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India Corporate
Renewable PPA Forum

PPAs in India: Market & Policy Update for 2019

Contents

1 Introduction

Energy is no longer merely a cost for companies to manage. Energy is climbing up the corporate agenda due to sweeping environmental, social and business trends, including rising expectations about corporate environmental performance, innovations in energy-related business models and plummeting renewable energy prices. These trends bring new paths for value creation.

Renewable power procurement helps companies reduce electricity expenditures and increase visibility over future electricity costs, while contributing to a company's carbon emission reduction or renewable energy target. Increasing grid power tariffs for commercial and industrial consumers, falling prices for renewable projects and the growing importance of corporate sustainability commitments are leading companies to actively procure renewable power for their operations.

Corporate renewable power purchase agreements, or PPAs, provide the benefits outlined above. They also address off-take risk for developers and financing parties, making them an important instrument in accelerating renewable energy deployment.

In 2016 and 2017, members of the World Business Council for Sustainable Development (WBCSD) spent 18 months exchanging practical knowledge on how they are implementing corporate renewable PPAs in India, covering both rooftop and utility-scale installations. We combined this knowledge with research on the regulatory environment and market conditions to produce the Accelerating corporate procurement of renewable energy in India report (June 2018).

During this first growth phase of corporate renewable PPAs in India, many large commercial and industrial customers had their initial experiences with renewable power procurement or at least evaluated renewable power procurement options. Both have created learnings for market players and policy-makers. The Indian corporate PPA market is ready to move into the second phase of growth, where more companies are starting to procure renewable energy and companies with good initial experiences are scaling up procurement.

The Indian power market is constantly evolving as the value chain learns, reacts and shifts to accommodate to the changing state-level electricity tariff, policy and regulation landscape. As power procurement is often not part of their core business, these changes can often become difficult to track, especially for corporate buyers.

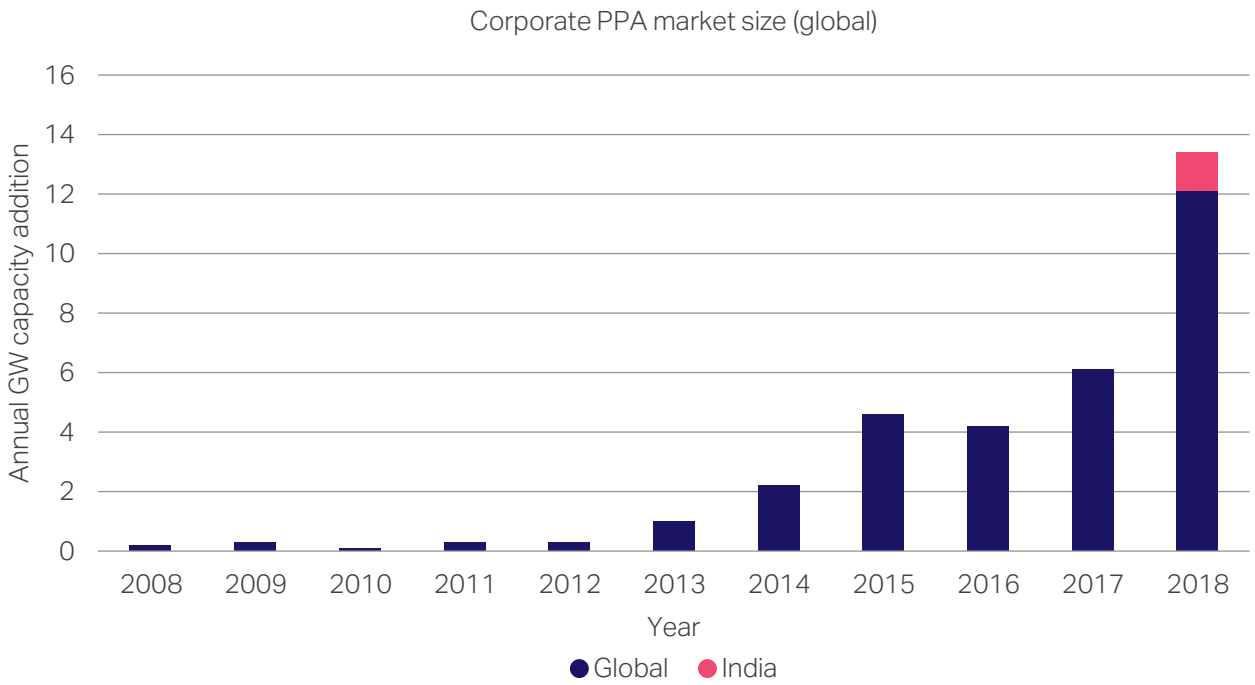
The objective of this paper is to provide a market, policy and regulatory update on corporate renewable PPAs in India, covering both utility-scale and rooftop projects.

