



STATE OF THE MARKET 2019:

CORPORATE RENEWABLE PROCUREMENT IN CHINA



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ABOUT THIS DOCUMENT

This annual report aims to provide the latest updates on options available for corporations to procure renewable energy in China to meet sustainability targets.



ABOUT ROCKY MOUNTAIN INSTITUTE

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Beijing, People's Republic of China, and Basalt and Boulder, Colorado; New York City; San Francisco Bay Area; Washington, D.C. in the United States.

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An aerial photograph of a vast solar farm. The image shows numerous rows of solar panels stretching across a landscape. A bright sun flare is visible on the left side, casting a warm glow over the scene. The panels are arranged in a grid-like pattern, with some areas showing more densely packed panels than others. The overall color palette is dominated by the blue of the solar panels and the green of the surrounding vegetation.

Executive Summary

Executive summary

- Over the past year, government subsidies and centrally planned project installation targets continued driving **rapid growth in renewables** in an effort to improve air quality, accelerate energy transition, and cultivate the local wind and solar industry in China.
- Rapid renewable energy (RE) growth strained the subsidy fund and current grid operation norms. The Chinese government has been continuously taking actions to **drive renewable costs down** to grid parity to alleviate subsidy burden and **reduce curtailment**.
- **Three major policy changes** in 2019 in part address these challenges:
 - ♦ **Competitively procuring new projects (auctions, non-subsidy project pilots)** has driven down new project costs to grid parity and alleviated subsidy burden.
 - ♦ **Continued power sector deregulation** introduced new markets that improve renewable integration and open opportunities for customer-side participation.
 - ♦ **The Renewable Portfolio Standard (RPS)** mandates RE consumption across provinces and will likely increase the amount of RE imports in coastal provinces.
- These reforms impact corporate procurement options by:
 - ♦ Laying the foundations for RE direct power purchases (DPPs) by:
 - ◇ Creating **template DPP transactions** in curtailed provinces
 - ◇ **Pressuring market operators to allow RE participation** for RPS compliance buyers to manage their obligations, and
 - ◇ Possibly **enabling virtual models for RE DPPs in the future** for provinces with spot markets
 - ♦ Opening new (and complicating existing) attribute claims by:
 - ◇ Creating **uncertainty around attribute claims** under the new RPS (e.g., potential double-counting in claims)
 - ♦ Beginning to increase developer interest in corporate partnerships by:
 - ◇ Shifting developer **focus to distributed projects** at customer sites, which have better economics and no risk of curtailment
 - ◇ Making **corporate green electricity certificate (GEC) offtake** attractive for projects forgoing subsidies
- BRC China's goal is to support the development of renewable procurement options by addressing market challenges through collaborative industry and policymaker engagement. We identified the following key working areas for accelerating the market in 2020:
 - ♦ Developing necessary market foundations (attribute clarification, development of attribute price curves, etc.) and best practices to give corporate confidence to transact deals
 - ♦ Supporting pilot transactions for large-scale DPPs of renewables in specific provinces
 - ♦ Bringing together industry to demonstrate a sizable market demand for RE DPPs to governments and regulators



Market and policy changes

In this section, we:

- Highlight general trends for China's renewable energy (RE) industry
- Summarize major challenges faced by RE and what policies were implemented to address these challenges
- Provide outcomes and draw implications from recent policy implementation
- Indicate how these changes may impact options for corporate procurement

The RE market continues to grow, despite an abrupt phase out for RE subsidies, in part offset by declines in curtailment and new market access.

In this section we cover **three macro trends** that are shaping corporate RE procurement, deep dive into the **three major RE policy changes** in 2019 and draw implications for corporate procurement.

THREE MACRO TRENDS IN 2019

1. Renewable energy continues to grow
2. Cost of renewable energy starts to reach grid parity
3. Greater customer direct participation in electricity procurement

GOVERNMENT OBJECTIVES IN 2019

- 1 Drive renewable cost down
- 2 Reduce curtailment

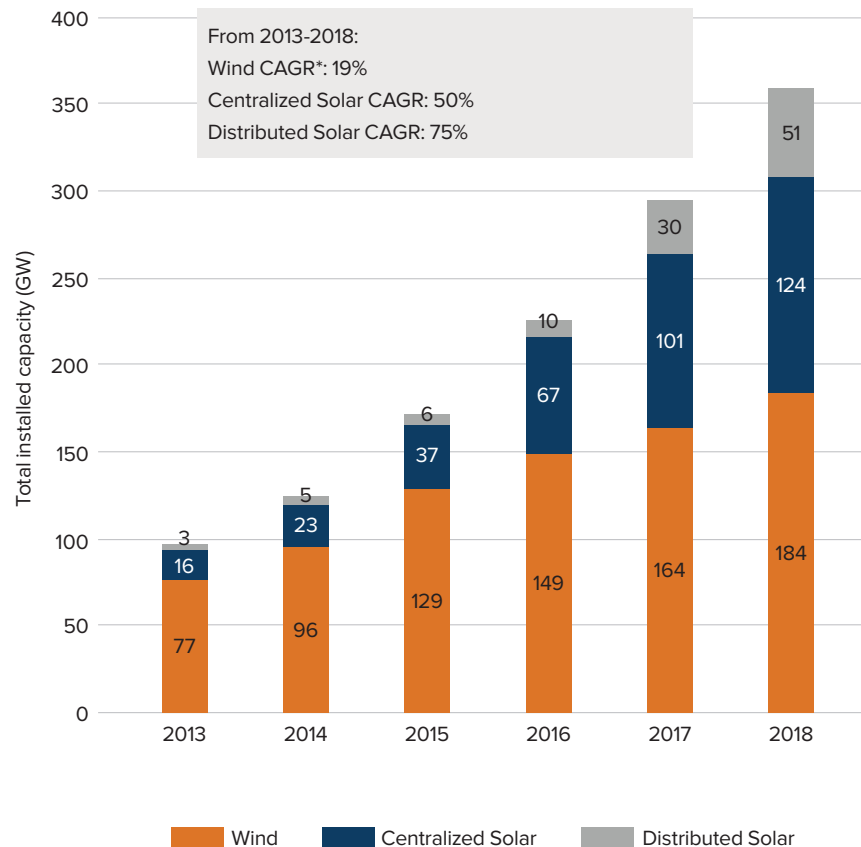


THREE MAJOR POLICY CHANGES

- 1 Competitive procurement of new projects (auctions, non-subsidy project pilots)
- 2 Increased RE market participation
- 3 Renewable portfolio standard

Trend 1: Renewable energy continues to grow, still driven by planned capacity targets and some subsidies, especially for distributed solar projects (accounted for over 30% of new RE capacity installed in 2018).

