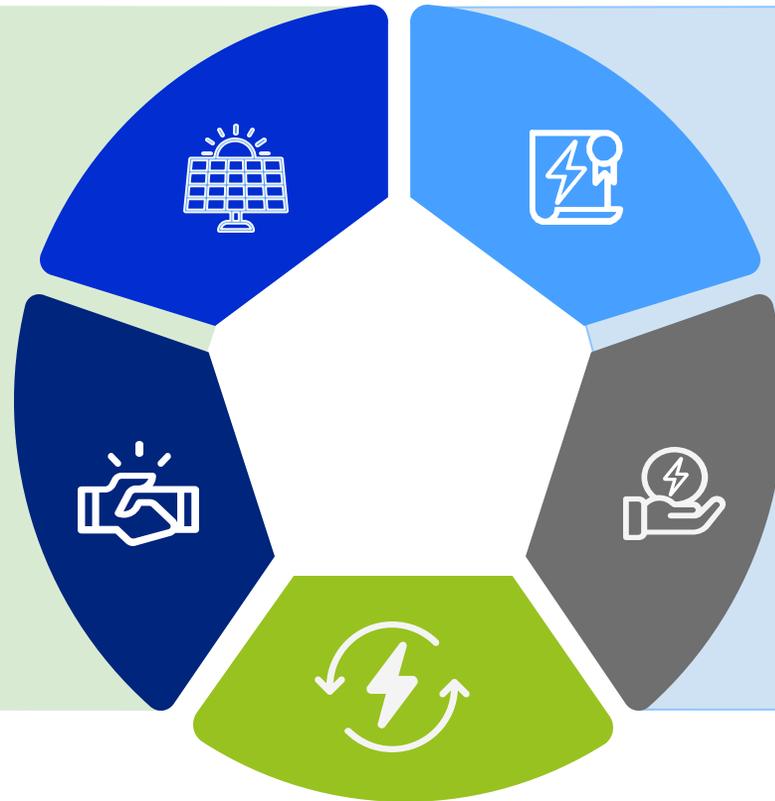
Onsite renewable

Various investment models are available in China, including **CAPEX** (self-financed) and **OPEX** (third-party financed).

Power purchase agreements (PPAs)

Only physical PPAs are available in China and these are transacted under the Green Power Trading programme.*

Virtual PPAs are not currently **available** in China.



Unbundled energy attribute certificates (EACs)

- Green Energy Certificates (**GECs**),
- International Renewable Energy Certificates (**I-RECs**) - *Phasing out after March 2025*

Green Tariffs

Green Tariffs is not available in China.

Typically cost premium solutions



National guideline and provincial trading rules

Regulatory structure of Green Power Trading

National policy

- **'Reply on the Pilot Work Plan for Green Electricity Trading'** by the **National Development and Reform Commission** and the **National Energy Administration**
《国家发展改革委员会 国家能源局关于绿色电力交易试点工作方案的复函》