The first section outlines key market trends observed in 2018, including information on market growth and a brief analysis of changes in sub-national (or state-level) markets. The second section provides an update on policy and regulatory changes in 2018. We conclude with an outlook for 2019, bringing together how we expect changes in the market in 2018 to impact corporate buyers in 2019.

2 Key market trends

In 2018, the annual corporate PPA capacity addition in India passed the 1 GW mark for the first time. Many companies from across sectors are also switching to renewable energy in India.

FIGURE 1: Annual global corporate PPA market size



According to Bloomberg New Energy Finance, companies purchased a total of 13.4 GW of clean power globally in 2018, which was a record amount of clean power procurement through PPAs in a year (see figure 1).[1] The US was the single largest market, with 8.5 GW deployed, while India, although farther behind, emerged as the second largest corporate PPA market, deploying 1.3 GW.

In 2018, the annual corporate PPA capacity addition in India passed the 1 GW mark for the first time. The number and breadth of companies that are switching to renewable energy in India is worth noting. The list of corporate buyers adopting renewable power included global technology providers (Adobe, Microsoft), automotive manufacturers (Volvo, Mahindra), food and beverages companies (United Breweries, Coca Cola) and airports (Bangalore, Cochin).

The logic underpinning the rapid growth in and broadening customer base of renewable power comes down to two factors. The first factor is sustainability. While most companies have always viewed clean energy favorably, in the last two years, more and more large companies have begun to make tangible progress on renewable energy. Whether or not they are signatories of global campaigns such as RE100, most leading companies today are aiming for anywhere from 50 to 100% reliance on renewable electricity within a defined timeline.

The second factor is economics. Depending on the location, companies can source renewable energy at a 15 to 40% discount on industrial grid tariffs in India (see figure 2).

FIGURE 2: Renewable energy vs. grid tariff in select states[2]

State	Industrial grid tariff (INR/kWh)	Open access solar	
		Approximate landed cost of solar power (INR/kWh)	Cost savings (%)
Karnataka	7.20	5.25	27%
Andhra Pradesh	6.66	5.33	20%
Tamil Nadu	6.67	5.40	19%
Uttar Pradesh	6.80	5.60	18%

[1] BloombergNEF. (2019). "Corporate Clean Energy Buying Surged to New Record in 2018". Bloomberg New Energy Finance. 28 January 2019. Retrieved from https://about.bnef.com/blog/corporate-clean-energy-buying-surged-new-record-2018/

[2] Analysis by CleanMax Solar.

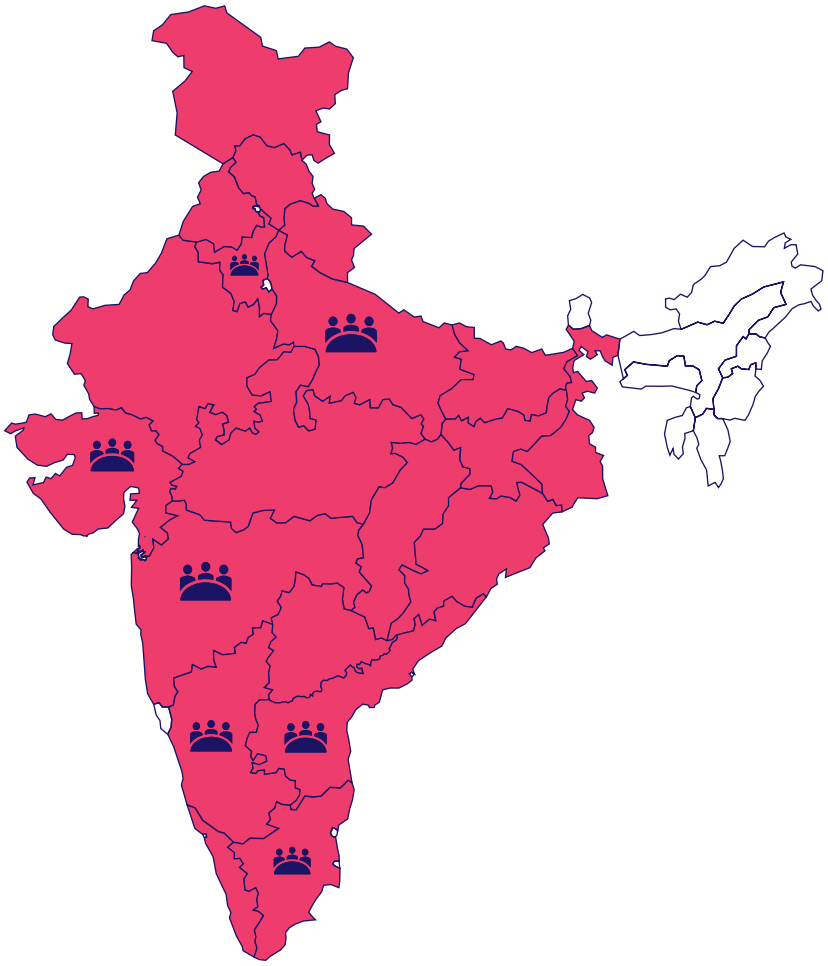
Reductions in wind and solar costs are making them competitive with thermal generation in many geographies.