Total installed capacity of wind and solar in China
(2013-2018)



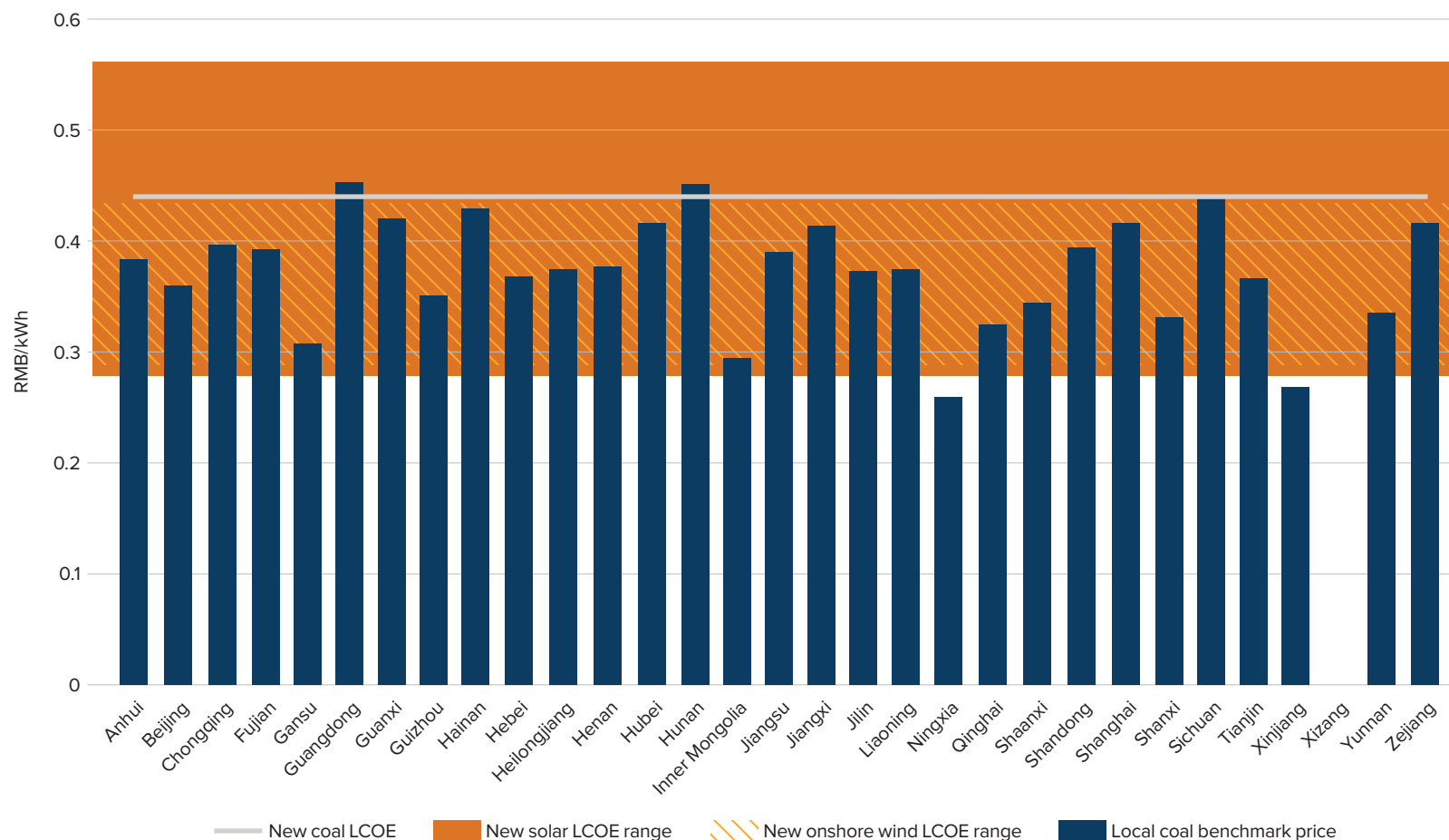
Drivers of growth

- The Chinese government sees RE development as a critical part of its vision for improving air quality, meeting climate commitments, and developing local wind and solar manufacturing companies and engineering, procurement, and construction companies. This driver is reflected in the capacity targets in national 5-year plans and regional/provincial sub-plans.
- 2018 saw a 70% increase over 2017 in distributed solar projects installed due to lower subsidies for utility-scale projects and restrictions in new projects in curtailed provinces.

* Compound annual growth rate

Source: National Energy Administration

Trend 2: RE starts to reach grid parity in some resource-rich provinces with higher coal benchmark prices, in particular for wind.

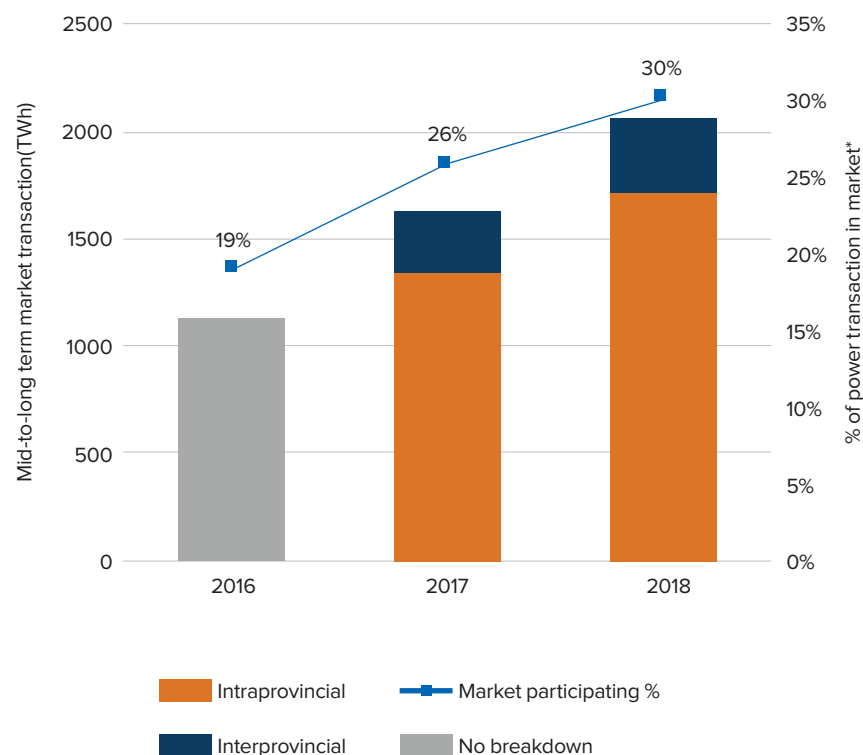


* Coal benchmark price is not set in Xizang.