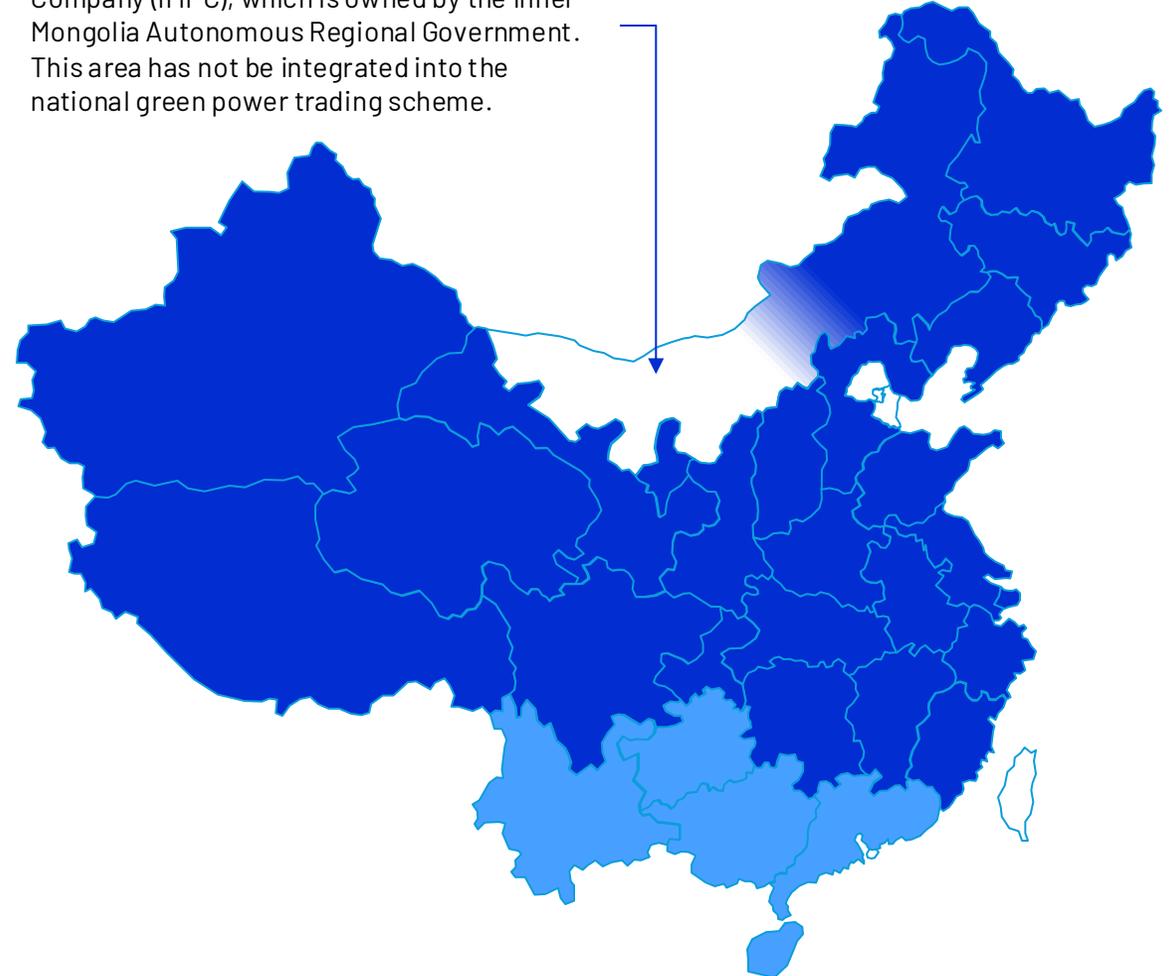
State grid/Southern grid (regional policy)

- **'BPX Green Electricity Trading Rules'** by **Beijing Power Exchange Center (BPX)** for state grid areas
《北京电力交易中心绿色电力交易实施细则》
- **'Southern Region Green Electricity Trading Rules (Pilot)'** by **Guangzhou Power Exchange Center (GZPEC)** for Southern grid areas
《南方区域绿色电力交易规则（试行）》

Provincial policy

- **'Provincial Mid-to-Long-term (M2L) Electricity Trading Rules'** by **Provincial Development and Reform Commission/energy bureaus**
《xx省电力中长期交易规则》
- **'Provincial Green Electricity Trading Rules'** by **PX**
《xx省可再生能源交易规则》

West Inner Mongolia Region is governed and operated by the Inner Mongolia Power Company (IMPC), which is owned by the Inner Mongolia Autonomous Regional Government. This area has not be integrated into the national green power trading scheme.