Renewables reached grid parity – when a renewable source of energy costs the same as a conventional source of energy – about two years ago in India and many other countries, and have now gone beyond. In India, companies bid for solar and wind projects at well below the average cost of coal power procured by the National Thermal Power Corporation (NTPC), the national power generator.[3] Utilities worldwide, including in India, may face obstacles in moving immediately to cheaper and cleaner generation technologies. However, private electricity users can usually move faster than utilities.

Given that solar power is economical, scalable and relatively less dependent on location across India, it has taken the lion's share of corporate renewable procurement volumes. Wind power is a distant second for new capacity additions.

Solar power adoption by companies can take two forms: rooftop solar, where the solar capacity is deployed onsite and net metering is used to manage power supply and demand; and utility-scale solar, where an offsite project is set up and the public grid is used to wheel power to the corporate buyer under an open access mechanism.[4]

FIGURE 3: States where rooftop solar and utility-scale corporate PPAs are viable



States where rooftop solar is cost-effective

States where open access group captive solar is viable and cost-effective

[3] Dutta, Sanjay. (2017). "Solar power tariffs sink further below coal power at INR 2.44." Times of India. 12 May 2017. Retrieved from http://timesofindia.indiatimes.com/articleshow/58641464.cms.

[4] Open access mechanisms allow power consumers to wheel power from a generating asset to their premises by paying relevant regulatory fees and charges. For more information, see the WBCSD Accelerating corporate procurement of renewable energy in India report.

FIGURE 4: Percentage of demand that rooftop solar or open access solar can meet for various customer types[5]

Customer segment	Max. percentage of load typically met by rooftop solar	Percentage of load that utility scale open acess solar can meet
Educational Institutions	**~25%**	**50-80%**
Automotive Plant Manufacturing	**5-15%**	
Data Centers	**<1%**	
Commercial Buildings	**0-5%**	

Given the economics, companies in India see the adoption of rooftop solar as an obvious solution. But there are limits to the capacity each consumer can install: depending on a facility's size and power consumption, rooftop installations can typically supply only 10-15% of industrial facility demand, even less for a commercial building, hospital or data center. Increased demand for renewables has led companies to purchase power from utility-scale, open access or offsite power, which can meet 50-80% of a facility's power consumption.

Rooftop solar, which is less dependent on state policy, is commercially viable in all major states across India. Volumes across states in 2018 were well distributed.

Utility scale solar, on the other hand, is still dependent on state-wide open access charges and regulations. For this reason, the distribution of open access solar power capacity has been disproportionately high in states that have favorable regulations and charges. One state that stood out in 2018 was Karnataka.

Karnataka was the single largest market for open access renewables in 2018 due to the state's favorable solar policy, which provided a 10-year grid charge exemption for open access solar projects.

An estimated 100 corporate buyers signed long-term PPAs for solar in the state. Combined with government tenders, these open access projects catapulted Karnataka into the number one position among Indian states, with more than 6,000 MWp (megawatt peak) now operational. Many of the country's largest renewable developers installed capacity in the state, with CleanMax, Renew Power, Amplus and Avaada installing the largest volumes.