- Onshore wind reached grid parity in most provinces and the national average LCOE is lower than local coal benchmark prices in most provinces
- LCOE of solar projects presents larger range, and solar projects have reached grid parity in few resource-rich provinces with higher coal benchmark prices but remain slightly less competitive than coal in the majority of the country

Trend 3: Greater direct customer participation in electricity procurement, with most commercial and industrial customers now eligible to participate.

Mid-to-long-term electricity contracts transacted in provincial markets (market opened in Q4 2015)



Market transaction has expanded to broader participants in 2019

USERS

- Market transaction participation has expanded to most small and medium commercial and industrial (C&I) users through direct purchase from generators, purchase through independent retail companies, and other transaction mechanisms (such as peer-to-peer trading of local generation) available in specific geographies.

GENERATORS

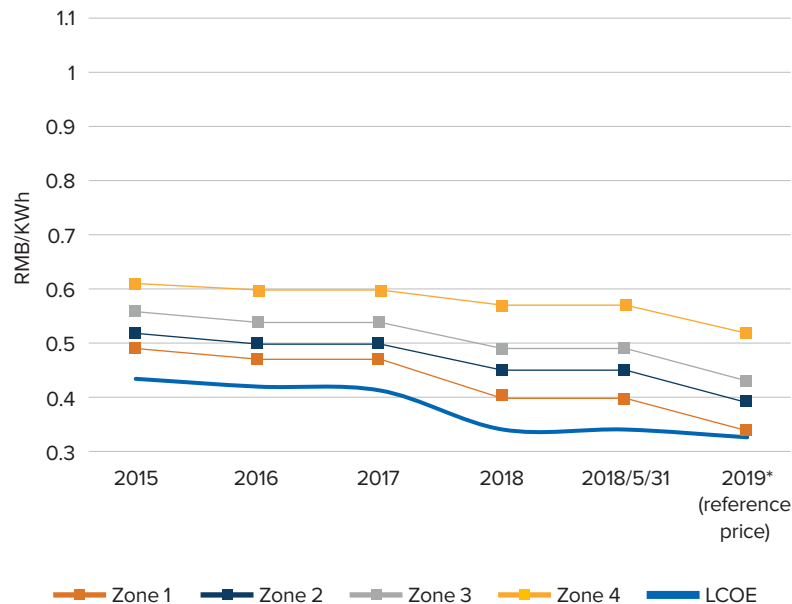
- More generators are also included in the market transaction; however, RE remains excluded in most provinces without curtailment.

* in terms of total society electricity usage

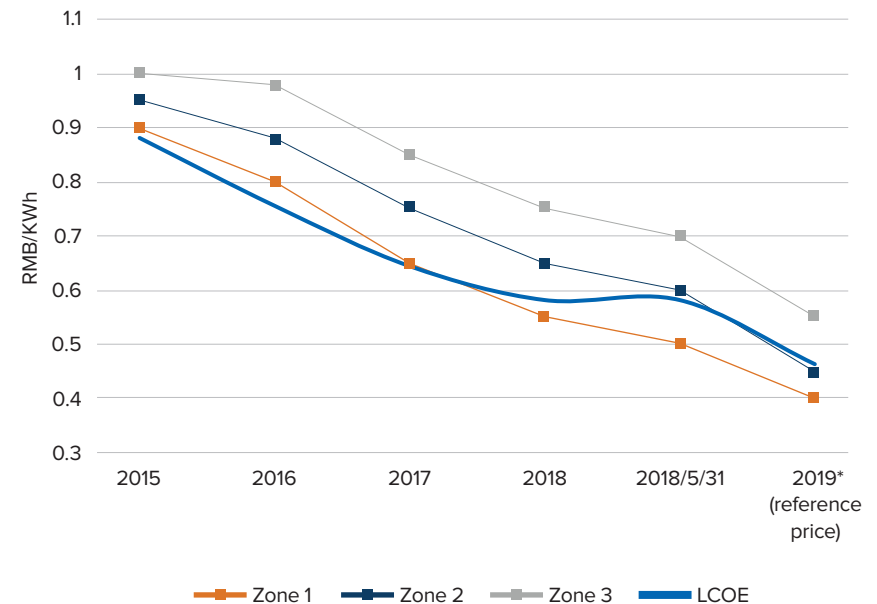
Source: National Energy Administration

Challenge: Historically, high feed-in-tariffs led to remarkable growth in RE but lacked sufficient flexibility to respond to the cost changes and provided limited incentives for further cost reduction.

Onshore Wind FiT and LCOE



Utility Solar FiT and LCOE



*Reference price sets the highest price for auction prices.

Auction and subsidy free project: China lowered subsidies, using reverse auctions to set subsidy prices for new solar and wind projects and encouraging the piloting of subsidy-free projects.

Subsidy-free projects

Accelerating wind and solar's integration into the grid without subsidy (January 2019, NDRC)

- The purpose of this policy is to encourage development of projects requiring no subsidies or cheaper than local coal benchmark prices, which are exempt from annual construction quota.
- Subsidy-free projects will be able to issue GECs and sign power purchase agreements (PPAs) at the local coal benchmark price with grid companies for periods no shorter than 20 years.

Working plan for project construction of solar and wind without subsidy (for comment) (April 2019, NDRC)

- Projects requiring subsidies will not be permitted until 2019's first batch of subsidy-free projects are announced.
- The grid company ensures the priority dispatch and full government-guaranteed procurement of subsidy-free projects to minimize curtailment.

Solar price-setting auctions

Notice on improving the solar Feed-in Tariff policy (April 2019, NDRC)

- Utility-scale projects: Subsidized projects will be permitted via auction mechanism and cannot exceed the reference prices set for the regions (CNY 0.40, 0.45, and 0.55/kWh for Zones 1, 2, and 3 respectively).
- C&I distributed projects exporting excess generation to grid: Reference price for the subsidy is set at CNY 0.1/kWh.
- C&I distributed projects selling all generation to grid: Same as utility-scale projects.

Wind price-setting auctions

Notice on improving the wind power FiT policy (May 2019, NDRC)

- Onshore: Reference prices are set at CNY 0.34, 0.39, 0.43, and 0.52/kWh for Zones 1, 2, 3, and 4 respectively. Projects commissioned after January 1, 2021 will become subsidy-free.
- Offshore: Reference prices are set at 0.8/kWh for 2019 and 0.75/kWh for 2020.

Auction and subsidy free project: Over 20GW of non-subsidy projects were permitted, and some project developers want to sign GEC offtake agreements with corporate buyers for better economics.