Introduction of commercial procurement options in China

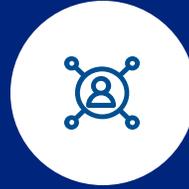
- **Non-market-based Trading:**
 - Grid-representation

- **Market-based Trading:**
 - Wholesale trading,
 - Retail trading

Note:

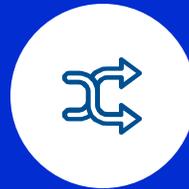
- Commercial power users can only participate in green power trading to acquire bundled RECs **through Market-based Trading.**

- According to the *"RE100 TECHNICAL CRITERIA (Dec. 12, 2022)"*: "Corporate buyers sourcing renewable electricity through M2L contracts are not contracting with generators themselves. They must report their procurement as **project-specific contracts with electricity suppliers**. The procurement must not be reported as a form of power purchase agreement, because there is no direct contracting with generators."



Grid-rep trading 电网企业代理购电

Non-market-based Trading is **direct procurement from the provincial grid company**



Wholesale trading 电力批发交易

Market-based Trading is based on the **provincial M2L Electricity Trading Rules**

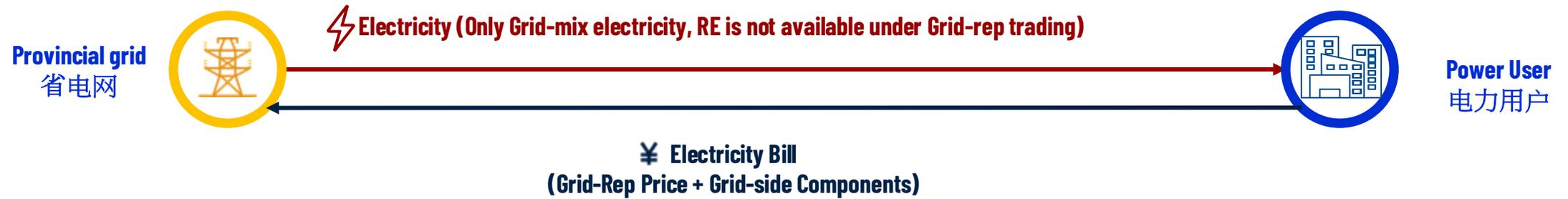


Retail trading 电力零售交易

Market-based Trading is based on the **provincial M2L Electricity Trading Rules**