However, Karnataka has not extended its favorable open access policy into 2019.

[5] Analysis by CleanMax Solar.

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Policy and regulatory update

Broadly, central authorities set overarching rules for the sector, propose model policies for tariffs and dictate open access charges for interstate power sales.

In India, regulations issued by central authorities (government or regulators) and state regulations issued by government and regulators at the sub-national level control the electricity sector. Broadly, central authorities set overarching rules for the sector, propose model policies for tariffs and dictate open access charges for interstate power sales.

State authorities operate within the broad framework issued by central authorities to issue state-specific regulations, tariff orders and open access charges for the sale of power within their state.

Since the physical settlement of energy is the only permitted option to source renewables in India, a company can source renewable energy through following two routes:

- Onsite: behind the meter arrangements such as rooftop or backyard solar projects;
- Offsite: wheeling of power from renewable energy projects to the consumption point.

Our Accelerating corporate procurement of renewable energy in India report details the key provisions of net metering and open access regulations, the different types of open access charges, the rationale for their levy, and specific renewable energy exemptions.

Since the interface with the grid is an essential element of corporate renewable PPAs, they are heavily dependent on grid regulations, especially for offsite installations. Changes in open access regulation can impact their commercial viability. It is thus important for companies to consider these risks when they plan to source renewable power. In this paper, we cover major policy and regulatory changes announced in the last year or expected in near future.

STATE REGULATIONS

During 2018, many states announced changes in open access regulations. At first glance, these changes may appear to be negative as most were related to the withdrawal of incentives or benefits for open access renewable energy transactions. However, at the system level, as well as from a long-term perspective, we see these changes as a shift towards market-led growth as corporate PPA projects become economically viable without a need for incentives or waivers.

One such change is the tapering of banking benefits for renewable energy. In India, energy distributors allocate electricity on a 15-minute block basis, meaning that electricity companies match electricity generated during a 15-minute block with consumption recorded at the consumer during the same 15-minute block. If consumption is greater than generation, the consumer pays for the shortfall in energy delivered to the local distribution company – as per their electricity tariff. But if generation is higher than consumption, surplus generation gets lapsed.

To promote corporate sourcing of renewable energy, most states have provided banking benefits for renewable power. This has allowed renewable power companies to use an accounting duration of longer than 15 minutes, banking any surplus against any shortfall in subsequent months during the same financial year. This benefit has helped overcome vagaries in the variable nature of renewable energy generation, thus allowing companies to source a higher quantity of renewable power without requiring extra effort in forecasting and scheduling of renewable energy.

[6] In the context of India's power sector, model policies are standardized documents usually created by central government agencies that state government agencies can adopt with or without changes.

During the last few years, Indian states have tightened or withdrawn banking provisions for renewable power. Some of the major states have introduced a 15-minute settlement period for renewable power and others have restricted the withdrawal of banked energy to a few months. We expect this trend of tightening regulations to continue; over the next few years most states will require 15-minute settlement periods. If renewable power, which was close to 9% of India's total electricity generation in 2018-19, is to become mainstream, grid operators need to be able to manage the mismatch that arises due to banking. A lack of rationalized banking provisions could lower the grid operator's appetite for renewable capacity on the grid.

A few specific regulatory changes led by state governments in 2018 have impacted the sourcing of renewable power:

- As previously mentioned, Karnataka saw the highest renewable power capacity addition for corporate renewable procurement over the last couple of years due to waivers offered on most open access charges. This policy was instrumental in accelerating the growth of corporate PPAs in Karnataka, but the local government has not extended it beyond the 31 March 2018 deadline. However, the Karnataka Electricity Regulatory Commission (KERC) has issued a discussion paper on rooftop solar installations in Karnataka under the PPA model. This paper envisages 38 GW of cumulative grid-connected rooftop solar installations by 2022.
- The Appellate Tribunal for Electricity (APTEL) in Maharashtra delivered an important order on the levy of an additional surcharge on group captive PPA consumers by the state. APTEL held that the imposition of the additional surcharge on group captive consumers is against the provisions of the Electricity Act as there should be no distinction between a captive and group captive consumer. This is a positive ruling for group captive renewable energy consumers in the state. However, the Maharashtra Electricity Regulatory Commission (MERC) announced that it will no longer allow consumers to have more than one open access power supplier, thus reducing flexibility for corporate renewable PPA consumers.
- Haryana announced the waiver of open access charges for 10 years for solar power under its policy in 2018. However, a few months later, it modified this provision to limit waivers only to captive power projects. This is a setback for many players as it has created uncertainty and discouraged third-party PPA structures in the state.