Results of first batch of subsidy-free project (MWs of projects approved in each province)

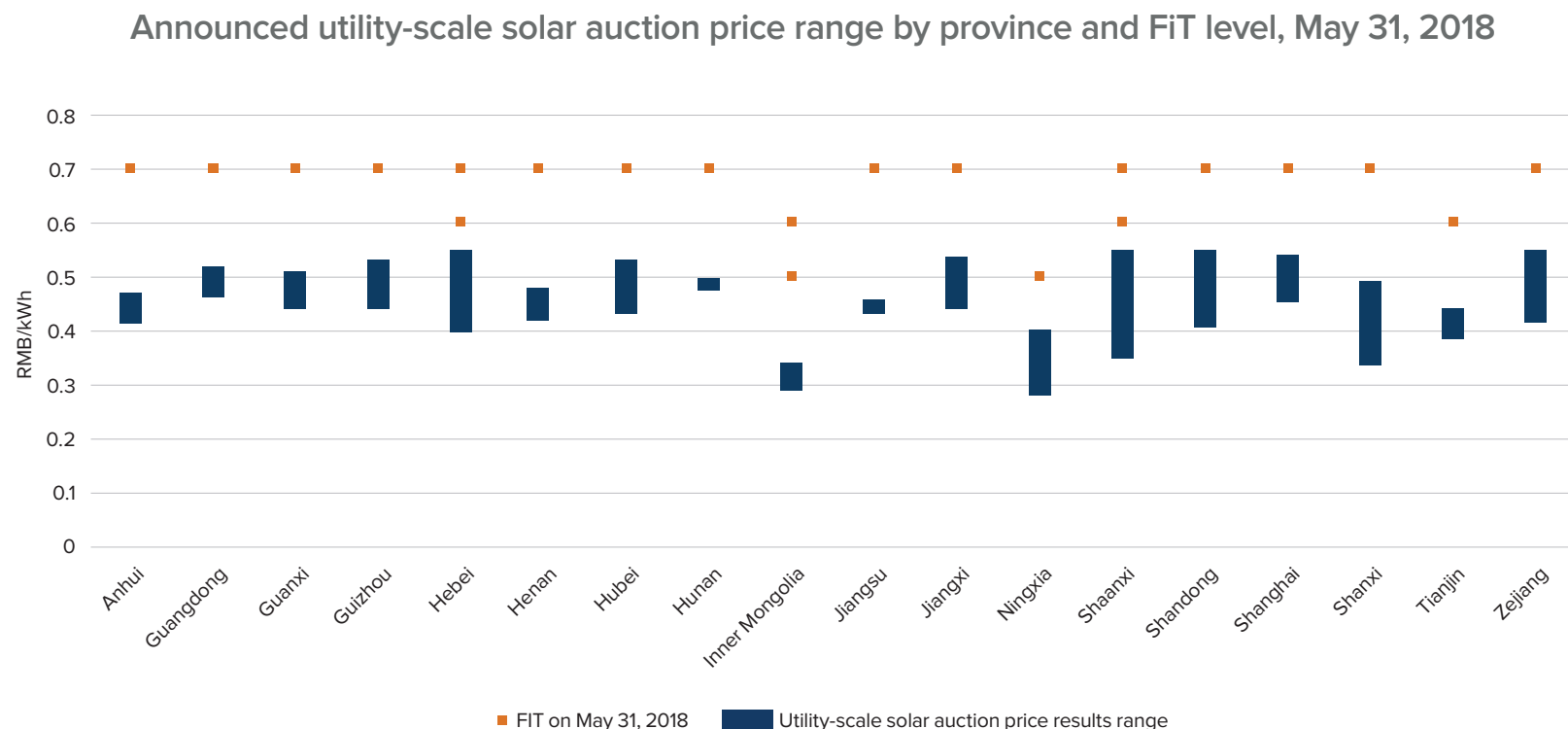
Province	Wind (MW)	Solar (MW)	Distributed transaction (MW)
Guangdong	200	2,380	0
Shaanxi	100	2,040	100
Guangxi	0	1,930	0
Henan	1,100	270	360
Heilongjiang	1,000	1,650	50
Hebei	0	1,310	150
Shandong	350	910	0
Shanxi	0	1,000	200
Jilin	1,190	0	0
Liaoning	0	1,190	0
Jiangsu	0	1,090	210
Anhui	50	670	110
Hubei	0	340	90
Hunan	350	0	0
Tianjin	160	0	110
Ningxia	10	0	90
Total	4,510	14,780	1,470

Implication for corporate procurement

- **Obtaining GECs from subsidy-free projects** will become an important approach for renewable energy developers to source additional revenues, **enhancing the financial predictability of renewable investment** for generators with more reliable cash flows.
- With the decoupling of GEC price from subsidy, **the price of subsidy-free project GEC is expected to be reduced** in the near future, becoming **an option for corporate buyers offtake** to support additional renewable energy development.
- However, majority of the announced subsidy-free projects will not be commissioned before 2020 given project developers are expecting modules/equipment costs continue to be reduced early next year. Therefore, the market for subsidy-free project GECs **will not be activated until then**.
- Subsidy-free projects are **guaranteed for grid integration and could present a low-risk option** for corporate buyers to consider.

Note: Permitting of new subsidy-free projects is subject to wind and solar monitoring reports, which are based on provincial-level curtailment “seriousness” and the integration capability of the local grid.

Auction and subsidy free project: The auction based tender process for new project construction helped lower new utility-scale solar project prices by over 30% on average in provinces compared to May 2018 levels.

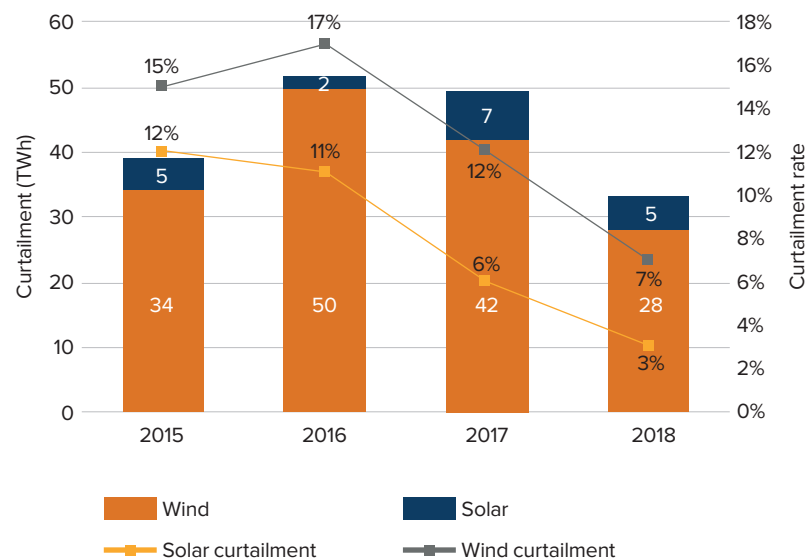


Note: Provinces with two points on FIT price fall into two resource zones, giving them two FIT price levels.