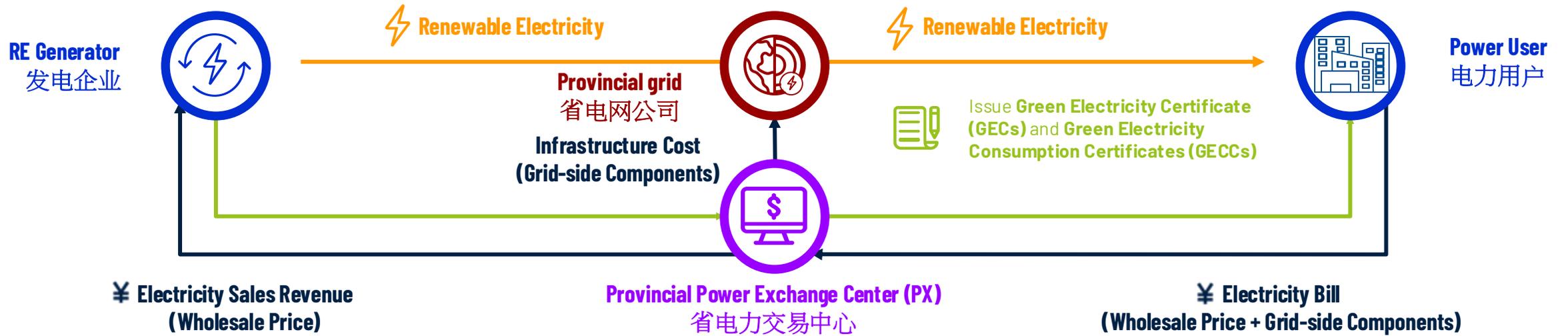


Grid-rep trading 电网企业代理购电



| Attribution | Availability | Note |
|-----------------------------|--------------|---|
| Annual Procurement Contract | ✔ | Direct procurement from the provincial grid company |
| Multi-year Transaction | ✘ | Grid-Rep only support annual transaction |
| Grid-Mixed Electricity | ✔ | Power users can only source Grid-Mixed Electricity through grid-rep trading, so both renewable electricity and bundled EACs are unavailable |
| Renewable Electricity | ✘ | |
| Bundled EACs (GECs) | ✘ | |
| Unbundled EACs (GECs) | ● | Power users can procure unbundled EACs to match their annual consumption volume |
| Fixed Rate | ✘ | Nominated rate announced monthly by the provincial grid company |
| Floating Rate | ✔ | |

Wholesale trading 电力批发交易



| Attribution | Availability | Note |
|-----------------------------|--------------|--|
| Annual Procurement Contract | ✔ | Between RE Generator and Power Users |
| Multi-year Transaction | ✔ | |
| Grid-Mixed Electricity | ✔ | Wholesale trading is usually tied to a single coal-fire or RE project by matching the generation volume with the consumption volumes |
| Renewable Electricity | ✔ | |
| Bundled EACs (GECs) | ✔ | Streamline issuance and delivery of bundled GECs through PX transaction according to the annual Procurement Contract |
| Unbundled EACs (GECs) | ● | Volume deviation has to be handled through spot market or contract exchange (合同划转) with other PSCs or wholesale power users |
| Fixed Rate | ✔ | Pricing mechanism determined through bilateral negotiation in compliance with the provincial trading rules |
| Floating Rate | ✔ | |

Retail trading 电力零售交易



| Attribution | Availability | Note |
|-----------------------------|--------------|--|
| Annual Procurement Contract | ✓ | Between PSCs and Power Users |
| Multi-year PPA | ✓ | |
| Grid-Mixed Electricity | ✓ | Wholesale trading is usually tied to a single coal-fire or RE project by matching the generation volume with the consumption volumes |
| Renewable Electricity | ✓ | |
| Bundled EACs (GECs) | ✓ | Streamline issuance and delivery of bundled GECs through PX transaction according to the annual Procurement Contract |
| Unbundled EACs (GECs) | ✓ | Volume deviation has to be handled through spot market or contract exchange (合同划转) with other PSCs or wholesale power users |
| Fixed Rate | ✓ | Pricing mechanism determined through bilateral negotiation in compliance with the provincial trading rules |
| Floating Rate | ✓ | |

Streamline issuance and delivery of bundled GECs



Bundled certificates come with GPT?



GECCs (Green Electricity Consumption Certificates) issued by RPX (Regional Power Exchange Center, i.e. BPX & GZPEC)



GECs (Green Electricity Certificates) issued by NREIMC (National RE Information Management Center)

Experience in PPA with clients and implementation



Supporting Philips to contract a PPA in China under Green Power Trading

Background: Philips, a global leader in health technology, has committed to reducing its carbon footprint and transitioning to 100% renewable electricity across its global operations. To achieve this goal for its Suzhou facility in Jiangsu province, China, Philips partnered with South Pole to secure a long-term PPA.

Challenge: The Chinese power market is complex with regulations varying across provinces. Each province has specific trading rules, buyer offtaker requirements as well as price and market liquidity.

How we're helping: South Pole supported Philips by first assessing feasibility of contracting PPAs across provinces, identifying the most attractive one. Subsequently, South Pole managed an end-to-end RFP which included business case analysis and contract negotiation. This process led to successfully signing a **5-year agreement** with a power sales company (PSC) to supply **48,000 MWh** per year from a solar-PV system in Jiangsu province. Our support ensured that the PPA met Philips' sustainability goals, **guaranteeing the Suzhou facility will operate on 100% RE** at least for the next five years.