CENTRAL REGULATIONS

The central government led several important regulatory changes in 2018 that have impacted renewable power sourcing:

- Until recently, the central government did not categorize large hydropower generation (>25 MW) as renewable energy. To promote hydropower plants and increase consumer usage of electricity generated by them, India's Ministry of Power issued a notification categorizing large hydropower projects (>25 MW) as renewable energy projects. We expect the government to announce a separate requirement to consume a minimum quantity of hydropower as part of the overall Renewable Energy Purchase Obligation (RPO) regulation.

- The Central Electricity Regulatory Commission (CERC) issued a discussion paper titled "Market Based Economic Dispatch of Electricity: Re-designing of Day-Ahead Market (DAM) in India". The proposed model described in the discussion paper would function on a day-ahead time horizon to schedule and dispatch all generation purely on economic principles, subject to technical constraints. CERC has directed the Power System Operation Corporation (POSOCO) to pilot this model. We expect this to increase liquidity in the short-term market, support new product development and reduce overall energy costs for the utility and for consumers.
- The Ministry of Power has issued guidelines allowing for the import and export of electricity and power trading with neighboring countries. Thus, utilities can export coal power (with certain restrictions), renewable power or hydropower to companies in neighboring countries directly or via trading licensees in India, after receiving government approval.
- The Ministry of New and Renewable Energy set up a Renewable Purchase Obligation (RPO) compliance department in early 2018 to coordinate and take up matters related to RPO non-compliance across states and to publish monthly reports/updates. We expect this to improve adherence to RPO requirements and promote renewable energy procurement.
- The central government proposed to rollout major reforms in the electricity sector through its draft Electricity (Amendment) Act 2018. However, the government was unable to enact this within its latest term. We expect the government to consider the reform again during its new five-year term, starting in 2019. Some of the major reforms in the proposal include:

  i. Mechanisms to improve consistency in open access rules across states;

  ii. Guidance on the appointment and performance review of central/state commissions (regulators) to ensure they are truly independent;

  iii. Separation of utilities' wire and supply businesses, thus promoting more competition at the distribution level;

  iv. Capping of some of the open access charges; and

  v. Direct benefit transfer (DBT) of subsidies to consumers, instead of cross-subsidization of tariffs.

In conclusion, we view the changes in the regulatory landscape for corporate renewable procurement across India as mixed. However, we see the overall transition to mainstreaming of renewable power and market-led growth models as positive developments for long-term certainty.

The government may undertake larger power sector reforms in its second term.

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Outlook for 2019

Much of the utility-scale renewable energy capacity addition for corporate renewable power procurement in India in 2018 came from Karnataka, led by a complete waiver of grid charges for wheeling of power for 10 years.

However, the local government has not extended this policy for new projects and other governments have not replicated it elsewhere, although some states are still providing limited waivers for shorter time periods.

These regulation changes are leading to growing corporate interest in market-led group captive projects.

Group captive projects are those where the consumer of the power holds at least 26% of the equity ownership. Under India's Electricity Act (2003), these projects are exempt from the cross-subsidy surcharge (CSS). CSS is the largest and most unpredictable component of grid charges for open access power. The Electricity Act protects fully compliant group captive projects from the CSS, making it a suitable way for corporate buyers to secure power at low costs and avoid regulatory uncertainty.

In the past, many companies have not considered group captive projects in order to avoid the complexity of holding shares in a project holding company. However, corporate buyers are increasingly accepting that group captive projects are the most cost-effective and low risk structures available to help them make further progress on their renewable sourcing targets.

While group captive projects offer a credible path to meeting corporate renewable sourcing targets, a word of caution is necessary as some developers have misused this mechanism in the past by structuring project holding companies such that they do not follow the spirit of the law. Corporate buyers should approach group captive projects only after ensuring that the developers have structured the projects in full compliance with the law and that experienced and ethical project developers have taken up the co-investment so as to not expose corporate buyers to undue project risks.