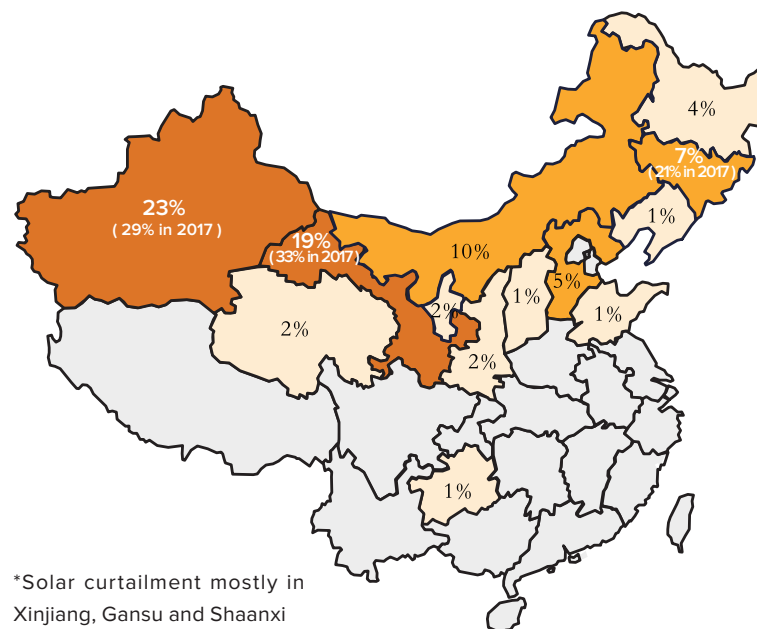
- The use of auction-based permitting is forcing developers to drive down cost. Auctions therefore provide **valuable benchmarking information for future RE procurement negotiations with developers**, since developers tend to bid closer to their real cost in order to get new project permits in this competitive process. All projects from here on will use auctions to set prices.

Curtailment remains a challenge in western and northern provinces, driven by overcapacity and importing provinces prioritizing their own generators.

Historical curtailment rate and quantity in China



2018 wind curtailment by province



Reducing curtailment is a key focus for the Chinese government and regulators

- Grid companies** are mandated to reduce curtailment through guaranteed procurement of renewable energy and improved efficiency in system operation and management.
- The Chinese government** has made curtailment reduction into local provincial government KPIs and instituted an “alert” system to monitor new project construction in high curtailment regions and halt construction, if required.
- Thermal generators** have improved their flexibility in order to prioritize power generation from renewable generators, especially heating plants.
- The Chinese government** and **grid companies** have instituted interprovincial markets for RE transactions to help bring power from remote provinces to demand centers.

Increased RE market participation: Renewables are increasingly participating in market transactions in curtailed provinces.

Renewables participate in five markets:

- **Mid-to-long-term markets in curtailed provinces:** Signing DPP guarantees developers a higher level of integration than projects without DPPs.
- **Cross-provincial mid-to-long-term markets:** Grid companies can buy neighboring grid power at lower prices, provided it is bundled with RE.
- **Spot markets:** In curtailment provinces piloting spot markets (Gansu, Inner Mongolia, and Shanxi), renewables are paid at spot-market prices for any integration beyond DPPs and government contracts.
- **Interprovincial curtailed renewable spot markets:** If provinces are heading into a period of high curtailment, they can offer their likely curtailed volume to other provinces at low prices (usually small scale).
- **Peak regulation markets:** Renewables and other generators can pay thermal plants to ramp down to increase integration.

Results from RE market participation

1. Reduced curtailment
2. More interprovincial imports
3. Reduced prices per MWh of RE (although increased integration hours on net will make the overall revenue for project developers increase)

Implications for corporate procurement

1. Developers are having to underbid to be integrated and are increasingly willing to transact with corporate customers that may offer better offtake terms in exchange for renewable attributes.
2. These transactions lay the foundations for renewable DPP contracts and terms and will likely serve as important foundations going forward.

Renewable Portfolio Standard: The RPS aims to reduce renewable curtailment by mandating each province procure a fixed percent of RE that ratchets up each year.

POLICY INTRODUCTION

- On May 10 2019, the long-awaited renewable portfolio standard policy was formally released following three rounds of comments by NDRC and NEA. It is in effect for five years
- The main objective of the RPS is to ensure minimum renewable energy consumption at a provincial level and allocate the responsibilities for renewable consumption fairly among significant energy users

WAYS TO FULFILL RPS OBLIGATIONS

- Consuming renewable electricity from onsite wind and solar projects or direct power purchases of wind and solar (where transactions are available)
- Purchasing renewable energy consumption from other obligated parties that have exceeded their own targets (prices will be negotiated between the two parties)
- Purchasing voluntary GECs to offset the MWhs obligated to them

WHO IS AFFECTED BY THE POLICY

- Provincial-level grid companies and retailers (load serving entities)
- Buyers participating in Direct Power Purchase (DPP) transactions and buyers with captive generation facilities

IMPLICATION FOR CORPORATE PROCUREMENT

- The RPS introduces systematic double counting issues and brings uncertainty on attribute claims. RPS will track who consumes the RE and those entities may claim that amount of RE in their mix, but at the same time that RE sold to customers can also issue GECs or other voluntary attributes. These attributes can be sold to other parties who may also make claims on the ownership of that RE. This challenge also presents among corporates using internationally issued RECs. In the interim, buyers may need guidance for what claims can be made through each method
- Distributed projects are shielded from this conflict for the time being
- Policymakers want the RPS to be a market-based solution. This may open opportunities to procure excess RE consumption and make voluntary claims

A photograph of a wind farm at sunset. Several large white wind turbines are visible against a sky with orange and blue hues. In the foreground, there is a field of tall, green and yellow crops, possibly corn. A dark blue semi-transparent rectangle is overlaid on the right side of the image, containing white text.