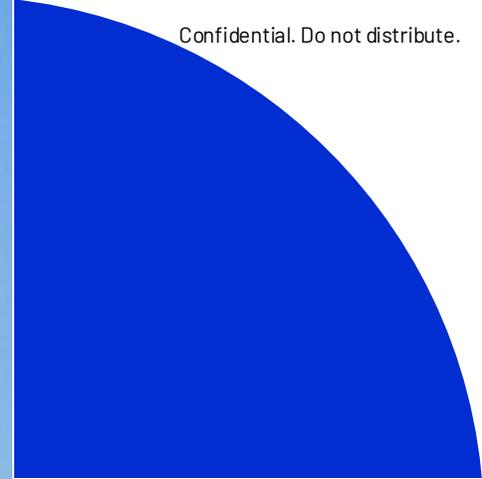
Managing Nike's supplier Buyer Groups for PPAs in China

Background: Nike aim to assist their supply chain partners in China to source renewable electricity. A rapidly developing opportunity is Green Power Trading which enables suppliers to shift from purchasing unbundled renewable energy certificates to long-term procurement contracts.

Challenge: Green Power Trading in China is rapidly evolving, making regulations challenging to interpret. It typically operates within provincial boundaries, leaving supply chain partners uncertain about where and how to begin navigating policies.

How we're helping: South Pole conducted a comprehensive assessment of Green Power Trading regulations across provinces to prioritize key regions. Suppliers were actively engaged, including knowledge-building efforts to familiarize them with Green Power Trading concepts and establish Buyer Groups in priority provinces. South Pole managed the RFP process for Buyer Groups, aiming to secure long-term green power contracts.

The program expanded to include new Buyer Groups in 2024.



Key terms to consider for PPA negotiation



Contract tenure



Price mechanism



GEC exclusivity



Vintage limitations



Exit clause



Volume deviation



Information
confidentiality and
security



Due diligence of
sourcing project

Contact us



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Thank you.

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We create chemistry

REMAAsia 2025 Singapore

Evolving China Power Market and its
implication to power users

30.04.2025

We create chemistry for a sustainable future – BASF's emission targets

2030

25%

Scope 1 and **Scope 2**

CO₂ emission reduction
(compared with 2018)