Predicting capacity addition for 2019 and beyond is difficult in the corporate renewable PPA segment, but there is no mistaking the overall trend. Fundamentally, the economics of solar power for corporate buyers continue to improve. With so many corporate buyers leading the way in solar procurement in 2018 in Karnataka, many others are looking to follow. Demand for group captive projects in large industrial states such as Maharashtra, Haryana, Andhra Pradesh and Telangana will likely fill the space vacated by the withdrawal of open access waivers in Karnataka.

Another nascent trend is the rise of group captive renewable projects over the procurement of traditional power on power exchanges. Most consumers compare the financial evaluation of group captive solar or wind to the cost of grid electricity, but a large number of companies also procure power on exchanges such as the Indian Energy Exchange (IEX). Companies that want to avoid power price volatility on the exchanges favor renewable power procurement via open access or group captive solar.

Indian Energy Exchange (IEX) has proposed Central Electricity Regulatory Commission (CERC) to allow trading of renewable energy on the exchange. In May 2019, CERC invited comments from stakeholders for Green – Day Ahead Markets (G-DAM) contracts. Launch of such contracts will be a positive development for the private renewable energy procurement market.

In addition to solar, wind can also play a larger role in corporate sourcing of renewables, as it has in the US in particular. However, this will require certain policy changes. In India, only six states are actively pursuing wind power generation. It is also highly seasonal, which makes it heavily reliant on the availability of favorable banking policies from states that need to allow companies to carry surplus generation over to subsequent months.

The underlying logic for renewable energy procurement by corporate buyers becomes stronger every year and underpins the growth in this sector. As the focus shifts from a single state (Karnataka) in 2018 to a broader range of states in 2019, corporate buyers need to keep track of regulatory developments in the states where they have operations and plan their energy sourcing strategy accordingly.

DISCLAIMER

This publication is released in the name of the World Business Council for Sustainable Development (WBCSD). This document is the result of a collaborative effort between WBCSD, CleanMax Solar, CLP India and representatives from companies participating in the India Corporate Renewable PPA Forum. A range of WBCSD members reviewed the material, thereby ensuring that the document broadly represents the majority view of the India Corporate Renewable PPA Forum. It does not mean, however, that every company within the forum agrees with every word. The paper has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice.

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ABOUT WBCSD'S RESCALE PROJECT

REscale brings together leading companies representing the full renewable energy value chain to accelerate the deployment of renewables and the transition to a low-carbon electricity system. REscale members share the ambition to scale up renewable deployment beyond average growth.

This paper builds on the previous WBCSD report on corporate renewable PPAs in India: Accelerating corporate procurement of renewable energy in India (June 2018), which discusses options for renewable power procurement in India and examines key PPA terms, regulatory landscapes and market barriers. It also delves into financing options and concludes with recommendations for corporate buyers. The platform undertaking this work is called the India Corporate Renewable PPA Forum.

To find out more about REscale, the Corporate Renewable PPA Forum and previous reports, visit our webpage or contact:

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ABOUT THE WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (WBCSD)

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD $8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. WBCSD is uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within the boundaries of our planet, by 2050.

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RE100

RE100 is a collaborative, global initiative uniting influential businesses committed to 100% renewable electricity, working to massively increase demand for – and the delivery of – renewable energy. Led by The Climate Group in partnership with CDP, RE100 brings together the world's most significant, ambitious and forward-thinking companies that are accelerating the transition to a zero emissions economy by committing to 100% renewable electricity across their operations.

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Green Power Market Development Group (GPMDG) India

Green Power Market Development Group (GPMDG) India is an industry-led initiative aimed at rapidly increasing the share of renewable energy in the overall energy consumption of commercial and industrial establishments. This will be accomplished by addressing the policy, regulatory and market barriers that currently impede the growth of renewable energy sector. GPMDG works with government agencies and other relevant institutions to help member companies voluntarily set and achieve their renewable energy goals.

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Renewable Energy Demand Enhancement (REDE)

The Renewable Energy Demand Enhancement (REDE) initiative aims to build an alliance among corporate buyers (commercial and industrial consumers) to increase commitments to renewable energy procurement and to catalyze solutions to address challenges that are significantly restricting demand. By means of developing an appropriate interface between buyers, suppliers and policy-makers, the initiative intends to create a cohesive and informed market to meet corporate renewable energy demand. REDE is built on the success of the Renewable Energy Buyers Alliance (REBA) founded in June 2016 in the USA.

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