Impacts on corporate procurement options

In this section, we:

- Summarize each option for corporate buyers to procure renewables in China
- Provide an assessment on market readiness and highlights of what changed in 2019
- Deep-dive into each procurement option to explain how recent policies and market dynamics impact procurement options
- Evaluate different options based on corporate buyers' key criteria

Summary of Corporate RE Procurement Mechanisms and Major Changes in 2019

Mechanisms	Description	What changed in 2019?
1. Attribute offtake	Certificates representing RE attributes; customers purchasing certificates can claim that amount of renewable electricity consumed.	<ul style="list-style-type: none"> The formal release of the RPS allows Chinese GECs to be used as one mechanism to fulfill RE quota shortfalls for obligated parties. Subsidy-free projects can issue GECs, which developers may offer for less since there is no subsidy to forgo to sell.
2. Direct investment in utility-scale project	Companies directly invest in renewable projects, owning an equity share of the renewable projects.	<ul style="list-style-type: none"> The implementation design of RPS in the provincial level might influence the renewable attributes ownership of utility-scale projects. Whether that belongs to investor or power offtaker remains unclarified.
3. Distributed wind and solar	New solar or wind capacity installed on company premises, behind the meter or grid tied.	<ul style="list-style-type: none"> Distributed projects changed from fixed Feed-in-Tariff to auction-based project permitting, with a reference price provided for guidance.
4. Distributed market transaction (peer-to-peer)	Companies buy excess on-site project renewable generation within a highly localized region.	<ul style="list-style-type: none"> No solid change on pilot progression. One policy has been released in Jiangsu about the market transaction rule (trial version). One pilot has been set up in Shandong; however it only covers one solar project now.
5. Direct Power Purchasing (DPP)	Direct contract signed between renewable generators and corporate buyers for utility-scale projects.	<ul style="list-style-type: none"> For existing, fossil fuel, DPPs, market participants are expanded to broader C&I users. More provinces have established but remains inactive.
6. Virtual PPA (VPPA)	A financial agreement (no title transfer) between a corporate buyer and a renewable generator, requiring open market prices, for corporates to acquire environment attributes at scale.	<ul style="list-style-type: none"> The launch of spot markets in eight provincial pilots might enable VPPA contracts.

1~3

Ready to go

4

Piloting

5

Not nationally replicable

6

Not yet available

1. Introducing the RPS alongside GECs creates attribute claim questions, but new models for attribute offtake are emerging as the two systems unfold.

Description

- GECs are certificates that verify RE generation. Customers purchasing certificates can claim that amount of RE consumed.
- Different attribute systems exist besides Chinese-government-issued GECs, including I-REC (International REC), Gold Power, and TIGRs (Tradable Instrument for Global Renewables), with various levels of acceptance domestically and internationally.

Changes in 2019

China GEC as RPS fulfillment tool

- In May 2019, the RPS was released in China. China GEC is listed as one of the two options to fulfill RE consumption quota shortfalls for obligated market players under the RPS. Detailed mechanisms describing how GECs will be designed under the RPS are still under design and potentially will be released by the end of this year.

Subsidy-free project GEC

- Starting in January 2019, subsidy-free projects will be allowed to issue GECs as an extra revenue stream. This decouples GEC prices with the subsidy prices. BRC China expects that the offtake of subsidy-free project GECs will be an attractive option for corporate buyers to support additional renewable permitting. The introduction of subsidy-free projects will also enhance the financial predictability of renewable investment for generators with more reliable cash flows.

Challenges

- Though already feasible at the policy level, the transaction for subsidy-free project GECs is **still a relatively new concept in this market**. Without fully understanding the existing market and available future price forecasts, buyers and sellers are not comfortable accepting these initial deals.
- The presence of the RPS and GECs gives rise to a **systematic double-counting issue**. The amount of renewable energy consumption and the GECs associated which corporate buyers purchase will all be counted towards RPS obligation fulfillment, then the same portion of green energy production is counted twice in the system.
- Compared to other mechanisms, the purchase of attributes/certificates is still a pure cost premium and does not meet many corporate buyers' internal criteria for selecting options.
- The carbon market and REC market are still **two separate markets** in China, creating confusion and misalignment.

2. Direct investment in renewable projects remains unpopular for corporate buyers whose core business is not energy.

Description

- Companies directly invest in utility-scale or distributed renewable projects, owning a specified share of the renewable project.
- This investment requires significant upfront capital investment, as well as additional knowledge to conduct due diligence and identify good projects.

Changes in 2019

Project economics became less attractive with subsidy reduction

- The subsidy for RE projects have been reduced, which induced lower returns on project investment.
- This makes project developers more willing to share ownership. In the past, project developers did not want to share project ownership unless companies could provide additional value in securing cheaper capital.

Difficult to find viable projects under the competitive project tendering process

- Due to the transition to auction based bidding for new project permitting, new project permitting is more competitive, making it difficult for corporate buyers to find projects to invest in.

Challenges

- **State owned enterprises intend not to sell project equity to others;** only a few private project developers are willing to agree to this kind of deal.
- **Internal alignment within the corporate buyer,** including legal, finance, tax, and sustainability, is difficult to achieve for transaction approval.
- **Environmental attribute ownership is still unclear.** It is not stated in the RPS whether the environmental attribute will belong to investors, or directly transfer to the grid company with the power. For distributed projects, this won't be a problem at this moment, while in the future when distributed projects are included in the scope of China GECs, they will face similar challenges.

3. Distributed wind and solar projects are increasingly attractive as PPA models have matured. Despite subsidy reductions, economics are still favorable.

Description	<ul style="list-style-type: none"> • Companies put distributed renewables onsite so they can directly consume the power and sell excess power back to the grid. • Companies can choose to invest their own money to install those on-site facilities or sign a PPA with project developers, enjoying an electricity bill discount by renting their rooftops to developers.
Changes in 2019	<p>Transitioning to auction-based new project permitting reduced the economics of projects</p> <ul style="list-style-type: none"> • Distributed solar and onshore wind projects are required to go through auction based bidding for new project permitting starting in 2019, compared with the fixed FiT in the past. This will make the economics of new projects less attractive compared with earlier years. <p>Distributed projects as a qualified option for RPS fulfillment</p> <ul style="list-style-type: none"> • Corporate buyers can use on-site wind and solar projects to fulfil their RE consumption obligations under the RPS, which will make distributed projects more popular and attractive for corporate buyers.
Challenges	<ul style="list-style-type: none"> • Currently, distributed projects cannot issue China GECs, making corporates who want to use certificates to claim environmental attributes challenging. • The amount distributed projects can generate normally does not meet internal goals and can only produce 5%-10% of load.

4. Distributed market transaction pilots have yet to be implemented. Regulators continue to negotiate with grid companies on payment for using lines.

Description

- Companies buy excess RE from their neighbors' rooftops via distribution lines.
- RE is not limited to rooftop solar; it could be other forms of distributed or even mid-scale renewables.

Changes in 2019

- Nationwide, the **first batch of pilots was approved** and published in May 2019 after rounds of delays.
- In December 2019, Jiangsu province released distributed energy market transaction rules (trial version), which is the first of this kind released on the provincial level. These series of files clarify market player definition, requirements for participation, registration process, transaction process and price, contract terms, clearing rules as well as government entity in charge. However this rule applies only to the already approved pilot projects in Jiangsu, not to all distributed energy resources throughout the province.