15%

specific **Scope 3.1**

CO₂ emission reduction
(compared with 2022)¹

2050

net zero

Scope 1, Scope 2

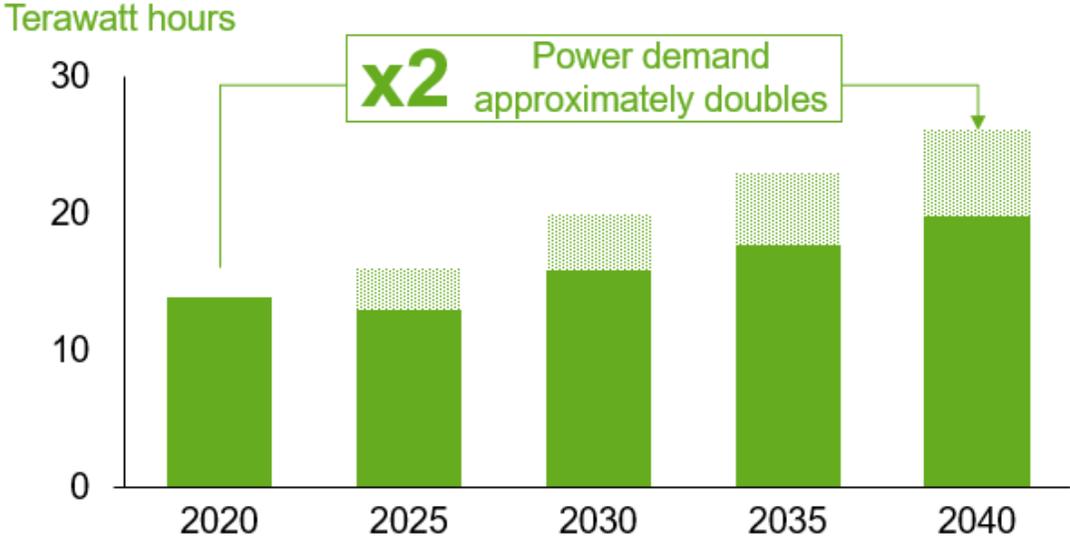
and **Scope 3.1**

CO₂ emissions

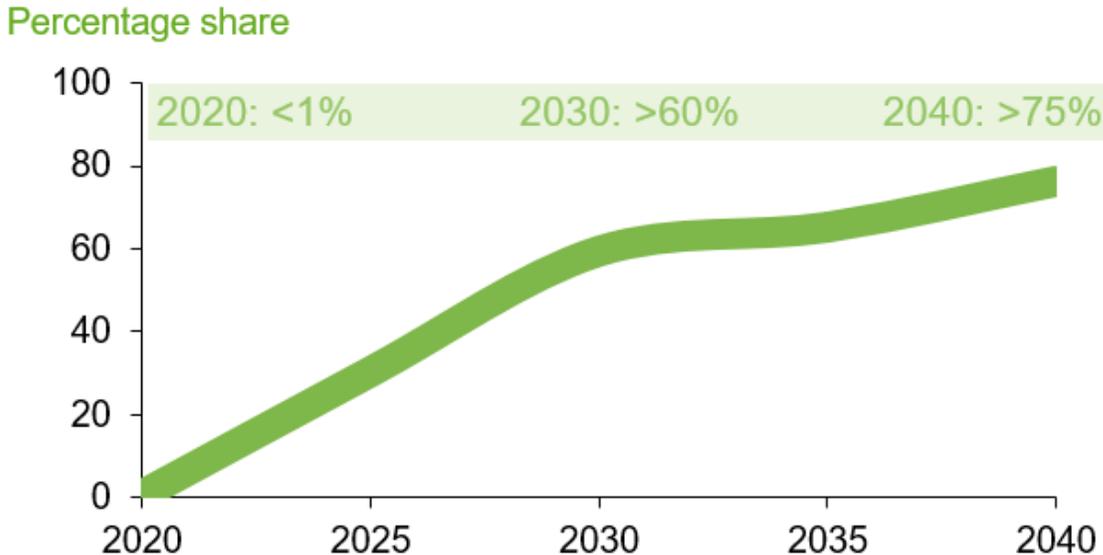
¹ Corresponds to a reduction from 1.58 to 1.34 kilograms of CO₂e per kilogram of raw material bought; calculated on the basis of relevant Scope 3.1 emissions of 48 million metric tons

BASF's efforts are paying off: A significantly increasing share of renewable energy alongside a rising electricity demand

BASF projected global power demand



BASF projected global power demand



 **Rising power demand due to electrification strategy and economic growth (including new site in China)**

 **Increasing share due to successful renewable investments and conclusion of PPAs**

■ Power demand ■ Forecast uncertainty

BASF drives forward renewable energy projects across the globe



Hollandse Kust Zuid offshore wind park



Nordlicht 1&2 offshore wind parks in (DE)



BASF solar park Schwarzheide (DE)



25 years solar & wind power for BASF India



Solar power for several Chinese sites



25 years wind power from Borkum Riffgrund 3 (DE)



Wind and solar power for several US sites



New offshore windfarm for BASF Zhanjiang site



Renewable power for BASF sites in Korea

Chinese-style Contract-for-Difference: the Reform of Renewable Energy On-grid Electricity Price