Challenges

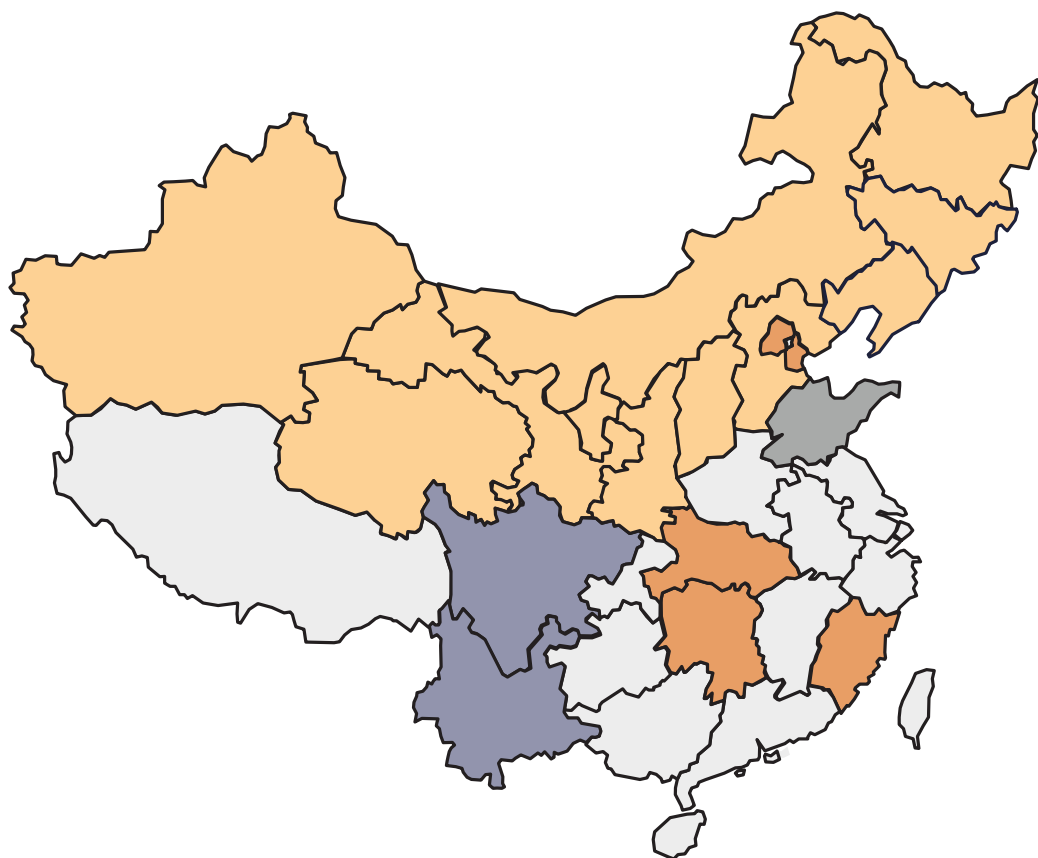
- **Implementation of the pilot and calculation of the wheeling fee remain difficult** with push-back from stakeholders.
- Even though the scale of distributed market transaction may be larger than on-site renewables, **it is still unlikely to meet the size of deals companies need to meet goal** for renewable generation.

5. RE DPPs are now common in curtailed provinces but remain prohibited or economically unattractive to developers in coastal demand centers.

Description	<ul style="list-style-type: none"> • DPPs are direct contracts signed between generators and corporate consumers. • Customers and generators need to be included in the government approved list to transact through the provincial power exchange. • In general, transactions are limited within a single province. Interprovincial transactions are mostly between different provincial grid companies.
Changes in 2019	<p>Expanded transaction parties to all C&I users</p> <ul style="list-style-type: none"> • A new policy released allows all C&I users to be eligible participants in electricity markets. Small- and medium-sized corporations who failed to qualify for DPPs will have access to such options. <p>Obligated parties under the RPS</p> <ul style="list-style-type: none"> • The RPS makes companies that participate in market transactions obligated parties. • This encourages provincial governments to develop implementation plans in a timely manner so that they can distribute their responsibility to corporate users. • Current provinces where intraprovincial renewable transactions are available are shown in the next page of this report.
Challenges	<ul style="list-style-type: none"> • For most provinces without renewable curtailment, renewable generators are still not allowed to participate in DPPs. Even if they are, developers do not find these deals attractive. • Interprovincial transactions are typically restricted to grid companies. Where they are not, multiple stakeholders across provincial lines must be involved for approval, making it infeasible for individual corporate buyers.

Despite the expansion to new eligible participants, the scope of provinces remains unchanged in 2019 where intraprovincial transactions of renewables are available.

Provinces open for RE transactions in 2019



- Provinces with high curtailment rate which allow for direct transaction of wind and solar of one-year term
- Provinces which allow for wind and solar transaction at hydro-abundant season
- Provinces where bundled renewable (capped at 40%) and thermal power can be procured. Transmission from Shanxi, Gansu, Qinghai, and Ningxia to Shandong are enabled by high-voltage direct-current (HVDC) line
- Provinces without curtailment where RE generators lack motivation to transact despite eligibility

- Intraprovincial renewable energy transactions exist in curtailed provinces where generators are incentivized to sell power otherwise abandoned.
- In regions with high loads and no curtailment, renewables are entitled to full dispatch. Generators therefore lose motivation to directly transact with users.
- Interprovincial transactions have not progressed in the past year.

6. VPPA remains unavailable in China. However, spot-market pilots could enable this kind of financial contract in the future.

Description	<ul style="list-style-type: none">• A VPPA is a financial agreement between a corporate buyer and a renewable generator that provides renewable generators and buyers price stability over the term of the contract for energy in exchange for a clear claim of additional renewable power for buyers in a province.• A VPPA is an increasingly popular option in the United States and Europe, but it is still not available in China.
Changes in 2019	<ul style="list-style-type: none">• Power market deregulation in a few provinces relies heavily on financial contracts, which could enable VPPAs in the future (e.g., in Guangdong, Zhejiang, and Shandong).
Challenges	<ul style="list-style-type: none">• Without a spot market fully operating in China with renewables involved, VPPA remains difficult to be implemented.

Corporate buyers can select the mechanism that meets their internal requirements based on cost, additionality, or project scale to achieve their RE goal.

Mechanism	Price Cost to the corporate buyer	Additionality Whether it helps new project come online	Scale Size of the project
1. Attribute offtake	<p>China Green Electricity Certificate</p> <ul style="list-style-type: none"> Wind: 130-280 RMB/MWh; Solar: 500-900 RMB/MWh Subsidy free project GEC price is expected to be much lower (no market data yet) <p>International REC</p> <ul style="list-style-type: none"> Much cheaper; price based on negotiation, usually at a few cents per kWh. (but has to check local legal requirement to confirm environmental attributes ownership) 	Varies, if new GEC for non-subsidy projects then yes	Pending on corporate requirement
2. Direct investment in utility-scale project	Project-based; upfront capital based on MW of capacity invested, location and types of project	Yes, unless buying stakes in existing projects	Pending on corporate requirement
3. Distributed wind and solar	For energy management contract, lower than retail price; corporate buyers can usually get a 10%-20% discount on their electricity bill by lending their rooftops to developers	Yes	Limited size; often cannot meet corporate buyer's internal goals
4. Distributed market transaction (peer-to-peer)	No market data yet; project-based and cheaper than market retail price	Varies, if used as bankable for new project then yes	Larger than distributed projects but still limited to meet corporate buyer's target
5. Direct Power Purchasing (DPP)	Only market data available in curtailed provinces. Price based on bilateral negotiation. In curtailed provinces prices are much cheaper than the benchmark price. In non-curtailed provinces, prices would need to be cheaper than the benchmark price based on current DPP rules.	Varies, if curtailed or used for bankable revenue streams then yes	Large scale

Note: VPPA is not included in this table considering its not available in China yet.

A photograph of a wind farm with several white wind turbines on a green, rolling hill under a clear blue sky. The turbines are arranged in a line, with the one in the foreground being the most prominent.

How BRC China is helping?

In this section we:

- Indicate what BRC China sees as the priority challenges to address for RE procurement in 2020
- Highlight what BRC China is providing to corporate buyers

Necessary market foundations, pilot projects and community building should be prioritized for RE procurement in 2020.



Create necessary market foundations for RE procurement

- Clarify RE attributes to use to give corporate buyers confidence in the RE attributes they use when executing transactions
- Standardize renewable attribute offtake contracts to procure unbundled GECs
- Support the development of price-forward curves to enable market offtake in the early phase
- Inventory firms that have a proven record of providing on-the-ground transaction support (such as legal and financial modeling)



Open specific provinces to direct purchase of renewables

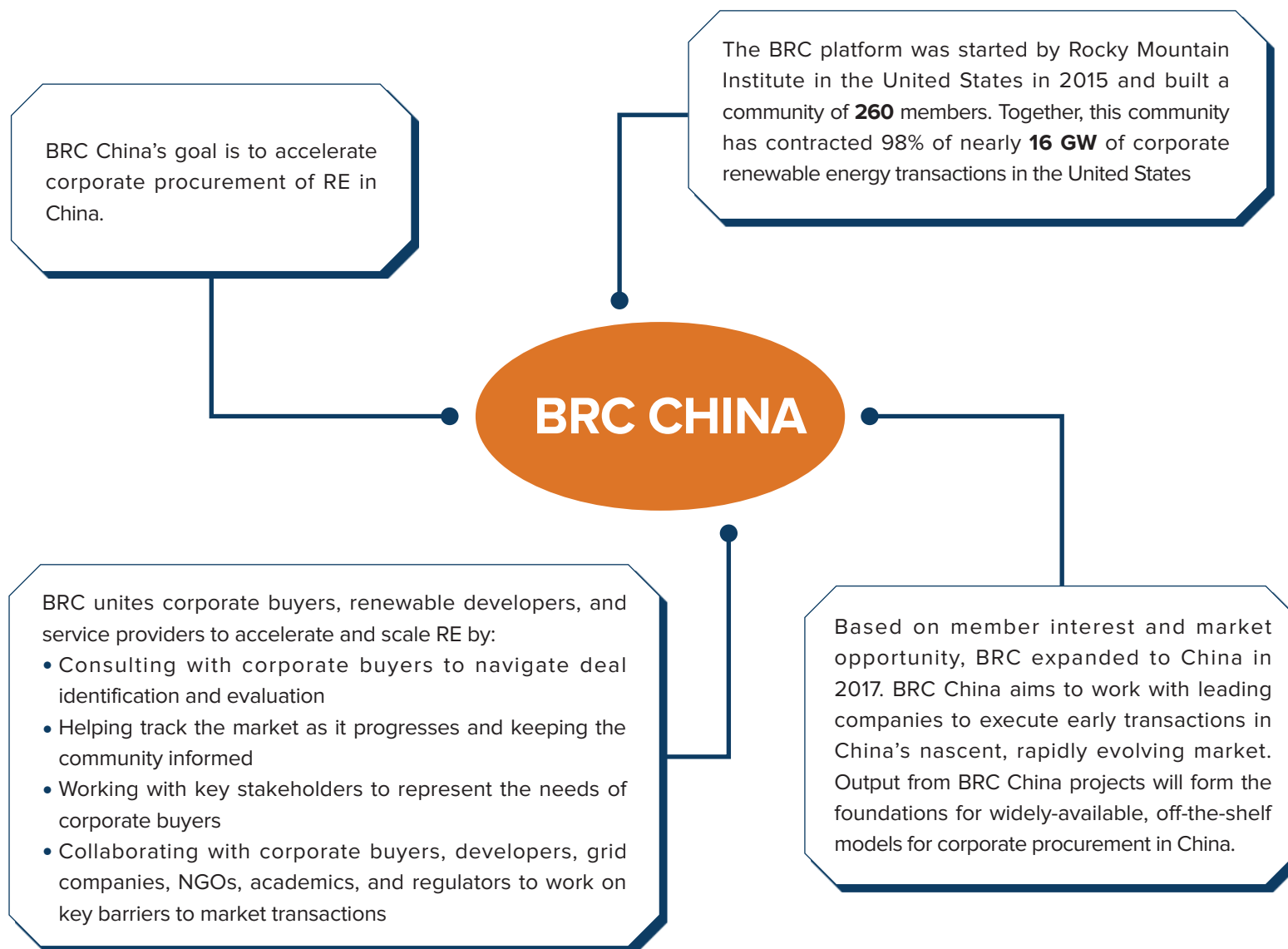
- Engage with local policymakers and market operators to advocate for RE participation by demonstrating how it supports their local goals and objectives
- Pilot deals and standardize contracting terms
- Provide capacity building support to developers and corporate buyers on how to execute DPPs and advocate for them in different geographies
- Enhance the business case for RE DPPs to attract more developers and corporate buyers to the market



Build up a community of stakeholders to effectively advance renewable procurement through joint advocacy and shared learning

- Create a platform and cases that help corporate buyers learn from each other on RE procurement best practices in China
- Consolidate the effort of individuals and create an aggregation of RE procurement demand to jointly move the market forward
- Collaborate with NGOs, the government, local think tanks, and industry associations to coordinate activities and accelerate action

Business Renewables Center China's goal is to support progress toward market transactions.





Questions or comments?

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