On February 9, 2025, the NDRC and the NEA jointly issued the "Notice on Deepening market-oriented Reform of Renewable Energy on-grid Electricity Price to Promote high-quality development of renewable energy" (the "Notice"), marking the key transformation of China's renewable energy electricity price mechanism from policy-dependence to market-driven allocation

| | Before | After | Implication/Opportunity |
|--|--|--|---|
| Electricity price formation mechanism | Government pricing(on-grid tariff) and subsidies | Market trading + CfD contract | <ul style="list-style-type: none"> Electricity price further reflects the relationship between supply and demand. CfD strike price might be a market price anchor for long-term PPAs. |
| For renewable energy project | Projected benefits are measurable | <ul style="list-style-type: none"> Project revenue faces more uncertainty. June 1, 2025 is the cut-off line. Existing projects and new projects after cut-off line will be treated differently. | <ul style="list-style-type: none"> New project investment requires more prudent and rational decision making. The investment logic for renewable projects will shift from "resource fight" to "competence competition". Revenue uncertainty will become the norm, whereby trading capability becomes the core competitiveness. |
| For end electricity user | Price volatility is not passed to end users | <ul style="list-style-type: none"> Electron price may be further suppressed when all renewables are pushed to market. Auxiliary service charge and other relevant market-sharing cost may increase | <ul style="list-style-type: none"> Optimize trading strategy Improve user-side energy management |
| BESS | Mandatory, coupled with RE assets | No longer requires mandatory installation of energy storage | <ul style="list-style-type: none"> BESS business model innovation Other revenue stream for BESS |

GEC new policy -- RPS green electricity consumption target shift to energy users

Shift RPS target from provincial government to major energy users, with annual compulsory consumption %

- GEC* is the tool to measure target completion and accounting.
- Accelerate the growth of green electricity consumption in key energy-intensive sectors like steel, petrochemicals and chemicals etc.
- Gradually increase mandatory % of green in total consumption. In principle, by 2030, it should not be less than average RPS target

Explore to set up GEC price index

- Stabilize market expectation, and ensure that the price of GEC remains at a reasonable level.
- Price of GECs traded unbundled should have synergy with GECs traded in bundled electricity transactions (PPAs)
- Encourage and promote mid-long term GEC purchase agreements



Enhance the correlation of GEC and other mechanisms

- Incorporation of green electricity consumption requirements into energy-saving and carbon-reduction management for key energy users and carbon-emitting entities.
- Application of GEC in carbon footprint accounting of key products and in product carbon labeling.

Expand GEC application scenarios

- Establish example of green factories and industry parks that have high green electricity consumption %, supporting efforts to achieve 100% usage of green electricity.
- Green electricity consumption % should be included in ESG reports of all listed companies

BASF APAC keeps pace with BASF carbon targets

June

FIRST renewable deal in China BIG with CR Power, after long and active promotion since 2019 of renewable PPA concept with Guangdong province in the development of the Renewable Electricity Marketization Policy

March

FIRST long-term PPA in China → 25-year framework agreement with SPIC to secure BIG 100% RE supply

2023

Sep

On 6th, **FIRST** 25-year PPA in China with SPIC final definitive agreements concluded.

Jan

100% renewable supply for all sites in Jiangsu, Zhejiang, Guangxi, BIG initial phase

Oct/Korea

For Korea, signed **20-year renewable PPA** with SK E&S, supplying renewable to BASF Korea from 2025 onwards.
For Taiwan, won **FIRST bid** of small volume renewable energy auction by Taipower for 3 years.

2024

April/India

Captive power purchase agreement signed for Mangalore site, bringing the site additional 30% renewable power

2021

Sep

RE trade national-wide pilot, BASF sites in Shanghai were the **FIRST** few to join inter-provincial RE transaction, and **LARGEST** renewable purchaser in the Yangtze River Delta region

Dec

FIRST user-side storage in BASF, 4MWh/12MWh in BACC

July

FIRST Sino-German offshore wind farm project -- BASF and Mingyang, 20-year power purchase agreement

April

On 11th, **GEDI** signed for BIG to advance in partnership in renewable power and low carbon technologies

Oct

10-year sleeved PPA with CLP and Envision, for 3 BASF sites in Jiangsu.





We create chemistry

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